Project Guide

for

VETERINARY EQUIPMENT

JEFFERSON COUNTY ANIMAL CARE FACILITY
PROJECT NO.: PW19B035BLD

4848 STATE ROUTE 30
HOUSE SPRINGS, MO 63501

Jefferson County Department of Public Works
729 Maple Street
P.O. Box 100
Hillsboro, MO 63050

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Rm #	Rm Name	No.	Description	Exist/New	Qty	OF/CI/VI	Make	Model	Options	Depth Length (in)	Width (in)	Height (in)	Weight (lb)	Struc. Wgt (lb)	Electrical	Data	Water	Exhaust	BTU	Notes
102	Reception Area, Adoptions	410.01	Hook, Leash	N	4	OFCI	Bobrick	B-6727												
102	Waiting Area (Adopters & Reclaimers)	634	Monitor, Display, Wall Mount,	N	1	OFVI	Dell	D32118HN		28.7	0.3	18.9	16.09	20	120V	Yes				
102	Waiting Area (Adopters & Reclaimers)	634.02	Monitor, Bracket, Wall Mount, Articulating 10"-29"	N	1	OFCI	Peerless-AV	TVT624												
103	Waiting Area (Surrenders & Finders)	634	Monitor, Display, Wall Mount,	N	1	OFVI	Dell	D32118HN		28.7	0.3	18.9	16.09	20	120V	Yes				
103	Waiting Area (Surrenders & Finders)	634.02	Monitor, Bracket, Wall Mount, Articulating 10"-29"	N	1	OFCI	Peerless-AV	TVT624												
103	Waiting, Surrender & Finders	681	Cabinet, Fire Extinguisher	N	1	CFCI	Larsen	24096R-FG		6	9.5	24								
104	Reception Area	631	Computer, Desktop	N	4	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
104	Reception Area	642	Multi-function Device	N	1	OFVI	Konica Minolta	bizhub 25e												
104	Reception Area, Surrenders	410.01	Hook, Leash	N	4	OFCI	Bobrick	B-6727												
106	Admissions, Exam Room	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
106	Admissions, Exam Room	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
106	Admissions, Exam Room	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
106	Admissions, Exam Room	562	Table, Exam, Peninsula, Lift, Foot Operated, Scale	N	1	OFCI	Midmark Animal Health	110-0310-21		44	22	90		300	120V					
106	Admissions, Exam Room	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
106	Admissions, Exam Room	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
106	Admissions, Exam Room	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
107	Temporary Cat Holding	330.01	Cage, Cat, Holding	N	6	OFCI	Snyder	B3		25.75	46.75	67.5								
107	Temporary Cat Holding	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
107	Temporary Cat Holding	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
107	Temporary Cat Holding	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
108	Temporary Dog Holding	333	Cage, Dog, Holding	N	1	OFCI	Snyder	F		25.75	46.75	31.5								
108	Temporary Dog Holding	333.01	Cage, Dog, Holding	N	2	OFCI	Snyder	B3		25.75	46.75	22.5								
108	Temporary Dog Holding	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
108	Temporary Dog Holding	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
108	Temporary Dog Holding	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
109	Reception Area	410.01	Hook, Leash	N	4	OFCI	Bobrick	B-6727												
109	Reception Area	631	Computer, Desktop	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
109	Reception Area	642	Multi-function Device	N	1	OFVI	Konica Minolta	bizhub 25e												
111	SNC/SMC Waiting Area	681	Cabinet, Fire Extinguisher	N	1	CFCI	Larsen	24096R-FG		6	9.5	24								
112	SNC/SMC Exam Room #1	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
112	SNC/SMC Exam Room #1	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
112	SNC/SMC Exam Room #1	451	Disposal, Syringe, Wall Enclosure	N	2	OFCI	Cardinal Health (5 QT)	85161H	Service Contract											
112	SNC/SMC Exam Room #1	552	Table, Exam, Wall Mount, Perpendicular	N	1	OFCI	Midmark Animal Health	101-1640-00		44	22	36								
112	SNC/SMC Exam Room #1	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
112	SNC/SMC Exam Room #1	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
112	SNC/SMC Exam Room #1	634	Monitor, Display, Wall Mount,	N	1	OFVI	Dell	D32118HN		28.7	0.3	18.9	16.09	20	120V	Yes				
112	SNC/SMC Exam Room #1	634.02	Monitor, Bracket, Wall Mount, Articulating 10"-29"	N	1	OFCI	Peerless-AV	TVT624												
112	SNC/SMC Exam Room #1	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
113	SNC/SMC Exam Room #2	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
113	SNC/SMC Exam Room #2	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
113	SNC/SMC Exam Room #2	451	Disposal, Syringe, Wall Enclosure	N	2	OFCI	Cardinal Health (5 QT)	85161H	Service Contract											
113	SNC/SMC Exam Room #2	552	Table, Exam, Wall Mount, Perpendicular	N	1	OFCI	Midmark Animal Health	101-1640-00		44	22	36								
113	SNC/SMC Exam Room #2	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
113	SNC/SMC Exam Room #2	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
113	SNC/SMC Exam Room #2	634	Monitor, Display, Wall Mount,	N	1	OFVI	Dell	D32118HN		28.7	0.3	18.9	16.09	20	120V	Yes				
113	SNC/SMC Exam Room #2	634.02	Monitor, Bracket, Wall Mount, Articulating 10"-29"	N	1	OFCI	Peerless-AV	TVT624												
113	SNC/SMC Exam Room #2	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
115	Medication/Dispensing, Lab	145.01	Refrigerator, Undercounter, Locking, Temp Display	N	1	OFCI	Summit	FF6L7NZ		23.5	23.63	33.5			120V					
115	Medication/Dispensing, Lab	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
115	Medication/Dispensing, Lab	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
115	Medication/Dispensing, Lab	512	Analyzer, Blood (22 Parameters)	N	1	OFOI	Abaxis	VETSCAN HM5		10.6	12.5	14			100-240V					
115	Medication/Dispensing, Lab	514	Analyzer, Electrolyte	N	1	OFOI	DiaSys	x-pedite ise vet		13.2	12.4	12	14							
115	Medication/Dispensing, Lab	515	Centrifuge, Microhematocrit	N	2	OFOI	LW Scientific	V24T												
115	Medication/Dispensing, Lab	516	Centrifuge, Fecal	N	1	OFOI	LW Scientific	Universal Centrifuge												
115	Medication/Dispensing, Lab	517	Microscope / USB Camera	N	1	OFOI	AmScope	40X-2000X 3W LED							115V					
115	Medication/Dispensing, Lab	720	Eyewash, Deck Mounted	N	1	CFCI	Haws	76i10									1/2" CW			
115	Medication/Dispensing, Lab	773	Electrical, Power Strip, Multi-Plug 15A	N	1	CFCI	Legrand	2000												
115	Medication/Dispensing, Lab	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
116	SNC/SMC Staff, Unisex, Restroom	411	Mirror	N	1	CFCI	Bobrick	B-293-1830		4.25	18	30								
116	SNC/SMC Staff, Unisex, Restroom	433	Grab Bar, Toilet	N	1	OFCI	Bobrick	B-6897		54	42									

Rm #	Rm Name	No.	Description	Exist/New	Qty	OF/CI/VI	Make	Model	Options	Depth Length (in)	Width (in)	Height (in)	Weight (lb)	Struc. Wgt (lb)	Electrical	Data	Water	Exhaust	BTU	Notes
116	SNC/SMC Staff, Unisex, Restroom	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
116	SNC/SMC Staff, Unisex, Restroom	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
116	SNC/SMC Staff, Unisex, Restroom	446	Dispenser, Toilet, Paper	N	1	OFCI	Bobrick	B-2890			42									
117	Janitor	480	Shelf, Mop	N	1	OFCI	Eagle	US0824-16/3		8	24	6.5								
117	Janitor	822	Dispenser, Chemical	N	1	OFCI	Diversy	3764735	Air Gap	7.5	18.5	24.25		30						
119	SNC/SMC Medical Offices	631	Computer, Desktop	N	2	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
120	Lab Waste Storage	174	Shelf, Wall Mount, 36"	N	1	OFCI	Advance Tabco	WS-15-36-16		36	15									
120	Lab Waste Storage	827	Bin, Bio-Hazard with Lid / Dolly	N	2	OFOI	Rubbermaid	FG352600RED	28 Gallon											
121	Radiology Room (Digital)	182.01	Shelf, Wall Mtd, Stainless Steel	N	1	OFCI	Advance Tabco	AWS-KD-24		24	12	10.5								Over Ultrasound
121	Radiology Room (Digital)	533	Ultrasound	N	1	OFVI	GE	LOGIQ V5 Vet												
121	Radiology Room (Digital)	575	X-ray, Table / Head / Bucky	N	1	OFVI	MyVet	i72W		59.1	25.2	80			280/230 VAC Single Phase					
121	Radiology Room (Digital)	575.01	Immobilizer	N	1	OFOI	Wolf X-Ray	80-224CC	Large											
121	Radiology Room (Digital)	575.02	Immobilizer	N	1	OFOI	Wolf X-Ray	80-215CB	Medium											
121	Radiology Room (Digital)	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
121	Radiology Room (Digital)	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
121	Radiology Room (Digital)	711	Outlet, Oxygen	N	2	OFCI	Hospital Systems Inc.	Oxygen	299056-OXY											
121	Radiology Room (Digital)	712	Outlet, Vacuum WAGD	N	2	OFCI	Hospital Systems Inc.	Vacuum	299059-WAGD											
121	Radiology Room (Digital)	817	Rack, Apron, Lead, Mobile	N	1	OFOI	Infab	683419	(6) Box Hangers	25	27	78								
122	Pre-Op Holding Area	332.01	Cage, Standard, Stainless Steel	N	3	OFCI	Midmark Animal Health	160-4836-00	Double Door	28	48	36								
122	Pre-Op Holding Area	332.04	Cage, Standard, Stainless Steel	N	6	OFCI	Midmark Animal Health	160-3630-00	Single Door	28	36	30								
122	Pre-Op Holding Area	452	Track, IV	N	2	OFCI	C/S Cubicle Curtains	17000	17100 IV Pendant (3)	48										
122	Pre-Op Holding Area	711	Outlet, Oxygen	N	2	OFCI	Hospital Systems Inc.	Oxygen	299056-OXY											
122	Pre-Op Holding Area	774	Electrical, Cord Drop	N	2	OFCI	Hospital Systems Inc.	1 Duplex	299098											
123	Pack Prep Area	166.01	Washer, Commercial	N	1	OFCI	LG	WM1388HW		27.75	24	33.5			120V/10A					
123	Pack Prep Area	166.02	Dryer, Commercial, 40 LB	N	1	OFCI	LG	DLEC888W		25.25	24	33.5			240V/30A					
123	Pack Prep Area	182.01	Shelf, Wall Mtd, Stainless Steel	N	1	OFCI	Advance Tabco	AWS-KD-36		36	12	10.5								
123	Pack Prep Area	441.01	Dispenser, Towel, Paper	N	1	OFCI	Bobrick	B-29744	Semi-Recessed	5.06	17.18	9.13								
123	Pack Prep Area	443.01	Dispenser, Soap, Touchless	N	1	OFCI	Steris	SDS	Touchless Adapter											
123	Pack Prep Area	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
123	Pack Prep Area	511.02	Autoclave, Steam, Countertop	N	1	OFVI	Tuttnauer	EZ10		21.5	20	14.4			120V/12A					
123	Pack Prep Area	810	Cleaner, Ultrasonic, Countertop	N	1	OFVI	Coltene/BioSonic	UC150/60021987	60022042 Accessory Kit	10.8	13.6	14								
123	Pack Prep Area	815	Box, Glove, Wall Mount	N	2	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
123	Pack Prep Area	819	Cabinet, Surgical, Pass-Thru	N	1	OFCI	Tristar	70050		12	36	36								
123	Pack Prep Area	819.01	Panel, Louver	N	1	OFCI	Quantum Storage	QLP-4819CO	Assortment of Bins		48	19	18							
123	Pack Prep Area	820	Dispenser, Sterile Paper	N	1	OFCI	Duralov	DL-RD-WM-36		6	38	10								
124	SNC/SMC Surgery	571	Table, Surgical, V-Top, 60"	N	2	OFVI	Midmark Animal Health	100-4071-00	Non-Heated Top	60	20.25	33.5 - 39.5								
124	SNC/SMC Surgery	592	Light, Surgical, Double Head	N	2	OFVI	Startrol	8X4-GS2							100-240V					
124	SNC/SMC Surgery	595	Electrosurgery, Cauterizer	N	1	OFVI	Apyx Medical Corporation	Bovie 1250S-V	Smoke Shark System and Mobile Stand											
124	SNC/SMC Surgery	595.01	Electrosurgery, Smoke Evacuator	N	1	OFVI	Apyx Medical Corporation	Shark System SE02												
124	SNC/SMC Surgery	595.01	Electrosurgery. Stand	N	1	OFVI	Apyx Medical Corporation	ESMS2 Mobile Stand												
124	SNC/SMC Surgery	634	Monitor, Display, 55"	N	2	OFVI	Sony	LMD-X550MD		3.4	49.9	30.4	35		110V/3.2A					
124	SNC/SMC Surgery	634.01	Mount, Display, 24" Clg. Mount	N	2	OFCI	GCX Solutions	FLP-0010-20												
124	SNC/SMC Surgery	682	Clock, Battery Operated, Wall Mount	N	1	OFCI	Global Industrial	T9F695324	Radio Controlled	2.5	14	14								
124	SNC/SMC Surgery	711	Outlet, Oxygen	N	2	OFCI	Hospital Systems Inc.	Oxygen	299056-OXY											
124	SNC/SMC Surgery	712	Outlet, Vacuum WAGD	N	2	OFCI	Hospital Systems Inc.	Vacuum	299059-WAGD											
124	SNC/SMC Surgery	774	Electrical, Cord Drop	N	2	OFCI	Hospital Systems Inc.	1 Duplex	299098											
124	SNC/SMC Surgery	812	Suction, Portable	N	2	OFOI	Gomco	G-180		7.5	16.8	9.4	11							
124	SNC/SMC Surgery	813	Cart, Treatment, 4 Drawer	N	1	OFOI	Harloff	ETC-4		15.13	23.38	27.25	60							
124	SNC/SMC Surgery	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
124	SNC/SMC Surgery	816	Rack, Endotracheal	N	1	OFCI	Jorgensen Labs	J0160A												
124	SNC/SMC Surgery	818	Stand, Mayo	N	2	OFOI	Medline Industries													
124	SNC/SMC Surgery	826	Cart, Supply	N	1	OFVI	Mass Medical	MX610DHG	Custom Fit for Tubes and Supplies	26	45.12	78.75								
125	SNC/SMC Treatment & Surgery Prep	332.01	Cage, Standard, Stainless Steel	N	3	OFCI	Midmark Animal Health	160-4836-00	Double Door	28	48	36								
125	SNC/SMC Treatment & Surgery Prep	332.04	Cage, Standard, Stainless Steel	N	6	OFCI	Midmark Animal Health	160-3630-00	Single Door	28	36	30								
125	SNC/SMC Treatment & Surgery Prep	441	Dispenser, Towel, Paper	N	2	OFCI	Bobrick	B-262		4	10.8	14.1								
125	SNC/SMC Treatment & Surgery Prep	443.01	Dispenser, Soap, Touchless	N	2	OFCI	Steris	SDS	Touchless Adapter											
125	SNC/SMC Treatment & Surgery Prep	444	Dispenser, Sanitizer	N	4	OFCI	Steris	2D53-Q7/2D45-OK												
125	SNC/SMC Treatment & Surgery Prep	451	Disposal, Syringe, Wall Enclosure	N	2	OFCI	Cardinal Health (5 QT)	85161H	Service Contract											
125	SNC/SMC Treatment & Surgery Prep	452	Track, IV	N	5	OFCI	C/S Cubicle Curtains	17000	17100 IV Pendant (3)	48										
125	SNC/SMC Treatment & Surgery Prep	531	Dental, Arm, Cabinet Mount	N	1	OFVI	Midmark Animal Health	VetPro 5000	With Oil Free Compressor											
125	SNC/SMC Treatment & Surgery Prep	531.01	Dental Prophylaxis, Sensor, Wall Mount	N	1	OFVI	Midmark Animal Health	VetPro DR												
125	SNC/SMC Treatment & Surgery Prep	542	X-Ray, Dental, Wall Mount	N	1	OFVI	iM3	CR7 Vet Dental					95		240					
125	SNC/SMC Treatment & Surgery Prep	542.1	Computer, Dental Imaging System	N	1	OFVI	Midmark Animal Health	VetPro CR												
125	SNC/SMC Treatment & Surgery Prep	573	Table, Treatment, Wet	N	1	OFCI	Midmark Animal Health	8003-005-00-XXX	3 Drawers, Racks, Custom Color , Integrated Handle	25	60	36		275						

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125	SNC/SMC Treatment & Surgery Prep	573.01	Table, Treatment, Wet, Tub	N	1	OFCI	Midmark Animal Health	8003-005-00-XXX	Tub	25	60	36		275						
125	SNC/SMC Treatment & Surgery Prep	573.02	Table, Treatment, Dry	N	1	OFCI	Midmark Animal Health	8007-007-00-XXX	Custom Color	26	61	36		230						
125	SNC/SMC Treatment & Surgery Prep	593	Light, Treatment	N	2	OFVI	Midmark Animal Health	255 LED	Single Head LED					65	115					
125	SNC/SMC Treatment & Surgery Prep	593.1	Light, Dental LED	N	1	OFVI	Midmark Animal Health Henry Schein		003-1287-00 Ceiling Track with Monitor											
125	SNC/SMC Treatment & Surgery Prep	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
125	SNC/SMC Treatment & Surgery Prep	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
125	SNC/SMC Treatment & Surgery Prep	711	Outlet, Oxygen	N	2	OFCI	Hospital Systems Inc.	Oxygen	299056-OXY											
125	SNC/SMC Treatment & Surgery Prep	713	Outlet, Vacuum	N	2	OFCI	Hospital Systems Inc.	Vacuum	299055-VAC											
125	SNC/SMC Treatment & Surgery Prep	774	Electrical, Cord Drop	N	2	OFCI	Hospital Systems Inc.	1 Duplex	299098											
125	SNC/SMC Treatment & Surgery Prep	774.1	Low Voltage, Cord Drop	N	2	OFCI	Hospital Systems Inc.	1 Data	299100											
126	Post Op Recovery	332.01	Cage, Standard, Stainless Steel	N	3	OFCI	Midmark Animal Health	160-4836-00	Double Door	28	48	30								
126	Post Op Recovery	333	Cage, Standard, Stainless Steel	N	6	OFCI	Midmark Animal Health	160-3630-00	Single Door	28	36	30								
126	Post Op Recovery	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
126	Post Op Recovery	711	Outlet, Oxygen	N	2	OFCI	Hospital Systems Inc.	Oxygen	299056-OXY											
126	Post Op Recovery	713	Outlet, Vacuum	N	2	OFCI	Hospital Systems Inc.	Vacuum	299055-VAC											
126	Post Op Recovery	774	Electrical, Cord Drop	N	2	OFCI	Hospital Systems Inc.	1 Duplex	299098											
126	Post Op Recovery	774.1	Low Voltage, Cord Drop	N	2	OFCI	Hospital Systems Inc.	1 Data	299100											
126	Post Op Recovery	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
126	SNC/SMC Treatment & Surgery Prep	523	Floor Scale	N	1	OFCI														
127	Field Supervisor Officers	631	Computer, Desktop	N	3	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
127	Field Supervisor Officers	642	Multi-function Device	N	1	OFVI	Konica Minolta	bizhub 25e												
127	SNC/SMC Treatment & Surgery Prep	523.01	Floor Scale - Readout	N	1	OFOI														
128	Animal Control Officers	631	Computer, Desktop	N	6	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
128	SNC/SMC Treatment & Surgery Prep	553	Gurney	N	1															
129	Changing Room	411	Mirror	N	1	CFCI	Bobrick	B-293-1830		4.52	40	30								
130	Changing Room (ACCESSIBLE)	411	Mirror	N	1	CFCI	Bobrick	B-293-1830		4.52	40	30								
131	Departure Closet	140	Freezer, chest 8.8 CF	N	1	OFVI	Summit Appliance	SCFM162	KEYPAD/DT	27.5	55.75	33			115V					
132	Quarantine Bite Dog Housing - Exercise Runs	380	Run, Panel, Divider, 48"	N	3	OFCI		1048-SP												
132	Quarantine Bite Dog Housing - Exercise Runs	382	Run, Gate, 12" Glass Side Panel	N	4	OFCI		1036-KD / Side Partition												
132	Quarantine Bite Dog Housing - Exercise Runs	387	Run, Transfer Door, Surface Mtd	N	4	OFCI														
132	Quarantine Bite Dog Housing - Exercise Runs	390	Run, Bench	N	4	OFCI		1048-RB												
132	Quarantine Bite Dog Housing - Exercise Runs	441	Dispenser, Towel, Paper	N	2	OFCI	Bobrick	B-262		4	10.8	14.1								
132	Quarantine Bite Dog Housing - Exercise Runs	443.01	Dispenser, Soap, Touchless	N	2	OFCI	Steris	SDS	Touchless Adapter											
132	Quarantine Bite Dog Housing - Exercise Runs	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
132	Quarantine Bite Dog Housing - Exercise Runs	751	System, Cleaning, Hose Reel,	N	1	OFVI	SMT	SMT-300HDR	Provide Hose and Spray Wand	24	41	41								
132	Quarantine Bite Dog Housing - Exercise Runs	751.1	Hose Reel, Ceiling Mounted (50')	N	1	OFCI	SMT	300-5025	Extended Spray Wand.											
132	Quarantine Bite Dog Housing - Exercise Runs	751.1	System, Cleaning, Hose Reel, Mixing Box	N	1	OFVI	SMT	300-5213	Surface Remote Station	2.125	8.5	6.5								
132	Quarantine Bite Dog Housing - Exercise Runs	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
133	Quarantine Bite Dog Housing - Resting Runs	380	Run, Panel, Divider, 48"	N	3	OFCI		1048-SP												
133	Quarantine Bite Dog Housing - Resting Runs	382	Run, Gate, 12" Glass Side Panel	N	4	OFCI		1036-KD / Side Partition												
133	Quarantine Bite Dog Housing - Resting Runs	441	Dispenser, Towel, Paper	N	2	OFCI	Bobrick	B-262		4	10.8	14.1								
133	Quarantine Bite Dog Housing - Resting Runs	443.01	Dispenser, Soap, Touchless	N	2	OFCI	Steris	SDS	Touchless Adapter											
133	Quarantine Bite Dog Housing - Resting Runs	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
133	Quarantine Bite Dog Housing - Resting Runs	740	Waste-Flush Drain Activator Button	N	3	CFCI	Zurn Sloan	Z-300-C-WB-FG 110ESS(3450147)	w/ Trap 3/4" Tap & Water Supply Control Box, Remote Flush Valve											
133	Quarantine Bite Dog Housing - Resting Runs	751.1	System, Cleaning, Hose Reel, Mixing Box	N	1	OFVI	SMT	300-5213	Surface Remote Station	2.125	8.5	6.5								
133	Quarantine Bite Dog Housing - Resting Runs	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
134	Isolation, Infectious (Parvo)	330	Cage, Isolation	N	4	OFCI	Mason	ISO-CARE		36.25	30.75	81.5			115V					
134	Isolation, Infectious (Parvo)	441	Dispenser, Towel, Paper	N	1	OFCI	Bobrick	B-262		4	10.8	14.1								
134	Isolation, Infectious (Parvo)	443.01	Dispenser, Soap, Touchless	N	1	OFCI	Steris	SDS	Touchless Adapter											
134	Isolation, Infectious (Parvo)	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
134	Isolation, Infectious (Parvo)	550.01	Table, Exam Wall Hugger, Parallel	N	1	OFCI	Midmark Animal Health	101-2740-00		44	22		200							
134	Isolation, Infectious (Parvo)	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
134	Isolation, Infectious (Parvo)	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
134	Isolation, Infectious (Parvo)	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
135	Quarantine Bite Dog Housing - Isolation	333	CAGE-30x48	N	4	OFCI														
135	Quarantine Bite Dog Housing - Isolation	441	Dispenser, Towel, Paper	N	1	OFCI	Bobrick	B-262		4	10.8	14.1								
135	Quarantine Bite Dog Housing - Isolation	443.01	Dispenser, Soap, Touchless	N	1	OFCI	Steris	SDS	Touchless Adapter											
135	Quarantine Bite Dog Housing - Isolation	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
135	Quarantine Bite Dog Housing - Isolation	451	Disposal, Syringe, Wall Enclosure	N	1	OFCI	Cardinal Health (5 QT)	85161H	Service Contract											

Rm #	Rm Name	No.	Description	Exist/New	Qty	OF/CI/VI	Make	Model	Options	Depth Length (in)	Width (in)	Height (in)	Weight (lb)	Struc. Wgt (lb)	Electrical	Data	Water	Exhaust	BTU	Notes
135	Quarantine Bite Dog Housing - Isolation	550.01	Table, Exam Wall Hugger, Parallel	N	1	OFCI	Midmark Animal Health	101-2740-00		44	22		200							
135	Quarantine Bite Dog Housing - Isolation	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
135	Quarantine Bite Dog Housing - Isolation	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
135	Quarantine Bite Dog Housing - Isolation	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
136	Quarantine Bite Dog Housing - Resting	380	Run, Panel, Divider, 48"	N	3	OFCI		1048-SP												
136	Quarantine Bite Dog Housing - Resting	382	Run, Gate, 12" Glass Side Panel	N	4	OFCI		1036-KD / Side Partition												
136	Quarantine Bite Dog Housing - Resting	387	Run, Transfer Door, Surface Mtd	N	6	OFCI														
136	Quarantine Bite Dog Housing - Resting	390	Run, Bench	N	6	OFCI		1048-RB												
136	Quarantine Bite Dog Housing - Resting	441	Dispenser, Towel, Paper	N	1	OFCI	Bobrick	B-262		4	10.8	14.1								
136	Quarantine Bite Dog Housing - Resting	443.01	Dispenser, Soap, Touchless	N	1	OFCI	Steris	SDS	Touchless Adapter											
136	Quarantine Bite Dog Housing - Resting	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
136	Quarantine Bite Dog Housing - Resting	740	Waste-Flush Drain Activator Button	N	3	CFCI	Zurn Sloan	Z-300-C-WB-FG 110ESS(3450147)	w/ Trap 3/4" Tap & Water Supply Control Box, Remote Flush Valve											
136	Quarantine Bite Dog Housing - Resting	751.1	System, Cleaning, Hose Reel, Mixing Box	N	1	OFVI	SMT	300-5213	Surface Remote Station	2.125	8.5	6.5								
136	Quarantine Bite Dog Housing - Resting	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
137	Quarantine Bite Dog Housing - Exercise	380	Run, Panel, Divider, 48"	N	3	OFCI		1048-SP												
137	Quarantine Bite Dog Housing - Exercise	382	Run, Gate, 12" Glass Side Panel	N	4	OFCI		1036-KD / Side Partition												
137	Quarantine Bite Dog Housing - Exercise	441	Dispenser, Towel, Paper	N	1	OFCI	Bobrick	B-262		4	10.8	14.1								
137	Quarantine Bite Dog Housing - Exercise	443.01	Dispenser, Soap, Touchless	N	1	OFCI	Steris	SDS	Touchless Adapter											
137	Quarantine Bite Dog Housing - Exercise	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
137	Quarantine Bite Dog Housing - Exercise	451	Disposal, Syringe, Wall Enclosure	N	2	OFCI	Cardinal Health (5 QT)	85161H	Service Contract											
137	Quarantine Bite Dog Housing - Exercise	740	Waste-Flush Drain Activator Button	N	3	CFCI	Zurn Sloan	Z-300-C-WB-FG 110ESS(3450147)	w/ Trap 3/4" Tap & Water Supply Control Box, Remote Flush Valve											
137	Quarantine Bite Dog Housing - Exercise	751.1	System, Cleaning, Hose Reel, Mixing Box	N	1	OFVI	SMT	300-5213	Surface Remote Station	2.125	8.5	6.5								
137	Quarantine Bite Dog Housing - Exercise	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
138	Oxygen Closet	714	Rack, 'H' Cylinder, Wall Mount	N	1	OFCI	WT Farley	CR-WM200		7.75	1.5	20.5								
138	Oxygen Closet	716	Generator, Oxygen	N	1	OFVI	Summit Hill Laboratories	VGS5015	50 PSI, 15, LPM	25	17	38		220	230V					
139	Bathing, Dog	410.01	Hook, Leash	N	2	OFCI	Bobrick	B-211		3.5	2.75	2.75								
139	Bathing, Dog	524	Dryer, Dbl Motor	N	1	OFOI	Go Pet Club	DT-505												
139	Bathing, Dog	526	Bathing System	N	2	OFCI	Oster	BathPro 5.1	Hydrosurge								5GPM			
139	Bathing, Dog	590	Tub, Grooming, Bathing (Splash / Ramp)	N	1	OFCI	Midmark Animal Health	105-0446-10	Ramp on Right Side	60	25	58.5								
140	Clerical Area	642	Multi-function Device	N	1	OFVI	Konica Minolta	bizhub 25e												
141	Clean Supply / Mop	480	Shelf, Mop	N	1	OFCI	Eagle	US0824-16/3		8	24	6.5								
141	Clean Supply / Mop	822	Dispenser, Chemical	N	1	OFCI	Diversy	3764735	Air Gap	7.5	18.5	24.25		30						
143	Restroom, Staff, Male, Shower	433	Grab Bar, Toilet	N	1	CFCI	Bobrick	B-6897		54	42									
143	Restroom, Staff, Male, Shower	433.01	Grab Bar, Shower	N	1	CFCI	Bobrick	B-6806x30												
143	Restroom, Staff, Male, Shower	433.02	Seat, Shower	N	1	CFCI	Bobrick	B-207x36												
143	Restroom, Staff, Male, Shower	433.03	Curtain, Shower / Rod / Hook	N	1	CFCI	Bobrick	B-204-1/B-204-2												
143	Restroom, Staff, Male, Shower	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
143	Restroom, Staff, Male, Shower	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
143	Restroom, Staff, Male, Shower	446	Dispenser, Toilet, Paper	N	1	OFCI	Bobrick	B-2890			42									
144	Restroom, Staff, Female, Shower	433	Grab Bar, Toilet	N	1	CFCI	Bobrick	B-6897		54	42									
144	Restroom, Staff, Female, Shower	433.01	Grab Bar, Shower	N	1	CFCI	Bobrick	B-6806x30												
144	Restroom, Staff, Female, Shower	433.02	Seat, Shower	N	1	CFCI	Bobrick	B-207x36												
144	Restroom, Staff, Female, Shower	433.03	Curtain, Shower / Rod / Hook	N	1	CFCI	Bobrick	B-204-1/B-204-2												
144	Restroom, Staff, Female, Shower	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
144	Restroom, Staff, Female, Shower	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
144	Restroom, Staff, Female, Shower	446	Dispenser, Toilet, Paper	N	1	OFCI	Bobrick	B-2890			42									
145	Break Room, Staff / Volunteers	120	Coffee, Maker	N	1	OFOI	Keurig	K155	Direct Water Connect/Filter											
145	Break Room, Staff / Volunteers	121	Microwave, Commercial, Counter	N	1	OFOI	Summit Appliance	SCM1000SS		14.75	20.25	12.25			115V					
145	Break Room, Staff / Volunteers	122	Dispenser, Water, Filtered	N	1	OFVI	Waterlogic	WL800 Max II		20.1	16.9	49.2			110V/60Hz		1/2" NPT			
145	Break Room, Staff / Volunteers	144.01	Regrigerator, Commercial (18 CF)	N	1	OFOI	Summit Appliance	BKRF18SS		30	29.63	67.63			115V					
145	Break Room, Staff / Volunteers	163	Disposal, Garbage	N	1	OFCI	Emerson, Insinkerator	Evolution Septic Assist 76006							115/1Ph/5.7A					
145	Break Room, Staff / Volunteers	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
145	Break Room, Staff / Volunteers	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
145	Break Room, Staff / Volunteers	671	Lockers, Half-Height	N	21	OFCI	Salisbury Industries	37165	4" Base	18	12	72								
145	Break Room, Staff / Volunteers	811	Oven, Toaster	N	1	OFOI	Waring	WCO250X		21	19	12			120V/14A					
146	File Room	670	File Cabinet Lateral - 5 Drawer	N	3	OFOI	Hon	H695		19.25	42	67								
147	Food Prep Kitchen (Dogs)	121	Microwave, Commercial, Counter	N	1	OFOI	Summit Appliance	SCM1000SS		14.75	20.25	12.25			115V					
147	Food Prep Kitchen (Dogs)	144.01	Regrigerator, Commercial (18 CF)	N	2	OFVI	Summit Appliance	BKRF18SS		30	29.63	67.63			115V					
147	Food Prep Kitchen (Dogs)	163	Disposal, Garbage	N	1	OFCI	Emerson, Insinkerator	Evolution Septic Assist 76006							115/1Ph/5.7A					
147	Food Prep Kitchen (Dogs)	173	Cart, Utility	N	2	OFCI	Inter Metro Industries	MY 1627-34BU		35.5	18.3	31.5	34							
147	Food Prep Kitchen (Dogs)	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
147	Food Prep Kitchen (Dogs)	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
147	Food Prep Kitchen (Dogs)	450	Dispenser, Food (40 lb)	N	2	OFCI	Bergan	11732	Wall Mounting Bracket	11.25	15.75	26.13		200						
147	Food Prep Kitchen (Dogs)	814.01	Table, Work, SSl w/ Dbl Sink, Drainboard L/R	N	1	OFCI	Aero Mfg	MF2-2418-30LR		96	24	35								
147	Food Prep Kitchen (Dogs)	825	Table, Work, Stainless Steel (78")	N	1	OFCI	Aero Mfg	2F1-3020-78LR	Custom	30	78	35								
147	Food Prep Kitchen, Canine	174.01	Shelf, Wire, Wall Mount	N	2	OFCI	Inter Metro Industries	12WS32C		38.25	12									

Rm #	Rm Name	No.	Description	Exist/New	Qty	OF/CI/VI	Make	Model	Options	Depth Length (in)	Width (in)	Height (in)	Weight (lb)	Struc. Wgt (lb)	Electrical	Data	Water	Exhaust	BTU	Notes
150	Clerical Area	642	Multi-function Device	N	1	OFVI	Konica Minolta	bizhub 25e												
151	Closet, WAGD	717	Gas, Scavenging, WAGD	N	1	OFVI	Midmark Animal Health	Matrx												
152	Power Wash Pump Room (SMT)	752	System, Cleaning, Central Station	N	1	OFVI	SMT	SMT-600REK SS	Sized by Vendor (48" Clear Space Required	28	48	43 - 60								
153	Puppy Whelping Room	815.01	Table, Work, Stainless Steel, w/ Over Shelf	N	1	OFCI	Aero Mfg	3TSBX-3048/3DO-1248		48	30	36								
154	Office, Animal Control JT	631	Computer, Desktop	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
155	Office, Administrative Assistant	631	Computer, Desktop	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
156	Office, Open, Shelter Attendants	631	Computer, Desktop	N	4	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
159	Housing, Adoptable Dog	332.01	Cage, Standard, Stainless Steel 48	N	5	OFCI	Tristar Vet	160-4830-01		28	48	36								
159	Housing, Adoptable Dog	332.02	Cage, Standard, Stainless Steel 24	N	8	OFCI	Tristar Vet	160-2424-00		28	24	24								
159	Housing, Adoptable Dog	332.03	Cage, Standard, Stainless Steel 30	N	4	OFCI	Tristar Vet	160-2430-00		28	24	30								
159	Housing, Adoptable Dog	332.04	Cage, Standard, Stainless Steel 36	N	4	OFCI	Tristar Vet	160-3630-00		28	36	30								
159	Housing, Adoptable Dog	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
161	Housing, Stray & Surrender Dog	332.01	Cage, Standard, Stainless Steel 48	N	5	OFCI	Tristar Vet	160-4830-01		28	48	36								
161	Housing, Stray & Surrender Dog	332.03	Cage, Standard, Stainless Steel 30	N	12	OFCI	Tristar Vet	160-2430-00		28	24	30								
161	Housing, Stray & Surrender Dog	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
161	Housing, Stray & Surrender Dog	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
161	Housing, Stray & Surrender Dog	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
161	Housing, Stray & Surrender Dog	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
161	Housing, Stray & Surrender Dog	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
162	Janitor	480	Shelf, Mop	N	1	OFCI	Eagle	US0824-16/3		8	24	6.5								
162	Janitor	822	Dispenser, Chemical	N	1	OFCI	Diversy	3764735	Air Gap	7.5	18.5	24.25		30						
163	Housing, Stray & Surrender - Exercise	380	Run, Panel, Divider, 72"	N	3	OFCI		1072-SP												
163	Housing, Stray & Surrender - Exercise	382	Run, Gate, 12" Glass Side Panel	N	4	OFCI		1036-KD / Side Partition												
163	Housing, Stray & Surrender - Exercise	387	Run, Transfer Door, Surface Mtd	N	10	OFCI														
163	Housing, Stray & Surrender - Exercise	390	Run, Bench	N	10	OFCI		1048-RB												
163	Housing, Stray & Surrender - Exercise	740	Waste-Flush Drain Activator Button	N	3	CFCI	Zurn Sloan	Z-300-C-WB-FG 110ESS(3450147)	w/ Trap 3/4" Tap & Water Supply Control Box, Remote Flush Valve											
163	Housing, Stray & Surrender - Exercise	750	System, Cleaning, Connection Port, Recessed	N	1	OFVI	SMT	300-5213	Surface Remote Station	2.125	8.5	6.5								
163	Housing, Stray & Surrender - Exercise	751.1	Hose Reel, Ceiling Mounted (50')	N	1	OFCI	SMT	300-5025	Extended Spray Wand.											
164	Housing, Stray & Surrender - Resting	380	Run, Panel, Divider, 48"	N	3	OFCI		1048-SP												
164	Housing, Stray & Surrender - Resting	382	Run, Gate, 12" Glass Side Panel	N	4	OFCI		1036-KD / Side Partition												
164	Housing, Stray & Surrender - Resting	740	Waste-Flush Drain Activator Button	N	3	CFCI	Zurn Sloan	Z-300-C-WB-FG 110ESS(3450147)	w/ Trap 3/4" Tap & Water Supply Control Box, Remote Flush Valve											
164	Housing, Stray & Surrender - Resting	750	System, Cleaning, Connection Port, Recessed	N	1	OFVI														
164	Housing, Stray & Surrender - Resting	750	System, Cleaning, Connection Port, Recessed	N	1	OFVI	SMT	300-5213	Surface Remote Station	2.125	8.5	6.5								
165	Housing, Adoptable Dog - Resting	380	Run, Panel, Divider, 48"	N	3	OFCI		1048-SP												
165	Housing, Adoptable Dog - Resting	382	Run, Gate, 12" Glass Side Panel	N	4	OFCI		1036-KD / Side Partition												
165	Housing, Adoptable Dog - Resting	387	Run, Transfer Door, Surface Mtd	N	10	OFCI														
165	Housing, Adoptable Dog - Resting	740	Waste-Flush Drain Activator Button	N	3	CFCI	Zurn Sloan	Z-300-C-WB-FG 110ESS(3450147)	w/ Trap 3/4" Tap & Water Supply Control Box, Remote Flush Valve											
165	Housing, Adoptable Dog - Resting	750	System, Cleaning, Connection Port, Recessed	N	1	OFVI	SMT	300-5213	Surface Remote Station	2.125	8.5	6.5								
165	Housing, Adoptable Dog - Resting	751.1	Hose Reel, Ceiling Mounted (50')	N	1	OFCI	SMT	300-5025	Extended Spray Wand.											
166	Housing, Adoptable Dog - Exercise	380	Run, Panel, Divider, 72"	N	3	OFCI		1072-SP												
166	Housing, Adoptable Dog - Exercise	382	Run, Gate, 12" Glass Side Panel	N	4	OFCI		1036-KD / Side Partition												
166	Housing, Adoptable Dog - Exercise	387	Run, Transfer Door, Surface Mtd	N	10	OFCI														
166	Housing, Adoptable Dog - Exercise	390	Run, Bench	N	10	OFCI		1048-RB												
166	Housing, Adoptable Dog - Exercise	740	Waste-Flush Drain Activator Button	N	3	CFCI	Zurn Sloan	Z-300-C-WB-FG 110ESS(3450147)	w/ Trap 3/4" Tap & Water Supply Control Box, Remote Flush Valve											
166	Housing, Adoptable Dog - Exercise	750	System, Cleaning, Connection Port, Recessed	N	1	OFVI	SMT	300-5213	Surface Remote Station	2.125	8.5	6.5								
166	Housing, Adoptable Dog - Exercise	751.1	Hose Reel, Ceiling Mounted (50')	N	1	OFCI	SMT	300-5025	Extended Spray Wand.											
168	Wash, Food Bowl	161.01	Washer, Compact	N	1	OFVI	Auto-Chlor	A4	Pass-thru	31	28.5	73			115V/20A/1		7.5GPM			
168	Wash, Food Bowl	163	Disposal, Garbage	N	1	OFCI	Emerson, Insinkerator	Evolution Septic Assist 76006							115/1Ph/5.7A					
168	Wash, Food Bowl	173	Cart, Utility	N	2	OFOI	Inter Metro Industries	MY 1627-34BU		35.5	18.3	31.5	34							
168	Wash, Food Bowl	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
168	Wash, Food Bowl	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
168	Wash, Food Bowl, Canine	175	Table, Clean, Stainless Steel (48")	N	1	OFVI	Aero Mfg	4TSBX-3048	Secure to Washer	30	48	35	92							
168	Wash, Food Bowl, Canine	176.01	Sink, Prewash, Drainboard, Right	N	1	OFVI	Aero Mfg	MF1-3020-24R	Secure to Washer	30	48.77	35	120							
173	Janitor	480	Shelf, Mop	N	1	OFCI	Eagle	US0824-16/3		8	24	6.5								
173	Janitor	822	Dispenser, Chemical	N	1	OFCI	Diversy	3764735	Air Gap	7.5	18.5	24.25		30						

Rm #	Rm Name	No.	Description	Exist/New	Qty	OF/CI/VI	Make	Model	Options	Depth Length (in)	Width (in)	Height (in)	Weight (lb)	Struc. Wgt (lb)	Electrical	Data	Water	Exhaust	BTU	Notes
175	Laundry, General	177	Washer/Extractor, Commercial 30 LB	N	2	OFVI	Continental Girbau	EH030	Front Loading	34.9	34.9	52.2								
175	Laundry, General	178	Dryer, Commercial 40 LB	N	2	OCVI	Continental Girbau	CG30-40	Front Loading	46.875	31.5	63.875								
179	Multi-Purpose	120	Coffee, Maker	N	1	OFOI	Keurig	K155	Direct Water Connect/Filter											
179	Multi-Purpose	121	Microwave, Commercial, Counter	N	1	OFOI	Summit Appliance	SCM1000SS		14.75	20.25	12.25			115V					
179	Multi-Purpose	144.01	Regrigerator, Commercial (18 CF)	N	1	OFOI	Summit Appliance	BKRF18SS		30	29.63	67.63			115V					
179	Multi-Purpose	163	Disposal, Garbage	N	1	OFCI	Emerson, Insinkerator	Evolution Septic Assist 76006							115/1Ph/5.7A					
179	Multi-Purpose	410.01	Hook, Leash	N	4	OFCI	Bobrick	B-6727												
179	Multi-Purpose	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
179	Multi-Purpose	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
179	Multi-Purpose	683	Screen, Projection, Fixed	N	1	OFCI	Draper	254207	Fixed, Bezel Frame	81.25	51.25		76							
179	Multi-Purpose	684	Floor Box, Tel Data Power	N	2	OFCI	Legrand	EFB45CTCAL	Access. Cover Plate, Alum Finish	9.875	13.875	1.5								
185	Janitor, Cleaning Supply	174	Shelf, Wall Mount, 36"	N	1	OFCI	Advance Tabco	WS-15-36-16		36	15									
185	Janitor, Cleaning Supply	480	Shelf, Mop	N	1	OFCI	Eagle	US0824-16/3		8	24	6.5								
185	Janitor, Cleaning Supply	822	Dispenser, Chemical	N	1	OFCI	Diversy	3764735	Air Gap	7.5	18.5	24.25		30						
202	Mop	480	Shelf, Mop	N	1	OFCI	Eagle	US0824-16/3		8	24	6.5								
202	Mop	822	Dispenser, Chemical	N	1	OFCI	Diversy	3764735	Air Gap	7.5	18.5	24.25		30						
202	Mop	823	Cart, Cleaning	N	1	OFOI	Rubbermaid	FG9T7300BLA		49.75	22.9	44.13		55						
204	Housing, Respiratory Isolation/Feline	145.01	Refrigerator, Undercounter, Locking, Temp Display	N	1	OFCI	Summit	FF6L7NZ		23.5	23.63	33.5			120V					
204	Housing, Respiratory Isolation/Feline	330	Cage, Isolation	N	2	OFCI	Mason	ISO-CARE		36.25	30.75	81.5			115V					
204	Housing, Respiratory Isolation/Feline	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
204	Housing, Respiratory Isolation/Feline	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
204	Housing, Respiratory Isolation/Feline	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
204	Housing, Respiratory Isolation/Feline	451	Disposal, Syringe, Wall Enclosure	N	1	OFCI	Cardinal Health (5 QT)	85161H	Service Contract											
204	Housing, Respiratory Isolation/Feline	550	Table, Exam Wall Mount, Parallel	N	1	OFCI	Tristar Vet	400-24		35	20		200							
204	Housing, Respiratory Isolation/Feline	631	Computer, Desktop	N	4	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
204	Housing, Respiratory Isolation/Feline	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
205	Housing, Infectious Isolation, Feline	145.01	Refrigerator, Undercounter, Locking, Temp Display	N	1	OFCI	Summit	FF6L7NZ		23.5	23.63	33.5			120V					
205	Housing, Infectious Isolation, Feline	330	Cage, Isolation	N	2	OFCI	Mason	ISO-CARE		36.25	30.75	81.5			115V					
205	Housing, Infectious Isolation, Feline	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
205	Housing, Infectious Isolation, Feline	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
205	Housing, Infectious Isolation, Feline	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
205	Housing, Infectious Isolation, Feline	451	Disposal, Syringe, Wall Enclosure	N	1	OFCI	Cardinal Health (5 QT)	85161H	Service Contract											
205	Housing, Infectious Isolation, Feline	550	Table, Exam Wall Mount, Parallel	N	1	OFCI	Tristar Vet	400-24		35	20		200							
205	Housing, Infectious Isolation, Feline	631	Computer, Desktop	N	4	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
205	Housing, Infectious Isolation, Feline	815	Box, Glove, Wall Mount	N	1	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
208	Bathing, Cat	524	Dryer, Dbl Motor	N	1	OFOI	Go Pet Club	DT-505												
208	Bathing, Cat	526	Bathing System	N	1	OFCI	Oster	BathPro 5.1	Hydrosurge								5GPM			
208	Bathing, Cat	816	Sink, Bathing	N	1	OFCI	Tristar Vet	800-18	Elevated Grate	36	25.75	58								
209	Housing, Cat, Adoptable	350	Condo, Feline	N	14	OFCI	Mason Company	Quad Unit/Glass Front	Litter Box Units/Exhaust	24.125	24	40.125								
209	Housing, Cat, Adoptable	350.1	Condo, Feline, Litter Unit	N	4	OFCI	Mason Company	Litter Box Unit	3.75" Base	24.125	18	40.125								
209	Housing, Cat, Adoptable	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
209	Housing, Cat, Adoptable	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
209	Housing, Cat, Adoptable	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
209	Housing, Cat, Adoptable	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
212	Housing, Cat, Stray / Surrender	350	Condo, Feline	N	24	OFCI	Mason Company	Quad Unit/Wire Front	Litter Box Units/Exhaust	24.125	24	40.125								
212	Housing, Cat, Stray / Surrender	350.1	Condo, Feline, Litter Unit	N	12	OFCI	Mason Company	Litter Box Unit	3.75" Base	24.125	18	40.125								
212	Housing, Cat, Stray / Surrender	350.2	Condo, Feline, Litter Unit/Wire Front	N	4	OFCI	Mason Company	Single Unit/Wire Front	3.75" Base	24.125	36	40.125								
212	Housing, Cat, Stray / Surrender	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
212	Housing, Cat, Stray / Surrender	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
212	Housing, Cat, Stray / Surrender	444	Dispenser, Sanitizer	N	1	OFCI	Steris	2D53-Q7/2D45-OK												
212	Housing, Cat, Stray / Surrender	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
212	Housing, Cat, Stray / Surrender	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						
212	Housing, Cat, Stray / Surrender	815	Box, Glove, Wall Mount	N	2	OFCI	Bowman	GS-006	Vertical Mount	3.8	15.8	10.06	2.7							
214	Kitchen, Food Prep, Cat	144.01	Regrigerator, Commercial (18 CF)	N	2	OFVI	Summit Appliance	BKRF18SS		30	29.63	67.63			115V					
214	Kitchen, Food Prep, Cat	163	Disposal, Garbage	N	1	OFCI	Emerson, Insinkerator	Evolution Septic Assist 76006							115/1Ph/5.7A					
214	Kitchen, Food Prep, Cat	173	Cart, Utility	N	2	OFCI	Inter Metro Industries	MY 1627-34BU		35.5	18.3	31.5	34							
214	Kitchen, Food Prep, Cat	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
214	Kitchen, Food Prep, Cat	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
214	Kitchen, Food Prep, Cat	450	Dispenser, Food (40 lb)	N	2	OFCI	Bergan	11732	Wall Mounting Bracket	11.25	15.75	26.13		200						
214	Kitchen, Food Prep, Cat	814.01	Table, Work, SSl w/ Dbl Sink, Drainboard L/R	N	1	OFCI	Aero Mfg	MF2-2418-30LR		96	24	35								
214	Kitchen, Food Prep, Cat	825	Table, Work, Stainless Steel (78")	N	1	OFCI	Aero Mfg	2F1-3020-78LR	Custom	30	78	35								
214	Kitchen, Food Prep, Feline	174.01	Shelf, Wire, Wall Mount	N	2	OFCI	Inter Metro Industries	12WS32C		38.25	12									

Rm #	Rm Name	No.	Description	Exist/New	Qty	OF/CI/VI	Make	Model	Options	Depth Length (in)	Width (in)	Height (in)	Weight (lb)	Struc. Wgt (lb)	Electrical	Data	Water	Exhaust	BTU	Notes
214	Kitchen, Food Prep, Feline	175	Table, Clean, Stainless Steel (48")	N	1	OFCI	Aero Mfg	4TSBX-2448	Undershelf	48	24	35								
216	Housing, Exotic (Bird / Fish)	334	Cage, Avian	N	2	OFCI	Marineland	3-Tier Bird Display		42.25	21.75	80			120V/15A					
216	Housing, Exotic (Bird / Fish)	370	Aquarium- Tank & Filter	N	1	OFCI	Marineland	Z090520	Single Module	51.5	21.5	87			115V/10.5A 115V/2.2A		1/2" CW			
216	Housing, Exotic (Bird / Fish)	773	Electrical, Power Strip, Multi-Plug 15A	N	2	CFCI														
219	Housing, Small Animal	332.02	Cage - 28x30	N	4	OFCI	Mason Company	Quiet Cottage - 28	1/3 Glass Panel	30	28	31								
219	Housing, Small Animal	332.03	Cage-30x36	N	2	OFCI	Mason Company	Quiet Cottage - 36	1/3 Glass Panel	30	36	31								
219	Housing, Small Animal	370	Cage - Small Animal Display	N	1	OFCI	Mason Company	3-Drawer Small Animal Display	Dividers	52	25	76			120V/15A			150 CFM		
219	Housing, Small Animal	773	Electrical, Power Strip, Multi-Plug 15A	N	2															
221	Wash, Food Bowl	161.01	Washer, Compact	N	1	OFVI	Auto-Chlor	A4	Pass-thru	31	28.5	73			115V/20A/1		7.5GPM			
221	Wash, Food Bowl	163	Disposal, Garbage	N	1	OFCI	Emerson, Insinkerator	Evolution Septic Assist 76006							115/1Ph/5.7A					
221	Wash, Food Bowl	173	Cart, Utility	N	2	OFOI	Inter Metro Industries	MY 1627-34BU		35.5	18.3	31.5	34							
221	Wash, Food Bowl	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
221	Wash, Food Bowl	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
221	Wash, Food Bowl	814	Table, Work, Stainless Steel	N	1	OVCI	Aero Mfg	4EG-2448		48	24	35	74							
221	Wash, Food Bowl, Feline	175	Table, Clean, Stainless Steel (48")	N	1	OFVI	Aero Mfg	4TSBX-3048	Secure to Washer	30	48	35	92							
221	Wash, Food Bowl, Feline	176	Sink, Prewash, Drainboard, L/R	N	1	OFVI	Aero Mfg	MF1-3020-24R	Secure to Washer	30	48.77	35	120							
C-1	PUBLIC CORRIDOR	681	Cabinet, Fire Extinguisher	N	2	CFCI	Larsen	24096R-FG		6	9.5	24								
C-11	PUBLIC CORRIDOR	681	Cabinet, Fire Extinguisher	N	2	CFCI	Larsen	24096R-FG		6	9.5	24								
C-12	STAFF CORRIDOR	681	Cabinet, Fire Extinguisher	N	1	CFCI	Larsen	24096R-FG		6	9.5	24								
C-2	PUBLIC CORRIDOR	681	Cabinet, Fire Extinguisher	N	1	CFCI	Larsen	24096R-FG		6	9.5	24								
C-3	PUBLIC CORRIDOR	681	Cabinet, Fire Extinguisher	N	1	CFCI	Larsen	24096R-FG		6	9.5	24								
C-4	PUBLIC CORRIDOR	681	Cabinet, Fire Extinguisher	N	1	CFCI	Larsen	24096R-FG		6	9.5	24								
C-5	STAFF CORRIDOR	681	Cabinet, Fire Extinguisher	N	1	CFCI	Larsen	24096R-FG		6	9.5	24								
C-6	STAFF CORRIDOR	681	Cabinet, Fire Extinguisher	N	1	CFCI	Larsen	24096R-FG		6	9.5	24								
C-8	STAFF CORRIDOR	681	Cabinet, Fire Extinguisher	N	2	CFCI	Larsen	24096R-FG		6	9.5	24								
C-9	Corridor, Public	441	Dispenser, Paper, Towel	N	1	OFCI	Bobrick	B262		4	10	14								
C-9	Corridor, Public	443	Dispenser, Soap	N	1	OFCI	Steris	1308-Q7/4D40-Q5/4D51-Q7		4.5	10.75	10.75								
C-9	Corridor, Public	630	Computer, Wall Mounted	N	1	OFVI	Dell	OptiPlex 3050 Micro	i5-7500T Processor, 8G, Software Package, Keyboard and Monitor											
C-9	Corridor, Public	630.01	Computer, BracketWall Mounted	N	1	OFCI	GCX Solutions	WC-0002-11	WMM-0005-09, FLP-004-89, WM-0023-56, WM-007-41	37	14		4.5	25						

DTP1201-006030 _ B155 _ ENG _ FRCH _ UCG _ RevE _ 2012 _ Size:215.9X139.7MM _ Color:CMYK+PMS8480C+PMS130C

NO. 120 COFFEE, MAKER

KEURIG®

OWNER'S MANUAL

OfficePRO® Premier B155 Keurig® Brewer

MANUEL D'UTILISATION

Cafetière OfficePRO® Premier B155

IMPORTANT SAFEGUARDS Safe Operation & Use

When using electrical appliances, basic safety precautions should be followed, including the following:

1. Read all instructions before using.
2. Do not touch hot surfaces. Use handles and knobs when available.
3. This appliance must be properly installed and located in accordance with these instructions before it is used.
4. The use of accessory attachments not recommended by the appliance manufacturer may result in fire, electrical shock or injury to persons.
5. Do not place on or near a hot gas or electric burner, or in a heated oven.
6. Do not use outdoors.
7. To protect against fire, electric shock and injury do not immerse cords, plugs, or the appliance in water or any other liquid.
8. Do not overfill the Water Reservoir.
9. Use **only water** in this appliance! Do not put any other liquids or foods in the Water Reservoir except as directed in the Cleaning Instructions.
10. Turn off and unplug the Brewer before cleaning or maintenance. Allow to cool before putting on or taking off parts and before cleaning the appliance.
11. For best operation, plug the appliance into its own electrical outlet on a dedicated circuit to prevent flickering of lights, blowing of fuses or tripping a circuit breaker.
12. Do not operate any appliance with a damaged cord or plug or after the appliance malfunctions or is damaged in any manner. Contact Keurig Customer Service to report any malfunction of or damage to the Brewer.
13. Do not let the cord hang over the edge of the table or counter, or touch hot surfaces.
14. To disconnect, turn Power Button to 'OFF' status and then remove the plug from the wall outlet.
15. Close supervision is necessary when any appliance is used by or near children.
16. **Do not lift the Handle to open the Lid of the Brewer while brewing is in progress.**
17. Always keep the Water Reservoir Lid on unless you are refilling it.
18. This appliance is equipped with a power cord having a grounding wire with a grounding plug. The appliance must be grounded using a 3-hole properly grounded outlet. In the event of an electrical short circuit, grounding reduces the risk of electrical shock.
19. If the outlet is a standard 2-prong wall outlet, it is your personal responsibility and obligation to have it replaced with a properly grounded 3-prong wall outlet.
20. Do not, under any circumstances, cut or remove the third (ground) prong from the power cord or use an adapter.
21. Consult a qualified electrician if the grounding instructions are not completely understood, or if doubt exists as to whether the appliance is properly grounded.
22. Do not use the appliance for other purposes than its intended use.

SAVE THESE INSTRUCTIONS.

WARNING TO USERS AND PARENTS

1. DO NOT permit children to use brewer unless there is adult supervision. Brewer dispenses very hot water.

2. SPECIAL NOTICE FOR HOT COCOA USERS: IMMEDIATELY AFTER USING A HOT COCOA K-CUP® PACK, RUN a Hot Water Brew Cycle without a K-Cup® pack to avoid the possibility of clogging the exit needle. **DO NOT** assume the next user will do this.

CAUTION: There are two sharp needles that puncture the K-Cup® pack, one above the K-Cup® Pack Holder and the other in the bottom of the K-Cup® Pack Holder. To avoid risk of injury, do not put your fingers in the K-Cup® Pack Assembly Housing.

CAUTION: There is extremely hot water in the K-Cup® Pack Holder during the brewing process. To avoid risk of injury, do not lift the Handle or open the K-Cup® Pack Assembly Housing during the brewing process.

If an extension cord is used, (1) the marked electrical rating of the cord set or extension cord should be at least as great as the electrical rating of the appliance; (2) the cord should be arranged so that it will not drape over the countertop or tabletop where it can be pulled on by children or tripped over unintentionally; and (3) the extension cord must include a 3-prong grounding plug.

THIS PRODUCT IS FOR
HOUSEHOLD USE & COMMERCIAL USE

WARNING THIS PRODUCT CONTAINS CHEMICALS, INCLUDING LEAD, WHICH IS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

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KEURIG® GOURMET SINGLE CUP BREWING SYSTEM
OfficePRO® Premier B155 — Using Your Brewer

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Pour des directives en français, veuillez vous reporter à la page 20.

Record your Brewer Serial Number here.

Removing the serial number label from the Brewer will void warranty.

Set-up

Helpful Hints

1. **Keep your Brewer turned "ON" at all times.**
   To brew a fresh cup of coffee, tea or hot cocoa anytime you want, we suggest you keep your Brewer turned "ON" all the time. However, the Brewer is fully programmable so you can set it to turn on and off automatically to match your schedule. Or, if you prefer, set the Brewer to automatically turn off after a period of time. Follow the simple instructions on pages 13–14 to make using the Brewer convenient for you.

2. **For the best tasting gourmet coffee, tea or hot cocoa, Keurig recommends using bottled water or the Keurig™ Water Filter Starter Kit (available at www.keurig.com).**
   Water quality varies from place to place. If you notice an undesirable taste in your cup of coffee, such as chlorine or other mineral tastes, we recommend you consider using bottled water or water from a filtration system.

3. **Customize the Size, Flavor & Brew That's Perfect for You.™**
   With the choice of over 200 varieties of K-Cup® packs and 4 brew sizes (Small Cup-4 oz., Small Mug-6 oz., Medium Mug-8 oz., and Large Mug-10 oz.) your Keurig® Brewer gives you endless options to customize the size, flavor and brew that's perfect for you. For a strong, intense cup, select an Extra Bold K-Cup® pack (with up to 30% more ground coffee than regular varieties) and brew the size that's right for you. The smaller the brew size, the more intense flavor in your cup. The larger the brew size, the less intense flavor in your cup.

4. **Plug Brewer into its own grounded outlet.**
   If the electric circuit is overloaded with other appliances, your Brewer may not function properly. The Brewer should be operated on its own circuit, separate from other appliances.

5. **Brewing into a travel mug.**
   To brew into a travel mug, simply remove the Drip Tray Assembly and place the travel mug on the Drip Tray Base.

6. **De-scale Brewer regularly.**
   Please see pages 16 and 17 for instructions.

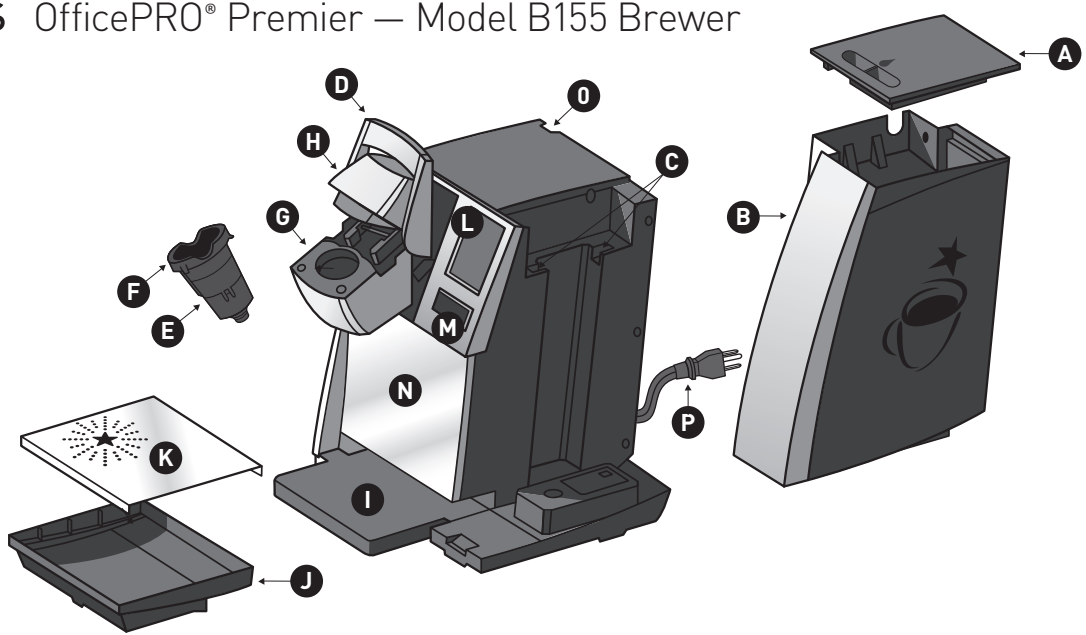
Unpacking Instructions

1. Place Brewer box on a large steady surface (such as a table or countertop) or on the floor. Open the box.
2. Remove enclosed literature and K-Cup® variety pack.
3. Turn the box on its side with the front of the box face down.
4. Reach into the box and grasp the foam insert that contains the Brewer.
5. Carefully pull the foam insert toward you and out of the box. The Brewer will still be encased in the polyfoam and be on its side.
6. Remove the top polyfoam packaging material.
7. Carefully lift Brewer off of the bottom polyfoam and place it upright on a flat, steady surface.
8. Lift plastic bag off of Brewer.
9. Record the serial number for this Brewer on page 3 of this guide. The serial number can be found on the side of the Brewer box or on the bottom of the Brewer.
10. Place the Brewer upright on a flat, steady surface. Remove tape holding Water Reservoir in place.

We recommend you save all packing materials in case future shipping of the product is necessary.

WARNING:
Keep all plastic bags away from children.

Features OfficePRO® Premier — Model B155 Brewer



OfficePRO® Premier B155 Brewer

A. Water Reservoir Lid
B. Water Reservoir
C. Water Reservoir Lock Tab Slots
D. Handle
E. K-Cup® Pack Holder Funnel
F. K-Cup® Pack Holder (E and F are the K-Cup® Pack Holder Assembly)
G. K-Cup® Pack Assembly Housing
H. Lid
I. Drip Tray Base
J. Drip Tray
K. Drip Tray Plate
L. LCD Screen
M. BREW Button
N. Housing
O. Power Switch
P. Power Cord

SECTION 1 Set-Up & First Brew

IMPORTANT: You cannot use your Keurig® Brewer until it has been set up for its first use.

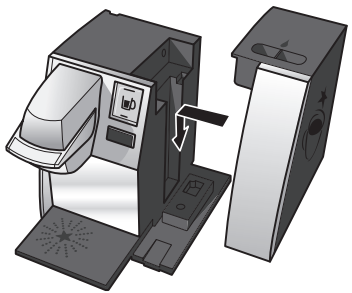
NOTE: If Brewer has been exposed to temperatures below freezing, allow Brewer at least two hours to reach room temperature before brewing. A frozen or extremely cold Brewer will not operate.

Setting Up Your Brewer

fig. 1

1. Remove all pieces of packing tape from the Brewer and Drip Tray. Remove the clear plastic film from the LCD Display. Unwrap cord and plug the Brewer into a grounded outlet.
2. Turn the Brewer on, the Power Switch is located at the top left hand side of the Brewer on the back. The Brewer's LCD Display will display the power up welcome screen (fig. 1).
3. Remove the Water Reservoir from Brewer by first removing Lid from the Water Reservoir then lifting the Water Reservoir straight up and toward the right of the Brewer (may be tight). Rinse the Water Reservoir thoroughly with fresh, clean water.

fig. 2



4. Fill the Water Reservoir up to the fill mark with fresh, clean water. Replace the Water Reservoir on the Brewer making sure that the locking tabs engage with the Brewer (fig. 2). Replace Lid on Water Reservoir.
5. The Brewer will automatically fill the Internal Hot Water Tank with water and then the water will be heated. This will take about 3 minutes. During the heating period, "HEATING PLEASE WAIT" will be displayed on the LCD Screen (fig. 3).

fig. 3

6. Place a 10 oz. mug on the Drip Tray Plate, then fully raise and lower the Brewer Handle. The Brew Button will now be illuminated. Press the Brew Button to start a cleansing brew. **NOTE: A K-Cup® pack should not be used for this sequence.**
7. When the cleansing brew is complete, the Brewer will go into its idle state and will be ready to brew your first K-Cup® pack.

fig. 4

fig. 5

Ready to Brew Your First Cup

1. The LCD Display will be in its idle state (fig. 4).
2. Lift the Handle. The K-Cup® Pack Holder will open toward you (fig. 5).
3. Select a K-Cup® pack.
   NOTE: Do not remove the foil lid or puncture the K-Cup® pack.

4. Place a K-Cup® pack in the K-Cup® Pack holder (fig. 6).
   CAUTION: There are two sharp needles that puncture the K-Cup® pack, one above the K-Cup® Pack Holder and the other in the bottom of the K-Cup® Pack Holder. To avoid risk of injury, do not put your fingers in the K-Cup® Pack Assembly Housing.
5. Lower the Handle to close the Lid over the K-Cup® Pack Holder. (When it is closed completely, the BREW Button will flash up to 60 seconds.)
6. Place a mug on the drip tray and select your brew size (fig. 7), then press BREW (fig. 8).
   NOTE: If you do not press BREW within 60 seconds the Brewer will return to its idle state and the Brew Button will cease to flash to prevent accidental activation. Re-activate by raising the handle fully and then closing it.

fig. 6

fig. 7

7. There may be a short pause prior to coffee being dispensed. The entire brew process lasts for approximately 1 minute and ends with a burst of air to remove all liquid from the K-Cup® pack.
   CAUTION: There is extremely hot water in the K-Cup® Pack Holder during the brew process. To avoid risk of injury, do not lift the Handle or open the K-Cup® Pack Assembly Housing during the brew process.
8. The end of brew is indicated by "KEURIG BREWED ENJOY".
9. Lift the Handle, remove and dispose of the used K-Cup® pack.
   CAUTION: K-Cup® pack will be hot.
10. Enjoy your first cup of Keurig Brewed® gourmet coffee, tea or hot cocoa!
11. Your Brewer may display "HEATING PLEASE WAIT" as it heats water for the next brew cycle.

fig. 8

Stopping the Brew Process

If you need to stop the brewing after the process has started, press and release the Power Switch to turn the Brewer 'OFF'. The flow of coffee, tea or hot cocoa will stop and the heating element and the LCD Screen will shut off.
NOTE: You may get more coffee, tea or hot cocoa in your cup during your next brew. We recommend that you perform a cleansing brew with water only after a terminated brew. Then your next brew will be the volume you have selected.

Adding Water

fig. 9

The LCD Display of your Brewer will indicate when the water level in the Reservoir is low or if the Water Reservoir has been removed by displaying the words "FILL WATER RESERVOIR" (fig. 9). The Brewer will not allow you to brew when "FILL WATER RESERVOIR" is displayed (fig. 9).

The Water Reservoir can be filled in two ways.

1. Remove the Water Reservoir from Brewer by first removing Lid from the Water Reservoir, then lifting the Water Reservoir straight up and toward the right of the Brewer. Fill with water. Place the Water Reservoir back on the Brewer and replace the Lid.

IMPORTANT: Do not remove the Water Reservoir during the brewing process.

2. Lift off the Water Reservoir Lid and pour water directly into the Water Reservoir while it is still attached to the Brewer, then replace the Lid.

Brewing Hot Water

Your Brewer is able to produce hot water for making hot cocoa from a packet, or for use in cooking, etc. Simply follow the instructions on page 7, "Ready To Brew Your First Cup" without adding a K-Cup® pack.

NOTE: After brewing a hot cocoa K-Cup® pack, we recommend running a hot water brew cycle without a K-Cup® pack.

Purging the Brewer

If your Brewer has not been used for more than one week, you should purge the water from the internal water tank.

1. If there is water in the Water Reservoir, remove the Lid, then lift the Water Reservoir straight up and away from Brewer. Discard water, rinse and refill with water. Place the Water Reservoir back on the Brewer and replace the Lid. (If there is no water in the Water Reservoir, simply refill.)
2. Be sure the Brewer is turned 'ON'. Raise and lower the Handle on the Brewer without inserting a K-Cup® pack.
3. The LCD Display will be in its idle state (fig. 4).

fig. 10

4. Place a large mug on the drip tray and select Large Mug (10 oz. serving) brew size from the Select Brew Size Menu (fig. 10).
5. Discard water.
6. Repeat steps 2 - 5 two more times to completely purge water from the Internal Hot Water Tank.

SECTION 2 Menu Controls & Indicators

Menu Mode

To enter the MENU MODE the Brewer's power must be off.
Press and hold your finger on the display while pressing and releasing the power switch. Continue pressure on the display for **5 seconds (**fig. 11). The MENU screen will appear. (fig. 12).

Press any line item to enter the set up for that particular feature.
Please reference the Menu navigation on page 11.

If you are experiencing any problems with your Brewer, please contact Customer Service at 1.866.901.BREW (2739).

fig. 11

fig. 12

Menu Key Navigation

Home
Press HOME at any time to return to your Brewer to an idle state.

Clock
Setting the clock is optional. To program the clock, follow the instructions on page 12.

Brew Temp
The brew temperature is pre-set at 193˚F. You do not have to set the brew temperature but you can adjust it up or down by 5˚. Simply follow the instructions on page 12.

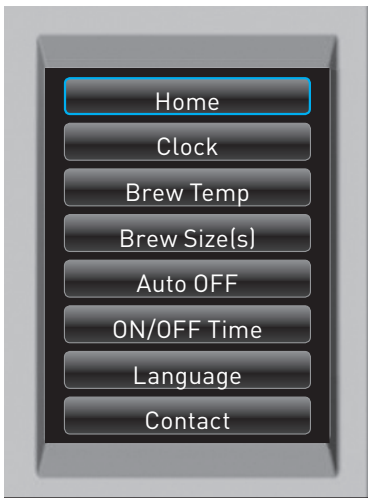
Brew Size(s)
Four brew sizes are available: 4 oz., 6 oz., 8 oz., and 10 oz. To program the brew sizes see page 13.

Auto OFF
Auto Off allows you to program your Brewer to automatically turn off two hours after the last brew. See page 14 for programming instructions.

ON/OFF Time
You can leave your Brewer on all the time and use the Power button to turn it off. Or you can program the Brewer to brew at a specific time as shown on page 13.

Language
This Brewer is shipped with English as the default language. To change the language, follow the instructions on page 14.

Contact
The contact setting features allows you to program the contact information you need for Brewer support and help. To program, follow the instructions on page 14.



Setting the Clock

Setting the clock is optional. When the clock is set, the time will appear in the LCD Control Center. **NOTE: You must set the clock if you will be programming the Auto On/Off Time feature.**

fig. 13

1. From the Menu Mode, press "CLOCK".
2. The set clock screen will display "DISABLED" if the Brewer is new or if electrical power has been interrupted. Press "DISABLED" to set a time. Press H repeatedly to advance the hour in steps or hold it down to scroll through the hours quickly. When you have set the hour then press the M to set the minutes, press repeatedly to advance by a minute each time or keep it pressed to scroll quickly (fig. 13).
3. Press "OK" when you are finished. The Clock is now set.
4. The correct time should now be displayed in the LCD Home Screen.

NOTE: If power is interrupted to the Brewer, follow the procedure above to reset the time as the clock will not be visible . Brew size and brew temperature menu settings will be restored automatically. All other settings will be restored automatically after clock is set.

NOTE: To disable the clock, press the time. However, the 'On/Off' time setting will also be disabled.

Programming Brew Temperature (188° – 198° F)

The Brewer brews at a preset temperature of 193°F. You can adjust this temperature up or down by 5°. Simply follow the instructions below.

fig. 14

1. From the Menu Mode, press "BREW TEMP".
2. The LCD Display will now display the Brew Temperature programming options (fig. 14). The temperature 193°F (initial setting) will be displayed at the top of the LCD Display to indicate the current temperature setting.
3. Press the + symbol to increase the temperature and the – symbol to lower the temperature one degree at a time.
4. Once you have reached your desired brew temperature, press "OK". The Brew Temperature is now set.
5. To change the brew temperature, repeat steps 1 through 4.

NOTE: At high altitudes (over 5,000 feet) if boiling occurs, use the temperature adjustment (-5°) to lower the temperature.

Programming Your Brew Size

All brew sizes are enabled in the default setting. If you want to disable any brew size, just press on the appropriate icon(s). Please follow instructions outlined below.

fig. 15

1. From the Menu Mode, press "SET BREW SIZE(S)".
2. The LCD will display all enabled brew sizes. To disable a brew size press the icon. The check mark will change to an "X" indicating that the brew size is disabled (fig. 15).
3. Once you have selected your desired brew size(s), press "OK". The brew size(s) are now set.

NOTE: You can not delete all brew sizes. To enable a brew size you have already disabled, just press its icon and then press "OK". The default brew size is always 8 oz. This brew size cannot be changed or disabled.

Programming On/Off Features

The Brewer provides three modes so that you can enjoy gourmet coffee, tea or hot cocoa on your own schedule.

fig. 16

1. **Leave it ON all the time.** The Brewer can be left on all the time so that it is always ready to brew a fresh cup of gourmet coffee, tea or hot cocoa. To turn the Brewer off at any time, simply press and release the Power Switch. Press and release the Power Switch again to restore power to the Brewer. You will have to wait for the water to heat up before the Brewer is ready to brew.
2. Program the Brewer for a specific On/Off Time. **NOTE: To use this programming feature, the clock must be set to the correct time.**

a. After setting the correct time (see "Setting The Clock" page 12), return to the Menu Mode and press "ON/OFF TIME".

b. To set the ON time, press "DISABLED". The display will change to a time of day. Press "H" to set the hours and "M" to set the minutes. Once the desired time is set, press "OK" to accept this time.

c . To set the OFF time, press "DISABLED". The display will change to a time of day. Press "H" to set the hours and "M" to set the minutes. Once the desired time is set, press "OK" to accept this time (fig. 16).

fig. 17

3. Set the Brewer to "AUTO OFF" to automatically turn off 2 hours after the last brew.

a. From the Menu Mode, press "AUTO OFF". The LCD Display will now display the "AUTO OFF" programming option (fig. 17).

b. To enable the "AUTO OFF" feature, press "ON". "ENABLED" will appear on the screen and press "OK". To disable the "AUTO OFF" feature, press "OFF". "DISABLED" will appear on the screen and press "OK".

fig. 18

Language Settings

The Brewer is shipped with English as the default language. To change the default to Francais or Espanol, follow the instructions outlined below.

Set Language

1. From the Menu Mode, press "LANGUAGE".
2. The LCD Display will now display the Language programming options (fig. 18).
3. Press the desired Language button, then press OK to confirm your selection.

fig. 19

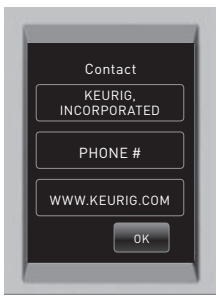


fig. 20

Setting Contact Screen

The contact screen is pre-programmed with the following information: Keurig, Incorporated. and www.keurig.com.

You can reprogram the brewer with your contact information. The contact screen will appear in the screen saver.

1. From the Menu Mode, press "CONTACT". The LCD screen will display the Keurig default contact information (fig. 19).
2. Press the Upper (Company Name) Box. The Keypad will appear along with the current information (fig. 20). **NOTE: Unless changed by the user, Keurig contact information will be present on the display.**

a. Press Delete Key repeatedly to remove current information. Enter new information using the Keypad.
NOTE: To select Upper Case, Lower Case, Numerals, Upper Case Accents, Lower Case Accents, press the Keypad Change Key located at the bottom center of the screen.

fig. 21

fig. 22

b. Press "OK" to save your changes and return to the Main Contact Screen.
NOTE: Pressing the Back Arrow Key will return to the Main Contact Screen without saving changes.

3. Press the Middle (Phone Number) Box. The Numeral Keypad Mode will appear along with the current information (fig. 21).

a. Delete current phone number and enter new information using the Keypad.

b. Press "OK" to save your changes and return to the Main Contact Screen.

4. Press the Lower Box. This box can be customized to contain any information such as web/email address, contact name, etc (fig. 22).

a. Enter new information using the Keypad.

b. Press "OK" to save your changes and return to the Main Contact Screen.

c. In Main Contact Screen (fig. 19), press "OK" to save the updated screen as the default and return to the Menu Screen.

SECTION 3 Cleaning & Maintenance

Cleaning External Parts

Regular cleaning of the Brewer's external components is recommended.

1. Never immerse the Brewer in water or other liquids. The Housing and other external components may be cleaned with a soapy, damp, non-abrasive cloth.

2. The Drip Tray can accumulate up to 12 ounces of overflow. The Drip Tray and Drip Tray Plate should be periodically inspected and rinsed clean. To remove the Drip Tray Assembly, simply slide it toward you, keeping it level at all times to avoid spilling. The Drip Tray and Drip Tray Plate should not be placed in the dishwasher. They should be cleaned with a damp, soapy, non-abrasive cloth and rinsed thoroughly.

fig. 23

Cleaning the K-Cup® Pack Holder Assembly

1. **Cleaning the Parts**—The K-Cup® Pack Holder Assembly can be placed onto the top shelf of a dishwasher. **NOTE: Use low temperature cycles in the dishwasher.** To remove the K-Cup® Pack Holder Assembly from the Brewer, open the cover by lifting the Handle. Grasp the top of the K-Cup® Pack Holder with one hand while pushing up on the bottom of the K-Cup® Pack Holder from underneath with the other until it releases (fig. 23). After cleaning, align the K-Cup® Pack Holder with the opening

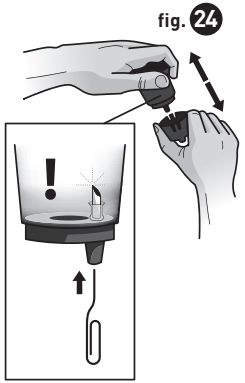


fig. 24

using the two front ribs as a guide, and snap them into place from the top.

2. **Cleaning the Funnel**—The Funnel can be removed from the K-Cup® Pack Holder by pulling on it until it pops off (fig. 24). The Funnel is dishwasher safe. To replace it, just snap it back onto the K-Cup® Pack Holder.
3. **Cleaning the Exit Needle**—The Exit Needle is located on the inside bottom of the K-Cup® Pack Holder. Should a clog arise due to coffee grinds, it can be cleaned using a paper clip or similar tool. Remove the K-Cup® Pack Holder Assembly and detach Funnel. Insert the paper clip (as shown in fig. 24) into the Needle to loosen the clog, then flush with water. The K-Cup® Pack Holder Assembly can be placed onto the top shelf of a dishwasher. **NOTE: Use low temperature cycles in the dishwasher.**

CAUTION: There are sharp needles that puncture the K-Cup® pack above the K-Cup® Pack Holder and in the bottom of the K-Cup® Pack Holder. To avoid risk of injury, do not put your fingers in the K-Cup® Pack Assembly Housing.

Cleaning the Water Reservoir & Water Reservoir Lid

The Water Reservoir Lid or Water Reservoir should not be put into the dishwasher. They should be cleaned with a damp, soapy, non-abrasive cloth and rinsed thoroughly. Do not dry the inside of the Water Reservoir with a cloth as lint may remain. **CAUTION: Please rinse the Water Reservoir thoroughly after cleaning to ensure that no cleaners or cleaning solutions remain in this area as they may contaminate the water supply in the Brewer.**

De-Scaling Your Brewer

Mineral content in water varies from place to place. Depending on the mineral content of the water in your area, calcium deposits or scale may build up in your Brewer. Scale is non-toxic, but left unattended, it can hinder Brewer performance. De-scaling your Brewer helps maintain the heating element and other internal parts of the Brewer that come in contact with water.

The Brewer should be de-scaled every 3-6 months to ensure optimal performance. It is possible for calcium deposits to build up faster, making it necessary to de-scale more often.

De-Scaling Instructions

A. PREPARE

Step 1: Make sure you have at least 90 oz. of undiluted white vinegar on hand. You will also need an empty sink and a large ceramic mug (do not use a paper cup).

Step 2: Empty the water in the Water Reservoir.

Step 3: Disable "Auto Off" and programmed "On Off" time (pages 13-14).

B. FILL AND CLEAN

Step 1: Pour the vinegar into the Water Reservoir to fill it.

Step 2: Place a large mug on the Drip Tray Plate and run a water brew cycle. **DO NOT USE A K-CUP® PACK,** just select the Large Mug brew size. Pour the contents of the large mug into the sink.

Step 3: Repeat the brew process 3 times.

Step 4: Let the Brewer stand for at least 4 hours while still on.

C. RINSE

Step 1: Ensure the Water Reservoir is filled with fresh water.

Step 2: Place a large mug on the Drip Tray Plate and run a water brew cycle. Pour the contents of the large mug into the sink.

Step 3: Repeat brew process until the Water Reservoir is empty.

Step 4: You may need to perform additional water brew cycles if you notice any residual taste or odor.

Service

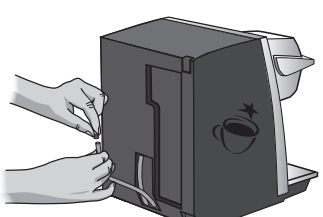
Beyond these recommended cleaning and maintenance procedures this Brewer is not user serviceable. For service, please refer to the Warranty section of this guide.

Storage

Draining the Brewer

1. Turn off the Brewer, unplug it, and allow the Brewer to cool approximately 30 minutes.
2. Empty the Water Reservoir by first removing the Lid from the Water Reservoir then lifting the Water Reservoir straight up and toward the right of the Brewer (may be tight). Rinse and Empty the Water Reservoir.
3. Turn the Brewer around so the back is facing out. Unscrew the small knob to release the back panel, remove the panel from the Brewer, and set it aside. If the screw is tight, you may need to use a flathead screw driver. Pull the tube downward until the end is free (fig25). Over a large pitcher, remove the plug and drain the water from the Internal Hot Water Tank into the pitcher. **CAUTION: If the Brewer was not allowed to cool sufficiently, the water draining from the tube may be very hot.** Re-cap the tube. **NOTE: To avoid losing parts, when finished, re-insert the tube and screw the panel back onto the Brewer.**

fig. 25



SECTION 4 Troubleshooting

Situation	Solution
Brewer does not have power	• Plug Brewer into an independent outlet. • Check to be sure that it is plugged in securely. • Plug into a different outlet. • Reset your home's circuit breaker if necessary. • Make sure that the Power Switch has been turned on and LCD Display is illuminated.
Brewer will not brew	• After placing the K-Cup® pack in the K-Cup® Pack Holder, make sure the Handle is pushed down securely and the LCD Control Center reads "READY TO BREW" with the BREW Button flashing, then press the BREW Button. • The Exit Needle may be clogged (refer to page 16). LCD Messages • If the water reservoir is empty and needs to be refilled, the LCD Screen will direct you to "Lift Water Reservoir, Fill Water Reservoir, Replace Water Reservoir" with slideshow of images. Follow these instructions. • In pour-over mode, if the water flow has been interrupted, the LCD screen will state "Water Flow Interrupted. To Reset, Please Lift and Remove Water Reservoir". When reservoir has been removed screen states "If necessary, please fill water reservoir to Max Fill line. Then replace". Follow these instructions. • If the messages persist after following these instructions, contact Customer Service at 1.866.901.BREW (2739).
Chlorine or mineral taste in coffee	• Consider using bottled water,filtered water, or the Keurig™ Water Filter Starter Kit (available at www.keurig.com).
Brewing a partial cup	• The Exit Needle may be clogged (refer to page 16). • Clean the K-Cup® Pack Holder assembly if necessary and rinse under faucet (refer to pages 15-16). • The Water Reservoir may have been removed during brewing. Replace the Water Reservoir and perform a water brew without a K-Cup® pack. • "De-Scale" the Brewer (refer to pages 16-17). • If you have repeated the de-scale procedure on your Brewer two times and it is still only brewing a partial cup, contact Customer Service at 1.866.901.BREW (2739).
The time is not displayed on the LCD Message Center	• The time will not be displayed on the LCD unless you have set it. To set the clock, follow the procedure on page 12. • If power is interrupted to the Brewer, you will need to set the clock again using the procedure on page 12.
Brewer shuts off or turns on automatically	• Check to make sure that the Auto Off timer and/or On/Off time features have not been set. To do this, press the MENU Button below "MENU" and scroll through the programming options. "OFF" should be displayed for Auto Off timer and On/Off. If "OFF" is not displayed, follow directions on pages 13-14 to reset.

If any problems persist, contact Customer Service at 1.866.901.BREW (2739)

SECTION 5 Warranty

Limited One Year Warranty

Keurig warrants that your Brewer will be free of defects in materials or workmanship **under normal** use for one year from the date of purchase. It is recommended that you fill out and return the warranty card enclosed with your Brewer so that your purchase information will be stored in our system. Keurig will, at its option, repair or replace the Brewer without charge upon its receipt of proof of the date of purchase. If a replacement Brewer is necessary to service this warranty, the replacement Brewer may be new or reconditioned. If a replacement Brewer is sent, a new limited one year warranty will be applied to the replacement Brewer.

This warranty only applies to Brewers operated in the United States and Canada. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state and, in the case of Canada, from province to province.

What is not covered by the Limited Warranty?

THIS WARRANTY DOES NOT COVER CONSEQUENTIAL OR INCIDENTAL DAMAGES SUCH AS PROPERTY DAMAGE AND DOES NOT COVER INCIDENTAL COSTS AND EXPENSES RESULTING FROM ANY BREACH OF THIS WARRANTY, EVEN IF FORESEEABLE. Some states or provinces do not allow the exclusion or limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you depending on the state or province of purchase.

Nor does this warranty cover damages caused by services performed by anyone other than Keurig or its authorized service providers, use of parts other than genuine Keurig parts, or external causes such as abuse, misuse, inappropriate power supply or acts of God.

Other Limitations

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY OTHER EXPRESS WARRANTY, WHETHER WRITTEN OR ORAL. IN ADDITION, KEURIG HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES WITH RESPECT TO YOUR PROFESSIONAL SERIES B155 BREWER, INCLUDING ANY IMPLIED WARRANTY OF MERCHANT ABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. Some states or provinces do not allow disclaimers of such implied warranties or limitations on how long an implied warranty lasts, so the above limitation may not apply to you depending on the state or the province of purchase.

How do you obtain warranty service?

Keurig® Brewers are high-quality appliances and, with proper care, are intended to provide years of satisfying performance. However, should the need arise for warranty servicing, simply call Keurig Customer Service at our toll free phone number 1.866.901.BREW (2739). Please do not return your Brewer for servicing without first speaking to Keurig Customer Service to obtain an Authorization to Return number (ATR). Keurig® Brewers returned without an ATR number will be returned to the sender without servicing.

Keurig, Incorporated
55 Walkers Brook Drive
Reading, MA 01867
1.866.901.BREW (2739)

SCM1000SS

12.25" x 20.25" x 14.75" (H x W x D)

Commercially approved microwave with stainless steel exterior and interior

Highlights:

Commercially approved to NSF standards

Stainless steel exterior and interior

Intuitive digital controls allow you to store settings for faster cooking

Product Features:

Stainless steel construction	Interior and exterior in brushed stainless steel
Commercially listed	Approved to NSF standards for use in the foodservice industry
Digital controls	Easy time settings with touch buttons
Saved cooking settings	Save your commonly used cooking programs in a few quick steps
Operations count	Includes function to display how many times the oven has been used
Child lock	Easy to set optional locking function
Digital display	Convenient timer readout

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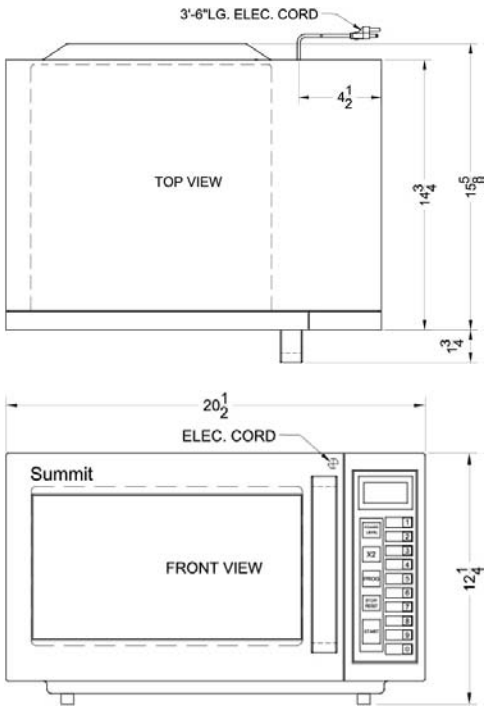
770 Garrison Avenue Bronx, NY 10474 USA **TEL** 718-893-3900 **FAX** 844-478-8799 info@summitappliance.com **www.summitappliance.com**

SCM1000SS Specifications:

Overview	
Height of Cabinet	12.25" (31 cm)
Width	20.25" (51 cm)
Depth	14.75" (37 cm)
Capacity	0.9 cu.ft. (25 L)
Cabinet	Stainless Steel
US Electrical Safety	ETL
Sanitation	ETL-S
Voltage/Frequency	115 V AC/60 Hz
Weight	39.0 lbs. (18 kg)
Shipping Weight	41.0 lbs. (19 kg)
Parts & Labor Warranty	90 Days
Microwave	
Type	Countertop
Wattage	1000.0
Controls	Digital
Digital Display	Yes



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NO. 122 DISPENSER, WATER, FILTERED

Aqua Bar II Standard Cooler

Contemporary Design, Innovative Features & Versatility

Features:

- Tri-temp: Hot, Cook and Cold
- 4 gallon stainless steel storage reservoir, perfect for reverse osmosis and filter applications
- High chilling capacity - 43 x 6 oz cups at 50^{0}F per hour
- Large faucet alcove for filling sports bottles and carafes
- Optional in-tank UV accessory for continuous sanitization (purchased separately)
- Optional in-cabinet leak detector accessory with inlet water shut off (purchased separately)
- Dual electrical float system with back-up safety
- Certified to NSF/ANSI 372 for low lead content
- Energy Star certified
- UL Listed
- 3 year limited warranty

Model:

- Standard Tri-temp: POU2LRHK

OASIS® Water Friendly Solutions

Quality & Innovation Since 1910

Certified WBENC Women's Business Enterprise

Aqua Bar II Standard Specifications

Cabinet: ABS plastic front and top with powder coat finished removable metal side panels. Holes are pre-drilled on cabinet side for cup dispenser.

Cold Water Refrigeration Unit: Convection cooled condenser. Internal, spring mounted, hermetically sealed compressor with automatic overload protector requires no lubrication. Refrigerant is controlled by a capillary tube.

Cold Water Thermostat: Temperature is controlled by an adjustable thermostat with “off” position that is easily accessible

Cold Water Reservoir: Four gallon, Non-removable type 300 series stainless steel with external copper refrigerant coil. Encased in pre-fitted molded plastic foam insulation.

Cold Water Capacity: 2.0 gallons of 50^{0}F water per hour (43 x 6oz cups).

Hot Water Tank: Tank is constructed of type 300 series stainless steel with 500 watt element.

Hot Water Capacity: 45 x 6 oz. cups of piping hot water per hour. 1 1/2 quart storage tank.

Hot Water Thermostat: Fixed thermostat with safety limiter.

Hot Water Safety Faucet: Self-closing activation requires a two-step action to prevent accidental dispensing.

Drip receptor: Durable dishwasher safe drip tray lifts out for easy cleaning.

Electrical: 115 volts, 60 hertz. 1/20 hp water cooler compressor. Three wire service cord & polarized plug.

Dimensions: W 12 3/4” x D 16 3/4” x H 44 3/4”
Approximate Net Weight: 60 lbs.

Optional water Filtration and Reverser Osmosis (RO): Aqua Bar II deluxe is filter and RO ready and is available with the Oasis three stage green filter system with RO.

Lead-Free: Components in the water cooler are lead-free as defined by the Safe Drinking Water Act Amendments of 1986 and the Lead Contamination Control Act of 1988. Model listed by Underwriter’s Laboratories to U.S. and Canadian Standards.

Warranty: Limited 3-year warranty (within the Continental Limits of the U.S. and Canada). Three years on the sealed refrigeration system, one year on most component parts. Detailed warranty certificate enclosed with each cooler; sample copy available upon request.

Specifications are subject to change without notice

www.oasiscoolers.com / 800.950.3226
Oasis International / 222 East Campus View Blvd. / Columbus, OH 43235

Oasis is a registered trademark of LVD Acquisition, LLC dba Oasis International,
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SCFM162

33" x 55.75" x 27.5" (H x W x D)

Commercially listed 16 cu.ft. manual defrost chest freezer

Highlights:

Commercially approved for use in foodservice establishments

Manual defrost operation and static cooling system

Added security with a factory installed lock

Product Features:

Commercially approved	UL-S listed to ANSI-NSF Standard 7 for commercial use
Manual defrost operation	Static cooling system
Factory installed lock	Keyed lock on the handle offers added security
One piece interior liner	Seamless interior ensures easier cleanup
Adjustable thermostat	Dial thermostat for easy temperature management
Storage baskets	Two removable plastic baskets offer convenient storage
Stainless steel front corner protectors	External "bumpers" are factory installed to protect the unit's front corners from dents
White exterior	Textured white finish fits well in any establishment
100% CFC free	Environmentally friendly design without ozone-damaging chemicals

SUMMIT APPLIANCE DIVISION, FELIX STORCH, INC. | ISO 9001:2015 Certified
770 Garrison Avenue Bronx, NY 10474 USA **TEL** 718-893-3900 **FAX** 844-478-8799 info@summitappliance.com **www.summitappliance.com**

SCFM162 Specifications:

Overview	
Height of Cabinet	33.0" (84 cm)
Width	55.75" (142 cm)
Depth	27.5" (70 cm)
Capacity	16.0 cu.ft. (453 L)
Defrost Type	Manual
Door	White
Cabinet	White
US Electrical Safety	UL
Canadian Electrical Safety	ULC
Sanitation	UL-S
Amps	5.0
Voltage/Frequency	115 V AC/60 Hz
Weight	170.0 lbs. (77 kg)
Shipping Weight	177.0 lbs. (80 kg)
Parts & Labor Warranty	1 Year
Compressor Warranty	5 Years
Refrigerator Features	
Door Swing	Lift-Up
Thermostat Type	Dial
Refrigerant Type	R134a
Temperature Range	-10 to 10°F
Dimensions	
Interior Height	29.13" (74 cm)
Interior Width	42.75" (109 cm)
Interior Depth	22.25" (57 cm)
Compressor Step Height	10.38" (26 cm)
Compressor Step Width	9.38" (24 cm)

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BKRF18SS

67.63" x 29.63" x 30" (H x W x D)

18 cu.ft. break room refrigerator-freezer with stainless steel doors and NIST calibrated alarm/thermometers

Highlights:

Perfect for break room applications

Includes NIST calibrated thermometers that provide a current and high/low temperature of the refrigerator and freezer compartments

True frost-free operation saves on maintenance by preventing icy buildup

Product Features:

NIST calibrated thermometers	Two thermometers provide an external readout of the current and high/low refrigerator and freezer temperature to the nearest tenth of a degree
High/low temperature alarms	Both thermometers include an audible alarm that can be set by the user
Frost-free operation	No-frost convenience requires no manual defrosting
Adjustable glass shelves	Rearrange refrigerator space to accommodate all sizes or remove shelves for simple cleanup
Interior light	Automatically illuminates when you open the door
Crisper drawers	Clear twin crispers with humidity control
Door storage	Keep bottles and condiments in easy reach
Gallon door storage	Lower refrigerator door shelf can hold gallon-sized containers
Adjustable thermostat	Dial thermostat located inside for easy temperature management

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BKRF18SS Specifications:

Overview	
Height of Cabinet	67.63" (172 cm)
Width	29.63" (75 cm)
Depth	30.0" (76 cm)
Depth with Handle	32.13" (82 cm)
Capacity	18.0 cu.ft. (510 L)
Defrost Type	Frost-Free
Door	Stainless Steel
Cabinet	Black
US Electrical Safety	CSA
Energy Usage/Year	404.0kWh/year
Amps	6.0
Voltage/Frequency	115 V AC/60 Hz
Weight	210.0 lbs. (95 kg)
Shipping Weight	220.0 lbs. (100 kg)
Parts & Labor Warranty	1 Year
Compressor Warranty	5 Years
Refrigerator-Freezer	
Door Swing	RHD
Reversible	Yes
Adjustable Shelves	Yes
Crisper Qty	2
Crisper Finish	Transparent
Crisper Cover	Glass
Interior Light	Yes
Refrigerator - Shelf Type	Glass
Refrigerator - Shelf Qty	2
Refrigerator - Full Door Shelves	3
Refrigerator - Half Door Shelves	1
Refrigerator - Temperature Range	36 to 46ºF
Freezer - Shelf Type	Wire
Freezer - Shelf Qty	1
Freezer - Full Door Shelves	2
Gallon Door Storage	Yes
Thermostat Type	Dial

Fan Type	Interior
Refrigerant Type	R134a
Refrigerant Amount	4.25 oz.
High Side PSI	300.0
Low Side PSI	140.0
Freezer - Temperature Range	0 to 10ºF

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FF6L7NZ

33.5" x 23.63" x 23.5" (H x W x D)

Commercially approved Nutrition Center series all-refrigerator in white for freestanding use, with front lock and digital temperature display

Highlights:

Commercially approved to NSF-7 standards

Digital temperature display and audible alarm allows easier temperature monitoring as recommended by JCAHO

Thermometer is NIST calibrated in our ISO/IEC 17025:2005 laboratory

Product Features:

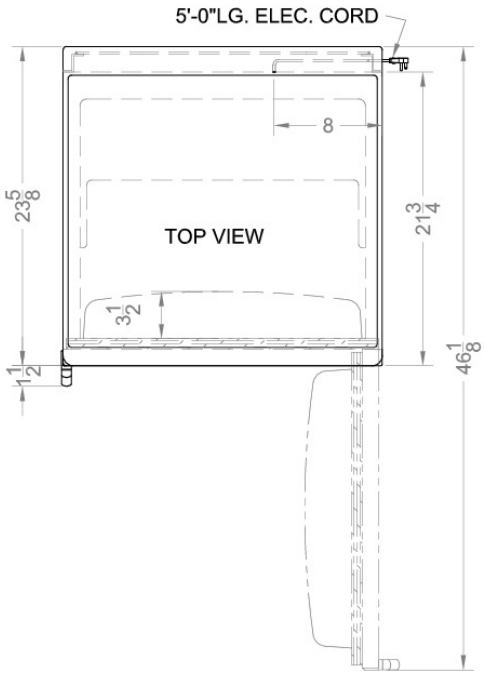
Commercially approved	ETL-S listed to NSF-7 commercial standards for food and beverage storage
24" footprint	Conveniently sized to offer sufficient capacity in a slim fit
NIST calibrated temperature display	Thermometer provides continuous display of the current and high/low temperature to the nearest tenth of a degree, with a readout switchable from Celsius to Fahrenheit at the touch of a button
High/low temperature alarm	Audible alarm sounds if the interior temperature rises or falls out of set range
Versatile display	Temperature display can be switched from Celsius to Fahrenheit at the touch of a button
Factory installed lock	Top-mounted keyed lock for convenient security, with two keys included
Automatic defrost	Reduced maintenance with auto defrost system
Adjustable epoxy-coated wire shelves	Rearrange your refrigerator space to accommodate all shapes and sizes or remove shelves for a simple clean-up
Door storage	Three door racks, including a covered rack and bottom shelf that allows you to store tall bottles in easier reach

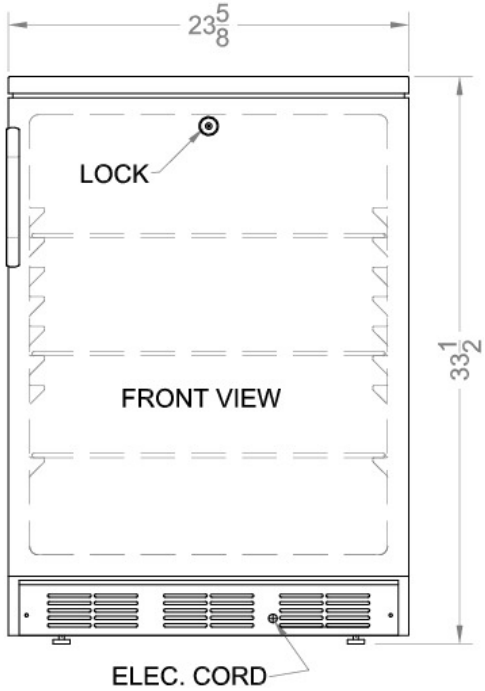
accucold

FF6L7NZ Specifications:

Overview	
Height of Cabinet	33.5" (85 cm)
Width	23.63" (60 cm)
Depth	23.5" (60 cm)
Depth with Handle	25.13" (64 cm)
Depth with door at 90°	46.13" (117 cm)
Capacity	5.5 cu.ft. (156 L)
Defrost Type	Automatic
Door	White
Cabinet	White
US Electrical Safety	ETL
Canadian Electrical Safety	ETL-C
Sanitation	ETL-S
Amps	1.3
Voltage/Frequency	115 V AC/60 Hz
Weight	100.0 lbs. (45 kg)
Shipping Weight	105.0 lbs. (48 kg)
Parts & Labor Warranty	1 Year
Compressor Warranty	5 Years
Refrigerator Features	
Door Swing	RHD
Reversible	Yes
Crisper Qty	1
Crisper Finish	Opaque
Crisper Cover	Glass
Shelf Type	Wire
Shelf Qty	3
Full Door Shelf Qty	3
Adjustable Shelves	Yes
Thermostat Type	Dial
Refrigerant Type	R134a
Refrigerant Amount	1.8oz.
High Side PSI	285.0
Low Side PSI	70.0
Level Legs Qty	2
Interior Light	Yes
Temperature Range	35 to 39ºF
Dimensions	

Interior Height	27.75" (70 cm)
Interior Width	20.0" (51 cm)
Interior Depth	17.5" (44 cm)
Compressor Step Height	7.0" (18 cm)
Compressor Step Width	20.0" (51 cm)
Compressor Step Depth	6.0" (15 cm)





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NO. 161.01 WASHER, BOWL, PASS-THRU

Auto-Chlor SYSTEM

A4 WaterSaver™

Single Rack • In Line • Low Energy Dishmachine

- Auto-Chlor System's proprietary WaterSaver™ design uses as little as 1.09 gallons/rack
- Powerful 1 HP pump delivers high pressure spray and mechanical cleaning action for single pass cleaning performance
- Built in water pressure regulator provides consistent water usage and cleaning results
- Exclusive fill-through-the-pump feature flushes and cleans the wash pump and spray system with every cycle
- External sump and screen provide easy access for cleaning
- Regularly scheduled 28-day service ensures sparkling results, minimizes mechanical problems and reduces operating costs
- Benefiting from more than 75 years of improvements and dishwashing experience and knowledge

Energy Efficient

- Exceeds Energy Star requirements
- Low temperature chemical sanitizing saves energy

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Total Satisfaction.

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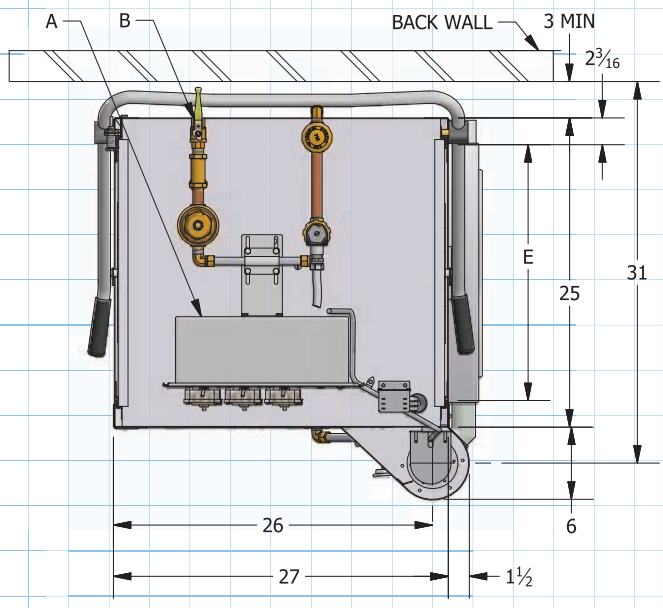
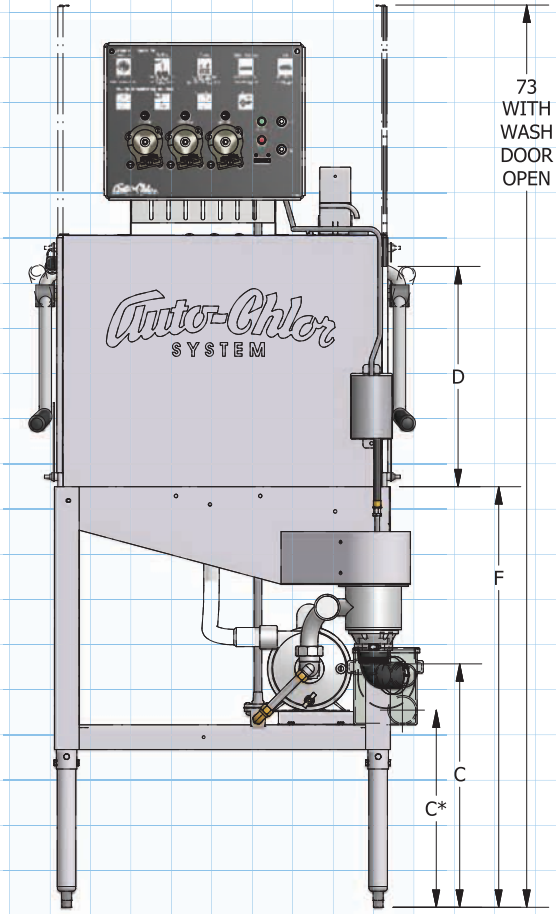
Auto-Chlor SYSTEM

A4 WaterSaver™

Single Rack • In Line • Low Energy Dishmachine





Specifications

Standard 90 second cycle, 38 rack/hr

A - Electrical -115 VAC, 60Hz, 1 PH
- 20A Dedicated Circuit Recommended
- Connects to Grounded Wall Outlet or ½" Conduit depending on local building codes

B - Water Consumption 1.09 gal/rack (41.3 GPH)
- Water Supply Flow Rate 7.5 GPM Minimum
- Water Supply Temp 120˚F Minimum
- Water Supply Connection ½" NPT female
- Backflow protection provided by ASSE 1001 Vacuum Breaker

C - Drain Connection 2" MPT
- 20" above floor

C* - Optional Scrap Accumulator
- Connection 2" MPT
- Centerline 15½" above floor

D - Wash Cavity Clearance 17" Max Height

E - Rack Clearance - 20 ⅛" between tracks
- Rack Size 20" x 20"

F - Table Height at Machine Entrance 34"

Available Options:
- Auto-Start
- Leg Extensions : 3"
- Vapor Removal System (VRX)
- 72 second cycle, 47 Racks/hr, 51 GPH
- 60 second cycle, 55 Racks/hr, 60 GPH
- Tall Hood 27" Max. Height Wash Cavity

Optional Supplemental Water Heaters Available
An optional integrated water heating system is available for this model dishmachine. The integrated system mounts within the framework of the machine so no additional floor space is required. The integrated heater is ideal for facilities with insufficient water heating capacity, on-demand style water heaters, or remotely located heaters. The heater can operate on 50A 208-240V circuits using either single or three phase power. Contact your local Auto-Chlor System representative for more information.

Note: This unit does not produce heat or steam

Total Service. Total Satisfaction.

NSF UL LISTED ENERGY STAR LEARN MORE AT energystar.gov CSA

ACM30002

Auto-Chlor® SYSTEM
autochlor.com

Auto-Chlor® SYSTEM

A4 WaterSaver™

Single Rack • In Line • Low Energy Dishmachine

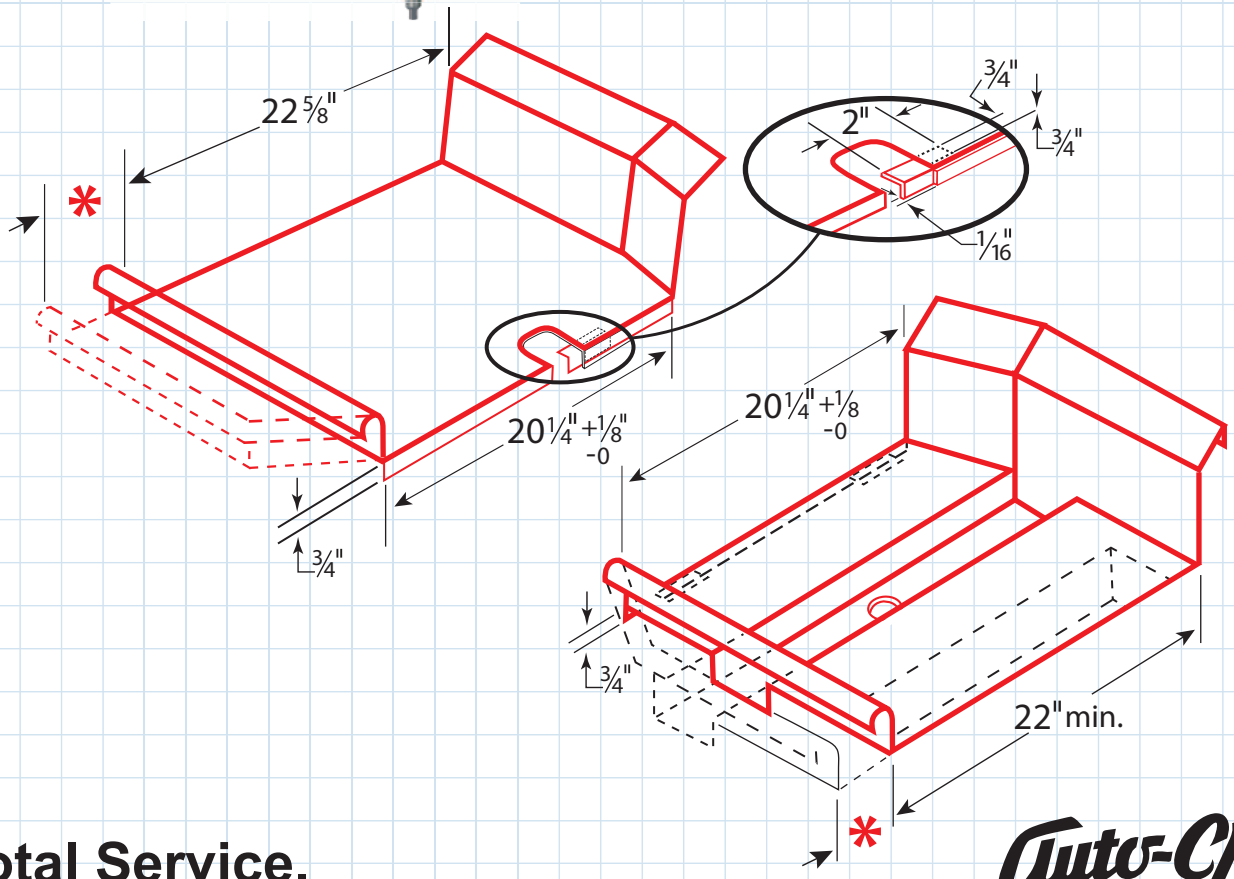
INLINE TABLE LAYOUT

Installation Specifications

*** NOTE:**

Dotted lines show how tables can be made to any desired width. Drain trough and/or pre-wash sink (dotted line) and some type of guide to center racks should be provided in "soiled dish" table.

Drawing shows right-to-left operation. For left-to-right feed, construct tables in reverse.



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EVOLUTION SEPTIC ASSIST®

FOOD WASTE DISPOSER DESIGNED FOR SEPTIC SYSTEM

TRITURADOR DE DESPERDICIOS DE ALIMENTOS DISEÑADO PARA SISTEMAS SÉPTICOS

AnswerLine®
1-800-558-5700

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DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE is used to address practices not related to personal injury.

CAUTION without the safety alert symbol, is used to address practices not related to personal injury.

PELIGRO indica una situación peligrosa que, si no se evita, provocará lesiones graves o incluso la muerte.

ADVERTENCIA indica una situación riesgosa, la cual, si no se evita, puede ocasionar lesiones graves o incluso la muerte.

PRECAUCIÓN empleado junto con el símbolo de alerta, indica una situación riesgosa, la cual, si no se evita, puede provocar heridas leves o moderadas.

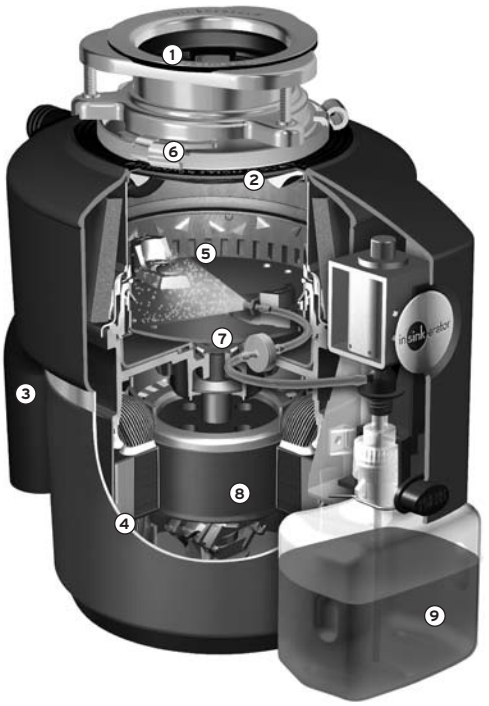
AVISO hace referencia a prácticas que no presentan riesgos de generar lesiones personales.

PRECAUCIÓN empleado sin el símbolo de alerta, hace referencia a prácticas que no presentan riesgos de generar lesiones personales.

76137 Rev B

The Evolution Series® by InSinkErator® is a new standard in sound and grind performance. Featuring exclusive patented **SoundSeal®** and **MultiGrind®** technologies, no food waste disposer grinds more with less noise.

Evolution Series® de InSinkErator® es el nuevo estándar dentro de la tecnología de conductos y trituración. Con las exclusivas tecnologías **SoundSeal®** y **MultiGrind®**, ningún triturador de desperdicios tritura más con menos ruido.



Sound Seal® Technology

1. **Quiet Collar® Sink Baffle**
2. **Anti-Vibration Mount®**
3. **Anti-Vibration Tailpipe Mount™**
4. **SoundLimiter™ Insulation**

Sound Seal® Tecnología

1. **Deflector del fregadero Quiet Collar®**
2. **Anti-Vibration Mount®**
3. **Anti-Vibration Tailpipe Mount™**
4. **Aislamiento SoundLimiter™**

Multi Grind® Technology

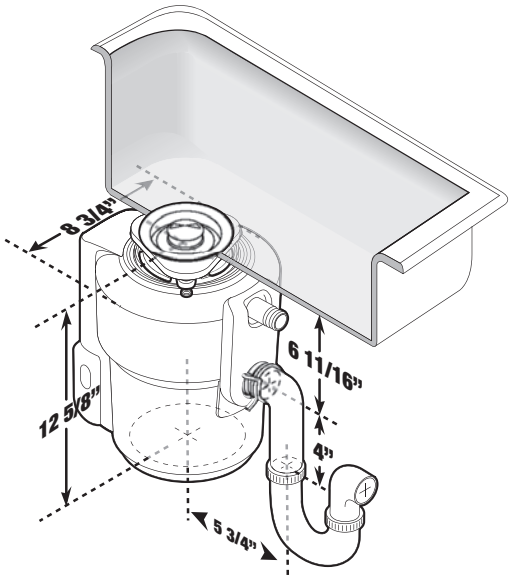
5. **GrindShear Ring®**
6. **Quick Lock® Sink Mount**
7. **Stainless Steel Grind Components**
8. **3/4 HP Heavy Duty Dura-Drive® Motor**
9. **Bio-Charge® Technology**

Multi Grind® Tecnología

5. **GrindShear Ring®**
6. **Montaje del fregadero Quick Lock®**
7. **Componentes de trituración de acero inoxidable**
8. **Motor Dura-Drive® de 3/4 HP para trabajos pesados**
9. **Bio-Charge® Tecnología**

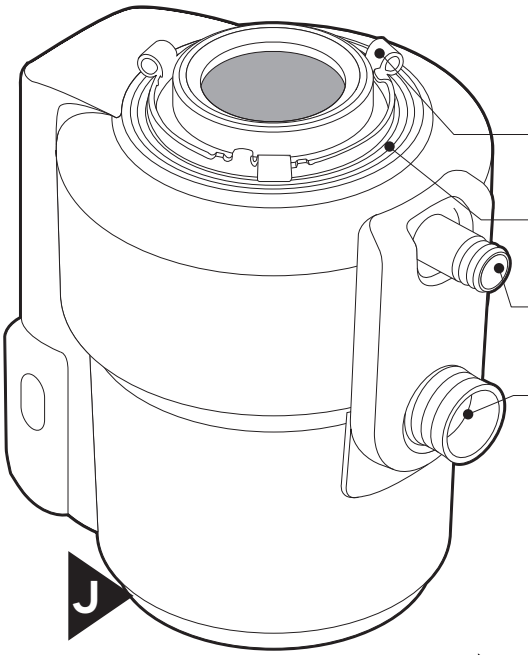
⚠ **Read all warnings before proceeding.**

⚠ **Lea todas las advertencias antes de continuar.**



Dimensions/Dimensiones

Includes/Incluye



- **A** Stopper / Tapón
- **B** Quiet Collar® Sink Baffle / Deflector del fregadero Quiet Collar®
- **C** Sink Flange / Brida del fregadero
- **D** Fiber Gasket / Junta de fibra
- **E** Backup Flange / Brida de apoyo
- **F** Mounting Ring / Anillo de montaje
- **G** 1-1/2" Screws / Tornillos de 1-1/2" (3,81 cm)
- **H** 1-1/8" Screws / Tornillos de 1-1/8" (2,85 cm)
- **I** Snap Ring / Anillo de cierre

Lower Mounting Ring
Anillo de montaje inferior

Anti-Vibration Mount®
Anti-Vibration Mount®

Dishwasher Inlet
Entrada del lavavajillas

Anti-Vibration Tailpipe Mount™

Anti-Vibration Tailpipe Mount™

J Disposer/Triturador

K Jam-Buster™ Wrench / Llave Jam-Buster™

Failure to use the spring type hose clamp provided voids warranty./ La garantía pierde validez si no usa la abrazadera de manguera tipo resorte incluida.

L Spring Type Hose Clamp / Abrazadera de manguera tipo resorte

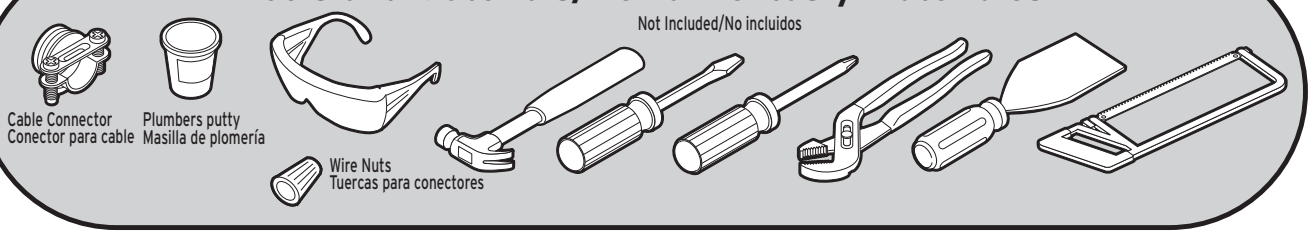
M Discharge Tube / Tubo de descarga

N Discharge Tube / Tubo de descarga

O Bio-Charge® Bottle / Botella Bio-Charge®

Tools and Materials/Herramientas y materiales

Not Included/No incluidos



Removal of old disposer/Extracción del triturador viejo

1 If you are replacing an existing disposer, continue to Step 2. If there is no existing disposer, disconnect sink drain and skip to Step 10.

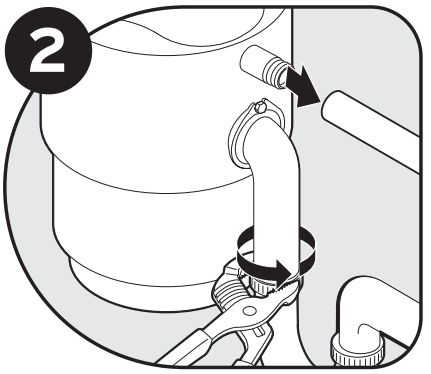
Si tiene que reemplazar un triturador existente, continúe con el Paso 2. Si no existe un triturador, desconecte el desagüe del fregadero y continúe con el Paso 10.

⚠ WARNING/ADVERTENCIA

SHOCK HAZARD
Turn off electric power at fuse box or circuit breaker.

PELIGRO DE DESCARGA ELÉCTRICA
Desconecte el suministro eléctrico desde la caja de fusibles o del interruptor de circuito.

2



Disconnect drain trap from waste discharge tube. Disconnect dishwasher if connected to the disposer.

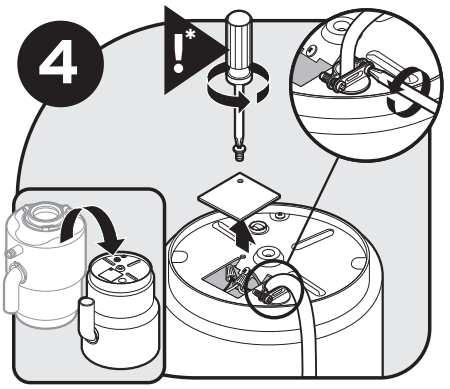
Desconecte la trampa de desagüe del tubo de descarga de desperdicios. Desconecte el lavavajillas si está conectado al triturador.

3

Support disposer, insert end of Jam-Buster™ Wrench (K) into right side of mounting lug, and turn. Disposer will fall free.

Apoye el triturador, inserte el extremo de la Llave Jam-Buster™ (K) en el lado derecho de uno de los salientes de montaje y gire. El triturador se liberará.

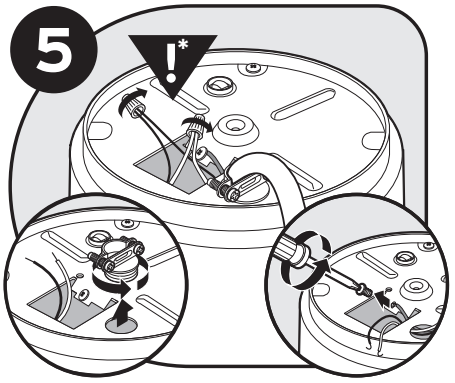
4



*** WARNING: SHOCK HAZARD**
With the electrical supply turned off, flip disposer over and remove electrical cover plate. Save cable connector if applicable.

*** ADVERTENCIA: PELIGRO DE DESCARGA ELÉCTRICA.** Con la energía eléctrica apagada, voltee el triturador y retire la placa de la cubierta eléctrica. Guarde el conector del cable si corresponde.

5



*** WARNING: SHOCK HAZARD**
With the electrical supply turned off, disconnect the disposer wires from the electrical supply.

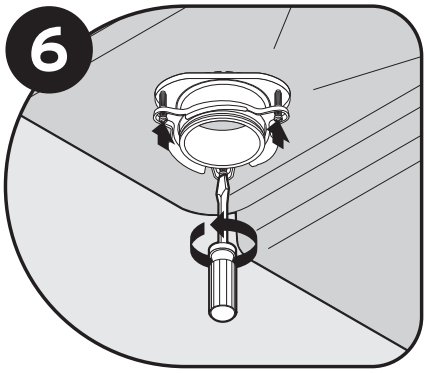
*** ADVERTENCIA: PELIGRO DE DESCARGA ELÉCTRICA.** Con la energía eléctrica apagada, desconecte los cables del triturador del suministro eléctrico.

If the new disposer mounting is the same as the old one, you can go to step 15.

Note: For sinks thicker than 3/8", you will need to replace existing 1-1/2" screws with 1-1/8" screws (H). See Step 14.

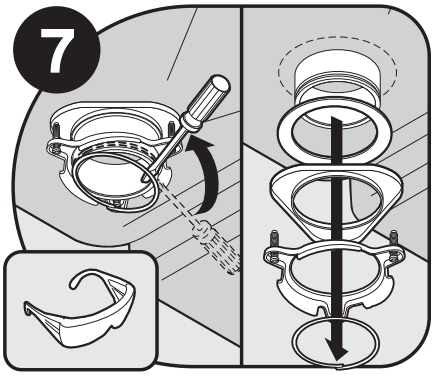
Si el montaje del triturador nuevo es el mismo que el viejo, puede ir al Paso 15.

Nota: Para los fregaderos con espesor mayor de 3/8" (0,95 cm), deberá reemplazar los tornillos existentes de 1-1/2" (3,81 cm) por tornillos de 1-1/8" (2,85 cm) (H). Consulte el Paso 14.



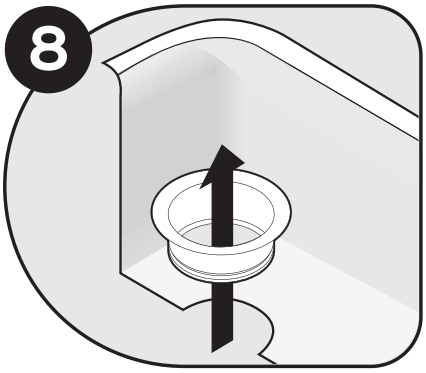
Loosen the 3 screws on the mounting assembly.

Afloje los 3 tornillos en el conjunto de montaje.



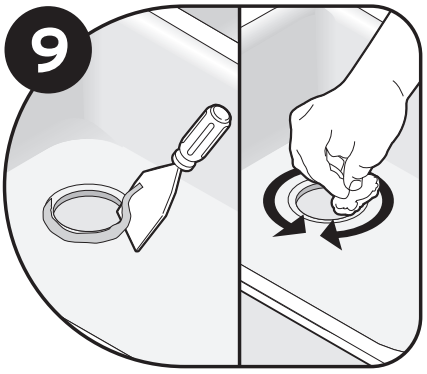
Using a screwdriver, remove the snap ring.

Retire el anillo de cierre con un destornillador.



Remove flange from sink.

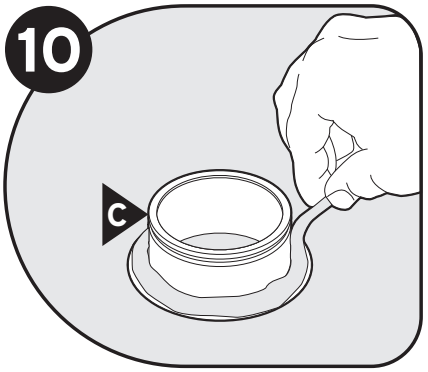
Retire la brida del fregadero.



Remove old plumber's putty from sink with putty knife.

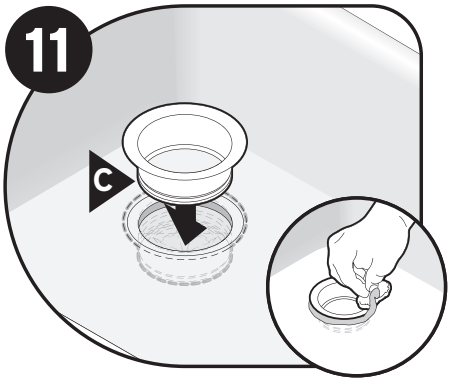
Retire la masilla de plomería vieja del fregadero con una espátula.

Installation/Instalación



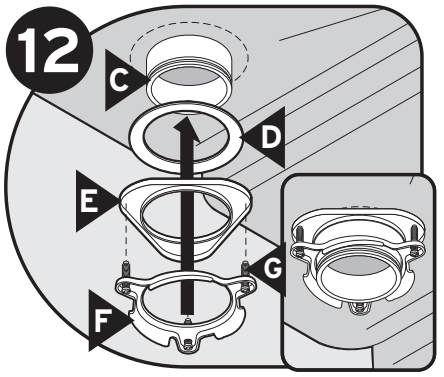
Evenly apply 1/2" thick rope of plumber's putty around flange (C).

Aplique una tira gruesa de masilla de plomería, de 1/2" (1,27 cm), en forma uniforme alrededor de la brida (C).



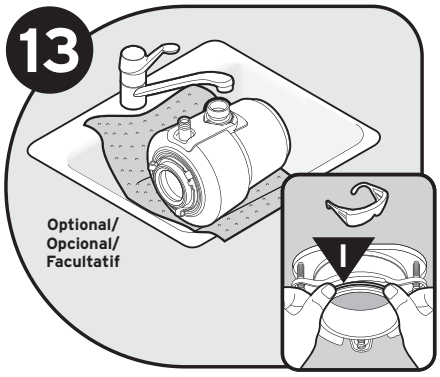
Press flange (C) firmly into sink drain. Remove excess putty.

Presione la brida (C) firmemente en el desagüe del fregadero. Retire la masilla sobrante.



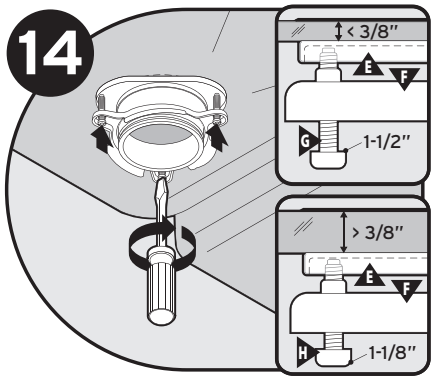
Insert fiber gasket (D), backup flange (E) and mounting ring (F).

Inserte la junta de fibra (D), la brida de soporte (E) y el anillo de montaje (F).



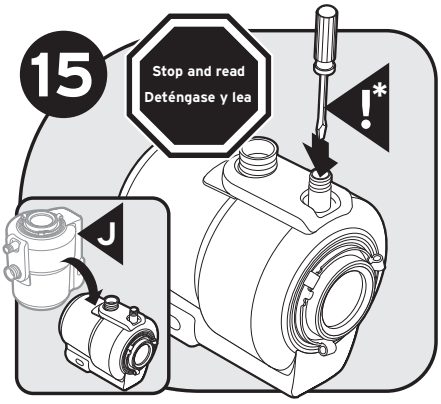
Hold in place while inserting snap ring (I). Place a weight such as the disposer on the sink flange to hold it in place. Use a towel to prevent scratching sink. Pull snap ring open and press firmly until it snaps into place.

Sosténgalos en su lugar mientras inserta el anillo de cierre (I). Coloque un peso, por ejemplo el triturador, sobre la brida del fregadero para mantenerla en su lugar. Utilice una toalla para evitar que se raye el fregadero. Abra el anillo de cierre y presione firmemente hasta que se coloque en el lugar.



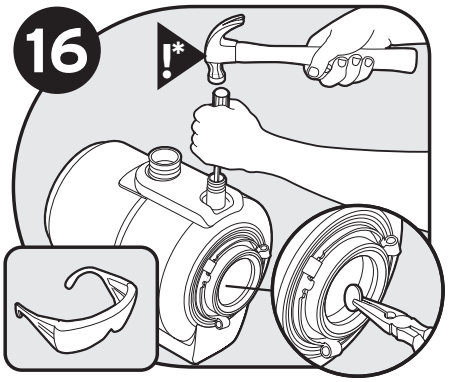
Tighten 1-1/2" screws (G) evenly and firmly against backup flange. Use shorter 1-1/8" screws (H) if sink is more than 3/8" thick.

Ajuste los tornillos de 1-1/2" (3,81 cm) (G) en forma uniforme y firme contra la brida de soporte. Utilice tornillos más cortos de 1-1/8" (2,85 cm) (H) si el fregadero tiene más de 3/8" (0,95 cm) de espesor.



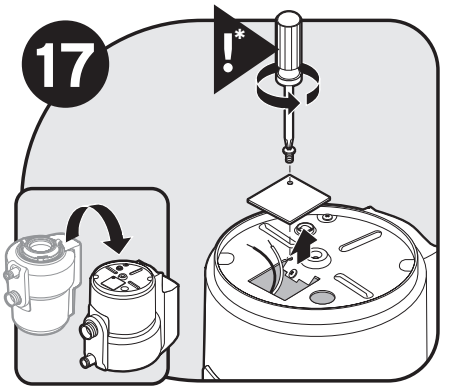
*** CAUTION: DISHWASHER CONNECTION ONLY** If you do not need to attach the dishwasher, go to Step 17. Turn disposer (J) onto side and insert screwdriver into dishwasher inlet.

*** PRECAUCIÓN: SÓLO PARA CONEXIÓN DEL LAVAVAJILLAS.** Si no es necesario conectar el lavavajillas, pase al Paso 17. Voltee el triturador (J) sobre un lado e introduzca el destornillador en la entrada del lavavajillas.



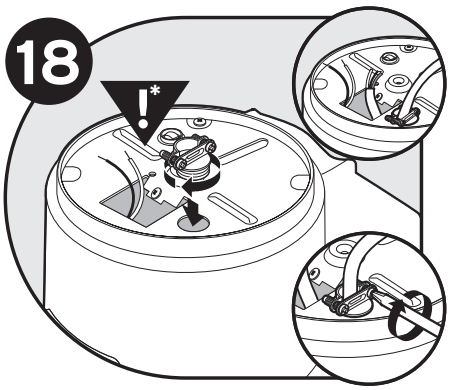
*** CAUTION: DISHWASHER CONNECTION ONLY** Knock out drain plug and remove plug from inside of disposer.

*** PRECAUCIÓN: SÓLO PARA LA CONEXIÓN DEL LAVAVAJILLAS.** Extraiga de un golpe el tapón de desagüe del interior del triturador.



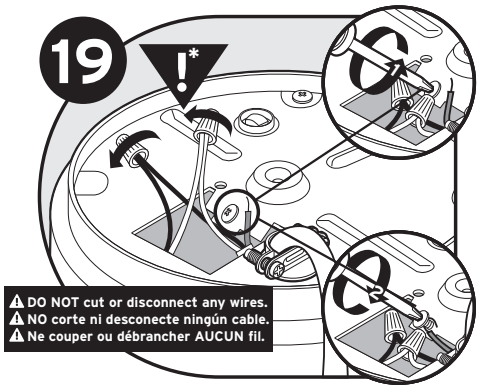
*** WARNING: SHOCK HAZARD.** Turn disposer over and remove electrical cover plate. Pull out wires. **DO NOT REMOVE CARDBOARD SHIELD.**

*** ADVERTENCIA: PELIGRO DE DESCARGA ELÉCTRICA.** Dé vuelta el triturador y retire la placa de cubierta eléctrica. Saque los cables. **NO RETIRE LA PROTECCIÓN DE CARTÓN.**



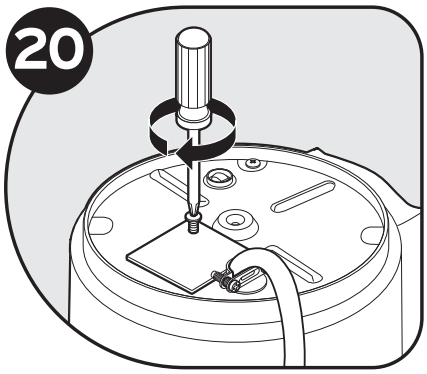
*** WARNING: SHOCK HAZARD.** With electrical supply turned off, insert cable connector (not included) and run electrical cable through access hole on bottom of disposer. Tighten cable connector.

*** ADVERTENCIA: PELIGRO DE DESCARGA ELÉCTRICA.** Con la corriente eléctrica apagada, introduzca el conector del cable (no incluido) y pase el cable eléctrico a través del orificio de acceso en la parte inferior del triturador. Ajuste el conector del cable.



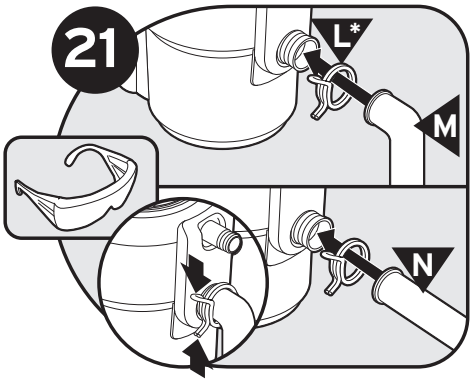
*** WARNING! Improper grounding can result in electric shock hazard.** Connect white wire from disposer to neutral (white) wire from power source and black wire from disposer to hot (black, red) wire from power source with wire nuts (not included); ground wire to green grounding screw. Unit must be grounded for safe and proper installation.

*** ADVERTENCIA: La conexión incorrecta a tierra puede representar un riesgo de descarga eléctrica.** Conecte el cable blanco del triturador al cable neutro (blanco) de la fuente de energía, y el cable negro del triturador al cable vivo (negro, rojo) de la fuente de energía, use para ello tuercas para cable (no incluidas); finalmente, una el cable de conexión a tierra con el tornillo verde conectado a tierra. La unidad debe estar conectada a tierra para una instalación segura y adecuada.



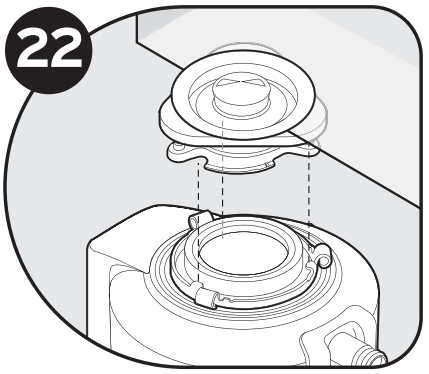
Push wires into disposer **(do not displace cardboard shield)** and replace electrical cover plate.

Coloque los cables dentro del triturador **(no retire la protección de cartón)** y reemplace la placa de la cubierta eléctrica.



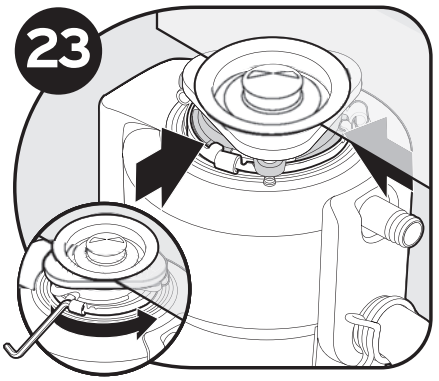
Place tube (M or N) into Anti-Vibration Tailpipe Mount™. Use provided tubes for best results. Secure with spring type hose clamp (L). ***Important: Failure to use the spring type hose clamp provided voids warranty.**

Coloque el tubo (M o N) dentro del Anti-Vibration Tailpipe Mount™. Utilice los tubos provistos para obtener mejores resultados. Fije con la abrazadera de manguera tipo resorte (L). ***Importante: La garantía pierde validez si no usa la abrazadera de manguera tipo resorte incluida.**



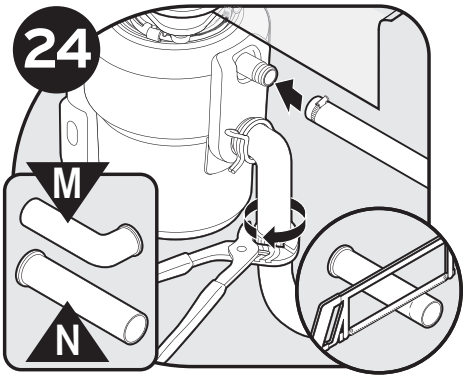
Hang disposer by aligning 3 mounting tabs with slide-up ramps on mounting ring.

Sostenga el triturador y alinee los 3 apéndices de montaje con rampas deslizables sobre el anillo de montaje.



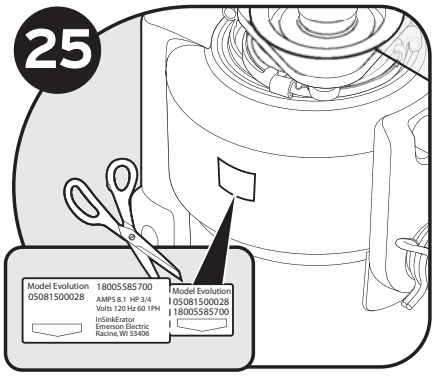
Turn mounting ring until all 3 mounting tabs lock over the ridges on the slide-up ramps.

Gire el anillo de montaje hasta que los 3 apéndices de montaje se cierren sobre los bordes de las rampas deslizables.



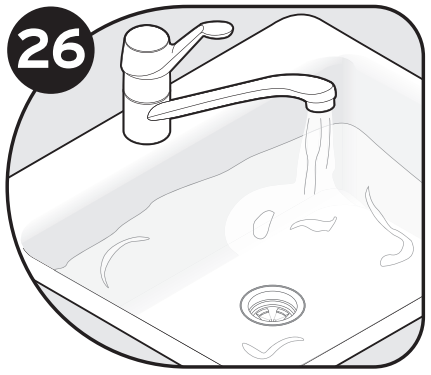
You may need to trim tube for proper fit. Reconnect plumbing (and dishwasher connection if used). Make sure Anti-Vibration Tailpipe Mount™ is straight.

Es posible que deba recortar el tubo para una colocación adecuada. Reconecte la plomería (y la conexión del lavavajillas, si utiliza uno). Asegúrese de que el Anti-Vibration Tailpipe Mount™ esté derecho.



Detach removable portion of spec label and place on a visible location.

Corte la parte desmontable de la etiqueta de especificaciones y colóquela en un lugar visible.



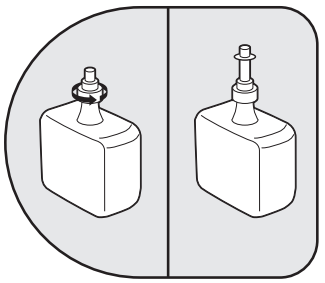
Insert Quiet Collar® Sink Baffle into sink opening. Fill sink with water, then test for leaks. Install Bio-Charge® Bottle. See following section.

Inserte el deflector del fregadero Quiet Collar® en la abertura del fregadero. Llene el fregadero con agua y luego verifique que no haya fugas. Instale la botella Bio-Charge®. Vea la sección siguiente.

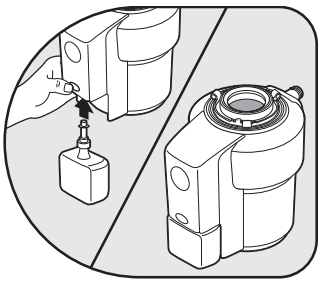
ENGLISH

Installing and Replacing the Bio-Charge® Bottle

Installing Bio-Charge® Bottle
Use only InSinkErator® Bio-Charge®. See Changing Bio-Charge® Bottle for safety instructions and information on obtaining Bio-Charge® replacements. Do not squeeze the Bio-Charge® Bottle; squeezing the bottle may cause Bio-Charge® to discharge and spill.

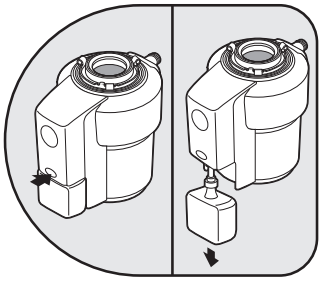


Unscrew Bio-Charge® dispenser cap nozzle counterclockwise until nozzle pops upward to dispensing position. Do not remove dispenser cap nozzle.



Aligning bottle with concave side toward disposer, press and hold the button while pushing bottle upward into holder. Release button. Pull bottle down slightly to ensure it is engaged.

Replacing Bio-Charge® Bottle
To keep your septic system operating at peak efficiency, replace the Bio-Charge® Bottle when it is empty. To change Bio-Charge® Bottle:



Make sure disposer is off. Press button on disposer just above bottle and pull bottle down to remove it. (Do not refill or reuse empty bottle.)

Bio-Charge® is available wherever InSinkErator® Septic Assist is sold. For Bio-Charge® reorder, questions, or comments call toll free 1 (888) 527-1493.

4 YEAR IN-HOME FULL SERVICE WARRANTY

This warranty is provided by InSinkErator®, a division of Emerson Electric Co., ("InSinkErator" or "Manufacturer" or "we" or "our" or "us") to the original consumer owner of the InSinkErator product with which this warranty is provided (the "InSinkErator Product"), and any subsequent owner of the residence in which the Product was originally installed ("Customer" or "you" or "your").

InSinkErator warrants to Customer that your InSinkErator Product will be free from defects in materials and workmanship, subject to the exclusions described below, for a period of 4 years (the "Warranty Period"), commencing on the later of: (a) the date your InSinkErator Product is originally installed, (b) the date of purchase, or (c) the date of manufacture as identified by your InSinkErator Product serial number. You will be required to show written documentation supporting (a) or (b). If you are unable to provide documentation supporting either (a) or (b), the Warranty Period commencement date will be determined by Manufacturer, in its sole and absolute discretion, based upon your InSinkErator Product serial number.

What is Covered
This warranty covers defects in materials or workmanship, subject to the exclusions below, in InSinkErator Products used by a consumer Customer for residential use only, and includes all replacement parts and labor costs. YOUR SOLE AND EXCLUSIVE REMEDY UNDER THIS LIMITED WARRANTY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE INSINKERATOR PRODUCT.

What is not Covered
This limited warranty does not extend to and expressly excludes:
- Losses or damages or the inability to operate your InSinkErator Product resulting from conditions beyond the Manufacturer's control including, without limitation, accident, alteration, misuse, abuse, neglect, negligence (other than Manufacturer's), failure to install, maintain, assemble, or mount the InSinkErator Product in accordance with Manufacturer's instructions or local electrical and plumbing codes.
- Wear and tear expected to occur during the normal course of use, including without limitation, cosmetic rust, scratches, dents or comparable and reasonably expected losses or damages. In addition to the above exclusions, this warranty does not apply to InSinkErator Products installed in a commercial or industrial application.

No Other Express Warranty Applies
This warranty is the sole and exclusive warranty provided to the Customer identified above. No other express warranty, written or verbal, applies. No employee, agent, dealer, or other person is authorized to alter this limited warranty or make any other warranty on behalf of Manufacturer. The terms of this warranty shall not be modified by the Manufacturer, the original owner, or their respective successors or assigns.

What we will do to Correct Problems
If your InSinkErator Product does not operate in accordance with the documentation provided to you, or you have questions concerning your InSinkErator Product or how to determine when service is needed, please call the toll free InSinkErator AnswerLine™ at 1 (800) 558-5700, or visit our website at www.insinkerator.com. You may also notify us at: InSinkErator Service Center, 4700 21st Street, Racine, Wisconsin 53406 USA.

The following information must be provided as part of your warranty claim: your name, address, phone number, your InSinkErator Product model and serial number, and if necessary, upon request, written confirmation of either: (a) the date shown on your installation receipt, or (b) the date shown on your purchase receipt.

Manufacturer or its authorized service representative will determine, in its sole and absolute discretion, if your InSinkErator Product is covered under this warranty. You will be given the contact information for your closest authorized InSinkErator Service Center. Please contact your InSinkErator Service Center directly to receive in home warranty repair or replacement service. Only an authorized InSinkErator service representative may provide warranty service. InSinkErator is not responsible for warranty claims arising from work performed on your InSinkErator Product by anyone other than an authorized InSinkErator service representative.

If a covered claim is made during the Warranty Period, Manufacturer will, through its authorized service representative, either repair or replace your InSinkErator Product. Cost of replacement parts or a new InSinkErator Product, and cost of labor for repair or installation of the replacement InSinkErator Product are provided at no cost to you. Repair or replacement shall be determined by Manufacturer or its authorized service representative in their sole discretion. All repair and replacement services will be provided to you at your home. If Manufacturer determines that your InSinkErator Product must be replaced rather than repaired, the warranty on the replacement InSinkErator Product will be limited to the unexpired term remaining in the original Warranty Period.

Limitation of Liability
TO THE EXTENT PERMITTED BY LAW, IN NO EVENT SHALL MANUFACTURER OR ITS AUTHORIZED SERVICE REPRESENTATIVES BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, INCLUDING ANY ECONOMIC LOSS, WHETHER RESULTING FROM NONPERFORMANCE, USE, MISUSE OR INABILITY TO USE THE INSINKERATOR PRODUCT OR THE MANUFACTURER'S OR ITS AUTHORIZED SERVICE REPRESENTATIVE'S NEGLIGENCE. MANUFACTURER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE AND IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL MANUFACTURER'S LIABILITY TO YOU EXCEED THE PRICE PAID BY THE ORIGINAL OWNER FOR THE INSINKERATOR PRODUCT.

The term "consequential damages" shall include, but not be limited to, loss of anticipated profits, business interruption, loss of use or revenue, cost of capital or loss or damage to property or equipment.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

OPERATING INSTRUCTIONS

1. Remove stopper from sink opening and run cold water.
2. Turn on wall switch to start disposer.
3. Slowly insert food waste into disposer. **CAUTION!** Position stopper to minimize possible ejection of material while grinding.
4. After grinding is complete, turn disposer off and run water for a few seconds to flush drain line.

DO...

- First turn on cold water and then turn on the disposer. Continue running cold water for several seconds after grinding is completed to flush the drain line.
- Grind hard materials such as small bones, fruit pits, and ice. A scouring action is created by the particles inside the grind chamber.
- Grind peelings from citrus fruits to freshen up drain smells.
- Use a disposer cleaner, degreaser, or deodorizer as necessary to relieve objectionable odors caused by grease build-up.

⚠ CAUTION

Regularly inspect disposer and plumbing fittings for water leaks, as water leaks can cause property damage. Manufacturer cannot be held responsible for property damage as a result of water leaks.

DON'T...

- ***POUR GREASE OR FAT DOWN YOUR DISPOSER OR ANY DRAIN. IT CAN BUILD UP IN PIPES AND CAUSE DRAIN BLOCKAGES. PUT GREASE IN A JAR OR CAN AND DISPOSE IN THE TRASH.***
- Use hot water when grinding food waste. It is OK to drain hot water into the disposer between grinding periods.
- Fill disposer with a lot of vegetable peels all at once. Instead, turn the water and disposer on first and then feed the peels in gradually.
- Grind large amounts of egg shells or fibrous materials like corn husks, artichokes, etc., to avoid possible drain blockage.
- Turn off disposer until grinding is completed and only sound of motor and water is heard.

USER-MAINTENANCE INSTRUCTIONS

CLEANING DISPOSER

Over time, food particles may accumulate in the grind chamber and baffle. An odor from the disposer is usually a sign of food buildup. To clean disposer:

1. Place stopper in sink opening and fill sink halfway with warm water.
2. Mix 1/4 cup baking soda with water. Turn disposer on and remove stopper from sink at same time to wash away loose particles.
3. Remove Quiet Collar® Sink Baffle and clean by hand or in dishwasher. Do not operate disposer without Quiet Collar® Sink Baffle in place.

Disposers may also be cleaned with Disposer Care®. This product is not sold by InSinkErator®, but is generally available in major home centers, hardware, and grocery stores. For more information on Disposer Care®, contact Summit Brands at 1-888-476-6688 or www.summitbrands.com.

RELEASING DISPOSER JAM

If motor stops while disposer is operating, disposer may be jammed. To release jam:

1. Turn off disposer and water.
2. Insert one end of self-service Jam-Buster™ Wrench into center hole on bottom of disposer (see Figure A). Work Jam-Buster™ Wrench back and forth until it turns one full revolution. Remove Jam-Buster™ Wrench.
3. Reach into disposer with tongs and remove object(s). Allow disposer motor to cool for 3 - 5 minutes, then lightly push red reset button on disposer bottom (see Figure B). (If motor remains inoperative, check service panel for tripped circuit breakers or blown fuses.)

Figure A

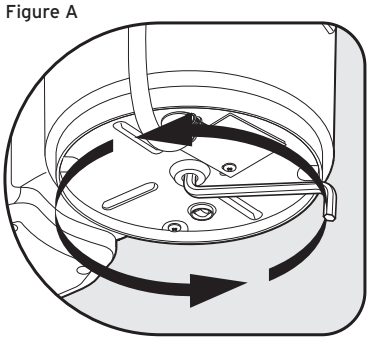
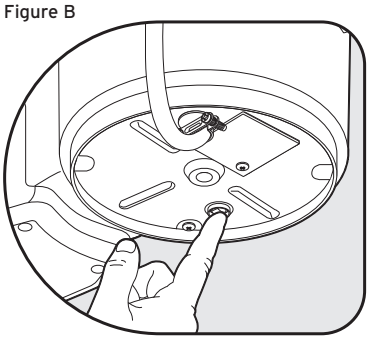


Figure B



INSTRUCTIONS PERTAINING TO RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

IMPORTANT SAFETY INSTRUCTIONS

⚠ WARNING **When using electric appliances, basic precautions are always to be followed, including:**

- Read all instructions before using the appliance.
- To reduce the risk of injury, close supervision is required when an appliance is used near children.
- Do not put fingers or hands into a waste disposer.
- Turn the power switch to the off position before attempting to clear a jam, removing an object from the disposer or pressing reset button.
- When attempting to loosen a jam in a waste disposer, use the self-service Jam-Buster™ Wrench.
- When attempting to remove objects from a waste disposer, use long-handled tongs or pliers.
- To reduce the risk of injury by materials that are expellable by a waste disposer, do not operate the disposer without the Quiet Collar® Sink Baffle in place. Do not put the following into a disposer: clam or oyster shells, caustic drain cleaners or similar products, glass, china, or plastic, metal (such as bottle caps, steel shot, tin cans, or utensils), hot grease or other hot liquids.
- When not operating a disposer, leave the stopper in place to reduce the risk of objects falling into the disposer.
- This product is designed to dispose of normal household food waste; inserting materials other than food waste into disposer could cause personal injury and/or property damage.
- To reduce the risk of injury, do not use the sink containing the disposer for purposes other than food preparation (such as baby bathing or washing hair).
- Do not dispose of the following in the disposer: paints, solvents, household cleaners and chemicals, automotive fluids, plastic wrap.
- Replace Quiet Collar® Sink Baffle when worn to help prevent entry or ejection of material and water.
- FIRE HAZARD: Do not store flammable items such as rags, paper or aerosol cans near disposer. Do not store or use gasoline or other flammable vapors and liquids in vicinity of disposer.

SAVE THESE INSTRUCTIONS

⚠ WARNING

Personal Injury: Do not position your head or body under disposer; unit could fall during removal or installation.

⚠ CAUTION

Do not use plumber's putty on any other disposer connection other than sink flange. Do not use thread sealants or pipe dope. These may harm disposer and cause property damage.

⚠ CAUTION

Do not operate disposer without Anti-Vibration Tailpipe Mount™ as water leaks may result.

⚠ WARNING

Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the disposer is properly grounded. If the plug provided with the disposer does not fit the outlet, do not modify the plug or attempt to force the plug into the outlet – have a proper outlet installed by a qualified electrician.

- This disposer must be properly grounded.
- Do not attach ground wire to gas supply line.
- Disconnect power before installing or servicing disposer.
- If three-prong grounded plug is used, plug must be inserted into three-hole grounded receptacle.
- All wiring must comply with local electrical codes.
- Do not reconnect electrical current at main service panel until proper grounds are installed.

GROUNDING INSTRUCTIONS

For all grounded, cord-connected disposers:
This disposer must be grounded to reduce the risk of electric shock in the event of a malfunction or breakdown. Grounding provides a path of least resistance for electric current. This disposer is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

For permanently connected disposers:
This disposer must be connected to a grounded, metal, permanent wiring system; or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the disposer.

Food waste disposers provide an environmentally responsible alternative to transporting food waste to landfills. And they can help reduce greenhouse gas emissions. At capable wastewater treatment plants, food waste can be converted to biosolids and used as fertilizer. Capable plants can also recycle food waste into renewable energy. (Check the plant in your area.)

For U.S. www.insinkerator.com/green For Canada www.insinkerator.ca

InSinkErator® may make improvements and/or changes in the specifications at any time, in its sole discretion, without notice or obligation and further reserves the right to change or discontinue models.

The mounting collar configuration is a trademark of Emerson Electric Co.

The Emerson logo is a trademark and service mark of Emerson Electric Co.
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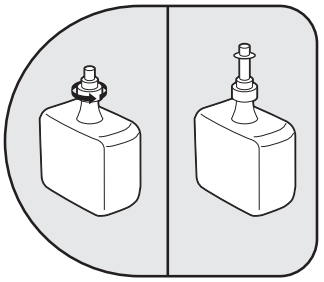
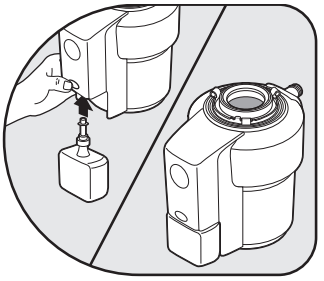
ESPAÑOL

La instalación y el cambiar de la Botella Bio-Charge®

Instale la Botella Bio-Charge®
Use únicamente Bio-Charge® de InSinkErator. Vea Cambio de la Botella Bio-Charge® para las instrucciones de seguridad y para información de cómo obtener los reemplazos del Bio-Charge®. No apriete la Botella Bio-Charge®; apretar la botella puede causar la salida y derrame del Bio-Charge®.

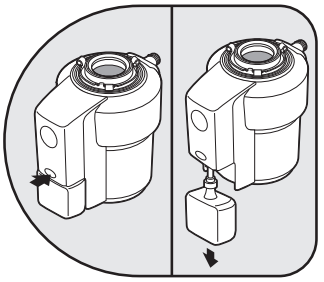


Desatornille la boquilla de la tapa dispensadora del Bio-Charge® hasta que la boquilla se mueva a la posición de dispensamiento. No retire la boquilla de la tapa dispensadora.



Alinee la botella con el lado cóncavo mirando al triturador y mantenga oprimido el botón mientras empuja la botella hacia el soporte de arriba. Suelte el botón. Hale la botella suavemente hacia abajo para asegurarse de que esté acoplada.

Cambio de la Botella Bio-Charge®
Para mantener su sistema séptico funcionando al máximo de eficiencia, reemplace la Botella Bio-Charge® cuando esté vacía o casi vacía. Para cambiar la Botella Bio-Charge®:



Asegúrese de que el triturador está apagado. Oprima el botón del triturador ubicado encima de la botella y hale la botella hacia abajo para retirarla. (No vuelva a llenar o a usar botellas vacías).

Bio-Charge® se encuentra disponible en donde se venda el Triturador Séptico InSinkErator®. Para volver a ordenar Bio-Charge®, preguntas o comentarios, llame al teléfono de llamada gratuita 1 (888) 527-1493.

GARANTÍA TOTAL DE SERVICIO POR 4 AÑOS EN SU HOGAR

Esta es una garantía que InSinkErator®, una división de Emerson Electric Co., ("InSinkErator", "Fabricante", "nosotros", "nos" o "nuestro") brinda al cliente original propietario del producto InSinkErator (el "Producto InSinkErator") y a cualquier otro propietario posterior de la residencia en la que se instaló originalmente el Producto ("Cliente", "usted" o "su").

InSinkErator le garantiza al Cliente que su Producto InSinkErator no tendrá defectos en el material o la mano de obra, sujetos a las exclusiones descritas a continuación, durante un período de 4 años (el "Período de garantía"), que comienza luego de: (a) la fecha en la que se instaló originalmente su Producto InSinkErator, (b) la fecha de compra o (c) la fecha de fabricación indicada por el número de serie de su Producto InSinkErator. Deberá presentar la documentación escrita correspondiente para justificar (a) o (b). En caso de que no pueda presentar la documentación para justificar (a) o (b), la fecha de inicio del Período de Garantía quedará a consideración del Fabricante, bajo su único y absoluto criterio, basado en el número de serie del Producto InSinkErator.

Qué cubre la garantía
Esta garantía cubre los defectos en el material o la mano de obra, sujetos a las exclusiones descritas a continuación, en lo que respecta a los Productos InSinkErator a los que el Cliente confiera un uso doméstico únicamente, e incluye todas las piezas de repuesto y los gastos de reparación. SU ÚNICO Y EXCLUSIVO RECURSO SEGÚN LOS TÉRMINOS DE ESTA GARANTÍA LIMITADA SERÁ LA REPARACIÓN O EL REEMPLAZO DEL PRODUCTO INSINKERATOR.

Qué no cubre la garantía
Esta garantía limitada no se extiende y excluye expresamente lo siguiente:
- Pérdidas, daños o incapacidad de operar el Producto InSinkErator, como resultado de circunstancias fuera del control del Fabricante, sin limitaciones, tales como: accidente, alteración, mal uso, abuso, abandono, negligencia (de otra persona que no sea el Fabricante), instalación, mantenimiento, ensamblaje o montaje inadecuados del Producto InSinkErator que no respeten las instrucciones del Fabricante o los códigos eléctricos y/o de plomería locales.
- Desgaste como resultado del uso normal del producto, lo que incluye sin limitaciones, oxidación de la superficie, rayones, abolladuras o pérdidas o daños similares y razonables. Además de las exclusiones antes descritas, esta garantía no se aplica en caso de que los Productos InSinkErator se instalen para fines industriales o comerciales.

No se aplica ninguna otra garantía expresa
Esta es la única y exclusiva garantía que se le brinda al Cliente descrito anteriormente. No se aplica ninguna otra garantía expresa, oral o escrita. No se autoriza a ningún empleado, agente, distribuidor u otra persona a alterar esta garantía limitada o a brindar cualquier otra garantía en nombre del Fabricante. Ninguna persona podrá modificar los términos de esta garantía, independientemente de si se trata del Fabricante, el propietario original o sus respectivos sucesores o beneficiarios.

Qué haremos para solucionar los problemas
Si su Producto InSinkErator no funciona de acuerdo con la documentación que usted recibió, o si tiene dudas acerca de su Producto InSinkErator o no sabe cómo determinar cuándo necesita servicio técnico, comuníquese con la línea de ayuda gratuita InSinkErator AnswerLine® al 1 (800) 558-5700 o bien, visite nuestra página web en www.insinkerator.com. También puede escribirnos a: Centro de Servicio InSinkErator, 4700 21st Street, Racine, Wisconsin, 53406, EE. UU.

En el reclamo de garantía debe especificar la siguiente información:
su nombre, dirección, número de teléfono, modelo y número de serie de su Producto InSinkErator y, si es necesario o si se lo solicitan, una confirmación por escrito de: (a) la fecha que figura en su recibo de instalación, o (b) la fecha que figura en su recibo de compra.

El Fabricante o el representante de servicio autorizado determinarán, bajo su único y absoluto criterio, si esta garantía cubre su Producto InSinkErator. Se le proporcionará la información de contacto del Centro de Servicio Autorizado de InSinkErator más cercano. Comuníquese directamente con dicho centro para recibir servicios de reparación o reemplazo cubiertos por la garantía en su hogar. El representante de servicio autorizado de InSinkErator es el único capaz de brindarle el servicio de garantía. InSinkErator no se hace responsable por los reclamos de garantía que surjan como consecuencia de trabajos realizados en su Producto InSinkErator por cualquier otra persona que no sea el representante de servicio autorizado de InSinkErator.

Si un reclamo cubierto se realiza durante el Período de Garantía, el Fabricante reparará o reemplazará su Producto InSinkErator por intermedio de su representante de servicio autorizado. Usted no deberá afrontar el costo de las piezas de repuesto o de un nuevo Producto InSinkErator, ni el costo de mano de obra para la reparación o instalación del Producto InSinkErator de reemplazo. El Fabricante o su representante de servicio autorizado, bajo su exclusivo criterio, determinarán si es necesaria la reparación o el reemplazo del producto. Recibirá todos los servicios de reparación o reemplazo en su hogar. Si el Fabricante determina que se debe reemplazar su Producto InSinkErator en vez de repararlo, la garantía del Producto InSinkErator de reemplazo se limitará al plazo vigente de la garantía original.

Limitación de responsabilidad
EN LA MEDIDA EN QUE LO PERMITA LA LEY, EL FABRICANTE O SUS REPRESENTANTES DE SERVICIO AUTORIZADOS NO SERÁN RESPONSABLES POR DAÑOS INCIDENTALES, ESPECIALES, INDIRECTOS O CONSECUENTES, TALES COMO DAÑOS PATRIMONIALES, YA SEA QUE SEAN CONSECUENCIA DEL INCUMPLIMIENTO, USO, MAL USO O INCAPACIDAD DE USAR EL PRODUCTO INSINKERATOR, O DE LA NEGLIGENCIA DEL FABRICANTE O SUS REPRESENTANTES DE SERVICIO AUTORIZADOS. EL FABRICANTE NO SERÁ RESPONSABLE POR LOS DAÑOS CAUSADOS POR EL RETRASO EN EL RENDIMIENTO Y EN NINGÚN CASO, SIN IMPORTAR EL TIPO DE RECLAMO O LAS MEDIDAS IMPLEMENTADAS (AUNQUE SE BASEN EN EL CONTRATO, UNA CONTRAVENCIÓN, LA NEGLIGENCIA, LA RESPONSABILIDAD ESTRICTA, OTRO AGRAVIO, ETC.), SU RESPONSABILIDAD EXCEDERÁ EL PRECIO QUE EL PROPIETARIO ORIGINAL HAYA PAGADO POR EL PRODUCTO INSINKERATOR.

El término "daños consecuentes" debe incluir, entre otros, la pérdida de ganancias anticipadas, la interrupción de los negocios, la falta de uso o ingresos, el costo del capital, o la pérdida o daño a la propiedad o al equipo.

Algunos estados prohíben la exclusión o limitación de los daños incidentales o consecuentes, de modo que estas limitaciones pueden no aplicarse en su caso. Esta garantía le otorga derechos legales específicos y también puede tener otros derechos que varían según el estado.

INSTRUCCIONES DE OPERACION

1. Retire el tapón del fregadero y haga correr agua fría.
2. Encienda el interruptor de pared para arrancar el triturador.
3. Introduzca lentamente los desperdicios de comida dentro del triturador. **¡PRECAUCIÓN!** Coloque el tapón para disminuir la posibilidad de que los materiales salgan despedidos durante la trituración.
4. Luego de que la trituración esté completa, apague el triturador y deje correr el agua durante unos segundos para enjuagar la línea de drenaje.

LO QUE DEBE HACER

- Primero haga correr el agua fría y luego encienda el triturador. Después de que termine la trituración, deje correr el agua durante varios segundos para enjuagar la línea de drenaje.
- Triture materiales duros como huesos pequeños, carozos de frutas y hielo. Las partículas crean una acción de restregado en el inte rior de la cámara de trituración.
- Triture cáscaras de frutas cítricas para refrescar el olor del drenaje.
- Utilice un limpiador, desengrasante o desodorante para trituradores cuando sea necesario a fin de eliminar malos olores causados por la acumulación de grasa.

⚠ PRECAUCIÓN

Revise periódicamente el triturador y los acoples de plomería para ver si hay fugas de agua, ya que éstas pueden ocasionar daños a la propiedad. El fabricante no es responsable de los daños a la propiedad resultantes de las fugas de agua.

LO QUE NO DEBE HACER

- ***NO VIERTA GRASA NI ACEITE EN EL TRITURADOR NI EN NINGÚN DRENAJE. ESTOS MATERIALES SE PUEDEN ACUMULAR EN LAS CAÑERÍAS Y TAPAR EL DRENAJE. COLOQUE LA GRASA EN UN FRASCO O LATA Y DESÉCHELO EN LA BASURA.***
- No use agua caliente para triturar desperdicios de comidas. Puede dejar correr agua caliente en el triturador entre períodos de trituración.
- No llene el triturador con demasiadas cáscaras de vegetales al mismo tiempo. Primero abra la llave del agua y encienda el triturador y luego coloque las cáscaras gradualmente.
- No triture grandes cantidades de cáscaras de huevo ni materiales fibrosos como barbas del choclo, alcachofas, etc., pues ello podría obstruir el drenaje.
- No apague el triturador hasta que la trituración esté completa y sólo se escuche el sonido del motor y del agua.

INSTRUCCIONES DE MANTENIMIENTO PARA EL USUARIO

LIMPIEZA DEL TRITURADOR

Con el tiempo, las partículas de comida se pueden acumular en la cámara de trituración y el deflector. Los malos olores provenientes del triturador son generalmente un signo de acumulación de grasa y comida causada por el flujo de agua insuficiente durante y después del uso del triturador. Para limpiar el triturador:

1. Apague el triturador y desconecte la corriente eléctrica.
2. Coloque el tapón en la abertura del fregadero y llénelo con agua tibia hasta la mitad.
3. Mezcle 1/4 de taza de bicarbonato de sodio con agua. Encienda el triturador y retire el tapón del fregadero al mismo tiempo para eliminar las partículas sueltas.
4. Retire el deflector del fregadero Quiet Collar® y límpielo a mano o en el lavavajillas. No opere el triturador sin el deflector del fregadero Quiet Collar® en su lugar.

Los trituradores también se pueden limpiar con Disposer Care®. InSinkErator no vende este producto, pero gene-ralmente se lo consigue en las principales tiendas de artículos para el hogar, en ferreterías y en tiendas de abarrotes. Si desea obtener más información sobre Disposer Care®, comuníquese con Summit Brands al 1-888-476-6688 o visite www.summitbrands.com.

CÓMO LIBERAR LAS OBSTRUCCIONES DEL TRITURADOR

Si el motor se detiene durante el funcionamiento del triturador, podría estar bloqueado. Para liberar las obstrucciones:

1. Apague el triturador y cierre la llave de agua.
2. Inserte un extremo de la llave incorporada Jam-Buster™ en el orificio central, en el fondo del triturador (ver Figura A). Mueva la llave Jam-Buster™ hacia adelante y hacia atrás hasta que gire una vuelta completa. Quite la llave Jam-Buster™.
3. Introduzca unas tenazas dentro del triturador y retire el objeto u objetos. Deje enfriar el motor durante 3 a 5 minutos y luego oprima suavemente el botón de reposición rojo ubicado en la parte inferior del triturador (ver Figura B). (Si el motor no funciona, revise el panel de servicio para ver si hay interruptores de circuito activados o fusibles quemados.)

Figura A

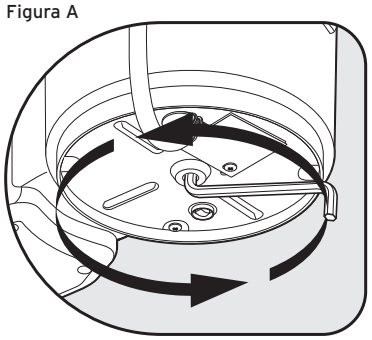
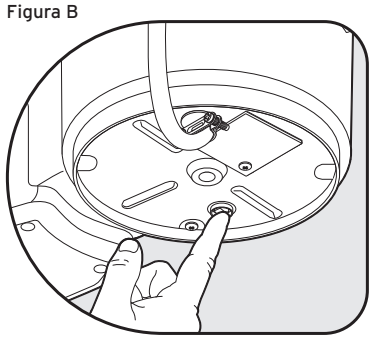


Figura B



INSTRUCCIONES CORRESPONDIENTES A RIESGO DE INCENDIO, DESCARGAS ELÉCTRICAS O LESIONES A PERSONAS (GUARDE ESTAS INSTRUCCIONES)

INSTRUCCIONES IMPORTANTES PARA SU SEGURIDAD

⚠ ADVERTENCIA **Al usar artefactos electrodomésticos, siempre se deben tomar precauciones básicas, las que incluyen:**

- Lea todas las instrucciones antes de utilizar el aparato.
- Para reducir el riesgo de lesiones, se requiere estrecha supervisión cuando se usa un artefacto cerca de niños.
- No ponga los dedos ni las manos dentro de un triturador de desperdicios.
- Coloque el interruptor de encendido en la posición de apagado antes de tratar de eliminar un atasco, retirar un objeto del triturador de desperdicios o presionar el botón de reposición.
- Cuando intente desatascar un triturador de desperdicios de comida, utilice la llave incorporada Jam-Buster™.
- Al tratar de extraer objetos de un triturador de desperdicios use tenazas o pinzas de mango largo.
- Para reducir el riesgo de sufrir lesiones pormateriales que salgan despedidos del triturador dedesperdicios, no lo opere sin tener el deflector del fregadero Quiet Collar® en su lugar. No coloque lossiguientes elementos dentro de un triturador: conchas de almejas u ostras, limpiadores de drenajecáusticos o productos similares, vidrio, loza o plástico, metales (como tapas de botellas, granalla de acero, latas o utensilios), grasa caliente u otros líquidos calientes.
- Cuando el triturador no esté en funcionamiento, deje la tapón del drenaje en su lugar para reducir el riesgo de que algún objeto caiga en el triturador.
- Este producto está diseñado para deshacerse de desperdicios normales de los alimentos hogareños; insertar materiales que no son desperdicios en el triturador podría ocasionar lesiones personales o daños a la propiedad.
- Para reducir el riesgo de lesiones, no utilice el fregadero o pileta que contiene el triturador para tar eas que no sean de preparación de los alimentos (como bañar a un bebé o lavarse el cabello).
- No elimine ninguno de los siguientes elementos en el triturador: pinturas, solventes, limpiadores de uso doméstico, productos químicos, líquidos para automóviles o envolturas de plástico.
- Para evitar que cualquier material ingrese o salga despedido y que se salpique agua, reemplace el deflector del fregadero Quiet Collar® cuando éste se desgaste.
- PELIGRO DE INCENDIO: No guarde artículos inflamables, como trapos, papel o aerosoles, cerca del triturador. No guarde ni utilice gasolina ni otros vapores o líquidos inflamables cerca del triturador.

GUARDE ESTAS INSTRUCCIONES

⚠ ADVERTENCIA

Lesiones personales: No coloque la cabeza ni el cuerpo debajo del triturador, ya que la unidad podría caerse mientras lo retira o instala.

⚠ PRECAUCIÓN

No opere el triturador sin el Dispositivo Anti-Vibration Tailpipe Mount™ ya que puede haber fugas de agua.

INSTRUCCIONES PARA LA CONEXIÓN A TIERRA

Instrucciones para todos los trituradores con conexión a tierra conectados por cable:
El triturador debe estar conectado a tierra a fines de reducir el riesgo de descarga eléctrica en caso de mal funcionamiento o avería. La conexión a tierra proporciona una vía de menor resistencia para la corriente eléctrica. Este triturador está equipado con un cable que tiene un conductor de conexión a tierra del equipo y un enchufe de conexión a tierra. El enchufe debe estar conectado a un tomacorriente que esté instalado correctamente y con conexión a tierra de acuerdo con todos los reglamentos y códigos locales.

Instrucciones para los trituradores de desperdicios de comida de conexión permanente:
El triturador debe estar conectado a un sistema de cableado permanente de metal y con conexión a tierra, o bien el conductor de conexión a tierra del equipo debe funcionar junto con los conductores de circuito y estar conectado al cable o terminal con conexión a tierra del equipo del triturador.

⚠ PRECAUCIÓN

No utilice masilla de plomería ni ninguna otra conexión del triturador que no sea la brida del fregadero. No utilice sellador de rosca ni grasa para rosca de cañerías. Estos productos pueden dañar el triturador y ocasionar daños a la propiedad.

⚠ ADVERTENCIA

La conexión incorrecta del conductor de conexión a tierra del equipo puede representar un riesgo de descarga eléctrica. Consulte a un electricista calificado o especialista en reparaciones si tiene dudas sobre la conexión a tierra del triturador. Si el enchufe que viene con el triturador no coincide con el tipo de tomacorriente, no altere el enchufe ni lo fuerce para que entre en el tomacorriente; pídale a un electricista calificado que instale un tomacorriente adecuado.

- Ce broyeur doit être correctement mis à la terre.
- Ne pas fixer de fil de mise à la terre au tuyau d'alimentation du gaz.
- Couper l'alimentation électrique avant d'installer ou de réparer le broyeur.
- Si une fiche de mise à la terre à trois branches est utilisée, celle-ci doit être insérée dans une prise de trois trous mise à la terre.
- Tout le câblage utilisé doit être conforme aux codes de l'électricité locaux en vigueur.
- Ne pas remettre le courant au panneau principal avant que des conducteurs de mise à la terre ne soient installés.

Los trituradores de desperdicios de comida proporcionan una alternativa ecológica para evitar el transporte de los desperdicios de comida a basureros. Y pueden ayudar a reducir las emisiones de los gases que provocan el efecto invernadero. En las plantas de tratamiento de aguas residuales adecuadas, los desperdicios de comida pueden transformarse en biosólidos y utilizarse como fertilizantes. Estas plantas también pueden reciclar los desperdicios de comida para producir energía renovable. (Constátelo con la planta de su área).

Para EEUU www.insinkerator.com/green Para Canadá www.insinkerator.ca

InSinkErator® se réserve le droit, à sa seule discrétion, d'apporter en tout temps des améliorations ou des modifications aux spécifications sans préavis ou obligation de sa part, ou de modifier ou de supprimer des modèles.

La configuration du collier de fixation est une marque de commerce de Emerson Electric Co.

LG LAUNDRY

WM1388HW

2.2 cu.ft. Compact Front Load Washer

NO. 166.01 WASHER, U/C

KEY FEATURES

2.3 cu.ft. Capacity

Compact Front Load Washer

14 Wash Programs

1,400 RPM

Internal Heater

NFC Tag On

ENERGY STAR® Qualified

PRODUCT FEATURES

CAPACITY	
Capacity	2.3 cu. ft.
ENERGY	
ENERGY STAR® Qualified	•
APPEARANCE	
Design Look	Front Control
Touch LED Display	•
Dial-A-Cycle™	•
WASH/DRY PROGRAMS	
No. of Programs	14
Wash Programs	Cotton/Normal, Bulky/Large, Baby Wear, Perm. Press, Delicates, Hand Wash/Wool, Speed Wash, Tub Clean, Sanitary, Heavy Duty, Drain+Spin, Color Care, Sports Wear, Downloaded Course
No. of Options	10
Options	Prewash, Rinse+Spin, Delay Wash(Time Delay), Water Plus, Extra Rinse, Child Lock, Signal (Beeper) On/Off, Custom PGM, PGM Save, Signal
No. of Wash/Rinse Temps	5 Extra Hot, Hot, Warm, Cold, Tap Cold (All Cold Rinses)
Spin Speeds	Extra High (1,400 max.), High, Medium, Low, No Spin
No. of Water Levels	Automatically adjusts to the size of load
No. of Soil Levels	3
Internal Heater	•
CONVENIENCE FEATURES	
TrueBalance™ Anti-Vibration System"	•
4 Tray Dispenser	•
LoDecibel™ Quiet Operation	•
End of Cycle Beeper	•
LoadSense	•
Forced Drain System	•
SMART THINQ™ TECHNOLOGY	
SmartDiagnosis™	•
NFC Tag On Technology	•

MOTOR AND AGITATOR	
Motor Type	Inverter Direct Drive Motor
Motor Speed	Variable
Max RPM	1,400
Axis	Horizontal
MATERIALS AND FINISHES	
NeveRust™ Stainless Steel Drum	•
Cabinet	PCM
Control Panel	Plastic
Top Plate	TBD
Door Rim	Glass/Chrome
Door Cover	Black Tinted Cover
Door Opening	13.8"
Available Colors	White (W)
POWER SOURCE	
Ratings	TBD
Electrical Requirements	120V, 10 Amps
Type	Electric
ACCESSORIES	
Hose Included	•
DIMENSIONS	
Product (WxHxD)	24" x 33 1/2" x 25 1/4" (45" D with door open)
Carton (WxHxD)	26" x 35 3/4" x 27 3/4"
Weight (Product/Carton)	147.7 lbs / 156.5 lbs
LIMITED WARRANTY	
	1 Year Parts and Labor, 10 Years Motor, Lifetime on Drum
UPC CODES	
WM1388HW Washer (White)	048231 016971
DLEC888W Dryer (White)	048231 018371

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LG LAUNDRY

DLEC888W

24" 4.2 cu.ft. Compact Electric Condensing Dryer

NO. 166.02 DRYER, COMMERCIAL, U/C

KEY FEATURES

4.2 cu.ft. Capacity

24" Wide Compact Electric Condensing Dryer

14 Dryer Programs

10 Options

Sensor Dry System

NFC Tag On

Wrinkle Care Option

Delicates Cycle

Stackable with Matching Washer (WM1388HW)
(Stacking Kit is included with the product)

PRODUCT FEATURES

CAPACITY	
Capacity	4.2 cu. ft.
APPEARANCE	
Design Look	Front Control Panel
Intelligent Electronic Controls with Touch LED Display	•
Dial-A-Cycle	•
DRYER PROGRAMS	
No. of Programs	14
Programs (Sensor Dry)	Cotton, Mixed Fabric, Easy Care, Bulky Item, Jeans, Skin Care, Quick Dry
Programs (Manual Dry	Sports Wear, Delicate, Wool, Download Cycle Cool Air, Gentle Air, Warm Air
No. of Options	10
Options	Gentle, Damp Dry Beep, More Time, Less Time, Time Delay, Custom Program Wrinkle Care, Drum Light, Child Lock, Time Dry
Temperature Settings	High, Medium High, Medium, Low, Ultra Low
Drying Levels	Very Dry, More Dry, Normal Dry, Less Dry, Damp Dry
Manual Dry Times	60 min., 20 min., More Time/Less Time
CONVENIENCE FEATURES	
End of Cycle Signal	•
Drum Light	•
Leveling Legs	4 Adjustable Legs
Remaining Time Display/Status Indicator(s)	•
SMART THINQ™ TECHNOLOGY	
NFC Tag On	•
SmartDiagnosis™	•
MATERIALS AND FINISHES	
NeveRust™ Stainless Steel Drum	•
Tub Rear	•
Cabinet	PCM
Control Panel	Plastic
Door/Rim	Glass/Chrome
Door Cover	Black Tint Cover
Available Colors	White (W)

POWER SOURCE	
Ratings	TBD
Electrical Requirements	240V, 30 Amps (Electric)
Type	Electric (product lating label 13A)
ACCESSORIES	
Stacking Kit (Comes with Dryer)	5001EL2001H
DIMENSIONS	
Product (WxHxD)	24" x 33 1/2" x 25 1/4" (45" D with door open)
Carton (WxHxD)	26" x 35 3/4" x 27 3/4"
Weight (Product/Carton) Electric	105 lbs / 115 lbs
LIMITED WARRANTY	
	1 Year Parts and Labor
UPC CODES	
DLEC888W Dryer (White)	048231 018371
WM1388HW Washer (White)	048231 016971

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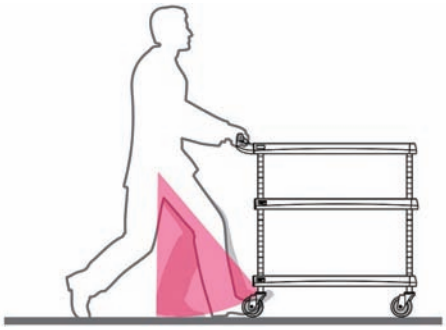
Item # NO. 173 CART, UTILITY (3 SHELF)

Job _____

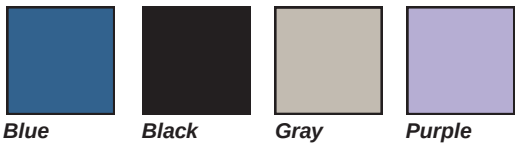
POLYMER UTILITY CART: myCart Series™

- **User-Friendly:** Ergonomic handle and additional legroom puts more distance between the shelves and you. You can push the cart more freely without hitting your shins and feet against the cart.
- **Convenient:** The utility tray is roomy enough to store every day objects. It offers 2x the amount of space than traditional utility carts; which allows for objects to fit in comfortably.
- **Personalized:** Each cart comes with two labels for easy identification.
- **Ultimate Cleanability:** Smooth polymer shelf surfaces with contoured edges are designed to resist staining and wipe clean easily.
- **Corrosion-Proof Shelves:** All-polymer shelves will never corrode.
- **Sturdy Construction:** Impact resistant shelves are designed to withstand daily abuse.

  Weight capacities evenly distributed:
  - — MY1627 and MY2030 models: 150lbs. (68kg) per shelf, not to exceed 300lb (136kg) on a 2-shelf cart and 400 lb. (181kg) on a 3-shelf cart.
  - — MY2636 Models: 200lbs. (90kg) per shelf, not to exceed 400 lb. (181kg) on a 2-shelf cart and 500 lbs. (227kg) on a 3-shelf cart.



- **Contains Spills:** 7/16" (11mm) ship's edge retains small spills and prevents items from sliding off during transport.
- Specific Models with Microban® product protection: The blue MyCart has built in Microban product protection. This inhibits the growth of bacteria, mold, mildew, and fungi that cause odors, stains, and product degradation.
- **Attractive Aesthetics** allow for use in a variety of applications.
- **2-tier and 3-tier models available**
- **Easy-to-Adjust:** Optional center shelf adjusts on 1" (25mm) increments.
- **Easy, No-Tool Assembly:** Ships knocked down.
- **myCart Series™ is NSF listed** NSF



Blue *Black* *Gray* *Purple*

Microban antimicrobial product protection

*Microban® antimicrobial protection inhibits the growth of stain and odor-causing bacteria on Starsys, keeping the surface areas "cleaner between cleanings."

InterMetro Industries Corporation
North Washington Street
Wilkes-Barre, PA 18705
www.metro.com

POLYMER UTILITY CART: myCart Series™

Short Form Specs — Base Models:

- Cart, Utility, consisting of at least 2 high-density polyethylene, injection-molded shelves and 4 chrome-plated posts. Handle shelf will have an integrated utility tray with a base width of 1.8-2.2" (46-56mm) and coved corners. Flat shelf will have a built in 3" (76mm) cutaway. All shelves will have a built-in $^{7}/_{16}$" (11mm) deep ship's edge around the perimeter. 2-shelf cart design is such that user may add an intermediate shelf if deemed necessary that adjusts on 1" (25mm) increments. Cart will include two nominal 4.625" L x .88" H (117.475 x 22.352mm) labels for easy identification.
- 1627 and 2030 models: Roll on four 4" (102mm) diameter thermoplastic, mark-resistant swivel/stem casters.
- 2636 models: Roll on four 5" (127mm) diameter thermoplastic, mark-resistant swivel/stem casters.

Construction:

- Continuous Usage Temperature: -20/120°F (-29/49°C)
- Carts are not intended for cart wash applications
- Casters
  4" (102mm) swivel caster: Thermoplastic, non-marking gray tread. Plated horn and axle.
  Replacement part: RPBC4M-4, bag of four.
  5" (127mm) swivel caster: Resilient rubber material, plated horn and axle.
  Replacement part: 5M, sold individually.

Configurations:

- 2-tier and 3-tier models
- MY1627 and MY2030 Base Model Specs: Chrome posts, 4" (102mm) non-marking swivel casters.
- MY2636 Base Model Specs: Chrome posts, 5" (127mm) swivel resilient rubber casters

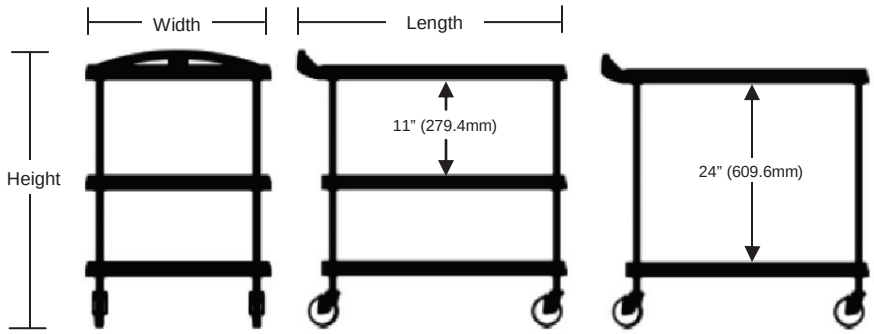
Model No. Gray	Model No. Black	Model No. Blue with Antimicrobial	Actual Width/Length/Height Including the Handle (in.)	(mm)	Description	Posts	Load Rating per Cart (lbs.)	(kg)	Approx. Pkd. Wt. (lbs.)	(kg)
MY1627-24G	MY1627-24BL	MY1627-24BU	$18^{5}/_{16}$x$31^{1}/_{2}$x$35^{1}/_{2}$	465.2x800.1x901.7	2-shelf base model	chrome-plated	300	136	28.5	12.93
MY1627-34G	MY1627-34BL	MY1627-34BU	$18^{5}/_{16}$x$31^{1}/_{2}$x$35^{1}/_{2}$	465.2x800.1x901.7	3-shelf base model	chrome-plated	400	181	34	15.42
MY2030-24G	MY2030-24BL	MY2030-24BU	$23^{7}/_{16}$x$34^{3}/_{8}$x$35^{1}/_{2}$	595.3x873.3x901.7	2-shelf base model	chrome-plated	300	136	33	14.97
MY2030-34G	MY2030-34BL	MY2030-34BU	$23^{7}/_{16}$x$34^{3}/_{8}$x$35^{1}/_{2}$	595.3x873.3x901.7	3-shelf base model	chrome-plated	400	181	41.5	18.82
MY2636-25G	MY2636-25BL	MY2636-25BU	$27^{11}/_{16}$x$40^{1}/_{4}$x$36^{7}/_{8}$	703.3x1022.4x936.6	2-shelf base model	chrome-plated	400	181	40	18.14
MY2636-35G	MY2636-35BL	MY2636-35BU	$27^{11}/_{16}$x$40^{1}/_{4}$x$36^{7}/_{8}$	703.3x1022.4x936.6	3-shelf base model	chrome-plated	500	227	51	23.13

New! Purple myCart:

Model No. Purple	Actual Width/Length/Height Including the Handle (in.)	(mm)	Description	Posts	Load Rating per Cart (lbs.)	(kg)	Approx. Pkd. Wt. (lbs.)	(kg)
MY2030-24AP	$23^{7}/_{16}$x$34^{3}/_{8}$x$35^{1}/_{2}$	595.3x873.3x901.7	2-shelf base model	chrome-plated	300	136	33	14.9
MY2030-34AP	$23^{7}/_{16}$x$34^{3}/_{8}$x$35^{1}/_{2}$	595.3x873.3x901.7	3-shelf base model	chrome-plated	400	181	41.5	18.8

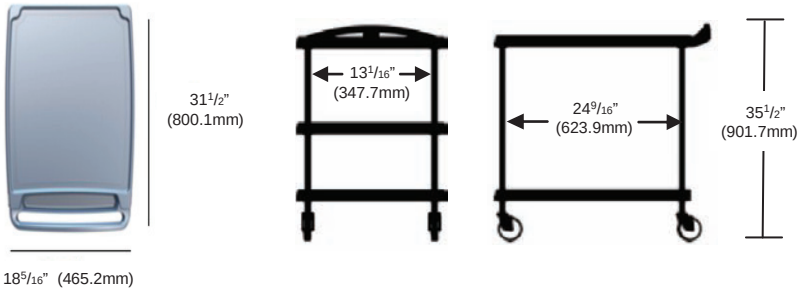
POLYMER UTILITY CART: myCart Series™

Dimensions:



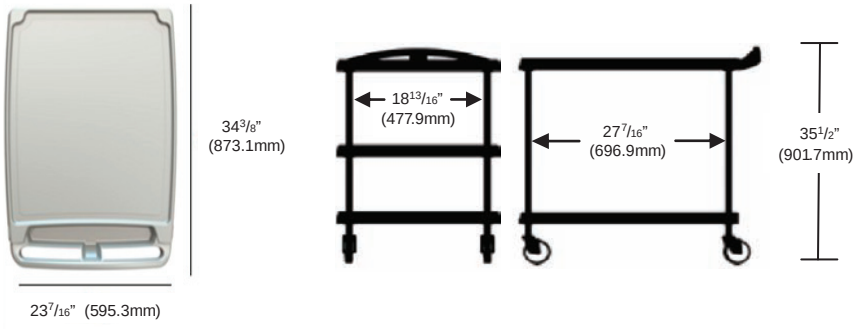
MY1627

- Easy-grip handle and utility tray
- Small footprint for tight spaces
- Accommodates Metro tote boxes and ISO totes



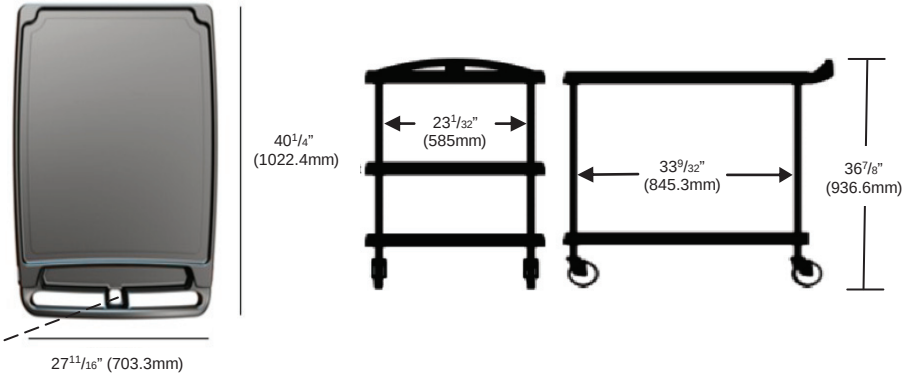
MY2030

- Cart handle has built-in recessed support channels to manage odd shaped items
- Sized for standard racks
  (1) Glass/dish rack
  (2) milk crates
  (2) bus box [on top shelf
  (1) bus box + (1) silverware tote [on mid/bottom shelf]



MY2636

- Top shelf can accommodate:
  (2) nominal 18 x 26" (457 x 660mm) polycarbonate totes side by side
  (2) Metro totes measuring 17 1/2 x 22 1/2" (445 x 571mm) side by side
- Cart handle has built in slot to hold scanners



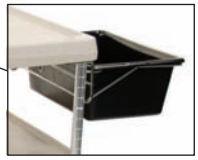
Job _____

POLYMER UTILITY CART: myCart Series™

Accessories:

Waste Basket

Utility Bin



Specifications:
Bin — ABS Thermoplastic
Wastebasket — Polyethylene

Model No.	Description	Fits Cart	Width/Height/Depth (in.)	Width/Height/Depth (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MYWB1	Wastebasket (including holder)	MY1627	17 7/8 x 16 1/4 x 14 3/4	454 x 413 x 375	5.7	2.5
MYWB2	Wastebasket (including holder)	MY2030	23 x 16 1/4 x 14 3/4	584 x 413 x 375	5.8	2.6
MF222	Wastebasket Only	MY1627, MY230	14 3/8 x 15 3/8 x 10 3/8	365 x 391 x 264	2.8	1.3
MYUB1	Utility Bin (including holder)	MY1627	17 7/8 x 7 x 15 1/4	454 x 178 x 387	5	2.2
MYUB2	Utility Bin (including holder)	MY2030	23 x 7 x 15 1/4	584 x 178 x 387	5.1	2.3
UB1	Utility Bin Only	MY1627, MY230	16 3/8 x 6 x 11	416 x 152 x 279	2	0.9

Personalization Label

Constructed of polyester material with a clear polyester flap to protect written information from wiping off.

Model No.	Description	Length/Height (in.)	Length/Height (mm)
MYCARTLBL-10PK	Pack of 10 Personalized Labels	4 3/5 x 7/8	117.5 x 22.4

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Phone: 570-825-2741
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

Printed in U.S.A Rev. 4/15

Information and specifications are subject to change without notice. Please confirm at time of order

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ADVANCE TABCO®
SMART FABRICATION™

STAINLESS STEEL

WALL SHELVES NSF

NO. 174 SHELF, WALL 36"

Item #: _____ Qty #: _____

Model #: _____

Project #: _____

FEATURES:

Brackets can be positioned to accommodate wall studs.

Furnished with a 1-5/8" Bullnose edge with a 1-1/2" turn-up edge at rear. Ends are turned down square.

MATERIAL:

16 Gauge Series - 304 stainless steel polished to a satin finish.

18 Gauge Series - 430 stainless steel polished to a satin finish.

CONSTRUCTION:

Secured to wall by means of bolts through support brackets.

Units 7 ft. and larger are furnished with 3 brackets.

	10" Wide			12" Wide			15" Wide			18" Wide			
L	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	Approx. Cu. Ft.
24"	WS-10-24-16	WS-10-24	8 lbs.	WS-12-24-16	WS-12-24	9 lbs.	WS-15-24-16	WS-15-24	11 lbs.	WS-18-24-16	WS-18-24	14 lbs.	3
36"	WS-10-36-16	WS-10-36	10 lbs.	WS-12-36-16	WS-12-36	12 lbs.	WS-15-36-16	WS-15-36	15 lbs.	WS-18-36-16	WS-18-36	21 lbs.	4
48"	WS-10-48-16	WS-10-48	12 lbs.	WS-12-48-16	WS-12-48	14 lbs.	WS-15-48-16	WS-15-48	18 lbs.	WS-18-48-16	WS-18-48	24 lbs.	5
60"	WS-10-60-16	WS-10-60	15 lbs.	WS-12-60-16	WS-12-60	17 lbs.	WS-15-60-16	WS-15-60	23 lbs.	WS-18-60-16	WS-18-60	28 lbs.	6
72"	WS-10-72-16	WS-10-72	17 lbs.	WS-12-72-16	WS-12-72	21 lbs.	WS-15-72-16	WS-15-72	28 lbs.	WS-18-72-16	WS-18-72	32 lbs.	7
84"	WS-10-84-16	WS-10-84	20 lbs.	WS-12-84-16	WS-12-84	25 lbs.	WS-15-84-16	WS-15-84	32 lbs.	WS-18-84-16	WS-18-84	36 lbs.	8
96"	WS-10-96-16	WS-10-96	23 lbs.	WS-12-96-16	WS-12-96	28 lbs.	WS-15-96-16	WS-15-96	36 lbs.	WS-18-96-16	WS-18-96	42 lbs.	10
108"	WS-10-108-16	WS-10-108	28 lbs.	WS-12-108-16	WS-12-108	32 lbs.	WS-15-108-16	WS-15-108	40 lbs.	WS-18-108-16	WS-18-108	48 lbs.	11
120"	WS-10-120-16	WS-10-120	32 lbs.	WS-12-120-16	WS-12-120	36 lbs.	WS-15-120-16	WS-15-120	44 lbs.	WS-18-120-16	WS-18-120	54 lbs.	12
132"	WS-10-132-16	WS-10-132	36 lbs.	WS-12-132-16	WS-12-132	42 lbs.	WS-15-132-16	WS-15-132	49 lbs.	WS-18-132-16	WS-18-132	60 lbs.	13
144"	WS-10-144-16	WS-10-144	40 lbs.	WS-12-144-16	WS-12-144	48 lbs.	WS-15-144-16	WS-15-144	55 lbs.	WS-18-144-16	WS-18-144	66 lbs.	14

ADVANCE TABCO®
SMART FABRICATION™
www.advancetabco.com

Customer Service Available To Assist You 1-800-645-3166 8:30 am - 8:00 pm E.S.T.

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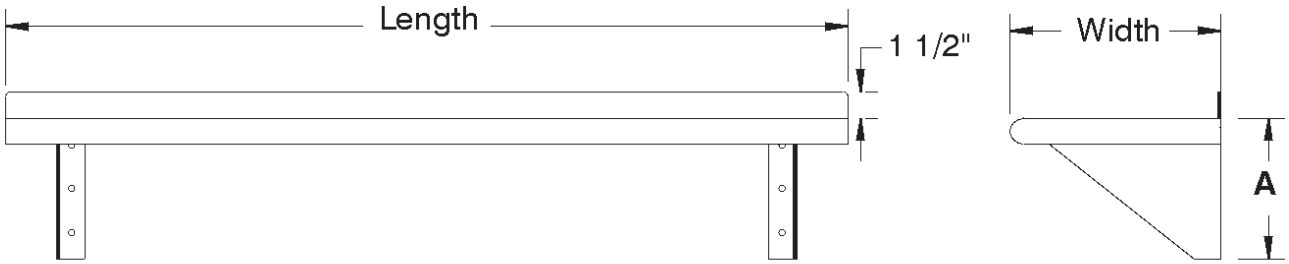
Email: customer@advancetabco.com or **Fax:** 631-242-6900

For Smart Fabrication™ Quotes:
Email: smartfab@advancetabco.com or **Fax:** 631-586-2933

DETAILS and SPECIFICATIONS

TOL ± .500”

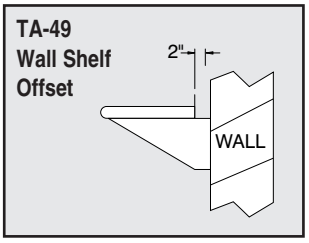
ALL DIMENSIONS ARE TYPICAL



Width	A
10”	8 1/2”
12”	10 1/2”
15”	13 1/2”
18”	16 1/2”

Wall Shelf Options

PRT-1	Printer Shelf
TA-22A	Square Edge Shelf
TA-26	Welded Shelf Brackets
TA-49	Wall Shelf 2” Offset
TA-71	Heat Lamp Provision
TA-77	Check Minder
TA-77A	Concealer for Heat Lamp (Requires TA-77)
TA-99A	14 Ga. S/S 304 Upgrade for Overshelves
TA-100A	Bullnose Edge On All 4 Sides of Shelf
TA-102	6” Cantilever Shelf Offset



Requirements for NSF Installations

1. Install at least 60” above floor.
2. Limit to dry storage.
3. Avoid contact with liquids.
4. For “Ganging-Up” installation, allow at least 2” between units or mount units side by side and seal joints with an approved sealant.

ADVANCE TABCO

SMART FABRICATION™

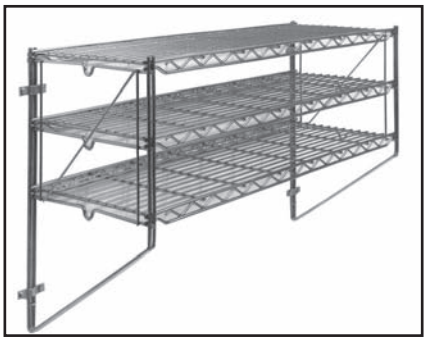
200 Heartland Boulevard, Edgewood, NY 11717-8380

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

© ADVANCE TABCO, DECEMBER 2016

Item # NO. 174.01 SHELF, WIRE, WALL MOUNT

Job _____



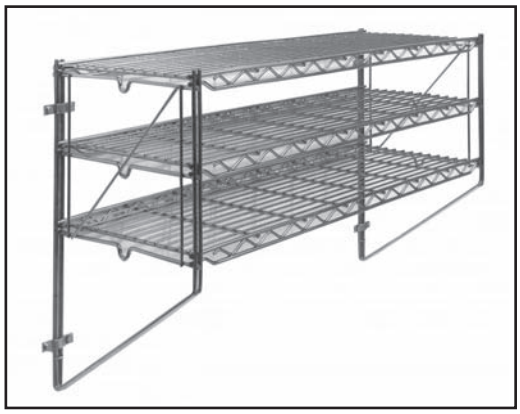
REGULAR ERECTA SHELF®
SHELVING ACCESSORIES

- **Wall Mounts:** Used to create wall-mounted shelving units with 12" or 18" (305 or 460mm) regular Erecta Shelf® shelves of any length. Models are available to accommodate from one to five shelves. Each mount consists of shelf support and mounting brackets. Wall bolts or screws not included; they must be selected according to type of wall. Order shelves from sheet #10.50.

Dimensions:

Width (in.)	Width (mm)	Height (in.)	Height (mm)	Capacity	Model No. Chrome	Approx. Pkd. Wt. (Pr.) (lbs.)	Approx. Pkd. Wt. (Pr.) (kg)
12	305	10 3/4	273	1 shelf	12WB1C	2 1/2	1
12	305	20 13/16	529	1 to 3 shelves	12WB3C	5	2
12	305	30 7/16	783	1 to 5 shelves	12WB5C	7 3/4	3 1/4
18	460	11 3/4	298	1 shelf	18WB1C	3	1 1/2
18	460	21 5/8	549	1 to 3 shelves	18WB3C	6	2 3/4
18	460	31 5/8	803	1 to 5 shelves	18WB5C	8 1/2	4

For additional mounting brackets (single) order. **Model No. 9975C**
Double mounting brackets are also available for use where continuous wall shelving is to be installed. **Model No. 9976C**



- **Wall Kit:** Kit includes two shelves, shelf supports, and mounting brackets. Wall bolts and screws not included; they must be selected according to type of wall.

Model No.	Shelf Length (in.)	Shelf Length (mm)	Overall Length (in.)	Overall Length (mm)	Shelf Width (in.)	Shelf Width (mm)	Overall Width (in.)	Overall Width (mm)	Overall Height (in.)	Overall Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
12WS12C	24	610	26 1/4	670	12	305	13	330	21	530	18 1/2	8 1/4
12WS32C	36	910	38 1/4	970	12	305	13	330	21	530	25 1/4	11 1/2
12WS52C	48	1220	50 3/4	1275	12	305	13	330	21	530	32	14 3/4

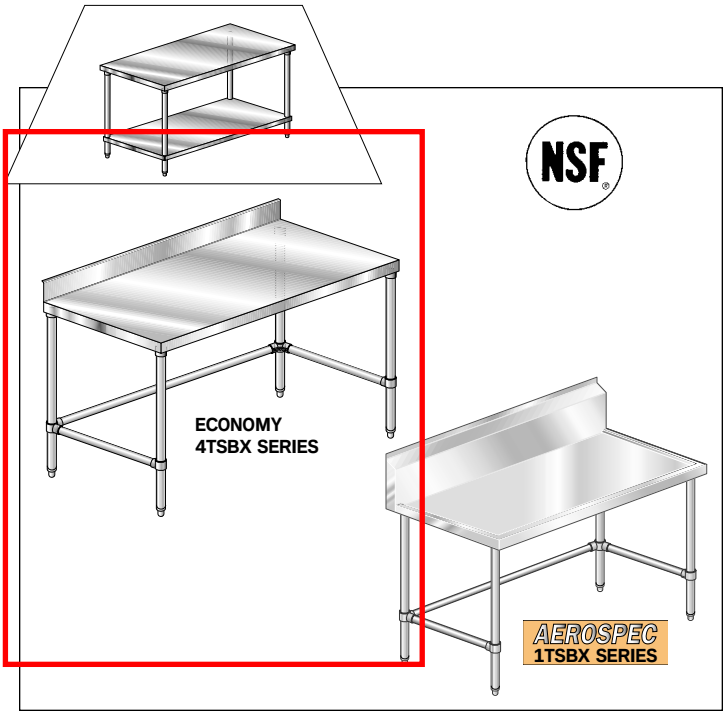
Kit packaged in one box and UPS shippable.

InterMetro Industries Corporation
North Washington Street
Wilkes-Barre, PA 18705
www.metro.com

EMERSON

WORK TABLE

TSBX SERIES 4" & 10" Backsplash, S/S Legs and Crossbracing



Item#_____Project_____

Quantity	ECONOMY 16GA 430 Model #	DELUX 16GA 304 Model #	PREMIUM 14GA 304 Model #	AEROSPEC 14GA 304 Model #
24" WIDE				
____	4TSBX–2424	3TSBX–2424	2TSBX–2424	1TSBX-2424
____	4TSBX–2430	3TSBX–2430	2TSBX–2430	1TSBX-2430
____	4TSBX–2436	3TSBX–2436	2TSBX–2436	1TSBX-2436
____	4TSBX–2448	3TSBX–2448	2TSBX–2448	1TSBX-2448
____	4TSBX–2460	3TSBX–2460	2TSBX–2460	1TSBX-2460
____	4TSBX–2472	3TSBX–2472	2TSBX–2472	1TSBX-2472
____	4TSBX–2484	3TSBX–2484	2TSBX–2484	1TSBX-2484
____	4TSBX–2496	3TSBX–2496	2TSBX–2496	1TSBX-2496
____	4TSBX–24108	3TSBX–24108	2TSBX–24108	1TSBX-24108
____	4TSBX–24120	3TSBX–24120	2TSBX–24120	1TSBX-24120
____	4TSBX–24132	3TSBX–24132	2TSBX–24132	1TSBX-24132
____	4TSBX–24144	3TSBX–24144	2TSBX–24144	1TSBX-24144
30" WIDE				
____	4TSBX–3024	3TSBX–3024	2TSBX–3024	1TSBX-3024
____	4TSBX–3030	3TSBX–3030	2TSBX–3030	1TSBX-3030
____	4TSBX–3036	3TSBX–3036	2TSBX–3036	1TSBX-3036
____	4TSBX–3048	3TSBX–3048	2TSBX–3048	1TSBX-3048
____	4TSBX–3060	3TSBX–3060	2TSBX–3060	1TSBX-3060
____	4TSBX–3072	3TSBX–3072	2TSBX–3072	1TSBX-3072
____	4TSBX–3084	3TSBX–3084	2TSBX–3084	1TSBX-3084
____	4TSBX–3096	3TSBX–3096	2TSBX–3096	1TSBX-3096
____	4TSBX–30108	3TSBX–30108	2TSBX–30108	1TSBX-30108
____	4TSBX–30120	3TSBX–30120	2TSBX–30120	1TSBX-30120
____	4TSBX–30132	3TSBX–30132	2TSBX–30132	1TSBX-30132
____	4TSBX–30144	3TSBX–30144	2TSBX–30144	1TSBX-30144
36" WIDE				
____	4TSBX–3636	3TSBX–3636	2TSBX–3636	1TSBX-3636
____	4TSBX–3648	3TSBX–3648	2TSBX–3648	1TSBX-3648
____	4TSBX–3660	3TSBX–3660	2TSBX–3660	1TSBX-3660
____	4TSBX–3672	3TSBX–3672	2TSBX–3672	1TSBX-3672
____	4TSBX–3684	3TSBX–3684	2TSBX–3684	1TSBX-3684
____	4TSBX–3696	3TSBX–3696	2TSBX–3696	1TSBX-3696
____	4TSBX–36108	3TSBX–36108	2TSBX–36108	1TSBX-36108
____	4TSBX–36120	3TSBX–36120	2TSBX–36120	1TSBX-36120
____	4TSBX–36132	3TSBX–36132	2TSBX–36132	1TSBX-36132
____	4TSBX–36144	3TSBX–36144	2TSBX–36144	1TSBX-36144

MATERIAL

TOP

- 1⅞" turn down on 3 sides.
- Rear has a 4" splash.
- Two heavy gauge steel box channels on 24" wide tables for rigidity.
- Three heavy gauge steel box channels on 30" tables for rigidity.
- Four heavy gauge steel box channels on 36" tables for rigidity.
- Sound deadened between table top and channels.

Crossbracing

- 1¼" O.D. 16 gauge 304 series stainless steel crossbracing, 1⅝" I.D. aluminum castings at all leg intersections.

LEGS

- 1⅝" O.D. 16 gauge 304 series stainless steel tubing, complete with 1" adjustable, impact resistant, white metal feet.

DESIGN FEATURES

- Crossbracing is fully adjustable and flexible in design.
- All tables fully cartoned.
- Easily assembled.

EXCLUSIVE AERO SAFETY EDGE

- Table hemmed to eliminate cuts from rough edges.

CONSTRUCTION

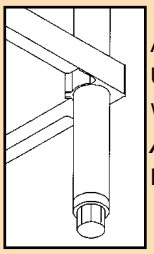
- Top is polished to a #4 mill finish.
- Heliarc welded construction creates uniform, rock-solid unit.
- Gussets fully welded for extra rigidity.
- All tables shipped K.D.

AEROSPEC

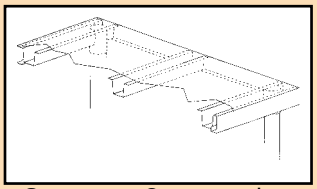
- 1TSBX TABLES ARE ***AEROSPEC DESIGNED.*** *In addition to above specifications;*
- Three sides have a "V" countertop edge to inhibit spillage.
- Backsplash is 10" high including a 2" return on a 45 deg. angle.
- Stainless steel gussets in lieu of galvanized.
- Stainless steel feet in lieu of white metal.

SEE PAGES SP-6A & SP-6B TO DESIGN YOUR FLEXIBLE WORKCENTER

SEE PAGES TS-5A & TS-5B TO CUSTOMIZE YOUR AERO TABLE



Adjustable Undershelf with Exclusive *AEROLOCK* Extrusion



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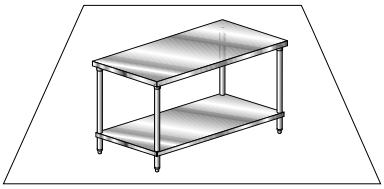
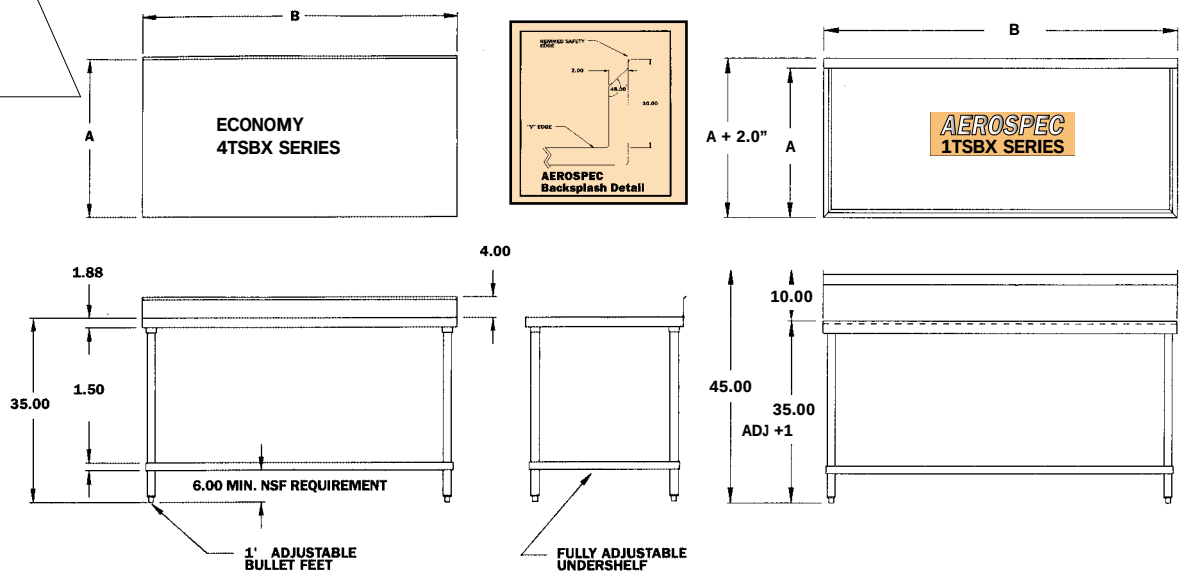
DIMENSIONAL SPECIFICATIONS

TSBX SERIES 4" & 10" Backsplash, S/S Legs and Crossbracing



- Tables over 72" in length are shipped with six legs.
- All feet have a full 1" adjustability.
- Crossbracing is fully adjustable.

NSF



A Width	B Length	ECONOMY 16GA 430 Model #	DELUX 16GA 304 Model #	PREMIUM 14GA 304 Model #	AEROSPEC 14GA 304 Model #	Ship Weight	Cubic Feet
24" WIDE							
24	24	4TSBX–2424	3TSBX–2424	2TSBX–2424	1TSBX-2424	50	3
24	30	4TSBX–2430	3TSBX–2430	2TSBX–2430	1TSBX-2430	55	3
24	36	4TSBX–2436	3TSBX–2436	2TSBX–2436	1TSBX-2436	66	4
24	48	4TSBX–2448	3TSBX–2448	2TSBX–2448	1TSBX-2448	81	5
24	60	4TSBX–2460	3TSBX–2460	2TSBX–2460	1TSBX-2460	95	7
24	72	4TSBX–2472	3TSBX–2472	2TSBX–2472	1TSBX-2472	113	8
24	84	4TSBX–2484	3TSBX–2484	2TSBX–2484	1TSBX-2484	135	9
24	96	4TSBX–2496	3TSBX–2496	2TSBX–2496	1TSBX-2496	150	11
24	108	4TSBX–24108	3TSBX–24108	2TSBX–24108	1TSBX-24108	165	12
24	120	4TSBX–24120	3TSBX–24120	2TSBX–24120	1TSBX-24120	268	13
24	132	4TSBX–24132	3TSBX–24132	2TSBX–24132	1TSBX-24132	301	15
24	144	4TSBX–24144	3TSBX–24144	2TSBX–24144	1TSBX-24144	316	16
30" WIDE							
30	24	4TSBX–3024	3TSBX–3024	2TSBX–3024	1TSBX-3024	56	3
30	30	4TSBX–3030	3TSBX–3030	2TSBX–3030	1TSBX-3024	70	4
30	36	4TSBX–3036	3TSBX–3036	2TSBX–3036	1TSBX-3036	77	5
30	48	4TSBX–3048	3TSBX–3048	2TSBX–3048	1TSBX-3048	92	7
30	60	4TSBX–3060	3TSBX–3060	2TSBX–3060	1TSBX-3060	111	8
30	72	4TSBX–3072	3TSBX–3072	2TSBX–3072	1TSBX-3072	129	10
30	84	4TSBX–3084	3TSBX–3084	2TSBX–3084	1TSBX-3084	153	12
30	96	4TSBX–3096	3TSBX–3096	2TSBX–3096	1TSBX-3096	171	13
30	108	4TSBX–30108	3TSBX–30108	2TSBX–30108	1TSBX-30108	195	15
30	120	4TSBX–30120	3TSBX–30120	2TSBX–30120	1TSBX-30120	294	17
30	132	4TSBX–30132	3TSBX–30132	2TSBX–30132	1TSBX-30132	331	18
30	144	4TSBX–30144	3TSBX–30144	2TSBX–30144	1TSBX-30144	346	20
36" WIDE							
36	36	4TSBX–3636	3TSBX–3636	2TSBX–3636	1TSBX-3636	92	6
36	48	4TSBX–3648	3TSBX–3648	2TSBX–3648	1TSBX-3648	101	8
36	60	4TSBX–3660	3TSBX–3660	2TSBX–3660	1TSBX-3660	121	10
36	72	4TSBX–3672	3TSBX–3672	2TSBX–3672	1TSBX-3672	142	12
36	84	4TSBX–3684	3TSBX–3684	2TSBX–3684	1TSBX-3684	169	14
36	96	4TSBX–3696	3TSBX–3696	2TSBX–3696	1TSBX-3696	189	16
36	108	4TSBX–36108	3TSBX–36108	2TSBX–36108	1TSBX-36108	160	18
36	120	4TSBX–36120	3TSBX–36120	2TSBX–36120	1TSBX-36120	315	20
36	132	4TSBX–36132	3TSBX–36132	2TSBX–36132	1TSBX-36132	358	22
36	144	4TSBX–36144	3TSBX–36144	2TSBX–36144	1TSBX-36144	373	24

All dimensions are typical (tol. ±½"). • For Accessories and Options see pages TS-5A & TS-5B.

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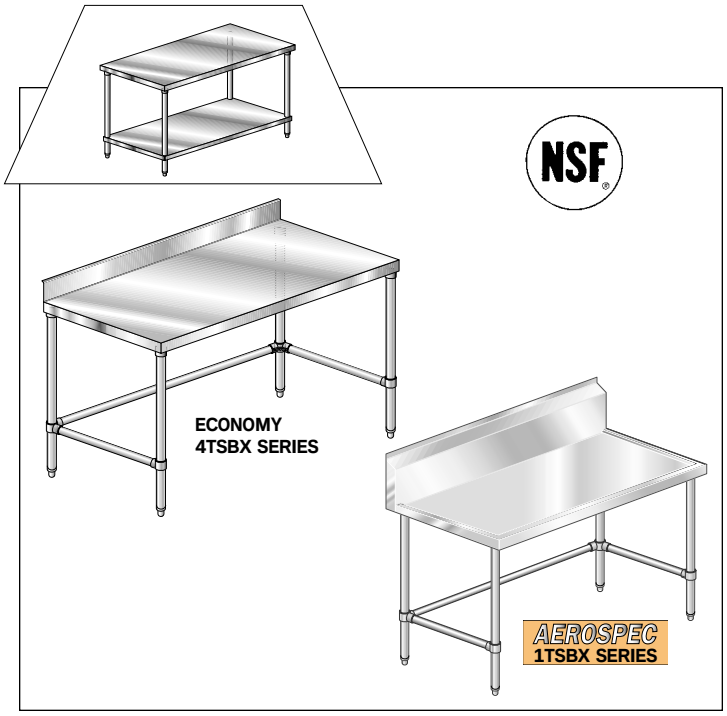
WORK TABLE

TSBX SERIES 4" & 10" Backsplash, S/S Legs and Crossbracing



Item#_____Project_____

Quantity	ECONOMY 16GA 430 Model #	DELUX 16GA 304 Model #	PREMIUM 14GA 304 Model #	AEROSPEC 14GA 304 Model #
24" WIDE				
____	4TSBX–2424	3TSBX–2424	2TSBX–2424	1TSBX-2424
____	4TSBX–2430	3TSBX–2430	2TSBX–2430	1TSBX-2430
____	4TSBX–2436	3TSBX–2436	2TSBX–2436	1TSBX-2436
____	4TSBX–2448	3TSBX–2448	2TSBX–2448	1TSBX-2448
____	4TSBX–2460	3TSBX–2460	2TSBX–2460	1TSBX-2460
____	4TSBX–2472	3TSBX–2472	2TSBX–2472	1TSBX-2472
____	4TSBX–2484	3TSBX–2484	2TSBX–2484	1TSBX-2484
____	4TSBX–2496	3TSBX–2496	2TSBX–2496	1TSBX-2496
____	4TSBX–24108	3TSBX–24108	2TSBX–24108	1TSBX-24108
____	4TSBX–24120	3TSBX–24120	2TSBX–24120	1TSBX-24120
____	4TSBX–24132	3TSBX–24132	2TSBX–24132	1TSBX-24132
____	4TSBX–24144	3TSBX–24144	2TSBX–24144	1TSBX-24144
30" WIDE				
____	4TSBX–3024	3TSBX–3024	2TSBX–3024	1TSBX-3024
____	4TSBX–3030	3TSBX–3030	2TSBX–3030	1TSBX-3030
____	4TSBX–3036	3TSBX–3036	2TSBX–3036	1TSBX-3036
____	4TSBX–3048	3TSBX–3048	2TSBX–3048	1TSBX-3048
____	4TSBX–3060	3TSBX–3060	2TSBX–3060	1TSBX-3060
____	4TSBX–3072	3TSBX–3072	2TSBX–3072	1TSBX-3072
____	4TSBX–3084	3TSBX–3084	2TSBX–3084	1TSBX-3084
____	4TSBX–3096	3TSBX–3096	2TSBX–3096	1TSBX-3096
____	4TSBX–30108	3TSBX–30108	2TSBX–30108	1TSBX-30108
____	4TSBX–30120	3TSBX–30120	2TSBX–30120	1TSBX-30120
____	4TSBX–30132	3TSBX–30132	2TSBX–30132	1TSBX-30132
____	4TSBX–30144	3TSBX–30144	2TSBX–30144	1TSBX-30144
36" WIDE				
____	4TSBX–3636	3TSBX–3636	2TSBX–3636	1TSBX-3636
____	4TSBX–3648	3TSBX–3648	2TSBX–3648	1TSBX-3648
____	4TSBX–3660	3TSBX–3660	2TSBX–3660	1TSBX-3660
____	4TSBX–3672	3TSBX–3672	2TSBX–3672	1TSBX-3672
____	4TSBX–3684	3TSBX–3684	2TSBX–3684	1TSBX-3684
____	4TSBX–3696	3TSBX–3696	2TSBX–3696	1TSBX-3696
____	4TSBX–36108	3TSBX–36108	2TSBX–36108	1TSBX-36108
____	4TSBX–36120	3TSBX–36120	2TSBX–36120	1TSBX-36120
____	4TSBX–36132	3TSBX–36132	2TSBX–36132	1TSBX-36132
____	4TSBX–36144	3TSBX–36144	2TSBX–36144	1TSBX-36144

MATERIAL

TOP

- 1⅞" turn down on 3 sides.
- Rear has a 4" splash.
- Two heavy gauge steel box channels on 24" wide tables for rigidity.
- Three heavy gauge steel box channels on 30" tables for rigidity.
- Four heavy gauge steel box channels on 36" tables for rigidity.
- Sound deadened between table top and channels.

Crossbracing

- 1¼" O.D. 16 gauge 304 series stainless steel crossbracing, 1⅝" I.D. aluminum castings at all leg intersections.

LEGS

- 1⅝" O.D. 16 gauge 304 series stainless steel tubing, complete with 1" adjustable, impact resistant, white metal feet.

DESIGN FEATURES

- Crossbracing is fully adjustable and flexible in design.
- All tables fully cartoned.
- Easily assembled.

EXCLUSIVE AERO SAFETY EDGE

- Table hemmed to eliminate cuts from rough edges.

CONSTRUCTION

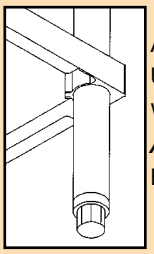
- Top is polished to a #4 mill finish.
- Heliarc welded construction creates uniform, rock-solid unit.
- Gussets fully welded for extra rigidity.
- All tables shipped K.D.

AEROSPEC

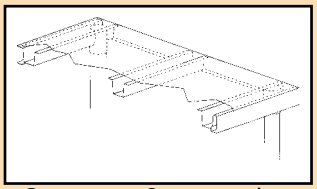
- 1TSBX TABLES ARE ***AEROSPEC DESIGNED.***
  In addition to above specifications;
- Three sides have a "V" countertop edge to inhibit spillage.
- Backsplash is 10" high including a 2" return on a 45 deg. angle.
- Stainless steel gussets in lieu of galvanized.
- Stainless steel feet in lieu of white metal.

SEE PAGES SP-6A & SP-6B TO DESIGN YOUR FLEXIBLE WORKCENTER

SEE PAGES TS-5A & TS-5B TO CUSTOMIZE YOUR AERO TABLE



Adjustable Undershelf with Exclusive *AEROLOCK* Extrusion



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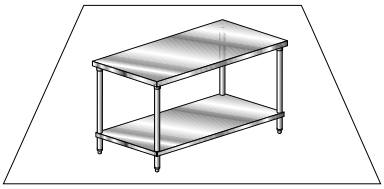
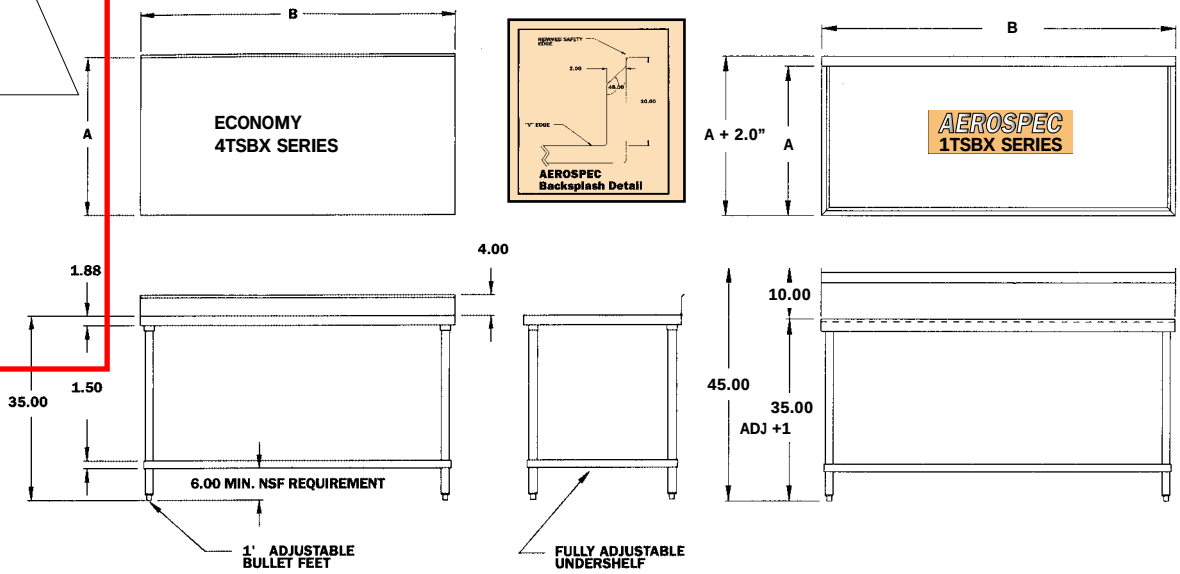
DIMENSIONAL SPECIFICATIONS

TSBX SERIES 4" & 10" Backsplash, S/S Legs and Crossbracing



- Tables over 72" in length are shipped with six legs.
- All feet have a full 1" adjustability.
- Crossbracing is fully adjustable.

NSF



A Width	B Length	ECONOMY 16GA 430 Model #	DELUX 16GA 304 Model #	PREMIUM 14GA 304 Model #	AEROSPEC 14GA 304 Model #	Ship Weight	Cubic Feet
24" WIDE							
24	24	4TSBX–2424	3TSBX–2424	2TSBX–2424	1TSBX-2424	50	3
24	30	4TSBX–2430	3TSBX–2430	2TSBX–2430	1TSBX-2430	55	3
24	36	4TSBX–2436	3TSBX–2436	2TSBX–2436	1TSBX-2436	66	4
24	48	4TSBX–2448	3TSBX–2448	2TSBX–2448	1TSBX-2448	81	5
24	60	4TSBX–2460	3TSBX–2460	2TSBX–2460	1TSBX-2460	95	7
24	72	4TSBX–2472	3TSBX–2472	2TSBX–2472	1TSBX-2472	113	8
24	84	4TSBX–2484	3TSBX–2484	2TSBX–2484	1TSBX-2484	135	9
24	96	4TSBX–2496	3TSBX–2496	2TSBX–2496	1TSBX-2496	150	11
24	108	4TSBX–24108	3TSBX–24108	2TSBX–24108	1TSBX-24108	165	12
24	120	4TSBX–24120	3TSBX–24120	2TSBX–24120	1TSBX-24120	268	13
24	132	4TSBX–24132	3TSBX–24132	2TSBX–24132	1TSBX-24132	301	15
24	144	4TSBX–24144	3TSBX–24144	2TSBX–24144	1TSBX-24144	316	16
30" WIDE							
30	24	4TSBX–3024	3TSBX–3024	2TSBX–3024	1TSBX-3024	56	3
30	30	4TSBX–3030	3TSBX–3030	2TSBX–3030	1TSBX-3024	70	4
30	36	4TSBX–3036	3TSBX–3036	2TSBX–3036	1TSBX-3036	77	5
30	48	4TSBX–3048	3TSBX–3048	2TSBX–3048	1TSBX-3048	92	7
30	60	4TSBX–3060	3TSBX–3060	2TSBX–3060	1TSBX-3060	111	8
30	72	4TSBX–3072	3TSBX–3072	2TSBX–3072	1TSBX-3072	129	10
30	84	4TSBX–3084	3TSBX–3084	2TSBX–3084	1TSBX-3084	153	12
30	96	4TSBX–3096	3TSBX–3096	2TSBX–3096	1TSBX-3096	171	13
30	108	4TSBX–30108	3TSBX–30108	2TSBX–30108	1TSBX-30108	195	15
30	120	4TSBX–30120	3TSBX–30120	2TSBX–30120	1TSBX-30120	294	17
30	132	4TSBX–30132	3TSBX–30132	2TSBX–30132	1TSBX-30132	331	18
30	144	4TSBX–30144	3TSBX–30144	2TSBX–30144	1TSBX-30144	346	20
36" WIDE							
36	36	4TSBX–3636	3TSBX–3636	2TSBX–3636	1TSBX-3636	92	6
36	48	4TSBX–3648	3TSBX–3648	2TSBX–3648	1TSBX-3648	101	8
36	60	4TSBX–3660	3TSBX–3660	2TSBX–3660	1TSBX-3660	121	10
36	72	4TSBX–3672	3TSBX–3672	2TSBX–3672	1TSBX-3672	142	12
36	84	4TSBX–3684	3TSBX–3684	2TSBX–3684	1TSBX-3684	169	14
36	96	4TSBX–3696	3TSBX–3696	2TSBX–3696	1TSBX-3696	189	16
36	108	4TSBX–36108	3TSBX–36108	2TSBX–36108	1TSBX-36108	160	18
36	120	4TSBX–36120	3TSBX–36120	2TSBX–36120	1TSBX-36120	315	20
36	132	4TSBX–36132	3TSBX–36132	2TSBX–36132	1TSBX-36132	358	22
36	144	4TSBX–36144	3TSBX–36144	2TSBX–36144	1TSBX-36144	373	24

All dimensions are typical (tol. ±½"). • For Accessories and Options see pages TS-5A & TS-5B.

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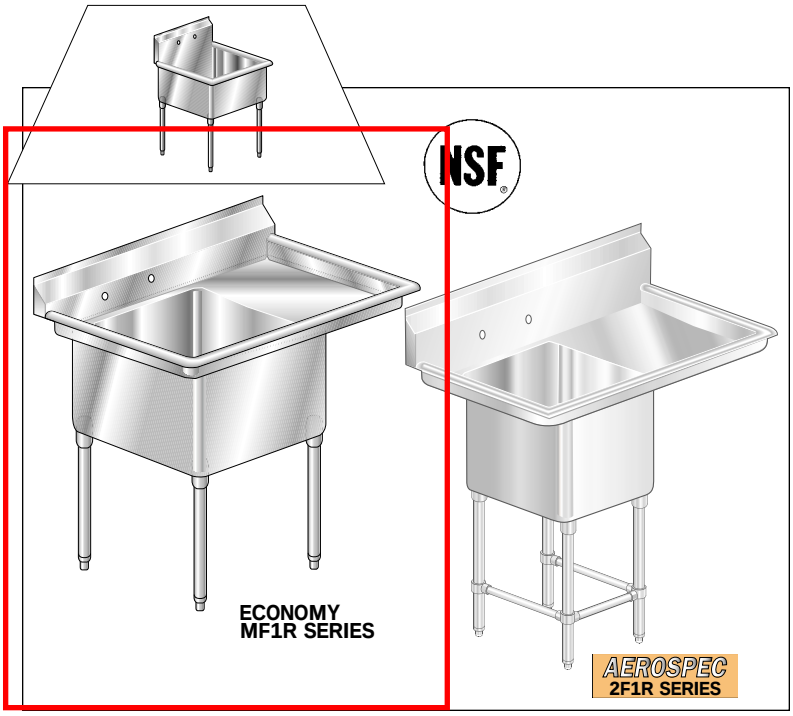
NSF SINKS

F1R SERIES, One Compartment with Right Drainboard



Item#_____Project_____

Quantity	ECONOMY MF1 Model #	DELUX 3F1 Model #	AEROSPEC 2F1 Model #
21" WIDE			
____	MF1–2116–18R	3F1–2116–18R	2F1–2116–18R
____	MF1–2116–24R	3F1–2116–24R	2F1–2116–24R
____	MF1–2116–30R	3F1–2116–30R	2F1–2116–30R
____	MF1–2116–36R	3F1–2116–36R	2F1–2116–36R
20" WIDE			
____	MF1–2020–20R	3F1–2020–20R	2F1–2020–20R
____	MF1–2020–24R	3F1–2020–24R	2F1–2020–24R
____	MF1–2020–30R	3F1–2020–30R	2F1–2020–30R
____	MF1–2020–36R	3F1–2020–36R	2F1–2020–36R
24" WIDE			
____	MF1–2418–18R	3F1–2418–18R	2F1–2418–18R
____	MF1–2418–24R	3F1–2418–24R	2F1–2418–24R
____	MF1–2418–30R	3F1–2418–30R	2F1–2418–30R
____	MF1–2418–36R	3F1–2418–36R	2F1–2418–36R
24" WIDE			
____	MF1–2424–18R	3F1–2424–18R	2F1–2424–18R
____	MF1–2424–24R	3F1–2424–24R	2F1–2424–24R
____	MF1–2424–30R	3F1–2424–30R	2F1–2424–30R
____	MF1–2424–36R	3F1–2424–36R	2F1–2424–36R
30" WIDE			
____	MF1–3020–20R	3F1–3020–20R	2F1–3020–20R
____	MF1–3020–24R	3F1–3020–24R	2F1–3020–24R
____	MF1–3020–30R	3F1–3020–30R	2F1–3020–30R
____	MF1–3020–36R	3F1–3020–36R	2F1–3020–36R

MATERIAL

BODY

- MF –16 gauge 304 stainless steel bowl, 430 body.
- 3F –16 gauge 304 stainless steel.
- 2F –14 gauge 304 stainless steel.(AEROSPEC)

LEGS

- 1⅝" O.D. 16 gauge 304 series stainless steel tubing, complete with 1" adjustable impact resistant white metal feet.

DESIGN FEATURES

- All sinks are fully cartoned.
- Easily assembled.
- Drainboards pitched ¼" for positive drainage.

EXCLUSIVE AERO SAFETY EDGE

- Sink hemmed on the roll and backsplash to eliminate cuts from rough edges.

CONSTRUCTION

- ***Exclusive 14" bowl depth on all models (consultant's spec).***
- ***Custom style fabricated bowl for true gauge integrity.***
- All sinks have a ¾" radius at all intersecting planes (consultant's spec).
- Stainless steel gusset is machine welded 360 deg. to a stainless steel triangular plate.
- Gusset plate is fully welded directly underneath the sink for support.
- Polished to a #4 blended finish.
- All sinks with drainboards 30" or longer equipped with 2 stainless steel 1⅝" O.D. legs with stainless steel gussets and white metal feet.

PLUMBING

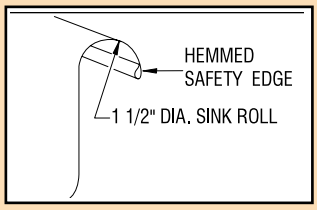
- Water supply is ½" hot and cold.
- Faucet holes are 8" o.c. (Faucets not included. See accessories).

AEROSPEC

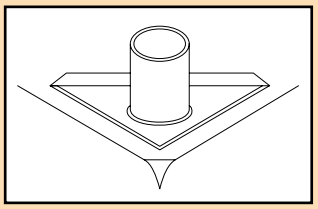
Includes all of the above and the following:

- Full 10" backsplash instead of standard 7".
- Stainless steel feet in lieu of white metal.
- Legs have stainless steel crossbracing with aluminum castings at all intersections.

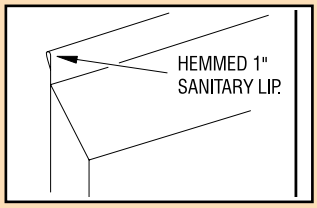
CUSTOM SIZES AVAILABLE



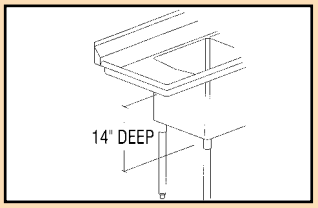
Exclusive
Aero Safety Edge



Fully Welded
Gusset Assembly



1" Sanitary Lip



14" Custom-Style
Bowl

CONSULTANT'S SPECS AT PRODUCTION PRICES

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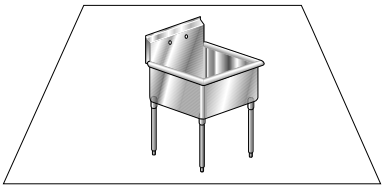
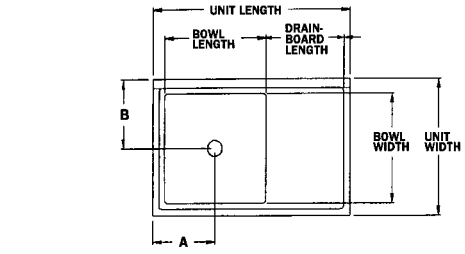
DIMENSIONAL SPECIFICATIONS

F1R SERIES, NSF Sinks, One Compartment, Right Drainboard

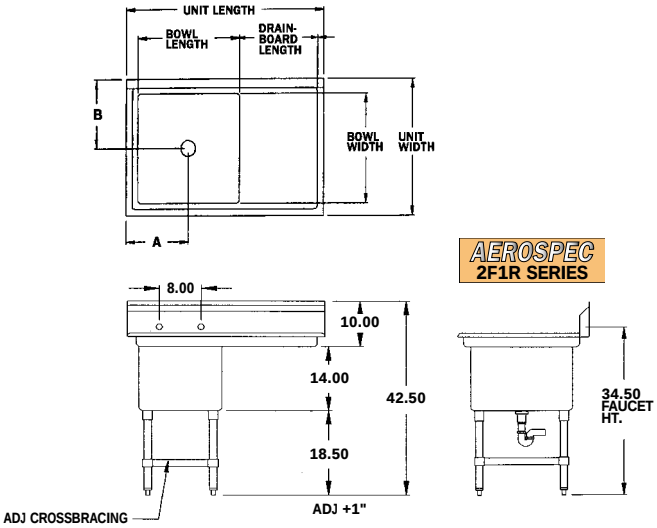


■ Supplied with stainless steel drain basket and strainer.

NSF



ECONOMY MF1R SERIES



AEROSPEC 2F1R SERIES

BOWL Width	BOWL Length	UNIT Width	UNIT Length	DRAIN BOARD Length	A Drain	B Drain	ECONOMY MF1 Model #	DELUX 3F1 Model #	AEROSPEC 2F1 Model #	Ship Weight	Cubic Feet	Sets, Faucet Holes
21" WIDE												
21	16	27	38.3	18	10.75	13.75	MF1–2116–18R	3F1–2116–18R	2F1–2116–18R	85	13	ONE
21	16	27	44.3	24	10.75	13.75	MF1–2116–24R	3F1–2116–24R	2F1–2116–24R	90	15	ONE
21	16	27	50.3	30	10.75	13.75	MF1–2116–30R	3F1–2116–30R	2F1–2116–30R	95	16	ONE
21	16	27	56.3	36	10.75	13.75	MF1–2116–36R	3F1–2116–36R	2F1–2116–36R	100	18	ONE
20" WIDE												
20	20	26	44.3	20	12.75	13.25	MF1–2020–20R	3F1–2020–20R	2F1–2020–20R	100	15	ONE
20	20	26	48.3	24	12.75	13.25	MF1–2020–24R	3F1–2020–24R	2F1–2020–24R	105	17	ONE
20	20	26	54.3	30	12.75	13.25	MF1–2020–30R	3F1–2020–30R	2F1–2020–30R	110	19	ONE
20	20	26	60.3	36	12.75	13.25	MF1–2020–36R	3F1–2020–36R	2F1–2020–36R	115	21	ONE
24" WIDE												
24	18	30	40.3	18	11.75	13.75	MF1–2418–18R	3F1–2418–18R	2F1–2418–18R	95	13	ONE
24	18	30	46.3	24	11.75	13.75	MF1–2418–24R	3F1–2418–24R	2F1–2418–24R	100	15	ONE
24	18	30	52.3	30	11.75	13.75	MF1–2418–30R	3F1–2418–30R	2F1–2418–30R	105	17	ONE
24	18	30	58.3	36	11.75	13.75	MF1–2418–36R	3F1–2418–36R	2F1–2418–36R	110	19	ONE
24" WIDE												
24	24	30	46.3	18	14.75	15.25	MF1–2424–18R	3F1–2424–18R	2F1–2424–18R	105	17	ONE
24	24	30	52.3	24	14.75	15.25	MF1–2424–24R	3F1–2424–24R	2F1–2424–24R	110	19	ONE
24	24	30	58.3	30	14.75	15.25	MF1–2424–30R	3F1–2424–30R	2F1–2424–30R	115	21	ONE
24	24	30	64.3	36	14.75	15.25	MF1–2424–36R	3F1–2424–36R	2F1–2424–36R	120	23	ONE
30" WIDE												
30	20	36	44.3	18	12.75	18.25	MF1–3020–20R	3F1–3020–20R	2F1–3020–20R	115	18	ONE
30	20	36	48.3	24	12.75	18.25	MF1–3020–24R	3F1–3020–24R	2F1–3020–24R	120	21	ONE
30	20	36	54.3	30	12.75	18.25	MF1–3020–30R	3F1–3020–30R	2F1–3020–30R	125	24	ONE
30	20	36	60.3	36	12.75	18.25	MF1–3020–36R	3F1–3020–36R	2F1–3020–36R	130	26	ONE

All dimensions are typical (tol. ±½"). • For Accessories and Options see pages FS-7A, FS-7B.

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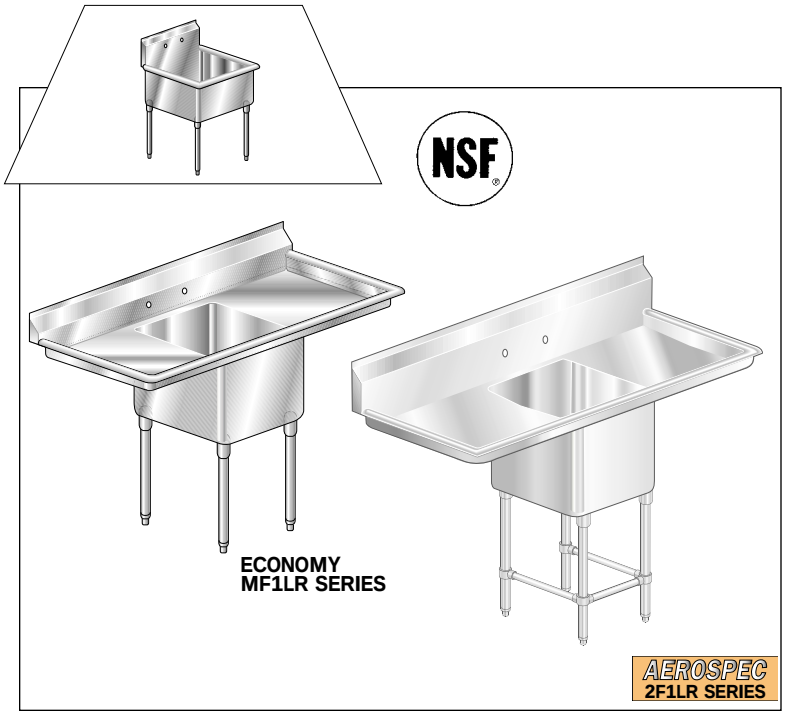
NSF SINKS

F1LR SERIES, One Compartment with Two Drainboards



Item#_____Project_____

Quantity	ECONOMY MF1 Model #	DELUX 3F1 Model #	AEROSPEC 2F1 Model #
21" WIDE			
____	MF1–2116–18LR	3F1–2116–18LR	2F1–2116–18LR
____	MF1–2116–24LR	3F1–2116–24LR	2F1–2116–24LR
____	MF1–2116–30LR	3F1–2116–30LR	2F1–2116–30LR
____	MF1–2116–36LR	3F1–2116–36LR	2F1–2116–36LR
20" WIDE			
____	MF1–2020–20LR	3F1–2020–20LR	2F1–2020–20LR
____	MF1–2020–24LR	3F1–2020–24LR	2F1–2020–24LR
____	MF1–2020–30LR	3F1–2020–30LR	2F1–2020–30LR
____	MF1–2020–36LR	3F1–2020–36LR	2F1–2020–36LR
24" WIDE			
____	MF1–2418–18LR	3F1–2418–18LR	2F1–2418–18LR
____	MF1–2418–24LR	3F1–2418–24LR	2F1–2418–24LR
____	MF1–2418–30LR	3F1–2418–30LR	2F1–2418–30LR
____	MF1–2418–36LR	3F1–2418–36LR	2F1–2418–36LR
24" WIDE			
____	MF1–2424–18LR	3F1–2424–18LR	2F1–2424–18LR
____	MF1–2424–24LR	3F1–2424–24LR	2F1–2424–24LR
____	MF1–2424–30LR	3F1–2424–30LR	2F1–2424–30LR
____	MF1–2424–36LR	3F1–2424–36LR	2F1–2424–36LR
30" WIDE			
____	MF1–3020–20LR	3F1–3020–20LR	2F1–3020–20LR
____	MF1–3020–24LR	3F1–3020–24LR	2F1–3020–24LR
____	MF1–3020–30LR	3F1–3020–30LR	2F1–3020–30LR
____	MF1–3020–36LR	3F1–3020–36LR	2F1–3020–36LR

MATERIAL

BODY

- MF –16 gauge 304 stainless steel bowl, 430 body.
- 3F –16 gauge 304 stainless steel.
- 2F –14 gauge 304 stainless steel. (AEROSPEC)

LEGS

- 1⅝" O.D. 16 gauge 304 series stainless steel tubing, complete with 1" adjustable impact resistant white metal feet.

DESIGN FEATURES

- All sinks are fully cartoned.
- Easily assembled.
- Drainboards pitched ¼" for positive drainage.

EXCLUSIVE AERO SAFETY EDGE

- Sink hemmed on the roll and backsplash to eliminate cuts from rough edges.

CONSTRUCTION

- ***Exclusive 14" bowl depth on all models (consultant's spec).***
- ***Custom style fabricated bowl for true gauge integrity.***
- All sinks have a ¾" radius at all intersecting planes (consultant's spec).
- Stainless steel gusset is machine welded 360 deg. to a stainless steel triangular plate.
- Gusset plate is fully welded directly underneath the sink for support.
- Polished to a #4 blended finish.
- All sinks with drainboards 30" or longer equipped with 2 stainless steel 1⅝" O.D. legs with stainless steel gussets and white metal feet.

PLUMBING

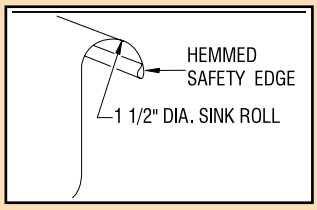
- Water supply is ½" hot and cold.
- Faucet holes are 8" o.c. (Faucets not included. See accessories).

AEROSPEC

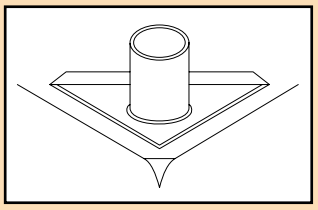
Includes all of the above and the following:

- Full 10" backsplash instead of standard 7".
- Stainless steel feet in lieu of white metal.
- Legs have stainless steel crossbracing with aluminum castings at all intersections.

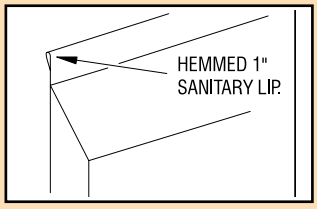
CUSTOM SIZES AVAILABLE



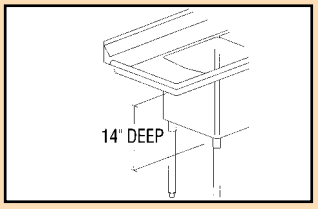
Exclusive Aero Safety Edge



Fully Welded Gusset Assembly



1" Sanitary Lip



14" Custom-Style Bowl

CONSULTANT'S SPECS AT PRODUCTION PRICES

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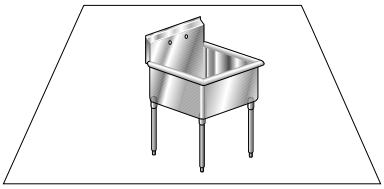
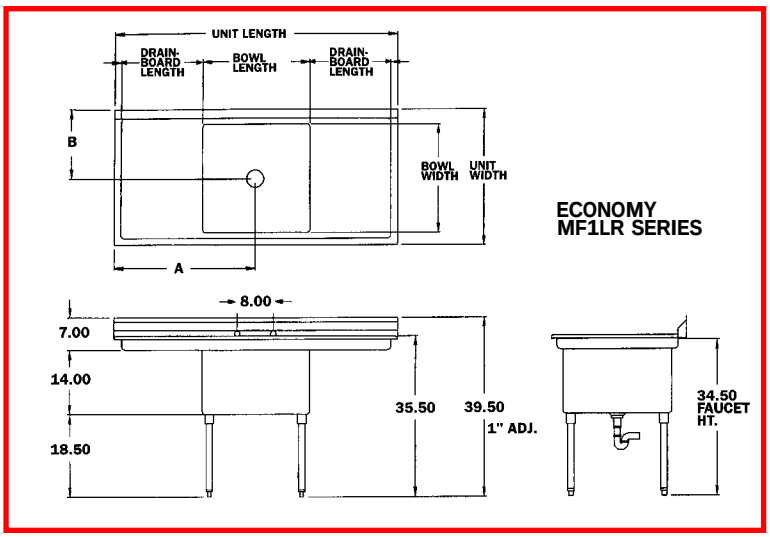
DIMENSIONAL SPECIFICATIONS

F1LR SERIES, NSF Sinks, One Compartment, Two Drainboards

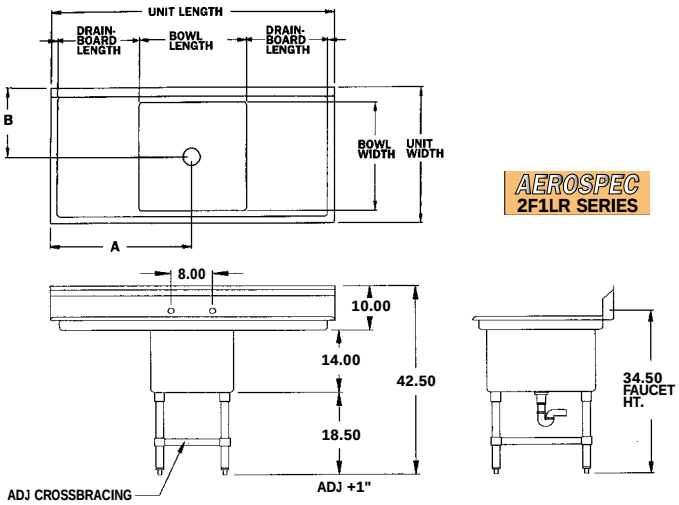


■ Supplied with stainless steel drain basket and strainer.

NSF



ECONOMY
MF1LR SERIES



AEROSPEC
2F1LR SERIES

BOWL Width	BOWL Length	UNIT Width	UNIT Length	DRAIN BOARD Length	A Drain	B Drain	ECONOMY MF1 Model #	DELUX 3F1 Model #	AEROSPEC 2F1 Model #	Ship Weight	Cubic Feet	Sets, Faucet Holes
21" WIDE												
21	16	27	57	18	27.5	13.75	MF1–2116–18LR	3F1–2116–18LR	2F1–2116–18LR	85	13	ONE
21	16	27	67	24	33.5	13.75	MF1–2116–24LR	3F1–2116–24LR	2F1–2116–24LR	90	15	ONE
21	16	27	79	30	39.5	13.75	MF1–2116–30LR	3F1–2116–30LR	2F1–2116–30LR	95	16	ONE
21	16	27	91	36	45.5	13.75	MF1–2116–36LR	3F1–2116–36LR	2F1–2116–36LR	100	18	ONE
20" WIDE												
20	20	26	63	20	31.5	13.25	MF1–2020–20LR	3F1–2020–20LR	2F1–2020–20LR	100	15	ONE
20	20	26	71	24	35.5	13.25	MF1–2020–24LR	3F1–2020–24LR	2F1–2020–24LR	105	17	ONE
20	20	26	83	30	41.5	13.25	MF1–2020–30LR	3F1–2020–30LR	2F1–2020–30LR	110	19	ONE
20	20	26	95	36	47.5	13.25	MF1–2020–36LR	3F1–2020–36LR	2F1–2020–36LR	115	21	ONE
24" WIDE												
24	18	30	59	18	28.5	13.75	MF1–2418–18LR	3F1–2418–18LR	2F1–2418–18LR	95	13	ONE
24	18	30	69	24	34.5	13.75	MF1–2418–24LR	3F1–2418–24LR	2F1–2418–24LR	100	15	ONE
24	18	30	81	30	40.5	13.75	MF1–2418–30LR	3F1–2418–30LR	2F1–2418–30LR	105	17	ONE
24	18	30	93	36	46.5	13.75	MF1–2418–36LR	3F1–2418–36LR	2F1–2418–36LR	110	19	ONE
24" WIDE												
24	24	30	63	18	31.5	15.25	MF1–2424–18LR	3F1–2424–18LR	2F1–2424–18LR	105	17	ONE
24	24	30	75	24	37.5	15.25	MF1–2424–24LR	3F1–2424–24LR	2F1–2424–24LR	110	19	ONE
24	24	30	87	30	43.5	15.25	MF1–2424–30LR	3F1–2424–30LR	2F1–2424–30LR	115	21	ONE
24	24	30	99	36	49.5	15.25	MF1–2424–36LR	3F1–2424–36LR	2F1–2424–36LR	120	23	ONE
30" WIDE												
30	20	36	63	18	31.5	18.25	MF1–3020–20LR	3F1–3020–20LR	2F1–3020–20LR	115	18	ONE
30	20	36	71	24	35.5	18.25	MF1–3020–24LR	3F1–3020–24LR	2F1–3020–24LR	120	21	ONE
30	20	36	83	30	41.5	18.25	MF1–3020–30LR	3F1–3020–30LR	2F1–3020–30LR	125	24	ONE
30	20	36	95	36	47.5	18.25	MF1–3020–36LR	3F1–3020–36LR	2F1–3020–36LR	130	26	ONE
CUSTOM SIZE												
30	20	30	49	9								

All dimensions are typical (tol. ±½"). • For Accessories and Options see pages FS-7A, FS-7B.

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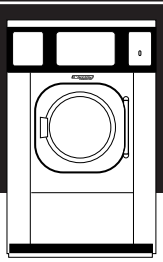
ARCHITECTURAL/MECHANICAL PRODUCT SPECIFICATIONS



EH030

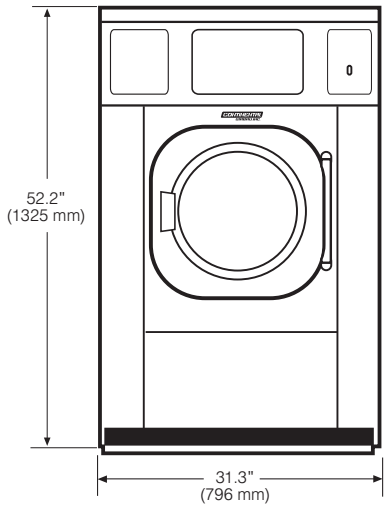
ON-PREMISE LAUNDRY E-SERIES 30-POUND CAPACITY HIGH-PERFORMANCE WASHER-EXTRACTOR

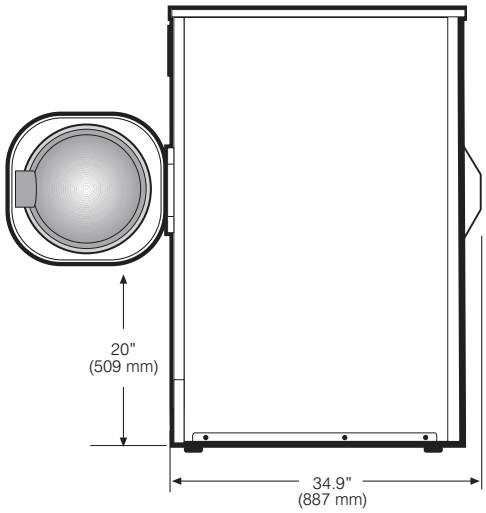
CONTINENTAL GIRBAU®
2500 State Road 44 • Oshkosh, WI 54904
920.231.8222 • FAX 920.231.4666
www.continentalgirbau.com

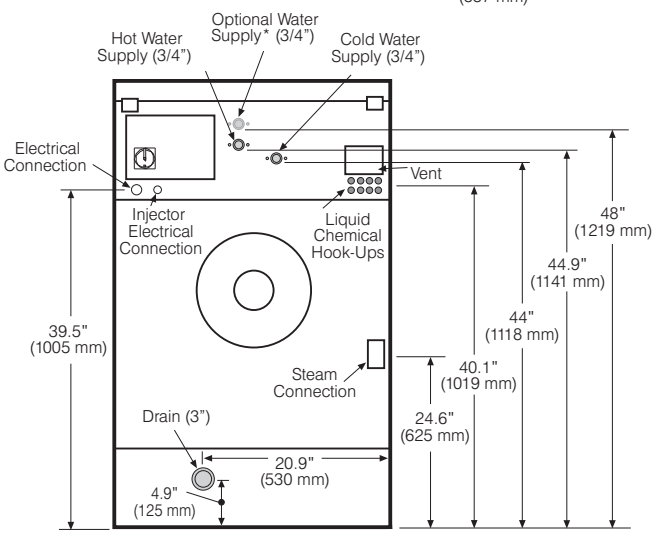
Capacity *lbs (kg)*	30 *(12.6)*
Cylinder Diameter *inch (mm)*	24.4 *(620)*
Cylinder Depth *inch (mm)*	16.4 *(416)*
Cylinder Volume *cu ft (dm³)*	4.4 *(126)*
Net Weight *lbs (kg)*	758 *(344)*
Crated Weight *lbs(kg)*	820 *(372)*
Machine Width *inch (mm)*	31.3 *(796)*
Machine Depth *inch (mm)*	34.9 *(887)*
Machine Height *inch (mm)*	52.2 *(1325)*
Door Opening *inch (mm)*	12.9 *(327)*
Floor to Door *inch (mm)*	20 *(509)*
Shipping Dimensions *inch (mm) (WxDxH)*	32.4 x 37.2 x 58.5 *(823 x 945 x 1485)*
Washing Speeds *rpm*	
Logi Control	46.5
Inteli Control	17/23/30/37/44
Spin Speeds *rpm*	48/100/400/600/800/1000
G-force	0.8/3.46/56/125/222/346
Static Force Transmitted *lbs (kg)*	902 *(409)*
Dynamic Force Transmitted *lbs (kg)*	201 *(91)*
Frequency of Dynamic Force *Hz*	16.7
Available Voltages/Wire Conductor/Amp	
Hot Water (standard)	208-240/60/1, 2W + G, 10 Amp
Electric Auxiliary Heat (optional)	208/60/1, 2W + G, 40 Amp
Electric Auxiliary Heat (optional)	240/60/1, 2W + G, 50 Amp
Electric Auxiliary Heat (optional)	208-240/60/3, 3W + G, 40 Amp
Modified Energy Factor (MEF)*	2.08
Water Consumption Factor (WCF)*	4.68
Drain Diameter *inch (mm)*	3 *(76)*
Water Inlets *inch (mm)*	2 @ 3/4 *(19)*
Recommended Water Pressure *PSI (bar)*	30-60 *(2-4)*
Water Flow *gal/min (l/min)*	16 *(60)*
Steam Connection *inch (mm)*	1/2 *(12.7)*
Steam Pressure (optional) *PSI (bar)*	29-87 *(2-6)*
Steam Flow (optional) *lbs/h (kg/h)*	176 *(80)*
Total Power *kW*	.87
Electric Heating Power (optional) *kW*	
Single Phase 240V	8.4
Three Phase 240V	12.4

* Modified Energy Factor (MEF) measured in cubic feet per kilowatt-hour per cycle. Water Consumption Factor (WCF) measured in gallons per cycle per cubic feet. MEF and WCF statistics are according to DOE test results report by Intertek, an independent testing laboratory, dated February 27, 2007.

** Specifications subject to change without notice or obligation. Call Continental Girbau Inc for dimensions not shown or for clarification.







ARCHITECTURAL/MECHANICAL PRODUCT SPECIFICATIONS

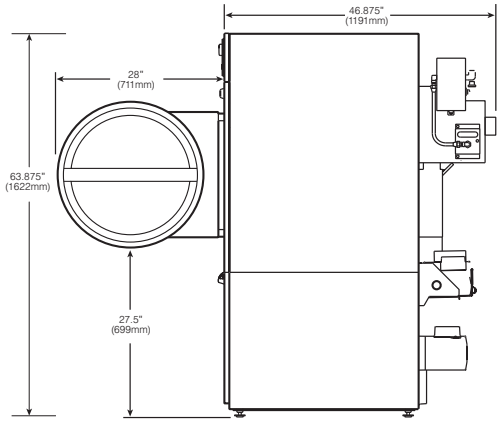
CG30-40

PRO-SERIES II DRYING TUMBLER

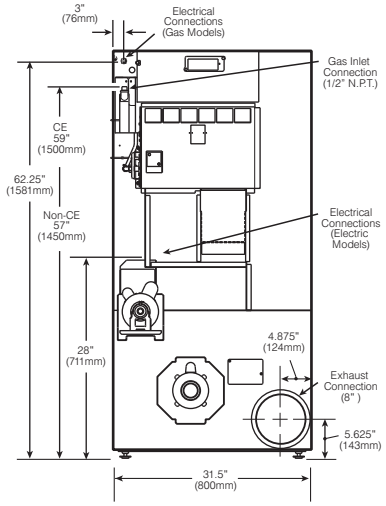
CONTINENTAL GIRBAU®
2500 State Road 44 • Oshkosh, WI 54904
920.231.8222 • FAX 920.231.4666
www.continentalgirbau.com

Capacity *lbs*	up to 40
Cylinder Diameter *inch (mm)*	30 *(762)*
Cylinder Depth *inch (mm)*	30 *(762)*
Cylinder Volume *cu ft (dm³)*	12.3 *(0.35)*
Net Weight *lbs (kg)*	360 *(163)*
Crated Weight *lbs (kg)*	394 *(179)*
Machine Width *inch (mm)*	31.5 *(800)*
Machine Depth *inch (mm)*	46.875 *(1191)*
Machine Height *inch (mm)*	63.875 *(1622)*
Door Opening *inch (mm)*	22.69 *(576)*
Floor to Door *inch (mm)*	27.5 *(699)*
Shipping Dimensions *inch (mm) (WxDxH)*	33 x 49 x 69 *(838 x 1245 x 1753)*
Motor Power *Hp (kW)*	2 @ 1/4 *(2 @ 0.19)*
Reversing Motor Power *Hp (kW)*	1/4 *(0.19)*
Exhaust Diameter *inch (mm)*	8 *(203)*
Exhaust Air Flow *cfm (l/s)*	650 *(307)*
Electric Heating *kW*	24
Gas Connection *inch (mm)*	1/2 NPT *(12.7)*
Gas Heating *BTU/h (Kcal/h)*	90,000 *(22,680)*
Steam Connection *inch*	3/4 NPT
Steam Heating *BTU/h (kW)* at 100 PSI (6.9 bar)	166,000 *(48.6)*
BHP Consumption *BHP* at 100 PSI (6.9 bar)	4.8
Available Voltages/Wire Conductor/Amp (Rev Amp)	
Gas/Steam	120/60/1, 1W + N + G, 12 208-240/60/1, 2W + N + G, 6.7 200-208/60/3, 3W + G, 3.2 (4.0) 240/60/3, 3W + G, 3.2 (4.0) 440/60/3, 3W + G, 1.6 460-480/60/3, 3W + G, 1.6 (2.0)
Electric	208/60/1, 2W + N + G, 122 240/60/1, 2W + N + G, 107 200-208/60/3, 3W + G, 71 (71) 240/60/3, 3W + G, 62 (62) 440/60/3, 3W + G, 33 460-480/60/3, 3W + G, 31 (31)

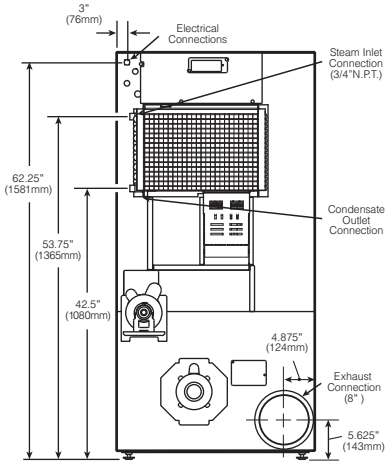
* Specifications subject to change without notice or obligation. Call Continental Girbau Inc for dimensions not shown or for clarification.



SIDE VIEW



REAR VIEW (Gas and Electric Models)



REAR VIEW (Steam Models)

ADVANCE TABCO®
SMART FABRICATION™

STAINLESS STEEL

WALL SHELVES NSF

NO. 182.91 SHELF, WALL MTD. STAINLESS STEEL

Item #: _____ Qty #: _____

Model #: _____

Project #: _____

FEATURES:

Brackets can be positioned to accommodate wall studs.

Furnished with a 1-5/8" Bullnose edge with a 1-1/2" turn-up edge at rear. Ends are turned down square.

MATERIAL:

16 Gauge Series - 304 stainless steel polished to a satin finish.

18 Gauge Series - 430 stainless steel polished to a satin finish.

CONSTRUCTION:

Secured to wall by means of bolts through support brackets.

Units 7 ft. and larger are furnished with 3 brackets.

	10" Wide			12" Wide			15" Wide			18" Wide			
L	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	Approx. Cu. Ft.
24"	WS-10-24-16	WS-10-24	8 lbs.	WS-12-24-16	WS-12-24	9 lbs.	WS-15-24-16	WS-15-24	11 lbs.	WS-18-24-16	WS-18-24	14 lbs.	3
36"	WS-10-36-16	WS-10-36	10 lbs.	WS-12-36-16	WS-12-36	12 lbs.	WS-15-36-16	WS-15-36	15 lbs.	WS-18-36-16	WS-18-36	21 lbs.	4
48"	WS-10-48-16	WS-10-48	12 lbs.	WS-12-48-16	WS-12-48	14 lbs.	WS-15-48-16	WS-15-48	18 lbs.	WS-18-48-16	WS-18-48	24 lbs.	5
60"	WS-10-60-16	WS-10-60	15 lbs.	WS-12-60-16	WS-12-60	17 lbs.	WS-15-60-16	WS-15-60	23 lbs.	WS-18-60-16	WS-18-60	28 lbs.	6
72"	WS-10-72-16	WS-10-72	17 lbs.	WS-12-72-16	WS-12-72	21 lbs.	WS-15-72-16	WS-15-72	28 lbs.	WS-18-72-16	WS-18-72	32 lbs.	7
84"	WS-10-84-16	WS-10-84	20 lbs.	WS-12-84-16	WS-12-84	25 lbs.	WS-15-84-16	WS-15-84	32 lbs.	WS-18-84-16	WS-18-84	36 lbs.	8
96"	WS-10-96-16	WS-10-96	23 lbs.	WS-12-96-16	WS-12-96	28 lbs.	WS-15-96-16	WS-15-96	36 lbs.	WS-18-96-16	WS-18-96	42 lbs.	10
108"	WS-10-108-16	WS-10-108	28 lbs.	WS-12-108-16	WS-12-108	32 lbs.	WS-15-108-16	WS-15-108	40 lbs.	WS-18-108-16	WS-18-108	48 lbs.	11
120"	WS-10-120-16	WS-10-120	32 lbs.	WS-12-120-16	WS-12-120	36 lbs.	WS-15-120-16	WS-15-120	44 lbs.	WS-18-120-16	WS-18-120	54 lbs.	12
132"	WS-10-132-16	WS-10-132	36 lbs.	WS-12-132-16	WS-12-132	42 lbs.	WS-15-132-16	WS-15-132	49 lbs.	WS-18-132-16	WS-18-132	60 lbs.	13
144"	WS-10-144-16	WS-10-144	40 lbs.	WS-12-144-16	WS-12-144	48 lbs.	WS-15-144-16	WS-15-144	55 lbs.	WS-18-144-16	WS-18-144	66 lbs.	14

ADVANCE TABCO®
SMART FABRICATION™
www.advancetabco.com

Customer Service Available To Assist You 1-800-645-3166 8:30 am - 8:00 pm E.S.T.

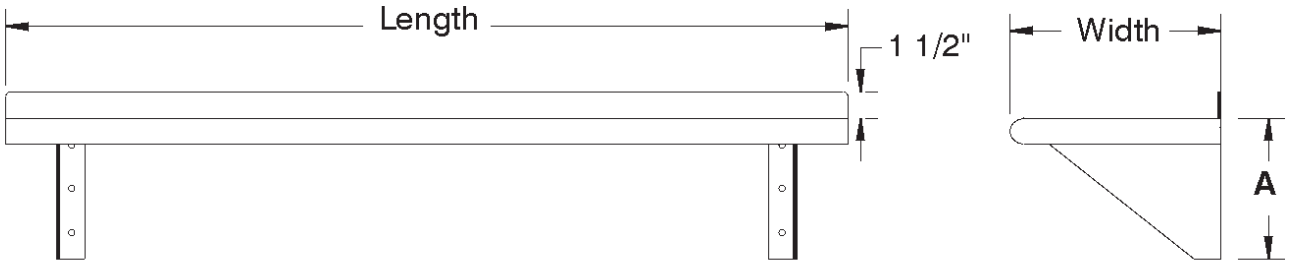
For Orders & Customer Service:
Email: customer@advancetabco.com or **Fax:** 631-242-6900

For Smart Fabrication™ Quotes:
Email: smartfab@advancetabco.com or **Fax:** 631-586-2933

DETAILS and SPECIFICATIONS

TOL ± .500”

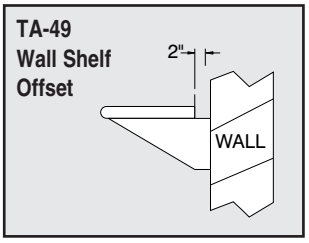
ALL DIMENSIONS ARE TYPICAL



Width	A
10”	8 1/2”
12”	10 1/2”
15”	13 1/2”
18”	16 1/2”

Wall Shelf Options

PRT-1	Printer Shelf
TA-22A	Square Edge Shelf
TA-26	Welded Shelf Brackets
TA-49	Wall Shelf 2” Offset
TA-71	Heat Lamp Provision
TA-77	Check Minder
TA-77A	Concealer for Heat Lamp (Requires TA-77)
TA-99A	14 Ga. S/S 304 Upgrade for Overshelves
TA-100A	Bullnose Edge On All 4 Sides of Shelf
TA-102	6” Cantilever Shelf Offset



Requirements for NSF Installations

1. Install at least 60” above floor.
2. Limit to dry storage.
3. Avoid contact with liquids.
4. For “Ganging-Up” installation, allow at least 2” between units or mount units side by side and seal joints with an approved sealant.

ADVANCE TABCO

SMART FABRICATION™

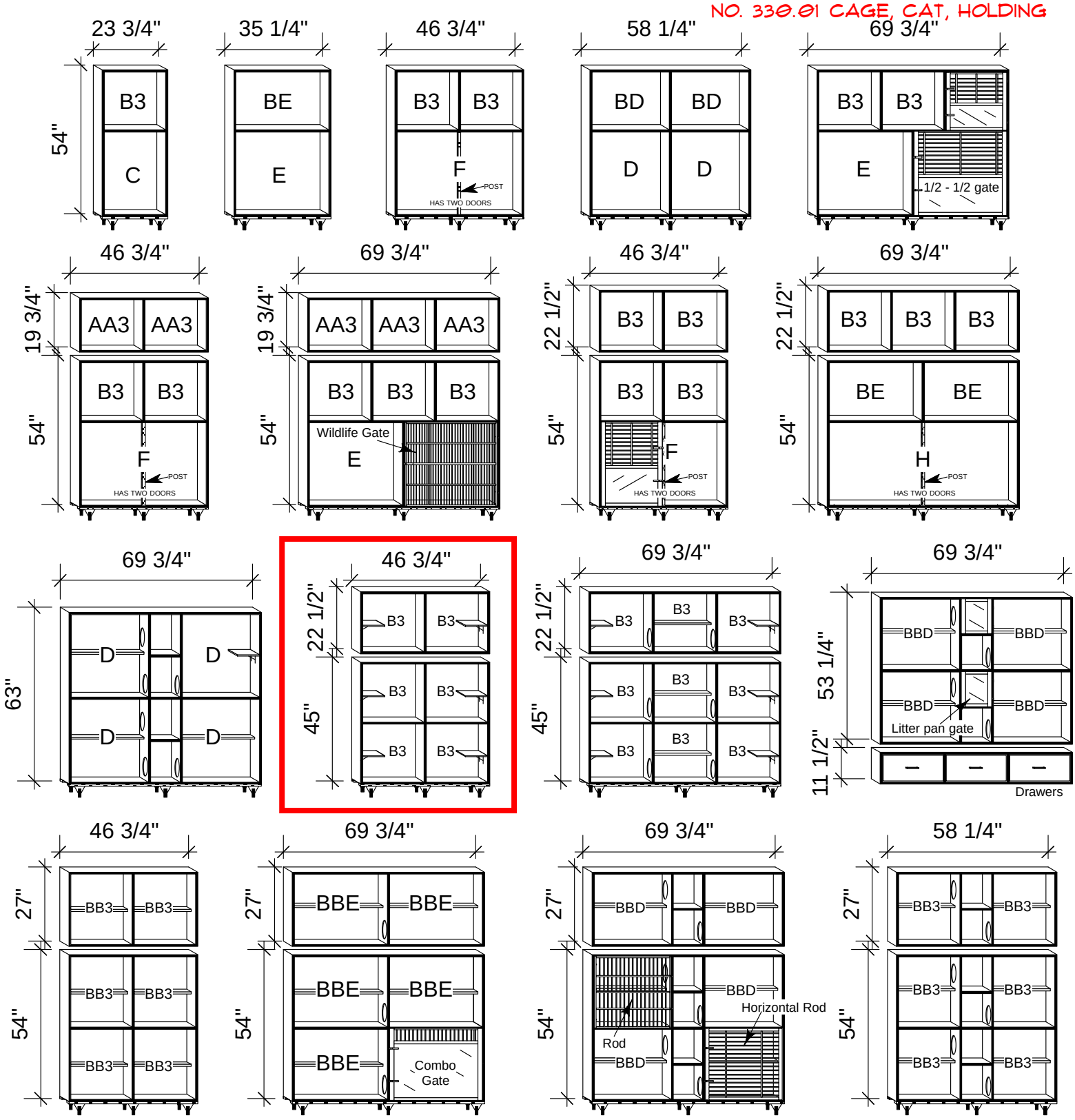
200 Heartland Boulevard, Edgewood, NY 11717-8380

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

© ADVANCE TABCO, DECEMBER 2016

Cage Combination Examples

NO. 330.01 CAGE, CAT, HOLDING



*Multi-tiered configurations over 54" tall by 58" wide are built as 2-tiered banks with stackable strips (exceptions can be made)

Flooring: FLOOR RACKS (Polypropylene)

#1 = 16"w x 25 3/4"

#2 = 18"w x 25 3/4"

#3 = 21 3/4"w x 25 3/4"

D = 27 3/4"w x 25 3/4"

E = 33 1/4"w x 25 3/4"

Legs (per rack) $11.00

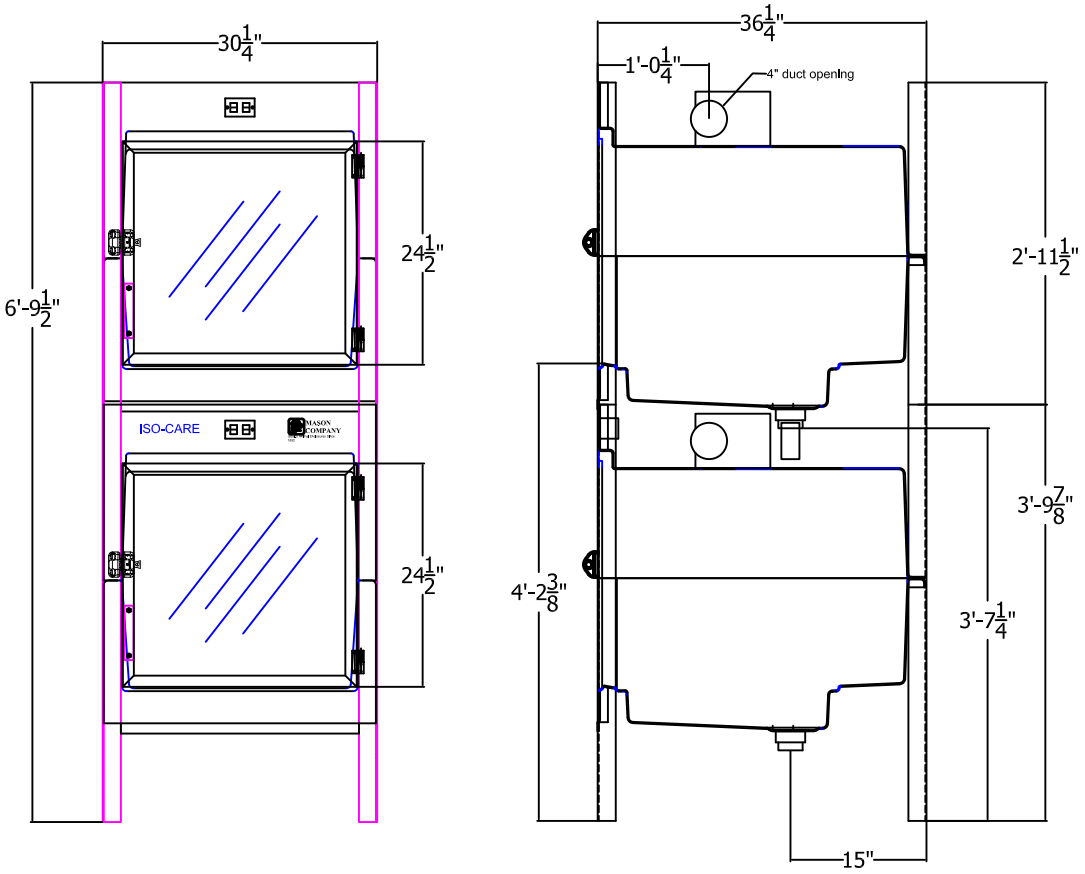
Vinyl Mat: VINYL FLOOR MAT

Roll lengths of 33' (Widths of 24", 30", & 36")

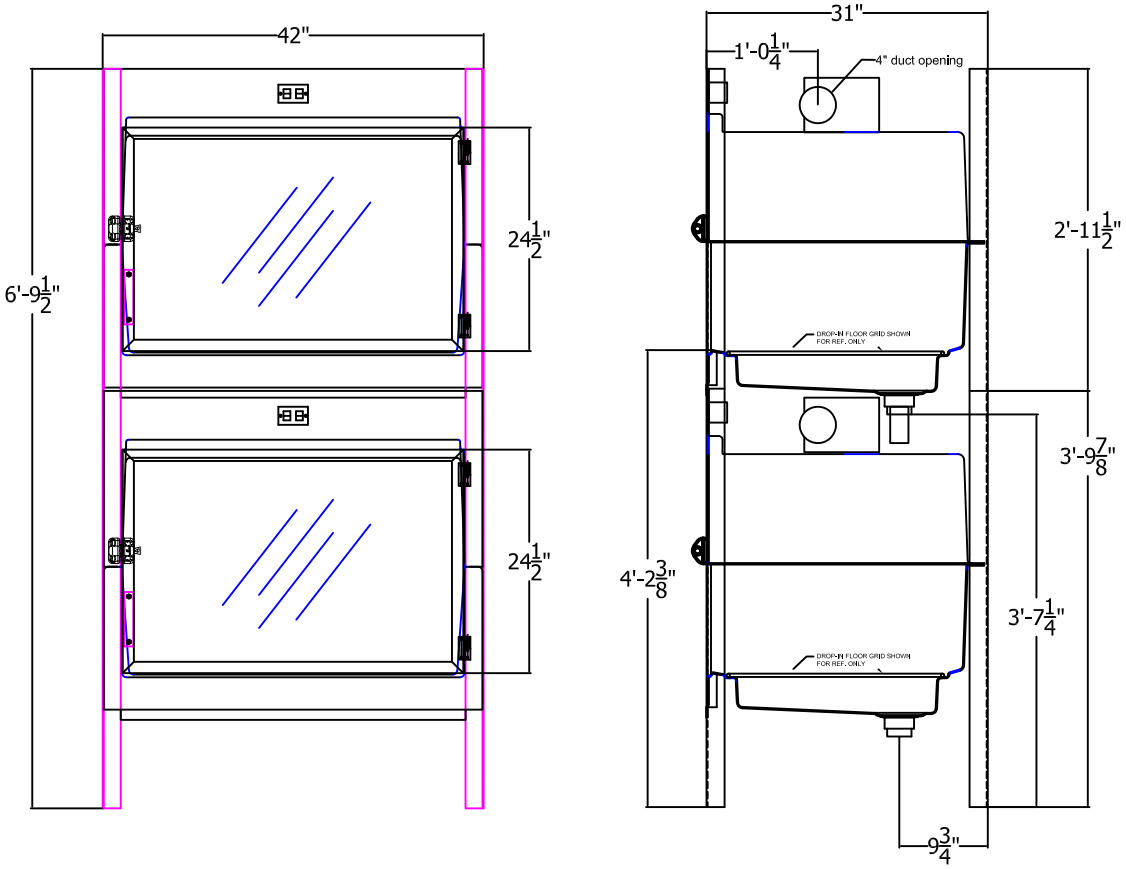
Roll colors: 24" - Black, Blue, & Green
30" - Black
36" - Black, Blue, & Green

NO. 330 CAGE, ISOLATION

30 3/4" x 36 1/4" Iso-Care Unit



42" x 31" Iso-Care Unit



NO. 332.01 CAGE, STANDARD, STAINLESS 48
NO. 332.02 CAGE, STANDARD, STAINLESS 24
NO. 332.03 CAGE, STANDARD, STAINLESS 30
NO. 332.04 CAGE, STANDARD, STAINLESS 36

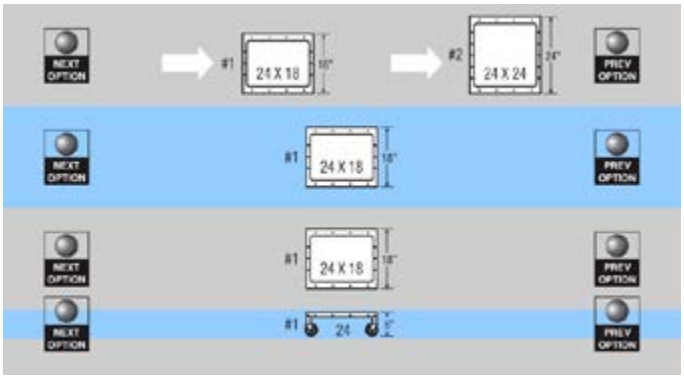
- All 20 Gauge 304 Stainless Steel Construction—23% thicker than industry average
- Heavy-duty reversible door
- One-piece stainless steel hinge plate—Multiple attachment points for stability—Prevents sagging
- 3/8" diameter frame
- 1/4" diameter crossmembers
- One-piece stainless steel corner/trim strips—Enhances strength and stability—Easier to clean
- 3/16" diameter vertical rods
- Full 1" radius corners
- Heavy-gauge latch—Padlock or door clip—Extremely quiet—Easily cleaned
- Formed Threading—Will not cross thread or strip out—Prevents self-Locking stainless steel screws from loosening with everyday use
- Easier to clean, less labor cost—Larger radius corners—Fluid retaining lip—Allows for a cleaner kennel environment
- Strong door latches and assemblies—Secure, yet easy to open and close

Single Doors

160-1824-00	Single Door 18"w x 24"h x 28"d	$375.00
160-2418-00	Single Door 24"w x 18"h x 28"d	$375.00
160-2424-00	Single Door 24"w x 24"h x 28"d	$386.00
160-2430-00	Single Door 24"w x 30"h x 28"d	$457.00
160-3024-00	Single Door 30"w x 24"h x 28"d	$457.00
160-3030-00	Single Door 30"w x 30"h x 28"d	$519.00
160-3630-00	Single Door 36"w x 30"h x 28"d	$543.00

Double Doors

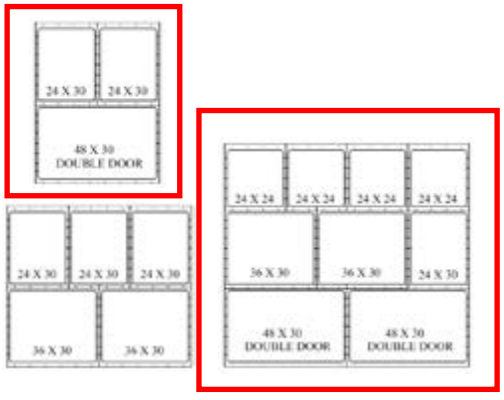
160-4830-00	Double Door 48"w x 30"h x 28"d	$787.00
160-4830-01	Double Door w/ Spring-loaded Latch 48"w x 30"h x 28"d	$787.00
160-4836-00	Double Door w/ Gravity Latch 48"w x 36"h x 28"d	$787.00



Configure Your Cage Bank Online

Select an assembly width and browse through the options to find the configuration that fits your needs.

Popular Configurations:



BACK TO CONTENTS

For questions on these formerly VSSI inc. products or for ordering information, please contact our Carthage customer service team at: **1-800-299-9525**

Made in USA

NO. 332.02 CAGE, SMALL ANIMAL - MODEL 4
NO. 332.03 CAGE, SMALL ANIMAL - MODEL 6

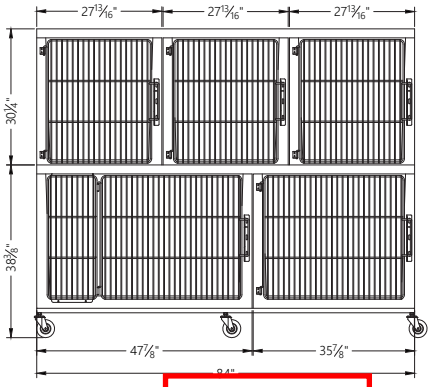
Quiet Cottages™ Fiberglass Cages

THE QUIET AND WARM ALTERNATIVE TO STAINLESS STEEL

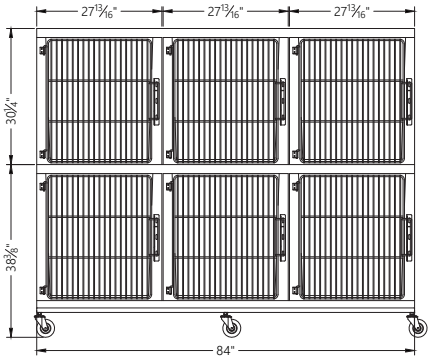
- Manufactured to provide warm, attractive and quiet animal housing areas
- Smooth molded fiberglass construction provides a gentle radius for easy cleaning and promotes a healthy living environment
- Available in several sizes and a variety of configurations
- Some models offered with drains for even quicker cleaning and drying time
- Models offered with drains have a removable 3/4'' grid grate
- Manufactured with welded stainless steel doors for durability
- Comes standard with dual point self-latching doors
- Models 1-8 and 12 come standard with swivel type casters for ease of movement
- Units are manufactured with a front debris and liquid retention lip
- Manufactured with a stainless steel support frame to maintain rigidity

Models 9, 10, and 11 all come equipped with the standard drain.

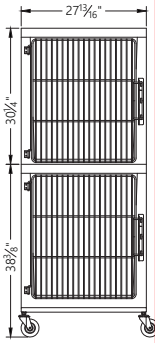
MODEL 1



MODEL 2



MODEL 3



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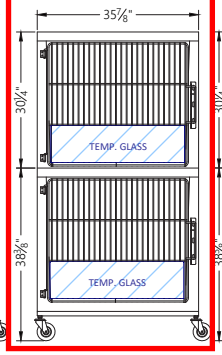
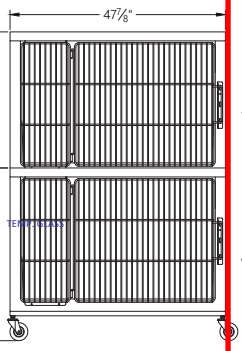


MODEL 5



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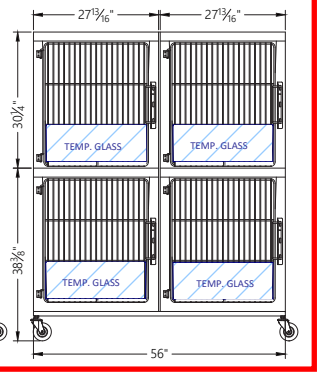
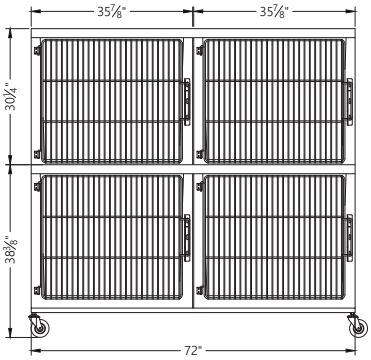


MODEL 7



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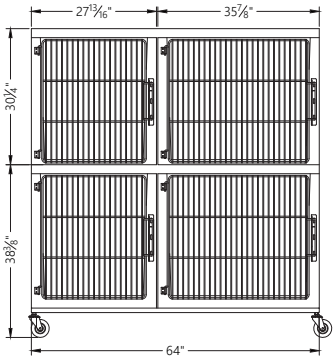
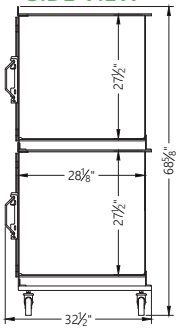


MODEL 1-8
SIDE VIEW



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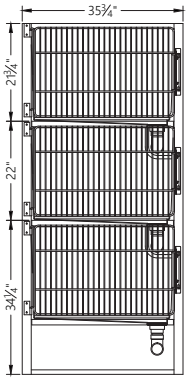
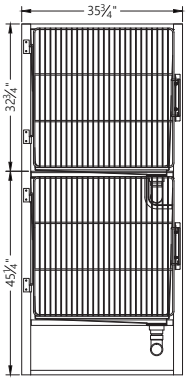
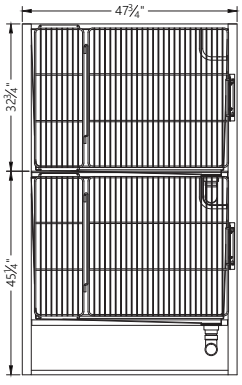


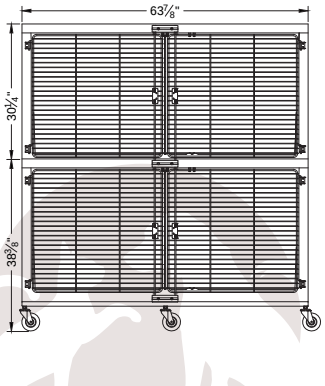
MODEL 10



MODEL 11



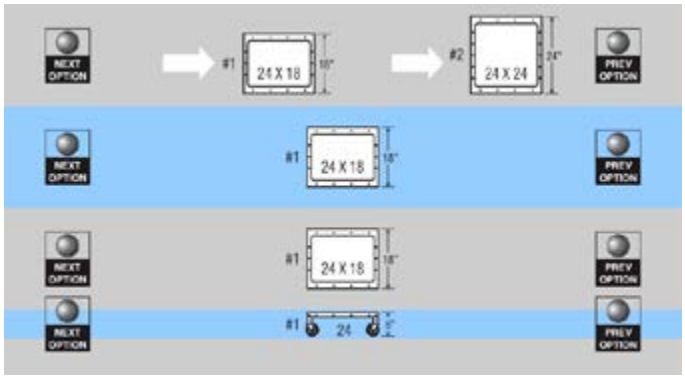
MODEL 12



NO. 332.03 CAGE, STANDARD, STAINLESS

Stainless Steel Cages

- All 20 Gauge 304 Stainless Steel Construction—23% thicker than industry average
- Heavy-duty reversible door
- One-piece stainless steel hinge plate—Multiple attachment points for stability—Prevents sagging
- 3/8" diameter frame
- 1/4" diameter crossmembers
- One-piece stainless steel corner/trim strips—Enhances strength and stability—Easier to clean
- 3/16" diameter vertical rods
- Full 1" radius corners
- Heavy-gauge latch—Padlock or door clip—Extremely quiet—Easily cleaned
- Formed Threading—Will not cross thread or strip out—Prevents self-Locking stainless steel screws from loosening with everyday use
- Easier to clean, less labor cost—Larger radius corners—Fluid retaining lip—Allows for a cleaner kennel environment
- Strong door latches and assemblies—Secure, yet easy to open and close



Configure Your Cage Bank Online

Select an assembly width and browse through the options to find the configuration that fits your needs.

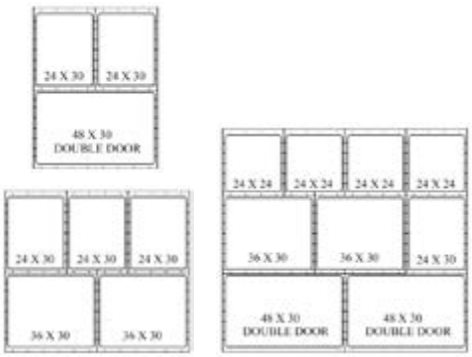
Single Doors

160-1824-00	Single Door 18"w x 24"h x 28"d	$375.00
160-2418-00	Single Door 24"w x 18"h x 28"d	$375.00
160-2424-00	Single Door 24"w x 24"h x 28"d	$386.00
160-2430-00	Single Door 24"w x 30"h x 28"d	$457.00
160-3024-00	Single Door 30"w x 24"h x 28"d	$457.00
160-3030-00	Single Door 30"w x 30"h x 28"d	$519.00
160-3630-00	Single Door 36"w x 30"h x 28"d	$543.00

Double Doors

160-4830-00	Double Door 48"w x 30"h x 28"d	$787.00
160-4830-01	Double Door w/ Spring-loaded Latch 48"w x 30"h x 28"d	$787.00
160-4836-00	Double Door w/ Gravity Latch 48"w x 36"h x 28"d	$787.00

Popular Configurations:



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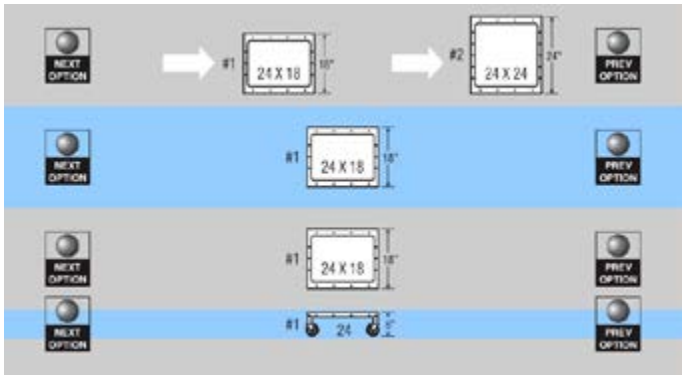
For questions on these formerly VSSI inc. products or for ordering information, please contact our Carthage customer service team at: 1-800-299-9525

Made in USA

NO. 332.04 CAGE, STANDARD, STAINLESS

Stainless Steel Cages

- All 20 Gauge 304 Stainless Steel Construction—23% thicker than industry average
- Heavy-duty reversible door
- One-piece stainless steel hinge plate—Multiple attachment points for stability—Prevents sagging
- 3/8" diameter frame
- 1/4" diameter crossmembers
- One-piece stainless steel corner/trim strips—Enhances strength and stability—Easier to clean
- 3/16" diameter vertical rods
- Full 1" radius corners
- Heavy-gauge latch—Padlock or door clip—Extremely quiet—Easily cleaned
- Formed Threading—Will not cross thread or strip out—Prevents self-Locking stainless steel screws from loosening with everyday use
- Easier to clean, less labor cost—Larger radius corners—Fluid retaining lip—Allows for a cleaner kennel environment
- Strong door latches and assemblies—Secure, yet easy to open and close



Configure Your Cage Bank Online

Select an assembly width and browse through the options to find the configuration that fits your needs.

Single Doors

160-1824-00	Single Door 18"w x 24"h x 28"d	$375.00
160-2418-00	Single Door 24"w x 18"h x 28"d	$375.00
160-2424-00	Single Door 24"w x 24"h x 28"d	$386.00
160-2430-00	Single Door 24"w x 30"h x 28"d	$457.00
160-3024-00	Single Door 30"w x 24"h x 28"d	$457.00
160-3630-00	Single Door 36"w x 30"h x 28"d	$543.00

Double Doors

160-4830-00	Double Door 48"w x 30"h x 28"d	$787.00
160-4830-01	Double Door w/ Spring-loaded Latch 48"w x 30"h x 28"d	$787.00
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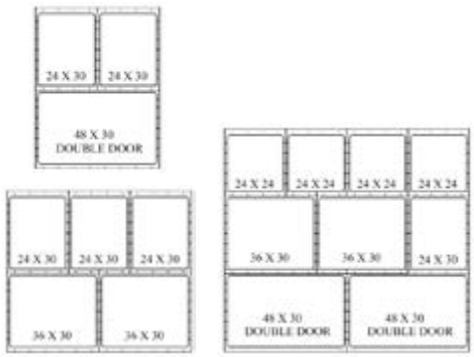
Popular Configurations:



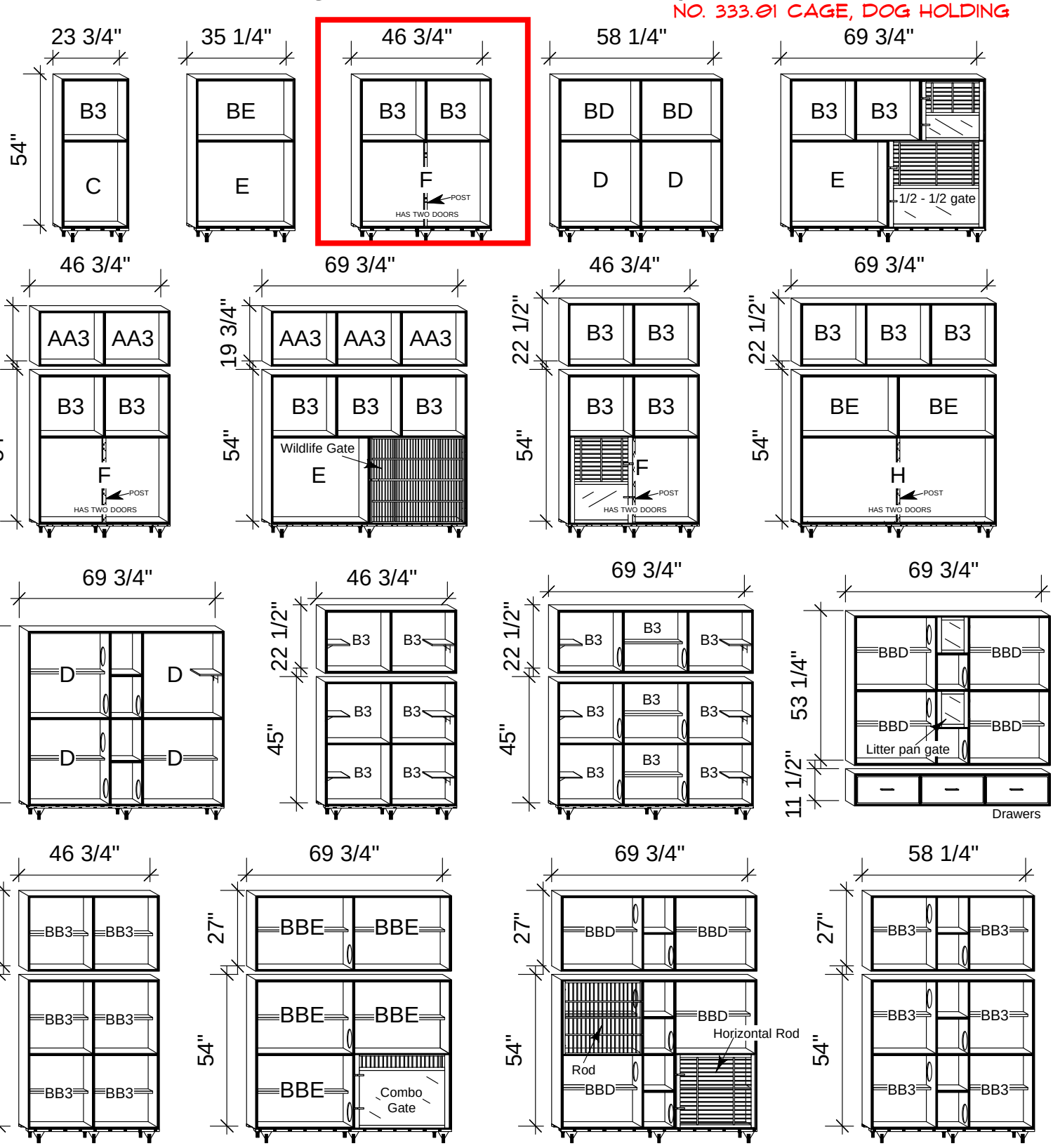
BACK TO CONTENTS

For questions on these formerly VSSI inc. products or for ordering information, please contact our Carthage customer service team at: 1-800-299-9525

Made in USA

Cage Combination Examples

NO. 333.01 CAGE, DOG HOLDING



*Multi-tiered configurations over 54" tall by 58" wide are built as 2-tiered banks with stackable strips (exceptions can be made)

Flooring: FLOOR RACKS (Polypropylene)

#1 = 16"w x 25 3/4"

#2 = 18"w x 25 3/4"

#3 = 21 3/4"w x 25 3/4"

D = 27 3/4"w x 25 3/4"

E = 33 1/4"w x 25 3/4"

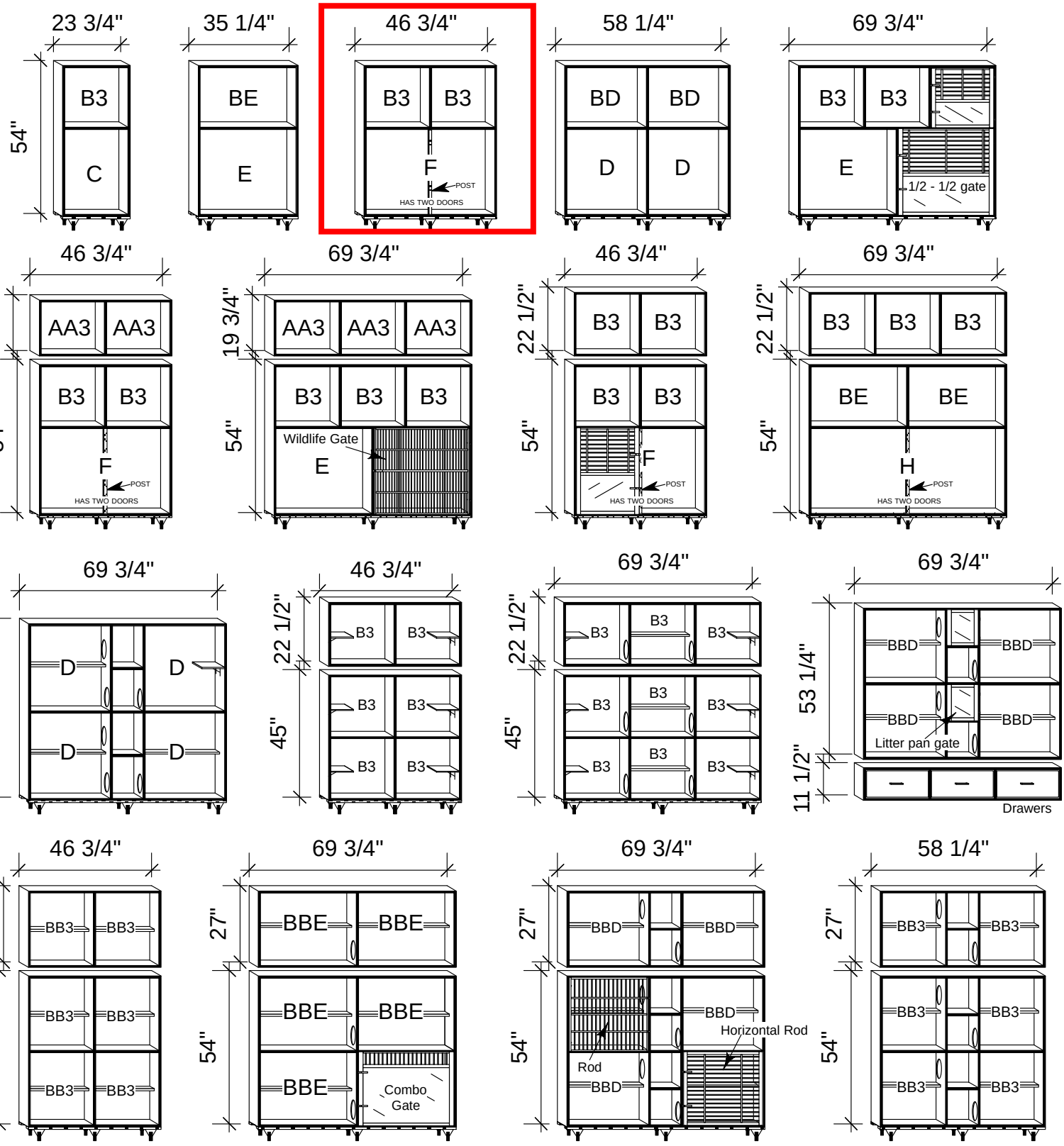
Legs (per rack) $11.00

Vinyl Mat: VINYL FLOOR MAT

Roll lengths of 33' (Widths of 24", 30", & 36")

Roll colors: 24" - Black, Blue, & Green
30" - Black
36" - Black, Blue, & Green

Cage Combination Examples



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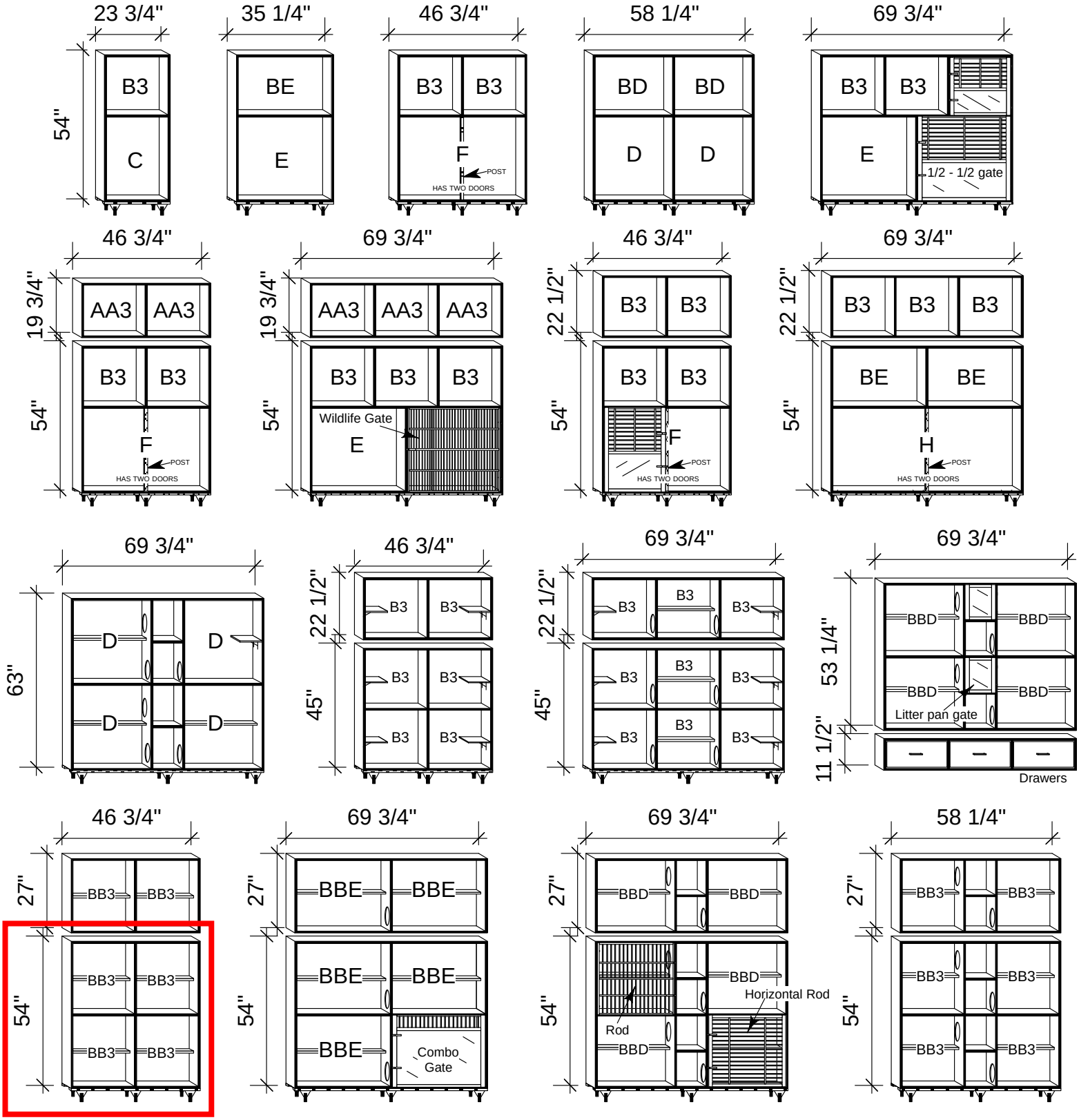
Cage Combination Examples



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E = 33 1/4"w x 25 3/4"

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Vinyl Mat: VINYL FLOOR MAT

Roll lengths of 33' (Widths of 24", 30", & 36")

Roll colors: 24" - Black, Blue, & Green
30" - Black
36" - Black, Blue, & Green

NO. 334 CAGE, AVIAN

OPERATING MANUAL

BIRD VERTICAL DISPLAY SYSTEMS

Commercial Systems
MARINELAND®

IMPORTANT SAFEGUARDS

WARNING

To guard against injury, basic safety precautions should be observed, including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

DANGER

**To avoid possible electric shock, special care should be taken in the use of this equipment.
For each of the following situations, do not attempt repairs yourself;
contact an authorized service facility for service.**

1. **Do not operate appliance if it has a damaged cord or plug, or if it is malfunctioning or if it is dropped or damaged in any manner.**
2. **Close supervision is necessary when any appliance is used by or near children.**
3. **To avoid injury, do not contact moving parts or hot parts such as reflectors, lamp bulbs, etc.**
4. **Always turn off power at main disconnect when not in use, before putting on or taking off lamp bulbs. Never yank a cord to pull a plug. Grasp the plug and pull to disconnect.**

5 **Do not use an appliance for other than intended use. The use of attachments not recommended or sold by the appliance manufacturer may cause an unsafe condition.**

6. **Make sure appliance is installed properly before operating it.**
7. **Read and observe all the important notices on the appliance.**
6. **This appliance is to be installed with all appropriate codes and ordinances.**

SAVE THESE INSTRUCTIONS

The Vertical Display System for Birds. Easier Maintenance, Increased Sales!

This manual will provide you with the information you need to successfully operate and maintain your Bird Vertical Display System. Please read it carefully and keep it for future reference.

Congratulations on your new, "Plug and Play" Marineland Bird Merchandiser purchase!

Improve your sales, enhance viewing and use less energy!

All part of the Marineland Bird Cage Merchandiser.

Your fully integrated Marineland, 3-Tier Bird System provides easy-to-maintain enclosures with Slide-out removable cages for easier cleaning and better hygiene.

The birds will love it and you will appreciate all the extra features the Bird Display System has to offer.

FEATURES

1 ► REMOVABLE CAGES TO ACCESS LIGHT FIXTURES AND FOR EASIER CLEANING OF UNIT AND CAGES.

2 ► REMOVABLE SLIDE-OUT SUBSTRATE TRAYS AND GRATES

3 ► PERCHES AND FEEDING/WATER BOWLS FOR EACH CAGE

4 ► FLUORESCENT LIGHTING

5 ► OPTIONAL MANUAL LOCKS FOR EACH CAGE

6 ► ALUMINUM CLADDING AND DURABLE ABS PANELS

1

2

5

6

SYSTEM SPECIFICATIONS – 3 TIER BIRD CAGE DISPLAY SYSTEM

MECHANICAL (approximate):
Size: $42^{1/4}$"L x $21^{3/4}$"W x 80"H
Locking System: Manual Locks (Optional)
ELECTRICAL:
Voltage: 120 VAC / 60Hz, 1 AMP
LIGHTING:
Lights: 3-each T8-25 watt Fluorescent
BUYER SUPPLIED CONNECTIONS:
Cord Connection: 120 VAC, 60 Hz, 15 AMP (plug and play)

INSTALLATION INSTRUCTIONS

Step 1: Position Bird Display System

With the assistance of at least one other person, move the pallet/crate with Bird Display unit to the installation area.

NOTE: To ensure easier installation, do not remove the Bird Display unit from the pallet/crate, until you have moved the unit to the installation area.

Use a pallet jack if possible.

Step 2: Unwrap/Remove Bird Display

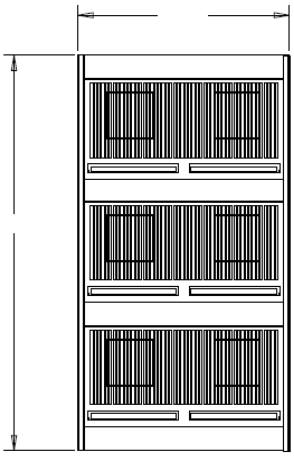
With assistance, unwrap and remove unit from pallet/crate.

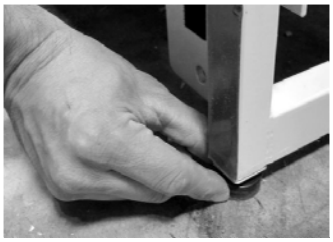
Step 3: Level Assembled Rack

Place the unit where you want it to be and check horizontal and vertical levels. Adjust Leveling Legs as necessary.

Step 4: Plug in Bird Display System

Have the Lighting System connections plugged into the appropriate receptacle.





For system technical support call the MaRS Technical Support Division: **(800) 576-6277**

MAINTENANCE

Enclosure Maintenance (as needed)

After removing substrate , bowls and other décor within the enclosure, use a damp cloth to remove dirt , dust and bird waste (a mild soap can be used if necessary).

*A damp cloth can also be used to remove dirt , dust and bird waste from within the within the trays and on the grates within the unit.

*Use a mild soap if necessary, do not use abrasive pads or harsh chemicals to clean the cages or modular. DO NOT USE DAMP CLOTH ON ELECTRICAL COMPONENTS (lighting).

*For a more thorough cleaning, the cages can be removed away from the Bird Unit.

Safety note: if possible, it's recommended that assistance is used to remove the cages from the Bird Display. Carefully remove the cages to prevent cosmetic damage to the bird unit.

FLUORESCENT LAMP REPLACEMENT

To ensure maximum illumination and color reflection, we recommend that you replace with the same lamp type for proper operation. To replace them with "Cool White" or other lamps of lesser quality will greatly lessen lighting intensity and overall effect. The fluorescent lamp provides a pure white Full Spectrum illumination.

1. To replace the fluorescent lamp, simply unplug the light power.
   NEVER change lamps on fixture while it's on.

2. Remove the cage(s) within, (this procedure makes it easier to replace lamps).

3. Remove fluorescent lamp. Gently twist 90 degrees and push backward and out from mounted station slots. Discard (according to established environmental procedure).

4. Replace discarded lamps with new lamps. Gently insert ends into slots and push up and forward or up and back until lamp fits securely in place.

5. After replacing the lamp, plug in the Bird System light power cord. Make sure the new lamp works before replacing the cage.

To order Fluorescent lamps, please call Marineland at 800-576-6277.

MANAUL LOCK INSTRUCTIONS

Operating Instructions.

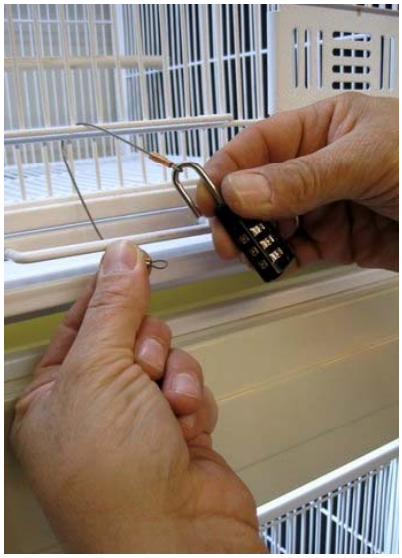
This lock is preset at the factory to open at 0-0-0.

To set own combination:

1. With dials at 0-0-0, pull out shackle.
2. Turn shackle counterclockwise 90° (1/4 turn) and press it down.
3. Continue pressing shackle and turn another 90° (1/4 turn).
4. Set the dials to your own combination.
5. Turn shackle clockwise back to the original 90° position. Lift and return shackle to closed position.

Cage Locking Instruction..

1. Loop small cable through Cage door and through bottom grate handle.
2. Once looped connect cable to lock and press close.



LIMITED WARRANTY

Marineland warrants their Bird Display systems for one year against defects in materials or workmanship. This warranty applies only to the system and does not cover water quality, live product, replacement parts or maintenance supplies.

If your system is found to be defective - and has not been modified, damaged or misused – call Marineland Commercial Aquariums (toll free) at (800) 576-6277 or fax us at (805) 517-7198. All calls received during regular business hours (8am - 5pm, Pacific Time) will be responded to within 24 hours. Please have your manual and the system serial number ready.

In most cases, the problem will be resolved by a simple maintenance procedure, recommendation or repair authorization. Upon authorization, and in instances where outside repair or replacement of parts is necessary, Marineland will absorb all appropriate costs.

Damage or injuries resulting from negligence, misuse or user modification are not covered by this warranty. Incidental or consequential damages are specifically excluded.

** This warranty gives you specific legal rights. You may also have other rights which vary from state to state.*

** Because some states do not allow the exclusion of incidental or consequential damages, this exclusion may not apply to you.*

CUSTOMER SERVICE

For emergency problems with this system, call the
MaRS Customer Service, Technical Support
at 800-576-6277
For non-emergency problems or questions please call the above number from 7a.m. – 5p.m. Monday – Friday.

CONSUMABLES ITEMS

SERVICING ITEMS

ADDITIONAL ITEMS

Z0-------- 8/12

All Fluorescent Lamps and Ultra Violet Lamps contain mercury.

Dispose of Properly.

MADE IN THE U S A

Commercial Systems MARINELAND®

UNITED PET GROUP, INC

A Division of The United Pet Group · Moorpark, CA 93021

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NO. 350.1 CONDO, FELINE, LITTER UNIT

Raintree™ Cat Condos

MATERIAL

3/4" thick melamine or PVC with a high pressure laminate coating

STANDARD FEATURES

- Wood-Grain Finish Condo Doors
- Coated Wire Grid Door Mesh
- Sealed Corners
- Two Built-In Feeding/ Watering/Resting Ledges
- Litter Area Privacy

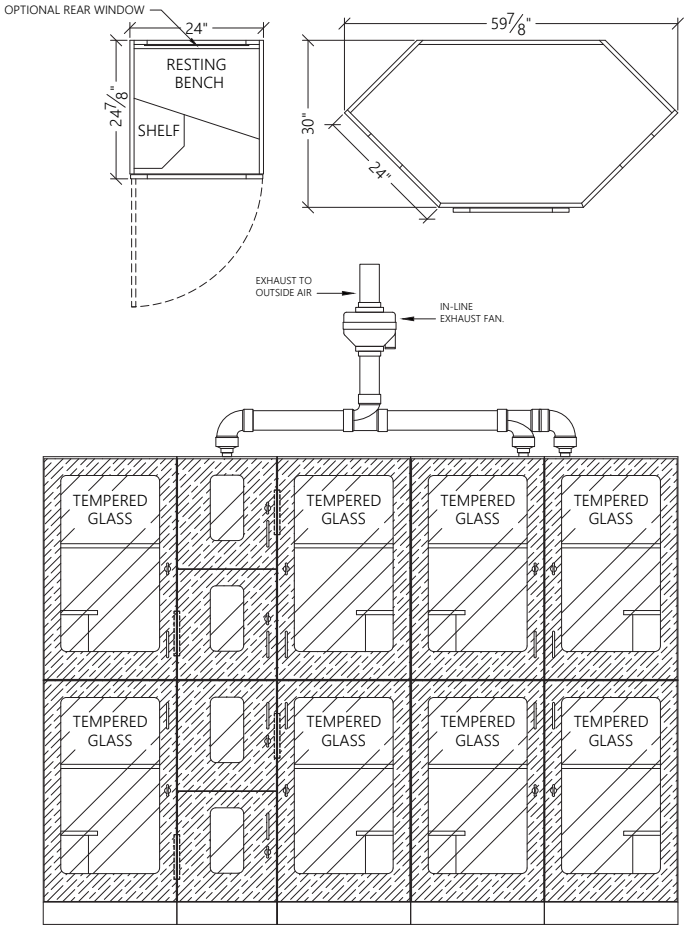
SIZE

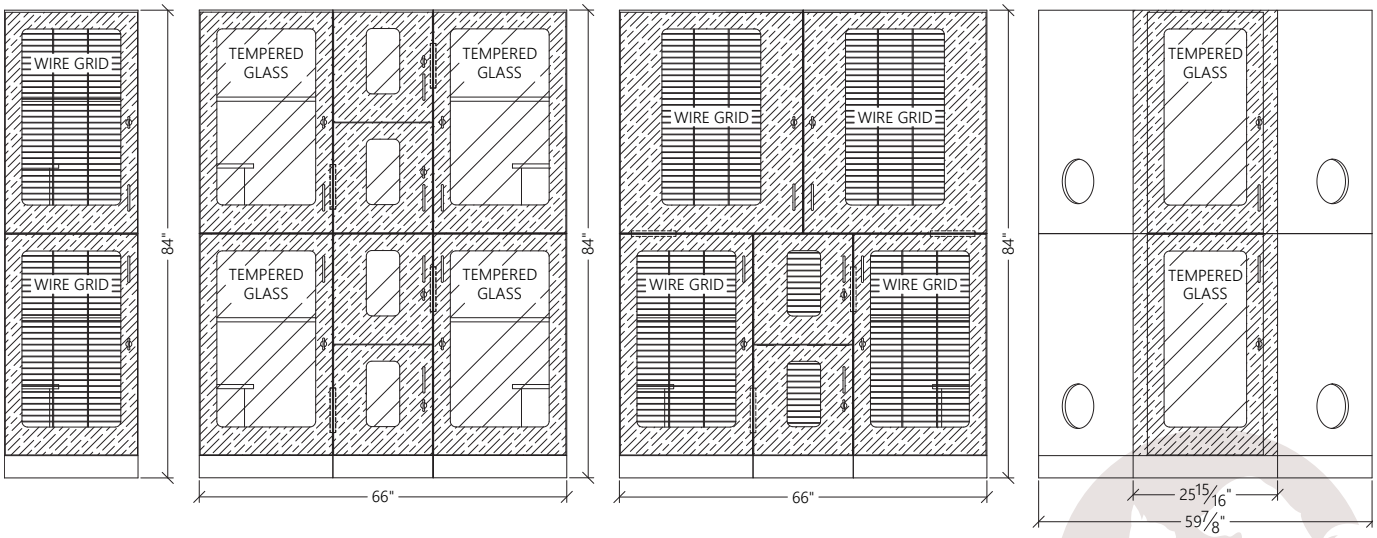
84" H X 24" W X 24 7/8" Deep

OPTIONAL FEATURES

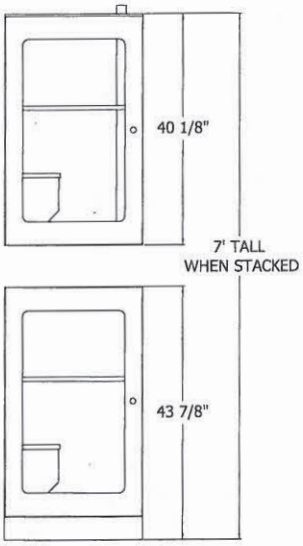
- Tempered Glass Doors With Air Vents
- Integrated Ventilation Ductwork (Ready For Connection To External Exhaust System)
- Optional flexible hosing for vented units on casters
- Wood-Grain Finish Side/Back Panels
- Matching Storage Closet
- Corner Unit Trim Kit
- Luxury Play Top
- Litter Pan

CORNER UNIT

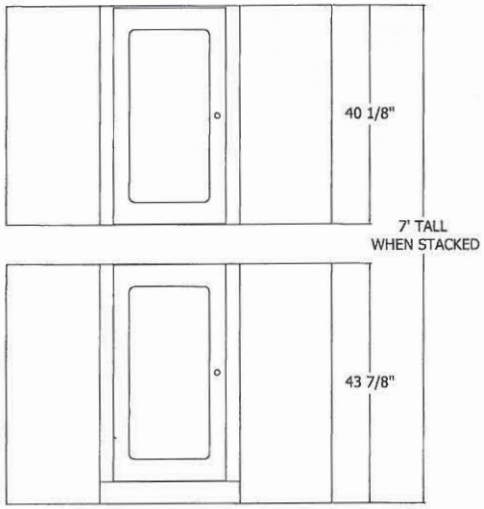




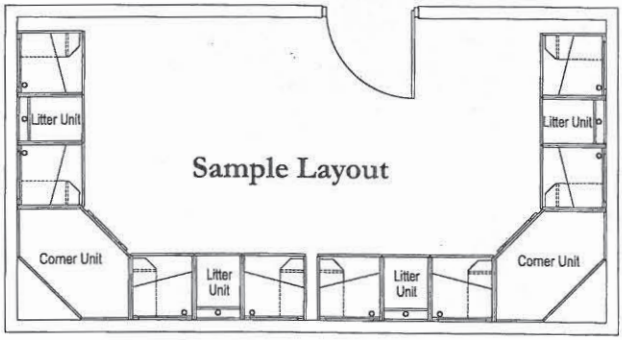
Double Stack Unit



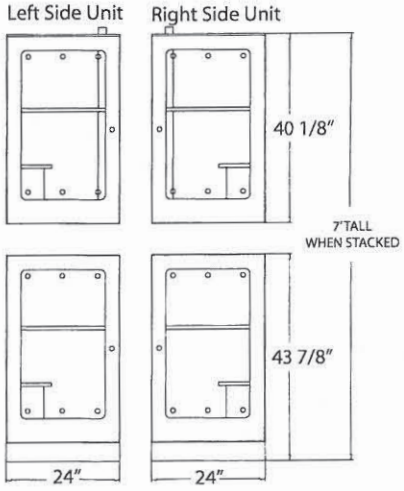
Corner Units



Front View with Doors

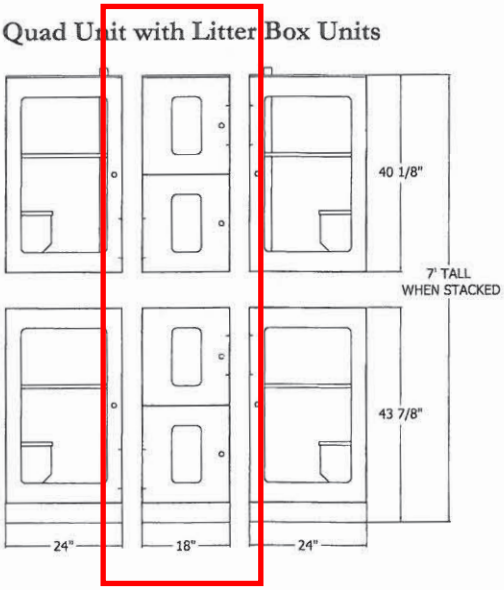


Quad Unit

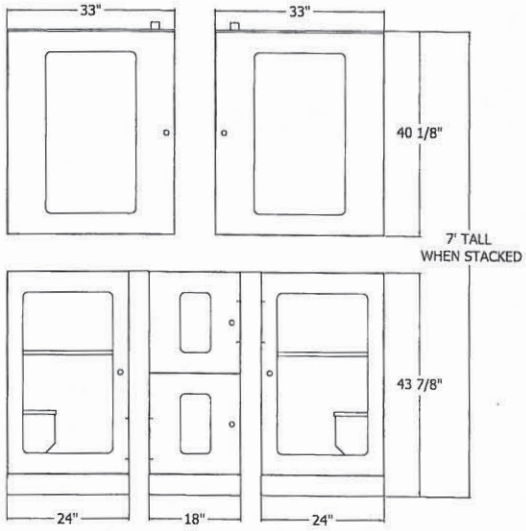


Front View with Doors

Quad Unit with Litter Box Units



Ultra Luxury Unit



NO. 350.2 CONDO, FELINE, LITTER UNIT, GRID FRONT

Raintree™ Cat Condos

MATERIAL

3/4" thick melamine or PVC with a high pressure laminate coating

STANDARD FEATURES

- Wood-Grain Finish Condo Doors
- Coated Wire Grid Door Mesh
- Sealed Corners
- Two Built-In Feeding/ Watering/Resting Ledges
- Litter Area Privacy

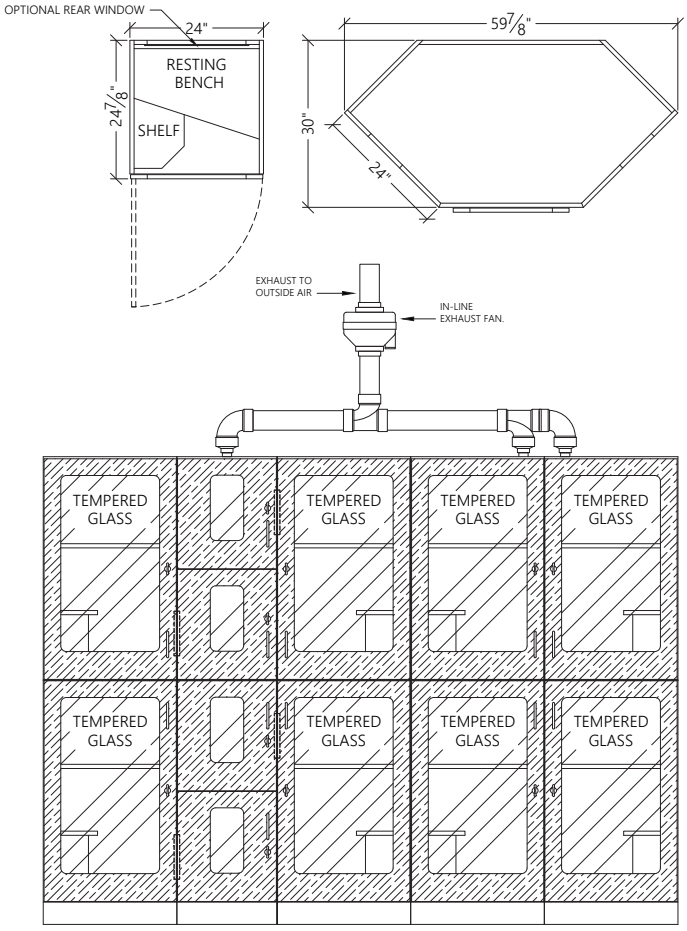
SIZE

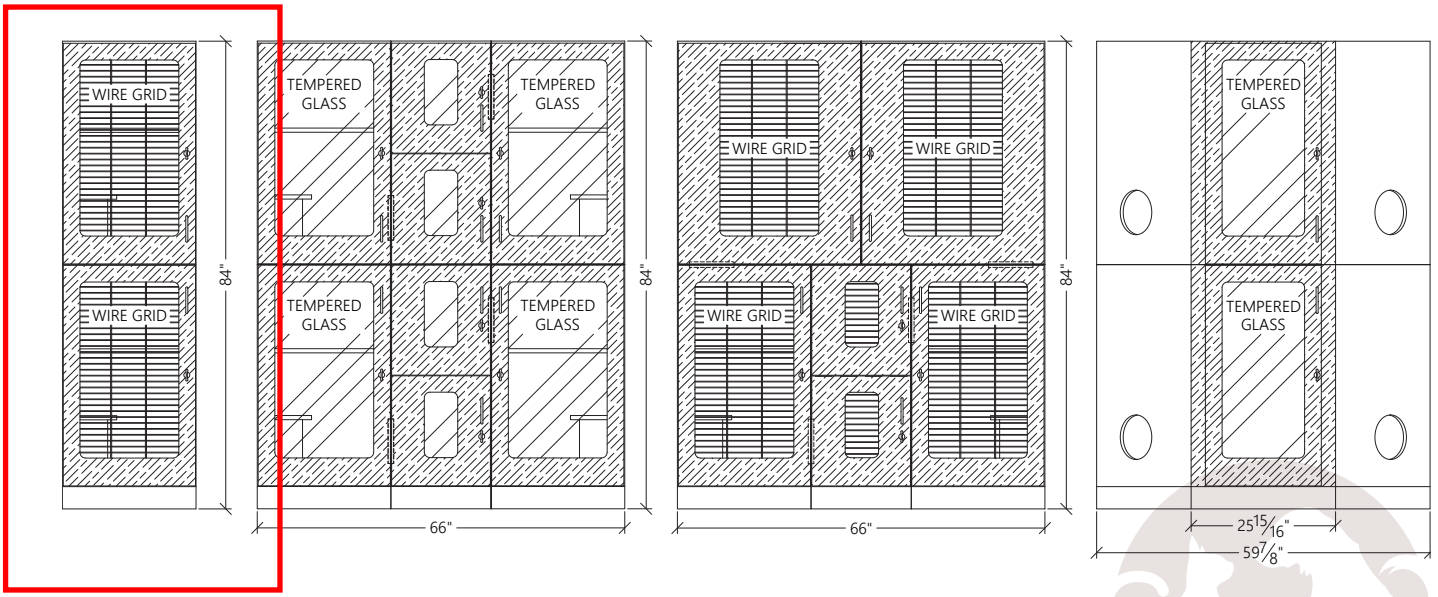
84" H X 24" W X 24 7/8" Deep

OPTIONAL FEATURES

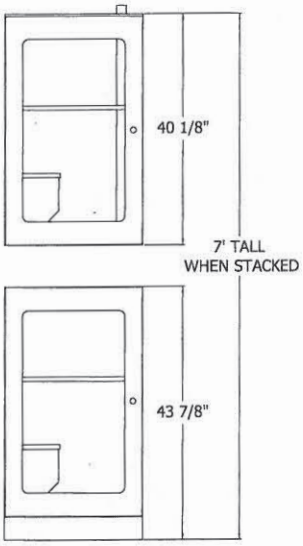
- Tempered Glass Doors With Air Vents
- Integrated Ventilation Ductwork (Ready For Connection To External Exhaust System)
- Optional flexible hosing for vented units on casters
- Wood-Grain Finish Side/Back Panels
- Matching Storage Closet
- Corner Unit Trim Kit
- Luxury Play Top
- Litter Pan

CORNER UNIT

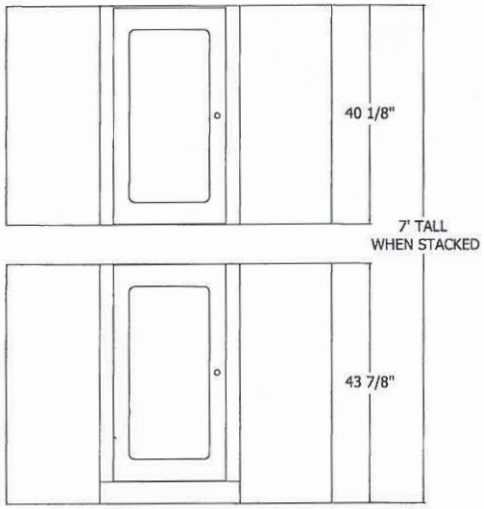




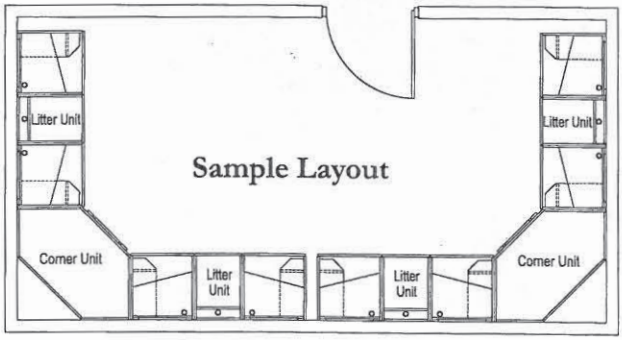
Double Stack Unit



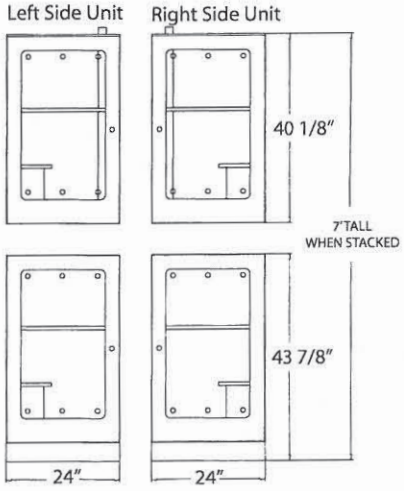
Corner Units



Front View with Doors

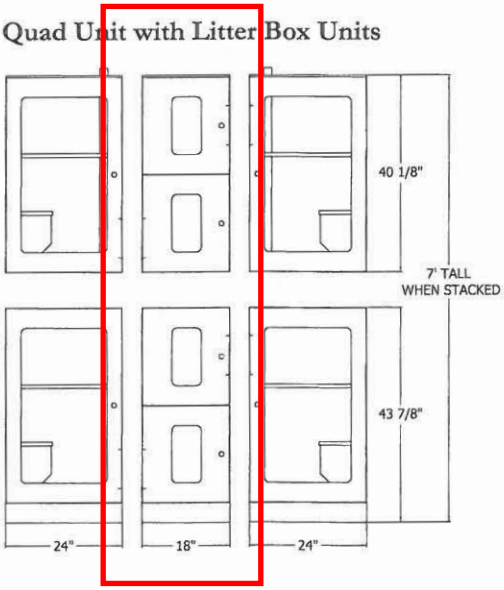


Quad Unit

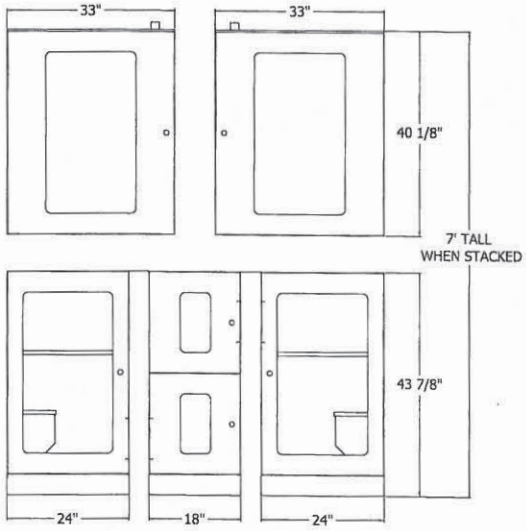


Front View with Doors

Quad Unit with Litter Box Units



Ultra Luxury Unit



NO. 350 CONDO, FELINE

Raintree™ Cat Condos

MATERIAL

3/4" thick melamine or PVC with a high pressure laminate coating

STANDARD FEATURES

- Wood-Grain Finish Condo Doors
- Coated Wire Grid Door Mesh
- Sealed Corners
- Two Built-In Feeding/ Watering/Resting Ledges
- Litter Area Privacy

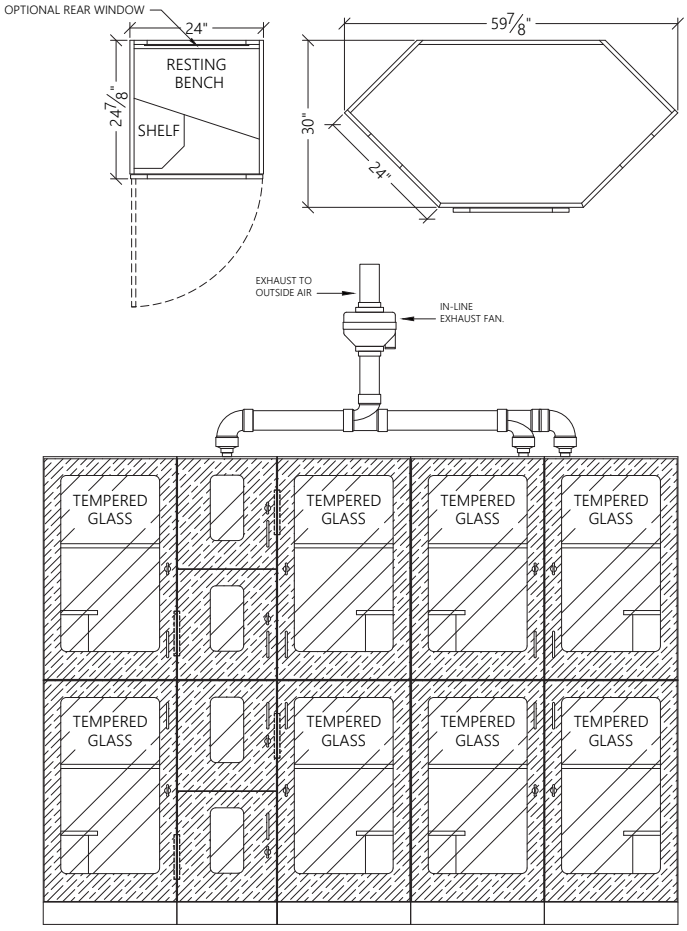
SIZE

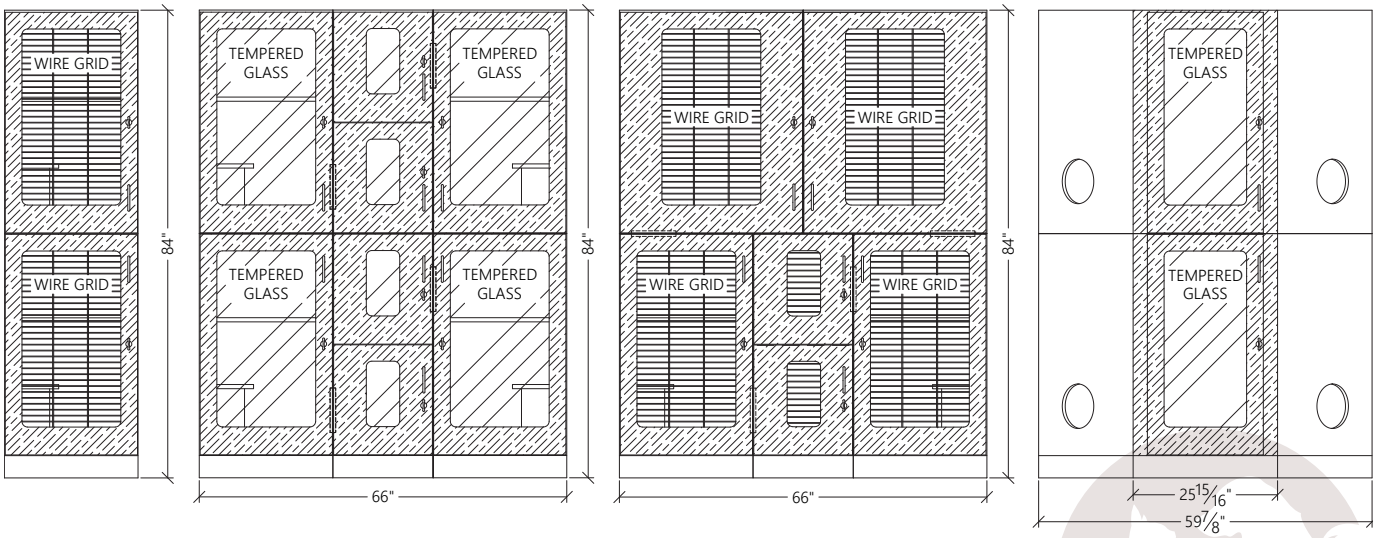
84" H X 24" W X 24 7/8" Deep

OPTIONAL FEATURES

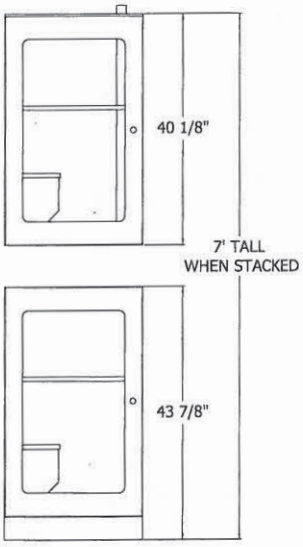
- Tempered Glass Doors With Air Vents
- Integrated Ventilation Ductwork (Ready For Connection To External Exhaust System)
- Optional flexible hosing for vented units on casters
- Wood-Grain Finish Side/Back Panels
- Matching Storage Closet
- Corner Unit Trim Kit
- Luxury Play Top
- Litter Pan

CORNER UNIT

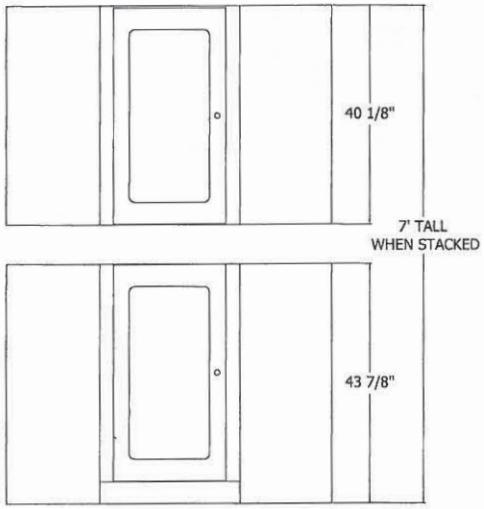




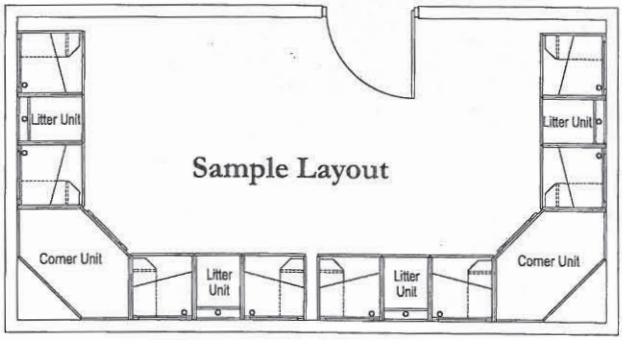
Double Stack Unit



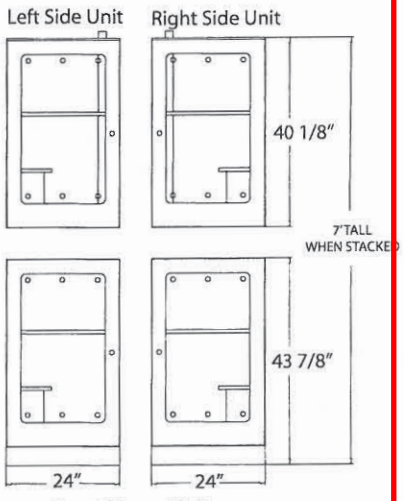
Corner Units



Front View with Doors

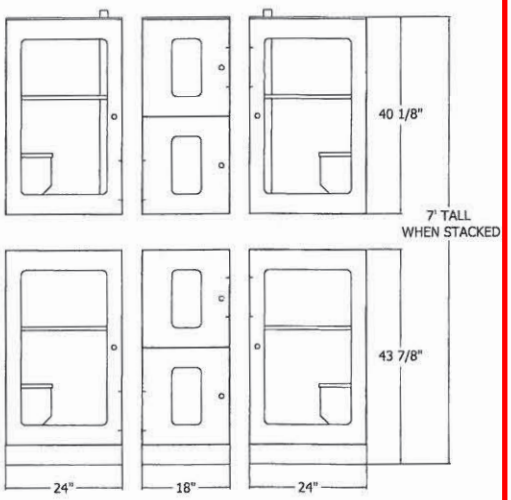


Quad Unit

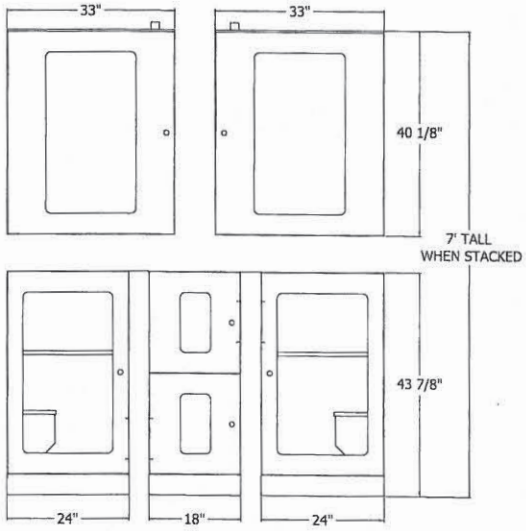


Front View with Doors

Quad Unit with Litter Box Units



Ultra Luxury Unit



OPERATING MANUAL

SMALL ANIMAL VERTICAL DISPLAY SYSTEMS

Commercial Systems
MARINELAND®

TABLE OF CONTENTS

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IMPORTANT SAFEGUARDS

WARNING

To guard against injury, basic safety precautions should be observed, including the following:

READ AND FOLLOW ALL
SAFETY INSTRUCTIONS

DANGER

To avoid possible electric shock, special care should be taken in the use of this equipment.
For each of the following situations, do not attempt repairs yourself;
contact an authorized service facility for service.

1. A. **If an appliance falls into the water, DON'T reach for it! First turn off power at main disconnect and then retrieve it. If electrical components of the appliance get wet, turn off the appliance immediately.**
   B. **Carefully examine the appliance after installation. It should not be plugged in if there is water on parts not intended to be wet.**
   C. **Do not operate any appliance if it has a damaged cord or plug, or if it is malfunctioning or if it is dropped or damaged in any manner.**

2. **Close supervision is necessary when any appliance is used by or near children.**

3. **To avoid injury, do not contact moving parts or hot parts such as heaters, reflectors, lamp bulbs, etc.**

4. **Always turn off power at main disconnect when not in use, before putting on or taking off parts and before cleaning. Never yank a cord to pull a plug. Grasp the plug and pull to disconnect.**

5 **Do not use an appliance for other than intended use. The use of attachments not recommended or sold by the appliance manufacturer may cause an unsafe condition.**

6. **Do not install or store the appliance where it will be exposed to the weather or to temperatures below freezing.**

7. **Make sure appliance is securely installed before operating it.**

8. **Read and observe all the important notices on the appliance.**

9. **This appliance should be connected to a grounded, metallic, permanent wiring system, or an equipment-grounding conductor should be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the appliance.**

10. **This appliance is to be installed by a qualified electrician in accordance with all appropriate codes and ordinances.**

SAVE THESE INSTRUCTIONS

The High Capacity Vertical Display System for Healthier Small Animals, Easier Maintenance, Increased Sales!

This manual will provide you with the information you need to successfully operate and maintain your Small Animal Vertical Display System. Please read it carefully and keep it for future reference.

Your fully integrated Marineland Small Animal System provides easy-to-maintain enclosures with minimal corners for easier cleaning and better hygiene. Enclosures slide out like no other system for cleaning purposes, better viewing of species and alternate capture. Also included are removable dividers that allow you to use an entire tank for larger species or just to make a more spacious enclosure. These enclosures are ventilated with perforated, closing lids and vents for optimal use of Ventilation System that includes Odor Control Cartridges.

The Marineland Small Animal System enhances viewing, improves sales and uses less energy.

Congratulations on your new, "Plug and Play" Marineland Small Animal Merchandiser purchase!

SYSTEM Specifications

Integrated 3 Drawer / Habitat Rack System
Small Animal Vertical Display Modular System

MECHANICAL (approximate):

Size: 52“L x 25“W x 76"H

Shipping Weight: 640 lbs (approx.)

Locking System: Mechanical Key

(Key Fob Option)

ELECTRICAL:

Voltage: 120 VAC / 60Hz, 5 AMP

LIGHTING:

Lights: T8-32 watt Florescent

AIR CIRCULATION:

Blower: 150 CFM

Filter: 60 Square Inches

BUYER SUPPLIED CONNECTIONS:

Cord Connection: 120 VAC, 60 Hz, 15 AMP

APPROVALS:

Electrical Safety: ETL Listed

Seismic: California Seismic Code

MATERIALS OF CONSTRUCTION:

Frame: Powder Coated Steel

Drawer Glides: 150 lbs

Glass: 3/16” Tempered

Doors: Extruded Aluminum

Side Panels: Impact Resistant ABS

Installation Instructions

For system technical support call the

MaRS Technical Support Division: **(800) 576-6277**

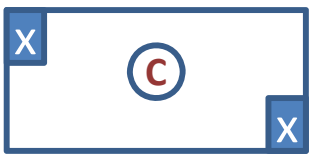
Your Small Animal system comes complete with these installation items:

- "Red Head" cement anchors with required nuts and washers
- Seismic braces and bolts
- Grade 5 "through" Bolts
- Extra leveling legs
- Roll of 1-inch, 2-sided mounting tape

In addition to those provided, you will need these items:

- Heavy-duty hammer drill with a 3/8-inch bit and drill gauge
- Tape measure
- ½-inch and a 9/16-inch open-end wrench
- Ratchet with a 9/16-inch socket
- Hammer
- Channel lock pliers
- Two levels: One large, one small

Note: A specially designed dolly is available for rent from Marineland for easier movement of the MaRS units.



FRONT OF REPTILE UNIT

Step 1: Position Small Animal System

Assistance of at least one other person is recommended to roll the Small Animal unit into the installation area.

Carefully place the Small Animal unit in an upright position. Make sure the unit is straight and in the correct place. Place the seismic brace and determine the proper drilling sites for the seismic brace anchor bolt holes. Make sure the hole on the unit is in the middle (*see picture A*)Use a black permanent marker to dot the area where you will drill into the floor (*see picture B*).

The Small Animal System will be anchored in 2-Corners (see drawing C).

Installation Instructions cont.

Step 2: Score and Drill

Remove the Small Animal system away from the marked area and use the drill to score the necessary holes. Drill the holes 3-inches deep at both corners.

NOTE: Take extra care to make sure the holes are drilled vertically.

Step 3: Install Anchor Bolts

Position each bolt in a drilled hole and hammer securely into place. Each anchor bolt should extend about 1 ½ - inches up from floor level.

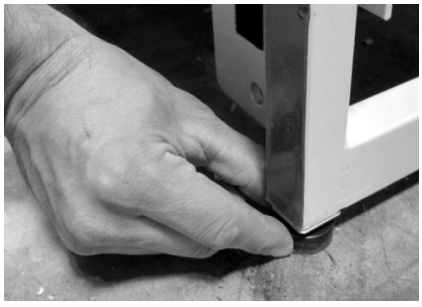
Step 4: Position Small Animal System

With the assistance of at least one other person, roll the small animal unit back into the installation area. Carefully tilt the Small Animal System to clear the anchor bolts and place the unit in an upright position.

NOTE: To ensure easier installation, remove front bottom (Kick) Panel. **Do not install provided end panels until the unit has been installed.**

Step 5: Level Assembled Rack

Check horizontal and vertical levels. Adjust Leveling Legs as necessary.



Step 6: Install Seismic Braces

Fit Seismic Braces to the cement Anchor Bolts. Attach Braces using washers and nuts provided.

Installation Instructions cont.

Step 7: Secure Assembled Rack

Insert front Through Bolts into the frame and Seismic Brackets (A). Secure all connections (B).

Before you begin Step 8 & 9, make sure you line up the End Panels and Vertical Extrusions correctly.

Step 8: Install System Side Panels

Strips of double-sided tape are included on the narrow surfaces of the end framework. Peel the tape (C) and press panels firmly into place (D). **Note:** Do not peel the front tape where the Vertical extrusion goes.

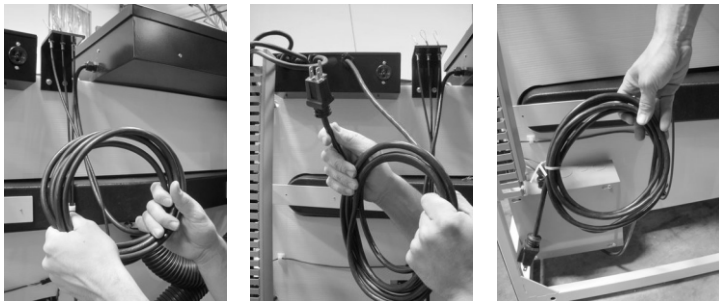
Step 9: Install System Vertical Extrusions

Peel the remaining double-sided tape included on the narrow surfaces of the end, front framework (E). Press Aluminum Vertical Extrusion firmly into place (F).

Step 10: Plug in Small Animal System

Have the Ventilation, Lighting and Door Locking System connections plugged into the appropriate receptacle.

Make sure that there are 3 electrical outlets available to plug the Ventilation, Lighting and Door Locking System.



(Left to Right) Ventilation, Lighting and Door Locking System connections

For system technical support call the

MaRS Technical Support Division: **(800) 576-6277**

OPERATION (SLIDE OUT DRAWERS)

Slide Out Drawer.

The Drawers on the Marineland Small Animal Vertical Display conveniently **Slide Out** for purposes such as cleaning and capture of small animals. The Drawers stabilizing feature include superior glides that improve strength and results in a smoother slide out of drawers.

To unlock a drawer, simply use the **key** (**see picture 1**), then pull open desired level. Or use the ***Key Fob** (**see picture 2**), then pull open desired level.

These actions allow you to open one tier at a time by holding the drawer in the middle (**see picture 3**) and gently pulling forward towards you.

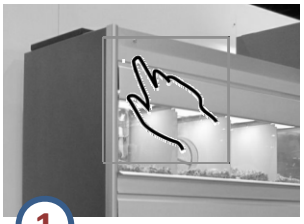
Note: Open the drawers gently and smooth so you do not disturb the small animals within the enclosures.

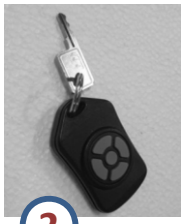
*If your purchase included a Key Fob (sold as an option), pressing the Key Fob for a second or two will allow you around 8 seconds to open one drawer.

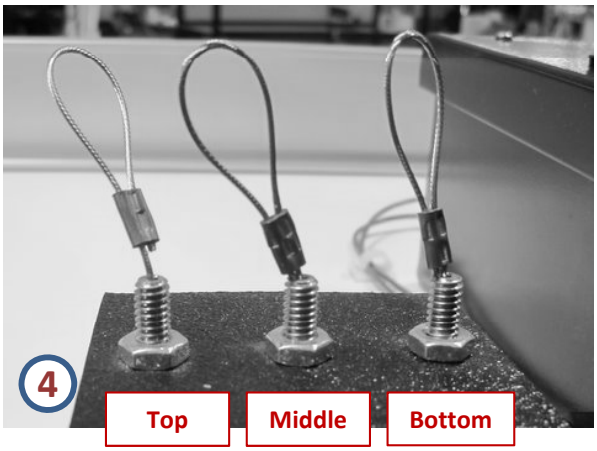
When ready to close the drawer, gently push the drawer away from you, smoothly and until you hear it lock.

Caution: Make sure that people are not near the drawer when closing **to prevent injury**. **To guard against injury, basic safety precautions should be observed.** Misuse of drawers may also cause damage to the Small Animal Vertical Display.

If needed and in case of an electrical issue where the Key Fob or Key will not open the drawers. A manual override is available on the system. The drawer manual override is located above the unit. Use an appropriate latter to reach the top (**see picture 4**). Each drawer is labeled, you must close the drawer in order to open another.





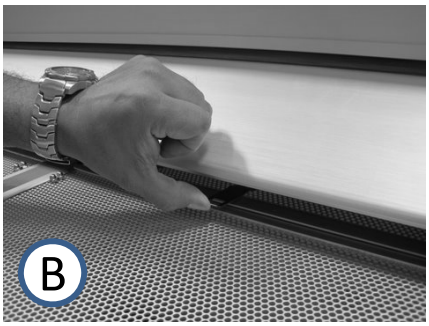


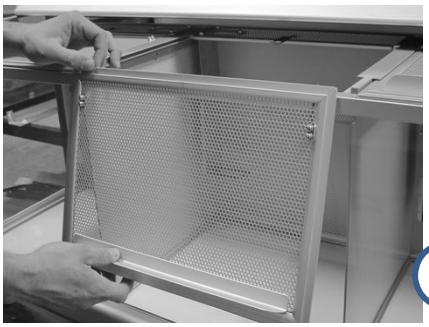
OPERATION (SLIDE OUT DRAWERS) cont.

Sliding Lid Enclosures

Vending made Easy.

1. Open Slide Out Drawer using the steps on page 7 (**picture A**).
2. Manually release the "Clip" to allow the front half of the lid to slide open (**picture B**).
3. Slide the front portion of the enclosure toward you to open for vending or cleaning purposes, (**picture C**).
   Note: The back portion of the slide out Lid is stationary to deter escape.
4. As you slide the lid toward you, use the 2 hooks on the bottom side of the lid to allow the lid to hang on the front of the tank, (**picture D**).
5. When done vending animals, remember to replace the "hanging" lid *before sliding in drawer*. Slide the lid in until the "clip" engages, (**picture E**).
6. Close Slide Out Drawer using the steps on page 7 (**picture F**).





OPERATION (SLIDE OUT DRAWERS) cont.

Removable Enclosures.

The enclosures are available with removable dividers to accommodate your merchandising needs.

Each Enclosure on the Small Animal Display System slide out and are removable for cleaning purposes.

After sliding out a drawer you can pick up the enclosure above the door I.D. Tag/Handle.

Gently pull the enclosure towards you and slide it until you can grab the enclosure securely with two hands for better support (see picture). Use assistance to remove or replace enclosure. When cleaning, the enclosures have minimal corners for easier maintenance and better hygiene. The enclosures are also vented on top and on the back for superior ventilation.

Remember to use the recommended substrate for the Small Animal within the enclosure. Add the appropriate amount per the tank dimensions. Most substrates have an amount recommendation on the product.

Note: It's recommended that enclosures containing a large amount of substrate, be cleaned within the small animal unit. If you decide to remove and carry the enclosure away from the Small Animal unit. Handle the enclosure securely to avoid an accident or damage. If available, use a service cart to move enclosures for cleaning purposes or feeding of species (see picture).

Service carts will help moving enclosures (example).

Enclosure Maintenance

After removing substrate , bowls and other décor within the enclosure, use a damp cloth to remove dirt and dust (a mild soap can be used if necessary). If needed a non toxic glass cleaner can be used for the front glass of the enclosure.

*By removing all enclosures from a drawer, a damp cloth can also be used to remove dirt and dust from within the drawer (use a mild soap if necessary, do not use abrasive pads or harsh chemicals to clean). DO NOT USE DAMP CLOTH ON ELECTRICAL COMPONENTS.

ODOR CONTROL CARTRIDGE REPLACEMENT

Ventilation System with Odor Control Cartridges

Each Small Animal Unit unit is equipped with a ventilation system that helps control odor. The well vented enclosures ensure superior ventilation within the Small Animal System.

Odor Control Cartridge Replacement Procedures

The cartridge should be replaced when 30 days are up. DO NOT exceed 30 days to replace the cartridge within the Ventilation System. Failure to replace the cartridge as recommended may result in unpleasant odor, temperature and ventilation issues.

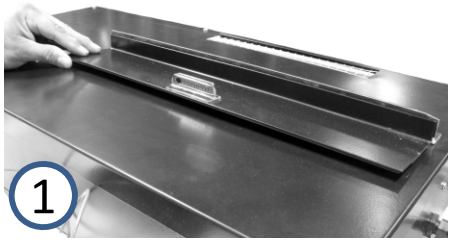
Step by step instructions:

1. ***Use an appropriate ladder to reach the Ventilation System above Small Animal Display System.***
2. ***Open access cover and "pull up" cartridge to remove (1, 2).***
3. ***Insert new Odor Control Cartridge and close access cover (3,4 and 5).***

To order Odor Control Cartridges, please call Marineland at 800-576-6277.

***Odor control cartridges (Ventilation Filter Cartridge) Part# MZ0412**

Note: The Ventilation unit within and around the cartridge compartment should be cleaned every 6 months. Simply use a damp cloth to remove dirt and dust. (Do not use soap or cleaning chemicals).



Helpful tip: Make sure that ventilation screens within the enclosures are not blocked off for proper Ventilation System operation.

FLUORESCENT LAMP REPLACEMENT

Fluorescent Lamp Replacement

To ensure maximum illumination and color reflection, we recommend that you replace with the same lamp type for proper operation. To replace them with “Cool White” or other lamps of lesser quality will greatly lessen lighting intensity and overall effect. The fluorescent lamp provides a pure white Full Spectrum illumination.

1. To replace the fluorescent lamp, simply shut off the light power.
   NEVER change lamps on fixture while it’s on.

2. Open Drawer and carefully remove enclosure (tank) within. This procedure makes it easier to replace lamps.

3. Remove fluorescent lamp. Gently twist 90 degrees and push backward and out from mounted station slots. Discard (according to established environmental procedure).

4. Replace discarded lamps with new lamps. Gently insert ends into slots and push up and forward or up and back until lamp fits securely in place.

5. After replacing the lamp, turn on the light power to the Small Animal System. Make sure the new lamp works before replacing the enclosure (tank).

To order Fluorescent lamps, please call Marineland at 800-576-6277.

Helpful tip: By simply shutting off the light power and removing enclosures . You are able to easily replace the old lamp on the Reptile Display System.

Water Bottle Replacement

Water Bottle Replacement

To remove water bottle from Holder, simply remove one side of the spring holder and replace water bottle with clean, freshwater.

Water bottle is not included on the Small Animal System. The Water Bottle Holder is made to hold a variety of water bottles.

Removable Divider Procedures

Removable Divider Procedures

To remove the divider, gently pull the divider up with both hands holding it on both sides. Then gently push the divider to one side to remove off the rail. Take to divider out of enclosure. *Reverse the procedure to replace.*

TROUBLESHOOTING GUIDELINES

For system technical support or to schedule a service, call the

MaRS Technical Support Division: **(800) 576-6277**

Drawer will not open?

Make sure all drawers were closed properly. Gently push in the drawers away from you and try opening the drawer using the key fob or key. If you continue to have issues contact Marineland Technical Support.

Need to open drawers during power outage?

If needed and in case of an electrical issue where the Key Fob or Key will not open the drawers. A manual override is available on the system (see page 7). This procedure will disengage the drawers allowing you to open one drawer at a time.

Slide-out Drawers are not sliding smoothly?

By removing all enclosures from a drawer, you can inspect the slide-out drawer for proper operation. If needed use a smooth brush to clean slide brackets. Also use a small portable vacuum to removed dust and debris.

Fluorescent Lamp not coming on?

To replace the fluorescent lamp shut off the light power by unplugging the unit. NEVER change lamps on fixture while it's on. Open Drawer and carefully remove enclosures within. This procedure makes it easier to replace lamps. *Please see page 11 for additional information*.

For ballast issues please contact Marineland Technical Support.

Noticeable unpleasant odor within Small Animal System?

Make sure enclosures are kept clean to ensure a healthy environment for the animal. A maintenance schedule is recommended.

If the Odor Control Cartridge needs replacement: The cartridge should be replaced when 30 days are up. DO NOT exceed 30 days to replace the cartridge within the Ventilation System. Failure to replace the cartridge as recommended may result in unpleasant odor, temperature and ventilation issues. *Please see page 10 for additional information*.

LIMITED WARRANTY

Marineland warrants their Reptile Display systems for one year against defects in materials or workmanship. This warranty applies only to the system and does not cover water quality, live product, replacement parts or maintenance supplies.

If your system is found to be defective - and has not been modified, damaged or misused – call Marineland Commercial Aquariums (toll free) at (800) 576-6277 or fax us at (805) 517-7198. All calls received during regular business hours (8am - 5pm, Pacific Time) will be responded to within 24 hours. Please have your manual and the system serial number ready.

In most cases, the problem will be resolved by a simple maintenance procedure, recommendation or repair authorization. Upon authorization, and in instances where outside repair or replacement of parts is necessary, Marineland will absorb all appropriate costs.

Damage or injuries resulting from negligence, misuse or user modification are not covered by this warranty. Incidental or consequential damages are specifically excluded.

** This warranty gives you specific legal rights. You may also have other rights which vary from state to state.*

** Because some states do not allow the exclusion of incidental or consequential damages, this exclusion may not apply to you.*

CUSTOMER SERVICE

For emergency problems with this system, call the
MaRS Customer Service, Technical Support
at 800-576-6277
For non-emergency problems or questions please call the above number from 7a.m. – 5p.m. Monday – Friday.

CONSUMABLES ITEMS	
1- VENTILATION FILTER CARTRIDGE(6 PACK)	MZ0412

SERVICING ITEMS	

ADDITIONAL ITEMS	

Z090618 6/11

All Fluorescent Lamps and Ultra Violet Lamps contain mercury.

Dispose of Properly.

MADE IN THE U S A

Commercial Systems MARINELAND

UNITED PET GROUP, INC

A Division of The United Pet Group · Moorpark, CA 93021

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NO. 370 AQUARIUM

OPERATING MANUAL

BIO-WHEEL® VERTICAL MODULAR DISPLAY SYSTEMS

MaRS™

Marineland Retailer Systems

IMPORTANT SAFEGUARDS

WARNING – To guard against injury, basic safety precautions should be observed, including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

DANGER – To avoid possible electric shock, special care should be taken in the use of aquarium equipment. For each of the following situations, do not attempt repairs yourself; contact an authorized service facility for service.

1. **A. If an appliance falls into the water, DON'T reach for it! First turn off power at main disconnect and then retrieve it. If electrical components of the appliance get wet, turn off the appliance immediately.**
   B. If the appliance shows any sign of abnormal water leakage, immediately turn off power at main disconnect.
   C. Carefully examine the appliance after installation. It should not be plugged in if there is water on parts not intended to be wet.
   D. Do not operate any appliance if it has a damaged cord or plug, or if it is malfunctioning or if it is dropped or damaged in any manner.
2. **Close supervision is necessary when any appliance is used by or near children.**
3. **To avoid injury, do not contact moving parts or hot parts such as heaters, reflectors, lamp bulbs, etc.**
4. **Always turn off power at main disconnect when not in use, before putting on or taking off parts and before cleaning. Never yank a cord to pull a plug. Grasp the plug and pull to disconnect.**
5. **Do not use an appliance for other than intended use. The use of attachments not recommended or sold by the appliance manufacturer may cause an unsafe condition.**
6. **Do not install or store the appliance where it will be exposed to the weather or to temperatures below freezing.**
7. **Make sure appliance is securely installed before operating it.**
8. **Read and observe all the important notices on the appliance.**
9. **This appliance should be connected to a grounded, metallic, permanent wiring system, or an equipment-grounding conductor should be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the appliance.**
10. **This appliance is to be installed by a qualified electrician in accordance with all appropriate codes and ordinances.**

SAVE THESE INSTRUCTIONS

The High Capacity Modular System for Healthier Fish, Easier Maintenance, Increased Sales!

This manual will provide you with the information you need to successfully operate and maintain your BIO-Wheel Vertical Modular Display System. Please read it carefully and keep it for future reference.

Your fully integrated MaRS System provides easy-to-maintain filtration for multiple tanks. Its high performance mechanical, chemical and commercial BIO-Wheel wet/dry biological filtration ensure optimum water quality at all times.

The system's compact design allows for convenient self-contained installation. It also provides the option of maintaining isolated filtration "zones", each showcasing a different aquatic environment. Every modular unit is equipped to provide ideal system conditions warm or cold, freshwater or marine. Front access panels ensure fast, trouble free maintenance and service.

While all units function in essentially the same manner, the marine systems come equipped with a Protein Skimmer to remove organic matter from the water and a second BIO-Wheel Module to provide additional 3-stage filtration.

Inside the System...

Water is automatically introduced to the Sump at a preset rate. As "new" water enters the system, "old" water is simultaneously removed. This continuous water cycle ensures constant water level, efficient nitrate removal and constant pH.

The system pump directs filtered water to the display tanks, the UltraViolet (UV) Disinfection Unit, the Protein Skimmer (Marine only) and the Heating or Refrigeration Unit.

The **UV Disinfection Unit** helps stop the spread of bacteria and disease throughout the system. Water enters the UV Housing, surrounding the lamp where it is exposed to UV light. This exposure destroys the DNA of free swimming bacteria, viruses and algae, preventing them from reproducing.

The thermostatically controlled **Heating or Refrigeration Unit** can be preset to the temperature (within a range of 70°- 80°F) required by your individual system. A thermometer strip is provided for every section module.

The **Protein Skimmer** (Marine System only) employs heavy aeration to remove organic matter from the tank in the form of foam. The foam is flushed from the system and deposited into the drain. Foam level can be easily and effectively regulated by means of the Air Adjustment Valve attached to the Venturi Air Inlet.

Water uniformly flows into each display tank, exiting via the Bi-Level Skimmer. The skimmer draws water and floating debris from both the bottom and surface levels to ensure uniform water circulation. It's easily removable for cleaning.

Water is directed from the tanks to the BIO-Wheel Filtration Module. Solid waste is mechanically trapped by the polyfiber Prefilter Pad and filter sleeve of the heavy duty Carbon Filter Pack contained in two "stacked" Filter Media Trays. The Carbon Filter Pack also contains a full pound of Black Diamond Premium Activated Carbon for chemical filtration...efficiently adsorbing dissolved organic compounds such as phenols and tannin.

Passing through the Filter Media Trays, water flows onto the BIO-Wheel Wet/Dry Biological Filter mounted below. Because system flow causes it to rotate, the BIO-Wheel is constantly exposed to both water *and* air, thus developing a thriving culture of aerobic nitrifying bacteria. This bioculture efficiently oxidizes all ammonia and nitrite on contact.

NOTE: Precultured BIO-Wheels are shipped to you ready to go. They provide full load biological filtration capacity immediately upon installation.

SPECIAL FEATURES

Service Panels

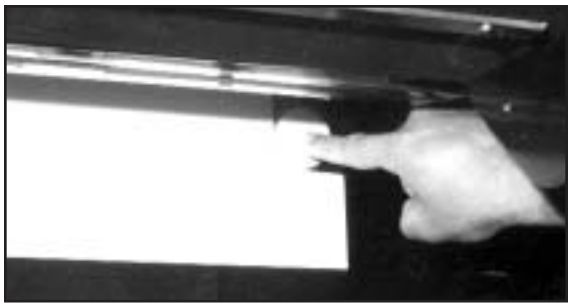
Latched panels provide easy access to filtration media, heating or refrigeration unit and electrical system components. All are equipped with locks for maximum safety.

Tilt Door Access System

Polyurethane doors allow easy tank access.

Fish Feeding Timer

Allows you to shut down the system pump for feeding (preset for 5 minutes) and then automatically restores the system to full operation after a preselected time has elapsed.



Fish Jumper Guards

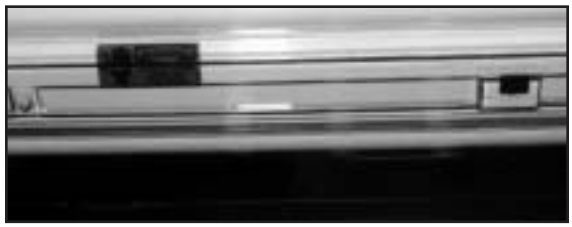
Each two-tank "zone" is equipped with a Fish Jumper Guard on each side and one in back. The bottom-notched side guards slot into the top side edge of each tank and press into place beneath the lamp cover. The back guard removes easily for cleaning.

Sump Replenishment Valve

This valve adds water to the Sump when Sump water level drops below ideal operational levels. During heavy sales, the Sump can be easily refilled using this simple spring-loaded manual attachment.

Lighting

The 5000K daylight fluorescent lamps are protected by a molded plastic lamp cover. To ensure maximum safety, the power cord is routed inside the system framework to connect to a central junction box. A single power cord exits the junction box for direct plug-in to any standard GFCI wall socket.



Backup Thermostat (refrigerated units only)

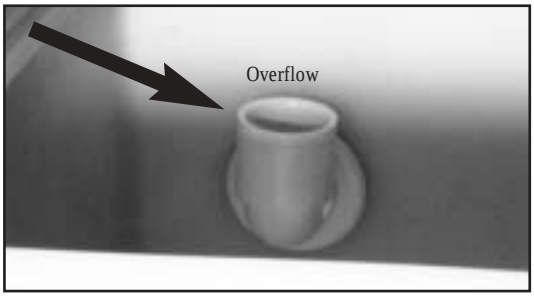
If water temperature drops below 40º, a second thermostat activates, stopping refrigeration unit output and preventing freezing of the heat exchanger.

OPERATION

Startup

Five simple steps are required to get your system up and running prior to the addition of filtration media. Consult Exploded Views (pgs. 24-37) for clarification.

1. Remove Sump Service Panel (lift panel up and off) and manually fill Sump to level of Overflow.



2. Open Display Tank Access Doors and fill display tanks to desired levels with sediment-free dechlorinated water.

3. **FOR FRESHWATER SYSTEMS ONLY:** Open New Water Supply Valve (A). Check Drip Emitter (B) for slow trickle of new water into Sump.

A

B

4. Unlock and remove Electrical Service Panel. Activate Master Switch. After system has operated for five minutes, fill Sump to level of Overflow.

   NOTE: Never activate Master Switch without water in tanks and Sump. Heater must be fully submerged or system damage may occur.

A Refrigerated System

B Heated System

5. Allow system to operate with mechanical and chemical filtration media (blue polyfiber Prefilter Pad and Carbon Filter Pack) for a period of 24 hours.

   NOTE: See Adding Filtration Media, steps 4-5 (pg. 8) for installation. Be sure to remove BIO-Wheel for first 24 hours of operation.

   Inspect areas near pump, UV and other components for leaks.

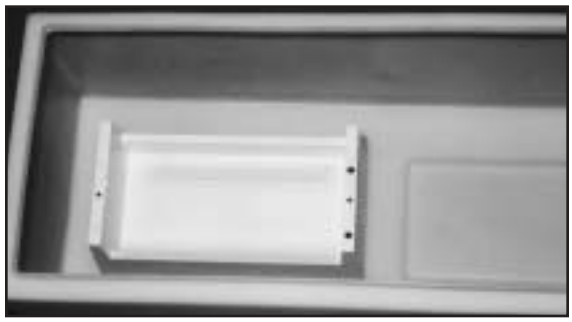
6. Adjust "IN" Water Nozzles in display tanks to ensure optimum circulation.

   NOTE: Water flow should just break the surface.

Adding Filtration Media

Follow the few easy steps outlined below to install filtration media. Refer to the Exploded Views for additional clarification.

1. Remove Service Panel.



2. Fit Bottom BIO-Wheel Housing securely over raised Housing Locator (left) in bottom of Sump.

3. Place cultured BIO-Wheel in Bottom Housing (A). Tray guides will ensure correct positioning. Place Top BIO-Wheel Housing over BIO-Wheel (B) and on top of Bottom BIO-Wheel Housing (notches on Bottom Housing match up with holes in Top Housing).

A

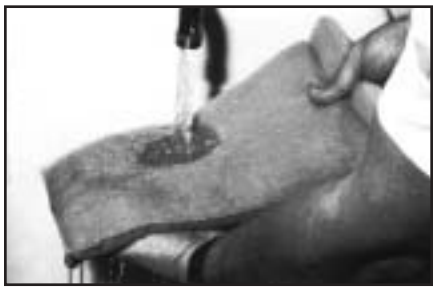
B

4. Install Lower Filter Media Tray (A) and place Carbon Filter Pack inside (B).

   NOTE: Before installing, be sure to rinse Carbon Filter thoroughly in cold water (at sink) until water runs clear (C).

A

B



C

5. Install Upper Filter Media Tray (A) and place blue polyfiber Prefilter Pad inside (B). Replace clear BIO-Wheel Assembly Cover (C).

A

B

NOTE: In Marine systems, follow steps 1-5 for additional installation of second BIO-Wheel Filtration Module over raised Housing Locator on right side of Sump.

C

MAINTENANCE

To ensure optimum operational efficiency, routine maintenance must be performed. The procedures listed below are neither difficult nor time consuming. They will keep your system clean, your fish healthy. Failure to follow these simple maintenance steps will adversely affect system performance and could lead to premature failure of some components. We recommend setting up a maintenance log to track procedure completion. *NOTE: For easier system maintenance, we recommend the MaRS Maintenance Kit. To order call 800-322-1266.*

Daily

Clean or replace Prefilter Pad

Clogged filter pads overflow and will not collect waste. Uncollected waste is returned to the display tanks and can severely reduce system efficiency.

To replace Prefilter Pad:

1. Remove clear BIO-Wheel Filtration Module Cover.
2. Remove used pad.
3. Rinse or replace with new pad.
   NOTE: Pads may be rinsed more than once. Replace when they become damaged or misshapen from repeated use.
4. Replace Cover.

Check Bi-Level Skimmers

Remove any debris or blockage.

Clean Gravel

Gently stir gravel in each tank and allow debris to be pulled through the Bi-Level Skimmer. This will eliminate the need to vacuum gravel on a regular basis. For more intensive spot cleaning or excessively dirty tanks, use the H.O.T. Magnum Canister Filter and Power Kleen Gravel Washer included in your MaRS Maintenance Kit.

Check Sump Water Level

Correct water level is designated by the "FILL TO THIS LINE" label located on the side of the BIO-Wheel Module. If necessary, add water to the sumps via the Sump Replenishment Valve (located at top rim of Sump) or other treated water supply.

Check Temperature

Refrigerated Systems: 68-70ºF Heated Systems: 78-80ºF.

Weekly

Replace Carbon Filter Packs

Keeping the Prefilter Pad and Carbon Filter Pack clean and unrestricted is critical to the successful operation of the BIO-Wheels. They must receive clean, filtered water to keep bacteria healthy and thriving.

1. Remove clear BIO-Wheel Filtration Module Cover.
2. Lift out Upper Filter Media Tray with Prefilter Pad.
   NOTE: Have bucket or large plastic pan ready to catch water spillage from Upper and Lower Tray.
3. Set Upper Filter Media Tray aside. Lift out Lower Filter Media Tray.
4. Replace Carbon Filter Pack (#MZ0175) and rinse out Filter Tray before replacing.
   NOTE: Before installing, be sure to rinse Carbon Filter Pack thoroughly in cold water until water runs clear.

Check Water Pump and BIO-Wheel Operation

Observe flow of water to the BIO-Wheel Assembly. Make sure that water flow to the BIO-Wheel is unhindered. The BIO-Wheel should rotate freely and remain wet at all times. Speed of rotation is not important. If a BIO-Wheel is turning - regardless of the rate - it is working.

If flow interruption is evident, check Pump Intake Strainer (in Sump) for obstructions. If clogged, shut off system, remove Strainer and clean. If flow interruption is still evident and no obstructions are found, consult Troubleshooting Guidelines section in this manual.

NOTE: A properly cultured BIO-Wheel is brown or discolored. There is no reason to clean a BIO-Wheel or replace it - unless it is damaged. If removed from the system for any reason, it should be kept moist and exposed to air until you reinstall it. If a BIO-Wheel is allowed to dry out or is inadvertently exposed to a contaminant, the bioculture may be destroyed. A precultured replacement can be purchased directly from Marineland (see back page).

Check Drip Emitter

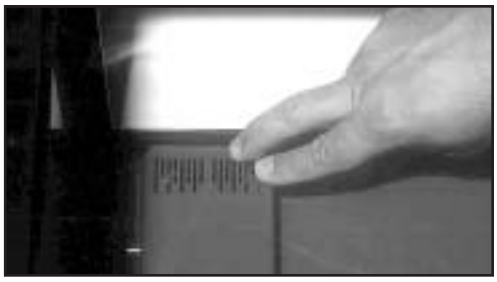
It's the job of the Drip Emitter (see pg. 6 and below) to regulate the amount of new water introduced to your MaRS system. Because the Drip Emitters are vital to optimum operation, it is necessary to check them each week to ensure their proper function. Emitter water flow should be slow and steady. Reduced flow indicates that the Drip Emitter should be cleaned or replaced.

CAUTION: *NEVER operate the system with the Drip Emitter removed. This results in too much water passing through the system, which can cause water temperature fluctuations. It can also diminish chlorine removal effectiveness of the Carbon Pack.*

Inspect Tanks For Algae Growth

Algae spores enter the system naturally via tank inhabitants and light allows them to grow. Although your system's UV Sterilizer eliminates the majority of algae spores, the more light you have, the greater the potential for some algae growth. To remove algae, simply wipe inside tank surface with a cloth, algae scraper or blue filter pad. NEVER use soap or metal scouring pads. Maintain a separate cloth only for the tanks. It should be kept clean and isolated from other departments so that it does not get contaminated by multiple task use.

Clean Bi-Level Skimmer and Area Behind



1. **Remove Bi-Level Skimmer.**
   Grasp Skimmer Cover on either side. Gently pull up and away from tank back and bottom slot.
2. **Wipe Areas Clean** with designated tank cloth.
3. **Replace Bi-Level Skimmer.**
   Insert bottom of Back Plate into lower slot on tank and push Skimmer gently into place.

Check UV "Lamp Out" Indicator Light

The "Lamp Out" Indicator Light is located on the UV Cover. When lit, it indicates the UV Lamp is operating. See Service section for replacement instructions.

A. REFRIGERATED SYSTEM

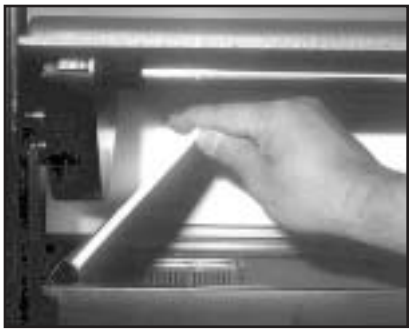
B. HEATED SYSTEM

Wipe Down All Exterior Casing Surfaces

Never use chemicals, soaps, detergents or harsh abrasives on any part of the system. Do not use cleaners inside or near the tanks at any time.

WARNING: *Never spray insecticides within 20 feet of your tank system. The resulting contamination could kill your fish and destroy your biological filter. If you must use insecticides, be careful to turn off the system and cover all open water until the odor has cleared from the area completely. And don't forget to turn the system back on.*

Clean Fish Jumper Guards



1. **Remove Side Jumper Guards:**
   Grasp top and gently pull toward you to free Guard from frame. Lift bottom of Guard up and away from tank rim.

2. **Remove Back Jumper Guard:**
   Using brackets, lift top up and out from system frame.

3. **Wipe down with a damp cloth.**
   If necessary, use tank scrubber pad for any calcium buildup.

4. **Remount Back Jumper Guard:**
   Slot bottom notch onto top rim of tank. Press into position.

5. **Replace Side Jumper Guards:**
   Slot bottom notch onto top rim of tank. Press into position beneath Locator Bumps in Lamp Cover.

   NOTE: Center Jumper guards may be wiped clean without having to be removed. Be sure to use ***only*** *a clean, damp cloth.*

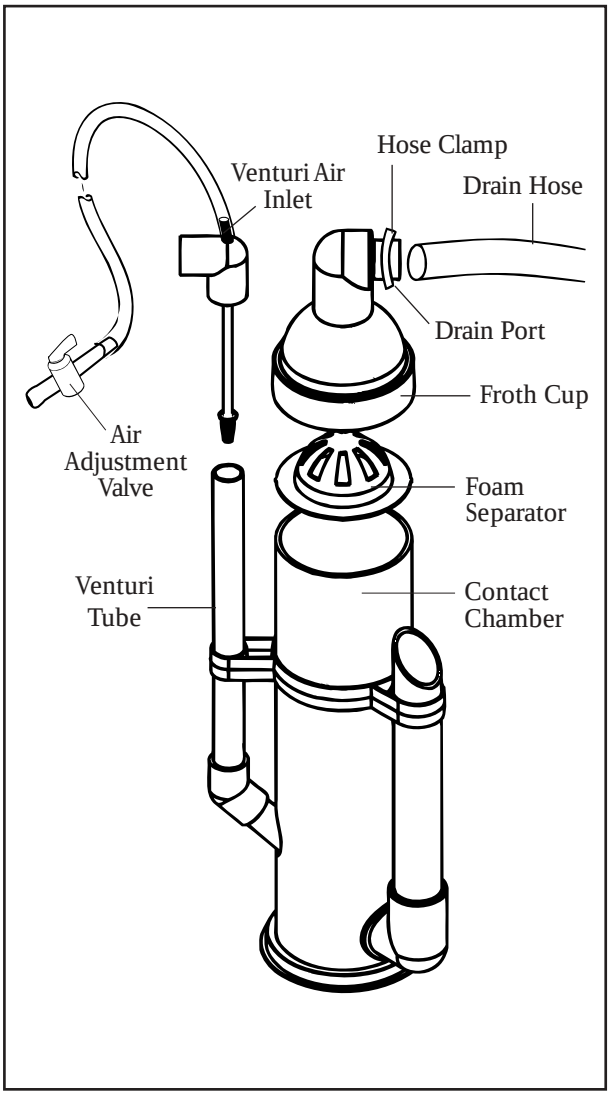
Clean Protein Skimmer Froth Cup/Foam Separator

(Marine System Only)

To ensure proper operation, Froth Cup and Foam Separator should be cleaned every week with warm water.

To remove Froth Cup and Foam Separator:

1. Shut down system.
2. Remove Sump Access Panel.
3. Remove Hose Clamp from Drain Hose.
4. Remove Drain Hose from Drain Port.
5. Remove (lift up) Froth Cup from Contact Chamber.
6. Clean Cup and Separator.
7. Return Cup and Separator to position atop Contact Chamber.
   NOTE: Make sure that good seal forms around Cup and Chamber.
8. Reconnect Drain Hose and Clamp.
   NOTE: Make sure Clamp is fastened securely around base of Hose.
9. Turn on system. Inspect Skimmer for leaks.
10. Replace Sump Access Panel



Protein Skimmer - Exploded View

Clean Protein Skimmer Venturi Air Inlet

Using pipe cleaner or squirt bottle, make sure Inlet orifice is clear and drawing air into Venturi Tube.

Monthly

Clean Heat Exchanger Screen *(refrigerated units only)*

1. Remove Service Panel and shut down system.
2. With handled brush (provided) reach through rack and brush accumulated dust and debris from rear screen.
3. Restart system. Replace Service Panel.

Clean Water Pump

Keep exterior surfaces clean and dust free. Wipe the dust from the electrical service area. All pumps require a clean environment in which to operate. It is important to see that no debris is "ingested" into the pump impeller. It is equally important to keep dust and debris away from the built-in cooling fans that keep the motor from overheating during operation.

Yearly

Clean Titanium Heater Housing *(heated unit only)*

1. Shut down system.
2. Clean outer housing with handled brush or non-abrasive scrubber pad.
   NOTE: Allow Heating Unit to cool (5-10 minutes) prior to cleaning. It is not necessary to remove Heating Unit. Reach through access port adjacent to housing when cleaning.
3. Turn on system.

As Needed

Change Fluorescent Lamps

To ensure maximum illumination and color reflection, the unit comes equipped with 5000K fluorescent lamps. We recommend that they be replaced with the same lamp type. To replace them with "Cool White" or other lamps of lesser quality will greatly lessen lighting intensity and overall effect.

1. Remove Side Fish Jumper Guards.
2. Using a dime or screwdriver, unscrew placement bolts (3) in Lamp Cover.
   NOTE: Placement Bolts are attached to Lamp Cover and will not fall out.

3. Carefully remove Lamp Cover.

4. Switch "Off." **NEVER** change fixtures while switch is "On."

5. Remove front fluorescent lamp. Gently twist 90° and pull forward and out from mounted station slots. Discard (according to established environmental procedure).

6. Remove rear fluorescent lamp. Gently twist 90° and push backward and out from mounted station slots. Discard.

WARNING: DO NOT attempt to remove white Access Housing from mounting. To do so may cause electric shock and severe injury.

7. Replace discarded lamps with new 5000K lamps. Gently insert ends into slots and push up and forward or up and back until lamp fits securely in place.

8. Switch "On".

9. Replace Lamp Cover. Line up cord notch (to the rear of Cover on one side) with power cord and screw in Placement Bolts.

   NOTE: Lamp Cover is specifically formed on one side to fit over the On/Off Switch. Be sure to match switch with molded protrusion before replacing Placement Bolts.

10. Replace Fish Jumper Guards.

Weekly Maintenance Procedures for Marine Modules

Water Change

Change 25% per week. Water should be mixed in a container used only for that purpose (recommended: 30 gallon refuse container on a dolly) with appropriate amount of salt (recommended: use a standard measuring cup for exact amount). Water should be added and a new batch mixed on the same day to ensure that supply is always available.

MODEL	SYSTEM CAPACITY	25% CHANGE
MV4	98 GALLONS	25 GALLONS
MV8	192 GALLONS	48 GALLONS

Gravel Cleaning

Siphon Kleen gravel thoroughly.

Brown Algae Removal

Scrub inside of glass lightly with blue filter pad or algae scrubber.

Salt “Creep” Removal

Wipe outer aquarium surface with a clean, damp cloth.

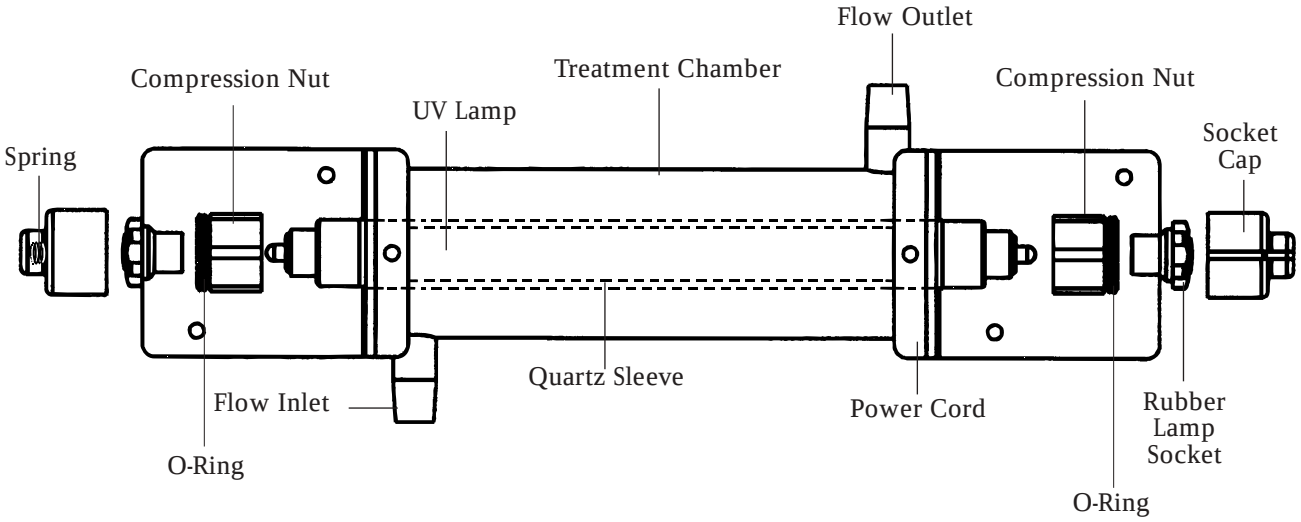
SERVICE

We strongly recommend that all servicing for your system be performed by a qualified technician or trained associate. For a service referral, call ***800-322-1266.***

Aquafine UV Disinfection Unit

IMPORTANT NOTE: To prolong the life of the AQUAFINE UV Disinfection Unit and avoid leaving fingerprints on the UV Lamp, we strongly recommend that you wear cotton gloves at all times during servicing of UV Sterilizer Unit.

For convenient Quartz Sleeve servicing, we recommend the MaRS UV Sterilizer Servicing Kit (MZ0017). Specifically assembled for this purpose, each kit contains a pair of cotton gloves, silicon lubricant and detailed instructions. UV Lamps are also available (MZ0190). To order call (800) 322-1266.



WARNING:

Never look directly into UV Lamp while in operation…eye injury may occur.

Never restore power while UV Lamp is separated from Treatment Chamber. Skin damage and/or injury may result.

Always make sure hands are absolutely dry before servicing equipment.

Every Six Months

UV Disinfection Unit Quartz Sleeve

The Quartz Sleeve will develop a layer of scum on its surface. This can reduce UV Lamp effectiveness. Scum should be cleaned off at least once every six months. Exercise care when cleaning.

To clean Quartz Sleeve:

1. Turn off Master Switch. Allow UV Unit to drain (3-5 minutes).

IMPORTANT: With the 4' Refrigerated Systems (MV4FR & MV4MR), it is necessary to remove the entire UV Disinfection Unit from the system before servicing.

To remove UV Unit:

A. Unclip UV Discharge Hose from back of Sump.

B. Carefully slide UV Housing out and away from the Hanger Bracket.

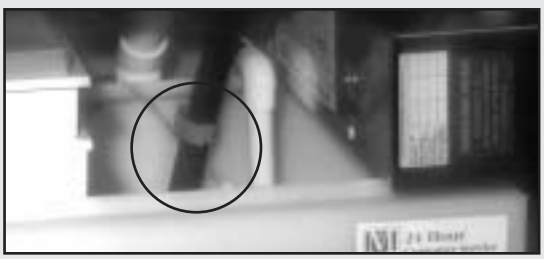
C. Gently remove the UV from the rack assembly and set aside.

2. Remove Cover.
3. Unscrew both threaded Socket Caps from Treatment Chamber ends. Gently disconnect UV Lamp from Rubber Lamp Sockets and carefully remove UV Lamp from treatment Chamber, sliding it through from one end to the other. Carefully set aside.
4. Unscrew and remove both threaded Compression Nuts. Grasp one end of Quartz Sleeve and gently draw it from Treatment Chamber. **Caution:** Quartz Sleeves are very fragile. Handle with care to prevent breaking or chipping.

If Quartz Sleeve breaks during service and a replacement is not readily available, close the UV Inlet Valve (Marine System: Close Inlet and Outlet Valve). Unplug UV. Do not replace UV Lamp until new Sleeve is acquired. Turn on Master Switch (system will operate without UV Lamp). When new Quartz Sleeve is acquired, follow installation procedure. Be sure to open UV Inlet and Outlet Valves…and plug UV Power Cord into proper receptacle.

5. Wash Quartz Sleeve with mild soap and hot water. Rinse thoroughly with hot water.
   NOTE: For heavier deposits, we recommend cleaning with CLR™. Gently wipe sleeve with clean cloth before reinstalling.
6. Working from one end of Treatment Chamber, carefully insert clean Quartz Sleeve through stainless steel nipple and into Treatment Chamber. Sleeve should protrude an equal distance from each end.
7. Before installing Compression Nuts, remove and clean O-Rings. Then lubricate each with a very thin coating of silicon lubricant. Reinstall O-Rings.
   NOTE: O-Rings should be replaced each year.
8. Install Compression Nut at one end. Finger tighten while holding opposite end of Quartz Sleeve.
9. Install remaining Compression Nut. Hand tighten (firmly) both Compression Nuts.
   CAUTION: *Do not* ***over*** *tighten Compression Nuts. This can fracture ends of Quartz Sleeve. After hand tightening Compression Nut, release it one half turn to avoid fracture.*
10. Carefully reinsert UV Lamp into open Quartz Sleeve and push it about 2-3 inches out beyond the opposite Compression Nut.
11. Insert lamp base into spring equipped Rubber Lamp Socket (see diagram), sliding "boot" portion over end of lamp. Push until you feel a firm, "bottomed out" connection. *NOTE: Make sure "boot" does not fold under.*
12. Connect opposite lamp base to remaining Rubber Lamp Socket.
13. Once Rubber Lamp Sockets are attached to UV Lamp at both ends, position Rubber Lamp Sockets inside Socket Caps. Making sure that Rubber Lamp Sockets are seated securely, join Socket Caps to threaded ends of Compression Nuts and finger tighten.

For refrigerated models (MV4FR & MV4MR), carefully replace UV on Hanger Bracket, making sure Service Panel will not touch end of UV housing. Reclip UV Discharge Hose into position at back of Sump.



14. Replace Cover.
15. Turn on Master Switch. Inspect Discharge Hose for leaks. Replace Service Panel.

Every Six Months (or as dictated by "Lamp Out" Indicator Light)

UV Disinfection Unit Lamp (Exploded diagram, pg.17)

The UV Lamp has a useful service life of about 6 months. After this time - whether it continues to appear functional or not - it loses intensity and must be replaced. When changing UV Lamp, *always* clean Quartz Sleeve.

To replace UV Lamp:

1. Turn off Master Switch. Allow UV unit to drain (3-5) minutes.

With the MV4FR and MV4MR systems, it is necessary to remove the entire UV Disinfection Unit from the system before servicing (consult page 18).

2. Remove Cover (unscrew outer nuts).
3. Unscrew both threaded Socket Caps from Treatment Chamber ends. Gently disconnect UV Lamp from Rubber Lamp Sockets and carefully remove UV Lamp from Treatment Chamber, sliding it through from one end to the other. Discard.
4. Remove Quartz Sleeve. Clean and reinstall (as directed in previous instructions).
5. Carefully insert new UV Lamp into open Quartz Sleeve and push it about 2-3 inches out beyond the opposite Compression Nut.
6. Insert lamp base into spring equipped Rubber Lamp Socket (see diagram), sliding "boot" portion over end of UV Lamp. Push until you feel a firm, "bottomed out" connection.

   NOTE: Make sure "boot" does not fold under.
7. Connect opposite lamp base to remaining Rubber Lamp Socket.
8. Once Rubber Lamp Sockets are attached to UV Lamp at both ends, position Rubber Lamp Sockets inside Socket Caps. Making sure that Rubber Lamp Sockets are seated securely, join Socket Caps to threaded ends of Compression Nuts and finger tighten.
9. Replace Cover.

WITH MV4FR and MF4MR systems, carefully replace UV on Hanger Bracket, making sure Service Panel will not touch end of UV Housing. Reclip UV Discharge Hose into position at back of Sump (see photo, pg.19)

10. Turn on Master Switch. Inspect unit for leaks. Replace Service Panel.

Yearly

UV Disinfection Unit O-Ring

The O-Rings should be replaced each year. Always clean and lubricate O-Ring with a very thin coating of silicone lubricant before inserting into section of threaded Compression Nut.

TROUBLESHOOTING GUIDELINES

CAUTION: Many of the corrective procedures recommended below require removal of the outer Service Panel. Only those familiar with basic filtration unit design should attempt to do so.

For a service referral,
call the MaRS 24-Hour Hotline:
(800) 576-MaRS (6277).

If entire system abruptly shuts down...

- *Make sure* Feeding Timer Switch has not been activated.
- *Reset* circuit breaker in main electrical panel.
- *Make sure* Master Switch is turned on.
- *Check* Pump Intake Strainer in Sump for obstructions.

If water turns yellow or odors develop...

- *Replace* Carbon Filter Pack(s).

If a BIO-Wheel fails to rotate...

- *Inspect* Prefilter Pad and Carbon Filter Pack for clogging. Clean or change as needed.
- *See* if BIO-Wheel is obstructed. Clean bearings, check for unimpeded rotation and reinstall.
- *Ensure* that Sump is not overfilled. Check Return Tube for obstruction.
- *Check* Pump Intake Strainer in Sump for obstructions.

If water flow to BIO-Wheels or display tanks stops or flow is sluggish…

- *Inspect* Pump Inlet Strainer in Sump. Clean and/or remove any debris or obstructions.
- *Remove* Electrical Service Panel and make sure System Pump is plugged in, motor fan is turning and all valves are open (parallel to direction of flow pipe).
- *Call* for service if problem persists.

If water level in a single tank is low or significantly lower than that in adjacent tanks…

- *Check* "IN" Water Nozzles for obstructions. Clean inside of nozzle with small brush or pipe cleaner. If necessary, remove nozzle from bulkhead (using open end wrench), clean and replace.
- *Call* for service if problem persists.

If UV "Lamp Out" Indicator Light goes out...

- *Replace* UV Lamp (see instructions, pg. 20). If problem persists after lamp is replaced, call for Service.

If water temperature is too low or too high...

- *Check* Thermostat setting.

  NOTE: Thermostat reading may differ from measured Display Tank temperature... adjust thermostat as required and monitor Display Tank temperature with thermometer, allowing 3-4 hours for temperature to stabilize before checking again.
- *Make sure* power cord to Refrigeration or Heating Unit is plugged into proper outlet.
- *Call* for service if Thermostat, Refrigeration Unit or Heating Unit is malfunctioning.

If large amounts of air bubbles are evident in display tanks...

- *Check* water level in Sump. If below standpipe, add water via Replenishment Valve and check frequently.
- *Inspect* "new" water entry into Sump. If water is not trickling into Sump, make sure Hose Bibs are open, and Drip Emitters are functioning properly.
- *Make sure* Pump Intake Strainer is fitted firmly in place.
- *Call* for service if problem persists.

If Drip Emitter or Replacement Value flow is greatly reduced or stopped...

- *Clean* Drip Emitter (twist top 90º and pull out to remove for cleaning).
- *Check* water level in Sump. If below standpipe, add water via Replenishment Valve until water level is at or near normal operating level.

If fluorescent lamps will not light...

- *Make* sure lights are plugged into wall receptacle.
- *Check* wall mounted GFCI's. Reset if necessary. If GFCI's trip repeatedly, call for service.
- *Make sure* lamps are inserted into the fixture properly.
- *Call* for service if problem persists.

If water leaks from rear of rack...

- *Remove* Sump Service Panel and Electrical Service Panels and check all hose connections. Tighten if necessary.
- *Remove* Back Jumper Guards and check all hose connections. Tighten if necessary.
- *Call* for service if problem persists.

If Protein Skimmer does not operate (no air bubbles)...

- *Use* Fish Feeding Timer to shut down and restart system. After restart, check Protein Skimmer operation.
- *Shut* down system and check aeration tube for blockage.
- *Call* for service if problem persists.

If water level in Protein Skimmer Drops...

- *Close* Venturi Air Adjustment Valve (partially or completely) to decrease oxygen intake.
- *Call* for service is problem persists.

SYSTEM Specifications

Integrated Rack System MV4FH
4 Foot Heated, Fresh Water System

MECHANICAL:

Size: 20”D x 51½”L x 94”H (shipping height: 85”)

Tilt: 20½” D x 51½” L x 86½”H

Weight: 490 Lb. (Est.)

Floor-attached for seismic loads

System Gallon Capacity: 98 gallons

ELECTRIC:

ETl listed for permanent installation

Voltage: 115 vac, 60 Hz

Current: Filtration/Circulation: 10.5 AMP

Lighting: 2.2 AMP

FILTRATION:

Mechanical Filter: 1 ea. Polyester Pad, 7½” x 14”

Chemical Filter: 1 lb. Black Diamond Activated Carbon in Carbon Filter Pack

Biological Filter: 1 ea. CBW-1

UV Treatment: Aquafine DW-300; 50,000 uWs/cm^2, @ 4,000 hrs.

“NEW” WATER FROM TREATED WATER SUPPLY:

Flow Rate: 1 gallon per hour

CIRCULATION/FILTRATION PUMP:

Pump: IWAKI MD-40RLT-115; 750 GPH; UL recognized

Display tank turns per hour (TPH): 5 TPH minimum

HEATER:

1,000 w. titanium heater; UL Listed

Thermostat Controller: UL listed; Temperature Range: 50°-130° F; GFCI Protected

LIGHTING:

UL listed light fixtures with polycarbonate lamp covers

Lamps: 6 each 40 W., 48”, T12, rapid start, fluorescent; 5,000K, 85 CRI, 20,000 hr. life; 2820 lumens (mean); GE SPX50 or Philips Ultralume 50

MATERIALS OF CONSTRUCTION:

Frame: Mild steel tubular welded construction, epoxy powder coated

Doors: Polyurethane

Misc. Panels & Covers: Expanded PVC, ABS, Formica

BUYER SUPPLIED CONNECTIONS FOR INSTALLATION:

Electric Supply:

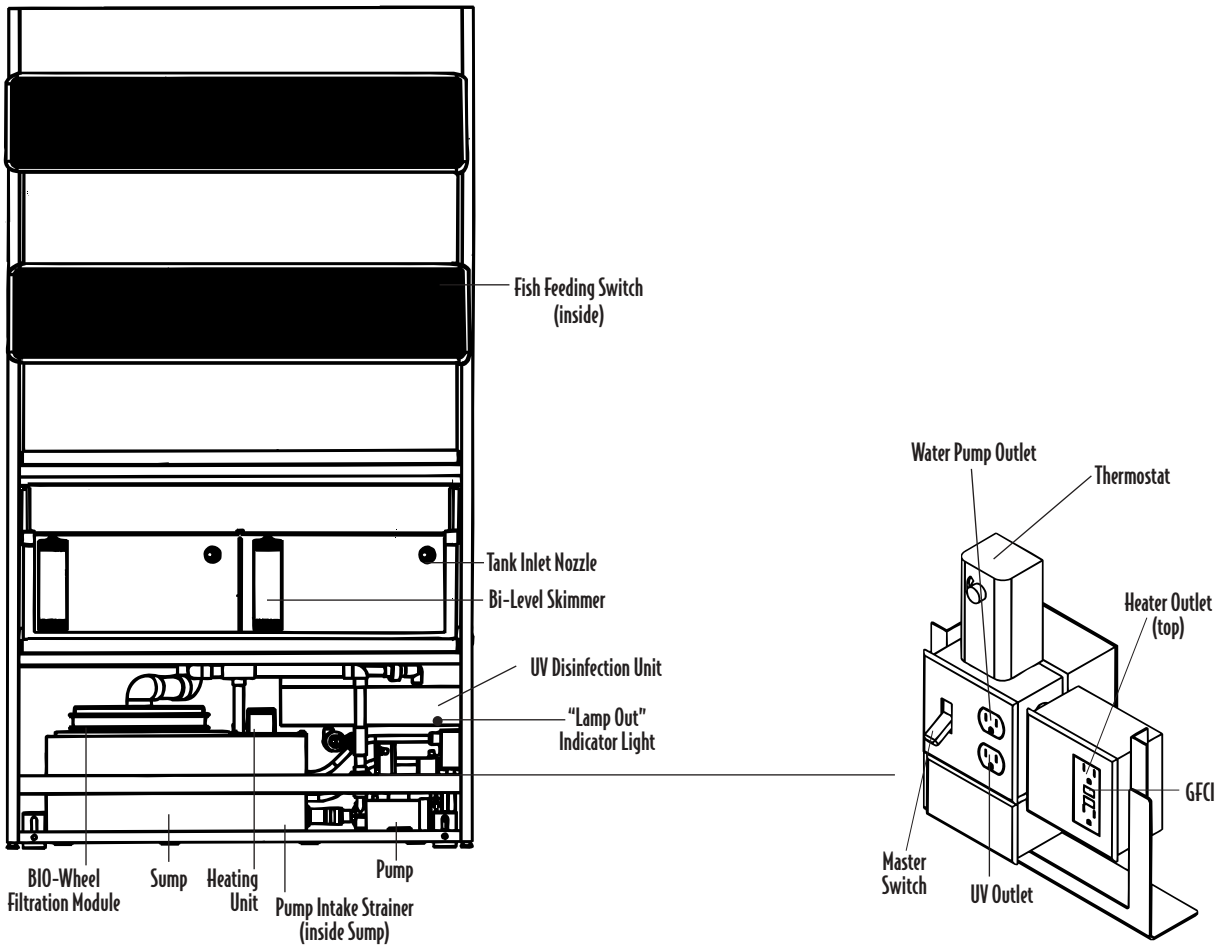
Main circuit: Hard wired J-Box, 115 VAC, 60 Hz, 15 AMP

Lighting: Plug connected, 2 places; 115 VAC, 60 Hz, 2.2 AMPs each, GFCI protected

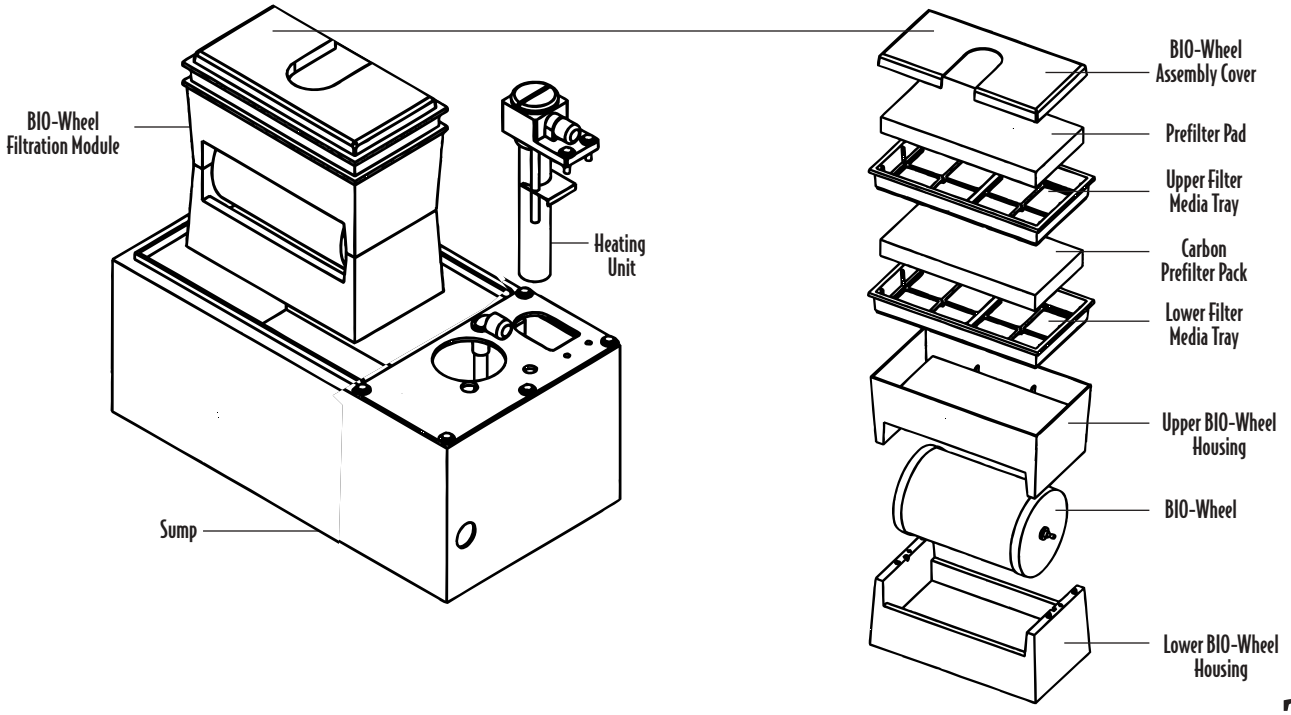
Treated Water Supply: 1 GPH, regulated to 25 PSIG

Drain: At or below grade, 30’ Run

Exploded View w/ Electrical Assembly Pullout



Sump w/ BIO-Wheel Filtration Module Exploded View



SYSTEM Specifications

Integrated Rack System MV8FH
8 Foot Heated, Fresh Water System

MECHANICAL:

Size: 20"D x 103"L x 94"H (shipping height: 85")

Tilt: 20 1/2" D x 103" x 86 1/2"

Weight: 860 Lb. (Est.)

Floor-attached for seismic loads

System Gallon Capacity: 192 gallons

ELECTRIC:

ETl listed for permanent installation

Voltage: 115 vac, 60 Hz

Current: Filtration/Circulation/Heater: 12.5 AMP

Lighting: 2.2 AMP for each 4 foot section, 4.4 AMP total

FILTRATION:

Mechanical Filter: 1 ea. Polyester Pad, 7 1/2" x 14"

Chemical Filter: 1 lb. Black Diamond Activated Carbon in Carbon Filter Pack

Biological Filter: 1 ea. CBW-1

UV treatment: Aquafine DW-300; 50,000 uWs/cm^2, @ 4,000 hrs.

"NEW" WATER FROM TREATED WATER SUPPLY:

Flow Rate: 1 gallon per hour

CIRCULATION/FILTRATION PUMP:

Pump: IWAKI MD-70RLT-115; 1200 GPH; UL recognized

Display tank turns per hour (TPH): 5 TPH minimum

HEATER:

1,000 w. titanium heater; UL listed Thermostat

Controller, UL Listed; Temperature Range: 50-130° F

GFCI Protected

LIGHTING:

UL listed light fixtures with polycarbonate lamp covers

Lamps: 12 each 40 W., 48", T12, rapid start, fluorescent; 5,000K, 85 CRI, 20,000 hr. life; 2820 lumens (mean); GE SPX50 or Philips Ultralume 50

MATERIALS OF CONSTRUCTION:

Frame: Mild steel tubular welded construction, epoxy powder coated

Doors: Polyurethane

Misc. Panels & Covers: Expanded PVC, ABS, Polycarbonate, Formica

BUYER SUPPLIED CONNECTIONS FOR INSTALLATION:

Electric Supply:

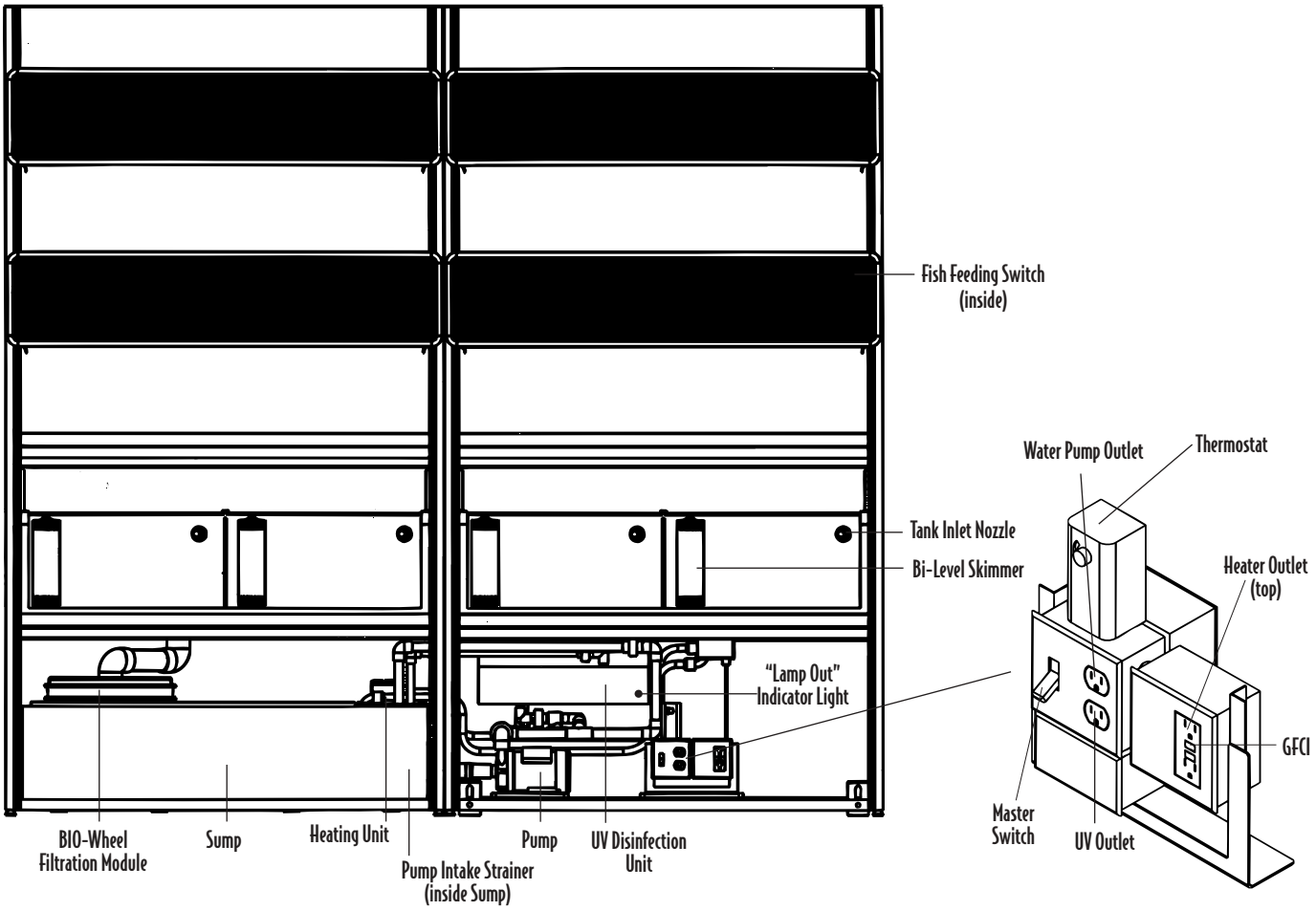
Main Circuit: Hard wired J-Box, 115 VAC, 60 Hz, 20 AMP

Lighting: Plug connected, 2 places; 115 VAC, 60 Hz, 2.2 AMPs each, GFCI Protected

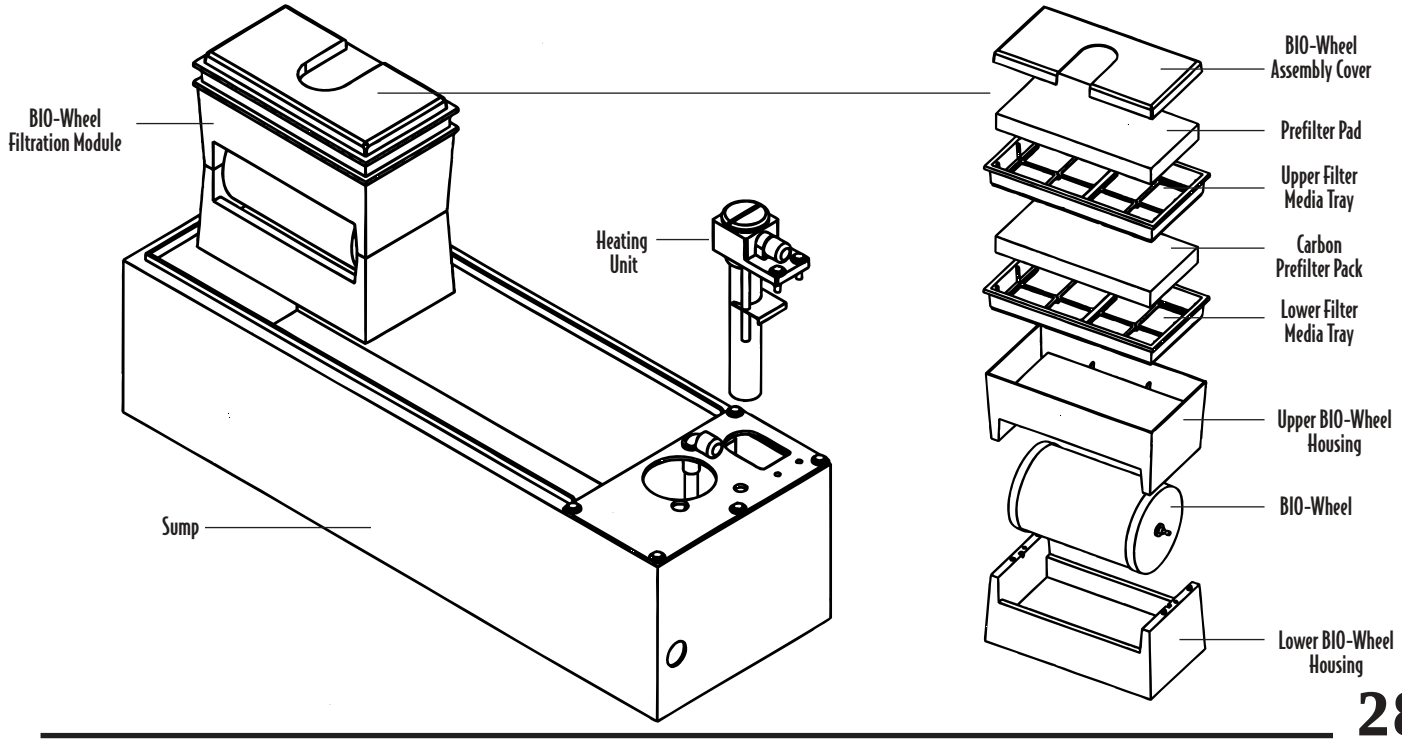
Treated Water Supply: 1 GPH, regulated to 25 PSIG

Drain: At or below grade, 30' run

Exploded View w/Electrical Assembly Pullout



Sump w/BIO-Wheel Filtration Module Exploded View



SYSTEM Specifications

Integrated Rack System MV12FH
12 Foot Heated, Fresh Water System

Mechanical:

Size: 20"D x 154½" L x 94" H (shipping height: 85")
Tilt: 20½" D x 154½" x 86½"

Weight: 1260 Lb. (Est.)

Floor-attached for seismic loads

System Gallon Capacity: 292 gallons

Electric:

ETL listed for permanent installation

Voltage: 115 VAC, 60 Hz

Current: Filtration/Circulation/Heater: 12.9 AMP

Lighting: 2.2 AMP for each 4 foot section, 6.6 AMP total

Filtration:

Mechanical Filter: 2 ea. Polyester Pad, 7½" x 14"

Chemical Filter: 2 lb. Black Diamond Activated Carbon in Carbon Filter Packs

Biological Filter: 2 ea. CBW-1

UV Treatment: Aquafine DW-300; 50,000 uWs/cm^2, @ 4,000 hrs.

"NEW" WATER FROM TREATED WATER SUPPLY:

Flow Rate: 2 gallons per hour

CIRCULATION/FILTRATION PUMP:

Pump: IWAKI MD-100RLT-115; UL recognized

Display tank turns per hour (TPH): 5 TPH minimum

HEATER:

1,000 W. Titanium Heater; UL Listed

Thermostat Controller, UL listed;

Temperature Range: 50-130° F

GFCI Protected

Lighting:

UL listed light fixtures with polycarbonate lamp covers

Lamps: 18 each 40 W., 48", T12, rapid start, fluorescent; 5,000K, 85 CRI, 20,000 hr. life; 2820 lumens (mean); GE SPX50 or Philips Ultralume 50

MATERIALS OF CONSTRUCTION:

Frame: Mild steel tubular welded construction, epoxy powder coated

Doors: Polyurethane

Misc. Panels & Covers: Expanded PVC, ABS, Polycarbonate, Formica

BUYER SUPPLIED CONNECTIONS FOR INSTALLATION:

Electric supply:

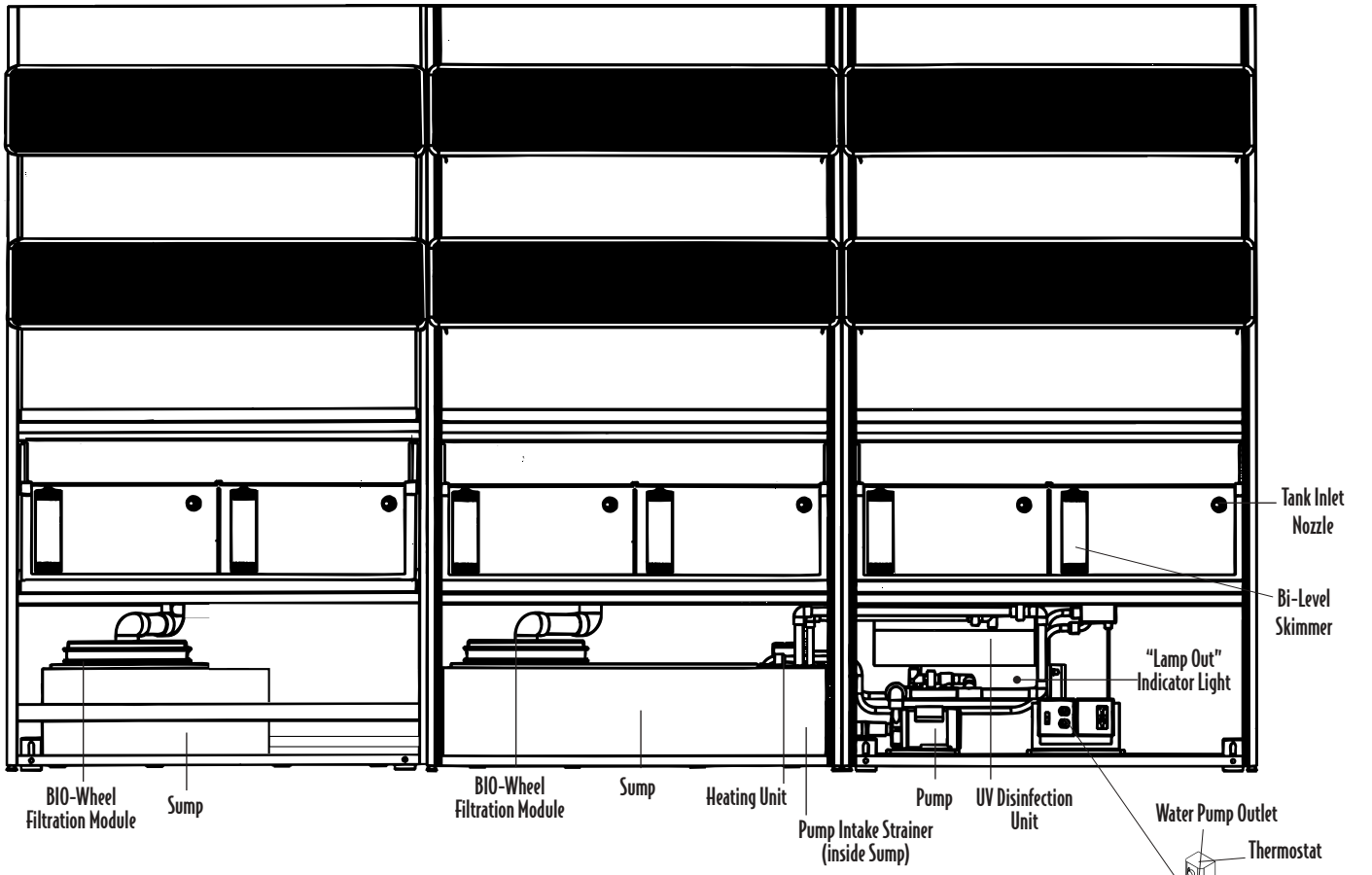
Main Circuit: Hard wired J-Box, 115 VAC, 60 Hz, 20 AMP

Lighting: Plug connected, 3 places; 115 VAC, 60 Hz, 2.2 AMPs each, GFCI protected

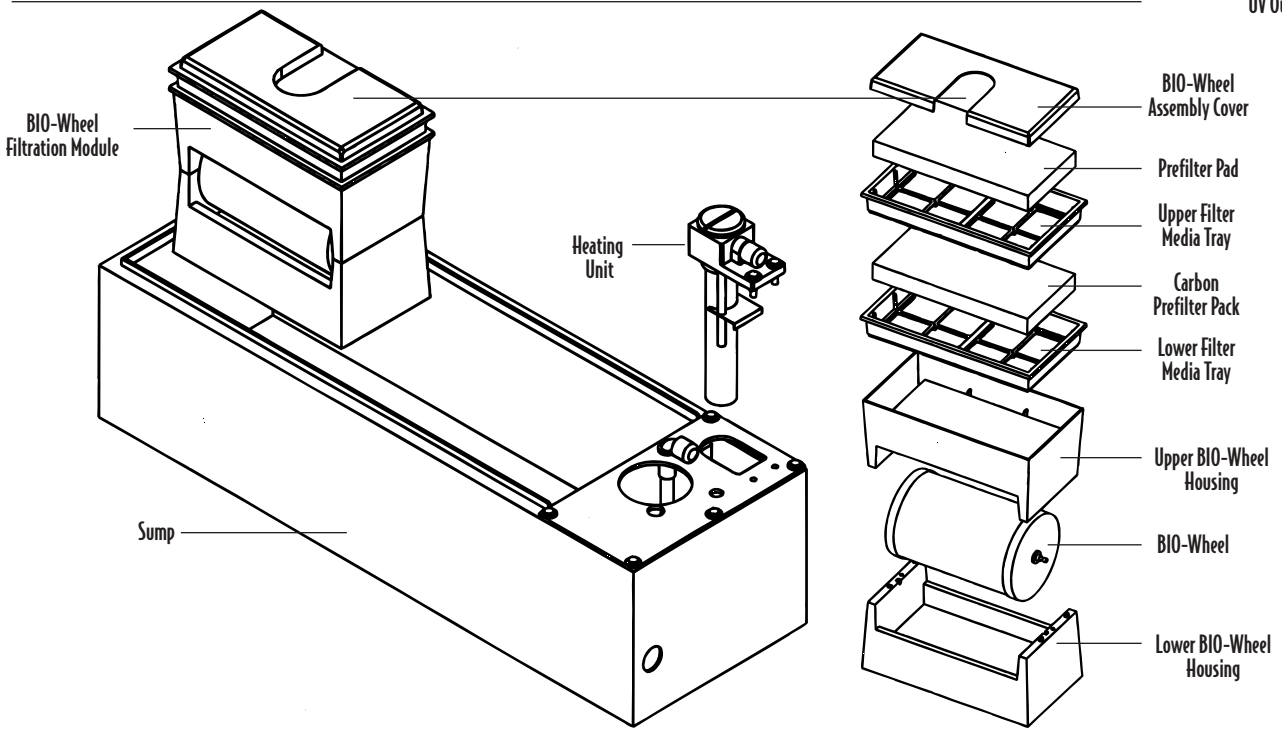
Treated Water Supply: 2 GPH, regulated to 25 PSIG

Drain: At or below grade, 30' run

Exploded View w/Electrical Assembly Pullout



Sump w/BIO-Wheel Filtration Module Exploded View



SYSTEM Specifications

Integrated Rack System MV4FR
4 Foot Refrigerated, Fresh Water System

MECHANICAL:

Size: 20" D x 51½" L x 94" H (shipping height: 85")

Tilt: 20" D x 51 1/2" L x 86 1/2" H

Weight: 490 Lb. (Est.)

Floor-attached for seismic loads

System Gallon Capacity: 98 gallons

ELECTRIC:

ETL listed for permanent installation

Voltage: 115 VAC, 60 Hz

Current: Filtration/Circulation: 10.5 AMP
Lighting: 2.2 AMP

FILTRATION:

Mechanical Filter: 1 ea. Polyester Pad, 7 1/2" x 14"

Chemical Filter: 1 lb. Black Diamond Activated Carbon in Carbon Filter Pack

Biological Filter: 1 ea. CBW-1

UV Treatment: Aquafine DW-300; 50,000 uWs/cm^2, @ 4,000 hrs.

"NEW" WATER FROM TREATED WATER SUPPLY:

Flow Rate: 1 gallon per hour

CIRCULATION/FILTRATION PUMP:

Pump: IWAKI MD-40RLT-115; 750 GPH; UL recognized

Display tank turns per hour (TPH): 5 TPH minimum

REFRIGERATION:

1/3 HP, R134A with Helical Heat Exchanger

Thermostat Controller, UL Listed; temperature range: 50-130° F. GFCI Protected

LIGHTING:

UL Listed light fixtures with polycarbonate lamp covers

Lamps: 6 each 40 W., 48", T12, Rapid Start, Fluorescent; 5,000K, 85 CRI, 20,000 Hr. Life; 2820 Lumens (mean); GE SPX50 or Philips Ultralume 50

MATERIALS OF CONSTRUCTION:

Frame: Mild steel tubular welded construction, epoxy powder coated

Doors: Polyurethane

Misc. Panels & Covers: Expanded PVC, ABS, Formica

BUYER SUPPLIED CONNECTIONS FOR INSTALLATION:

Electric Supply:

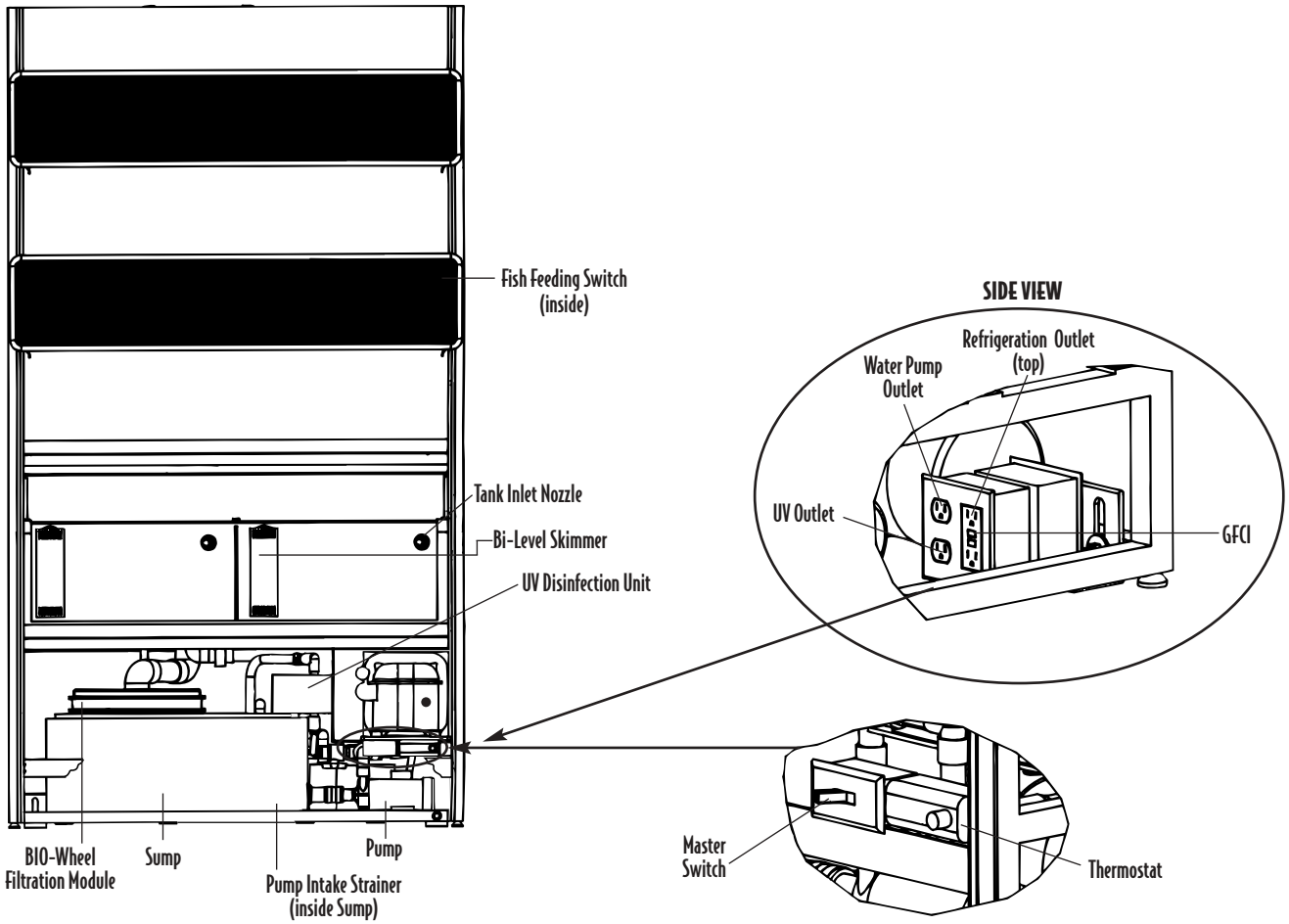
Main Circuit: Hard wired J-Box, 115 VAC, 60 Hz, 15 AMP

Lighting: Plug connected, 2 places; 115 VAC, 60 Hz, 2.2 AMPs each, GFCI protected

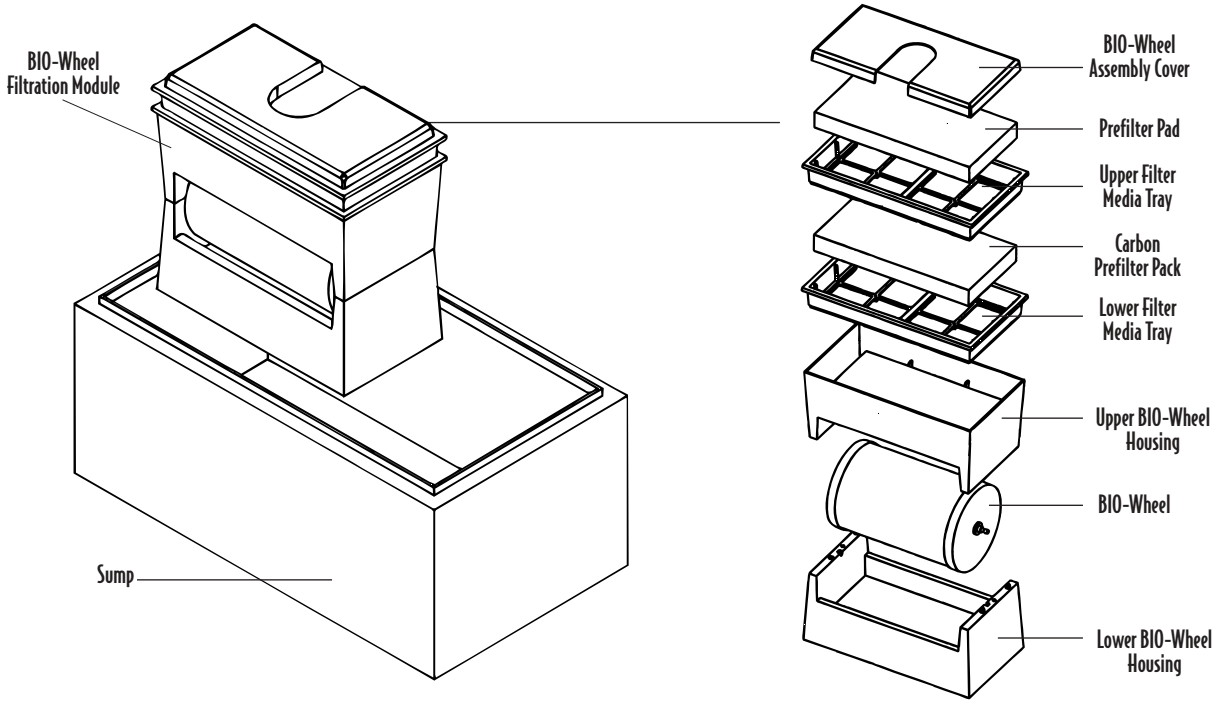
Treated Water Supply: 1 GPH, Regulated to 25 PSIG

DRAIN: At or Below Grade, 30' Run

Exploded View w/Electrical Assembly Pullout



Sump w/BIO-Wheel Filtration Module Exploded View



SYSTEM Specifications

Integrated Rack System MV8FR
8 Foot Refrigerated, Fresh Water System

MECHANICAL:

Size: 20"D x 103" L x 94" H (shipping height: 85")

Tilt: 20 1/2" D x 103" L x 85 1/2" H

Weight: 875 Lb. (Est.)

Floor-attached for seismic loads

System Gallon Capacity: 192 gallons

ELECTRIC:

ETL listed for permanent installation

Voltage: 115 VAC, 60 Hz

Current: Filtration/Circulation: 12.5 AMP

Lighting: 2.2 AMP for each 4 foot section, 4.4 AMP total

FILTRATION:

Mechanical Filter: 1 ea. Polyester Pad, 7 1/2" x 14"

Chemical Filter: 1 lb. Black Diamond Activated Carbon in Carbon Filter Pack

Biological Filter: 1 ea. CBW-1 (2 ea. CBW-1 w/Feeder System)

UV Treatment: Aquafine DW-300; 50,000 uWs/cm^2, @ 4,000 hrs.

"NEW" WATER FROM TREATED WATER SUPPLY:

Flow Rate: 2 gallons per hour

CIRCULATION/FILTRATION PUMP:

Pump: IWAKI MD-70RLT-115; 1200 GPH; UL recognized

Display tank turns per hour (TPH): 5 TPH minimum

REFRIGERATION:

1/2 HP, R134A with Helical Heat Exchanger

Thermostat Controller, UL listed; Temperature Range: 50-130° F. GFCI protected

LIGHTING:

UL Listed light fixtures with polycarbonate lamp covers

Lamps: 12 each 40 W., 48", T12, rapid start, fluorescent; 5,000K, 85 CRI, 20,000 hr. life; 2820 lumens (mean); GE SPX50 or Philips Ultralume 50

MATERIALS OF CONSTRUCTION:

Frame: Mild steel tubular welded construction, epoxy powder coated

Doors: Polyurethane

Misc. Panels & Covers: Expanded PVC, ABS, Formica

BUYER SUPPLIED CONNECTIONS FOR INSTALLATION:

Electric Supply:

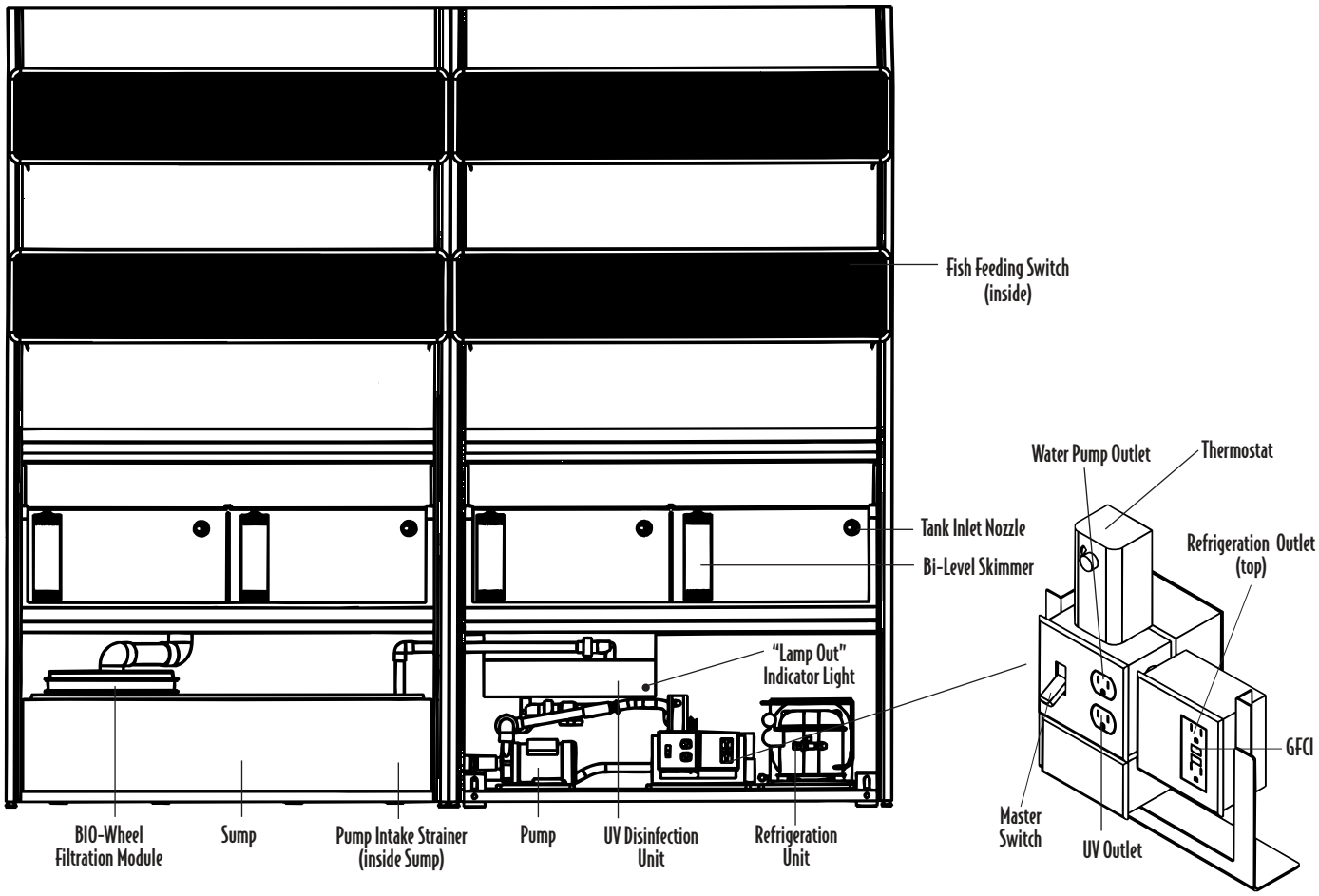
Main Circuit: Hard wired J-Box, 115 VAC, 60 Hz, 20 AMP

Lighting: Plug connected, 2 places; 115 VAC, 60 Hz, 2.2 AMPs each, GFCI protected

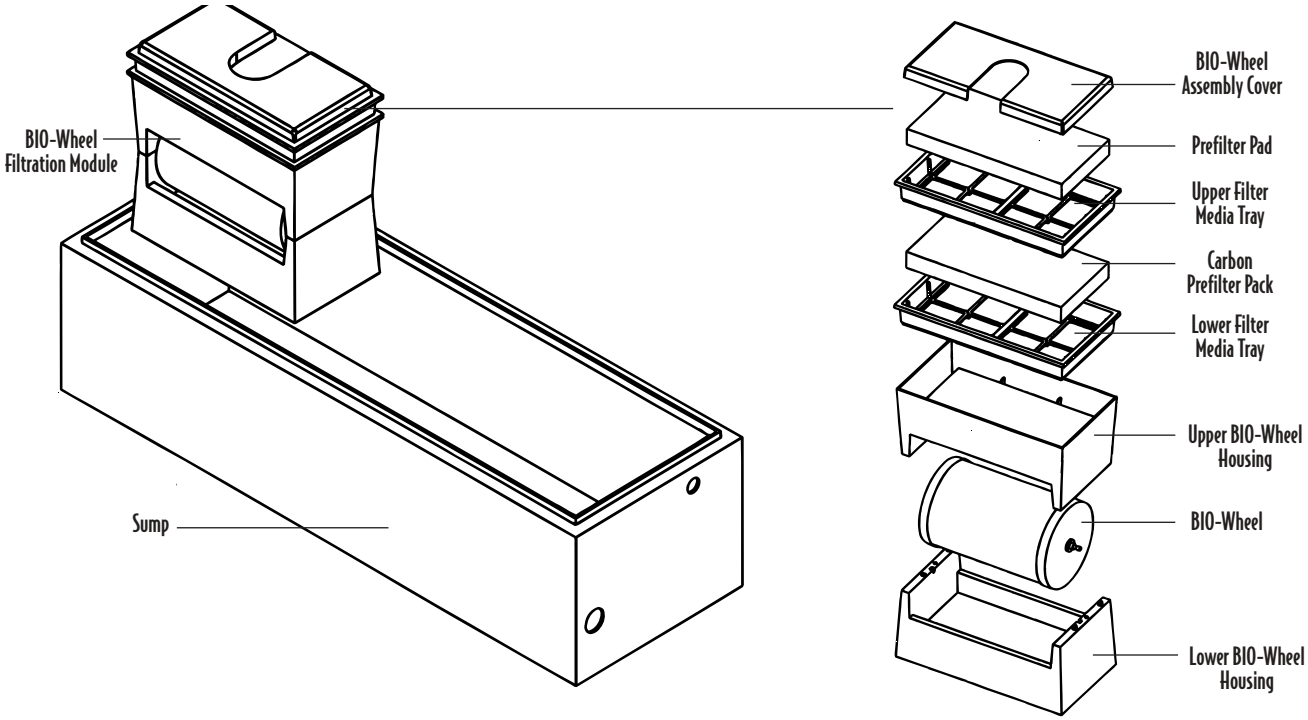
Treated Water Supply: 2 GPH, regulated to 25 PSIG

Drain: At or below grade, 30' run

Exploded View w/Electrical Assembly Pullout



Sump w/BIO-Wheel Filtration Module Exploded View



SYSTEM Specifications

Integrated Rack System MV4MH
4 Foot Heated, Marine Water System

MECHANICAL:

Size: 20”D x 51½”L x 94”H (shipping height: 85”)

Tilt: 20½” D x 103” L x 86½” H

Weight: 490 Lb. (Est.)

Floor-attached for seismic loads
System Gallon Capacity: 98 gallons

ELECTRIC:

ETL listed for permanent installation

Voltage: 115 VAC, 60 Hz

Current: Filtration/Circulation: 12.5 AMP

Lighting: 2.2 AMP

FILTRATION:

Mechanical Filter: 1 ea. Polyester Pad, 7 ½” x 14”

Chemical Filter: 1 lb. Black Diamond Activated Carbon in Carbon Filter Packs

Biological Filter: 1 ea. CBW-1

UV Treatment: Aquafine DW-300; 50,000 uWs/cm^2, @ 4,000 hrs.

Protein Skimmer: Marineland Commercial Foam Fractionator

“NEW” WATER FROM TREATED WATER SUPPLY:

None: Buyer supplies salt water as needed.

CIRCULATION/FILTRATION PUMP:

Pump: IWAKI MD-70RLT-115; 1200 GPH; UL recognized

Display tank turns per hour (TPH): 8 TPH normal

HEATER:

1,000 W. heater; UL listed, Thermostat Controller,

UL Listed; Temperature Range: 50-130° F.

GFCI protected

LIGHTING:

UL Listed light fixtures with polycarbonate lamp covers

Lamps: 6 each 40 W., 48”, T12, rapid start, fluorescent; 5,000K, 85 CRI, 20,000 Hr. life; 2820 lumens (mean); GE SPX50 or Philips Ultralume 50

MATERIALS OF CONSTRUCTION:

Frame: Mild steel tubular welded construction, epoxy powder coated

Doors: Polyurethane

Misc. Panels & Covers: Expanded PVC, ABS, Formica

BUYER SUPPLIED CONNECTIONS FOR INSTALLATION:

Electric Supply:

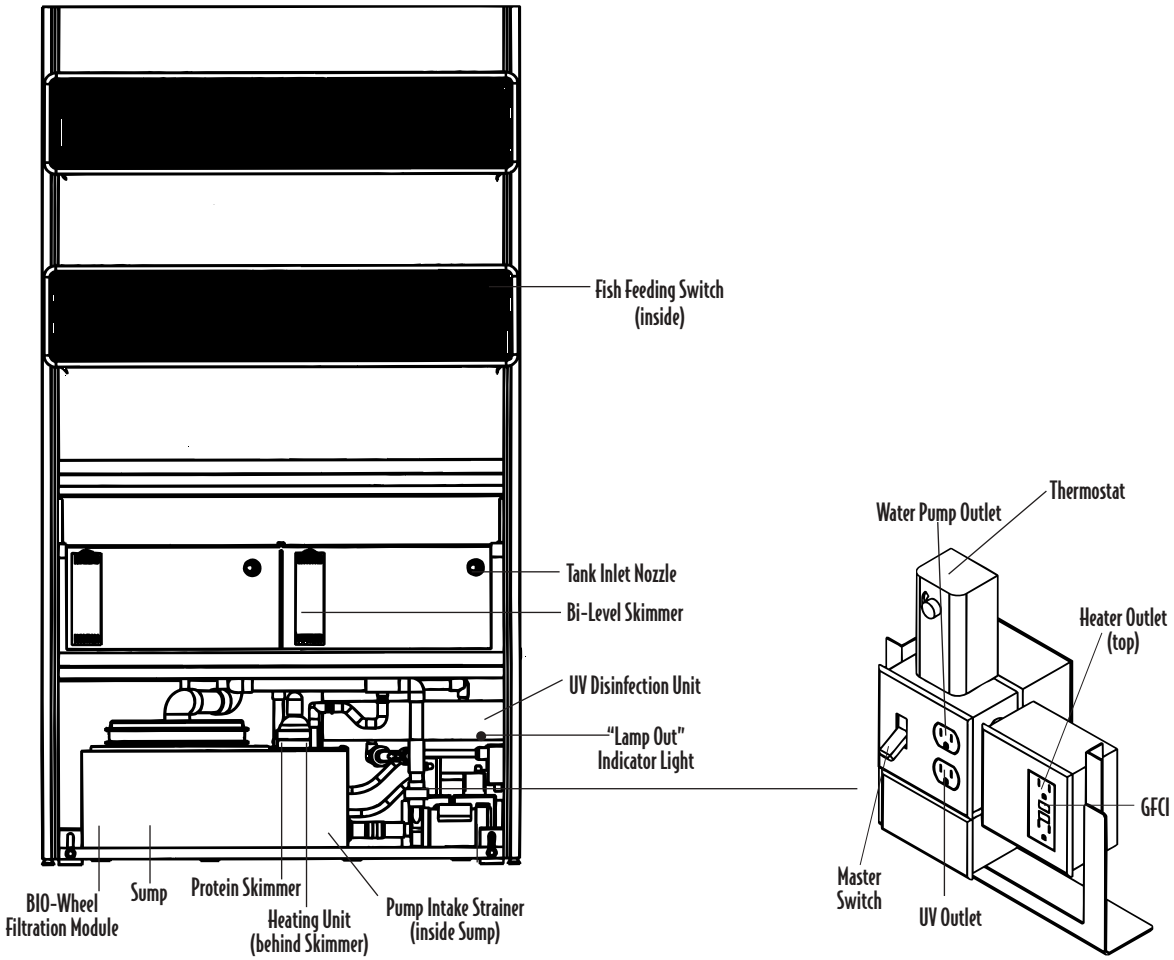
Main Circuit: Hard wired J-Box, 115 VAC, 60 Hz, 15 AMP

Lighting: Plug connected, 1 place; 115 VAC, 60 Hz, 2.2 AMPs, GFCI protected

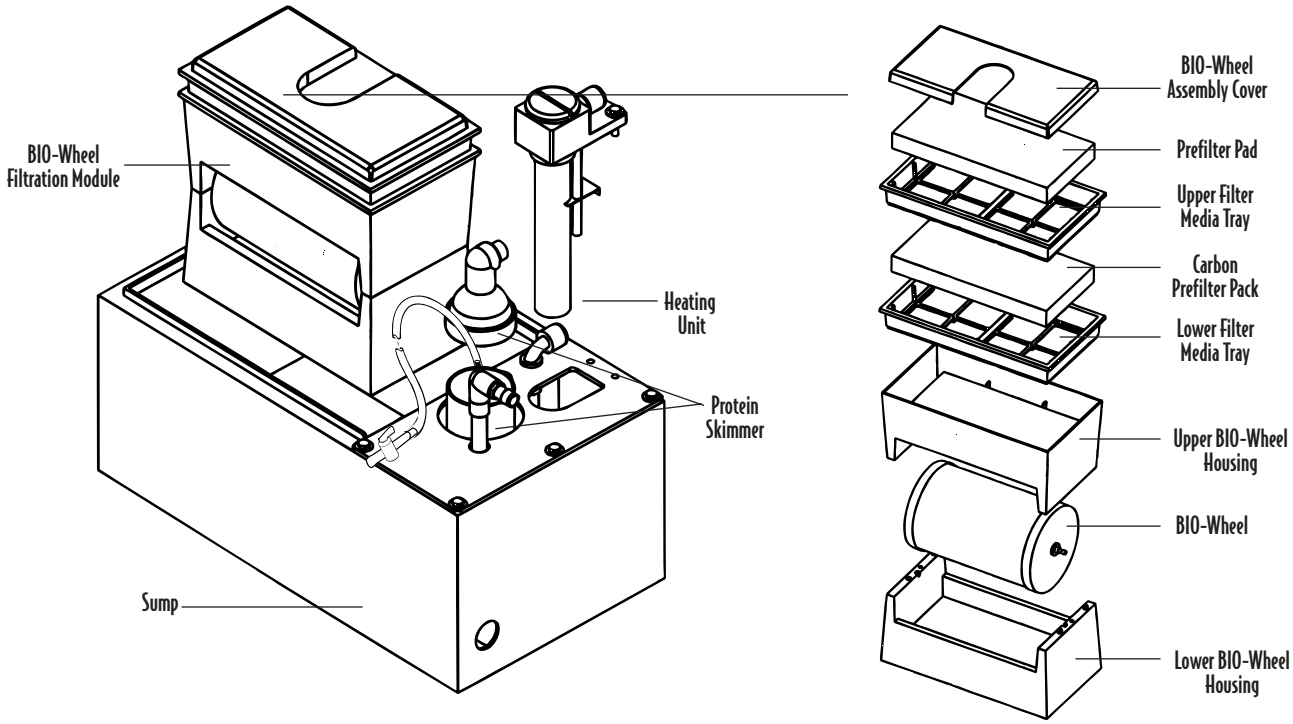
Treated Water Supply: None

Drain: At or below grade, 30’ run

Exploded View w/Electrical Assembly Pullout



Sump w/BIO-Wheel Filtration Module Exploded View



SYSTEM Specifications

Integrated Rack System MV8MH
8 Foot Heated, Marine Water System

MECHANICAL:

Size: 20"D x 103" L x 94" H (shipping height: 85")
Tilt: 20 ½" D x 103" L x 86 ½" H

Weight: 860 Lb. (Est.)

Floor-attached for seismic loads

System Gallon Capacity: 192 gallons

ELECTRIC:

ETL listed for permanent installation

Voltage: 115 VAC, 60 Hz

Current: Filtration/Circulation: 12.9 AMP

Lighting: 2.2 AMP for each 4 foot section, 4.4 AMP total

FILTRATION:

Mechanical Filter: 2 ea. Polyester Pad, 7 ½" x 14"

Chemical Filter: 2-1 lb. Black Diamond Activated Carbon in Carbon Filter Pack

Biological Filter: 2 ea. CBW-1

UV Treatment: Aquafine DW-300; 50,000 uWs/cm^2, @ 4,000 hrs.

Protein skimmer: Marineland Commercial Aquarium Foam Fractionator

"NEW" WATER FROM TREATED WATER SUPPLY:

None: Buyer supplies salt water as needed

CIRCULATION/FILTRATION PUMP:

Pump: IWAKI MD-100RLT-115; 1700 GPH; UL recognized

Display tank turns per hour (TPH): 8 TPH nominal

HEATER:

1,000 W. Titanium Heater, UL listed Thermostat

Controller, UL listed; Temperature range: 50-130° F.

GFCI Protected

LIGHTING:

UL listed light fixtures with polycarbonate lamp covers

LAMPS: 12 each 40 W., 48", T12, rapid start, fluorescent; 5,000K, 85 CRI, 20,000 hr. life; 2820 Lumens (mean); GE SPX50 or Philips Ultralume 50

MATERIALS OF CONSTRUCTION:

Frame: Mild steel tubular welded construction, epoxy powder coated

Doors: Polyurethane

Misc. Panels & Covers: Expanded PVC, ABS, Formica

BUYER SUPPLIED CONNECTIONS FOR INSTALLATION:

Electric Supply:

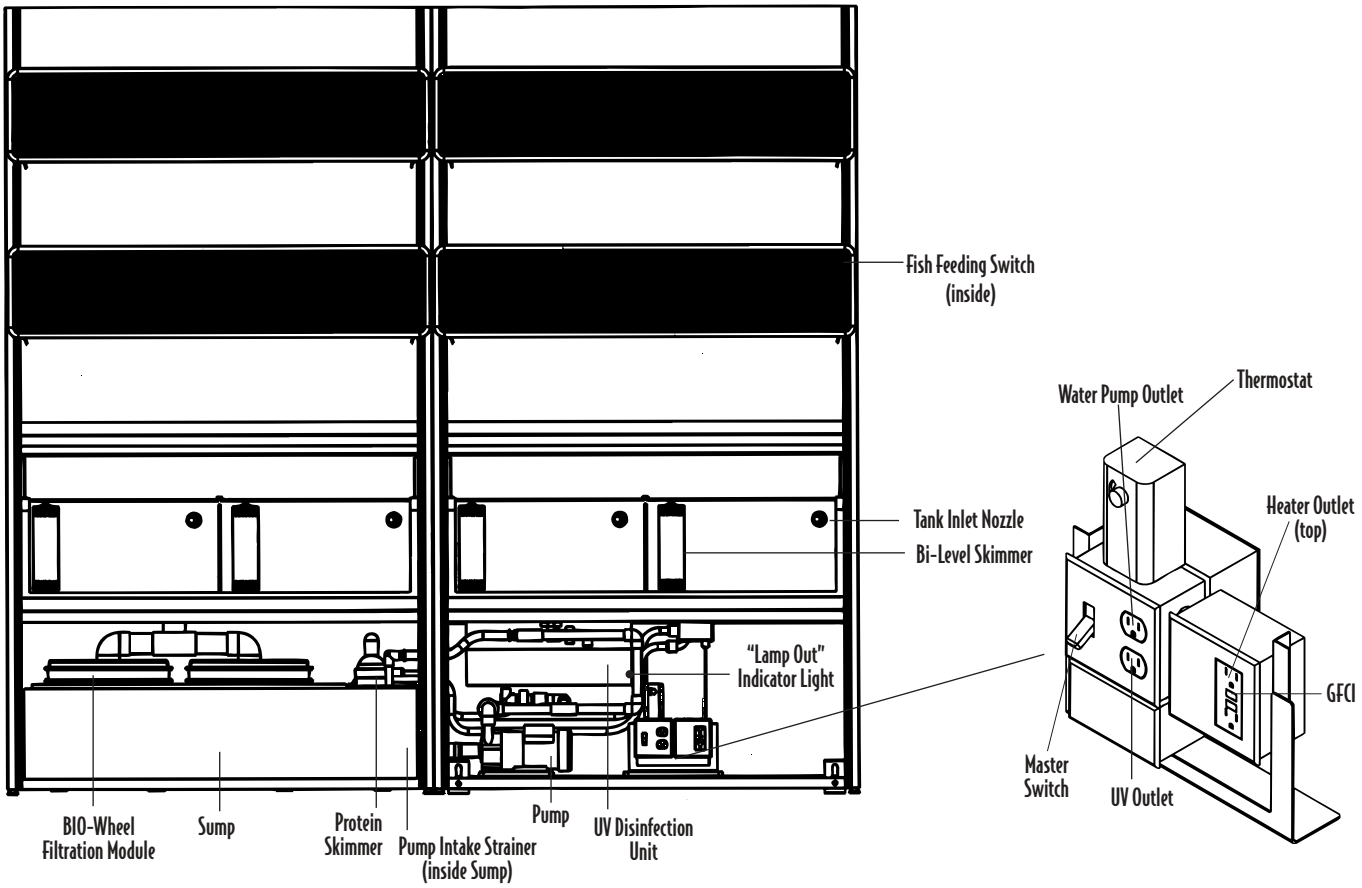
Main Circuit: Hard wired J-Box, 115 VAC, 60 Hz, 20 AMP

Lighting: Plug connected, 2 places; 115 VAC, 60 Hz, 2.2 AMPs Each, GFCI protected

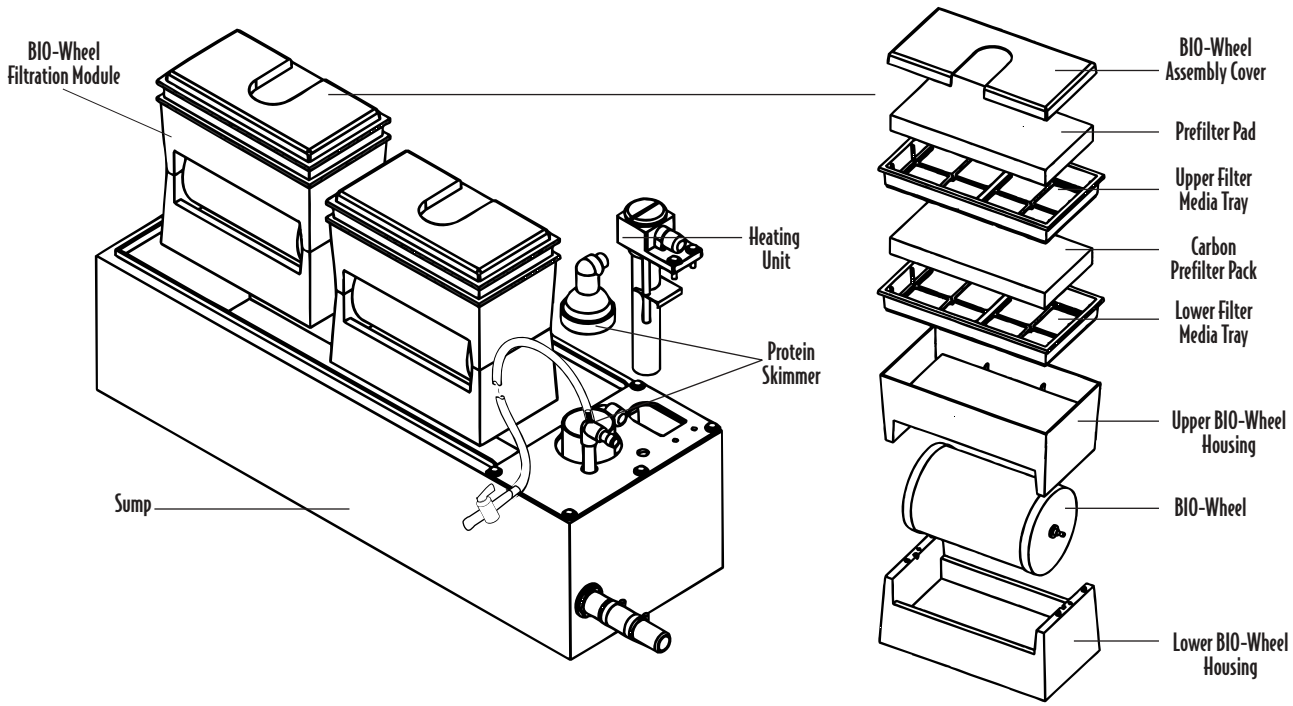
Treated Water Supply: None

Drain: At or below grade, 30' run

Exploded View w/Electrical Assembly Pullout



Sump w/BIO-Wheel Filtration Module Exploded View



SYSTEM Specifications

Integrated Rack System MV4MR
4 Foot Refrigerated, Marine Water System

MECHANICAL:

Size: 20”D x 51½” L x 94” H (shipping height: 85”)

Tilt: 20½” D x 51½” L x 86½” H

Weight: 490 Lb. (Est.)

Floor-attached for seismic loads

System Gallon Capacity: 98 gallons

ELECTRIC:

ETL listed for permanent installation

Voltage: 115 VAC, 60 Hz

Current: Filtration/Circulation: 12.5 AMP

Lighting: 2.2 AMP

FILTRATION:

Mechanical Filter: 1 ea. Polyester Pad, 7 ½” x 14”

Chemical Filter: 1 lb. Black Diamond Activated Carbon in Carbon Filter Pack

Biological Filter: 1 ea. CBW-1

UV Treatment: Aquafine DW-300; 50,000 uWs/cm^2, @ 4,000 hrs.

“NEW” WATER FROM TREATED WATER SUPPLY:

NoNE: Buyer supplies salt water as needed.

CIRCULATION/FILTRATION PUMP:

Pump: IWAKI MD-70RLT-115; 1200 GPH; UL recognized

Display tank turns per hour (TPH): 8 TPH minimum

REFRIGERATION:

1/3 HP, R134A with Helical Heat Exchanger

Thermostat Controller, UL Listed. Temperature Range 50-130˚F. GFCI Protected

LIGHTING:

UL Listed light fixtures with polycarbonate lamp covers.

Lamps: 6 each 40 W., 48”, T12, Rapid Start, Fluorescent; 5,000K, 85 CRI, 20,000 Hr. Life; 2820 Lumens (mean); GE SPX50 or Philips Ultralume 50

MATERIALS OF CONSTRUCTION:

Frame: Mild steel tubular welded construction, epoxy powder coated

Doors: Polyurethane

Misc. Panels & Covers: Expanded PVC, ABS, Formica

BUYER SUPPLIED CONNECTIONS FOR INSTALLATION:

Electric Supply:

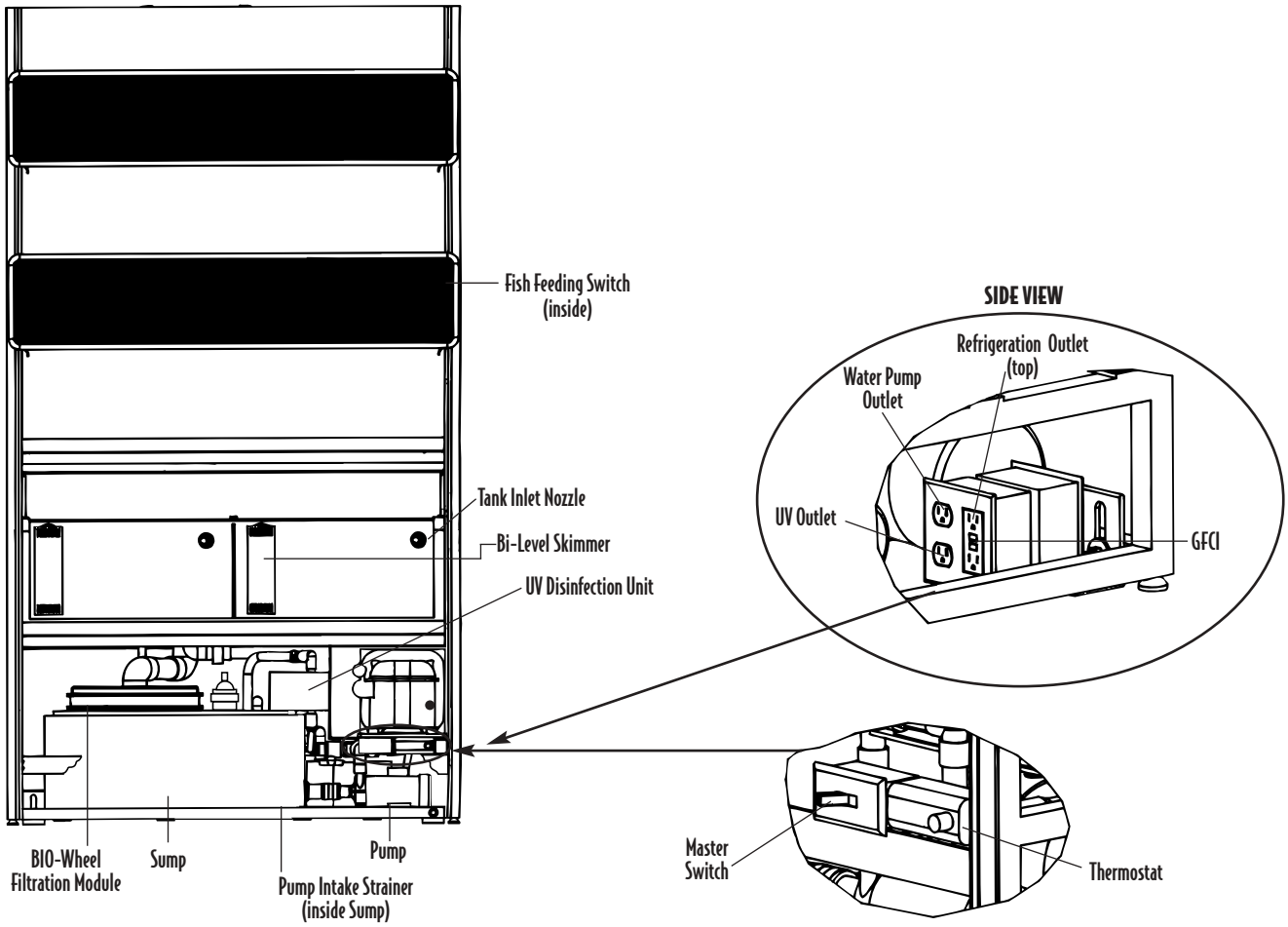
Main circuit: Hard wired J-Box, 115 VAC, 60 Hz, 15 AMP

Lighting: Plug connected, 2 places; 115 VAC, 60 Hz, 2.2 AMPs each, GFCI protected

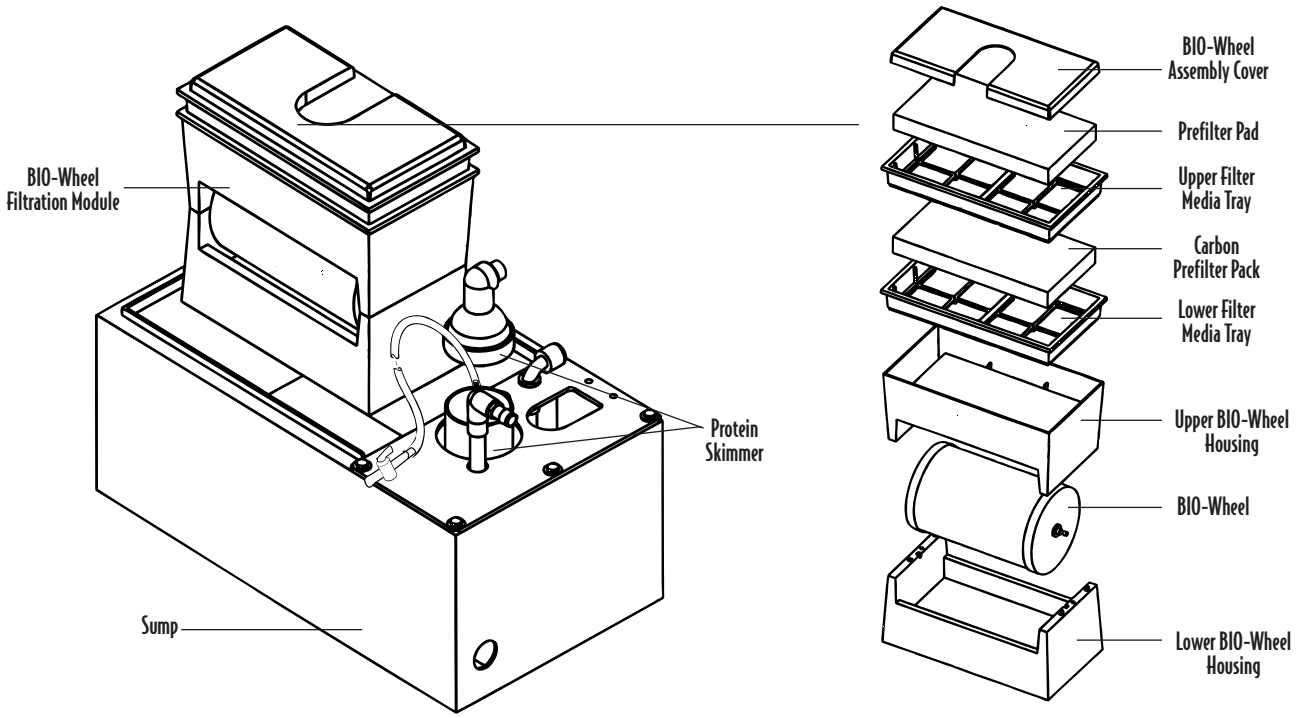
Treated Water Supply: None

Drain: At or Below Grade, 30’ Run

Exploded View w/Electrical Assembly Pullout



Sump w/BIO-Wheel Filtration Module Exploded View



SYSTEM Specifications

Integrated Rack System MV8MR
8 Foot Refrigerated, Marine Water System

Mechanical:

Size: 20"D x 103" L x 94" H (shipping height: 85")

Tilt: 20 1/2" D x 103" L x 85 1/2" H

Weight: 875 Lb. (Est.)

Floor-attached for seismic loads

System Gallon Capacity: 192 gallons

ELECTRIC:

ETL listed for permanent installation

Voltage: 115 VAC, 60 Hz

Current: Filtration/Circulation: 12.9 AMP

Lighting: 2.2 AMP for each 4 foot section, 4.4 AMP total

FILTRATION:

Mechanical Filter: 1 ea. Polyester Pad, 7 1/2" x 14"

Chemical Filter: 1 lb. Black Diamond Activated Carbon in Carbon Filter Pack

Biological Filter: 2 ea. CBW-1

UV Treatment: Aquafine DW-300; 50,000 uWs/cm^2, @ 4,000 hrs.

"NEW" WATER FROM TREATED WATER SUPPLY:

None: Buyer supplies salt water as needed

CIRCULATION/FILTRATION PUMP:

Pump: IWAKI MD-100RLT-115; UL recognized

Display tank turns per hour (TPH): 8 TPH normal

REFRIGERATION:

1/2 HP, R134A with Helical Heat Exchanger

Thermostat Controller, UL Listed; Temperature Range: 50-130° F. GFCI protected

LIGHTING:

UL listed light fixtures with polycarbonate lamp covers

Lamps: 12 each 40 W., 48", T12, rapid start, fluorescent; 5,000K, 85 CRI, 20,000 hr. life; 2820 lumens (mean); GE SPX50 or Philips Ultralume 50

MATERIALS OF CONSTRUCTION:

Frame: Mild steel tubular welded construction, epoxy powder coated

Doors: Polyurethane

Misc. Panels & Covers: Expanded PVC, ABS, Formica

BUYER SUPPLIED CONNECTIONS FOR INSTALLATION:

Electric Supply:

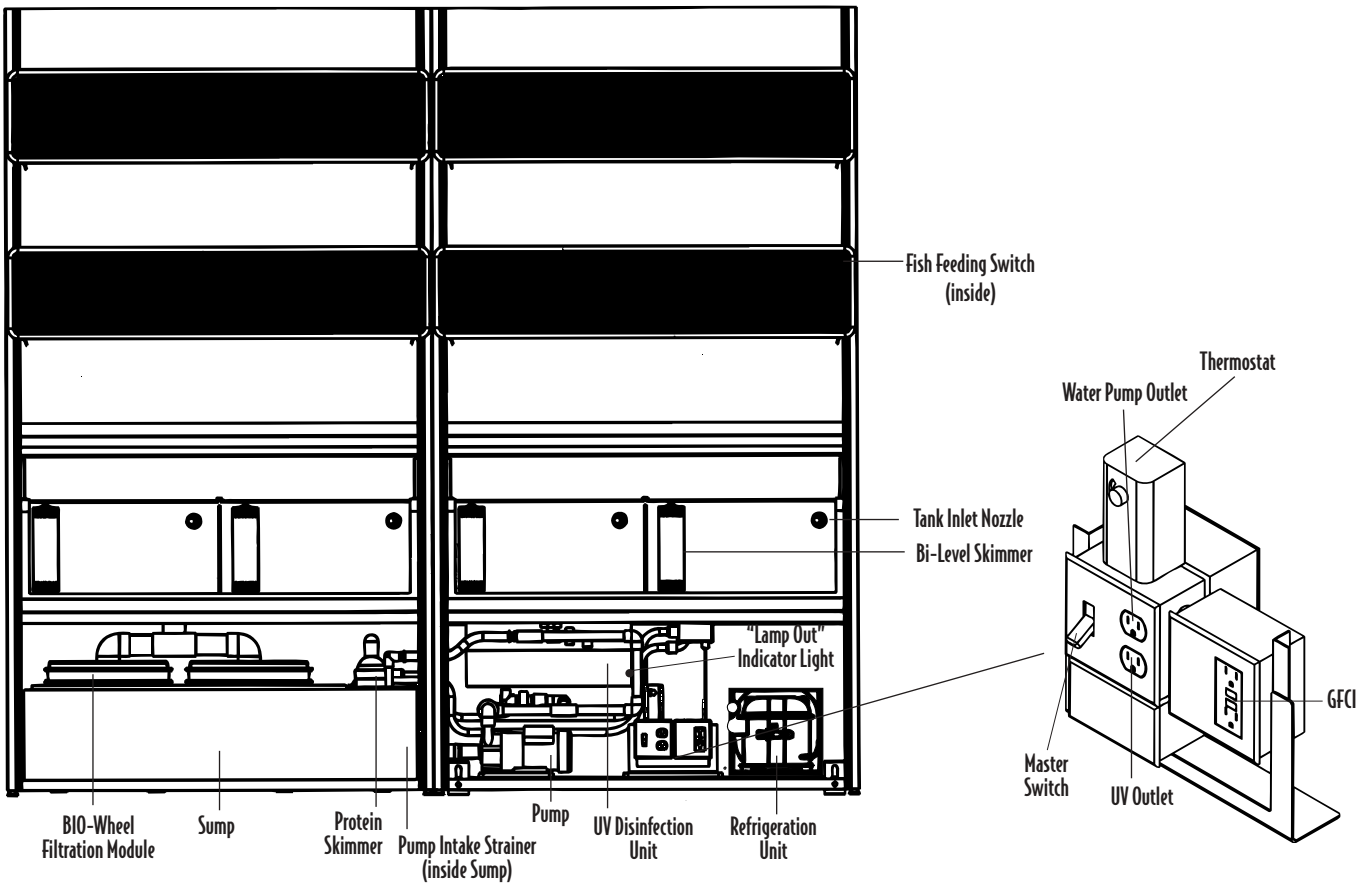
Main circuit: Hard wired J-Box, 115 VAC, 60 Hz, 20 AMP

Lighting: Plug connected, 2 places; 115 VAC, 60 Hz, 2.2 AMPs each, GFCI protected

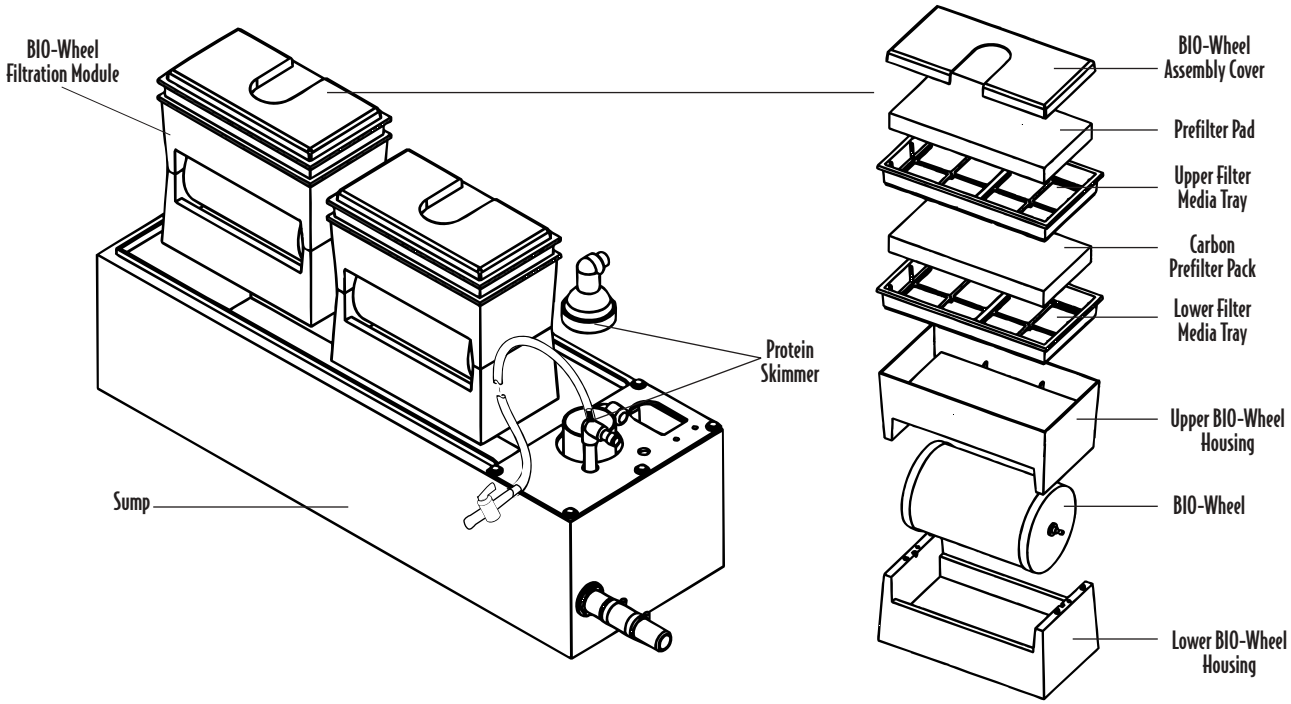
Treated Water Supply: None

Drain: At or below grade, 30' run

Exploded View w/Electrical Assembly Pullout



Sump w/BIO-Wheel Filtration Module Exploded View



CUSTOMER SERVICE

Should you experience problems with your system, call the 24-Hour MaRS Hotline at (800) 576-MaRS (6277).

To order any of the items listed below, call (800) 322-1266.

WEEKLY USE ITEMS:	
1. Prefilter Pads – Blue	MZ0180
2. Prefilter Pads – Coarse White	MZ0181
3. Carbon Filter Packs	MZ0175
SERVICING ITEMS:	
1. Maintenance Kit	MZ0012
2. KX Carbon/Micron Repl. Kit	MZ0040
3. UV Sterilizer Servicing Kit	MZ0017
4. UV Lamp	MZ0061
5. Replacement O-Rings	MZ0041
6. Maintenance Log (25-week supply)	074258

MaRS™

Marineland Retailer Systems

A Division of The Aquaria Group • Moorpark, CA 93021

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SIDE PANELS STAINLESS STEEL & STARLITE

Stainless Steel Side Panel

- Constructed of 18 gauge 304 stainless steel 1 1/4" square tubing
- 48" H isolation partition is double wall 20 gauge stainless steel sheet metal and is lined with high density foam to reduce noise
- No exposed raw edges to catch hair and dirt
- Side panel fits over a floor mount "U" channel to prevent cross contamination
- INCLUDES: Wall Angle to connect panel to back wall
- Available in custom sizes

#1048-SP 48" W x 75 1/2" H
#1060-SP 60" W x 75 1/2" H
#1072-SP 72" W x 75 1/2" H
#1084-SP 84" W x 75 1/2" H
#1096-SP 96" W x 75 1/2" H

Starlite Side Panel

- Frame body constructed of heavy duty TYPE 304 stainless steel
- Hand welded and polished
- 1/4" Stainless steel vertical and horizontal rods
- 48" H Isolation partition is a wall of 0.40" HDPE (high density polyethylene)
- INCLUDES: Wall Angle to connect panel to back wall

#1048-SLSP 48" L x 75 1/2" H Starlite Side Panel*
#1060-SLSP 60" L x 75 1/2" H Starlite Side Panel*
#1072-SLSP 72" L x 75 1/2" H Starlite Side Panel*
#1084-SLSP 84" L x 75 1/2" H Starlite Side Panel*
#1096-SLSP 96" L x 75 1/2" H Starlite Side Panel*
* INDICATE COLOR WHEN ORDERING

STARLITE IS A HIGH DENSITY POLYETHYLENE (HDPE)

- Abrasion Resistant
- Moisture Resistant
- Stain Resistant
- Odor Resistant
- Very Durable
- FDA Approved
- High Impact Strength
- Chemical Resistant

Available Starlite Colors

Blue Clay Green Red

*This is a photographic image and may not reflect exact color due to slight variations in manufacturing.
PLEASE CALL FOR FREE SAMPLE BEFORE ORDERING

DOORS PREMIUM & BOWL FEEDER

Premium Door

There are many reasons why the TriStar Premium kennel door will provide your facility with the performance you require.

- 1 1/4" stainless steel tubing is miter cut to create a pleasing aesthetic (Miter-diagonally joined at the corner)
- Stainless steel rods are welded to the bottom frame so urine, water and bacteria will not get trapped inside
- Kennel doors swing both in and out to assist with large or aggressive dogs and to allow kennel runs in narrow areas
- No bottom rail to trip over or trap urine, feces or fur
- Positive spring loaded latch allows one- handed operation & assures door can't be pushed open once closed
- Custom sizes available, great for renovating in existing spaces
- Wall angles to attach doors to block wall included/standard
- Grill door is made up of 1/4" stainless rods that pass through 14 gauge stainless band, Then tack welded to prevent rattling

#1036-KD 35 1/2" W x 75 1/2" H
#1048-KD 47 1/2" W x 75 1/2" H
#1060-KD 59 1/2" W x 75 1/2" H

Rotating Bowl Feeder

A stainless steel panel that rotates 360 degrees. This feature provides easy and safe access to food and water. A self-closing spring latch design makes this feature very easy to operate. This is an option that can be built into any door manufactured by TriStar. Two stainless steel 2 quart bowls included.

#1036-BF

NO. 387 RUN, TRANSFER DOOR. SURFACE MTD

BACK PANELS
STAINLESS STEEL & STARLITE

Stainless Steel Back Panel

- Panel is double wall 20 gauge stainless steel sheet metal and is lined with high density foam to reduce noise
- No exposed raw edges to catch hair and dirt
- Side panel fits over a floor mount "U" channel to prevent cross contamination
- INCLUDES: Wall Angle to connect panel to back wall
- Available in custom sizes
- Panel is designed with cross break for added strength

#1036-BP 35 1/2" W x 75 1/2" H Stainless Steel Back Panel
#1048-BP 47 1/2" W x 75 1/2" H Stainless Steel Back Panel
#1060-BP 59 1/2" W x 75 1/2" H Stainless Steel Back Panel

Starlite Back Panel

- Panel frame is constructed of heavy duty TYPE 304 stainless steel
- Panel is a wall of 0.40" HDPE (high density polyethylene)
- Hand welded and polished

#1036-SLBP 35 1/2" W x 75 1/2" H Starlite Back Panel*
#1048-SLBP 47 1/2" W x 75 1/2" H Starlite Back Panel*
#1060-SLBP 59 1/2" W x 75 1/2" H Starlite Back Panel*
* INDICATE COLOR WHEN ORDERING (See page 41 for color options)

GUILLOTINE

Open Position Closed Position

TRANSFER DOOR TO BE SURFACE MTD.

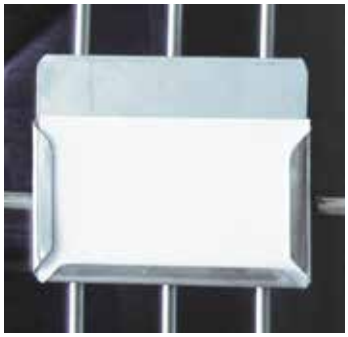
Starlite Back Panel Guillotine Door

The guillotine door is a feature offered in all starlite back panels. The door runs the width the back panel and slides inside of a stainless steel track. A back panel with guillotine door is usually used when you have a back-to-back kennel design. This feature provides easy and safe access to the adjoining kennel.

1000-EZCB
Upgraded Counter Balance & Slides

1000-GDCB
Counter Balance

ACCESSORIES



Card Holders

- Constructed of 304 stainless steel
- Attaches to any Kennel or Cage rod door

#CHGD-3x5 3"x5" Glass Door Card Holder
#CHGD-5x7 5"x7" Glass Door Card Holder
#CHRD-3x5 3"x5" Rod Door Card Holder
#CHRD-5x7 5"x7" Rod Door Card Holder

Kennel Mount Infusion Platforms

- Constructed of heavy type 304 stainless steel
- Attachment pole doubles as IV pole
- IV hook included
- Hanger hooks attach to most kennels and cages
- Available in custom sizes

#1000-IP Single Infusion Pump Platform
#1010-IP Dual Infusion Pump Platform

Stainless Steel Resting Bench

- Constructed of 304 stainless steel
- Hinge system enables it to swing up for cleaning

#1036-RB 35 1/2" W x 24" D Stainless Steel Resting Bench
#1048-RB 47 1/2" W x 24" D Stainless Steel Resting Bench
#1060-RB 59 1/2" W x 24" D Stainless Steel Resting Bench

Starlite Resting Bench (Not Shown)

- Stainless steel frame and Starlite surface design
- Hinge system enables it to swing up for cleaning

#1036-SLRB 35 1/2" W x 24" D Starlite Resting Bench
#1048-SLRB 47 1/2" W x 24" D Starlite Resting Bench
#1060-SLRB 59 1/2" W x 24" D Starlite Resting Bench

Starlite Trough Cover

- Stainless steel frame and Starlite surface design
- "Z-Clip" design enables you to lift off cover for easy cleaning

#1036-SLTC 35 1/2" W x 12" D Starlite Trough Cover
#1048-SLTC 47 1/2" W x 12" D Starlite Trough Cover
#1060-SLTC 59 1/2" W x 12" D Starlite Trough Cover

Stainless Steel Trough Cover (Not Shown)

- Constructed of 304 stainless steel
- "Z-Clip" design enables you to lift off cover for easy cleaning

#1036-TC 35 1/2" W x 12" D Stainless Steel Trough Cover
#1048-TC 47 1/2" W x 12" D Stainless Steel Trough Cover
#1060-TC 59 1/2" W x 12" D Stainless Steel Trough Cover

Kennel Roof Enclosures

- Constructed of heavy duty stainless steel

#1000-RE * CALL FOR SIZES AND PRICING

NO. 410.01 HOOK, LEASH

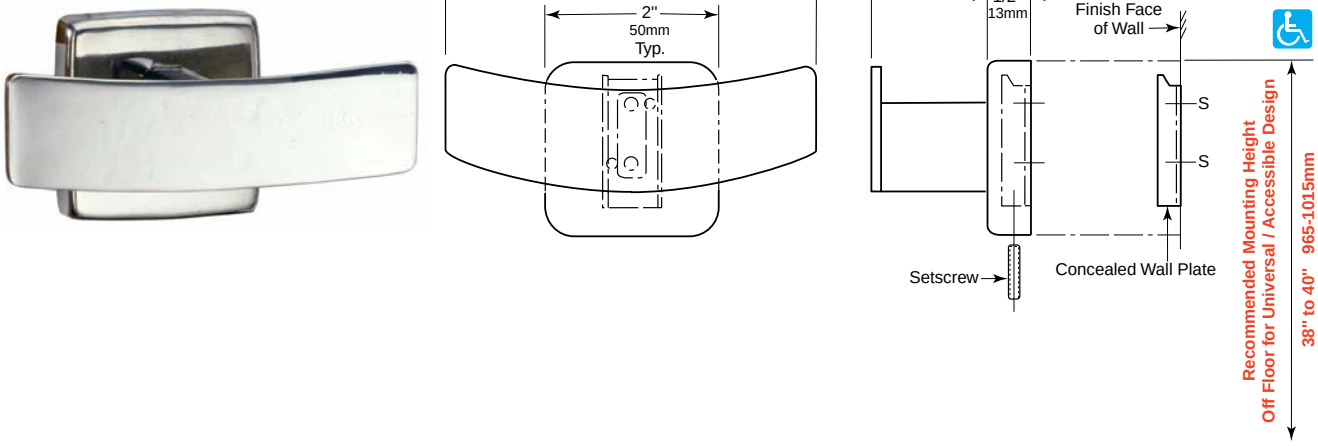
BOBRICK

Technical Data

ClassicSeries® SURFACE-MOUNTED DOUBLE ROBE HOOK

B-672
B-6727

Specify Model Required: ☐ Model B-672 Bright polished stainless steel
☐ Model B-6727 Satin-finish stainless steel



MATERIALS:

Flange and Support Arm — 18-8, type-304, 22-gauge (0.8mm) stainless steel. Concealed, 16-gauge (1.6mm) stainless steel mounting bracket. All-welded construction. Secured to wall plate with a stainless steel setscrew.

Concealed Wall Plate — 18-8, type-304, 16-gauge (1.6mm) stainless steel.

Cap — 18-8, type-304, 10-gauge (3.6mm) stainless steel. Welded to the support arm.

INSTALLATION:

To remove concealed wall plate from back of flange and mounting bracket, loosen setscrew. Mount wall plate so prongs are at top; secure with two sheet-metal screws, furnished by manufacturer, at points indicated by an *S*. Engage mounting bracket onto prongs of wall plate, then secure into position by tightening setscrew at bottom of flange.

For partitions with particle-board or other solid core, secure with sheet-metal screws furnished, or provide through-bolts, nuts, and washers.

For hollow-core metal partitions, provide solid backing into which the furnished sheet-metal screws can be secured.

For plaster or dry wall construction, provide concealed backing to comply with local building codes, then secure unit with sheet-metal screws furnished.

For other wall surfaces, provide fiber plugs or expansion shields for use with sheet-metal screws furnished, or provide 1/8" (3mm) toggle bolts or expansion bolts.

SPECIFICATION:

Surface-mounted double robe hook shall be type-304 stainless steel with _____ (insert one: bright polished or satin) finish. Flange and support arm shall be 22 gauge (0.8mm) and equipped with a concealed, 16-gauge (1.6mm) mounting bracket that is secured to a concealed, 16-gauge (1.6mm) wall plate with a stainless steel setscrew. Cap shall be 10 gauge (3.6mm), welded to the support arm.

Surface-Mounted Double Robe Hook shall be Model _____ (insert model number) of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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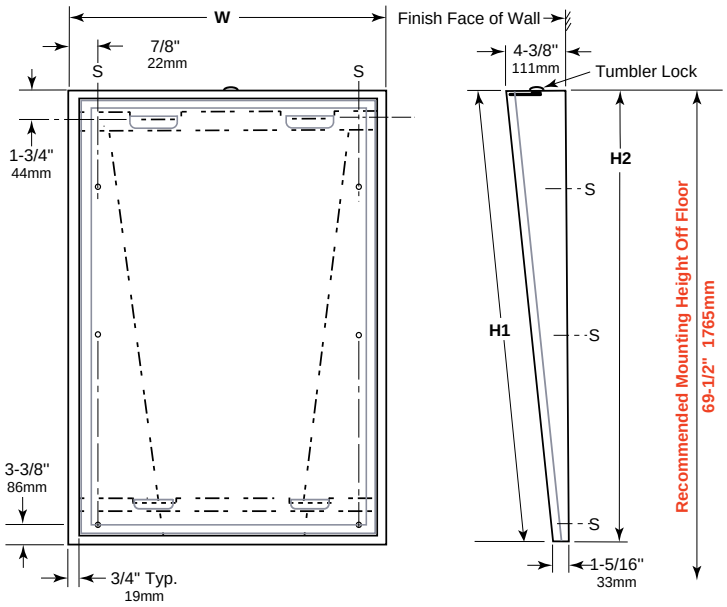
BOBRICK

Technical Data

TILT MIRROR WITH STAINLESS STEEL FRAME

B-293 SERIES



STANDARD STOCK SIZES

MODEL NO.	MIRROR SIZE W	MIRROR SIZE H1	OVERALL SIZE W	OVERALL SIZE H2
B-293 1830	18" (46cm)	30" (76cm)	18" (46cm)	30-3/16" (77cm)
B-293 1836	18" (46cm)	36" (91cm)	18" (46cm)	36-3/16" (92cm)
B-293 2436	24" (61cm)	36" (91cm)	24" (61cm)	36-3/16" (92cm)

Other sizes up to 40" x 40" (101 x 122cm) or 48" x 36" (122 x 91cm) are available on special order; minimum size available, 16" x 24" (41 x 61cm).
Design not as shown

MATERIALS:

Mirror Frame — 18-8, type 304, heavy-gauge stainless steel, 3/4" x 3/4" (19 x 19mm) angle with vertical-grain satin finish. One piece, roll-formed construction forms continuous integral stiffener on all sides. Bevel design on front of angle holds frame tightly against mirror. Corners of mirror frame are heliarc welded, ground and polish smooth. Galvanized steel back is fastened to frame with concealed screws and equipped with integral horizontal hanging brackets near the top and bottom of the mirror for hanging the mirror and to prevent the mirror from pulling away from the wall frame.

Wall Frame — 18-8, type 304, heavy-gauge stainless steel with satin finish. Tapers from 4-3/8" (111mm) depth at top to 1-5/16" (33mm) depth at bottom. Wall Frame furnished with tumbler lock to secure mirror to wall frame.
Designer's Note: Type 304 stainless steel provides superior corrosion resistance, compared to 400 Series stainless steel, against environmental moisture, hose-down maintenance and strong cleaning solutions.

Mirror — No. 1 quality, 1/4" (6mm) select float glass, selected for silvering; electrolytically copper-plated by the galvanic process, guaranteed for 15 years against silver spoilage. All edges are polished and protected by plastic filler strips; back is protected by full-size, shock-absorbing, water-resistant, nonabrasive, 1/8" (3mm) thick polystyrene padding.

OPERATION:

Mirror is designed to provide full visibility for wheelchair patients in hospitals and nursing homes.

INSTALLATION:

For complete installation instructions please follow 293-69 installation instruction sheet.

SPECIFICATION:

Tilt mirror assembly shall consist of a mirror and a separate wall frame with built-in wall hanger. Wall frame furnished with tumbler lock for securing mirror to wall frame. Tilt mirror frame shall be type 304 stainless steel with beveled front to hold frame tightly against mirror; corners shall be welded, ground, and polished smooth. Wall frame shall be type 304 stainless steel designed with horizontal locking bars to secure mirror to wall frame. All exposed surfaces shall have satin finish with vertical grain. Select float glass mirror shall be guaranteed for 15 years against silver spoilage. All edges shall be protected by plastic filler strips. Back shall be protected by full-size, shock-absorbing, water-resistant, nonabrasive, 1/8" (3mm) thick polystyrene padding.

Tilt Mirror shall be Model B-293 _____ (insert width and height) of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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BOBRICK

Technical Data

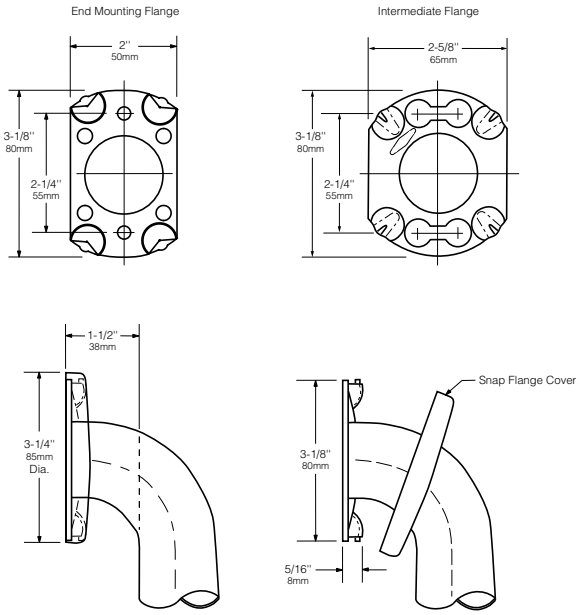
1½" (38mm) DIAMETER STAINLESS STEEL GRAB BARS WITH SNAP FLANGE

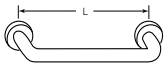
B-6806 SERIES

Specify Finish Required:

☐ Satin finish

☐ Satin finish with peened gripping surface; add suffix .99 to model number

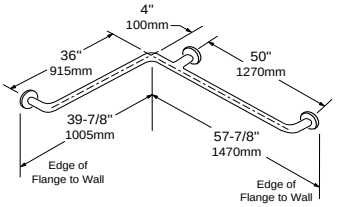




HORIZONTAL

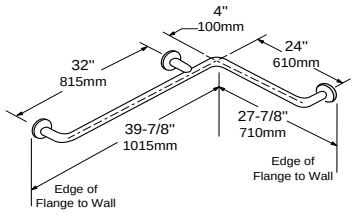
B-6806 x 12, 18, 24, 30, 36, 42, 48

VERTICAL



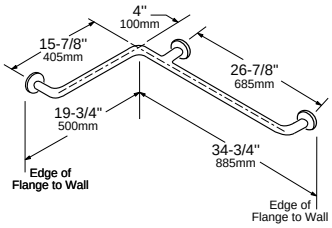
TWO-WALL WHEELCHAIR COMPARTMENT

B-68137



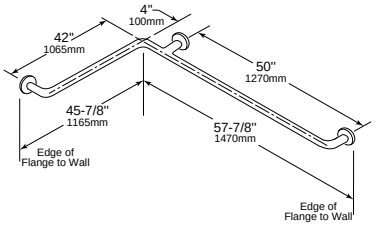
HORIZONTAL TUB / SHOWER COMPARTMENT BAR 24 x 36

B-68616



HORIZONTAL TWO-WALL BAR for Shower Stall

B-6861



TWO-WALL TOILET COMPARTMENT BAR 42 x 54

B-6897

continued . . .

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MATERIALS:

Grab Bar — 18-8 S, type-304, 18-gauge (1.2mm) stainless steel tubing with satin-finish. 1-1/2" (38mm) outside diameter. Ends are heliarc welded to flanges. Clearance between the grab bar and wall is 1-1/2" (38mm).

Concealed Mounting Flanges — 18-8 S, type-304, 11-gauge (3.2mm) thick, stainless steel plate; end flanges 2" x 3-1/8" (50 x 80mm) with holes for attachment to wall. Intermediate flanges 2-5/8" x 3-1/8" (65 x 80mm) wide x 3-1/8" (80mm) diameter.

Snap Flange Covers — 18-8 S, type-304, 22-gauge (0.8mm) drawn stainless steel with satin-finish. 3-1/4" (85mm) diameter x 1/2" (13mm) deep. Each cover snaps over mounting flange to conceal mounting screws.

STRENGTH:

Bobrick grab bars that provide 1-1/2" (38mm) clearance from wall can support loads in excess of 900 pounds (408kg) if properly installed. Other grab bar configurations can support loads in excess of 250 pounds (113kg) if properly installed, complying with accessible design (including ADAAG in the U.S.A.) for structural strength

Safety Warning: Grab bars are no stronger than the anchors and walls to which they are attached and, therefore, must be firmly secured in order to support the loads for which they are intended. To avoid potential injury, the building owner or maintenance personnel should remove the grab bar from service if the grab bar is not adequately secured to wall or if there is any observed damage to the welds.

INSTALLATION:

Provide concealed anchor device or backing as specified or required in accordance with local building codes before wall is finished. Fasten concealed mounting flanges to anchor device or backing with at least two screws opposing each other in each flange. Snap flange covers over each mounting flange to conceal mounting screws. Concealed anchor devices and mounting screws are not included with Bobrick grab bars and must be specified as an accessory.

For Grab Bars with an Intermediate Flange(s), Pull Snap-Flange Covers away from mounting flanges. Place grab bar in desired mounting location. Use intermediate flange as a template to mark location of mounting screws at intermediate flange only. Mark screw locations at the center of the slot in the middle of the double-keyhole shaped mounting holes (2) in the intermediate flange. Remove grab bar from wall. Drive the intermediate flange mounting screws into wall at marked locations. **Note:** Make sure to leave a space of just over 1/8" (3.17mm) between the underside of the screw head and the wall. Install grab bar on the wall by placing the round ends of the intermediate flange double-keyhole shaped mounting holes over the mounting screws (2) are located in the middle of the flange slots. Install the mounting screws into the wall at the end flanges and secure tightly. Tighten the mounting screws at the intermediate flange. Press all snap-flange covers into place to conceal mounting flanges.

Note: Recommend use of 1/4" or #14 sheet metal or wood screws to install Intermediate Flange. #12 screws may also be used.

Important Notes:

1. **Mounting Kits —** Bobrick offers a mounting kit for installing grab bars; **one Bobrick mounting kit is required for each flange.**

Mounting Kit No.	Description
252-30	Consists of # (3) 14 x 2½" type-304 stainless steel, Phillips round-head, sheet-metal screws.

2. **Grab Bar Fastener —** Bobrick offers a grab bar fastening system that secures all Bobrick grab bar series; **one Bobrick fastener is required for each flange.** Install grab bar without backing in wall requires minimum 5/8" (16mm) thick painted or tiled drywall.

WingIt™ Fastener No.	Description
251-4	Consists of 10–32 x 5/16" round-head, Phillips 18/8 stainless steel screws. (1) WingIt grab bar fastener.

3. **Optional Anchor Device —** Bobrick grab bar anchor device includes stainless steel machine screws to be used for attaching grab bars to anchors. **one Bobrick concealed anchor device is required for each flange.**

Optional Anchor No.	Description
2583	Anchor for 3/4" to 1" (19-25mm) panel 1 anchor required for each flange.
2586	Anchor for 1/2" to 1" (13mm) panel 1 anchor required for each flange.

SPECIFICATION:

Grab bar shall be type-304 stainless steel with satin-finish. Grab bar shall have 18-gauge (1.2mm) wall thickness and 1-1/2" (38mm) outside diameter. Clearance between the grab bar and wall shall be 1-1/2" (38mm). Concealed mounting flanges shall be 11-gauge (3.2mm) thick stainless steel plate, 2" x 3-1/8" (50 x 80mm), and equipped with at least two screw holes for attachment to wall. Flange covers shall be 22 gauge (0.8mm), 3-1/4" (85mm) diameter x 1/2" (13mm) deep, and shall snap over mounting flange to conceal mounting screws and/or WingIt fasteners. Ends of grab bar shall pass through concealed mounting flanges and be heliarc welded to form one structural unit. Grab bar shall comply with accessible design (including ADAAG in the U.S.A.) for structural strength.

Grab Bar shall be Model _____ (insert model number) of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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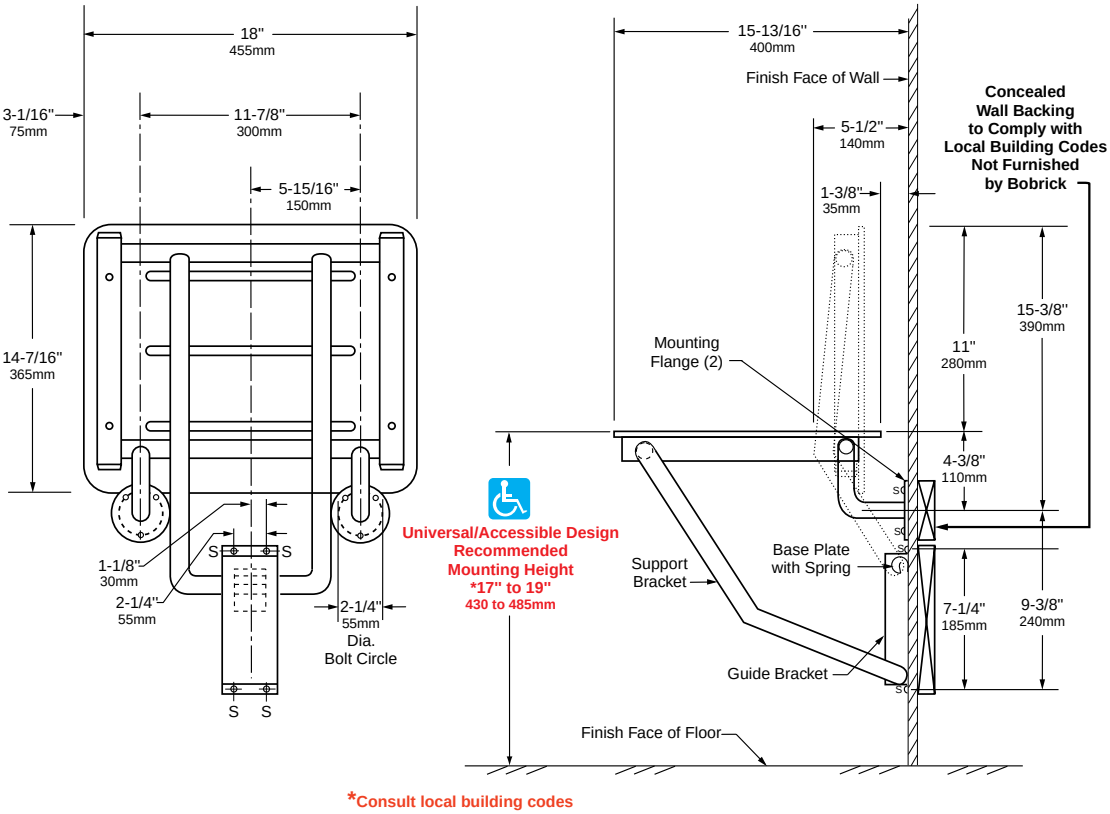
BOBRICK

Technical Data

SOLID PHENOLIC FOLDING SHOWER/DRESSING AREA SEAT

B-5191



*Consult local building codes

MATERIALS:

Seat — One-piece, 5/16" (8mm) thick, solidly fused plastic laminate with matte-finish melamine surfaces, ivory-colored face sheets, and black phenolic-resin core that are integrally bonded — cannot delaminate. Integral slots for water drainage. Secured to frame with stainless steel carriage bolts and acorn nuts.

Frame — 18-8, Type-304, stainless steel with satin finish. 16-gauge (1.6mm), 1-1/4" (30mm) square tubing and 18-gauge (1.2mm), 1" (25mm) diameter seamless tubing.

Mounting Flanges (2) — 18-8, Type-304, 3/16" (5mm) thick stainless steel with satin finish. 3" (75mm) diameter with three mounting screw holes.

Baseplate — 18-8, Type-304, heavy-gauge stainless steel.

Spring — 17-7, Type-301, 24-gauge (0.6mm) stainless steel. Spot-welded to baseplate.

Guide Bracket — 18-8, Type-304, 16-gauge (1.6mm) stainless steel with satin finish.

continued . . .

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OPERATION:

Shower seat can be folded up against the wall when not in use. The spring at the top of baseplate holds seat into upright position until released by pulling the top of seat away from wall. Bobrick Folding Shower Seats are not spring-loaded. The seats do not return automatically to the upright position after use. Support system with guide bracket allows varying mounting heights and leaves floor clear for easier cleaning. Nonporous solid phenolic seat has slots to permit water to drain, does not splinter or require oiling, and will not support growth of bacteria. Slotless round-head carriage bolts and acorn nuts provide additional safety to user. Bobrick shower seats, when properly installed, have sufficient strength to support 500 lbs., (227 kg) complying with accessible design guidelines (including ADAAG in the U.S.A.).

INSTALLATION:

Secure unit to wall at points indicated by an *S*, with the two mounting flanges located at top and the baseplate and guide bracket below. The bottom of support bracket must be positioned between the baseplate and guide bracket before they are secured to wall or partition. Mounting height of shower seat must comply with local building codes.

For stud walls, provide concealed backing to comply with local building codes and secure with #14 x 2-1/2" (6.3 x 65mm) stainless steel sheet-metal screws furnished by manufacturer.

For prefabricated shower stalls, provided adequate backing by the shower stall manufacturer. Secure with #14 x 2-1/2" (6.3 x 65mm) stainless steel mounting screws furnished by manufacturer. Bobrick offers a mounting kit for installing shower seats. For additional mounting kits please order 252-30. One mounting kit is required for each flange.

For masonry walls, provide fiber plugs or expansion shields for use with furnished sheet-metal screws, or provide 1/4" (6mm) toggle bolts or expansion bolts.

INSTALL SAFETY PLATE TO WALL:

Safety Plate is to be mounted on wall near Shower Seat in order to properly advise users of the Seat's weight restrictions. Correct installation of the Safety Plate will ensure that the Shower Seat meets A.N.S.I. Standards.

Permanently affix Safety Plate to wall on either side of the Shower Seat at a minimum height of 30" (760mm). If mounted above Seat, the Plate must be high enough so that it is not covered when Seat is on the up position. Mounting screws (4) are recommended, but double-sided tape on rear of Plate may be used for very smooth, non-porous surfaces.

SAFETY WARNING: Shower seats are no stronger than the anchors and walls to which they are attached and must be firmly secured in order to support the loads for which they are intended. Consult and comply with local building codes. To avoid potential injury, the building owner or maintenance personnel should remove the shower seat from service if the shower seat is not adequately secured to the wall. Unit shall support static loads of up to 500 lbs (227 kg) when properly installed and used. To avoid potential seat malfunction, DO NOT use seat if weight exceeds 500 lbs (227 kg).

SPECIFICATION:

Folding shower seat shall have a frame constructed of Type-304, satin-finish stainless steel that consists of 16-gauge (1.6mm), 1-1/4" (30mm) square tubing and 18-gauge (1.2mm), 1" (25mm) diameter seamless tubing. Seat shall be one-piece, 5/16" (8mm) thick, solidly fused plastic laminate with matte-finish melamine surfaces, ivory-colored face sheets, and black phenolic-resin core; secured to frame with stainless steel carriage bolts and acorn nuts. Shower seat shall be equipped with two 3" (75mm) diameter mounting flanges constructed of Type-304, 3/16" (5mm) thick, satin-finish stainless steel; a guide bracket constructed of Type-304, 16-gauge (1.6mm), satin-finish stainless steel; and a spring constructed of Type-301, 24-gauge (0.6mm) stainless steel that is spot-welded to a baseplate of Type-304, heavy-gauge stainless steel. Seat shall be able to lock in upright position when not in use. Shower seat shall comply with accessible design guidelines (including ADAAG in the U.S.A.).

Folding Shower Seat shall be Model B-5191 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

The illustrations and descriptions herein are applicable to production as of the date of this Technical Data Sheet.
The manufacturer reserves the right to, and does from time to time, make changes and improvements in designs and dimensions.

B-5191 r1/08/18 Printed in U.S.A.
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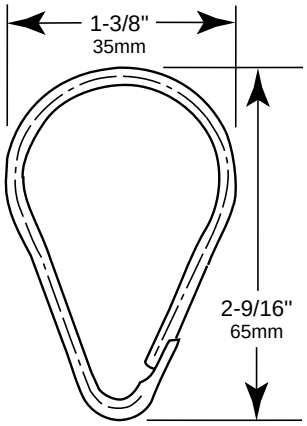
BOBRICK

Technical Data

STAINLESS STEEL SHOWER CURTAIN HOOK

204-1



MATERIALS:

18-8, Type-304, 0.09" (2.28mm) diameter stainless steel.

OPERATION:

Shower curtain hooks can be used with 1" and 1-1/4" (25 and 32mm) diameter shower curtain rods.

Designer's Note: 72" (1830mm) high shower curtains of opaque white vinyl are available from Bobrick as an optional accessory. Order Part No. 204-2 for 42" (1065mm) wide curtains (requires 7 hooks) or Part No. 204-3 for 70" (1780mm) wide curtains (requires 12 hooks).

INSTALLATION:

Hooks snap open to allow placement on 1" (25mm) or 1-1/4" (32mm) diameter shower curtain rods. Recommended for use with Bobrick Models B-207, B-4207, B-6047, and B-6107 stainless steel shower curtain rods.

SPECIFICATION:

Shower curtain hooks shall be 0.09" (2mm) diameter, type-304 stainless steel. Hooks shall be usable with 1" and 1-1/4" (25 and 32mm) diameter shower curtain rods.

Stainless Steel Shower Curtain Hooks shall be Part No. 204-1 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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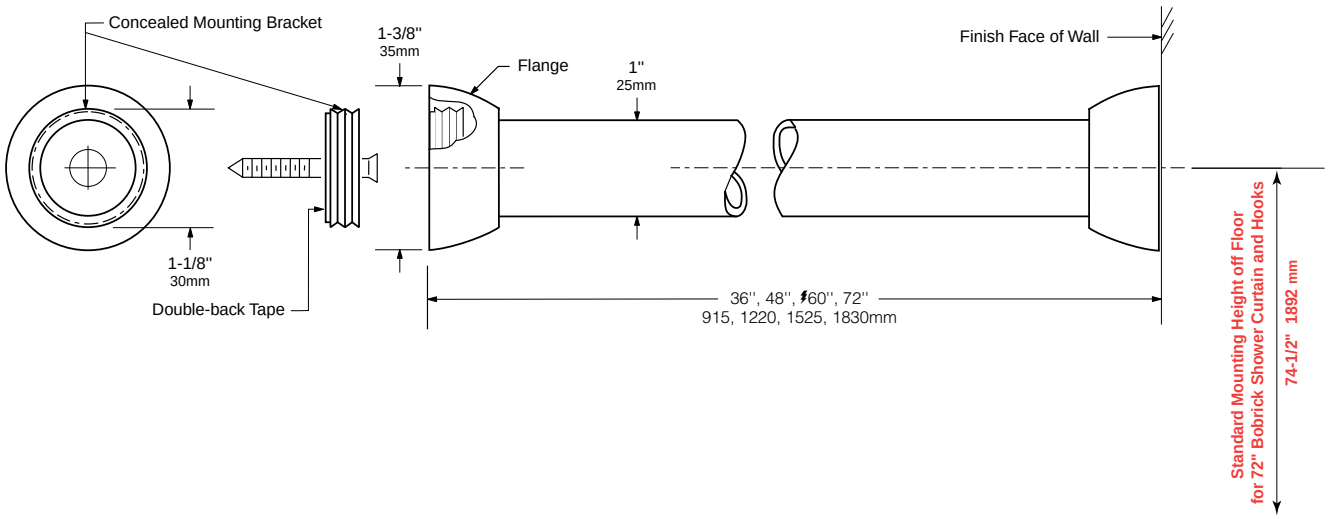
BOBRICK

Technical Data

HEAVY-DUTY SHOWER CURTAIN ROD WITH CONCEALED MOUNTING

B-207



MATERIALS:

Curtain Rod — 18-8, Type-304, 20-gauge (1.0mm) stainless steel tubing with satin finish. 1" (25mm) outside diameter. Available in lengths from 36" (915mm) up to 72" (1830mm).

Flanges (2) — 1-3/8" (35mm) diameter. Chrome-plated plastic. Bright polished finish.

Concealed Mounting Brackets (2) — Aluminum.

INSTALLATION:

Remove protective backing from tape attached to concealed mounting brackets. Position mounting brackets on opposite shower walls and secure with screws furnished by manufacturer. For plaster or dry wall construction, provide concealed backing to comply with local building codes, then secure brackets with screws furnished. For other wall surfaces, provide fiber plugs or expansion shields for use with screws furnished, or provide 1/8" (3mm) toggle bolts or expansion bolts. Slide flanges onto opposite ends of curtain rod. Position curtain rod, then screw threaded flanges onto mounting brackets.

SPECIFICATION:

Shower curtain rod shall be Type-304, 20-gauge (1.0mm) stainless steel with satin finish. It shall have an outside diameter of 1" (25mm). Flanges shall be 1-3/8" (35mm) diameter chrome-plated plastic with bright polished finish. Unit shall be equipped with concealed mounting brackets.

Shower Curtain Rod shall be Model B-207 x _____ (insert length) of Bobrick Washroom Equipment Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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BOBRICK

Technical Data

VINYL SHOWER CURTAINS

204-2
204-3

Specify Part Required:
- ❑ 204-2 42" wide x 72" high (1065 x 1830mm)
- ❑ 204-3 70" wide x 72" high (1780 x 1830mm)

MATERIALS:

Opaque, matte white vinyl 0.008" (0.2mm) thick, containing antibacterial and flame-retardant agents. White HDPE grommets along top, one every 6" (150mm). Bottom and sides are hemmed.

OPERATION:

Hooks available as optional accessory: order Bobrick Part No. 204-1. 204-2 shower curtain, 42" wide x 72" high (1065 x 1830mm), requires 7 hooks. 204-3 shower curtain, 70" wide x 72" high (1780 x 1830mm), requires 12 hooks.

INSTALLATION:

Recommended for use with Bobrick stainless steel shower curtain hooks on Bobrick stainless steel shower curtain rods: Models B-207, B-4207, B-6047 and B-6107.

SPECIFICATION:

Shower curtains shall be opaque, matte white vinyl 0.008" (0.2mm) thick, containing antibacterial and flame-retardant agents (Formulated to meet CFSM Title 19.13115), and shall have white HDPE grommets along top. Bottom and sides shall be hemmed.
NFPA-701 certified.

Vinyl Shower Curtains shall be Model _____ (insert model number) of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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BOBRICK

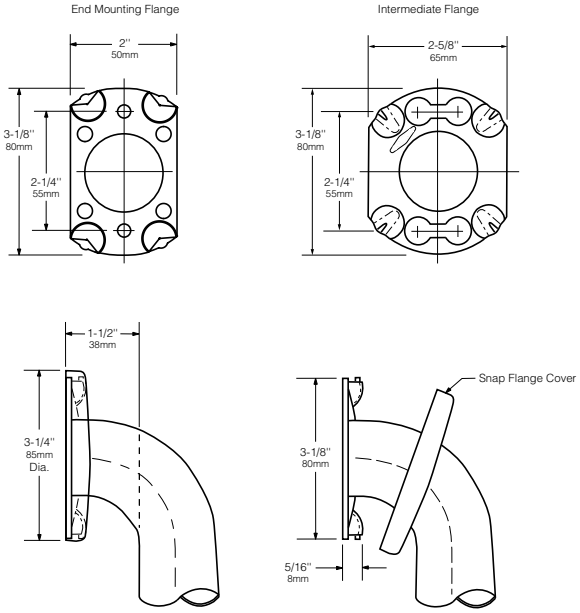
Technical Data

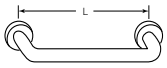
1½" (38mm) DIAMETER STAINLESS STEEL GRAB BARS WITH SNAP FLANGE

B-6806 SERIES

Specify Finish Required:

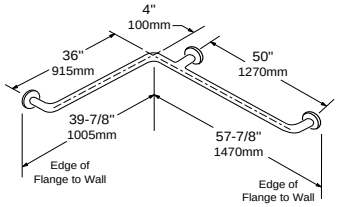
- ☐ Satin finish
- ☐ Satin finish with peened gripping surface; add suffix .99 to model number





HORIZONTAL

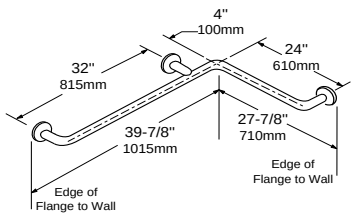
VERTICAL



TWO-WALL WHEELCHAIR COMPARTMENT

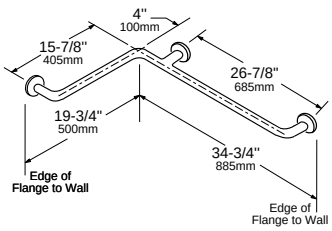
B-6806 x 12, 18, 24, 30, 36, 42, 48

B-68137



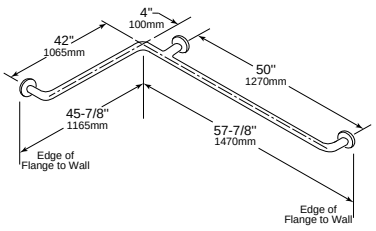
HORIZONTAL TUB / SHOWER COMPARTMENT BAR 24 x 36

B-68616



HORIZONTAL TWO-WALL BAR for Shower Stall

B-6861



TWO-WALL TOILET COMPARTMENT BAR 42 x 54

B-6897

continued . . .

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MATERIALS:

Grab Bar — 18-8 S, type-304, 18-gauge (1.2mm) stainless steel tubing with satin-finish. 1-1/2" (38mm) outside diameter. Ends are heliarc welded to flanges. Clearance between the grab bar and wall is 1-1/2" (38mm).

Concealed Mounting Flanges — 18-8 S, type-304, 11-gauge (3.2mm) thick, stainless steel plate; end flanges 2" x 3-1/8" (50 x 80mm) with holes for attachment to wall. Intermediate flanges 2-5/8" x 3-1/8" (65 x 80mm) wide x 3-1/8" (80mm) diameter.

Snap Flange Covers — 18-8 S, type-304, 22-gauge (0.8mm) drawn stainless steel with satin-finish. 3-1/4" (85mm) diameter x 1/2" (13mm) deep. Each cover snaps over mounting flange to conceal mounting screws.

STRENGTH:

Bobrick grab bars that provide 1-1/2" (38mm) clearance from wall can support loads in excess of 900 pounds (408kg) if properly installed. Other grab bar configurations can support loads in excess of 250 pounds (113kg) if properly installed, complying with accessible design (including ADAAG in the U.S.A.) for structural strength

Safety Warning: Grab bars are no stronger than the anchors and walls to which they are attached and, therefore, must be firmly secured in order to support the loads for which they are intended. To avoid potential injury, the building owner or maintenance personnel should remove the grab bar from service if the grab bar is not adequately secured to wall or if there is any observed damage to the welds.

INSTALLATION:

Provide concealed anchor device or backing as specified or required in accordance with local building codes before wall is finished. Fasten concealed mounting flanges to anchor device or backing with at least two screws opposing each other in each flange. Snap flange covers over each mounting flange to conceal mounting screws. Concealed anchor devices and mounting screws are not included with Bobrick grab bars and must be specified as an accessory.

For Grab Bars with an Intermediate Flange(s), Pull Snap-Flange Covers away from mounting flanges. Place grab bar in desired mounting location. Use intermediate flange as a template to mark location of mounting screws at intermediate flange only. Mark screw locations at the center of the slot in the middle of the double-keyhole shaped mounting holes (2) in the intermediate flange. Remove grab bar from wall. Drive the intermediate flange mounting screws into wall at marked locations. **Note:** Make sure to leave a space of just over 1/8" (3.17mm) between the underside of the screw head and the wall. Install grab bar on the wall by placing the round ends of the intermediate flange double-keyhole shaped mounting holes over the mounting screws (2) are located in the middle of the flange slots. Install the mounting screws into the wall at the end flanges and secure tightly. Tighten the mounting screws at the intermediate flange. Press all snap-flange covers into place to conceal mounting flanges.

Note: Recommend use of 1/4" or #14 sheet metal or wood screws to install Intermediate Flange. #12 screws may also be used.

Important Notes:

1. **Mounting Kits —** Bobrick offers a mounting kit for installing grab bars; **one Bobrick mounting kit is required for each flange.**

Mounting Kit No.	Description
252-30	Consists of # (3) 14 x 2½" type-304 stainless steel, Phillips round-head, sheet-metal screws.

2. **Grab Bar Fastener —** Bobrick offers a grab bar fastening system that secures all Bobrick grab bar series; **one Bobrick fastener is required for each flange.** Install grab bar without backing in wall requires minimum 5/8" (16mm) thick painted or tiled drywall.

WingIt™ Fastener No.	Description
251-4	Consists of 10–32 x 5/16" round-head, Phillips 18/8 stainless steel screws. (1) WingIt grab bar fastener.

3. **Optional Anchor Device —** Bobrick grab bar anchor device includes stainless steel machine screws to be used for attaching grab bars to anchors. **one Bobrick concealed anchor device is required for each flange.**

Optional Anchor No.	Description
2583	Anchor for 3/4" to 1" (19-25mm) panel 1 anchor required for each flange.
2586	Anchor for 1/2" to 1" (13mm) panel 1 anchor required for each flange.

SPECIFICATION:

Grab bar shall be type-304 stainless steel with satin-finish. Grab bar shall have 18-gauge (1.2mm) wall thickness and 1-1/2" (38mm) outside diameter. Clearance between the grab bar and wall shall be 1-1/2" (38mm). Concealed mounting flanges shall be 11-gauge (3.2mm) thick stainless steel plate, 2" x 3-1/8" (50 x 80mm), and equipped with at least two screw holes for attachment to wall. Flange covers shall be 22 gauge (0.8mm), 3-1/4" (85mm) diameter x 1/2" (13mm) deep, and shall snap over mounting flange to conceal mounting screws and/or WingIt fasteners. Ends of grab bar shall pass through concealed mounting flanges and be heliarc welded to form one structural unit. Grab bar shall comply with accessible design (including ADAAG in the U.S.A.) for structural strength.

Grab Bar shall be Model _____ (insert model number) of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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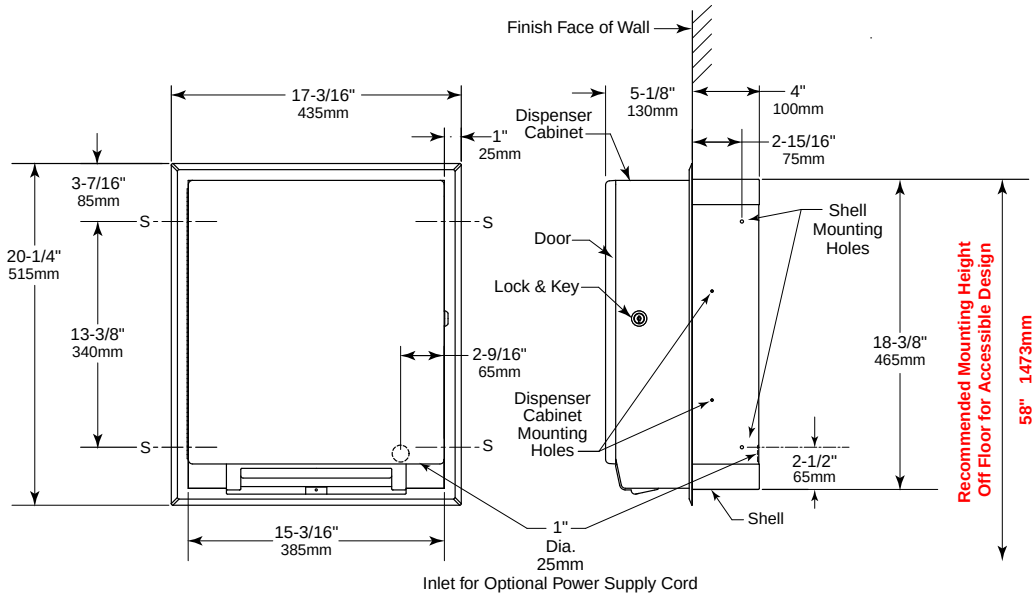
BOBRICK

Technical Data

SEMI-RECESSED AUTOMATIC, UNIVERSAL ROLL PAPER TOWEL DISPENSER

B-29744



Rough Wall Opening
16" (405mm) wide
18-7/8" (480mm) high
4" (102mm) minimum recessed depth

MATERIALS:

Cabinet — 18-8, Type-304, heavy-gauge stainless steel. All-welded construction. Exposed surfaces have satin finish. Equipped with a tumbler lock keyed like other Bobrick washroom accessories.

Door — 18-8, Type-304, 20-gauge (0.9mm) stainless steel with satin finish. Drawn, one-piece, seamless construction. Secured to cabinet with a full-length stainless steel piano-hinge.

Flange — 18-8, Type-304, 22-gauge (0.8mm)stainless steel with satin finish. Drawn, one-piece, seamless construction.

Shell — 18-8, Type-304, 22-gauge (0.8mm) stainless steel. All welded construction. Exposed surfaces have satin-finish.

Automatic Roll Towel Dispenser — Durable, high-impact resin materials. Accepts universal standard-core, non-perforated rolls 8" (205mm) wide, 8" (205mm) diameter. 800 ft (244 m) long. Dispenses one towel per dispense and can be set to dispense paper towels at three different lengths. Accommodates up to 3-1/2" (90mm) diameter stub roll with automatic transfer to full roll.

OPERATION:

Electronic sensor automatically dispenses towel when hands are placed under the towel opening. Intuitive LED light directs patrons to dispense area. Dispenses universal, 1-1/2" to 2" (38 to 51mm) diameter cores, up to 8" (205mm) diameter, 8" (205mm) wide, non-perforated, non-proprietary rolls. LED light at the towel opening flashes green when dispenser is ready to dispense, flashes orange, indicates low battery, flashes red if not ready to dispense or in need of service. Towel length can be set to 9" (230mm), 12" (305mm), 15" (380mm). Optional “Paper Saver” feature allows a shorter second sheet to dispense immediately after the first sheet. The “Paper Saver” feature has two second sheet length options: 25% shorter sheet length or 12.5% shorter sheet length. The battery pack power source, holds 4 “D” sized alkaline batteries (not furnished). Dispenser includes a 3-1/2" (90mm) diameter stub roll feature. When the stub roll is depleted, main roll automatically starts dispensing without the need to open the dispenser.

continued . . .

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POWER REQUIREMENTS:

Dispenser is powered by 4, "D" size alkaline batteries (not furnished) or an external 6-volt AC to DC power supply. Power supply is an optional accessory: order Bobrick Part No. 3974-57. (For non-U.S. compatible plugs, order Part No. 3974-55).

INSTALLATION:

Provide framed rough wall opening 16" wide x 18 7/8" high (405 x 480mm). Minimum recessed depth required to finish face of wall is 4" (102mm). Allow clearance for construction features that may protrude into rough wall opening from opposite wall. Coordinate with mechanical engineer to avoid pipes, vents and conduits. If unit projects above top of wainscot, provide channel or other filler to eliminate gap between flange and finish face of wall. Mount the Shell in wall opening with shims between framing and the shell at four points indicated by an S, then secure the Shell with #8 x 1-1/4" (4.2 x 32mm) sheet-metal screws (not furnished). Care should be taken to ensure that the heads of the mounting screws do not protrude. For plaster or dry wall construction, provide concealed backing to comply with local building codes, then secure the Shell with sheet-metal screws. For other wall surfaces, provide fiber plugs or expansion shields for use with flat-head sheet-metal screws, or provide 1/8" (3mm) toggle bolts or expansion bolts. Unlock and open the door of the dispenser cabinet. Carefully slide the dispenser cabinet into the shell while supporting it from underneath with one hand. Attach dispenser cabinet to shell using the pre-drilled pilot holes in the shell and four #8 x 1/2" (4.2 x 13mm) sheet metal screws (provided).

Open battery cover at the front of the dispenser and install 4, "D" size alkaline batteries. Select sheet length and "Paper Saver" mode using the switches to the right of the batteries. Load paper towel using the instructions on the dispenser.

Electrical supply for use with 6-volt AC to DC power supply must be installed per applicable building codes.

SPECIFICATION:

Semi-recessed mounted automatic universal roll paper towel dispenser shall be Type-304 stainless steel with all-welded construction; exposed surfaces shall have satin finish. Door shall be secured to cabinet with a full-length stainless steel piano-hinge and equipped with a concealed tumbler lock keyed like other Bobrick washroom accessories. No-touch dispenser, dispenses universal, 1-1/2" to 2" (38 to 51mm) diameter cores, up to 8" (205mm) diameter, 8" (205mm) wide, non-perforated, non-proprietary rolls. 800 ft (244 m) long. Dispenser automatically dispenses towel when hands are placed under the towel opening. Dispenser can be powered by 4 "D" size alkaline batteries or an optional 6-volt AC to DC power supply. Equipped with switches that allow paper length to be set at 9" (230mm), 12" (305mm) or 15" (380mm) and "Paper Saver" feature that provides a shorter second sheet with options of 25% shorter and 12.5% shorter. Blinking LED indicates if batteries need to be replaced. Automatic transfer shall dispense stub roll up to 3-1/2" (90mm) diameter before new roll is dispensed.

Semi-Recessed Automatic Universal Roll Paper Towel Dispenser shall be Model B-29744 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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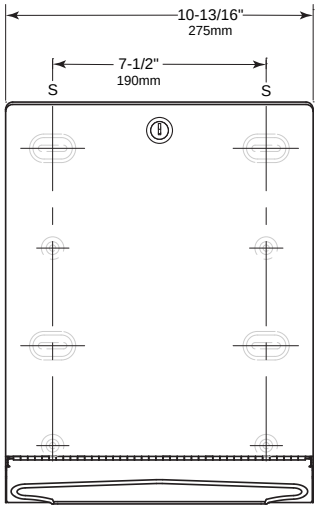
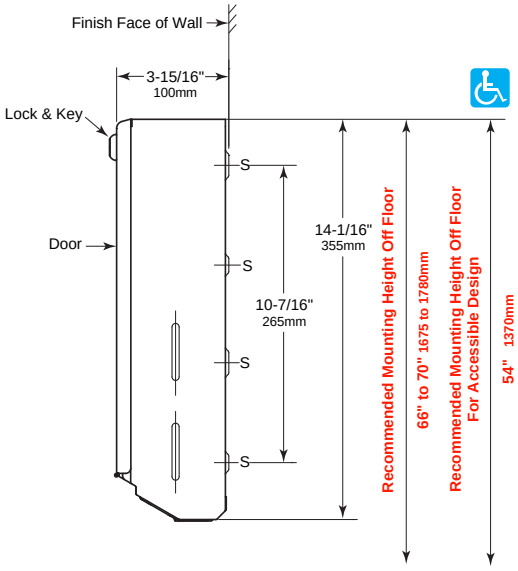
BOBRICK

Technical Data

ClassicSeries® SURFACE-MOUNTED PAPER TOWEL DISPENSER

B-262





MATERIALS:

Cabinet — 18-8, type-304, 22-gauge (0.8mm) stainless steel. All-welded construction. Exposed surfaces have satin finish. Towel tray has hemmed opening to dispense paper towels without tearing.

Door — 18-8, type-304, 22-gauge (0.8mm) stainless steel with satin finish. Secured to cabinet with a full-length stainless steel piano-hinge. Equipped with a tumbler lock keyed like other Bobrick washroom accessories.

Optional: Order Bobrick Part No. 262-130 TowelMate® available as an optional accessory. TowelMate accessory allows for paper towels to dispense one at a time without bulging, sagging or falling through the towel tray opening. TowelMate fits Gamco and most manufacturers' similar models.

OPERATION:

Unit dispenses C-fold and multifold paper towels 3-1/8" to 3-13/16" (79–97mm) deep. Slots in sides of cabinet indicate refill time. Capacity: 400 C-fold or 525 multifold paper towels. To dispense narrower towels 2-1/2" to 3-1/8" (64–79mm) deep, order optional TowelMate accessory Bobrick Part No. 262-130.

INSTALLATION:

Mount unit on wall with four #10 x 1-1/4" (4.8 x 32mm) sheet-metal screws (not furnished) at four of the eight mounting holes indicated by an *S* (top slots and bottom holes preferable). For plaster or dry wall construction, provide concealed backing to comply with local building codes, then secure with sheet-metal screws. For other wall surfaces, provide fiber plugs or expansion shields for use with sheet-metal screws, or provide 1/8" (3mm) toggle bolts or expansion bolts.

SPECIFICATION:

Surface-mounted paper towel dispenser shall be type-304 stainless steel with all-welded construction; exposed surfaces shall have satin finish. Door shall be secured to cabinet with a full-length stainless steel piano-hinge and equipped with a tumbler lock keyed like other Bobrick washroom accessories. Paper towel tray shall have hemmed opening to dispense paper towels without tearing. Unit shall be capable of dispensing 400 C-fold or 525 multifold paper towels measuring 3-1/8" to 3-13/16" (79 to 97mm) deep. Narrower paper towels 2-1/2" to 3-1/8" (65 to 79mm) deep may be efficiently dispensed with the use of an optional TowelMate accessory, Bobrick Part No. 262-130. TowelMate accessory allows for paper towels to dispense one at a time without bulging, sagging or falling through the towel tray opening.

Surface-Mounted Paper Towel Dispenser shall be Model B-262 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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NO. 443.91 DISPENSER, SANITIZER, TOUCHLESS

Omni-Foam Dispenser

Dispenser for foamed waterless sanitizers.
9oz and 17oz sizes available.

9 oz
2D43-Q7
(24/case)

2D45-QK
Optional
splashguard
24/case

17 oz
2D53-Q7
(12/case)

2D45-QK
Optional
splashguard
24/case

SDS Manual Dispenser

Dispenser for lotions, soaps, sanitizers and surgical scrubs.
Simply push the bar to dispense product. Fits 1L size.

NO. 444 DISPENSER, SANITIZER, TOUCHLESS

Omni-Foam Dispenser

Dispenser for foamed waterless sanitizers.
9oz and 17oz sizes available.

9 oz
2D43-Q7
(24/case)

2D45-QK
Optional
splashguard
24/case

17 oz
2D53-Q7
(12/case)

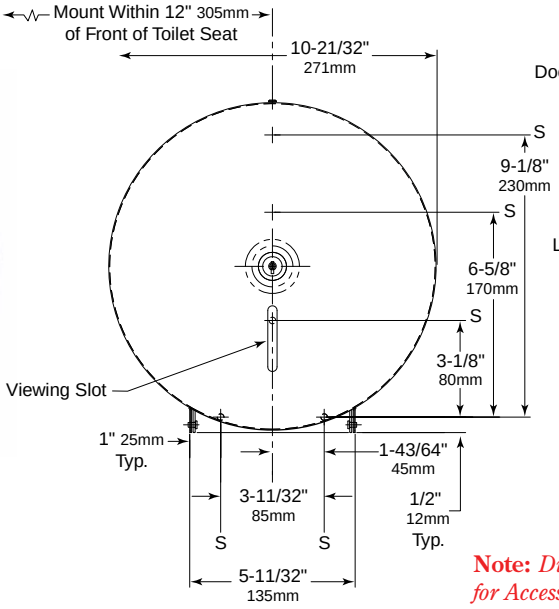
2D45-QK
Optional
splashguard
24/case

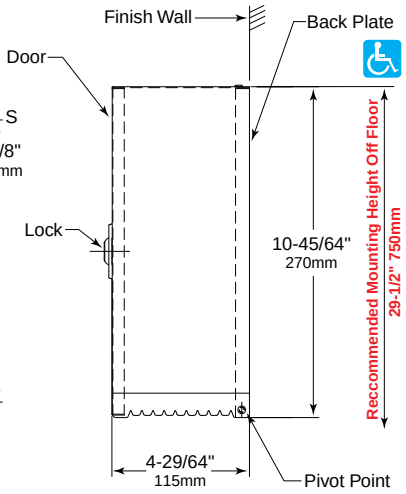
BOBRICK

Technical Data

SURFACE-MOUNTED SINGLE JUMBO-ROLL TOILET TISSUE DISPENSER

B-2890





Note: *Dispenser is ICC A117.1 - 2009 Standard for Accessibility compliant. Unit can be located below grab bar, in area 24" minimum to 42" maximum from rear wall, with outlet 18" minimum above floor.*

MATERIAL:

Mounting Plate — 16-gauge (1.6mm) stainless steel.

Door — Type-304, 22-gauge (0.8mm) stainless steel with satin-finish. Slot reveals toilet tissue supply inside cabinet. Equipped with a lock keyed like other Bobrick Washroom Equipment accessories.

Spindle — Removable rubber-o-rings converts to smaller spindle. Fixed inner spindle, 20 gauge (0.9mm) stainless steel.

OPERATION:

Door unlocks with key provided and swings down for loading dispenser. Spindle adapter accommodates one toilet tissue roll up to 10" (255mm) diameter with a 1-5/8" (40mm) diameter core roll; convertible for 3" (75mm) diameter core rolls. Rubber o-rings (2) (furnished by manufacturer) may be added to the steel inner spindle to accommodate a 2-1/8" (55mm) diameter core roll. Wide viewing slot in door reveals the amount of toilet tissue on roll. Unit is designed for quick reloading.

INSTALLATION:

Mount unit on wall or toilet partition with sheet-metal screws at points indicated by an *S*. Rear edge of unit should be 20" (510mm) from back wall. This locates toilet tissue within 12" (305mm) of front of standard toilet that projects 30" (305mm) from back wall.

For plaster or dry wall construction, provide concealed backing to comply with local building codes, then secure with sheet-metal screws (not furnished). For other wall surfaces, provide fiber plugs or expansion shields for use with sheet-metal screws (not furnished), or provide 6mm (1/4") toggle bolts or expansion bolts.

For partitions with particle-board or other solid core, secure with sheet-metal screws (not furnished), or provide through-bolts, nuts, and washers. For hollow-core metal partitions, provide solid backing into which the sheet-metal screws can be secured. If two units are installed back-to-back, then provide threaded sleeves and machine screws for the full thickness of partition.

SPECIFICATION:

Single jumbo-roll toilet tissue dispenser door shall be 22-gauge (0.8mm) stainless steel with satin-finish. Door shall be equipped with a lock keyed like other Bobrick washroom accessories. Door shall have a slot to reveal toilet tissue supply inside cabinet. Spindle shall accommodate one toilet tissue roll up to 10" (255mm) diameter with a 1-5/8" (40mm) diameter core roll convertable for 3" (75mm) diameter core rolls or 2-1/8" (55mm) diameter core roll by adding rubber o-rings (2) furnished.

Single Jumbo-Roll Toilet Tissue Dispenser shall be Model B-2890 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

The illustrations and descriptions herein are applicable to production as of the date of this Technical Data Sheet.
The manufacturer reserves the right to, and does from time to time, make changes and improvements in designs and dimensions.

Revised 01/12/18 Printed in U.S.A.
© 2018 by Bobrick Washroom Equipment, Inc.

Wall Enclosures

0:00 / 0:00

Reach out to our team for ordering information.

Contact product representative

CUSTOMER SERVICE

For product specifications, service, and certificate requests, please call our Customer Service team.

Call Customer Service 800.964.5227 »

Looking for instructions for use?
Please visit our IFUs website »

Would you like to leave us feedback on our product content or images?

Product description

Mounted wall enclosures secure sharps containers, keep counter space clear, and help prevent access to contents in high traffic areas. Contents can be viewed by hospital personnel, but unsightly items are not fully visible to patients and visitors. Optional glove box holders keep gloves readily available.

- Sturdy, locked sharps container mounting allows for secure point of use disposal of sharps
- For convenience, all cabinets are universally keyed
- Sturdy, durable, long lasting ABS plastic provides a secondary barrier of protection
- Easily monitored fill level through viewing windows on front and sides
- Keep gloves readily available with optional glove dispensers
- Beige, unobtrusive style fits any room decor

Ordering information

Order Code	Description	Ship Case
85161H	SharpSafety™ Wall Enclosure, For Ir Room Sharps Cortairer, 2 ard 5 Quart	1
8516SH	SharpSafety™ Wall Enclosure, For Ir Room Sharps Cortairer, 2 ard 5 Quart	5
8556H	SharpSafety™ Wall Enclosure with Glove Box ard Cortairer, For 2 ard 5 Quart, Safety Ir Room Cortairer	1
85301H	SharpSafety™ Wall Enclosure, For Ir Room Sharps Cortairer, 2 ard 3 Gallor	1
85401H	SharpSafety™ Wall Enclosure, For Wide Operirg Ir Room Sharps Cortairer, 3 ard 4 Gallor	1
8554B	SharpSafety™ Wall Mourtirg Bracket	5
8516HDL	SharpSafety™ Door for Wall Enclosure, For 2 ard 5 Quart, Safety Ir Room Cortairer	1
8550B	Glove Box & Mourtirg Brackets	5
31307005	Wall Cabiret for 2 & 3 Gallor GG	1
31353553	Wall Cabiret for 5 Quart GG JR	1

Cardinal Health Completes Acquisition of Medtronic's Patient Recovery Business

Cardiral Health has acquired Medtroric's Patiert Care, Deep Veir Thrombosis ard Nutritioral Irsufficiercy busiress.

Read the press release »

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C/S Cubicle Curtains

SECTION 10 21 23
SURFACE MOUNTED I.V. TRACK & PENDANTS

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with the requirements listed, provide cubicle curtains from the following manufacturer:

1. C/S Cubicle Curtains, a Division of Construction Specialties, Inc.
   3 Werner Way
   Lebanon, NJ 08833
   P: (908) 849-4000 / F: (908) 849-4398
   CCInfo@c-sgroup.com
   www.c-sgroup.com

2. Alternative manufacturers will not be accepted.

2.02 IV TRACK SYSTEM

A. I.V. Tracks: C/S Cubicle Curtains I.V. track model #17000. Surface-mounted tracks of heavy extruded aluminum alloy 6063-T5, 1 ⅜" x ¾", slotted to receive twist lock I.V. Carriage, compete with accessories and components required for complete and secure installations including splicers, end caps and corner bends.

1. Corner Bends: Shall have a 12” - 18" radius fabricated in one continuous “L” shape.
2. Finish: Clear anodized aluminum.

B. Carriers: C/S Cubicle Curtains 17500 Twist-Lock I.V. Carriage, Carrier mechanism shall be designed to lock against surface of reinforcing I.V. Track.

1. Provide one carrier per unit of I.V. Track, or as needed.

C. I.V. Pendants:

1. **Model # 17100 – STANDARD 5 BOTTLE I.V. PENDANT,** Fabricated of polished stainless steel 9/16" diameter tubing for the main shaft and four ¼" stainless steel folding arms. This I.V. Unit will be able to be raised or lowered to a height from 19" to 32" to adjust to most ceiling heights. The locking mechanism is a stainless steel thumb push at base of unit.

2. **Model # 17800 – DELUXE 9 BOTTLE I.V. PENDANT,** Fabricated of polished stainless steel this unit has a ¾" diameter tubing for the main shaft, 3/8" diameter for the inner

t D2Ao 2uR F.MDoAb&RuMr R.2P FcFct j .c2&t 2AFca 2cP t ND.t 1 u.ol .&3F 23&Fdo
3F c2.t FRbc&l FcFRdo 2DF.MDoAbP do do 2RVrt odP bt oUF.&uMDF.MDd

E C O N C E

3 Werner Way, Lebanon, NJ 08833 US, 800-972-7217
895 Lakefront Promenade, Mississauga, ON L5E 2C2 Canada, 905-274-3611
www.c-sgroup.com
© Copyright 2017 Construction Specialties, Inc. reserves the right to make design changes or withdraw any design without notice.

Specification Sheet

Item No.: _____
Project No.: _____
S.I.S. No.: _____

NO. 480 SHELF, MOP, HANGER

Utility Shelves

Short Form Specifications

Eagle Utility Shelf with Mop Hanger, model _____. Constructed of 16/304 stainless steel. Standard 8˝ wide. Furnished with mop hangers and hooks for hanging clothes.

MODELS:

- ❑ ***US0824-16/3***
- ❑ ***US0836-16/3***
- ❑ ***US0848-16/3***

#US0836-16/3

Design and Construction Features

- 16 gauge type 304 stainless steel.
- Mop hangers and hooks are riveted to front of shelf.
- Available in 24˝, 36˝, and 48˝ (610, 914, and 1219mm) lengths.
- Standard width is 8˝ (203mm).

EAGLE GROUP
100 Industrial Boulevard, Clayton, DE 19938-8903 USA
Phone: 302-653-3000 • Fax: 302-653-2065
www.eaglegrp.com

Foodservice Division: Phone 800-441-8440
MHC/Retail Display Divisions: Phone 800-637-5100

For custom configuration or fabrication needs, contact our **SpecFAB® Division.**
Phone: 302-653-3000 • Fax: 302-653-3091 • e-mail: specfab@eaglegrp.com

Spec sheets available for viewing, printing or downloading from our online literature library at *www.eaglegrp.com*

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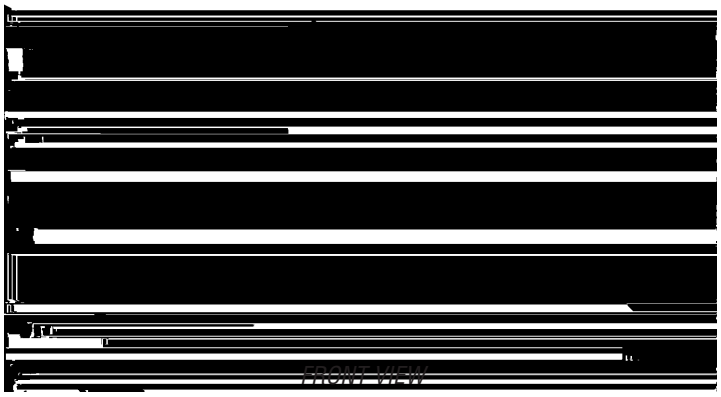
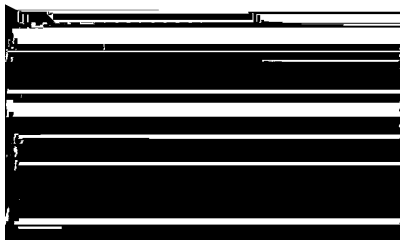
Item No.: _____
Project No.: _____
S.I.S. No.: _____

Utility Shelves



FRONT VIEW



SIDE VIEW

model #	shelf width in.	shelf width mm	shelf length in.	shelf length mm	weight lbs.	weight kg
US0824-16/3	8″	203	24″	610	9	4.1
US0836-16/3	8″	203	36″	914	11	5.0
US0848-16/3	8″	203	48″	1218	13	5.9

EAGLE GROUP
100 Industrial Boulevard, Clayton, DE 19938-8903 USA
Phone: 302-653-3000 • Fax: 302-653-2065
www.eaglegrp.com

Foodservice Division: Phone 800-441-8440
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Rev. 10/09

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Specification Sheet

Item No.: _____
Project No.: _____
S.I.S. No.: _____

NO. 480 SHELF, MOP

Utility Shelves

Short Form Specifications

Eagle Utility Shelf with Mop Hanger, model _____. Constructed of 16/304 stainless steel. Standard 8˝ wide. Furnished with mop hangers and hooks for hanging clothes.

MODELS:

- ❑ ***US0824-16/3***
- ❑ ***US0836-16/3***
- ❑ ***US0848-16/3***

#US0836-16/3

Design and Construction Features

- 16 gauge type 304 stainless steel.
- Mop hangers and hooks are riveted to front of shelf.
- Available in 24˝, 36˝, and 48˝ (610, 914, and 1219mm) lengths.
- Standard width is 8˝ (203mm).

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Phone: 302-653-3000 • Fax: 302-653-3091 • e-mail: specfab@eaglegrp.com

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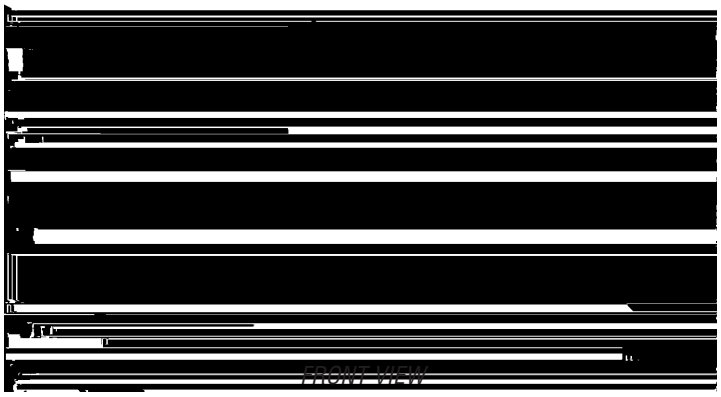
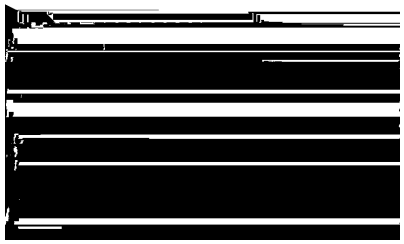
Item No.: _____
Project No.: _____
S.I.S. No.: _____

Utility Shelves



FRONT VIEW



SIDE VIEW

model #	shelf width in.	shelf width mm	shelf length in.	shelf length mm	weight lbs.	weight kg
US0824-16/3	8″	203	24″	610	9	4.1
US0836-16/3	8″	203	36″	914	11	5.0
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Veterinary Anesthesia Machines

Service and Parts Manual

Model Numbers:

VMS®
VMS®Plus
VMC™
VME™
VME2®
VML®
VMR™

Matrx VMS

Matrx VMS Plus

Matrx VMS Wall Mount

Matrx VMC

Matrx VME2

Matrx VME Tabletop

FOR USE BY MIDMARK TRAINED TECHNICIANS ONLY

Matrx VML & VMR (not shown)

Part No. 10578200 Rev. AA3 (11/13/2018)

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(*) Indicates multiple pages due to model / serial number break(s).

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General Information

Symbols

DANGER
Indicates an imminently hazardous situation which <u>will</u> result in serious or fatal injury if not avoided. This symbol is used only the most extreme conditions.

WARNING
Indicates a potentially hazardous situation which could result in serious injury if not avoided.

Caution
Indicates a potentially hazardous situation which <u>may</u> result in minor or moderate injury if not avoided. It may also be used to alert against unsafe practices

Equipment Alert
Indicates a potentially hazardous situation which could result in equipment damage if not avoided.

*In Section A, test the components as indicated. (ex. **1st** ✓ then go to, **2nd** ✓)*

Refer to Section B for testing procedures.

The symbols below may be used in this manual to represent the operational status of table functions and components.

Indicates the function / component is working properly. No action required.

Indicates the function / component is working, but a problem exists.

Indicates the function is not working at all, or that the component is faulty.

Caution
Federal law restricts this device to sale by or on the order of a licensed veterinarian.

Ordering Parts

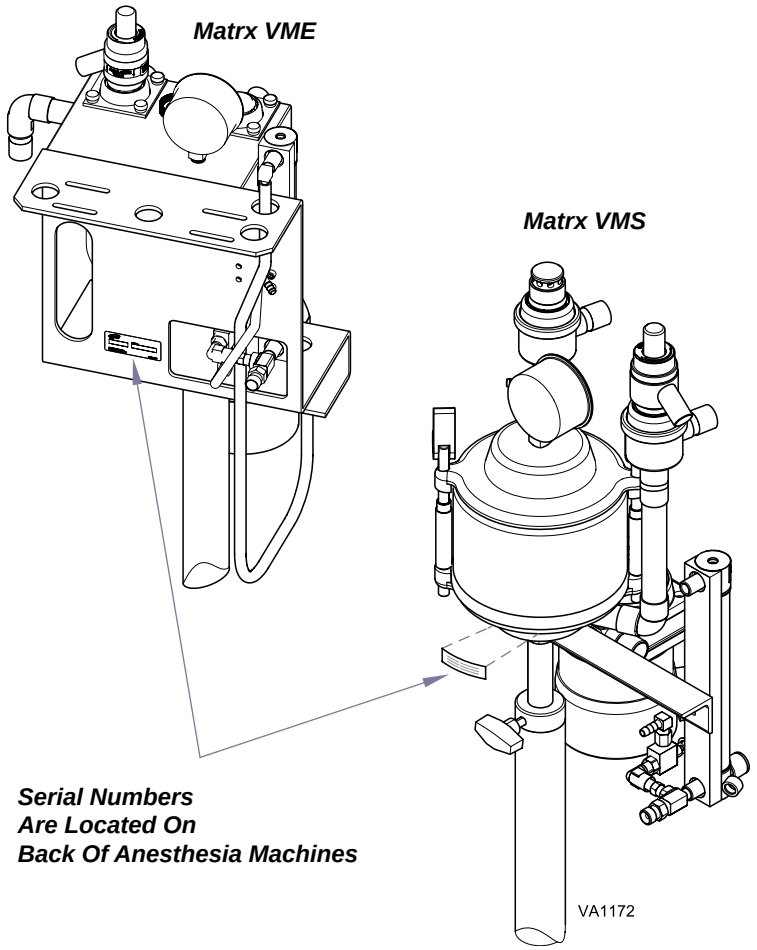
The following information is required when ordering parts:

- Serial number & model number
- Part number for desired part
  (Refer to Section E: Exploded Views & Parts Lists)

Non-warranty parts orders may be faxed to Midmark using the Fax Order Form in the back of this manual.

For warranty parts orders, call Midmark's Technical Service Department with the required information.
Hours: 8:00 am to 5:00 p.m. EST (Monday thru Friday)
Phone: 1-800-Midmark

Serial Number Location



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Scheduled Maintenance Chart

Scheduled Maintenance		
Interval	**Inspection / Service**	**Description**
Before Every Surgery	Inspect	Check machine connections and rubber parts for looseness, damage or wear. Replace as nesscessary.
	Perform Leak Test	Refer to Leak Test Procedure in Section B of this manual.
Daily	Clean	Refer to Cleaning Anesthesia Machine in Section B of this manual.
Weekly	Change Absorbent Material	Follow manufacturer's recommendations for proper use of CO2 absorbents.
Annually	Service Vaporizer	Service and calibrate vaporizer.
Every 2 Years	Replacement	*Replace components found in maintenance kits.* *(O-rings, gaskets, valve disks, breathing circuit, breathing bag, tubing)*
Date of Service: Location: Service Technician:		Model Number: Serial Number: Notes:

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Midmark Product Warranty / Return

Definition of a Warranty Return

A product or part covered by the Midmark warranty that fails while the terms of the warranty are in effect.

THIS WARRANTY IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.

No statement or claim about the product by any employee, agent, representative or dealer of Midmark shall constitute a warranty by Midmark or give rise to any liability or obligation of Midmark. Subject to the next sentence, Midmark warrants that each product or part shall be free from defects in workmanship and materials, under normal use and with appropriate maintenance, for one (1) year from the date of delivery to customer except for anesthesia machines and VIP 3000 vaporizers which have a five (5) year warranty, ClassicSeries Wet-ring Vacuums which have a three (3) year/6,000 hour warranty and ClassicSeries Lubricated Compressors which have a two (2) year/1,500 hour warranty. For plastic, rubber and disposable parts or items, Midmark warrants only that each such part and item shall be free from defects in

workmanship and materials at the time of delivery to the customer. Midmark's obligation for breach of this warranty, or for negligence or otherwise, shall be strictly and exclusively limited to Midmark's choice of repair or replacement of the product or part. This warranty shall be void for any product on which the serial number has been altered, defaced or removed. Midmark shall not be liable for any damage, injury or loss arising out of the use of the product, whether as a result of a defect in the product or otherwise, if, prior to such damage, injury or loss, the product was (1) damaged, misused, or misapplied; (2) repaired, altered or modified by persons other than Midmark; (3) not installed in strict compliance with applicable codes and ordinances; or (4) not installed by Midmark or an authorized Midmark dealer.

UNDER NO CIRCUMSTANCES SHALL MIDMARK BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES AS THOSE TERMS ARE DEFINED IN THE UNIFORM COMMERCIAL CODE.

Warranty Returns

1. Merchandise returned for warranty credit or replacement must have been purchased from Midmark within the specified warranty period or proof of installation within that time will be required.
2. Defective items will, at Midmark's discretion, either be repaired or replaced with equivalent merchandise.
3. If merchandise is found to not be defective, the 25% restocking fee will be charged.
4. Freight charges to return defective merchandise to Midmark are not reimbursable.
5. Freight charges to ship replacement or repaired merchandise to customer will be paid by Midmark.

Non-Warranty Returns

1. The following will NOT be accepted for credit: • Rubber goods over 30 days old • Rubber goods not in original, sealed package • All hoses • Special order items • Goods without a Return Goods Authorization (RA) • Merchandise more than 90 days old (from Midmark invoice date)
2. A 25% restocking charge will be deducted from the original purchase amount for all credits issued, except for return due to: • Midmark order entry error •

Warranty returns

3. Return Authorization (RA) numbers are valid for 180 days after the date issued.
4. Freight charges will not be credited.
5. Freight collect shipments are not accepted.
6. If merchandise is found to have been misused or in any way damaged after shipment from Midmark, credit will be made less charges for repair and less the 25% restocking charge. If merchandise is not salvageable, no credit will be issued.
7. All claims for damage or shortage occurring in transit must be made by the customer directly to the carrier.

Midmark Product Warranty / Return Continued On Next Page

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Midmark Product Warranty / Return (Continued)

Service and Repair Policy

Repair Service Procedures – Midmark offers repair service on all Midmark anesthesia equipment. This includes anesthesia equipment from Ohmeda, Fraser Harlake, Fraser Sweatman and Cyprane TEC 3. We provide excellent turnaround on all products with customer approval for service-repair work. All returns must be made through an authorized dealer. Units for repair should be sent to Midmark and packaged in the original shipping container if possible. Please contact our Customer Service Department prior to shipping the unit prepaid to receive an authorization RMA number. Specify the RMA number on the outside of the box and label it to the attention of Repair Service Center. Our highly qualified repair department is staffed with personnel trained in the manufacture and repair of Matrx veterinary anesthesia equipment. Vaporizer Service Warranty – In addition to the service records mentioned above, Midmark will warranty the service performed for a period of six months except for damage due to improper usage, handling or care.

Rental Returns, Anesthesia Equipment

1. Charges will accrue from the time the equipment was received by the customer through its receipt by Midmark and will be charged at the time of return of the rental to Midmark. A minimum
of one month charge will be made. Partial months will be rounded up to the next full month.
2. Loaners used during the repair of equipment that is under warranty will be at no charge. Loaner units must be returned to Midmark within 7 days after receipt of repaired unit or monthly
charge will be initiated. Freight charges for loaner to be sent to customer will be paid by Midmark.

Vaporizer Servicing

1. Vaporizers returned for servicing must be made through an authorized dealer. Units for repair should be sent to Midmark and packaged in the original shipping container if possible. Please contact our Customer Service Department prior to shipping the unit prepaid to receive authorization RMA number. Specify the RMA number on the outside of the box and label it to the attention of Repair Service Center.
2. Midmark Vaporizer -Service Records – Subsequent to servicing, each vaporizer has a separate service and performance record established which is placed on file at the Midmark Service Center in Versailles, OH. Should the need arise to verify that your equipment has been maintained to manufacturer's specifications, Midmark will be happy to supply this information.

Customer Return Instructions

Please follow the procedures outlined below so there is no delay of credit to your account. You must have a Return Authorization (RA) number before returning any merchandise to Midmark except for out-of-warranty repairs, equipment rentals, or vaporizers for servicing. Credit may be issued only after the merchandise is returned to and inspected by Midmark and determination is made that credit is due.

To Receive a Return Authorization

1. Call your Midmark Customer Service Representative at 1-800-MIDMARK (800-643-6275) to obtain an RA number.
2. Send the merchandise freight prepaid.

Non U.S. or Canada Service - Call your local Midmark Representative for the location of your nearest service center for further instructions.

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Section A

Operation & Troubleshooting

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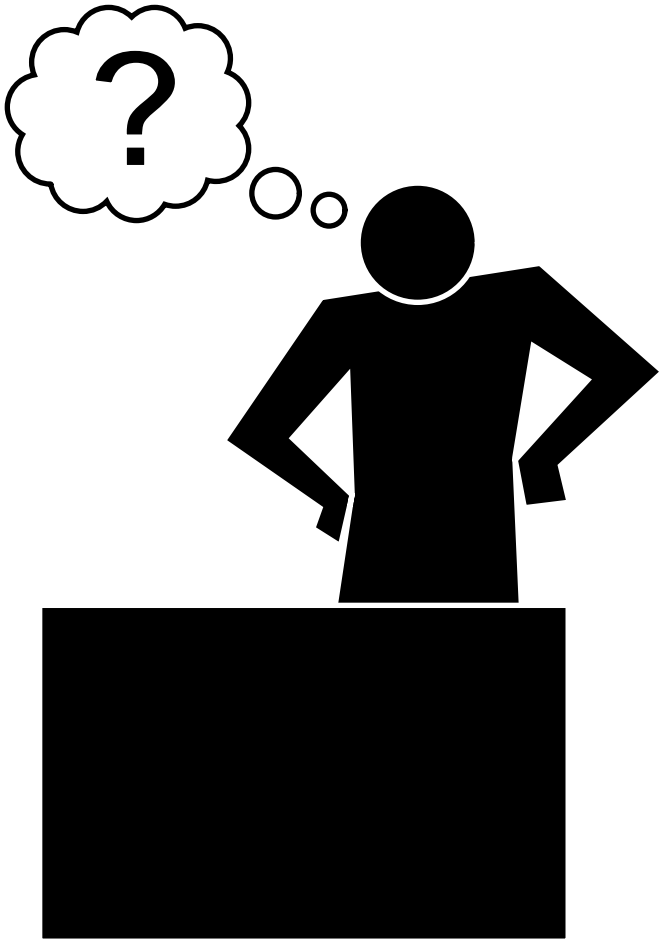

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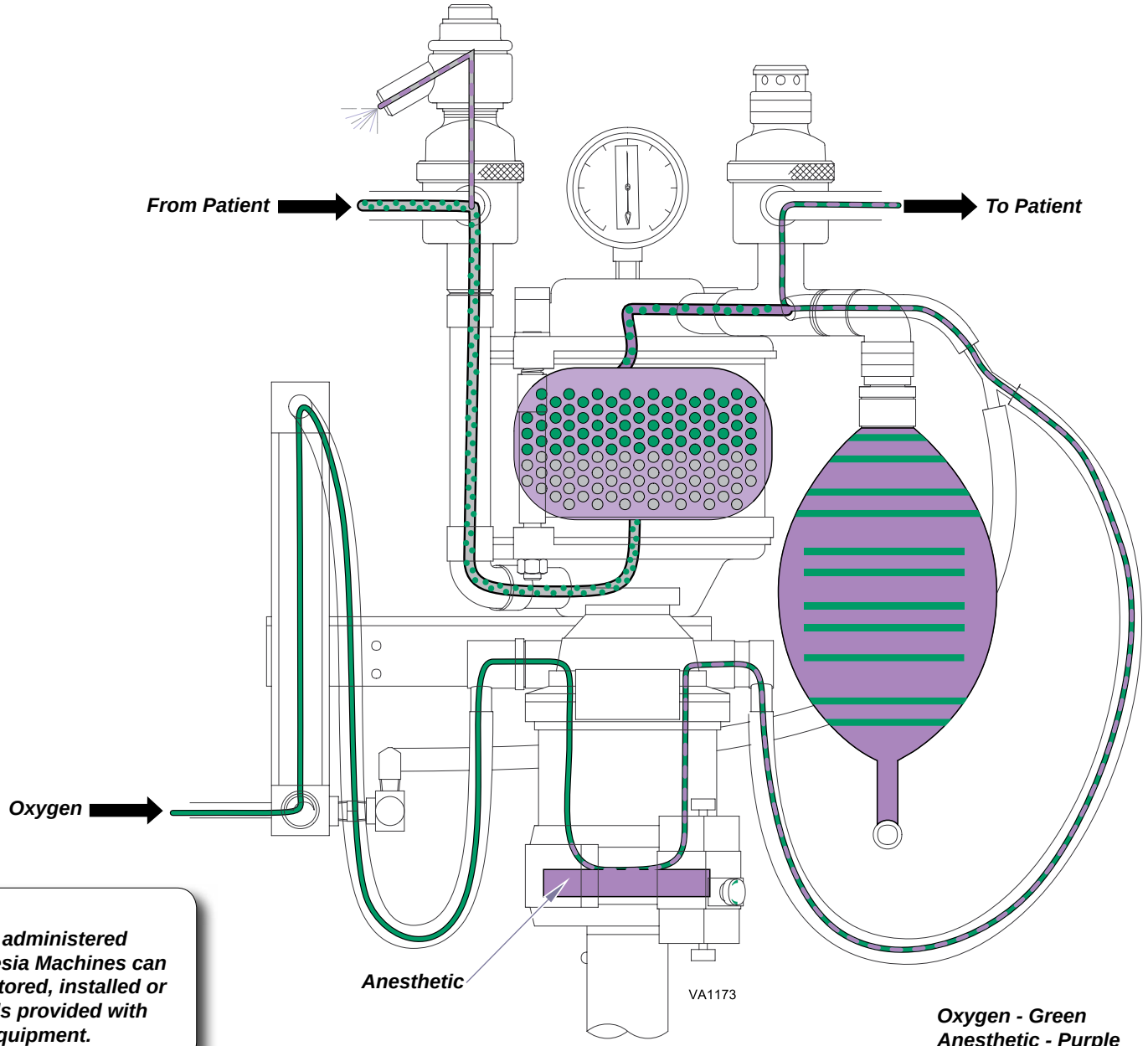
Theory of Operation

1. Oxygen enters the machine at the lower back of flowmeter.
2. Oxygen exits flowmeter near top.
3. The oxygen enters the vaporizer and collects anesthetic gas.
4. The oxygen and anesthetic exits the vaporizer.
5. Oxygen and anesthetic enters the reservoir bag and inhalation tube then is inhaled by the patient.
6. The patient exhales. Waste gas enters the machine.
7. Waste gas enters the CO2 absorber canister which removes the CO2.
8. Gas without CO2 enters the reservoir bag, inhalation tube and patient, recycling the gas.
9. A small amount of waste gas exits the APL valve, maintaining pressure in machine and patient's lungs at 1-3cm H2O.



Oxygen - Green
Anesthetic - Purple
CO2 - Grey

WARNING
Analgesic compounds and oxygen administered through Matrx by Midmark Anesthesia Machines can be dangerous to patient and practitioner if stored, installed or administered improperly. Follow all protocols provided with these substances and associated delivery equipment.

Models:	***All***	
Serial Numbers:		

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Always verify model & serial number

VMS, VMS Plus & VMC Operation

CAUTION

Insure gas supplies are adequate and turned on. Verify vaporizer is filled to eliminate the possibility of anesthetic depletion during surgery.

To Operate Anesthesia Machine...

A) *Lift CO2 absorber canister lock levers. Slide clear canister free of absorber assembly. Fill canister with absorbent material, following directions on canister label. Be sure canister and gasket mating surfaces are completely free of absorbent. Replace canister in absorber assembly. Simultaneously, close both lock levers to secure canister.*

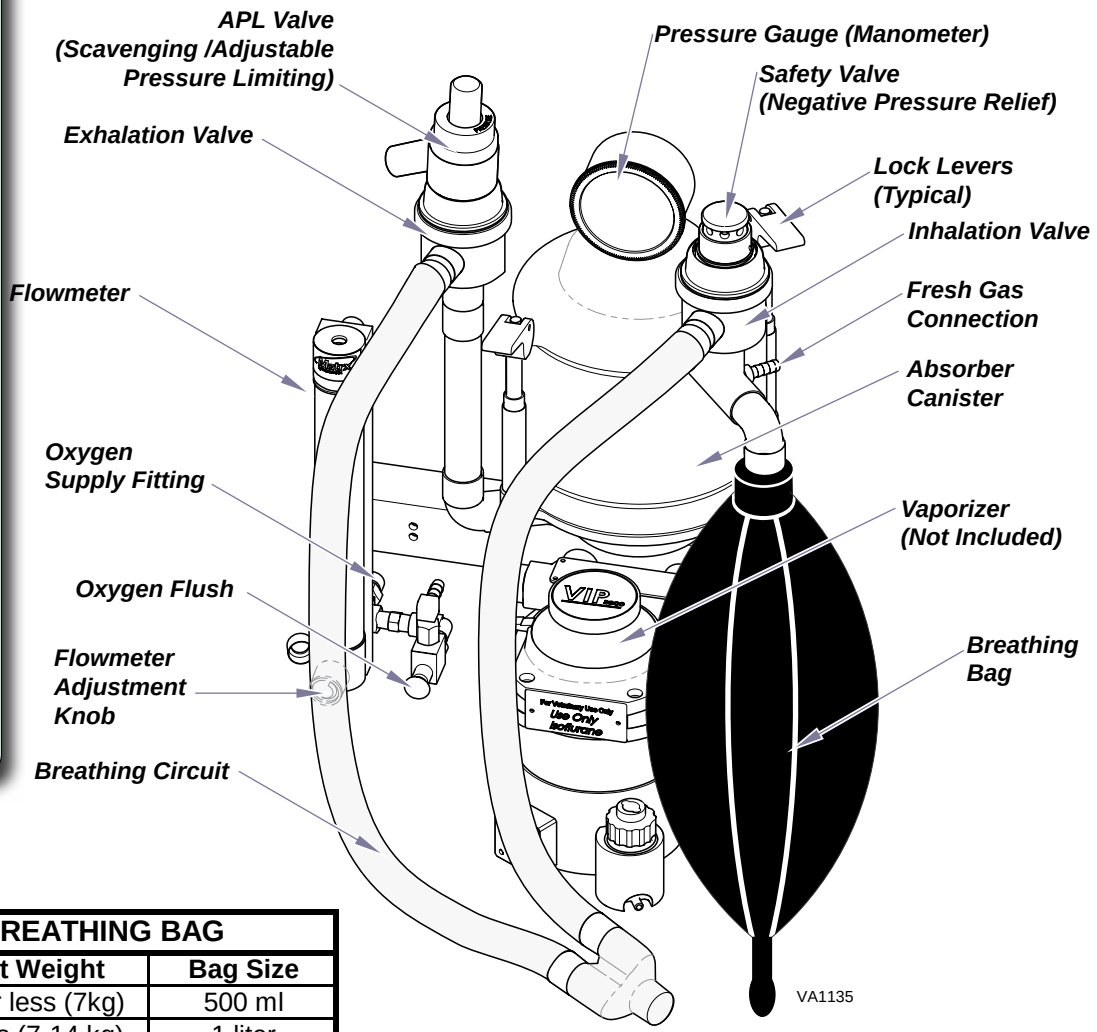
B) *Connect breathing bag and breathing circuit.*

C) *Connect a 50-55 PSI (3.4-3.8 Bar) oxygen supply line to the oxygen supply fitting on the back of the flowmeter.*

D) *Adjust flowmeter and vaporizer settings to meet physiologic needs of the patient.*

E) *During anesthesia, monitor the pressure gauge, inhalation and exhalation valves, and the breathing bag. Make necessary corrections in flow rate, vaporizer setting, and Scavenging/Adjustable Pressure Limiting (APL) valve, to insure adequate depth of anesthesia and adequate ventilation of the patient.*

Note: For guidelines on induction and anesthesia techniques, or particular species physiologic requirements, etc., please refer to a veterinary anesthesia textbook.



Equipment Alert

Never invert or tilt the vaporizer when it contains anesthetic liquid. Never overtighten the flowmeter needle valves, damage to the needle and seat will eventually result. Using the flowmeter, pressure gauge or pressure relief valve as handles when transporting can result in damage to compoents.

BREATHING BAG	
Patient Weight	**Bag Size**
15 lbs or less (7kg)	500 ml
15-30 lbs (7-14 kg)	1 liter
30-60 lbs (14-27 kg)	2 liter
60-100 lbs (27-45 kg)	3 liter
100 + lbs (45 + kg)	5 liter

Models:	***All VMS, VMS + and VMC***	
Serial Numbers:		

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Always verify model & serial number

VME & VME2 Operation

CAUTION

Insure gas supplies are adequate and turned on. Verify vaporizer is filled to eliminate the possibility of anesthetic depletion during surgery.

To Operate Anesthesia Machine...

A) Loosen thumb screw to remove CO2 absorber canister. Fill canister with absorbent material, following directions on canister label. Be sure canister and gasket mating surface are completely free of absorbent. Replace canister in absorber assembly. Tighten thumb screw.

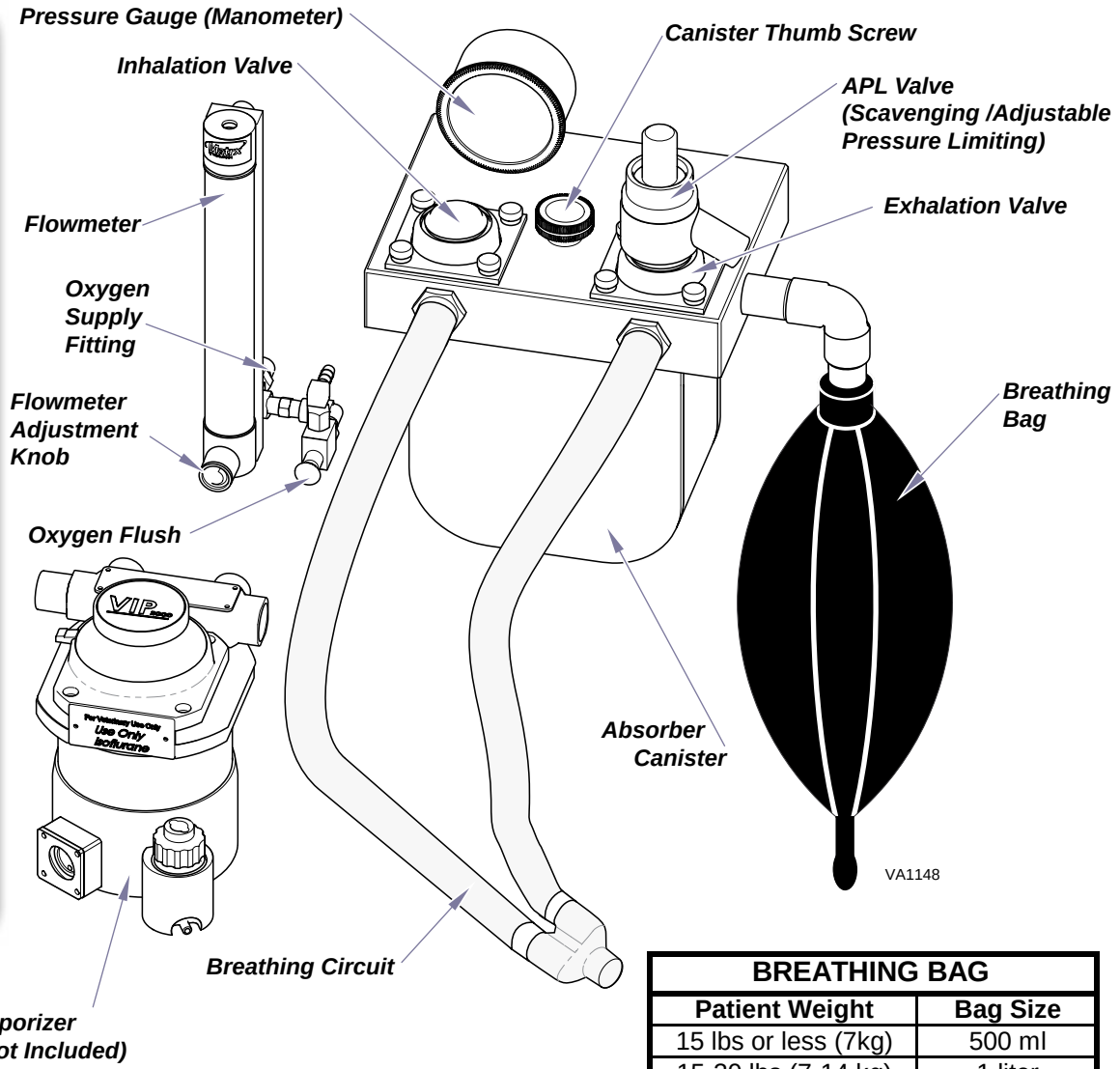
B) Connect breathing bag and breathing circuit.

C) Connect a 50-55 PSI (3.4-3.8 Bar) oxygen supply line to the oxygen supply fitting on the back of the flowmeter.

D) Adjust flowmeter and vaporizer settings to meet physiologic needs of the patient.

E) During anesthesia, monitor the pressure gauge, inhalation and exhalation valves, and the breathing bag. Make necessary corrections in flow rate, vaporizer setting, and Scavenging/Adjustable Pressure Limiting (APL) valve, to insure adequate depth of anesthesia and adequate ventilation of the patient.

Note: For guidelines on induction and anesthesia techniques, or particular species physiologic requirements, etc., please refer to a veterinary anesthesia textbook.



Equipment Alert

Never invert or tilt the vaporizer when it contains anesthetic liquid. Never overtighten the flowmeter needle valves, damage to the needle and seat will eventually result. Using the flowmeter, pressure gauge or pressure relief valve as handles when transporting can result in damage to compoents.

BREATHING BAG	
Patient Weight	**Bag Size**
15 lbs or less (7kg)	500 ml
15-30 lbs (7-14 kg)	1 liter
30-60 lbs (14-27 kg)	2 liter
60-100 lbs (27-45 kg)	3 liter
100 + lbs (45 + kg)	5 liter

Models:	***All VME & VME2***	
Serial Numbers:		

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Always verify model & serial number

Oxygen Flush

1. Oxygen enters the machine at the lower back of flowmeter.

2. Pressing the button on the oxygen flush valve bypasses the vaporizer.

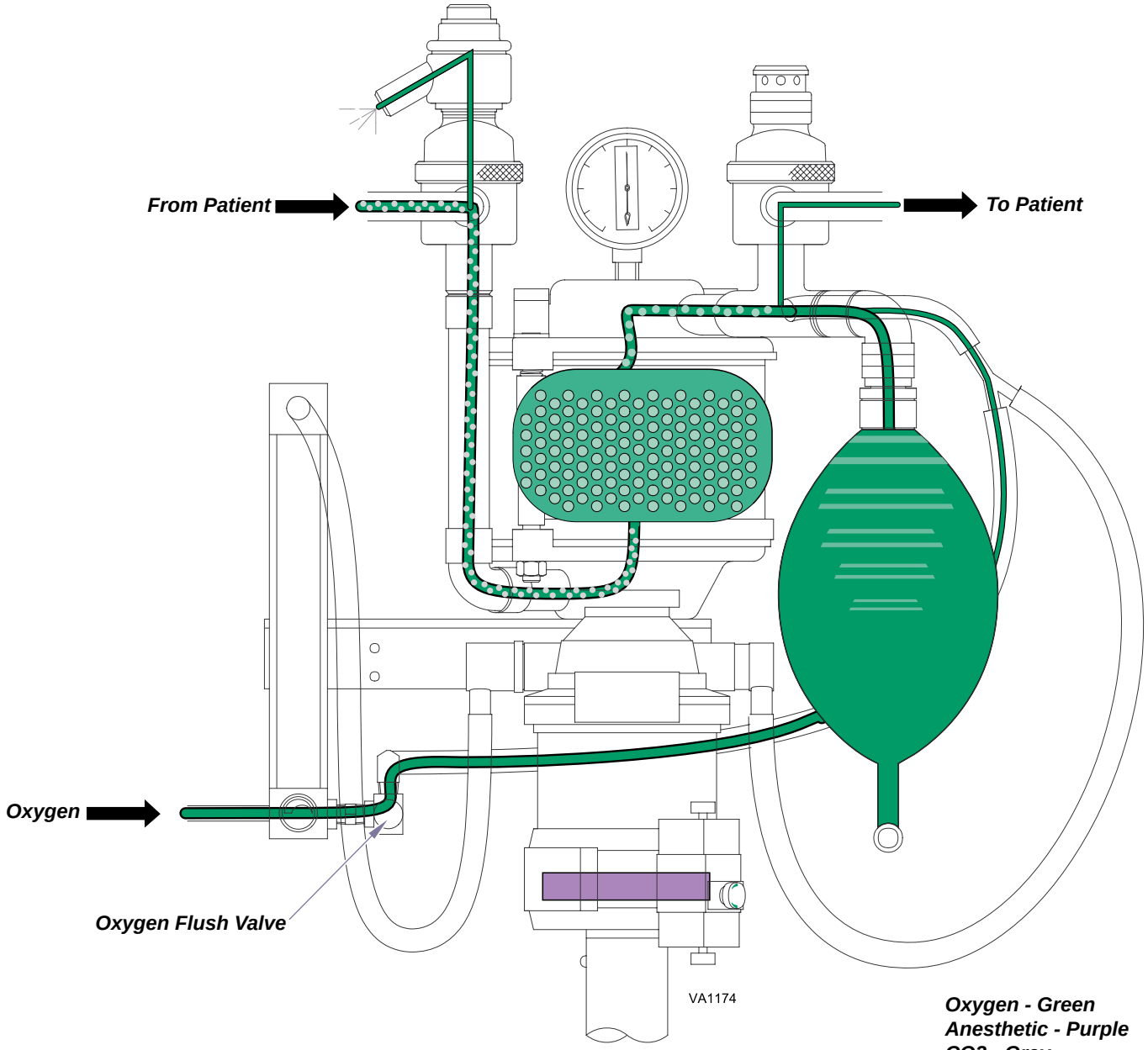
3. Oxygen enters the reservoir bag and inhalation tube then is inhaled by the patient.

4. The patient exhales. Waste gas enters the machine.

5. Waste gas enters the CO2 absorber canister which removes the CO2.

6. Oxygen without CO2 enters the reservoir bag, inhalation tube and patient, recycling the oxygen.

7. A small amount of waste gas exits the APL valve, maintaining pressure in machine and patient's lungs at 1-3cm H2O.



Oxygen - Green
Anesthetic - Purple
CO2 - Grey

Models:	***All***	
Serial Numbers:		

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Always verify model & serial number

Safety Valve
(Negative Pressure Relief Valve)

1. If there is no oxygen in the tank or the flow is shut of at the flow meter, room air enters the machine through the safety valve. The patient does not receive anesthetic gas

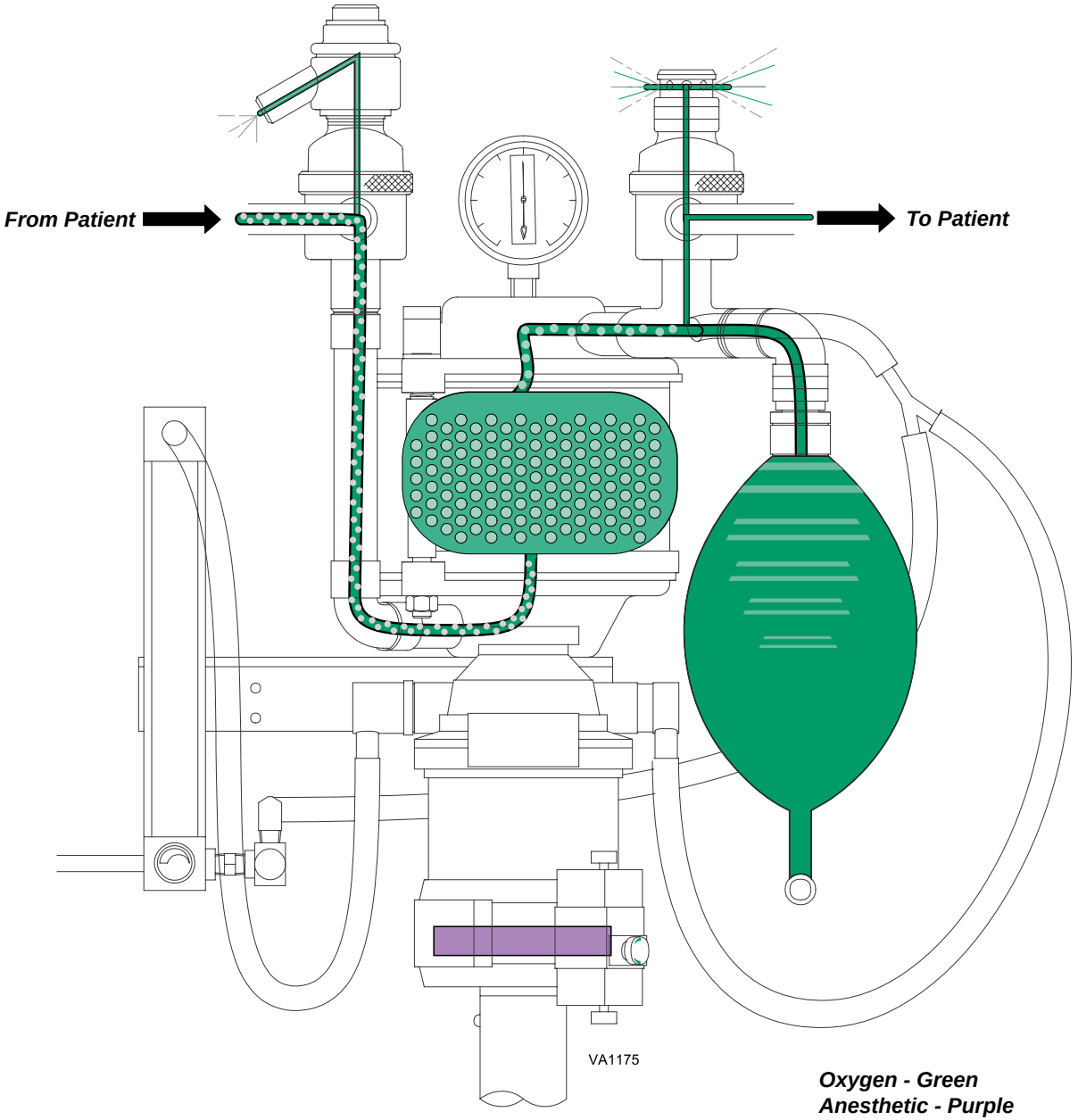
2. During inhalation, the reservoir bag deflates first, then air from the safety valve is drawn into the system.

3. The patient exhales. Waste gas enters the machine.

4. Waste gas enters the CO2 absorber canister which removes the CO2.

5. Air without CO2 enters the reservoir bag, inhalation tube and patient, recycling the air.

6. A small amount of waste gas exits the APL valve.



Oxygen - Green
Anesthetic - Purple
CO2 - Grey

Models:	***All***	
Serial Numbers:		

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Always verify model & serial number

Troubleshooting Chart

Problem	Probable Cause	Correction
Anesthesia Machine Leaks	Absorber canister.	Make sure gasket surfaces are clean and have no and free of absorbent granules. *VME Models Only* - Check tightness of absorber canister knob, verify no absorbent granules are in threaded hole. *VMS and VMC Models Only* - Verify absorber levers are in closed position. **Refer to: Section B Absorber Canister**
	Breathing bag, breathing circuit or hoses not sealing or has a hole.	Check breathing bag, breathing circuit and hoses for leak and replace if needed. **Refer to: Section B Breathing Bag and Breathing Circuit**
	Valve domes are loose.	Check inhalation and exhalation valve domes and o-rings are seated and clean. Verify thumb screws *(VME Models)* and or retainer rings *(VMS and VMC Models)* are tight. **Refer to: Section B Inhalation and Exhalation Valves**
	APL valve.	Make sure APL valve is closed during test and fully seated to clear exhalation dome. Remove APL valve, plug opening in clear dome to determine if leak originates from APL valve. Check O-ring under APL valve. **Refer to: Section B APL Valve**
	Vaporizer.	Verify fittings connected to vaporizer are tight. Check filler cap on vaporizer is tight and O-ring is undamaged. *(Test with Vaporizer turned off.)*
	Loose connection.	Check all connections to machine and fittings.
	Safety valve.	If machine is fitted with optional safety valve (negative pressure relief) valve, remove valve and plug opening in clear dome to determine if leak originates from safety valve. Check O-ring under safety valve. **Refer to: Section B Safety Valve**
Difficult to Induce Patient *"Will not go under"*	Machine leaking.	Perform leak test. **Refer to: Section B Leak Test**
	Anesthetic low.	Check anesthetic level.
	Flow rate setting.	Check for proper flow rate. **Refer to: Section B Flowmeter**
Desired Depth Of Anesthesia Not Maintainable *"Patient wakes up during procedure."*	Machine leaking.	Perform leak test. **Refer to: Section B Leak Test**
	CO_2 absorbent is old.	Change CO_2 absorbent. **Refer to: Section B Absorber Canister**
	Anesthetic low.	Check anesthetic level.
	Flow rate setting.	Check for proper flow rate. **Refer to: Section B Flowmeter**

Chart Continued on Next Page

Models:	***All***	
Serial Numbers:		

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Troubleshooting Chart (continued)

Problem	Probable Cause	Correction
Breathing Bag "Over-Inflated"	APL valve closed.	Open APL valve. **Refer to: Section B APL Valve**
	Pressure setting.	Check pressure reading on pressure gauge • If pressure is between 1 - 3 cm H_2O when bag appears "over inflated" machine is functioning properly. • If pressure is over 4 cm H_2O, check for obstructions in scavenging device. Replace APL valve. **Refer to: Section B Pressure Gauge**
Breathing Bag Does Not Inflate	Machine leaking.	Perform leak test. **Refer to: Section B Leak Test**
	Excessive draw (if using a active scavenger).	Check active scavenger for excessive draw.
	Oxygen flow rate.	Check oxygen flow. **Refer to: Section A Oxygen Flush**
Insufficient Or No Oxygen Flow	Machine leaking.	Perform leak test. **Refer to: Section B Leak Test**
	Oxygen supply and or pressure.	Check oxygen supply and pressure. **Refer to: Section B Flowmeter and Pressure Gauge**
	Flowmeter needle valve broken.	Check flowmeter needle valve for operation. **Refer to: Section B Flowmeter**
Inhalation and Exhalation Valves Not Working Properly	Valves dirty or damaged.	Check valve seats for damage. **Refer to: Section B Inhalation and Exhalation Valves**
		Replace dirty or warped valve disks.

Models:	***All***	
Serial Numbers:		

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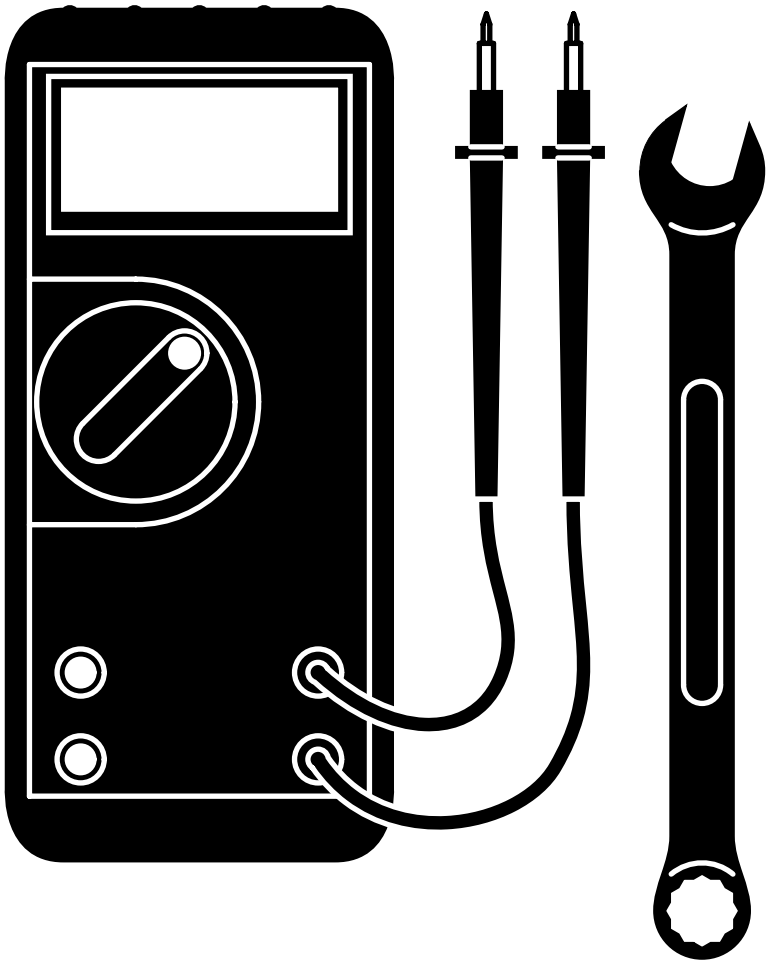
Section B



Component / System:	Page
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Oxygen Flush Valve	B-4
Breathing Bag	B-5
Breathing Circuit	B-6
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Safety Valve *(Negative Pressure Relief)*	B-8
Pressure Gauge *(Manometer)*	B-9
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Leak Test *(VMS, VMS+, VMC)*	B-16
Leak Test *(VME, VME2)*	B-17
Cleaning Anesthesia Machine	B-18

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Flowmeter

Function

The needle valve is used to adjust the flow of oxygen into the machine. Turning the green knob clockwise closes the valve. Turning it counterclockwise opens it.

The ball in the graduated glass tube indicates the current rate of flow. Readings should be taken based on the position of the center of the ball.

The oxygen connection on the back of the flow meter uses a DISS (Diameter Indexed Safety System) fitting. This means that no standard gas fitting other than oxygen should be able to physically connect to the back of the flowmeter.

The color of the knob and the hose from the oxygen tank match the standard color code for oxygen. This is green for units sold in the USA.

VMS Model Shown

Flowmeter	Page
Function	B-2
Functional Testing	B-3
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

www.midmark.com	File Name
Needle Valve Replacement	
Round Face	10536700
Flat Face	10188300

Models:	All	
Serial Numbers:		

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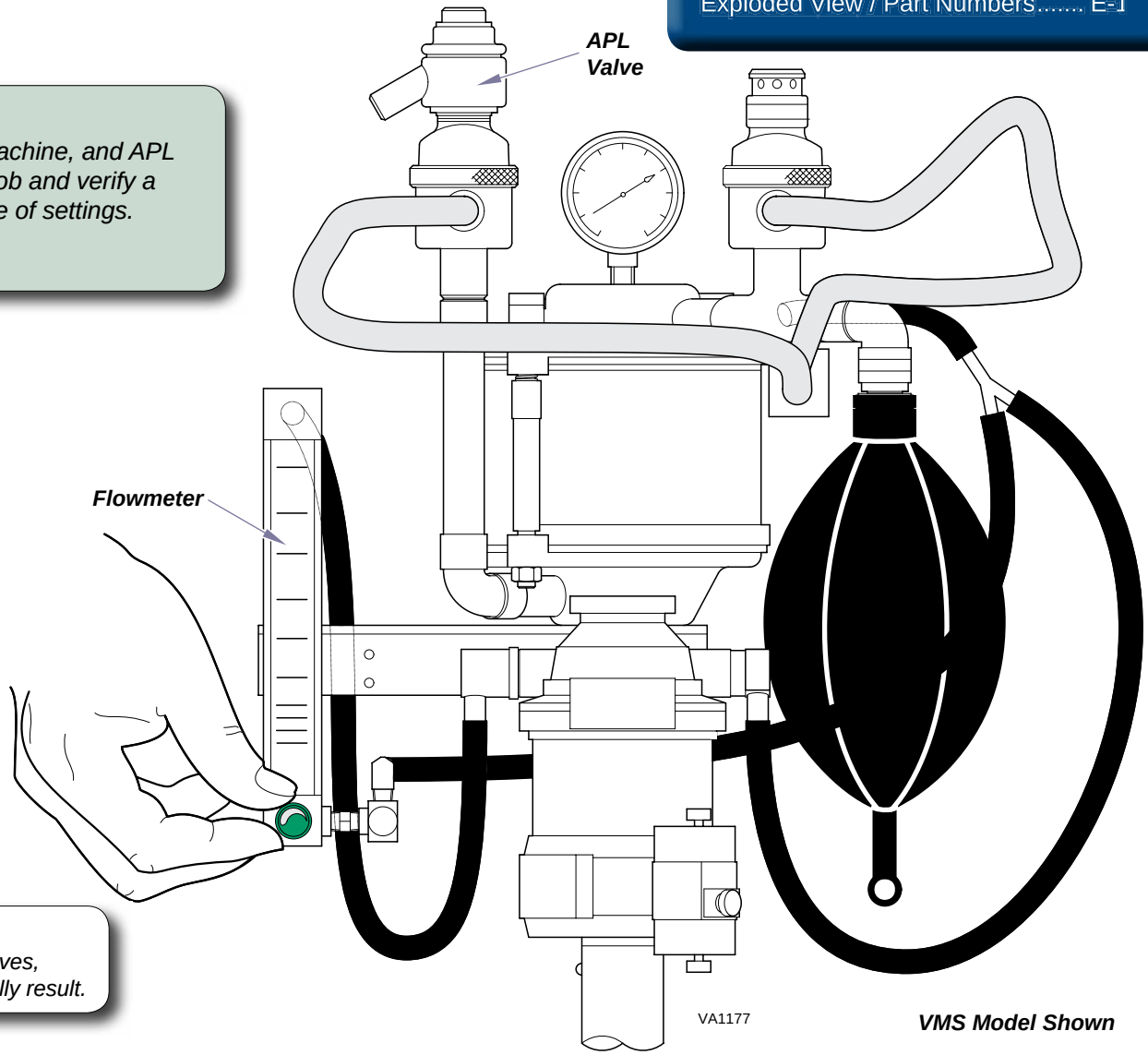
Flowmeter

Flowmeter	Page
Function	B-2
Functional Testing	B-3
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

Functional Test

To Test flowmeter functionality..
With (50-55 PSI (3.4-3.8 Bar)) oxygen supplied to machine, and APL valve fully opened, rotate flowmeter needle valve knob and verify a smooth movement of flowmeter ball though full range of settings.

Note: Do not over tighten needle valve when closed.



VMS Model Shown

Equipment Alert
Never overtighten the flowmeter needle valves, damage to the needle and seat will eventually result.

Models:	All	
Serial Numbers:		

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Always verify model & serial number

Oxygen Flush Valve

Oxygen Flush Valve	Page
Oxygen Flush Operation	A-3
Tubing Diagrams	D-1

Function

The oxygen flush valve is a single purpose, self closing device that receives oxygen from the supply line and directs a flow of oxygen (35 to 75 LPM) directly into the system while bypassing the vaporizer.

VMS Model Shown

Models:	All	
Serial Numbers:		

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Reservoir

Function

The reservoir bag (breathing bag) is composed of rubber or plastic. The neck of the bag includes an opening to enable attachment to the 22mm tapered bag port on the anesthesia machine.

In general, small bags are used for small patients and large bags are used for large patients.

Bag functions:

- Acts as a reservoir – Allows gas to collect during exhalation so a reservoir is available for the next inhalation if greater than supplied by the flowmeter.
- Visually monitor patients respiration.
- Bags are very compliant. They serve as a buffer for excessive pressure in the system
- Provides a method for manually assisted ventilation (bagging a patient).

Reservoir (Breathing Bag)	Page
Function	B-5
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

www.midmark.com	File Name
Maintenance Kit	
VMS, VMS +, VMC	10577100
VME, VME2	10577200

VMS Model Shown

Models:	All	
Serial Numbers:		

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Breathing Circuit

Breathing Circuit	Page
Function	B-6
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

www.midmark.com	File Name
Maintenance Kit	
VMS, VMS +, VMC	10577100
VME, VME2	10577200

Function

The breathing circuit is a flexible corrugated tube used to convey gases to and from the patient. Corrugated tubing reduces kinking. They are available in 15mm and 22mm sizes.

Breathing circuits have 22mm female fittings at either end, to enable connection to the inhalation and exhalation ports on the anesthesia machine, and a 15mm female patient end for connection to masks or Endotracheal tubes.

Unilimb Rebreathing Circuits are a unique tube-within-a- tube design, which reduces clutter of multiple tubes.

VMS Model Shown

Unilimb Breathing Circuit

Models:	All	
Serial Numbers:		

© Midmark Corporation 2008 SF-1926 Rev. 11/12/18

Always verify model & serial number

Inhalation Valve

Function

The inhalation valve is a simple unidirectional flutter valve with a 22mm male connector. A light thin disc seats horizontally on a circular knife-edge. A removable clear dome covers the top of the valve so that the disc can be observed. A guide, incorporated in the dome, prevents the disc from becoming dislodged.

Gas enters the valve at the bottom and flows through the center of the valve, raising the disc from its knife-edge seat. The gas then passes under the dome and through to the breathing circuit.

The inhalation valve opens on inhalation and closes on exhalation.

Breathing Circuit	Page
Function	B-7
Functional Testing	B-13
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

www.midmark.com	File Name
Maintenance Kit	
VMS, VMS +, VMC	10577100
VME, VME2	10577200

Inhalation Valve

Models:	All	
Serial Numbers:		

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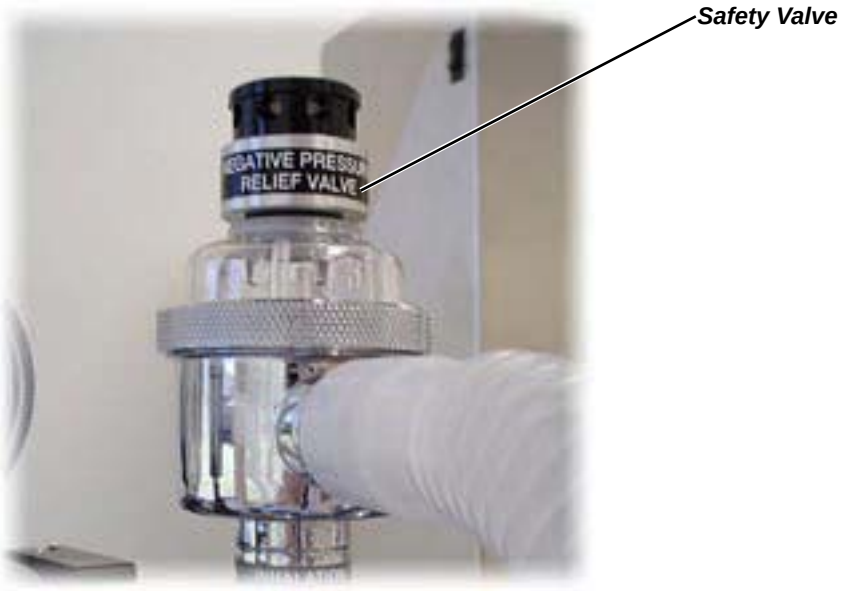
Always verify model & serial number

Safety Valve

Function

The safety (negative pressure relief) valve allows the patient to breathe if the oxygen supply runs out or is shut off.

This flexible diaphragm valve lets air in if the pressure inside the machine during inhalation becomes lower than the pressure outside.



Models:	All	
Serial Numbers:		

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Always verify model & serial number

Pressure Gauge (Manometer)

Function

The pressure gauge (manometer) allows you to monitor pressure inside the system.

It is especially useful for leak testing the anesthesia machine and for monitoring the system pressure during assisted ventilation.

Old Style Marshall Pressure Gauge

Old Style Weksler Pressure Gauge

New Style Wika Pressure Gauge

Models:	All	
Serial Numbers:		

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APL Valve

APL Valve	Page
Function	B-10
Functional Testing	B-11
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

www.midmark.com	File Name
Maintenance Kit	
VMS, VMS +, VMC	10577100
VME, VME2	10577200

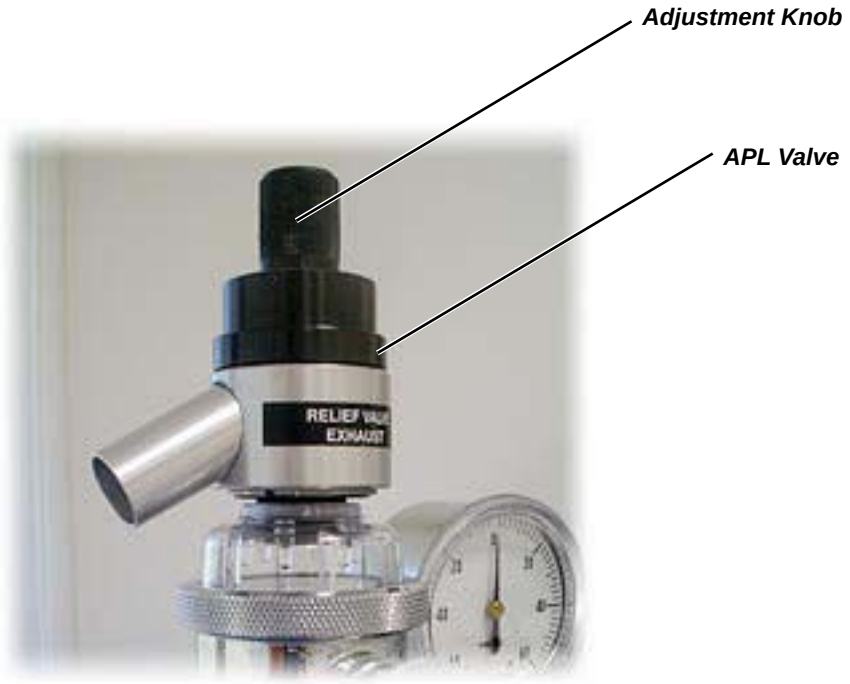
Function

The APL (scavenging / adjustable pressure limiting) valve controls the pressure in the system.

If the pressure in the system exceeds the pressure exerted by the weight of the poppet or the pressure exerted by the compression spring, the valve opens and gas escapes. This normally occurs when the patient is exhaling.

The pressure in the anesthesia machine and the patient's lungs can be controlled by turning the adjustment knob on top of the valve.

Fully open, the APL valve maintains a pressure in the anesthesia machine and the patient's lungs, of 1-3cm H2O.



Models:	All	
Serial Numbers:		

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Always verify model & serial number

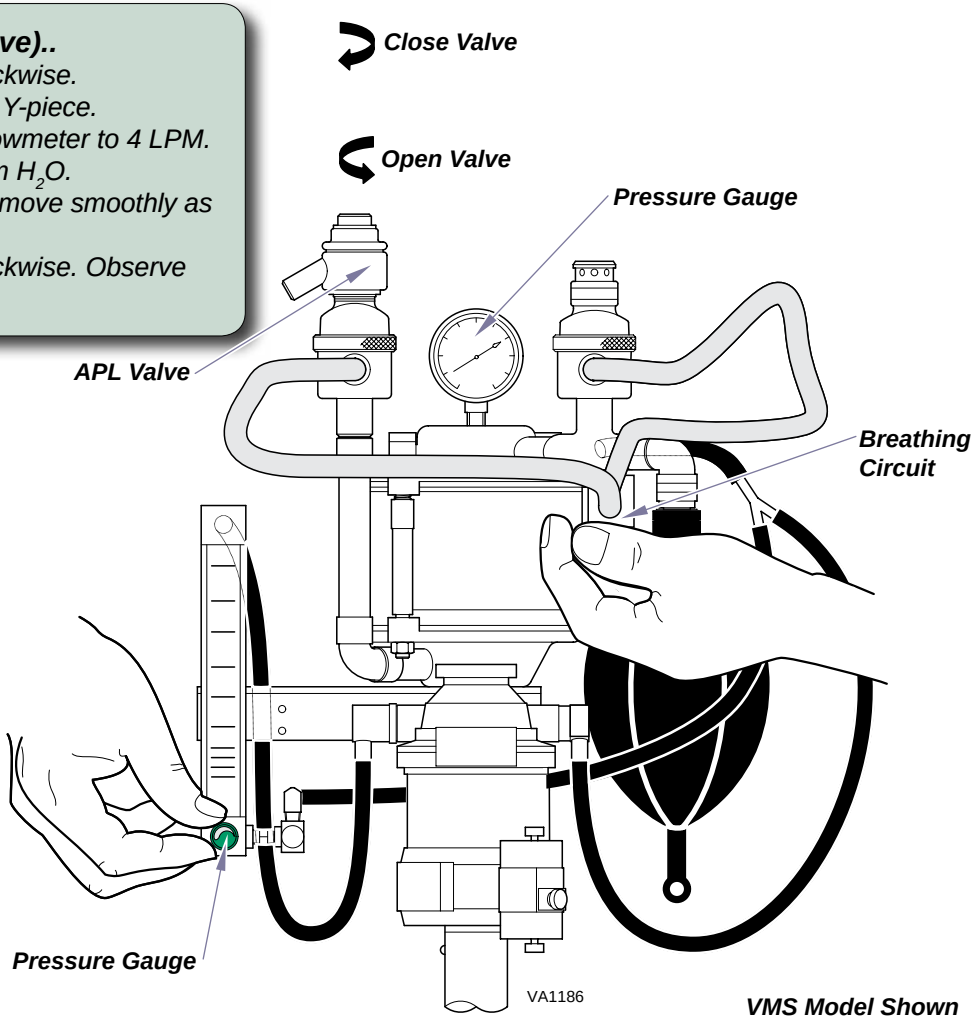
APL Valve	Page
Function	B-10
Functional Testing	B-11
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

APL Valve

Functional Test

Scavenging/Adjustable Pressure Limiting (APL Valve)..

A) Open APL valve all the way by turning knob counter clockwise.
B) Place thumb over patient connection of breathing circuit Y-piece.
C) Turn on oxygen supply (50-55 PSI - 3.4-3.8 Bar), turn flowmeter to 4 LPM.
D) Observe pressure gauge. Verify reading is less than 4cm H_2O.
E) Slowly begin closing APL valve. Pressure gauge should move smoothly as pressure increases. DO NOT EXCEED 40cm H_2O!
F) Open APL valve all the way by turning knob counter clockwise. Observe pressure gauge and return to less than 4cm H_2O.



VMS Model Shown

Models:	All	
Serial Numbers:		

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Always verify model & serial number

Exhalation Valve

Function

The exhalation valve is a simple unidirectional flutter valve with a 22mm male connector. A light thin disc seats horizontally on a circular knife-edge. A removable clear dome covers the top of the valve so that the disc can be observed. A guide, incorporated in the dome, prevents the disc from becoming dislodged.

Exhaled gas enters the valve through the breathing circuit port, raising the disc from the knife-edge seat. The gas then passes under the dome and through the absorber canister or is vented out the APL valve.

The exhalation valve opens on exhalation and closes on inhalation.

Exhalation Valve

Exhalation Valve	Page
Function	B-12
Functional Testing	B-13
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

www.midmark.com	File Name
Maintenance Kit	
VMS, VMS +, VMC	10577100
VME, VME2	10577200

Models:	All	
Serial Numbers:		

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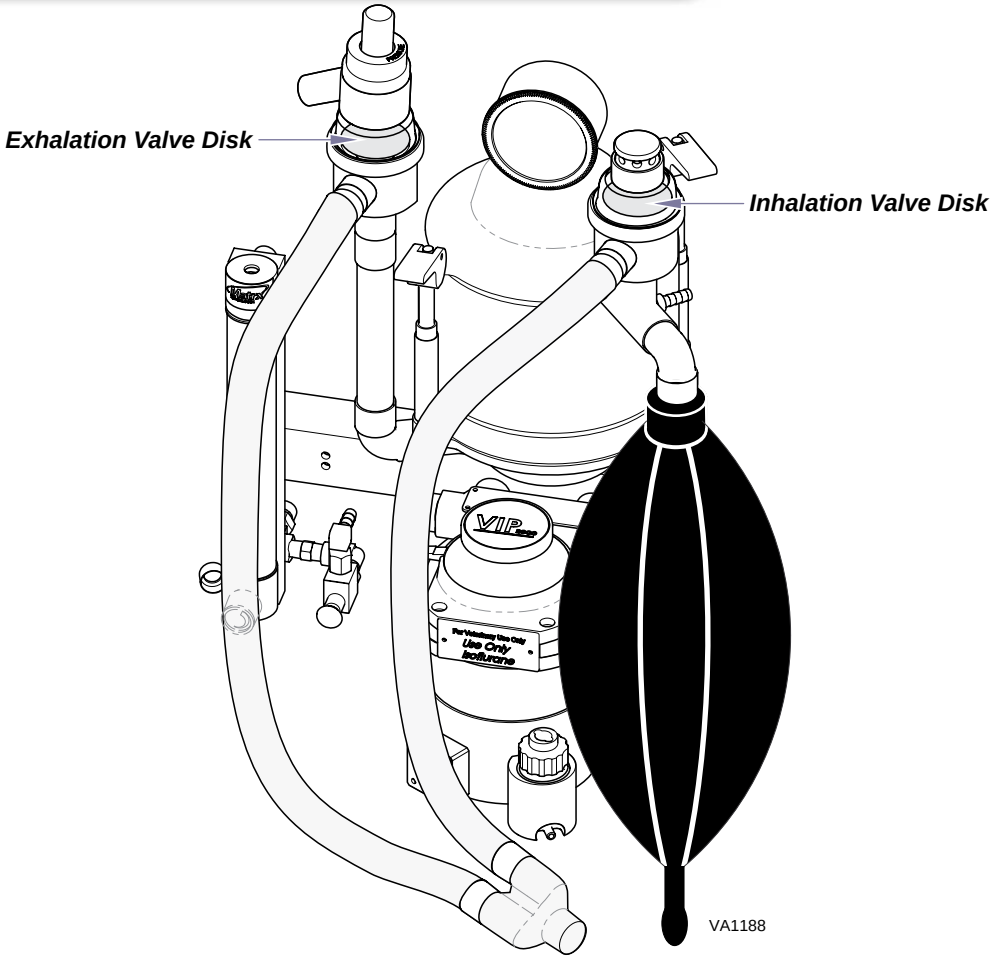
Always verify model & serial number

Valves	Page
Exhalation Function	B-12
Inhalation Function	B-7
Functional Testing	B-13
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

Functional Test

To test Inhalation and Exhalation Valves..
Check that valve disks are operating properly by observing movement during breathing cycles.



Models:	All	
Serial Numbers:		

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Always verify model & serial number

Absorber Canister

Function

The absorber canister holds carbon dioxide absorption material. The absorbent removes CO_2 from expired gases before gases recycle back to the patient.

The 1500cc (1350g) absorber canister (found on the VMS and VMC anesthesia machines) has a transparent plastic canister located between upper and lower metal housings. Gaskets at the top and bottom fit between the canister and metal housings. A screen in the bottom gasket holds granular material in place, and a screen in the top gasket prevents granular material from entering the breathing circuit, if loose absorbent is used.

The absorber canister for the VME and VME2 anesthesia machines has a gasket located under the manifold. The canister attaches to the manifold with a knob accessed on top of the manifold.

VMS Model Shown

Equipment Alert
Over-tighting the canister knob can strip the canister mounting hole.

Absorber Canister	Page
Function	B-14
Cleaning	B-15
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

www.midmark.com	File Name
Maintenance Kit	
VMS, VMS +, VMC	10577100
VME, VME2	10577200

Models:	All	
Serial Numbers:		

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Always verify model & serial number

Absorber Canister

Absorber Canister	Page
Function	B-14
Filling & Cleaning	B-15
Tubing Diagrams	D-1
Exploded View / Part Numbers	E-1

Filling & Cleaning

VMS, VMS+, VMC...

Loose absorbent

A) Fill canister one third full.
B) Gently tap sides of canister to settle absorbent.
C) Fill canister two-thirds full and repeat step B.
D) Fill canister to fill line and repeat step B.

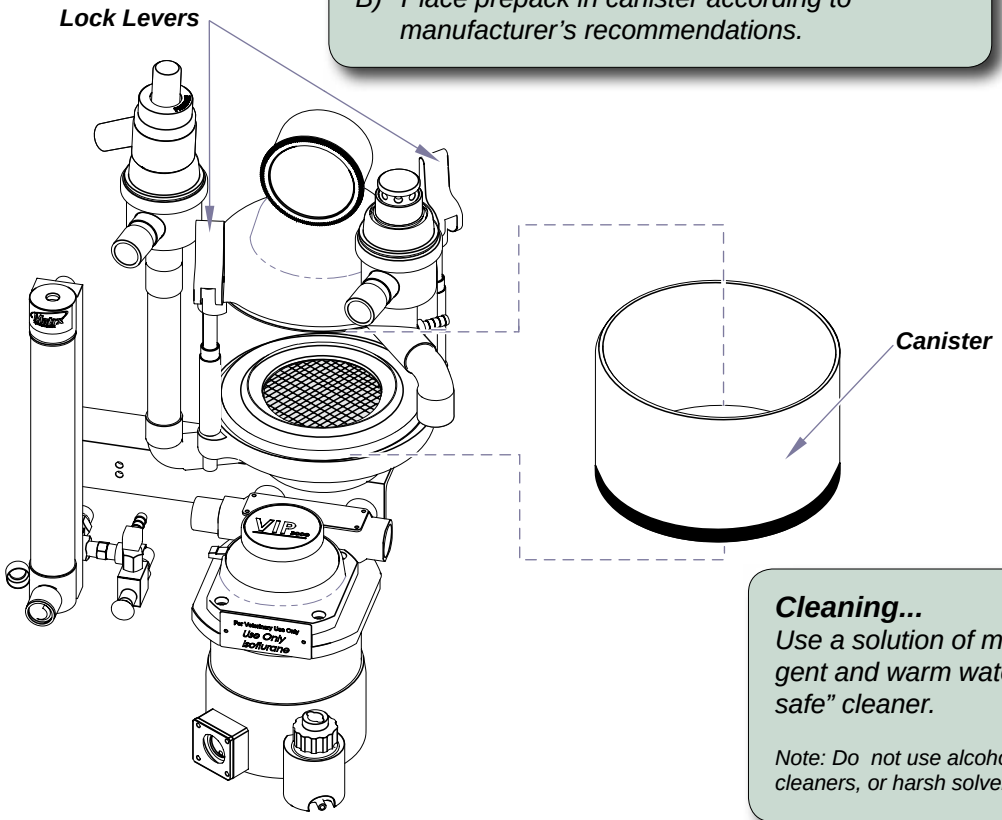
Prepacks

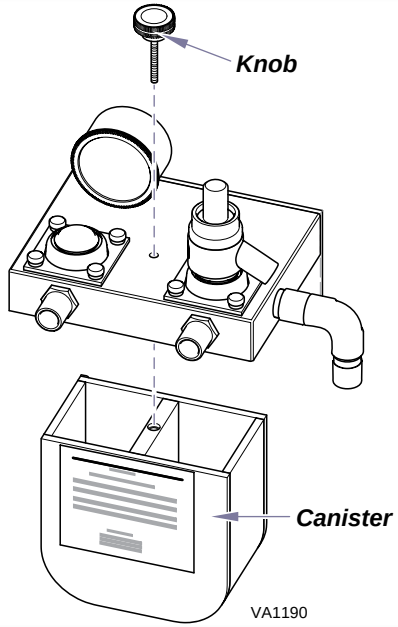
A) Peel off all sealing labels and wraps.
B) Place prepack in canister according to manufacturer's recommendations.

VME, VME2...

A) Cover threaded hole when filling.
B) Fill both sides of canister 1/2 full.
C) Gently tap sides of canister to settle absorbent.
D) Fill canister to fill line.

Note: The usable volume of absorbent should be not less than 1.5 times the tidal volume, do not wait for complete color change.





Cleaning...

Use a solution of mild soap or detergent and warm water, or any "acrylic safe" cleaner.

Note: Do not use alcohol, bleach, window cleaners, or harsh solvents.

Equipment Alert - VME & VME2

Over-tighting the canister knob can strip the canister mounting hole.

Models:	All	
Serial Numbers:		

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Always verify model & serial number

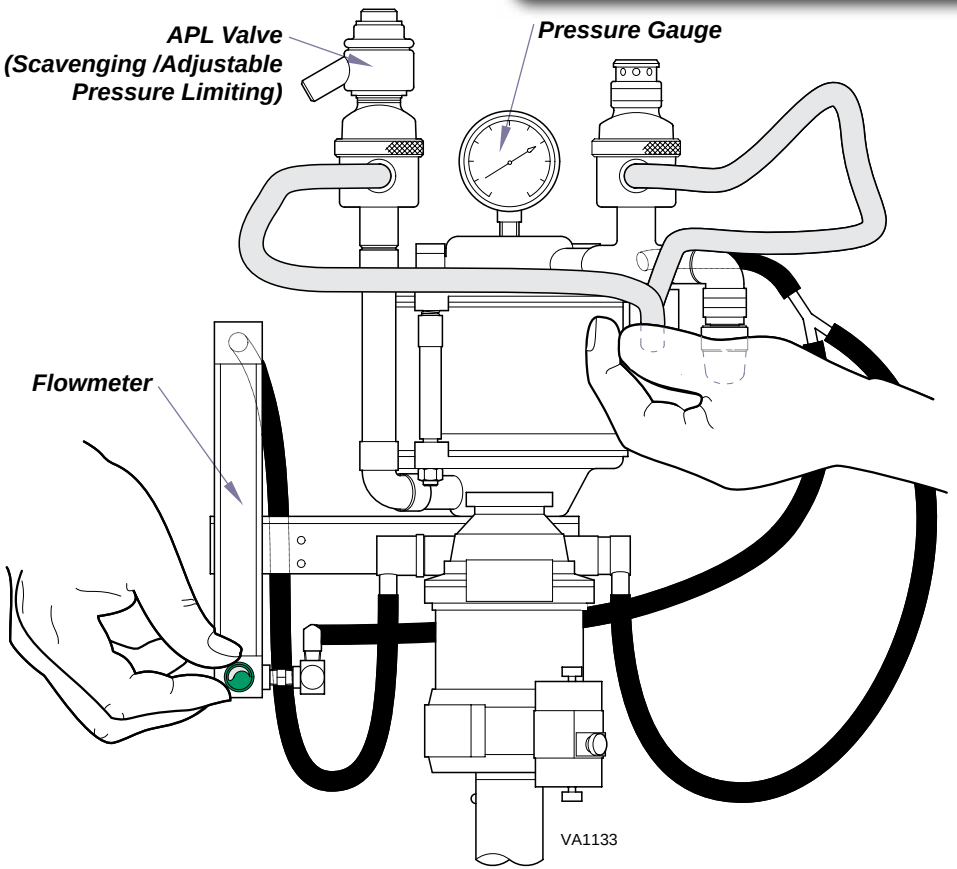
Testing & Repair

Leak Test - VMS, VMS Plus & VMC

Equipment Alert
Do not activate the oxygen flush during any part of this leak test.

To perform leak test...

A) Close APL (Scavenging /Adjustable Pressure Limiting) valve by turning knob clockwise.
B) Place thumb over patient connection of breathing circuit Y.
C) Remove breathing bag and cover bag port opening. (Use palm of hand that is covering Y.)
D) With oxygen (50-55 PSI [3.4-3.8 Bar]) supplied to anesthesia machine, slowly open flowmeter to register 30cm H_20 on anesthesia machine pressure gauge.
E) Turn off flowmeter when pressure reaches 30cm H_2O. (If pressure holds steady the system is leak free but if pressure drops, proceed to step (F).)
F) Slowly open flowmeter until pressure stabilizes at 30cm. H_2O setting. (This determines the magnitude of the leak. If leak rate is greater than 300ml/min; proceed to step (G).)
G) Refer to: "What if machine leaks?
H) Replace reservoir bag. Repeat step (B) and steps (D) through (F). This will determine the integrity of breathing bag.



What if Machine Leaks?

1) Breathing Bag - *If leak occurs, replace.*
2) Breathing Circuit - *Install new breathing circuit or obstruct inhalation / exhalation openings to determine if leak originates from breathing circuit.*
3) Vaporizer Fittings - *Verify fittings and tubing are securely attached.*
4) Canister Gaskets - *Check for loose absorbent grains between canister housing gaskets.*
5) Verify Canister *is seated properly.*
6) Safety Valves - *Remove valve and obstruct opening to determine if leak originates from negative pressure relief valve. Check the o-ring under valve for damage.*
7) APL Valve - *Remove valve and obstruct opening to determine if leak originates from APL valve. Check the o-ring under valve for damage.*
8) O-Rings *under chrome retaining rings. Check the o-rings for damage.*

Models:	All VMS, VMS + and VMC	
Serial Numbers:		

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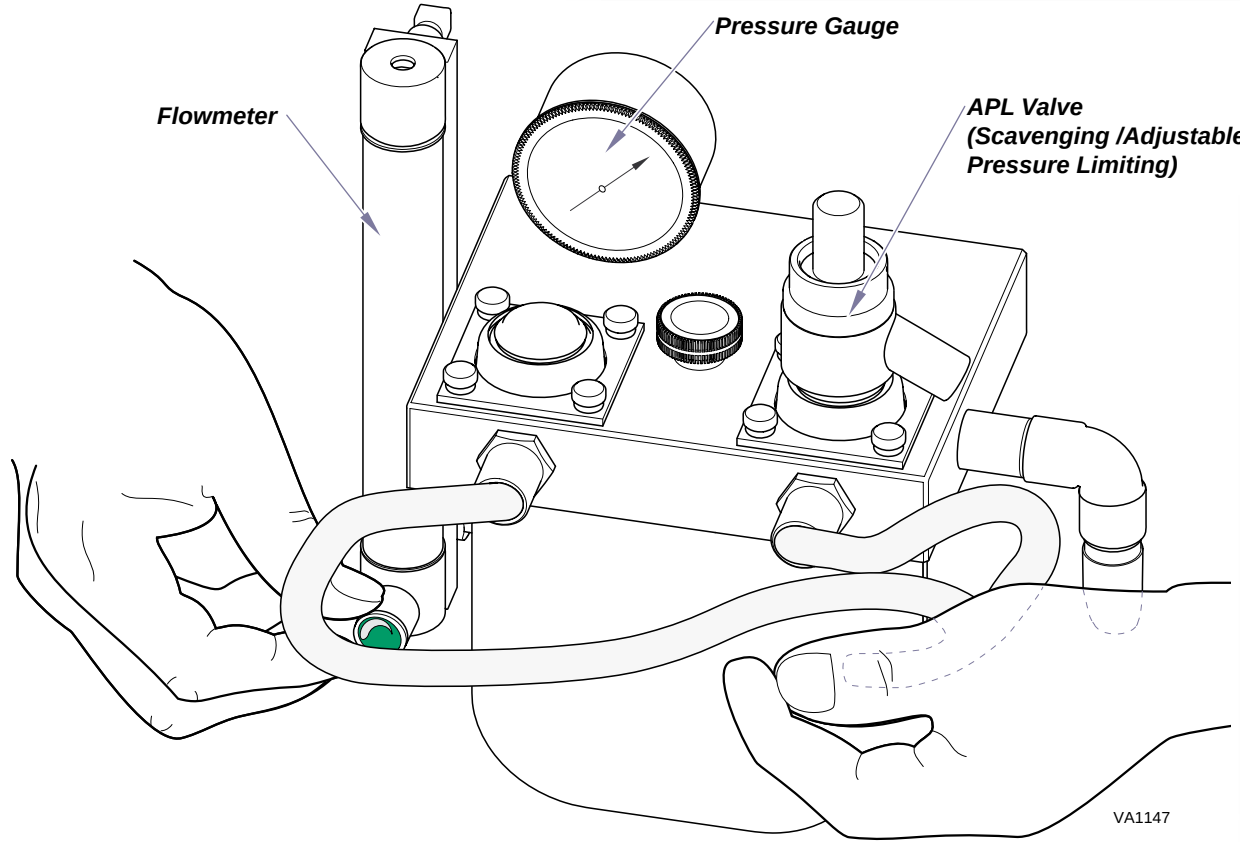
Testing & Repair

Leak Test - VME & VME2

BREATHING BAG	
Patient Weight	**Bag Size**
15 lbs or less (7kg)	500 ml
15-30 lbs (7-14 kg)	1 liter
30-60 lbs (14-27 kg)	2 liter
60-100 lbs (27-45 kg)	3 liter
100 + lbs (45 + kg)	5 liter

To perform leak test...

A) Close APL (Scavenging /Adjustable Pressure Limiting) valve by turning knob clockwise.
B) Place thumb over patient connection of breathing circuit Y.
C) Remove breathing bag and cover bag port opening. (Use palm of hand that is covering Y.)
D) With oxygen (50-55 PSI [3.4-3.8 Bar]) supplied to anesthesia machine, slowly open flowmeter to register 30cm H_2O on anesthesia machine pressure gauge.
E) Turn off flowmeter when pressure reaches 30cm H_2O. (If pressure holds steady the system is leak free but if pressure drops, proceed to step (F).)
F) Slowly open flowmeter until pressure stabilizes at 30cm. H_2O setting. (This determines the magnitude of the leak. If leak rate is greater than 300ml/min; proceed to step (G).)
G) Refer to: "What if machine leaks?
H) Replace reservoir bag. Repeat step (B) and steps (D) through (F). This will determine the integrity of breathing bag.



Equipment Alert

Do not activate the oxygen flush during any part of this leak test.

What if Machine Leaks?

1) Breathing Bag - *If leak occurs, replace.*
2) Breathing Circuit - *Install new breathing circuit or obstruct inhalation / exhalation openings to determine if leak originates from breathing circuit.*
3) Vaporizer Fittings - *Verify fittings and tubing are securely attached.*
4) Canister Gasket - *Check for loose absorbent grains between canister housing gasket.*
5) Verify Canister *is seated properly.*
6) APL Valve - *Remove valve and obstruct opening to determine if leak originates from APL valve. Check the o-ring under valve for damage.*
7) O-Rings *under dome and clamp. Check the o-rings for damage.*

Models:	***All VME & VME2***	
Serial Numbers:		

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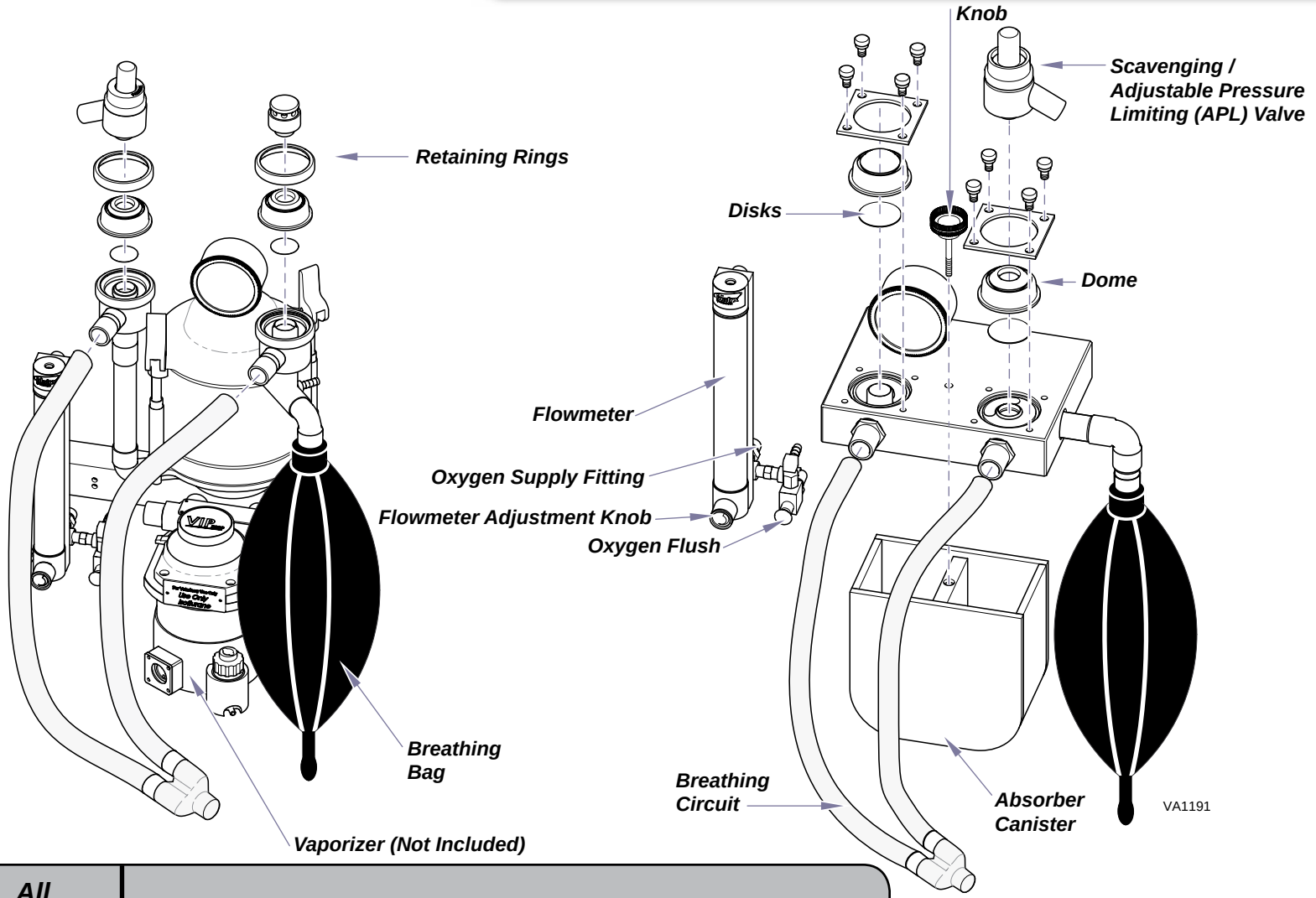
Testing & Repair

Cleaning

To Clean Anesthesia Machines...

A) Remove breathing bag and breathing circuit.
B) Wash with warm water and mild soap, rinse well and hang to dry.
C) Remove white disks from inhalation and exhalation valves.
D) Wipe disks with soft cloth, wipe out valves and reassemble.
E) Remove absorber canister and wipe off gaskets, canister and absorber housings.

Note: Anesthesia machines should be cleaned daily.



Models:	All	
Serial Numbers:		

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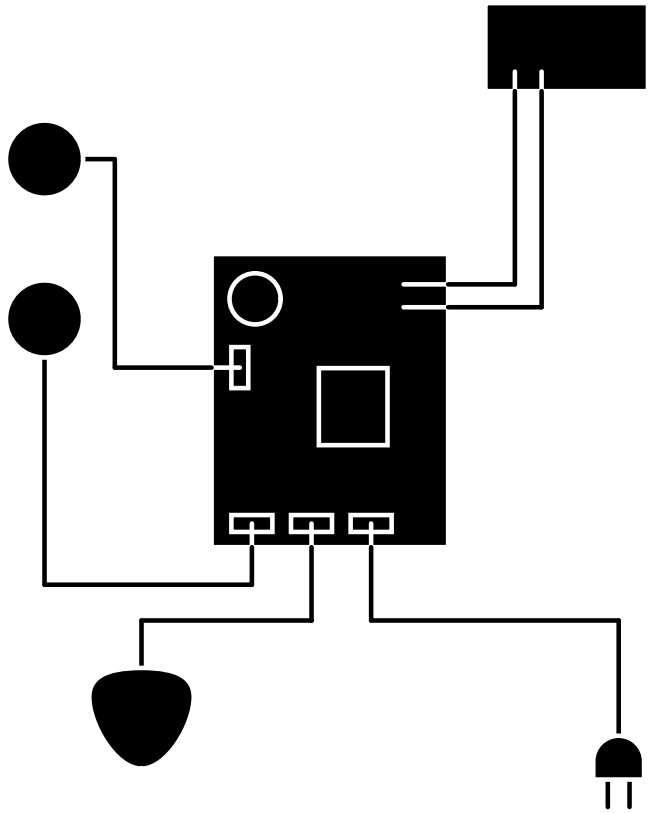
Section D

Tubing Diagrams

Diagrams	Page
VMS, VMS Plus	D-2
VMC	D-3
VME, VME2	D-4



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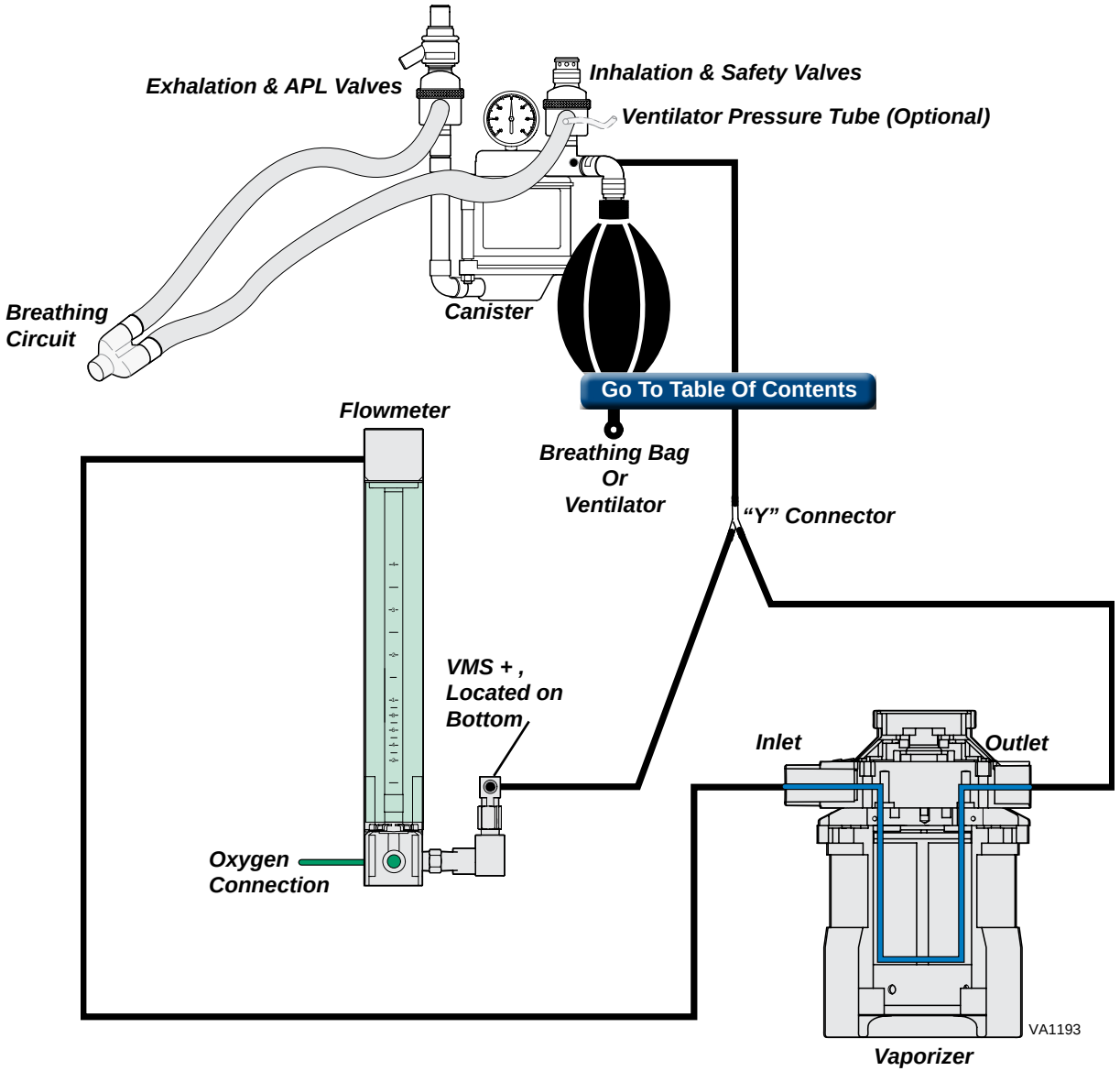
Tubing Diagrams

Refer To: Page
Exploded View / Part Numbers..... E-1



Models:	VMS	VMS Plus	
Serial Numbers:	all	all	

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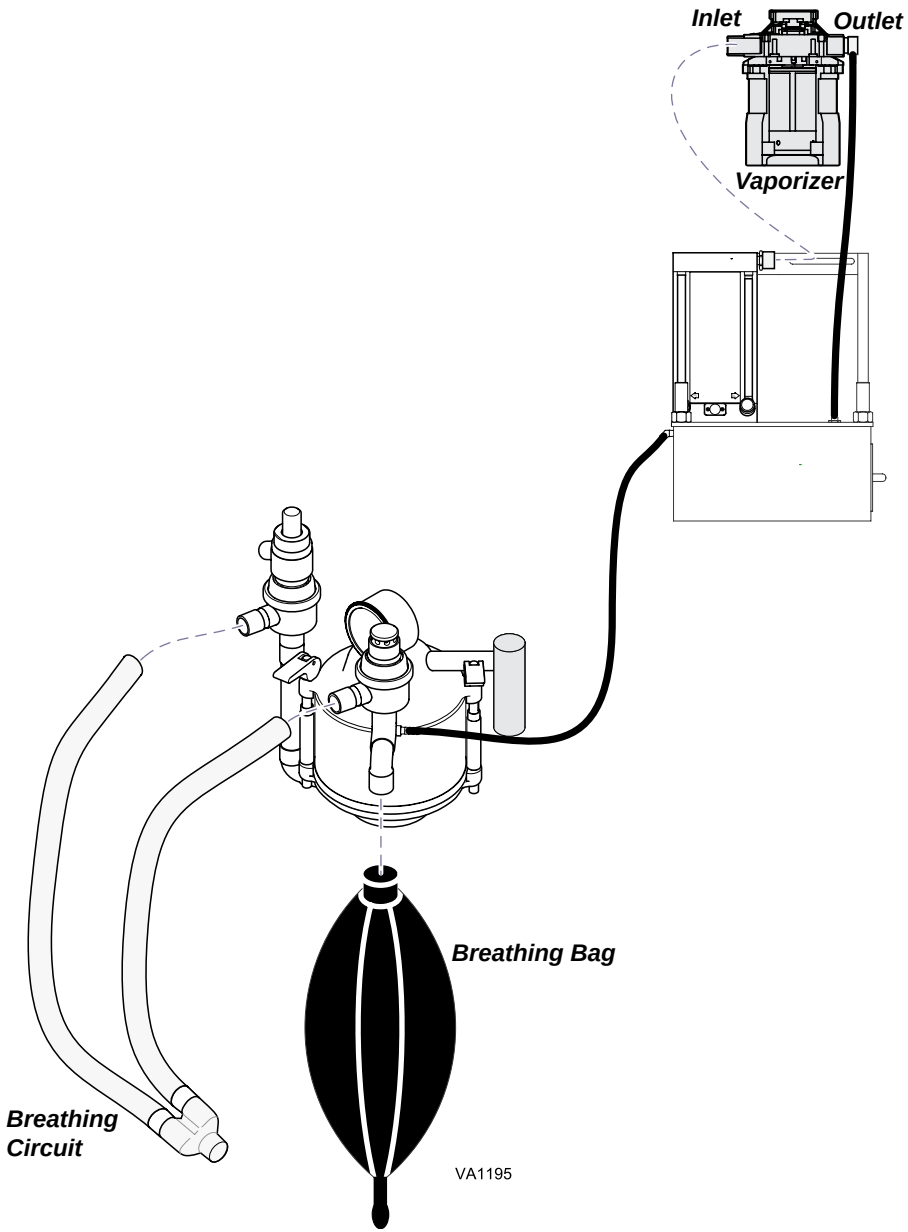
Tubing Diagrams

Refer To: Page
Exploded View / Part Numbers..... E-1



Models:	VMC	
Serial Numbers:	all	

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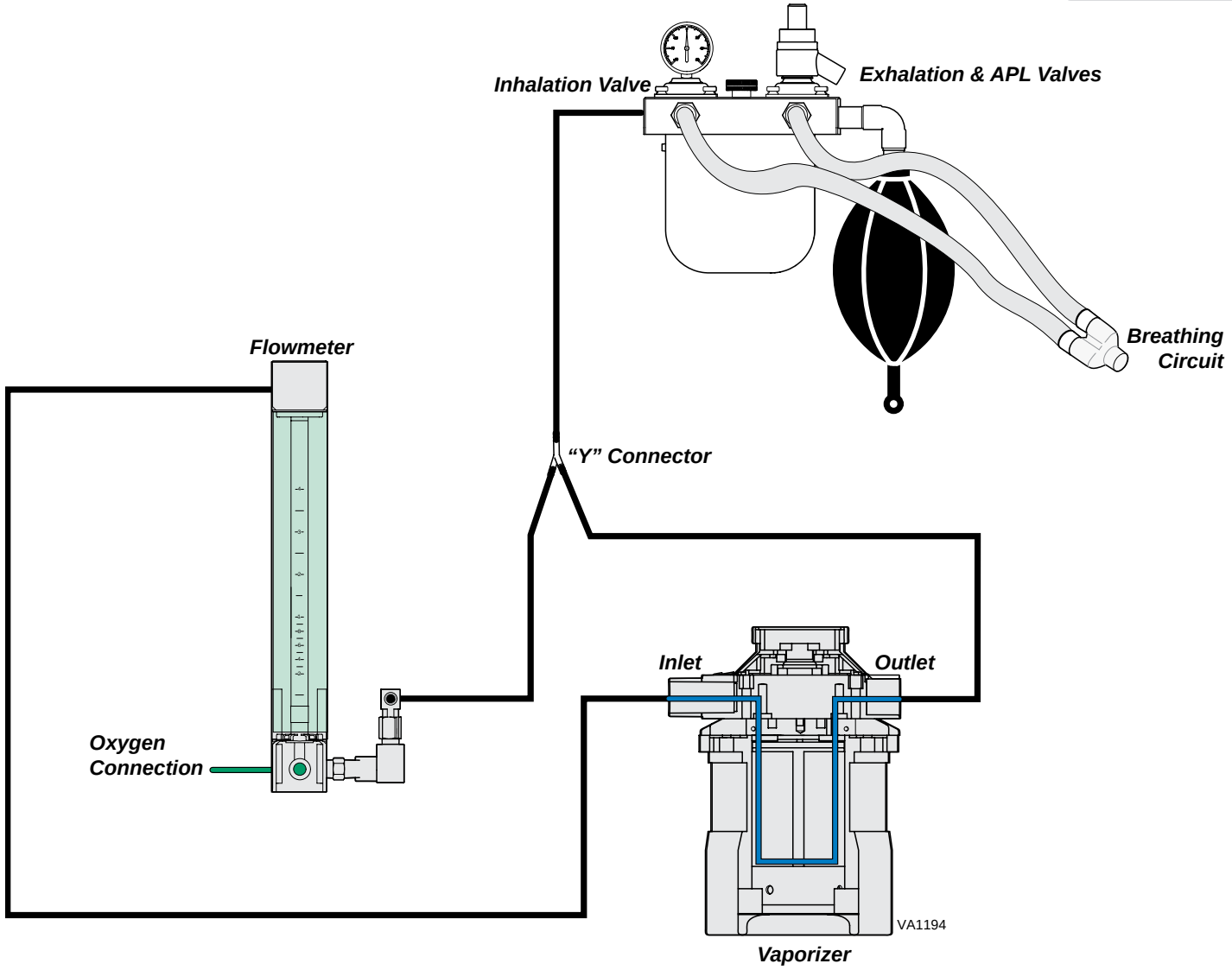
Tubing Diagrams

Refer To: Page
Exploded View / Part Numbers..... E-1



Models:	VME	VME2	
Serial Numbers:	all	all	

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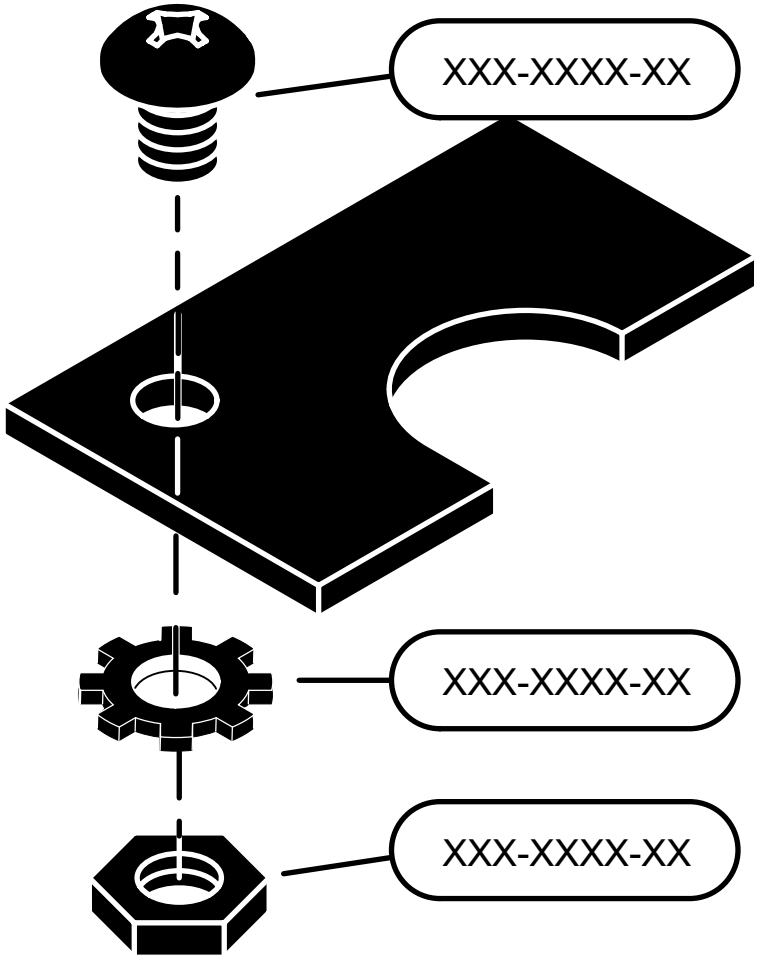
Section E

Exploded Views & Parts Lists

Model: Page
Model Index E-2



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Veterinary Anesthesia Machines

***Click on Button to Activate Link to Parts Lists**

VMC Models

VMC Drawer Assembly..... E-3

VMC Stand Assembly..... E-4

Absorber Assembly E-14

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Absorber Assembly E-14

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VME Tabletop E-10

VME - Inhalation / Exhalation Valve Parts with Canister Assembly E-11

VME Post Mount..... E-20

Flowmeter

Flowmeter Assembly (Present Models) ...E-12

Flowmeter Assembly (Older Models) E-13

Note:
Look at Item 7 (older models page) and Item 14 (present models page) to determine if you have an older or newer model flowmeter assembly. Older models use a plastic cover and present models use a lens.

**** Indicates multiple pages due to a serial number break for the parts illustration.***

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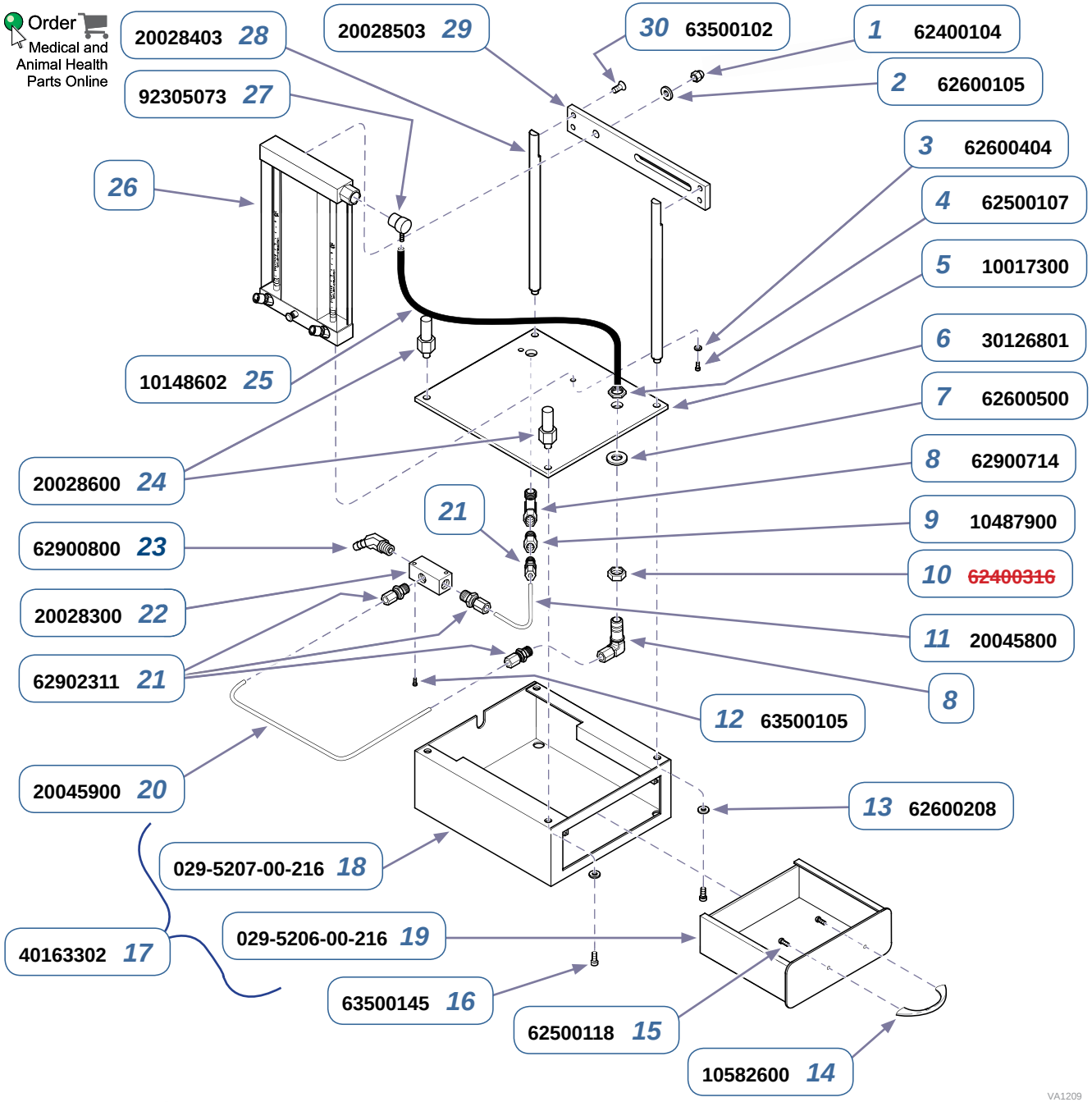

Price Quote

Animal Health Store

VMC Drawer Assembly

Item	Description	Qty.
1	Acorn nut *(1/4 - 20)*	1
2	Washer *(1/4")*	1
3	Lock Washer *(#8)*	4
4	Screw *(pan head 6-32 x 1/2")*	2
5	Hose Connector	1
6	Table top	1
7	Lock Washer *(1/2" external tooth)*	1
8	Elbow *(1/8 npt, apply teflon tape and adhesive)*	2
9	Oriface Assembly	1
10	Nut *(1/2" - 20)*	1
11	Tube *(O2 flush)*	1
12	Screw *(socket head 6 -32 x1")*	2
13	Lock Washer *(3/8")*	4
14	Drawer Handle	1
15	Screw *(pan head 8 - 32 x 1/4")*	2
16	Screw *(socket head 3/8 - 16 x 1")*	4
17	Drawer Unit (includes item 18 & 19)	1
18	• Drawer Unit Housing	1
19	• Drawer Assembly	1
20	Tube *(flowmeter outlet)*	1
21	Connector *(1/8" mnpt x 1/4 t)(apply adhesive)*	4
22	Manifold block *(apply adhesive to secure block)*	1
23	Connector *(45 deg. 1/8 npt x 1/4 t plated)*	1
24	Mounting post	2
25	Black Neoprene Rubber Tubing *(5/16" dia)*	AR
26	Refer to: Flowmeter Assembly	Ref
27	FS-2 outlet adapter	1
28	Upright bar *(painted)*	2
29	Cross bar *(painted)*	1
30	Screw *(socket head 6 - 32 x 3/8")*	4

Models:	VMC
Serial Numbers:	all

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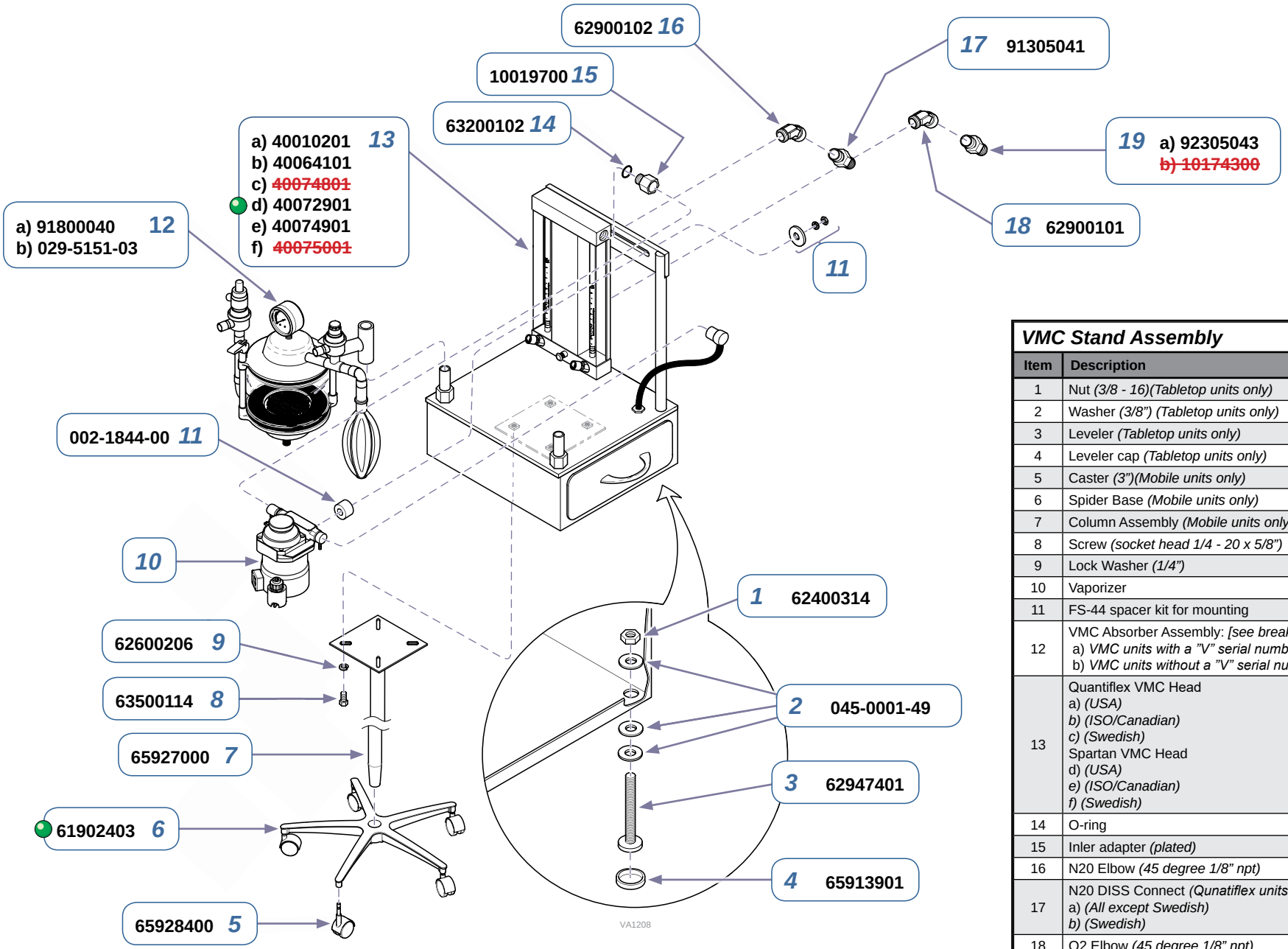

VMC Stand Assembly

Item	Description	Qty.
1	Nut *(3/8 - 16)(Tabletop units only)*	4
2	Washer *(3/8")* *(Tabletop units only)*	12
3	Leveler *(Tabletop units only)*	4
4	Leveler cap *(Tabletop units only)*	4
5	Caster *(3")(Mobile units only)*	5
6	Spider Base *(Mobile units only)*	1
7	Column Assembly *(Mobile units only)*	1
8	Screw *(socket head 1/4 - 20 x 5/8")*	4
9	Lock Washer *(1/4")*	4
10	Vaporizer	1
11	FS-44 spacer kit for mounting	1
12	VMC Absorber Assembly: *[see breakdown]* a) *VMC units with a "V" serial number prefix* b) *VMC units without a "V" serial number prefix*	Ref
13	Quantiflex VMC Head a) *(USA)* *b) (ISO/Canadian)* *c) (Swedish)* Spartan VMC Head d) *(USA)* *e) (ISO/Canadian)* *f) (Swedish)*	AR
14	O-ring	1
15	Inler adapter *(plated)*	1
16	N20 Elbow *(45 degree 1/8" npt)*	AR
17	N20 DISS Connect *(Qunatiflex units only)* a) *(All except Swedish)* *b) (Swedish)*	NSS
18	O2 Elbow *(45 degree 1/8" npt)*	AR
19	O2 DISS Connect a) *(All except Swedish)* *b) (Swedish)*	AR
Items 20 & 21 are not shown and also included with item 13		
20	*30020200* Back Cover	1
21	*20013100* Stand Off	1

Models:	***VMC***	
Serial Numbers:	*all*	

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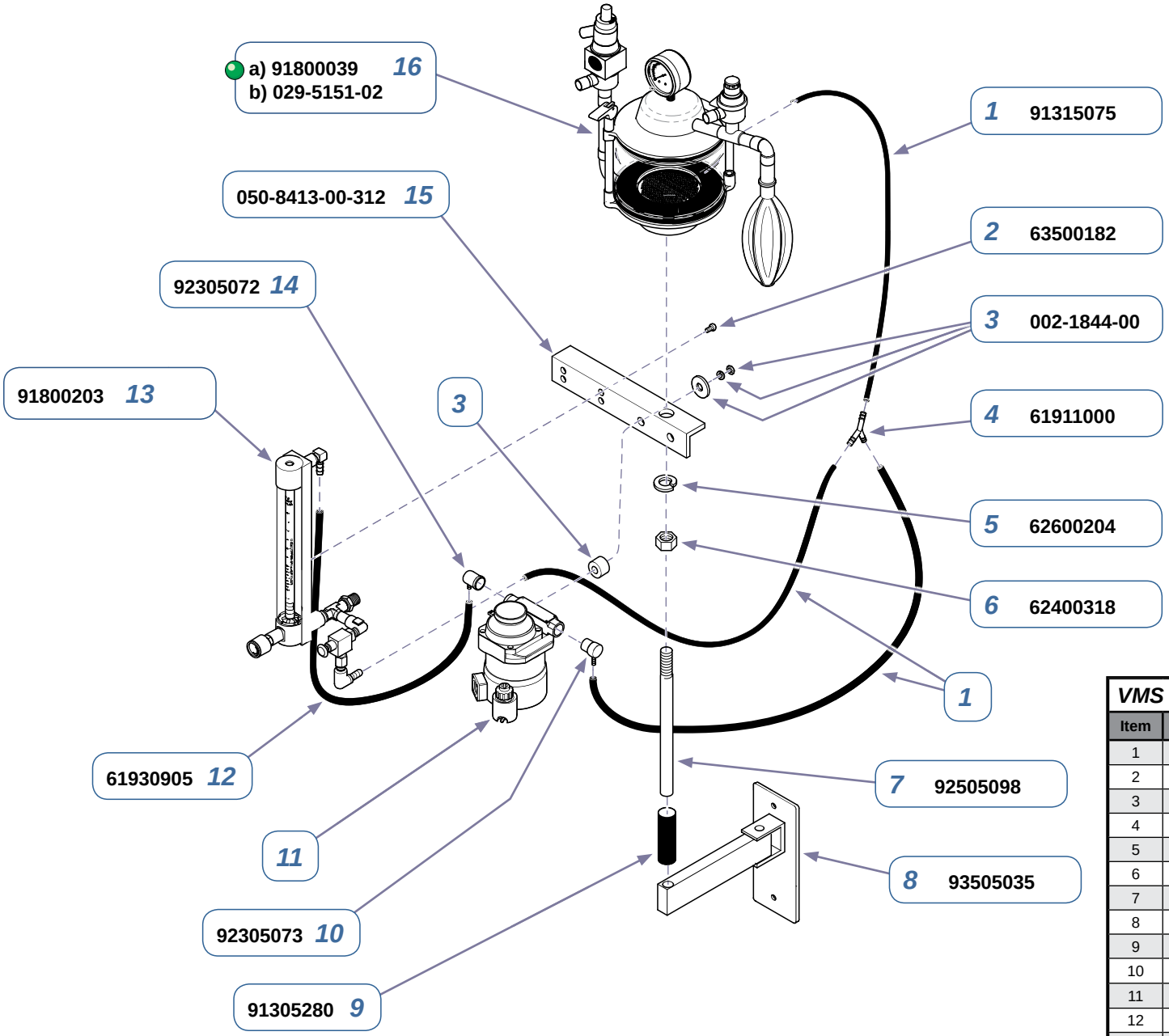

VMS Wall Mount

Item	Description	Qty.
1	Black Neoprene Rubber Tubing	AR
2	Screw Kit for Flowmeter *(10-32 x 5/16" socket hd)*	2
3	Screw Kit for Vaporizer Mounting	2
4	"Y" connector fitting	1
5	Lock Washer *(5/8")*	1
6	Nut *(5/8" -18)*	1
7	Mounting Stud	2
8	Mounting Bracket	1
9	Post spacer	1
10	FS-2 outlet adapter	1
11	Vaporizer	1
12	Black Neoprene Rubber Tubing *(24 in long)*	1
13	O2 Flowwmeter with flush assy.	NSS
14	a) FS-2A inlet adapter b) FS-2A inlet adapter *(without fittings)*	1
15	Mounting bracket	1
16	VMS Absorber Assembly: *[see breakdown]* a) *VMS units with a "V" serial number prefix* b) *VMS units without a "V" serial number prefix*	Ref

Models:	***VMS***	
Serial Numbers:	*all*	

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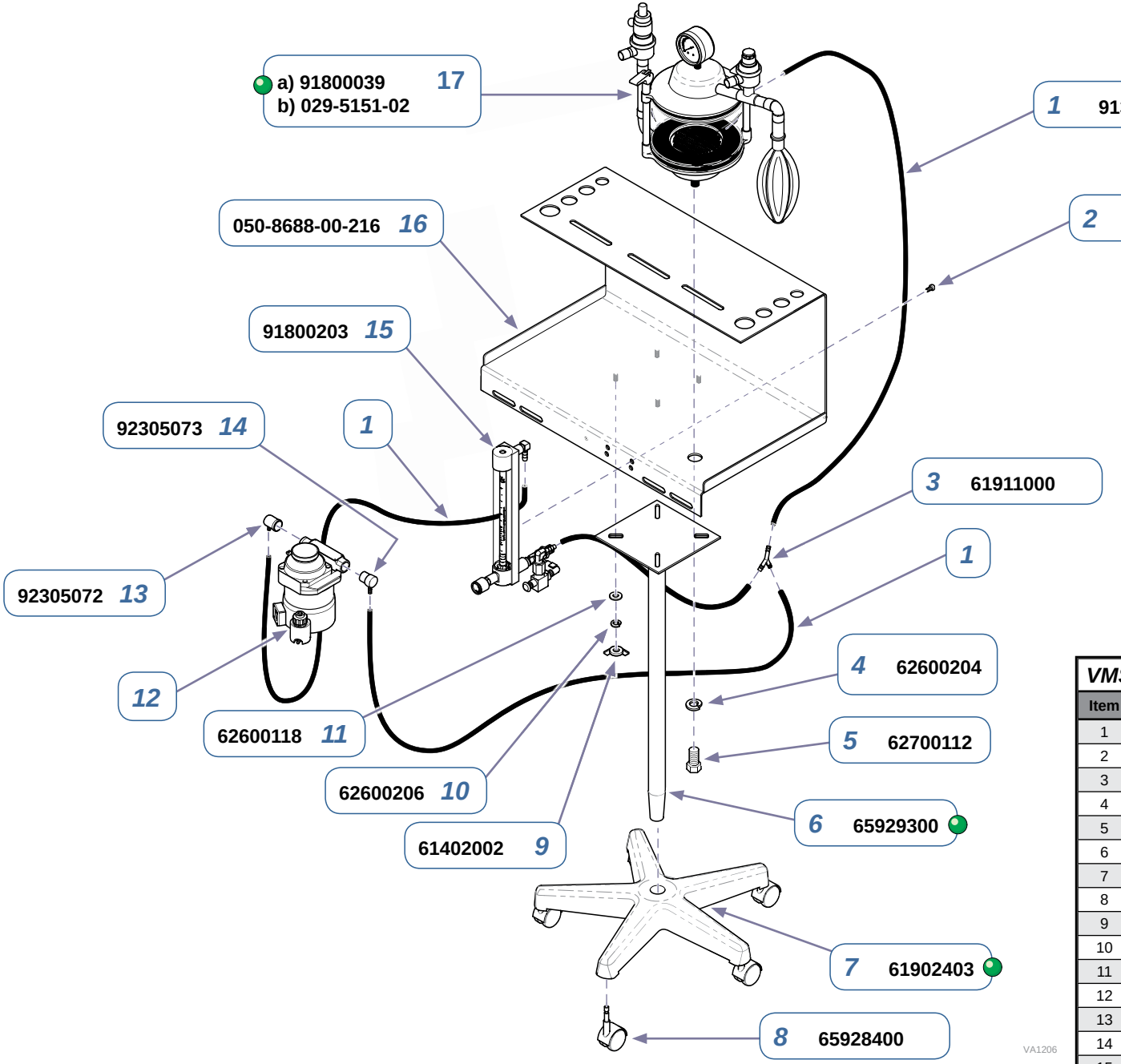

Models:	VMS Plus	
Serial Numbers:	all	

VMS Plus: Anesthesia Machine

Item	Description	Qty.
1	Black Neoprene Rubber Tubing 1/4" I.D.	AR
2	Screw Kit *(10-32 x5/6")*	2
3	"Y" Connector	1
4	Lock Washer	1
5	Bolt	1
6	Column	1
7	Spider base *(5 -leg)*	1
8	Caster	5
9	Wing Nut	4
10	Lock Washer	4
11	Flat Washer	4
12	Vaporizer	1
13	FS2A Inlet Adapter	1
14	FS2 Outlet Adapter	1
15	O2 Flowmeter Assembly with Flush	1
16	Shelf	1
17	VMS Absorber Assembly: *[see breakdown]* a) *VMS units with a "V" serial number prefix* b) *VMS units without a "V" serial number prefix*	Ref

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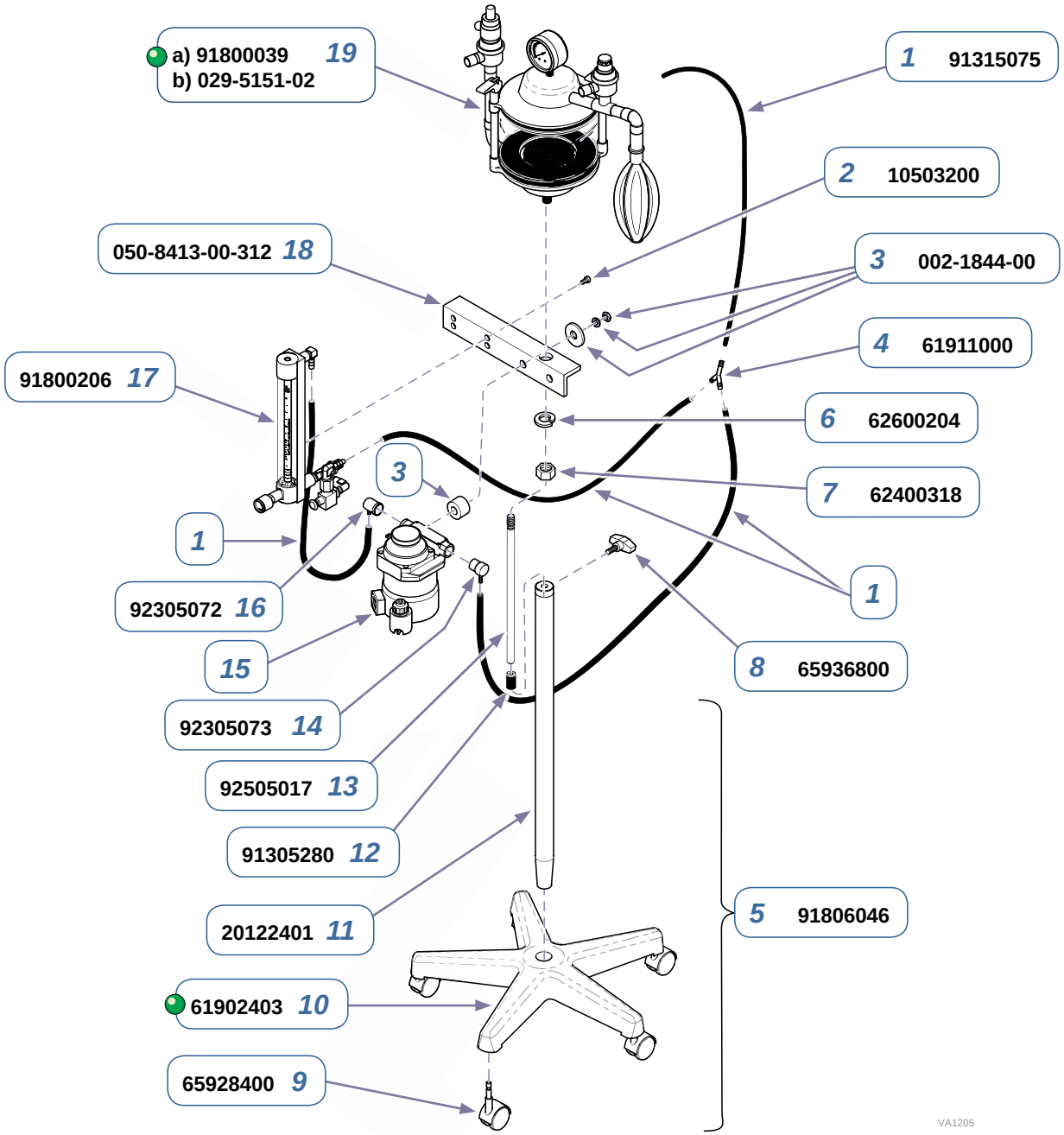

Models:	VMS
Serial Numbers:	all

VMS

Item	Description	Qty.
1	Black Neoprene Rubber Tubing *(1/4" dia)*	AR
2	Screw Kit for Flowmeter (10-32 x 5/16")	2
3	Vaporizer Mounting Kit	2
4	Nylon "Y" Connector	1
5	VMS 40" Stand Assy *(Includes items 6 thru 13)*	1
6	• Lock Washer *(5/8")*	1
7	• Nut *(5/8" -18)*	1
8	• Stand Tee-Handle	1
9	• Caster *(3')*	5
10	• Spider Base *(5 leg)*	1
11	• Column	1
12	• Post Spacer	1
13	• Mounting Stud *(15")*	1
14	FS-2 Adapter	1
15	Vaporizer	1
16	FS-2A Adapter	1
17	O2 Flowmeter with Flush Assembly	1
18	Mounting Bracket	1
19	VMS Absorber Assembly: *[see breakdown]* a) *VMS units with a "V" serial number prefix* b) *VMS units without a "V" serial number prefix*	Ref

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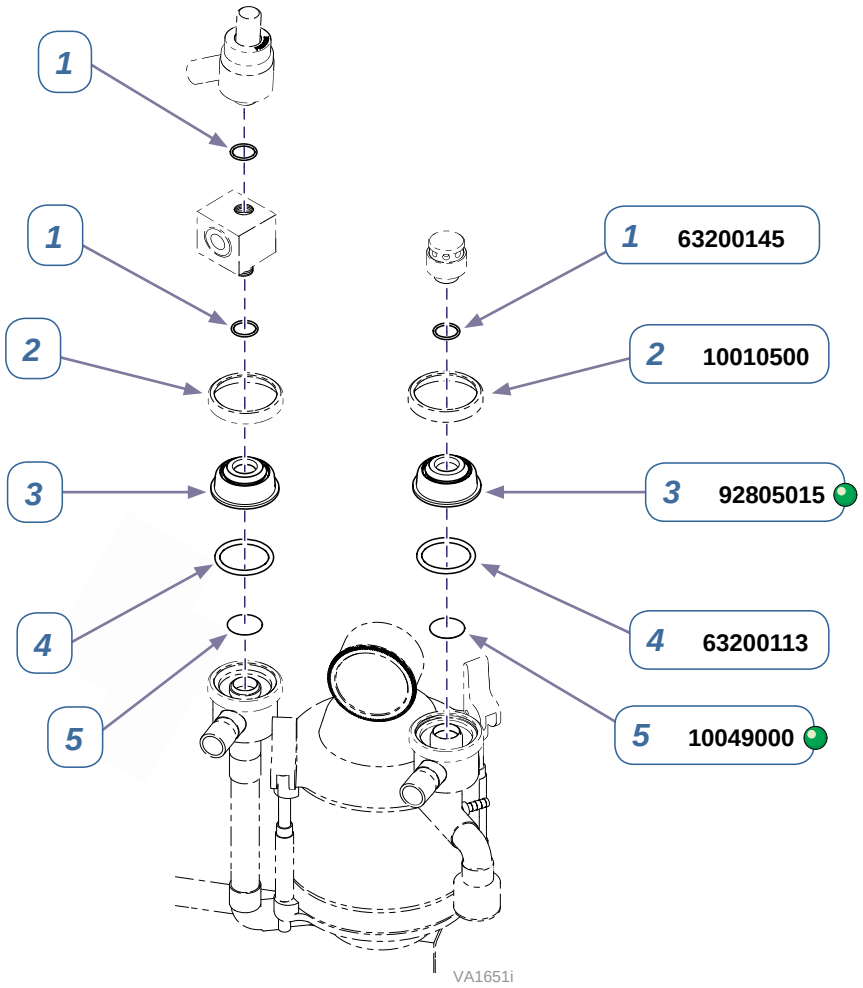

Models:	VMS	
Serial Numbers:	all	

VMS - Inhalation / Exhalation Valve Parts

Item	Description	Qty.
1	O-ring	3
2	Dome Retainer Ring	2
3	Dome Clamp	2
4	O-ring	2
5	White Nylon Valve Disc	2

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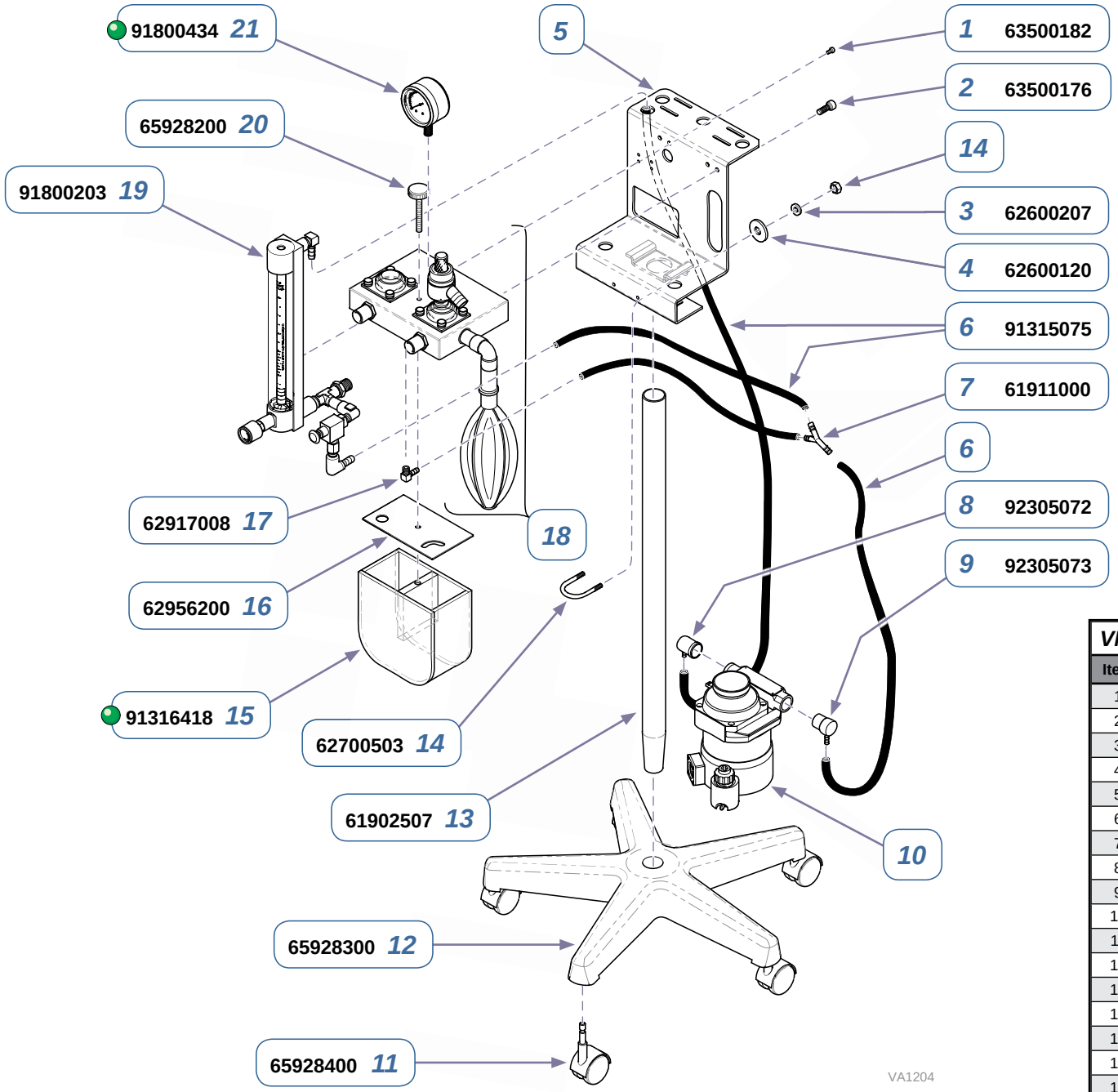

VME2: Anesthesia Machine

Item	Description	Qty.
1	Socket Head Bolt *(1/4 - 20 x 5/8")*	1
2	Screw*(5/16 - 18 x 3/4")*	2
3	Washer *(lock)*	2
4	Washer *(flat 5/16)*	2
5	Base Plate *(not available)*	1
6	Black Neoprene Rubber Tubing 1/4" I.D.	AR
7	"Y" Connector	1
8	FS2A Inlet Adapter	1
9	FS2 Outlet Adapter	1
10	Vaporizer	Ref
11	Caster	5
12	Spider base *(5 -leg)*	1
13	Column	1
14	U clamp *(includes 5/16" x 18 nuts)*	1
15	Asorber Canister *(w/decal)*	1
16	Gasket	1
17	Elbow *(90 Deg Male - 1/4 HB x 1/8 NPT Plated)*	1
18	Inhalation / Exhalation Valves	1
19	O2 Flowmeter Assembly with Flush	1
20	Canister Knob	1
21	Pressure Gauge	1

Models:	VME 2	
Serial Numbers:	all	

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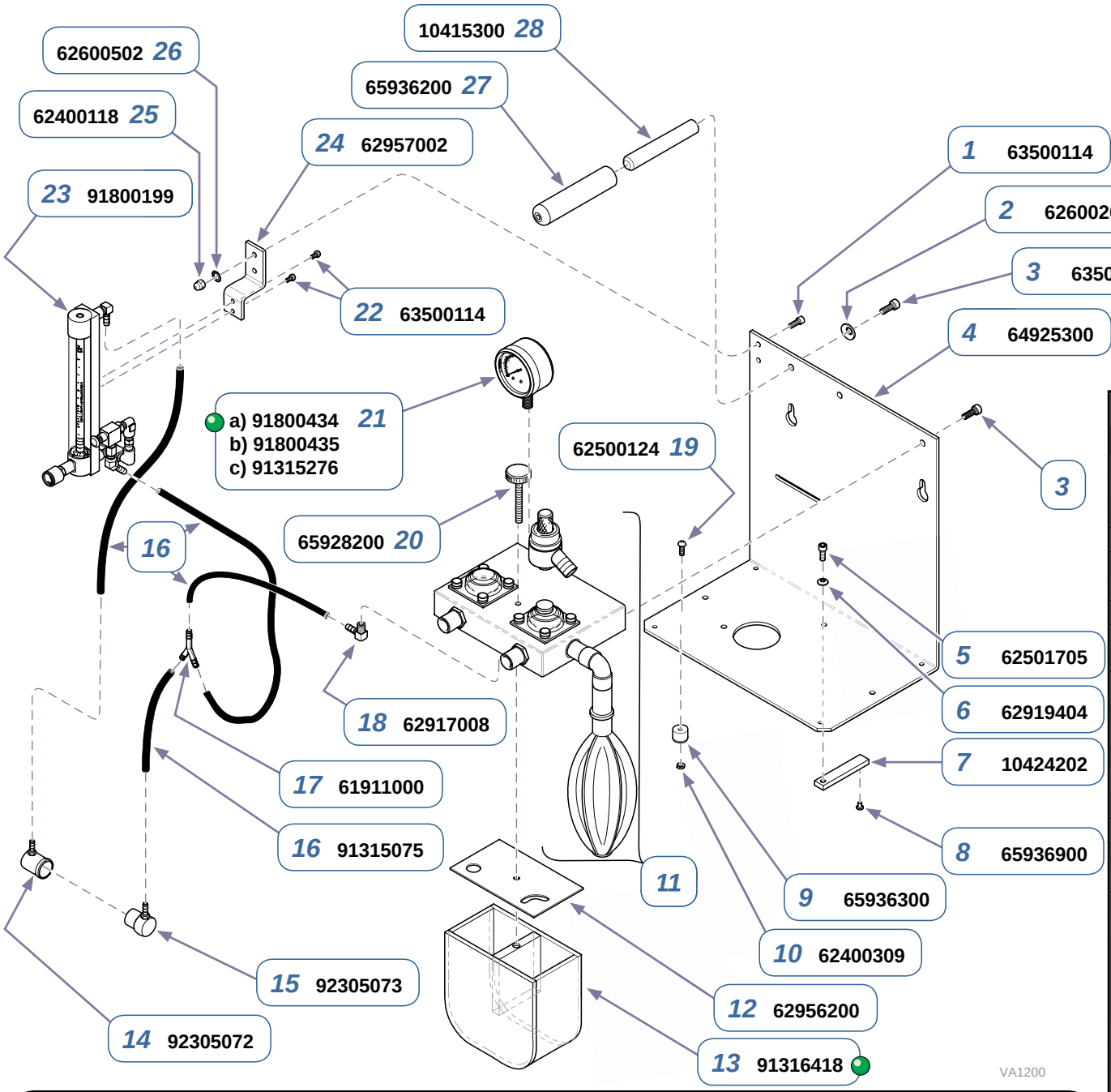

Models:	VME
Serial Numbers:	all

VME Table Top: Anesthesia Machine

Item	Description	Qty.
1	Socket head bolt *(1/4 - 20 x 5/8", Plated)*	1
2	Washer *(HLCL Spring Washer 5/16", Plated)*	1
3	Screw *(5/16 - 18 x 3/4")*	3
4	Panel	2
5	Should Bolt *(10 - 32)*	2
6	Spring Washer *(1/4")*	1
7	Anodized Leg	1
8	Bumper	1
9	Foot	4
10	Nut *(10-32 Plated)*	4
11	Inhalation / Exhalation Valves	1
12	Gasket	1
13	Absorber Canister *(w/decal)*	1
14	FS2A Inlet Adaptor	1
15	FS2 Outlet Adaptor	1
16	Black Neoprene Rubber Tubing *(1/4" dia)*	AR
17	"Y" Connector	1
18	Elbow *(90 Deg Male - 1/4 HB x 1/8 NPT Plated)*	1
19	Screw *(1/4" - 20 x 5/8", Plated)*	4
20	Canister Knob	1
21	a) Pressure gauge b) Pressure gauge replacement cover - Wexler (included with 91800434) c) Pressure gauge replacement cover - Marshall	1
22	Screw *(10 -032 x 5/16")*	2
23	O2 Flowmeter Assembly with Flush	1
24	Mounting Bracket	1
25	Acorn Nut **1/4 -20)*	2
26	Washer *(1/4")*	2
27	Handle Grip	1
28	Handle	1

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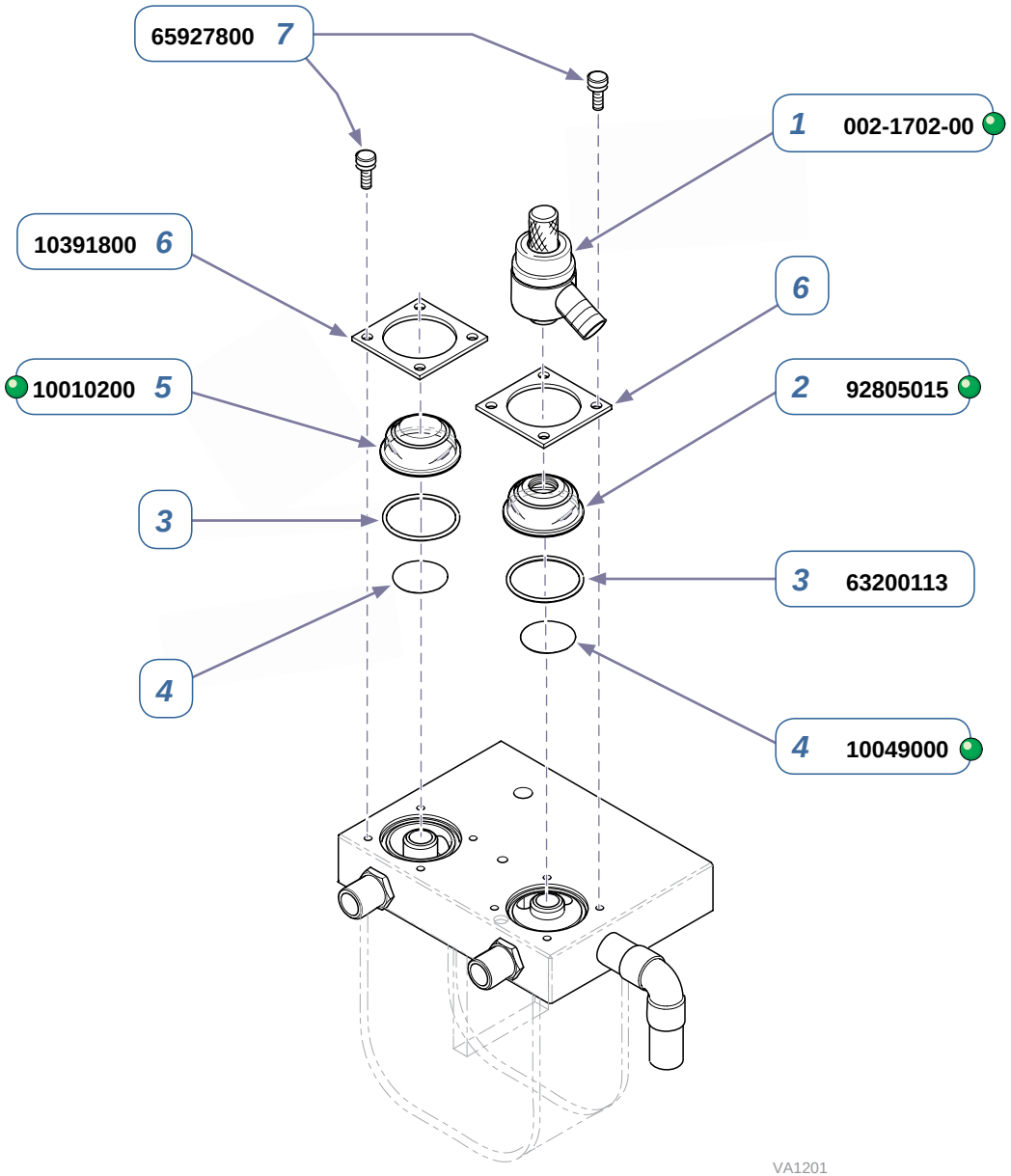

Models:	VME
Serial Numbers:	all

VME Table Top: Inhalation / Exhalation Valve Parts

Item	Description	Qty.
1	APL Valve	1
2	Exhalation Valve	1
3	Gasket	2
4	White Nylon Valve Disc	2
5	Inhalation Dome	1
6	Dome Clamp	2
7	Thumb Screws	8

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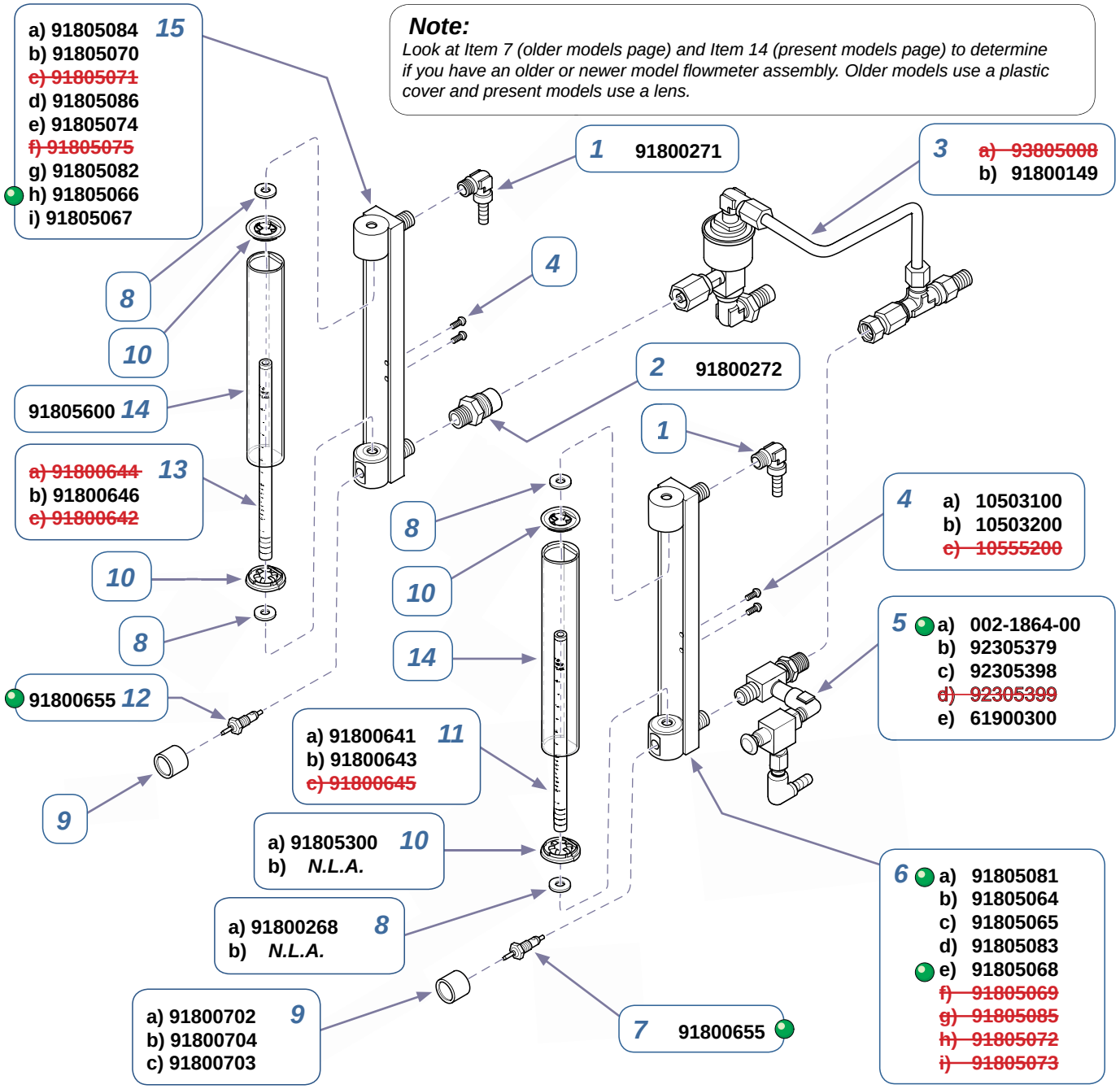

Note:
Look at Item 7 (older models page) and Item 14 (present models page) to determine if you have an older or newer model flowmeter assembly. Older models use a plastic cover and present models use a lens.

Flowmeter Assembly Present Models

Item	Description	Qty.
1	Elbow *(1/4M Hose Barb x 1/8" NPT)*	1
2	N2O DISS Fitting	1
3	N2O Fail-safe Assembly *a) (USA/ISO/Canadian)* *b) (Swedish)*	1
4	Screw Kit *a) VMS Plus Flowmeter (10-32 x 1/4")* *b) VMS/VME/VMR Flowmeter (10-32 x 5/16")* *c) VML (10-32 x 3/8")*	2
5	O2 Flush Assy *a) VMS/VML (USA/ISO/Canadian)* *b) VMS/VML (Swedish)* *c) VMS Plus/VME2 (USA/ISO/Canadian)* *d) VMS Plus/VME2 (Swedish)* *e) Push Button only*	1
6	O2 Flowmeter Assy without Flush *a) USA)* *g) VML (USA)* *b) (ISO/ Canadian)* *h) VML (ISO/Canadian)* *c) (Swedish)* *i) VML (Swedish)* *d) [USA(0-1000cc)]* *e) [ISO/Canadian (0-1000cc)]* *f) [Swedish (0-1000cc)]*	1
7	O2 Needle Valve Assembly with Positive Stop	1
8	Replacement Gaskets *a) (.2-4 lpm)* *b) (0-1000cc)*	2
9	Knob *a) Green* *b) Blue* *c) White*	2
10	Replacement End Caps *a) (.2-4 lpm)* *b) (0-1000cc)*	2
11	O2 Flowmeter Tube *a) (.2-4 lpm)* *c) VML* *b) (0-1000cc)*	1
12	N2O Needle Valve Assembly with Positive Stop	1
13	N2O Flowmeter Tube *a) (.2-4 lpm)* *b) (0-1000cc)* *c) VML (.5 - 10 lpm)*	1
14	Lens	1
15	N2O Flowmeter Assy without Flush *a) (USA)* *b) (ISO/Canadian)* *c) (Swedish)* *d) [USA(0-1000cc)]* *e) [ISO/Canadian (0-1000cc)]* *f) [Swedish (0-1000cc)]* *g) VML (USA)* *h) VML (ISO/Canadian)* *i) VML (Swedish)*	1

Models: / Serial Numbers:	VME2	VMR	VMS/VMS Plus	VME	VML	
	Newer Models	Newer Models	Newer Models	Newer Models	Newer Models	

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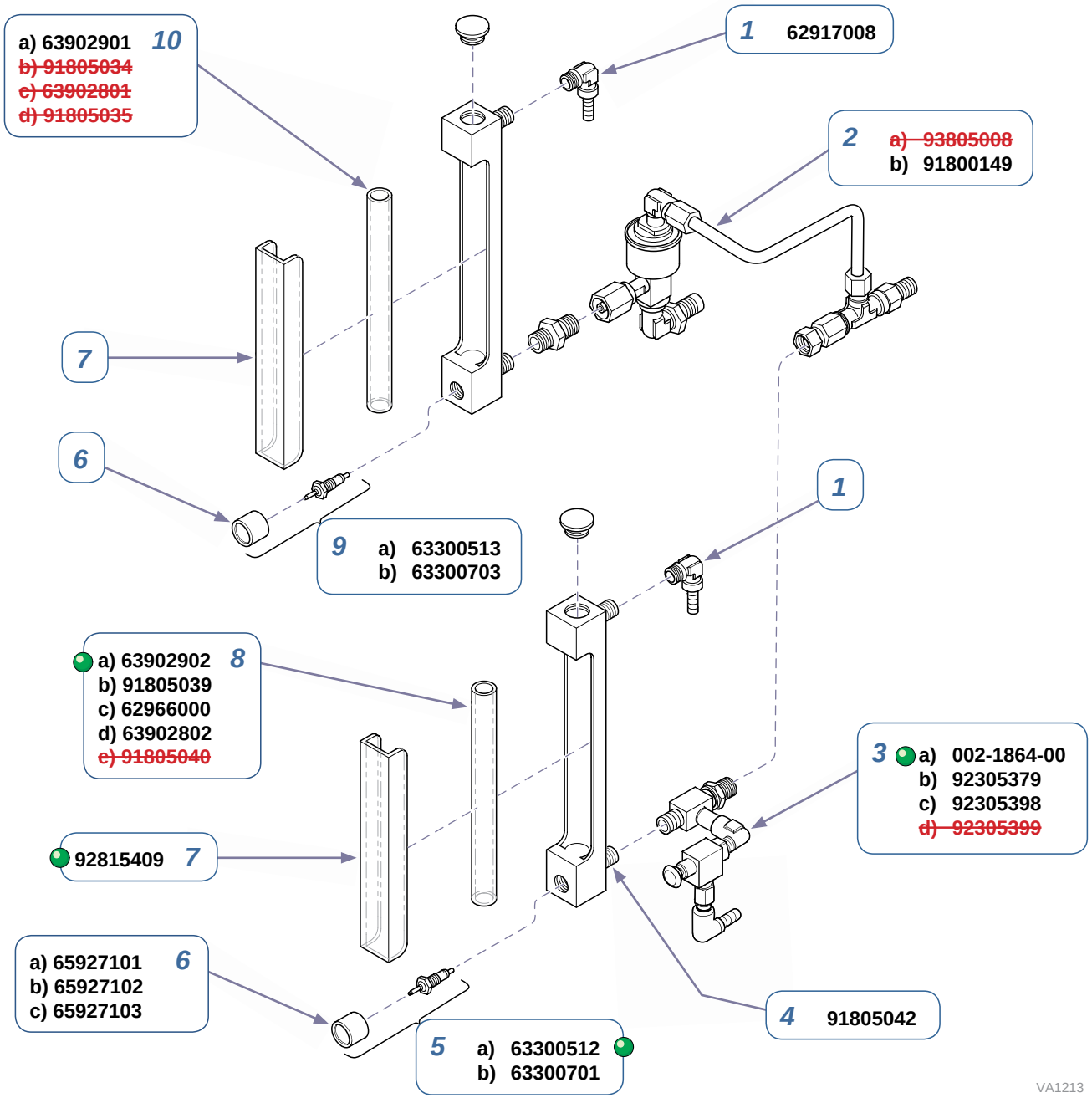

Note:
Look at Item 7 (older models page) and Item 14 (present models page) to determine if you have an older or newer model flowmeter assembly. Older models use a plastic cover and present models use a lens.

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Flowmeter Assembly Older Models

Item	Description	Qty.
1	Elbow *(1/4M Hose Barb x 1/8" NPT)*	1
2	N2O Fail-safe Assembly a) *(USA/ISO/Canadian)* *b) (Swedish)*	1
3	O2 Flush Assy *a) (VMS/VML)(USA/ISO/Canadian)* *b) (VMS/VML)(Swedish)* *c) (VMS Plus)(USA/ISO/Canadian)* *d) (VMS Plus)(Swedish)*	1
4	Inlet/Outlet Adapter *(npt x 1/4")*	1
5	O2 Needle Valve Assy w/Positive Stop a) *(USA)* *b) (ISO/Canadian/Swedish)*	1
6	Knob *a) Green* *b) Blue* *c) White*	1
7	Plastic Cover	1
8	O2 Flowmeter Tube Only a) *(VMS/VMS Plus/VME)(USA)* *b) (VMS/VMS Plus/VME)(ISO/Canadian/Swedish)* *c) (VMS/VMS Plus/VME)(USA/ISO/Canadian/ Swedish)(0-1000cc)* *d) (VML)(USA)* *e) (VML)(ISO/Canadian/Swedish)*	1
9	N2O Needle Valve Assy w/Positive Stop a) *(USA)* *b) (ISO/Canadian/Swedish)*	
10	N2O Flowmeter *(Flowmeter tube only)* a) *(VMS/VMS Plus)(USA)* *b) (VMS/VMS Plus)(ISO/Canadian/Swedish)* *c) (VML)(USA)* *d) (VML)(ISO/Canadian/Swedish)*	1

Models:	VMS	VMS Plus	VML	
Serial Numbers:	Older Models	Older Models	Older Models	

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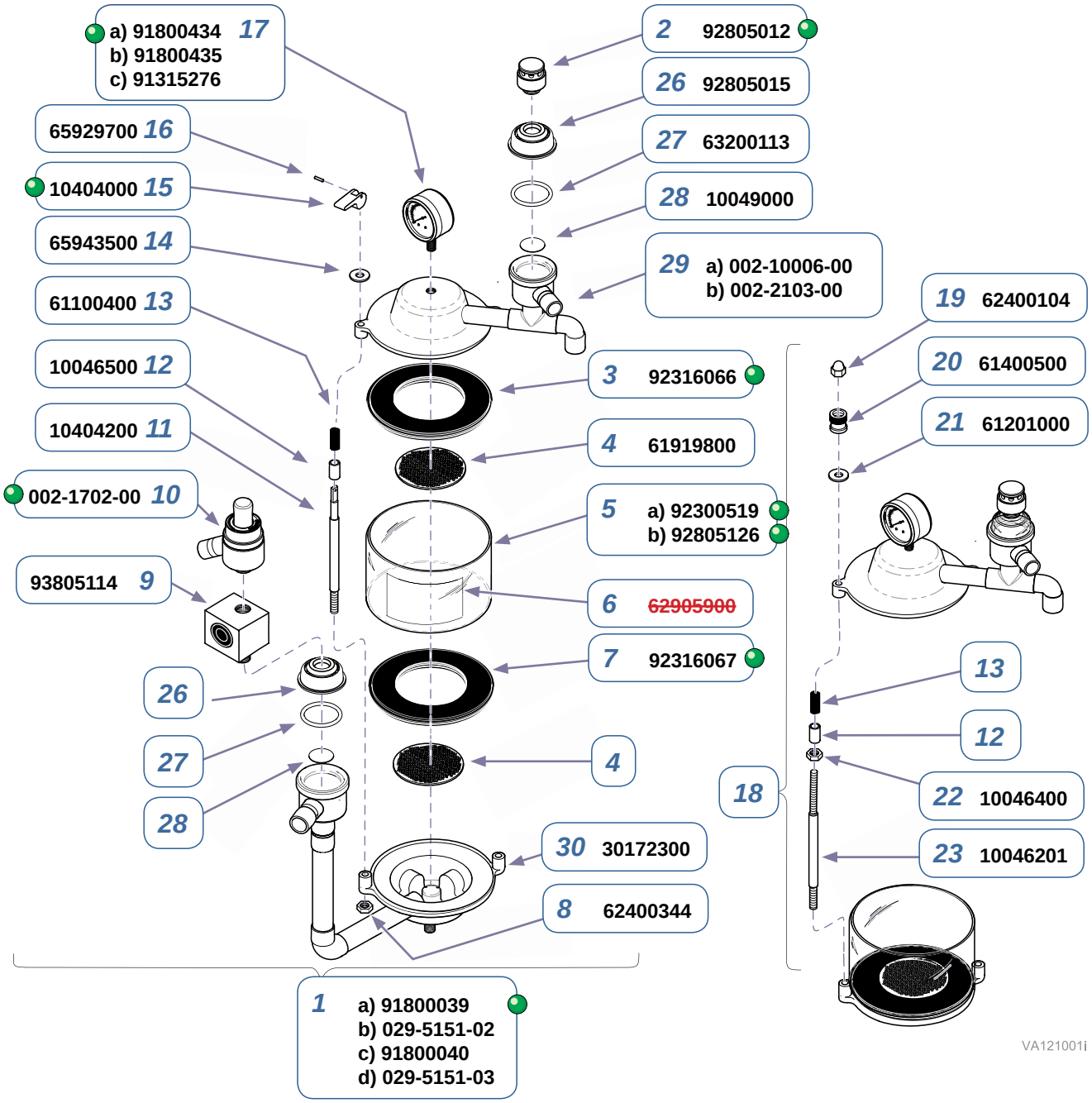

Absorber Assembly

Item	Description	Qty.
1	Absorber Assembly: *(VMS includes items 2 thru 16 and 26 thru 30)* a) *VMS units with a "V" serial number prefix* b) *VMS units without a "V" serial number prefix* *(VMC (incl. items 2 thru 8,10 thru 17 and 26 thru 30)* c) *VMC units with a "V" serial number prefix* d) *VMC units without a "V" serial number prefix*	Ref
2	• Air intake valve	1
3	• Upper gasket	1
4	• Screen *(upper and lower)*	2
5	• Canister assembly *a) (includes canister, lower gasket/screen, and fill label)* *b) (includes canister, decal and no gaskets)*	AR
6	• Fill label	*1*
7	• Lower gasket	1
8	• Hex Nut	1
9	• Occlusion Valve *(VMS and VMS Plus Only)*	1
10	• APL Valve	1
11	• Tie rod	2
12	• Sleeve	2
13	• Spring	2
14	• Nylon washer	2
15	• "Quick Release" lever	2
16	• "Quick Release" lever pin	2
17	• a) Pressure gauge • b) Pressure gauge replacement cover - Wexler (included with 91800434) • c) Pressure gauge replacement cover - Marshall	1
18	Thumb nut absorber replacement parts *(incl. items 19 thru 23)*	
19	• Acorn nut	2
20	• Thumb nut	2
21	• White nylon washer	2
22	• Adjusting screw	2
23	• Tie rod	2
24	Optional drain valve assy. *(91525269 VMS only)(not shown)*	AR
25	Replacement pipe plug assy. *(91525270 VMS only)(not shown)*	AR
26	• *Dome Clamp*	2
27	• *O-ring*	2
28	• *White Nylon Valve Disc*	2
29	• *a)VMC Upper Housing Assembly* • *b)VMS Upper Housing Assembly* *(Both kits include items 2-4, 16, 26-28)*	1
30	• *Lower Housing Assembly*	1

Models:	VMS	VMS Plus	VMC	
Serial Numbers:	all	all	all	

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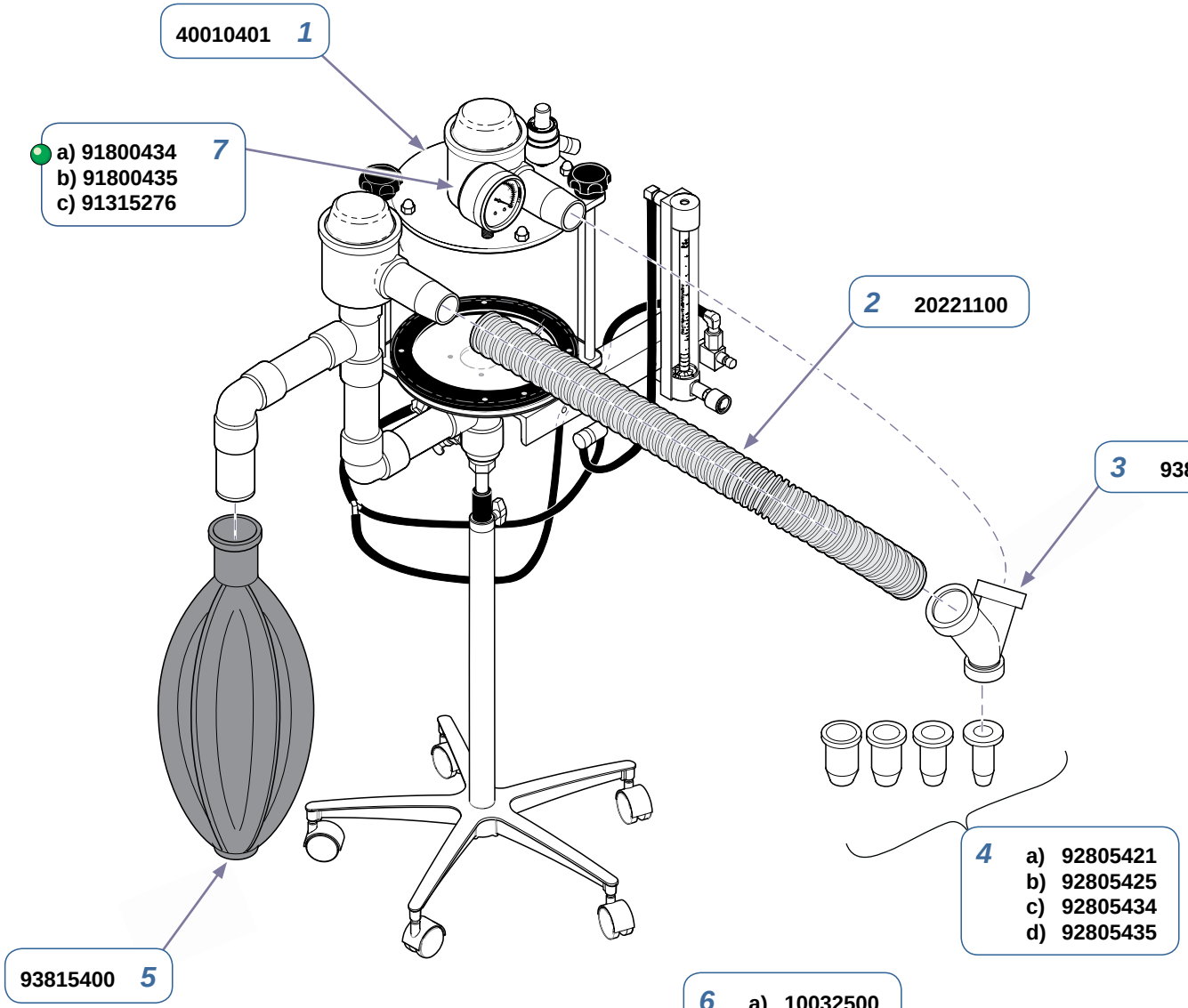

VML: Anesthesia Machine

Item	Description	Qty.
1	VML Basic Assembly *(see breakdown elsewhere)*	1
2	Breathing Tubes	2
3	"Y" Piece Assembly *(includes PN 10008200 Retaining Ring)*	1
4	Endo Tube Connector: a) *(21mm)* *b) (25mm)* c) *(30mm)* *d) (40 mm)*	1
5	Breathing Bag *(30L)*	1
6	FS-44 Spacer Kit *(not shown)* a) *(plated spacer [2])* *b) (flat washer [2])* *c) (socket set screw [2])* *d) (lock washer [2])* *e) (hex nut [2])*	1
7	*a) Pressure gauge* *b) Pressure gauge replacement cover - Wexler (included with 91800434)* *c) Pressure gauge replacement cover - Marshall*	

Models:	***VML***	
Serial Numbers:	*Newer Models*	

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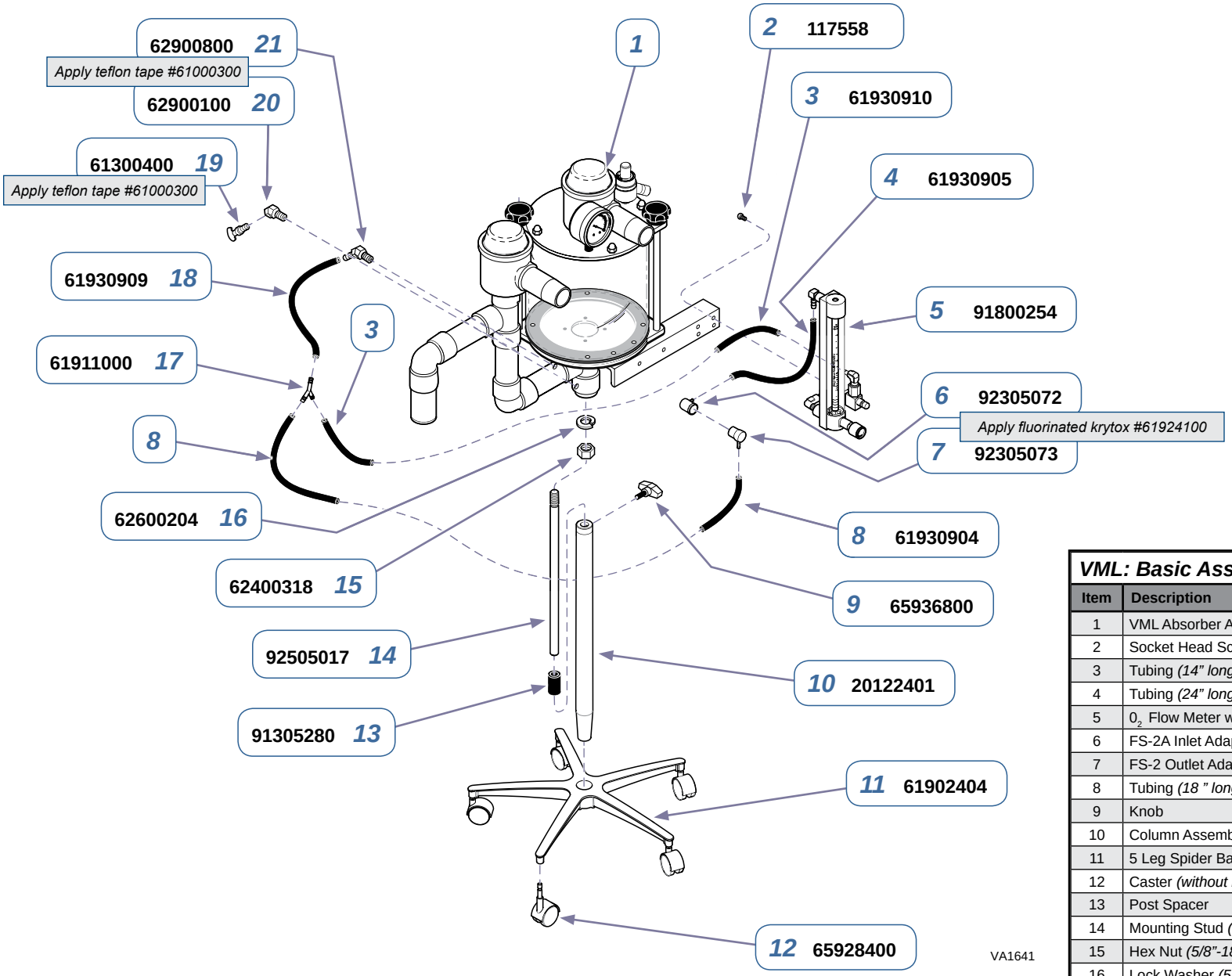

VML: Basic Assembly

Item	Description	Qty.
1	VML Absorber Assy. *(see breakdown elsewhere)*	Ref
2	Socket Head Screw *(#10-32 x 3/8")*	2
3	Tubing *(14" long)*	1
4	Tubing *(24" long)*	2
5	0_2 Flow Meter with Flush Assembly	1
6	FS-2A Inlet Adapter *(apply fluorinated krytox)*	1
7	FS-2 Outlet Adapter *(apply fluorinated krytox)*	1
8	Tubing *(18 " long)*	1
9	Knob	1
10	Column Assembly *(31" long)*	1
11	5 Leg Spider Base	1
12	Caster *(without brake)*	5
13	Post Spacer	1
14	Mounting Stud *(15" long)*	1
15	Hex Nut *(5/8"-18)*	1
16	Lock Washer *(5/8")*	1
17	"Y" Connector	1
18	Tubing *(6" long)*	1
19	Drain Valve *(apply teflon tape)*	1
20	45° Street Elbow *(1/8" NPT [apply teflon tape])*	1
21	45° Hose Connector *(1/8" NPT x 1/4" tube [apply teflon tape])*	1

Models:	VML
Serial Numbers:	Newer Models

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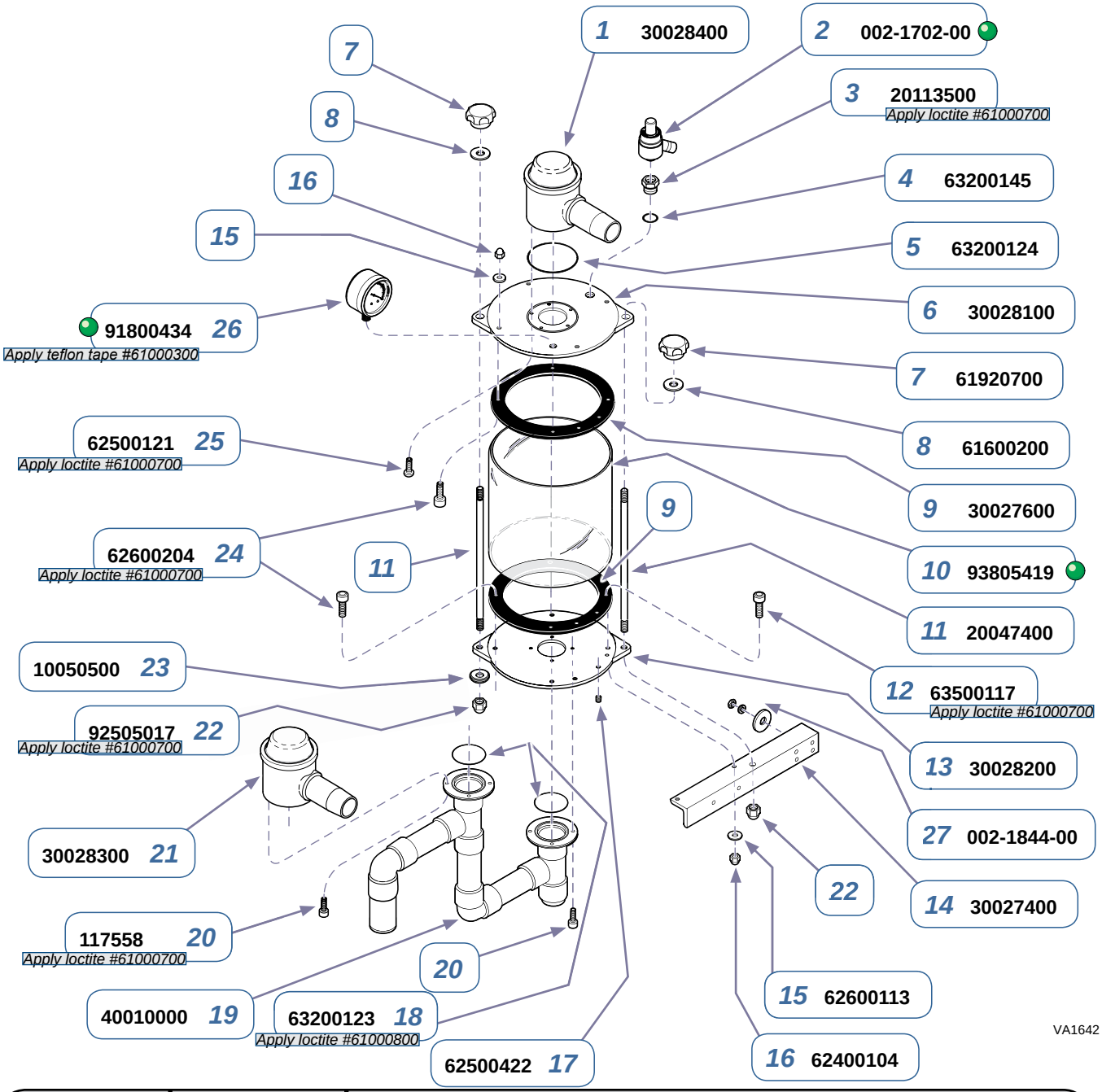

Models:	VML
Serial Numbers:	Newer Models

VML: Absorber Assembly

Item	Description	Qty.
1	Exhale Valve Assembly	1
2	APL Valve Assembly *Includes (Not Shown/Exploded)* 20004500 Dome Retainer Ring 20048200 Plastic Dome Assembly 61200700 Gasket 10006600 Nylon Disc 10006400 Dome Pin 63200124 Lower O-ring	1
3	APL Valve Adapter *(apply loctite)*	1
4	O-Ring	1
5	O-Ring	1
6	Upper End Plate Assembly	1
7	Fluted Knob	2
8	Thrust Washer	2
9	Gasket	2
10	Canister Assembly	1
11	Tie Rod	2
12	Socket Head Screw *(1/4"-20 x 1" [apply loctite])*	2
13	Lower End Plate Assembly	1
14	Mounting Bracket	1
15	Flat Washer *(.255" ID x .437 OD)*	10
16	Acorn Nut *(1/4"-20)*	10
17	Set Screw *(1/4"-20 x 3/4" [apply loctite])*	2
18	O-Ring	2
19	Plated Piping Assembly	1
20	Socket Head Screw *(#10"-32 x 3/8" [apply loctite])*	8
21	Inhale Valve Assembly	1
22	Acorn Nut *(1/2"-13 [apply loctite])*	2
23	Spacer	1
24	Socket Head Screw *(1/4"-20 x 3/4" [apply loctite])*	6
25	Pan Head Screw *(1/4"-20 x 3/4" [apply loctite])*	5
26	Pressure Gauge Manometer *(apply teflon tape)*	1
27	Spacer Kit	1

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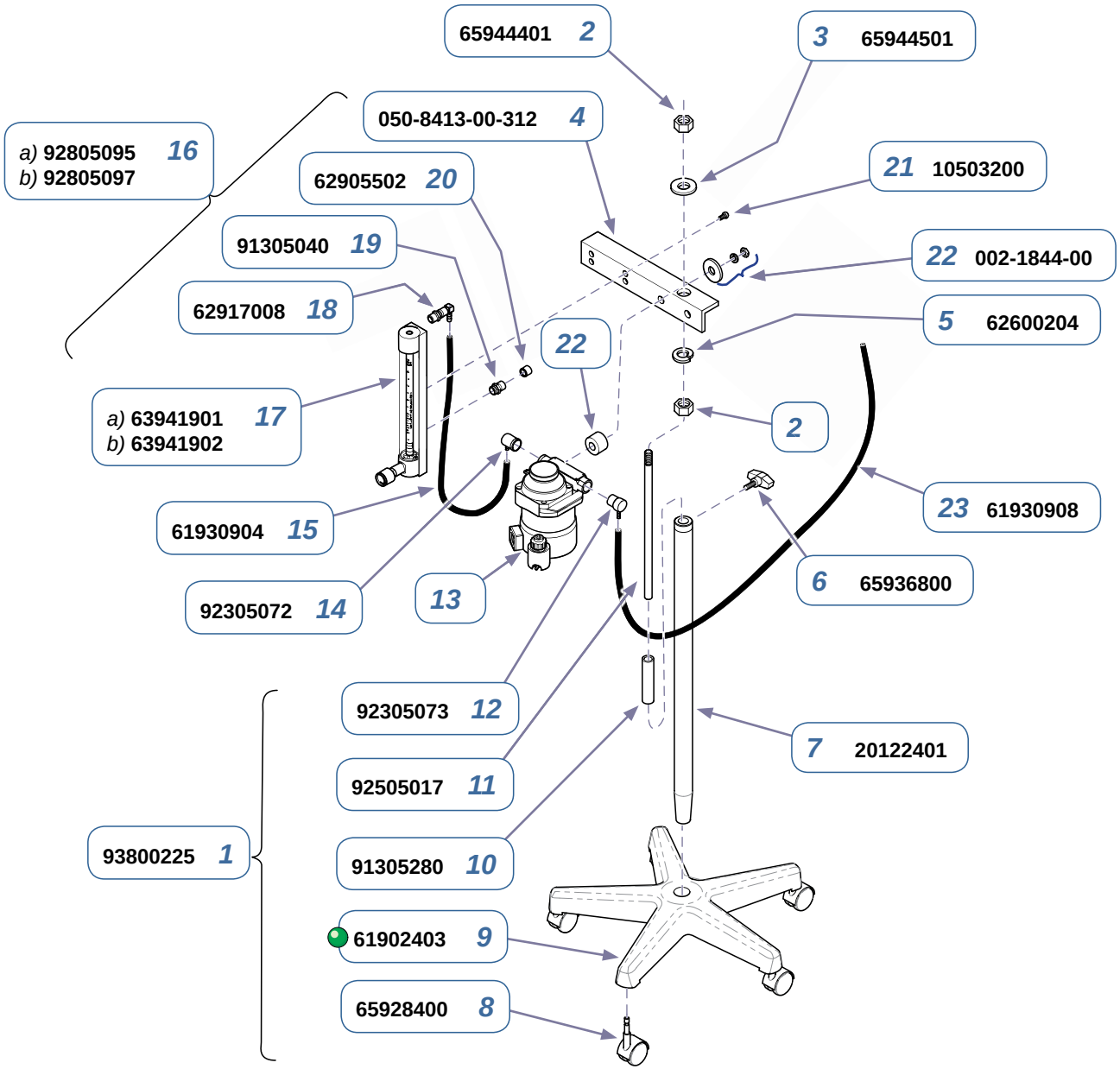

VMR: Non-rebreather System:
91800242 Low Flow VMR Stand w/o absorber
91800250 Standard Flow VMR Stand w/o absorber

Item	Description	Qty.
1	Stand Assembly (includes items 2 thru 11)	1
2	• Thin Hex Nut	2
3	• Washer	1
4	• Mounting Bracket	1
5	• Lock Washer	1
6	• Stands Knob	1
7	• Column Assembly *(31")*	1
8	• Caster *(without brakes)*	5
9	• Spider Base	1
10	• Post Spacer	1
11	• Mounting Stud	1
12	Adapter (FS-2 {PLTD})	1
13	Vaporizer	Ref
14	Adapter (FS-2A {PLTD})	1
15	Tubibg *(18")*	1
16	Flowmeter: Assembly *(includes items 17 thru 20):* *a)* 0 to 4 lpm *b)* 0 to 1000 ccm.	1
17	• Flowmeter: *a)* 0 to 4 lpm *b)* 0 to 1000 ccm.	1
18	• Elbow Fitting	1
19	• Plated Piping Assembly	1
20	• Caplug	1
21	Hardware Kit	1
22	Spacer Kit	1
23	Tubibg *(48")*	1

Models:	***VMR***	
Serial Numbers:	*Newer Models*	

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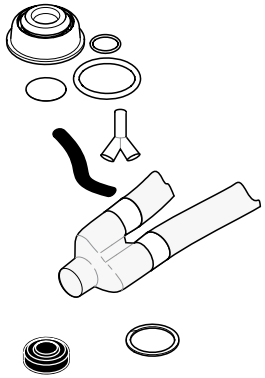
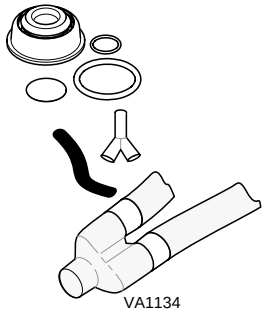
1 **91303015**



VA113401

2 **91303017**



VA1134

Maintenance Kits
(Note: not all parts shown)

Item	Description	Qty.
1	VMS, VMS Plus and VMC Maintenance Kit Includes: (2) Disc (2) Large O-ring (3) Small O-ring (2) Dome Tubing (1) Breathing Circuit Upper and Lower Gaskets Diaphragm (VMS only) Back Up Ring (VmS only)	1 kit
2	VME Tabletop and VME2 Maintenance Kit (2) Disc (2) Large O-rings (2) Small O-rings Domes 2 Liter Breathing Bag Tubing & Y Connector Breathing Circuit Reservoir Bag Gasket	1 kit

Models:	***VMS***	***VMS Plus***	***VMC***	***VME***	***VME2***	
Serial Numbers:	*all*	*all*	*all*	*2006 thru Present*	*all*	

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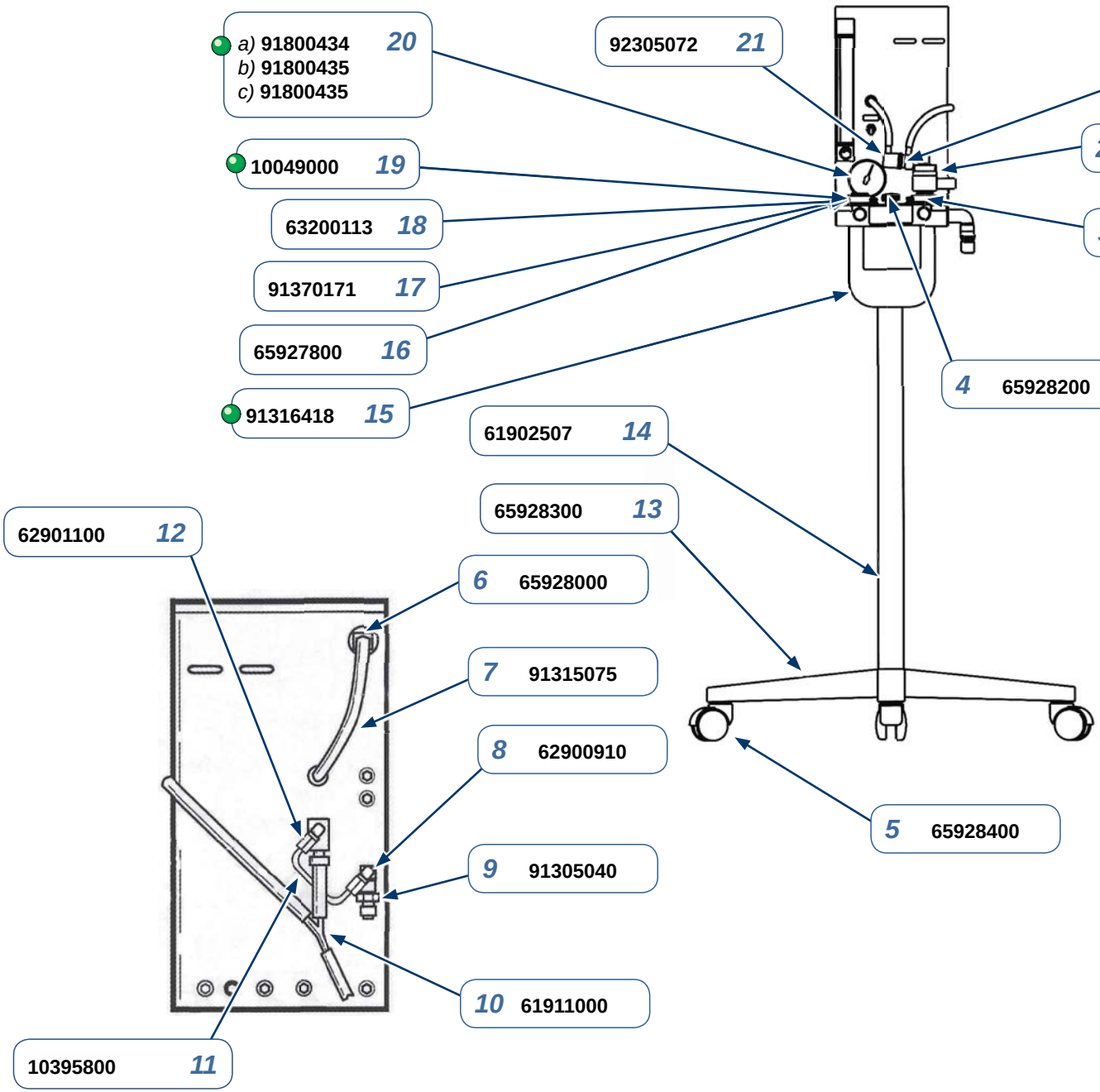

VME - Post Mount

Item	Description	Qty.
1	FS2 Outlet Adapter	1
2	APL Valve	1
3	Dome & Clamp, Exhalation Valve	1
4	Canister Knob	1
5	Caster	3
6	Flush Valve	1
7	Black Neoprene Rubber Tubing, 1/4" ID	AR
8	1/8 M x 1/8 F x 1/8F Pipe Tee	1
9	1/8 MPT 0_2 Male DISS Connector	1
10	"Y" Connector	1
11	0_2 Tube	1
12	1/8 NPT x 3/16 Tube Elbow	1
13	Spider Base, 5- Leg	1
14	Column	1
15	Absorber Canister	1
16	Thumbscrew	1
17	Dome& Clamp , Exhalation Valve	1
18	O-Ring	1
19	Disc., Ihhalation & Exhalation Valves	1
20	*a) Pressure gauge* *b) Pressure gauge replacement cover - Wexler (included with 91800434)* *c) Pressure gauge replacement cover - Marshall*	
21	FS2A Inlet Adapter	1
Not Shown		
22	91303016 - Maintenance Kit	1
23	62956200 - Absorber Canister Gasket	1

Models:	***VME - Post Mount***	
Serial Numbers:	*Built from 1997 thru 2006*	

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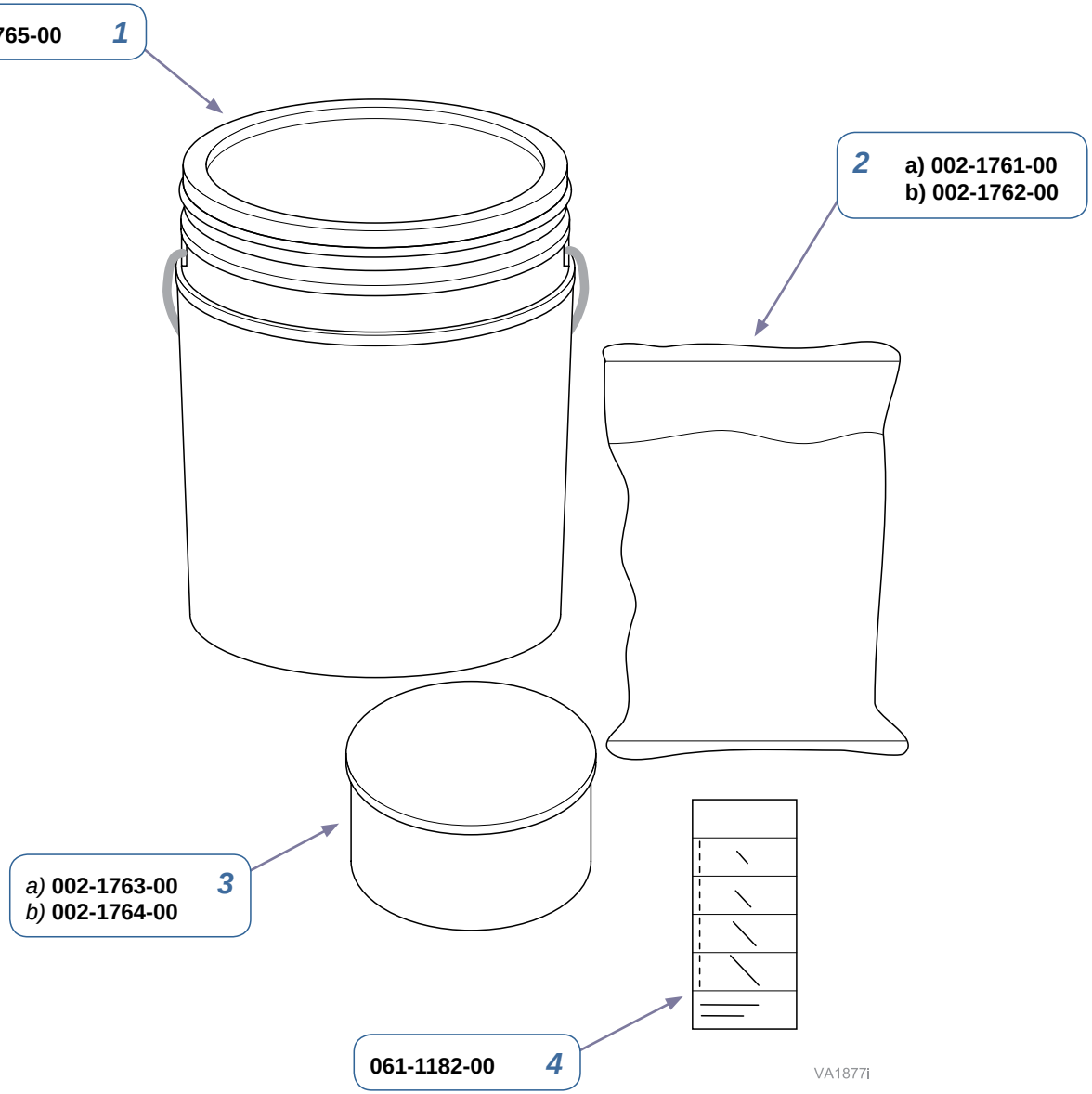

Sodasorb		
Item	**Description**	**Qty.**
1	Sodasorb Standard	Bucket
2	*a)* Sodasorb LF Canister Pak *b)* Sodasorb Standard Canister Pak	Case of 12
3	*a)* Sodasorb LF Pre-Pak *b)* Sodasorb Standard Pre-Pak	Case of 12
4	Sodasorb LF Color Chart	1

Models:	*All*	
Serial Numbers:		

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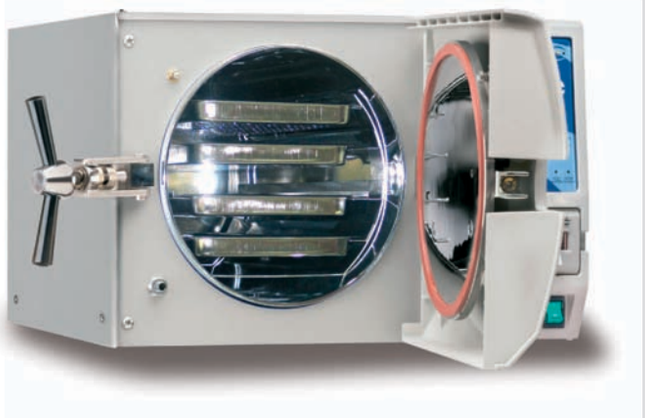
EZ9™ and EZ10™

Closed Door System
Fully Automatic Autoclaves



EZ10 with 4 large trays

EZ9™ and EZ10™

Autoclaves will meet all your sterilization needs

- Chamber door remains closed during entire cycle
- Hepa filtered air is circulated in chamber during drying
- All program parameters can be customized and stored
- New brighter and easier to read panel
- Two year parts and labor warranty

* Above photo shown with optional printer

EZ9™ and EZ10™ Closed Door System Fully Automatic Autoclaves

With the simplicity of one touch design all your sterilization and drying needs are fulfilled. The Tuttnauer fully automatic autoclaves fill, sterilize, exhaust and dry at the touch of a button.

EZ9 and EZ10 Series:

Item No.	Chamber Dimensions Ø x L In(mm)	Volume	Overall Dimensions DxWxH In(mm)	Standard Cassettes	Tray Dimensions DxWxH In(mm)	No. of Trays	Standard Unwrapped Cycle time	Voltage(V) Freq.(Hz)	Power(W) Current(A)	Shipping Weight lbs(kg)
EZ9™	9" x 18" (230 x 470)	5gal/19L	21.5"x20"x14.4" (545x510x365)	2 full/2 half	16.3"x6.7"x0.8" (415x170x20)	3	Cold: 27 mins Hot: 13 mins	120V 50/60	1400W 12A	95 (43)
EZ10™	10" x 19" (254 x 475)	6gal/23L	21.5"x20"x14.4" (545x510x365)	3 full/3 half	16.3"x6.7"x0.8" (415x170x20)	4	Cold: 30 mins Hot: 14 mins	120V 50/60	1400W 12A	95 (43)
*EZ10k™ Kwiklave™	10" x 19" (254 x 475)	6gal/23L	21.5"x20"x14.4" (545x510x365)	3 full/3 half	16.3"x6.7"x0.8" (415x170x20)	4	Cold: 21 mins Hot: 11 mins	230V 50/60	2200W 10A	95 (43)

*Model EZ10k™ requires a voltage between 220V and 235V for proper operation. When applicable a buck/boost transformer (0.5KVA) may be required.

Features:

- Closed door active drying system to maintain sterility and ensure efficient drying of packs and pouches
- High efficiency air pump circulates air in chamber during drying cycle
- 0.2µm Hepa air filter (replaceable)
- New brighter and easier to read panel
- Program parameters can be customized and stored

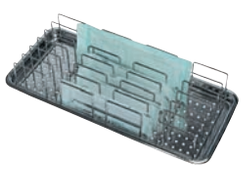
Control Panel:

1. Program Selection
2. Detailed Digital Display
3. Programmable Keys
4. System Indicators

Optional Internal Printer

Documents: date, time, temperature, pressure.

Clean&Simple™ Ultrasonic Cleaners and Tablets



Instrument Pouch Rack

Steam Distiller

Chamber Brite Autoclave Cleaner

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NO. 512 HEMATOCRIT

VetScan HM5

Operator's Manual

ABAXIS

VetScan HM5 Hematology System Original User's Manual

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September 2018

PN: 790-7013 Rev. F Text

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IMPORTANT: READ BEFORE USING THE VETSCAN® HM5 HEMATOLOGY ANALYZER FOR THE FIRST TIME

To get started quickly, please see the Quick Reference Guide in the pocket of this Operator's Manual.

Fill in this information for future reference.

Serial number (from the back of the unit): .....

Date of installation: .....

Distributor name and address: .....

.....

.....

Abaxis sales representative name: .....

Phone: .....

Email: .....

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September 2018
PN: 790-7013 Rev. F

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Section 1 General Information

This section provides general information about the Abaxis VetScan HM5 Hematology System.

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1.1 Introduction

The VetScan HM5 hematology analyzer is a compact, fully automated cell counter for in-vitro diagnostic use in veterinary clinics, research laboratories, universities, and pharmaceutical/biotech companies.

The VetScan HM5 can process 16–20 samples per hour, and is designed to determine the following 24 hematology parameters from 50 µl (2 x 25 µl) of whole blood:

- WBC, LYM#, MON#, NEU#, EOS#, BAS#
  LYM%, MON%, NEU%, EOS%, BAS%
- HGB, RBC, HCT, MCV, RDWc, MCH, MCHC, RDWs
- PLT, MPV, PCT, PDWc, PDWs

The VetScan HM5 is calibrated to analyze multiple veterinary species. Further species may periodically be added through a free software upgrade.

The VetScan HM5 system features the following components:

- The HM5 hematology analyzer itself, with a touchscreen interface and optimized software
- A reagent pack, including five individually-bottled solutions: Diluent, Lyse, Lyse 2, Cleaner, and Rinse

The HM5 provides multiple user-friendly features:

- Rapid CBC analyses, with full five-part differentials
- A database for up to 5000 records, with USB drive backup capability
- Automated on-screen reminders, and illustrated instructions to simplify routine maintenance tasks
- Quick reagent pack change method

For added convenience, the VetScan HM5 can be connected to a VetScan VS2 Chemistry Analyzer and an external printer, so that results from both instruments can be consolidated and printed on a single, standard-size page.

The VetScan HM5 can also be connected to a compatible Veterinary Practice Management Software system. For a list of these systems, visit http://www.abaxis.com.

1.1.1 Customer and Technical Support

Abaxis Technical Support personnel can answer your questions regarding the VetScan HM5 Hematology Analyzer, or the combined VetScan HM5/VS2 system.

1.1.1.1 For USA:

- **Telephone:** 1-800-822-2947, 24 hours a day, seven days a week
- **Email:** vetsupport@abaxis.com
- **Web:** www.abaxis.com
- **Fax:** 1-877-900-9333

1.1.1.2 For Europe:

- **Telephone:** +49 (6155) 780 210
- **Email:** techsupport@abaxis.de

  Or for the U.K.
- **Telephone:** +44 (1904) 909 500
- **Email:** info@abaxis.co.uk

1.1.1.3 For Other Areas:

- Contact a local Abaxis distributor, or email **vetsupport@abaxis.com**

1.1.2 Safety Information

WARNING: ***THE PERIPHERAL CONNECTORS ON THE ABAXIS VETSCAN HM5 ARE SELV (SAFETY EXTRA LOW VOLTAGE) CONNECTORS. TO AVOID THE RISK OF ELECTRICAL SHOCK, CONNECT THE INSTRUMENT ONLY TO EXTERNAL DEVICES THAT ARE SELV RATED.***

Note: *This equipment has been designed and tested to CISPR 11 Class A. In a domestic environment it may cause radio interference, in which case, you may need to take measures to mitigate the interference.*

Note: ***For Canada:*** *This product has been tested to the requirements of CAN/CSA-C22.2 No. 61010-1, second edition, including Amendment 1, or a later version of the same standard incorporating the same level of testing requirements.*

Note: *Abaxis recommends wearing protective eyewear and a lab coat when working directly with reagents (such as changing the reagent pack). In addition, users with sensitive skin should wear latex or nitrile gloves.*

1.2 HM5 System

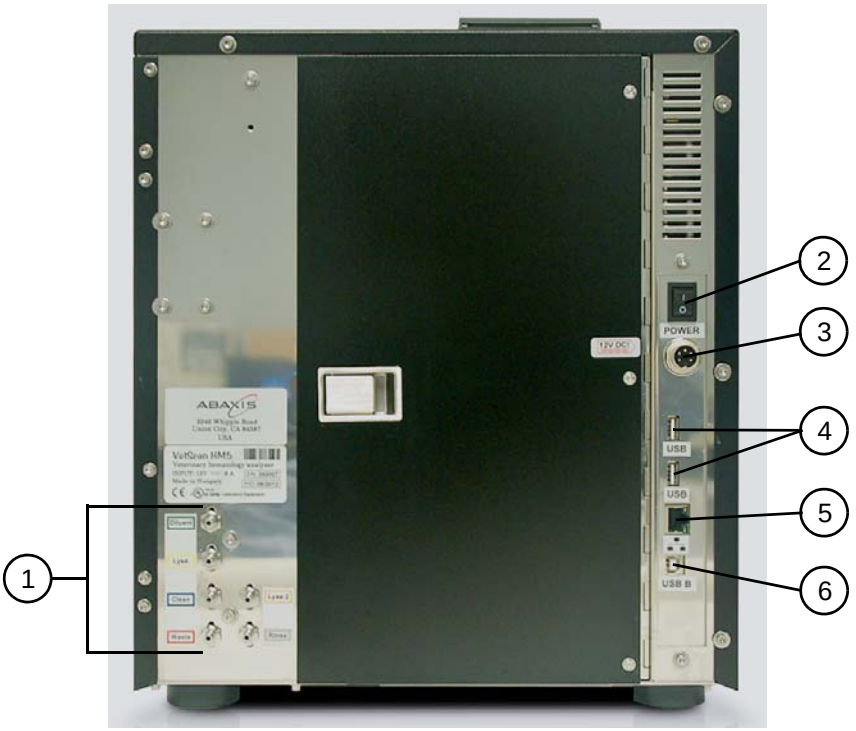
1.2.1 Main Components

1.2.1.1 Front View

1. Built-in thermal printer
2. LCD touchscreen
3. Sampling door and rotor
4. USB Type A ports (2)

1.2.1.2 Back View

1. Reagent ports/inlets
2. Power switch ON/OFF
3. Power supply connection
4. USB Type A ports (2)
5. Ethernet port
6. USB Type B port



1.2.2 Power Supply and Power Cord

The analyzer uses an external 12v DC power supply that can operate from a 220 or 110 volt main outlet. The power supply's input socket is a standard power cable connection, and its output is a special locking socket. The cord used will be designated by the region.

1.2.3 Reagents

The VetScan HM5 reagent pack (PN 770-9000) consists of five bottles containing Diluent, Cleaner, Lyse, Lyse 2, and Rinse solutions.

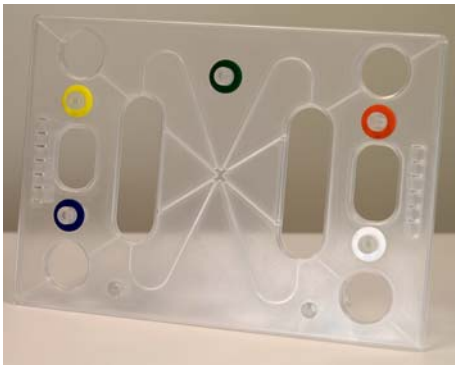
Table 1-1: Reagents and Containers

Reagents	Descriptions	Color	Volume
Diluent	Isotonic saline solution used to dilute whole blood specimens, and to rinse the analyzer's fluidic system between analyses.	Green	9 liters
Rinse	Used for certain species runs and for certain cleanings.	White	500 ml
Cleaner	Used in the fluidic system cleaning process.	Blue	300 ml
Lyse	Used to create hemolysate for three-part WBC differential, and for total WBC and HGB.	Yellow	300 ml
Lyse 2	Used to dilute whole blood and differentially hemolyse white blood cells to separate eosinophil granulocytes from other WBC by volume. Suitable for determining EOS, EOS%, BAS, and BAS% parameters.	Orange	800 ml

1.2.3.1 Reagent Connections

The VetScan HM5 draws in liquid reagents through a reagent tubing kit. This tubing can be configured in two ways, each of which connects to the analyzer's reagent inlets, but uses a different connection at the reagent pack.

- **Quick Change Apparatus (QCA):** The QCA (at right) allows a very rapid change to a new reagent pack, and can be used in setups where the reagent pack can be placed on a counter adjacent to the analyzer. The QCA includes a QCA frame, two kickstands (far right), and color-coded rigid dip tubes (below). In the QCA, the reagent tubing connects to the dip tubes in the reagent bottles.

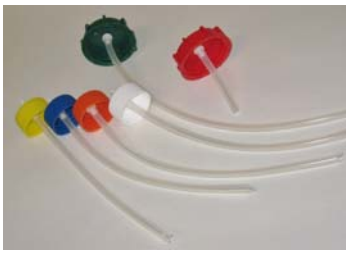


Note: *When using the QCA:*

- *To avoid contaminating the reagents, do not let the dip tubes rest on the counter. Instead, rest the frame on the kickstands.*
- *Do not use part of a QCA that is broken.*
- *Do not place anything on top of the assembled QCA. This helps avoid kinks in the reagent tubing.*

CAUTION: *The tips of the dip tubes may have a sharp edge.*

- **Bottle Caps:** The Bottle Caps setup includes color-coded caps with nozzles and attached flexible drop-down tubes. The bottle caps screw onto the appropriate reagent bottles and are intended for compact locations, such as under-counter installations. In the Bottle Caps setup, the reagent tubing connects to the bottle caps.

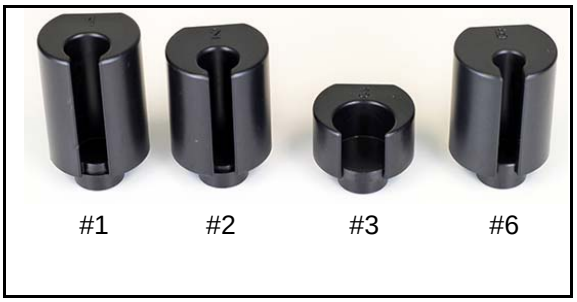


1.2.3.2 Reagent Tubing

The reagent tubing includes six color-coded tubes, all of which match the colors on the reagent and waste bottle caps.

1.2.4 Accessories

- **Keyboard:** A mini USB keyboard enables easier data input. Any USB keyboard can be used with the HM5.
- **Sample Tube Adaptors:**
  - **#1:** for 2-3 ml tubes and the Abaxis Control Tube
  - **#2:** for 1.3 ml tubes
  - **#3:** for 2 ml glass vials
  - **#6:** for microtainer tubes of 0.6 ml or less



- **Peristaltic Pump Tube:** In case this tube is damaged, a spare is provided. See "Peristaltic Pump Tubing Replacement" on page 6-13.

- **Thermal Paper Roll:** Two rolls are included with the analyzer package for use in the built-in printer. Each reagent pack also includes a new roll. Save the paper rolls, as printing to the built-in printer is often very useful for troubleshooting.

1.3 Touchscreen Icons

The following figures show the icons used in the HM5 touchscreen display.

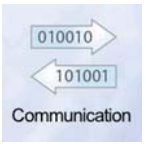
Measure: Analyze samples and run blanks

Database: Search, retrieve, view and manage up to 5,000 records

Maintenance: Clean, Calibrate, run Quality Control and manage Reagent Status

Settings: Manage printer, testing, date/time and other analyzer settings

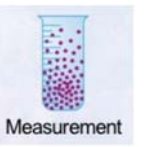
Exit: Select shut-down options and log in to user accounts



Communication: Manage VSx, serial USB communication and Device and Host Network Settings

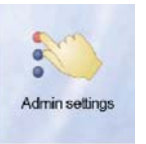
Printer: Manage printer settings and printout options

General Settings: Select analyzer options and language



Measurement Settings: Select units and set normal ranges for species

Date and Time: Change date and time options



Admin Settings: Allows Admin users to edit Reagent Replace settings, Schedule Maintenance and manage user accounts

Section 2

Installing the VetScan HM5

An Abaxis representative will normally install the VetScan HM5 analyzer. If this is not possible, however, follow the procedures in this section.

Section Contents

2.1 Choosing a Location 2-2

2.1.1 Environment Requirements 2-2

2.1.2 Electrical Requirements 2-3

2.2 Installation 2-3

2.3 Initializing the VetScan HM5 2-9

2.1 Choosing a Location

WARNING: ***MAKE SURE THE ANALYZER AND ALL ACCESSORIES ARE PROPERLY GROUNDED. IMPROPER GROUNDING CAN CAUSE INJURY, AND WILL VOID THE WARRANTY.***

The analyzer must be installed in a suitable location. To ensure accuracy and precision, and to maintain safety, the environmental and electrical requirements in this section must be met. Be sure to thoroughly consider all the following requirements in selecting a permanent location for the analyzer.

Note: *This analyzer is approved for use up to an altitude of 10,000 ft (3000 m).*

2.1.1 Environment Requirements

Choose a clean, dust-free, well-ventilated location, away from direct sunlight, and between 59–86 °F (15–30 °C). The location should also be level, sturdy, and as vibration-free as possible.

The HM5 works best if the analyzer and the reagent pack are on the same level. However, if this is not possible, place the reagent pack *below* the analyzer, so that the top of the reagent pack is *no more* than 18 in (45.7 cm) lower than the bottom of the analyzer.

WARNING: ***DO NOT PLACE THE REAGENT PACK ABOVE THE ANALYZER (SUCH AS ON A SHELF).***

DO NOT DROP THE REAGENT PACK, AS THIS CAN CAUSE MICRO-BUBBLES TO FORM, PREVENTING PROPER OPERATION.

IF THE PACK IS DROPPED, ALLOW IT TO SIT FOR 24 HOURS BEFORE INSTALLING IT ON AN ANALYZER.

Note: *To ensure accurate test results, use only reagents supplied by Abaxis.*

Avoid using equipment that can produce electromagnetic emissions nearby: refrigerators, freezers, centrifuges, fans, hair dryers, etc.

2.1.2 Electrical Requirements

- The VetScan HM5 is powered by a standard wall outlet, and requires a power supply of 100–240 VAC, 50–60 Hz, 1.5 A (this is provided with the analyzer).
- To avoid power surges and electrical noise, DO NOT plug the analyzer's power supply into a circuit that includes a centrifuge or other high-current device.

CAUTION: *Abaxis recommends using the analyzer with surge protection designed for a computer. In addition, a battery backup is strongly recommended if the VetScan HM5 will be used in an area prone to electrical surges or power outages.*

Use of an Abaxis provided power supply is required for system integrity and safety.

2.2 Installation

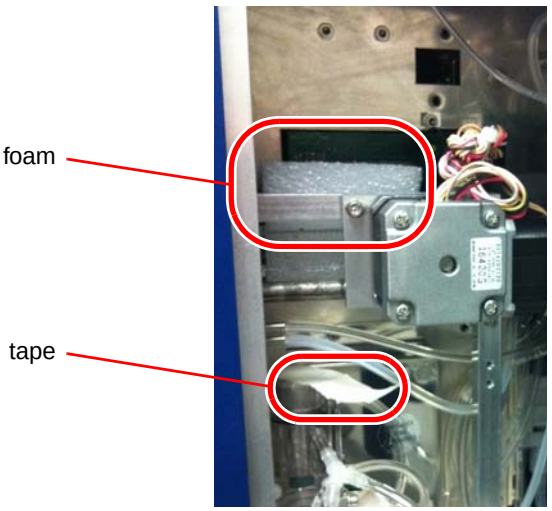
CAUTION: *Make sure the analyzer is powered* **OFF** *before connecting it to the power supply or any electrical device, such as an external printer, external keyboard, or computer.*

1. Open the shipping box, and lift the accessory box up and out of the shipping carton.
2. Remove the stabilizing foam from the top of the HM5.
3. Use both hands to carefully lift the HM5 out of the foam underneath it and out of the box.
4. Place the HM5 temporarily on a clean, stable counter.

CAUTION: ***Place the analyzer in upright position only.*** *Do not place the unit on its back, side, or top, or you could cause severe damage.*

5. Remove the plastic wrap from the HM5.
6. Use the metal latch to open the door on the right side of the HM5.

7. Remove the foam and tape from inside the unit, as shown.



8. Open the Accessory and Initial Goods boxes, and make sure all the following are included:

- HM5 Operator's Manual CD
- Mini-keyboard
- Tubing kit (reagent tubing, bottle caps with drop down tubing)
- Quick Reference Guide
- Four sample tube adapters
- VetScan HemaClean Kit
- 1 liter polypropylene flask
- Power supply and cord
- Thermal paper rolls (2)
- Peristaltic pump tube
- Waste bottle and lid with nozzle

9. Plug the battery backup or surge protector into a standard outlet. Hold the power button down until it beeps.

WARNING: ***USE ONLY THE POWER SUPPLY PROVIDED WITH THE VETSCAN HM5. USING ANY OTHER POWER SUPPLY CAN DAMAGE THE INSTRUMENT AND WILL VOID THE WARRANTY.***

10. Screw the power supply onto the back of the HM5.
11. Plug the power cable into the power supply and the battery side of the battery backup or surge protection device once it has been turned on.
12. Attach the long reagent tubes to the back of the HM5. Match the colors of the reagent tubing with the colors on the rear of the analyzer.

CAUTION: *When working with the reagent tubing, make sure the tubing does not become pinched or kinked and is not trapped between or beneath objects.*

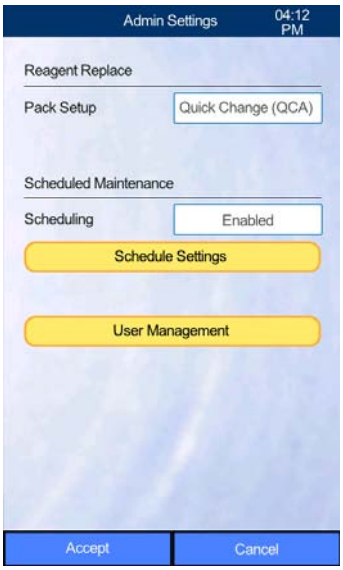
13. Attach the waste tube (red) to the top of the large white waste cap. Leave the other ends of the five reagent tubes free for now.
14. Place the white waste cap on the white waste bottle. This bottle can rest below the analyzer to provide more room on the counter.
15. If needed, attach the mini-keyboard to a USB Type A port on the back of the analyzer.

CAUTION: *If the analyzer has been kept at a temperature below 50 ºF (10 ºC), allow it to sit for* ***at least*** *an hour at the correct operating temperature (59–86 °F, 15–30 °C) before using it.*

16. Turn the analyzer on using the power switch on the back.
17. Allow the analyzer to boot up and initialize.

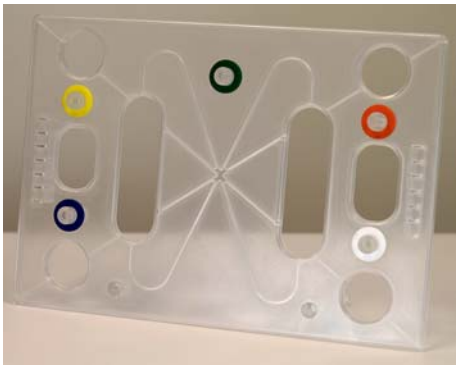
Note: *When the analyzer is turned on, it first performs a startup routine: all moving parts are tested, tubing is primed, sensors are calibrated, and automatic self-cleanings are performed. This process will take about 2 minutes.*

18. On the HM5's Home screen, select **Settings > Admin Settings**.



19. Select a **Pack Setup**:

- If the reagent pack will be *on the same level* as the HM5 (preferred) and you have the QCA (Quick Change Apparatus), select **Quick Change (QCA)** in **Reagent Replace.**



- If the reagent pack will be *on a lower level* than the HM5 and/or the Bottle Caps tubing set is being used, select **Bottle Caps**. Make sure the top of the reagent pack is no more than 18 in (45.7 cm) lower than the bottom of the analyzer.

20. Select **Schedule Settings > Reset > Accept** to restart maintenance timers from today.
21. Pour ~200 ml of distilled water into the Abaxis flask.
22. Submerge the free ends of the reagent tubes into the water.
23. Select **Maintenance > Reagent Status**, and then **Prime All**.
24. Run **Prime All** twice more (three times in all) until all water is gone from the flask and air is pumped into the tubing.

25. While the analyzer is priming, open the reagent pack. Remove the bottle caps from each of the five bottles. Save these lids for later disposal of the pack.

26. Make sure the foam liners stay in the bottle caps, and are not left on top of the bottles. See the photo.
27. Select **Exit > Change Reagent Pack**.
28. Follow the procedure below for the tubing set type being used: **QCA** or **Bottle Caps**.

CAUTION: *Use the color codes as guides when connecting tubing, dip tube heads, and reagent bottles. If the tubes are not connected correctly, the instrument will not produce accurate results.*

QCA Setup

a. Remove the QCA frame and both kickstands from the Initial Goods kit and unwrap them.

b. Insert the kickstands into the holes in the bottom of the frame and twist counterclockwise to lock them into place.

c. Place the QCA frame over the reagent pack so that the colors line up (green over green, yellow over yellow, etc.).

Note: *In the following steps, touch only the heads of the long dip tubes, or use clean gloves to prevent contamination of the dip tubes.*

d. Pull one of the five dip tubes (shown at right) out of the accessories kit.

Note: *To prevent contaminating the reagents, do not place the clean dip tubes on the counter.*

e. Insert the dip tube into the matching color-coded ring in the QCA frame.

f. When the dip tube touches the bottle seal, push the tube through the seal until the end of the tube contacts the bottom of the bottle.

Note: *The colored rings may not sit flush with the top of the frame.*

g. Connect the appropriately colored reagent tubes to the matching colored tops of the dip tubes.

h. Select **Next** through the steps of the pack change process until the analyzer primes.

Bottle Cap Setup

CAUTION: *In the following steps, do not touch the drop-down tubing with your bare hands, or you may contaminate the reagents. Wear latex or nitrile gloves.*

a. For each bottle in the reagent pack: cut an "X" in the heat seal and push down the 4 corners to open the bottle.

b. For each drop-down tube, one at a time:

i. Using a soft, lint-free cloth (such as a KimWipe®) moistened with distilled water (not tap water), wipe the drop-down tube to remove any lint or dust from the tube.

ii. Carefully place the drop-down tube into the appropriate color-matching bottle, then tighten the bottle cap.

Note: *Be sure to save the original reagent caps so you can re-cap the containers when the reagent pack is used up.*

CAUTION: *Make sure the small air vent on each cap is not blocked, so air can flow freely.*

c. Thread the long tubes from the back of the HM5 through the punched-out hole in the reagent pack lid.

d. Attach the long reagent tubes to the nozzles on the color-matching bottle caps.

29. Select **Next** through the steps of the pack change process until the analyzer primes.

30. Select **Home** to return to the Home screen.

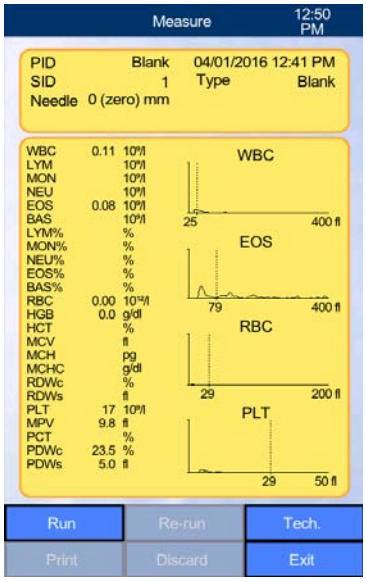
2.3 Initializing the VetScan HM5

1. Select **Measure > Run**. A Message that the blank has expired will appear.

2. Select **OK** to run a blank.

   The analyzer will run a blank measurement. When the process is complete, the instrument displays the result of the blank measurement. (Blank runs are described in more detail in "Running a Blank Measurement" on page 4-5.)

3. Select **Accept** if there are no flags and no values highlighted in red, indicating that the analyzer blank background level is within specifications.



   The analyzer then displays a sample measurement screen, as shown, and *is now ready to perform an analysis.*

Note: *You will be notified with a pop-up if the blank falls outside specifications. If this occurs, refer to "Blank Flags" on page 9-2. If the problem persists, call Abaxis Technical Support.*

4. Verify the analyzer's system settings, and make any needed changes: see "Settings" on page 3-1.

Section 3

Settings

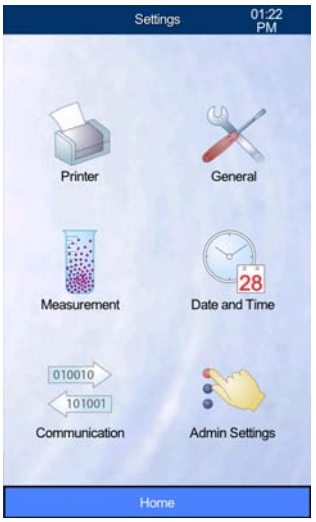
This section describes how to configure the VetScan HM5's settings for optimal performance and to meet your particular lab requirements.

Section Contents

3.1 Settings Overview 3-2
3.2 Printer Settings 3-2
3.2.1 Connecting an External USB Printer 3-2
3.3 General Settings 3-3
3.3.1 Screen Saver and Standby Time 3-3
3.4 Measurement Settings 3-4
3.5 Date and Time Settings 3-4
3.6 Communication Settings 3-5
3.6.1 VSx Communication 3-7
3.6.2 Serial USB Connection to a Computer 3-7
3.6.3 Network Communication 3-8
3.6.4 Host Network 3-9
3.7 Admin Settings 3-11

3.1 Settings Overview

The HM5 analyzer's Settings screen and icons are shown at right, and have these functions.



- **Printer**: sets printer type, paper size and margins, information included on printouts, and color options. See below.
- **General**: controls sounds, language, export format, and delays for screen saver and standby modes. See page 3-3.
- **Measurement**: sets units, normal ranges, and sampling needle depth. See page 3-4.
- **Date and time**: sets date, time, and format for each. See page 3-4.
- **Communications**: enables communication with a connected computer or VS2 analyzer. See page 3-5.
- **Admin Settings**: set the reagent tubing type, maintenance scheduling, and user management. See page 3-11.

3.2 Printer Settings

The Abaxis HM5 can print to its built-in printer or a connected external printer. (For a list of compatible printers, contact Abaxis Technical Support.)

The HM5's printer settings enable users to select specific information to print, manage print color and quality, modify margins, and add a personalized header.

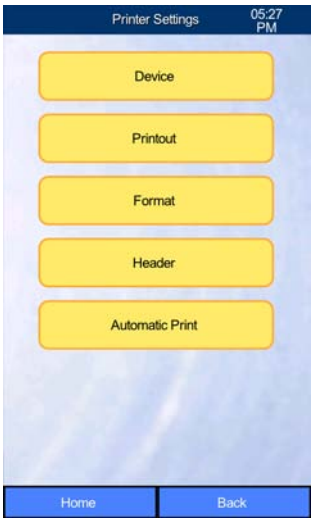
3.2.1 Connecting an External USB Printer

Follow these instructions to connect the HM5 to an external USB printer, and adjust the printer settings to fit the clinic's particular needs and setup.

You will need a USB A-B cable.

1. Plug the USB B (square) end of the cable into the printer, and the USB A (flat) end into a USB port on the back of the HM5.
2. From the HM5's Home screen, select **Settings > Printer**.

3. Adjust the printer settings as needed:



- **Device**: selects printer, print mode, and paper type.
- **Printout**: sets units and margins for printouts.
- **Format:** selects the items included with printed results.
- **Header:** sets up to 7 lines of customer information used at the top of the printout.
- **Automatic Print:** enables automatic printing of results after CBC runs. (Disable if combining with VS2 results to avoid multiple printouts.)

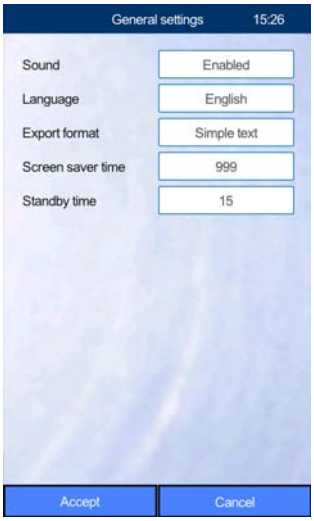
3.3 General Settings

Use **General Settings** to adjust sound, language, export format, screen saver time, and standby.

1. From the Home screen, select **Settings > General Settings**.
2. Select the settings to adjust:
   - **Sound**: enables/disables sound.
   - **Language:** selects the language used in analyzer displays.
   - **Data Export Format:** selects the format for exported data (**Advanced** is recommended).
   - **Screen Saver Time:** sets the delay time for screen saver activation, in minutes.
   - **Standby Time:** sets the delay time for standby activation, in minutes.

3.3.1 Screen Saver and Standby Time

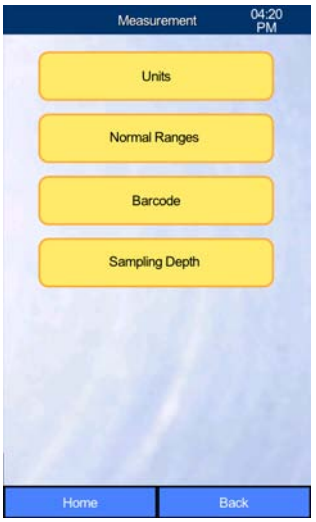
1. From the Home screen, select **Settings > General Settings**.
2. Select **Standby Time**, then enter the standby time in minutes.
3. Select **Screen Saver Time**, then enter the time before the screen saver activates, in minutes.
4. Select **Accept**.



3.4 Measurement Settings

Use **Measurement Settings** to set units, ranges, and sampling depth, or to enable scanning.

1. From the Home screen, select **Settings > Measurement**.
2. Select the settings to adjust:
   - ❑ **Units**: selects the units used for results.
   - ❑ **Normal Ranges**: sets default normal/reference ranges for each species.
   - ❑ **Barcode**: enables barcode scanning for patient ID numbers.
   - ❑ **Sampling Depth**: sets the default depth to which the needle descends into the sample tube to draw up blood.

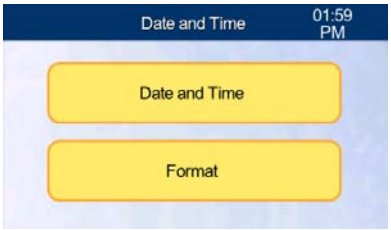


Note: *The HM5 software contains three duplicate software profiles called Dog2, Cat2 and Foal that measure with the same algorithms as Dog, Cat and Horse, respectively; users may edit these profiles with customized reference intervals for other species similar to dogs, cats or horses. They may also be used for younger pets, such as puppies, kittens or foals or geriatric populations. These customized reference ranges must be provided by the user.*

3.5 Date and Time Settings

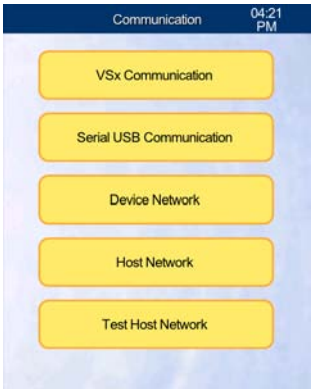
Use **Date and Time** to set the VetScan HM5's built-in clock and calendar, and the format used to display the date and time on results.

- ■ **Date and Time**: sets the displayed time and date on the analyzer clock.
- ■ **Format**: sets the date display format (Month/Day/Year, Year/Month/Day, or Day/Month/Year) and time display format (12- or 24-hour).



3.6 Communication Settings

This section provides information for network administrators to use in setting up the HM5 on a network.



The VetScan HM5 offers a variety of options for communicating with external systems such as practice management software, printers and selected Abaxis analyzers, using USB and/or network connections as described in this chapter.

The table below summarizes the USB and network data communication modes available to the HM5.

Table 3-1: VetScan HM5 USB/Network Communication Modes

Modes			
Target	**Name**	**Type**	**Purpose**
VetScan VS2 chemistry analyzers	VSx Communication	USB	Receives results from the VS2 analyzer and produces a formatted report that combines the VS2 and HM5 results when a Patient ID match is found in the HM5 database.
Computer (unidirectional)	Serial USB Cable Communication	USB	Sends results from the HM5 to a host (such as a computer with practice management software) through a USB serial COM port. See Table 3-2.
Computer (unidirectional)	Host PC (in Host Network)	Network	Sends results from the HM5 to a host computer via network-enabled software, such as a practice management system. See Table 3-3.
Computer (bidirectional)	Host EMR (in Host Network)	Network	Sends results from the HM5 to a host computer and receives work list orders from a host computer using network-enabled software, such as a practice management system or an electronic medical records (EMR) system. See Table 3-4.

These communication modes act independently and multiple modes can be enabled simultaneously though typical analyzer operation enables only one of the above modes at a time.

Note: *When changing communication modes, be sure to verify the settings for all modes to ensure that only the desired mode is enabled. VSx Communication can be enabled or disabled independently of other settings with no unintended consequences.*

The following tables list the most commonly used settings.

Table 3-2: Unidirectional Transmission to a Host Through a USB Cable

Communication	Setting Name	Setting
Serial USB Communication	Serial USB Link	**Enabled**
	Serial Automatic Send	**Enabled**
Host Network	Personal Computer (PC)	Inactive
	PC Automatic Send	Disabled
	Electronic Medical Record (EMR)	Inactive
	EMR Automatic Send	Disabled

Table 3-3: Unidirectional Transmission to a Host Computer Through a Network Connection

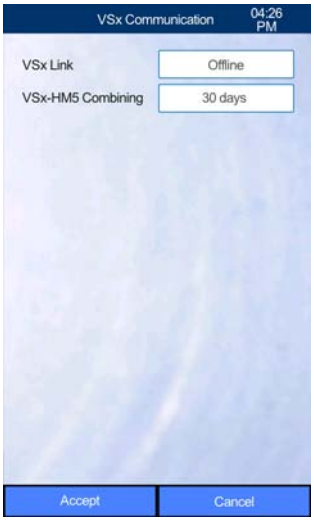
Communication	Setting Name	Setting
Serial USB Communication	Serial USB Link	Disabled
	Serial Automatic Send	Disabled
Host Network	Personal Computer (PC)	**Active**
	PC Automatic Send	**Enabled**
	Electronic Medical Record (EMR)	Inactive
	EMR Automatic Send	Disabled

Table 3-4: Bidirectional Transmission to a Host Computer Through a Network Connection

Communications	Setting Name	Setting
Serial USB Communication	Serial USB Link	Disabled
	Serial Automatic Send	Disabled
Host Network	Personal Computer (PC)	Inactive
	PC Automatic Send	Disabled
	Electronic Medical Record (EMR)	**Active**
	EMR Automatic Send	**Enabled**

3.6.1 VSx Communication

The HM5 can provide a formatted printout of results from an Abaxis VS2 analyzer and can produce a printout of VS2 results combined with HM5 results when a matching Patient ID is found in the HM5 result database.



1. On the Home screen, select **Settings > Communication > VSx Communication**.
2. Set **VSx Link** as needed:
   - ❑ **USB**: enables VSx communication and prints VS2 results.
   - ❑ **Offline**: VSx communication is disabled.
3. Set **VSx-HM5 Combining** to control the date range for the HM5 result lookup to match the VS2 patient result. Select **Same Day** to combine only HM5 results that were run on the same day as the VS2 result.
4. Connect the USB B (square) end of the USB cable to the USB B port on the back of the VS2.
5. Connect the USB A (flat) end of the cable to a USB A port on the HM5.
6. Press **Accept**.

3.6.2 Serial USB Connection to a Computer

The VetScan HM5 can connect to practice management software (PMS) on a computer using a USB A-B cable. For a list of compatible PMS software, visit the Abaxis website at www.abaxis.com.

3.6.2.1 USB A-B Cable Connection

1. Connect the B end of the cable into the USB B port on the back of the HM5.
2. Connect the A end of the cable into the PMS computer.
3. On the Home screen, select **Settings > Communication > Serial USB Communication**.
4. Enable **Serial USB Link** and **Serial Automatic Send**.
5. Set **Serial Link Baud Rate** to the rate recommended by the practice management software (typically 9600).
6. Using a computer connected to the internet, browse to www.abaxis.com.
7. Download and install the Color HM5 USB driver on the computer, following the instructions on the website. Contact the PMS company to complete the setup with the HM5.

3.6.3 Network Communication

The HM5 can connect to a computer network through the Ethernet port on the back of the analyzer (see “Back View” on page 1-4) using standard Cat5 networking cables:

- Unidirectional connections transmit results from the HM5 to a computer.
- Bidirectional communication transmits work orders to the HM5, from a software application such as practice management software, and results to the computer from the HM5. (For a list of compatible software, visit the Abaxis website at www.abaxis.com.)

When network communication is necessary, the HM5 must always be configured with a Device Network address assignment (see “Device Network,” below). This establishes the HM5 as a location on the network and enables the HM5 for subsequent use with the Host Network settings (see “Host Network” on page 3-9).

3.6.3.1 Device Network

The Device Network setting establishes the network address of the HM5 analyzer.

The network address may be assigned automatically via DHCP, or manually by making a static IP address assignment. The method to use depends on a number of factors, is best determined by the local network administrator.

DHCP address assignment is the easiest to configure and is the preferred method when Host EMR communication is not being used.

When using Host EMR communication, a fixed or static address is preferred. Contact your system administrator for details (see “Configure for Static Address Assignment” on page 3-9).

Note: *In some cases you may be directed to use the DHCP setting on the HM5, and the network administrator will configure the DCHP server to assign a fixed address to the HM5.*

In the Device Network screen, **Current Settings** shows the address assignment based on the most recent configuration: the information is automatically assigned if **DHCP Enabled** was used, or information entered manually for a static assignment.

Use **New Settings** to update the address assignment: see “Configure for DHCP Address Assignment,” or “Configure for Static Address Assignment,” below.

- Configure for DHCP Address Assignment
  1. Change the DHCP setting to **Enabled**. (You can ensure **Enabled** is set by selecting the setting value.)
  2. Press **Accept**.

- Configure for Static Address Assignment

  To use static address assignment for the HM5, your local network administrator must supply the necessary information.

  1. Change the DHCP setting to **Disabled**. (You can ensure **Disabled** is set by selecting the setting value.)
     The data entry fields in the New Settings area then become available.

  2. Enter the following settings using the values from your network administrator:
     - IP Address
     - Subnet Mask
     - Gateway
     - DNS

  3. Press **Accept**.

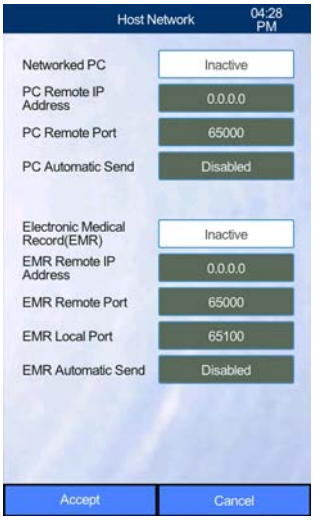
3.6.4 Host Network

When configured for Host Network communication, the HM5 can send results to another computer on the network (unidirectional mode), or accept work orders from and send results to a computer (bidirectional mode). The computer must be running compatible software to accept the result information and optionally send order information. For a list of compatible software, visit the Abaxis website at www.abaxis.com.

3.6.4.1 Personal Computer (PC)

The **Host Network > Personal Computer (PC)** settings enable the HM5 to send results one-way (unidirectional) to a network-enabled Personal Computer (PC) system or software such as a practice management system. In this mode, the HM5 cannot accept work list orders (bidirectional communication) from a PC system.

When sending results, the HM5 establishes an outbound connection to a specified IP address and port (see below). The receiving PC must be running a service that listens for incoming connections on the IP address and port. The local network administrator or software vendor can provide the necessary IP address and port values.



To configure the HM5 to send results to a PC system:

1. In the Host Network screen, set the Networked PC field to **Active**.
2. Enter the PC Remote IP Address and PC Remote Port number, as provided by your local network administrator or software vendor.

3. Set PC Automatic Send to **Enabled**.

Note: *Enabling PC Automatic Send is typical for this configuration, but may not be appropriate for your PMS or individual configuration. If you have questions about the correct setting for your clinic, contact Abaxis Technical Support or consult your PMS vendor.*

4. Select **Accept**.

3.6.4.2 Electronic Medical Record (EMR)

The **Host Network > Electronic Medical Record (EMR)** settings enable the HM5 to exchange work order and results (bidirectional) with a network-enabled PC or software such as a practice management system. Orders flow from the EMR host to the HM5, and results from the HM5 to the EMR host. The EMR host system software must be capable of bidirectional communication with the HM5.

When receiving orders, the HM5 establishes a listening service and waits for connections from the EMR host. The listening address is the HM5 analyzer IP address (see “Device Network” on page 3-8), and the listening port is determined by the EMR Local Port setting (see below).

When sending results, the HM5 establishes an outbound connection to the specified IP address and port (see below), and the receiving EMR system must be running a service listening for incoming connections on that IP address and port. The IP address and port values are provided by the local network administrator or software vendor.

To configure the HM5 to communicate with an EMR system:

1. In the Host Network screen, set Electronic Medical Record (EMR) to **Active.**
2. Enter the EMR Remote IP Address and EMR Remote Port number, as provided by your local network administrator or software vendor.
3. Enter the EMR Local Port number provided by, or determined in conjunction with, the EMR software vendor. (This is the port the HM5 listens on for incoming order connections.)
4. Set EMR Automatic Send to **Enabled**.

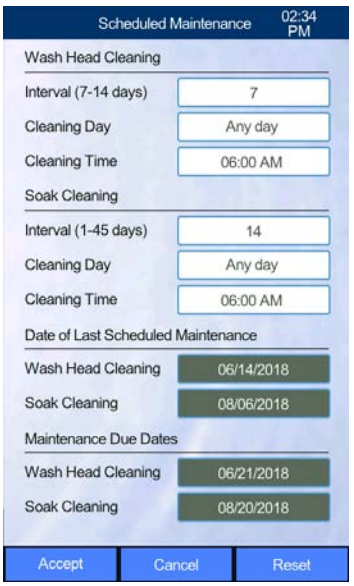
Note: *Enabling EMR Automatic Send is typical for this configuration, but may not be appropriate for your PMS or individual configuration. If you have questions about the correct setting for your clinic, contact Abaxis Technical Support or consult your PMS vendor.*

5. Press **Accept**.

3.7 Admin Settings

This menu is available to Admin-level users only (see Section 7). Use **Admin Settings** to adjust maintenance dates to fit the clinic's schedule, to tailor directions to the tubing set being used, and to set up user permissions.

1. On the HM5 Home screen, select **Settings > Admin Settings**.
2. The **Pack Setup** setting identifies the reagent pack tubing setup: select **QCA** or **Bottle Caps** (see "Installation" on page 2-3).
3. Select **Scheduling** and select the schedule for Wash Head Cleaning and Soak Cleaning:
   - ❑ To use the default maintenance schedule, select **Disable**.
   - ❑ To customize the maintenance schedule and enable full screen reminders for maintenance, select **Enable**.
4. Then select **Schedule Settings:**
   - ❑ The **Interval** fields can be used to set the number of days between cleanings. Abaxis recommends that **Intervals** be left at the default values of a 7 day Interval for Wash Head Cleaning and a 14 day Interval for Soak Cleaning. Use the **Cleaning Day/Time** fields to set the specific day and time that cleaning is due. Users who run fewer than 5 samples per day may set the Soak Cleaning Interval to 30 days.
   - ❑ Use **Last Date of Scheduled Maintenance** and **Maintenance Due Dates** to track the previous and the next scheduled cleanings.



Note: *The default interval settings are ideal for most clinics.*

Note: *Enabling Schedule Settings allows the user to set the preferred day and time for maintenance and will not allow samples to be run until maintenance procedures have been performed.*

Section 4

Running a Sample

Running a sample on the HM5 is a simple process that begins with good sample draws, proper mixing, and correct storage of the samples.

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4.2 Storing Samples 4-3
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4.1 Collecting and Handling Samples

Because sample integrity is essential for accurate test results, always follow the guidelines in this section for sample handling.

CAUTION: *Use only tubes containing potassium EDTA (purple/lavender top) for CBC analysis.*

Note: *For multiple tube draws, always fill the tubes in this order:*
1) blue top
2) red top or tiger top
3) green top
4) lavender/purple top

- When collecting a sample, select the largest vein possible, and select the appropriate needle size for the vein.
- If blood stops flowing into the syringe before enough sample is acquired, dispose of that syringe and attempt a new draw with a new needle, new syringe, and new draw site.
- Avoid delays of more than 20 seconds between the venipuncture and the sample transfer to the EDTA tube, and between filling the tube and mixing. Delays can cause platelet clumping and clot formation.

Note: *For best results, fill the tube with blood to at least half its maximum fill volume (as marked on the tube).*

- To achieve proper mixing and prevent clotting, immediately mix samples by inverting the tubes 10-15 times (25-30 times with very small samples or in low volume microtubes) Inversion speed should be 2-3 inversions per second.

Note: ***Do not shake samples!*** *Doing so can damage the blood cells, and can form micro-bubbles that will cause inaccurate results.*

- Mix thoroughly by hand immediately before analysis by gently inverting the tube 10-15 times.

- When using a vacutainer system, allow the vacuum to pull the sample in. If the tube stops filling before enough sample is acquired, try to quickly redirect the needle.

  If this takes more than 5-10 seconds, remove the needle and dispose of the sample, and attempt a new draw at a new site, with a new needle and new tube. Once the tube is full, mix by inverting the tube 10-15 times (25-30 times in low volume microtubes).
- When using a butterfly with a vacutainer system, gently invert the tube while the tube is filling.
- IMMEDIATELY mix tubes after filling them to prevent the blood from clotting in the tube.

4.2 Storing Samples

- Samples may be put in a rack or on a counter until ready to run.
- Samples should be run within 4 hours if stored at room temperature, or 8 hours if refrigerated.
- If the samples were refrigerated, allow them to warm to room temperature before analysis by sitting on the counter for 10-15 minutes. Samples may also be warmed by slowly rolling the tube in the palms of the hands for 5-10 minutes.
- Do not use a rocker to mix samples smaller than 1.0 ml.

Note: *Rockers do not mix samples well. To mix properly, invert each sample by hand 10 to 15 times* ***immediately after*** *drawing, then invert 10 to 15 times again* ***immediately before*** *running the sample.*

4.2.1 Remixing Before Running

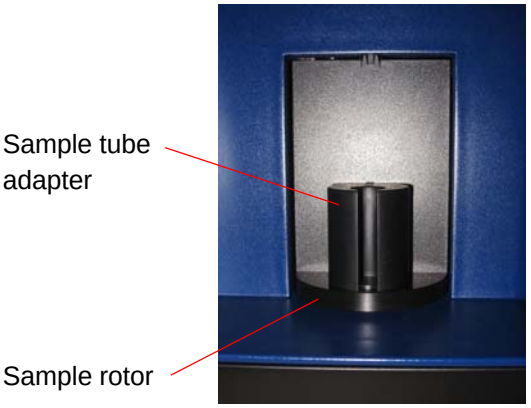
The HM5 software will display a reminder to mix samples before each sample run.

- Always mix the sample again with 10-15 inversions before analyzing the sample in the HM5. Over time, samples settle and start to separate so they must be mixed well again before being run.
- If any specks of solid blood (indicating clotting) are observed, or if there were any delays in filling the tube, discard the sample and redraw.

4.3 Before Performing an Analysis

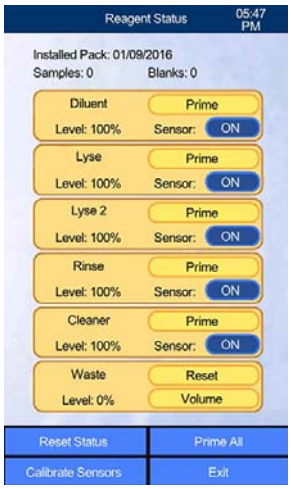
4.3.1 Daily Cleaning

1. Wipe up any spills on the sample rotor.
2. Keep the instrument and immediate surroundings as clean as possible.

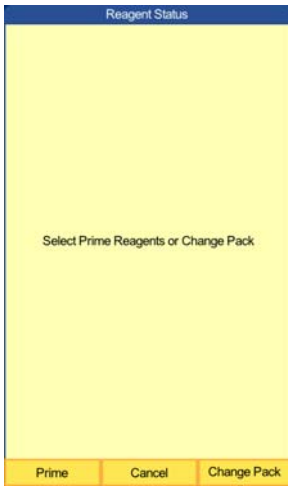


4.3.2 Check Tubing

1. Inspect the reagent tubes and connections to make sure the reagents can flow freely. Make sure the tubes are not pinched or kinked, or trapped between or beneath objects.
2. Check the reagent tubes (except the red waste tubing) for bubbles or air gaps. A few small, “soda-sized” bubbles are normal, but if any large bubbles (spanning the width of the tubing) or gaps exist, clear the affected tubes as follows.
   a. Make sure the affected tubes are securely attached at both ends.
   b. From the Home screen, select **Maintenance > Reagent Status**.



   c. Select **Prime All** to start priming the reagents. Confirmation will be required. Select **Change Pack** if you are currently changing the reagent pack, or **Prime** if you only need to clear bubbles in the tubes. For details on changing the reagent pack, see “Changing the Reagent Pack” on page 6-9.



   d. Repeat if needed to remove all air gaps and large bubbles from the reagent tubes.
   e. If priming is required more than two times or bubbles persist, call Abaxis Technical Support.

Note: *Air gaps in the waste tubing (red) are normal.*

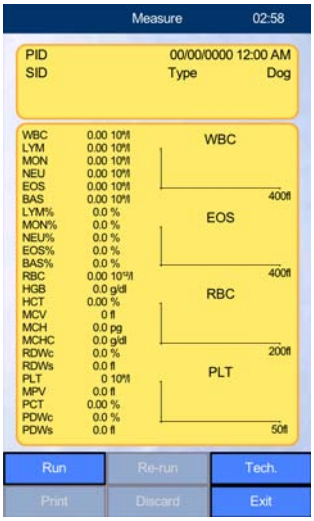
4.4 Running a Blank Measurement

A blank measurement must be run at the beginning of the day before any samples can be run, or every 12 hours for 24-hour clinics. Blanks must also be run after a reagent pack change. The blank checks the cleanliness of the VetScan HM5's fluidic system, and establishes a baseline for sample measurements. The results of a blank are used to determine if the background will affect the test results, and whether the analyzer needs cleaning or maintenance.

Note: *Each blank measurement is valid for 12 hours, after which the analyzer displays* **Blank results are expired!** *Accept the running of the blank then accept the blank to begin running samples again.*

In addition, a new blank must be run each time the analyzer is powered off and then powered on again.

1. From the Home screen, select **Measure > Run**.

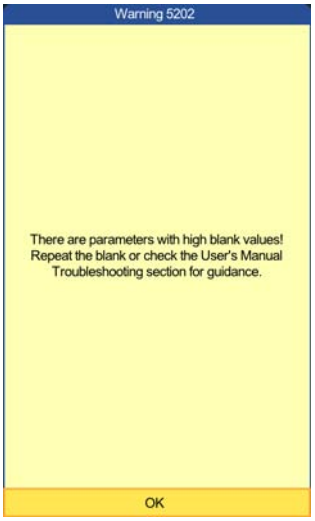


2. If the **Blank results are expired** screen appears, select **OK** to run a blank.

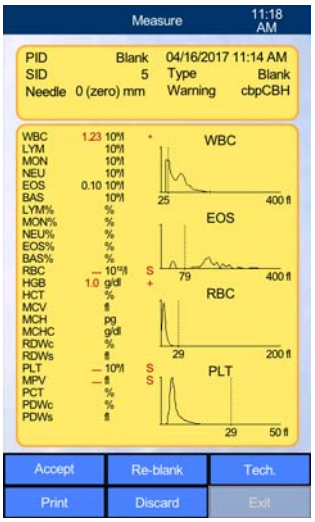
   (If a blank has already been run and accepted for the day, this message does not appear. To run a new blank, select **Run > Blank**.)

3. When the blank has run, if the blank is successful (meaning there are no values reported in red with **+** or ***** signs, and no warning message displayed) the results will appear on the screen.

4. If blank results are unacceptable for certain parameters, the analyzer will rerun the blank. If the results are still unacceptable, the message shown at right appears.



If this occurs, press **OK**, find the warning flag displayed at the upper right on the screen, then go to the section of "Troubleshooting" on page 9-1 for that flag.



CAUTION: *Do not accept an unacceptable blank (with high values).*

Note: *A new blank will be required after the following procedures:*

- ❑ Reagent Pack Change
- ❑ Soak Cleaning (see "Soak Cleaning" on page 6-6)
- ❑ Deep Cleaning (see "Deep Cleaning" on page 9-18)
- ❑ Self-test
- ❑ HM5 Reboot

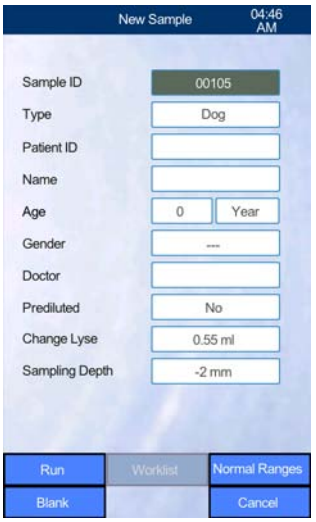
4.5 Running a Sample

Use this general procedure to analyze samples with the VetScan HM5.

1. Prepare a well-mixed, potassium EDTA-preserved sample — see "Collecting and Handling Samples" on page 4-2.
2. Select the appropriate sample tube adapter for the tube size being used:
   - ❑ **#1:** for 2-3 ml tubes and the Abaxis Control tube.
   - ❑ **#2:** for 1.3 ml tubes.
   - ❑ **#3:** for 2 ml glass vials.
   - ❑ **#6:** for microtainer tubes of 0.6 ml or less
3. Place the adapter into the slot in the sample door.

4. From the Home screen, select **Measure > Run**.
5. Select the patient species under **Type**.
6. Enter patient information: select the needed fields, enter the information, then select **Enter**.

Note: *If combining with a VS2 or sending results to a PMS, be sure to enter the matching patient number into the Patient ID.*



7. Make sure the sample tube is at least half full. If the tube is not adequately filled (see "Collecting and Handling Samples" on page 4-2), results can be affected. *Good sample acquisition and sample handling are essential to prevent issues.*

8. Adjust the sampling depth if needed. If the sample fill is adequate, use the 0 mm sampling depth. However, if the sample tube is less than half full and a new draw cannot be performed, or the values resemble a blank and an E Warning is present, lower the sampling depth to -2 mm.

    a. Select the **Sampling Depth** field.

    b. Select the appropriate sampling depth (If using false-bottom tubes, **+5 mm** may be needed.)

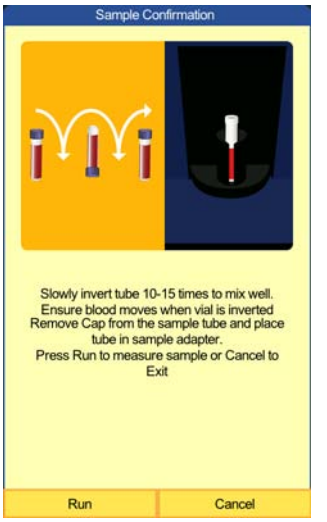
9. Select **Run**.

10. When prompted:

    a. Slowly invert the tube 10-15 times to mix well.

    b. Remove the cap from the sample tube, and place the tube in the appropriate sample adapter.

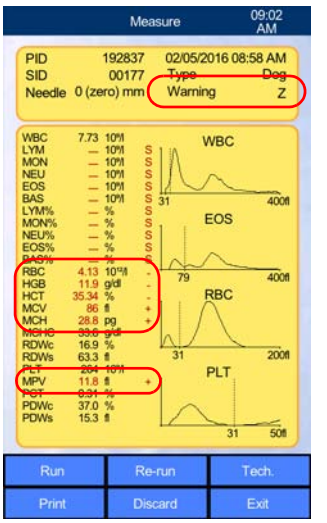
    c. Select **Run** as shown at right.



    The sample is taken into the HM5 and analysis begins. The CBC process takes approximately 4 minutes for a five-part differential, and 3 minutes for a three-part differential.

    When complete, results are displayed on the screen, and transmitted to a printer and/or the PMS, depending on configuration. (If the analyzer is not set to print results automatically, print them by selecting **Print**.)

If warning flags occur for the blanks or sample results, they will be indicated as shown in the example at right. See the Troubleshooting section for resolutions.



If results are out of range they will be indicated as follows:

1. Results *above* the species reference range are highlighted and marked with a plus sign (**+**).

2. Results *below* the species reference range are highlighted and marked with a minus sign (**–**).

4.6 Adjusting the Lyse Volume

The Lyse volume generally only needs adjustment on rare occasions if the patient has Lyse-resistant red blood cells, as indicated by an **L** warning on the results after other potential causes have been eliminated. For details on other potential causes and instructions, see "Result Warning Flags" on page 9-5.

If an L Warning occurs, proceed as follows:

1. If the sample was from a Cavalier King Charles Spaniel, or other breed with a known predisposition to macrothrombocytosis, perform a manual smear.
2. If the draw was difficult or the platelet value is low, redraw and rerun as this could be platelet clumping causing the L Warning.
3. Make sure the Lyse tube (yellow) has no kinks, or loose connections at the analyzer or bottle.
4. Make sure the tube is well attached to the connector on the dip tube or bottle cap.
5. Check for bubbles in the Lyse tube. If found, prime the Lyse and rerun the sample.
6. If the Lyse tube is in working order, from the Home screen, select **Measure > Run**.
7. Select the **Change Lyse** field, and increase the volume by 0.1 ml.
8. Rerun the sample.
9. If the **L Warning** persists, increase the Lyse by 0.2 ml, then rerun the sample.
10. If the L Warning still persists and there are no Lyse issues, perform a manual smear or send the sample out.

Note: *The new Lyse volume will be used for the current run only, then will revert to the default setting.*

4.7 Interpreting Results

The VetScan HM5 produces a printed report containing the patient ID, measurement data, numeric results with flags (if any), and histograms showing the different cell populations.

Note: *Always check whether the results include warning flags, at the top-right corner of the HM5 screen or the bottom of the HM5 printouts.*

Complete Blood Count (CBC) parameters are useful in assessing overall wellness of a patient, as well as identifying and monitoring certain disease states. See "CBC Parameters and Associated Indications" on page E-1 for information on the various CBC parameters and associated clinical indications.

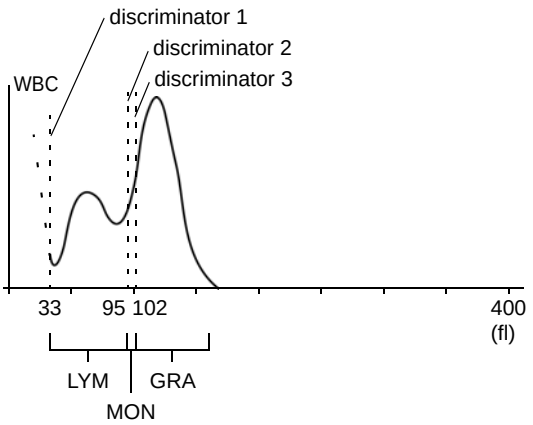
4.7.1 Histograms

In five-part differential mode, histograms display population distributions of each cell type: leukocytes (white blood cells — WBC), eosinophils (EOS), erythrocytes (red blood cells — RBC), and thrombocytes (platelets — PLT). The histograms show the relative frequency of cells on the vertical (Y) axis, and cell volume in femtoliters (fl) on the horizontal (X) axis.

Histograms enable you to quickly scan results for abnormalities, and also allow the versed practitioner to derive more information about the sample than is displayed by the values alone. The following pages describe each of the histograms (WBC, EOS, RBC, and PLT), and show a typical example of each with an explanation.

4.7.1.1 White Blood Cell Histogram (WBC)

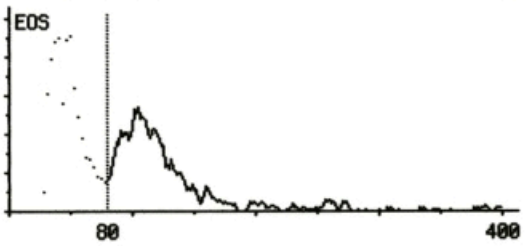
WBC histograms show white blood cell populations sorted by size. Cells larger than discriminator 1 are counted as WBCs. Blood includes three WBC populations:



- Lymphocytes (LYM), shown by the first peak in the histogram.
- Monocytes (MON), indicated by the area between the second and third discriminators (although the MON region does demonstrate a distinctive peak of its own, this peak is not always clear in histogram form).
- Granulocytes (GRA) are the neutrophils, eosinophils, and basophils, indicated by the peak to the right of the third discriminator.

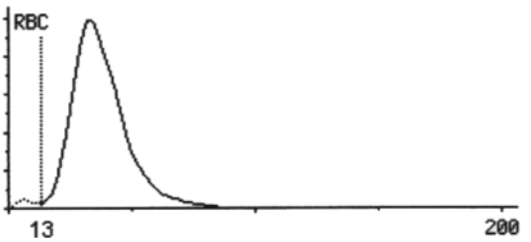
4.7.1.2 Eosinophil Histogram (EOS)

The distribution of eosinophils is shown by the second peak in the histogram. The first peak (dotted line) is the RBC "ghost" and other WBCs.

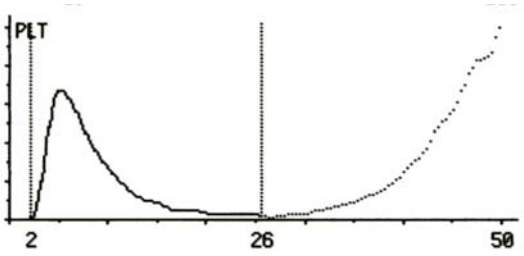


4.7.1.3 Red Blood Cell Histogram (RBC)

The distribution of red blood cells normally appears as a single, steep, bell-shaped curve. The presence of reticulocytes and nucleated red blood cells (nRBCs) cause this curve to widen.



4.7.1.4 Platelet Histogram (PLT)



The PLT histogram is a magnified portion of the beginning of the RBC histogram.

The example PLT histogram at right follows a log-normal distribution, with a good separation from RBCs.

The most commonly identified anomaly in platelet histograms results from aggregated (clumped) platelets. This appears as a flattened, lumpy histogram that increases towards the right side (see “Cat: Clumped PLT, Increased LYM” on page D-10).

Section 5

Quality Control and Calibration

This section describes the quality control and calibration procedures for the VetScan HM5.

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5.1 Quality Control

The VetScan HM5 includes a quality control (QC) function that verifies the analyzer's accuracy. Performing QC checks regularly helps ensure optimal performance.

Note: *Quality control cannot be run if the blank results are elevated.*

Note: *Performing quality control does not change the HM5's settings or functions (unlike calibration).*

5.1.1 Required Quality Control Sample

The quality control procedure requires using VetScan HM5 Hematology control samples, which can be purchased from Abaxis or an authorized distributor. These control samples are available in low, normal, and high range. Abaxis recommends *only the normal control* for most veterinary facilities, though low and high controls can also be run in particularly stringent regulatory environments.

Note: *Use only Abaxis VetScan HM5 Hematology controls on the VetScan HM5.*

5.1.2 Handling Quality Controls

When opening new Abaxis HM5 controls, *always write the open date* onto the package insert and the control tube itself. Users can then monitor the open date of each tube and avoid using degraded control material. After the control is first opened, it will be good for up to 14 days if it is properly stored.

WARNING: ***THE CONTROL MATERIAL IS PARTIALLY DERIVED FROM HUMAN SOURCES. OBSERVE UNIVERSAL SAFETY PRECAUTIONS WHEN HANDLING THE CONTROL.***

CAUTION: *Abaxis recommends wearing latex or nitrile gloves for these procedures.*

5.1.3 Entering Quality Control Values

Each lot of quality control material has assigned target values that must be entered into the HM5. This can be done using any of three methods:

- Enter values manually through the HM5's touchscreen or a USB keyboard: see "Entering Values Manually" on page 5-3.
- Load USB control value files: see "Loading Values from a USB Drive" on page 5-5.
- Load values through a USB 2D barcode reader: see "Loading Control Values with a 2D Barcode Reader" on page 5-6.

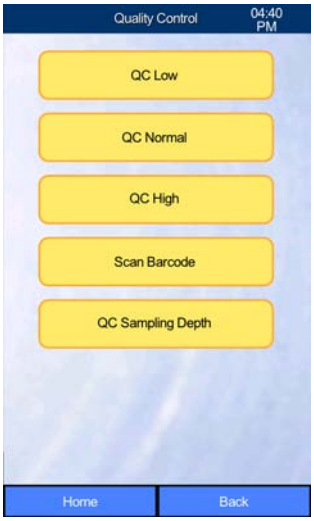
5.1.3.1 Entering Values Manually

Enter control values manually, for one level of control at a time, using the HM5's touchscreen or a USB keyboard.

1. From the Home screen, select **Maintenance > Quality Control**.

   The Quality control screen includes buttons for QC levels **QC Low**, **QC Normal**, and **QC High**:

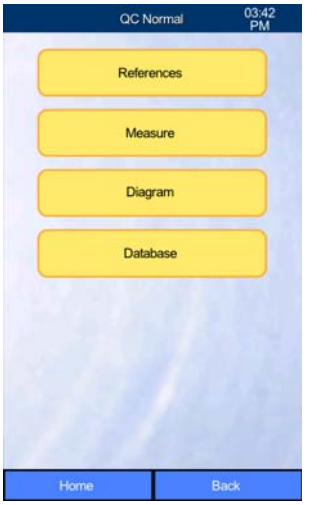
   - ❑ **QC Normal** for normal controls (required)
   - ❑ **QC Low** for low-level controls (optional)
   - ❑ **QC High** for high-level controls (optional)



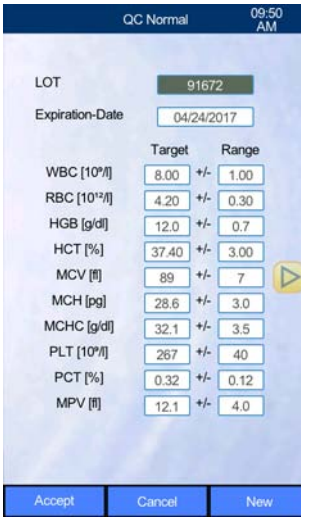
2. Select a QC level.

3. Select **Measure**.

4. Select **Run QC**.



5. Compare the on-screen lot number, expiration date, and target values with those shown on the package insert.



- ❑ If the lot number and expiration date of the current control tube in hand *are the same* as those displayed on-screen, verify that the on-screen target and range values match those on the control package insert, then select **Accept** and proceed to "Running a Quality Control Sample" on page 5-8.

- ❑ If the lot number and expiration date of the control tube *are different* than those on-screen, select **New**.

6. Select **Enter Manually** to enter values using the touchscreen and keyboard, **Load from USB Drive** for downloading the values from a USB Drive (with the values downloaded from www.abaxis.com) or **Scan Barcode** if a 2D barcode scanner from Abaxis is present.

7. When Manual is selected, enter the lot number, expiration date, Target (assay) values and Gap (ranges) from the pack.
8. Select **Accept**, followed by **Confirm**.
9. Go to "Running a Quality Control Sample" on page 5-8.

5.1.3.2 Loading Values from a USB Drive

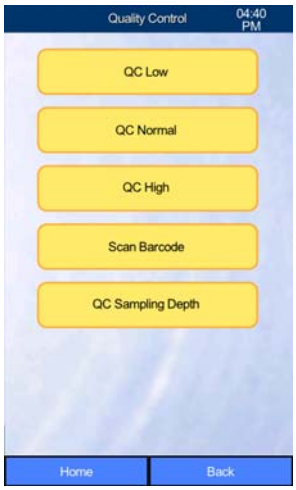
1. Download the most recent control lot values files from www.abaxis.com onto a computer. Unzip the files then open it. Copy the files in the unzipped folder onto a USB drive. See the Abaxis website for more detailed instructions on extracting the files.
2. From the Home screen, select **Maintenance > Quality Control**.
3. Select **QC Normal** (or another level) **> Measure**.
4. Select **Run QC** then **New**.
5. Select **Load from USB Drive**.
6. Insert the USB drive containing the unzipped control values files downloaded from www.abaxis.com.
7. Enter the control lot number from the tube or control pack package insert into the LOT field on the screen, then select **Load**. The HM5 then loads the lot number file from the USB drive.
8. Verify that the loaded values are correct and match the package insert. Correct any incorrect values, then select **Accept**.
9. Verify that the lot number and expiration date match that on the tube to be measured, then select **Confirm**. Select **Accept** again then **Run QC**.
10. Go to "Running a Quality Control Sample" on page 5-8.

5.1.3.3 Loading Control Values with a 2D Barcode Reader

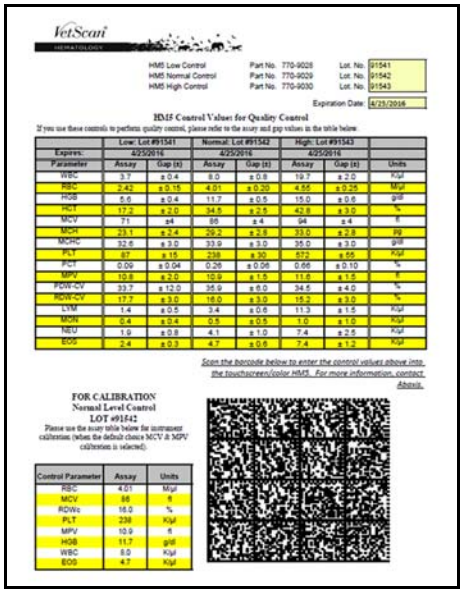
A 2D barcode reader can be used to quickly and accurately enter control values from an HM5 control values sheet.

1. Plug the 2D USB barcode reader into a USB port on the HM5.
2. From the Home screen, select **Maintenance > Quality Control**

.



3. Select **Scan Barcode**, then scan the 2D barcode on the HM5 value assignment sheet provided with the control tube.

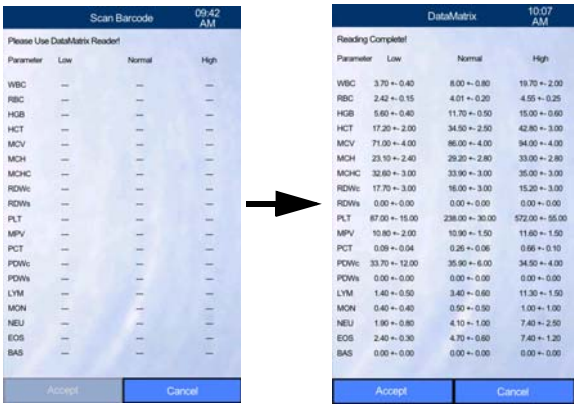


Note: *When scanning the barcode, make sure the control sheet is on a flat surface.*

Note: **Scan Barcode** *can also be selected after choosing the QC level and selecting* **New***.*

4. Verify that the loaded values are correct, then select **Accept**.

5. Select **OK** to delete previous QC results and save the new reference ranges.



6. If the 2D barcode reader will not scan the barcode, check the reader's brand and model:

   - **For a Motorola/Symbol reader:** Scan "Return to Factory Defaults" below.

Return to Factory Defaults

SET DEFAULTS

Then scan the three barcodes below: 1,2 then 3.

1

SCAN OPTIONS

2

<DATA><SUFFIX>

3

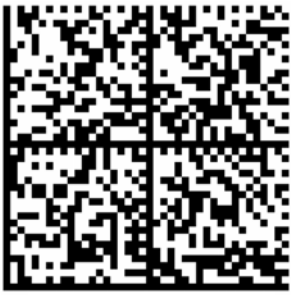
ENTER

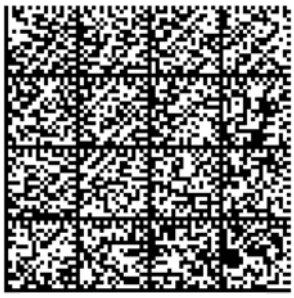
❑ **For a Code reader:**

a. Unplug the reader and plug it in again.

b. If the reader still doesn't scan correctly, scan the reset code at upper right, then scan the programming barcode at lower right.

1. Reset code





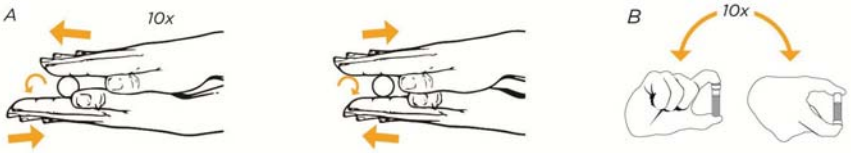
2. Programming code

7. Go to "Running a Quality Control Sample," below.

5.1.4 Running a Quality Control Sample

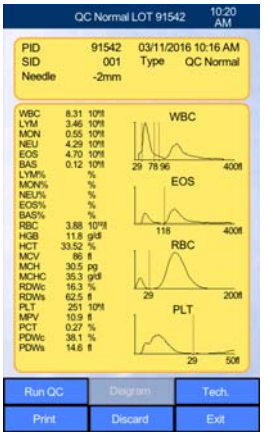
Note: *Before running a QC sample, make sure the control tubes have come to room temperature. Remove the controls from the refrigerator at least 15 minutes prior to use. Do not use a control that is expired or has been open for more than 14 days, as it may be degraded.*

1. Be sure that you have already entered control values: see "Entering Quality Control Values" on page 5-3.
2. After accepting the new control values, select **Run QC**.
3. Mix well by slowly rolling the tube flat between your hands (A), and then slowly inverting the tube 10-15 times (B).



4. Select **Run**.

5. When analysis is complete, the analyzer displays the results.



Note: *Any values out of range are highlighted in red, along with a plus or minus sign.*

6. Abaxis recommends performing at least two control runs:
   - ❑ If the values reported are in range, the analyzer is functioning properly and calibration is not necessary.
   - ❑ If any value is consistently out of range, refer to the next section, "What to Do If QC Values Are Out of Range," or contact Abaxis Technical Support.
   - ❑ A third QC run may be performed if the results of the first two QC runs are conflicting (meaning one is out of range while the other is not, or if the results are widely different from each other).

5.1.5 What to Do If QC Values Are Out of Range

Note: *There are many reasons why QC values may be out of range so stop to investigate the cause before calibrating the analyzer. Calibration is rarely needed. Most QC out of range issues are related to the cleanliness of the analyzer and/or the storage or shipping conditions of the control.*

Values to focus on during QC runs are RBC, MCV, RDWc, PLT, MPV, HGB, WBC and EOS. All other values are calculated using these eight parameters. Certain values such as PDWs and BAS do not have ranges so may always report as out of range because of the lack of target and range data.

- ■ If there are any Warning flags, refer to the "Troubleshooting," section of this manual to resolve the cause of the Warning.
- ■ If the RDWc value is two or more points above the target value, discard the control and order a new one as this indicates it has frozen or been exposed to too much heat.
- ■ If all values which are counted (RBC, WBC, PLT, HGB and EOS) are all low, run Soak Cleaning then rerun the QC sample.
- ■ If MCV is high or low, run a Soak Cleaning (see "Soak Cleaning" on page 6-6) then run the QC sample again.

- If the WBC and EOS values are low, mix the QC sample better and rerun.
- If the WBC, RBC and HGB are high, mix the QC sample better and rerun.
- If just the RBC value is low, make sure the control is at room temperature, mix well and rerun.
- If the RBC and/or PLT values are elevated, clean any visible debris from the Wash Head and dilution chamber below it and perform a Soak Cleaning before running an additional QC run.

5.2 Calibration

5.2.1 When to Calibrate

The VetScan HM5 is factory-calibrated for optimal performance. In certain situations, calibration is needed to fine-tune the analyzer:

- When quality control measurements show that one or more parameters are consistently out of range, and the analyzer has been determined to be clean and the control has been stored and shipped properly.
- After relocating the HM5.

Note: *Calibration cannot be performed if the blank is unsuccessful.*

5.2.2 Required Calibration Materials

The calibration procedure requires the VetScan HM5 Hematology Normal control (Abaxis part number 770-9029), which can be purchased through an authorized distributor or directly from Abaxis.

WARNING: ***THE CONTROL MATERIAL IS PARTIALLY DERIVED FROM HUMAN SOURCES. OBSERVE UNIVERSAL SAFETY PRECAUTIONS WHEN HANDLING THE CONTROL.***

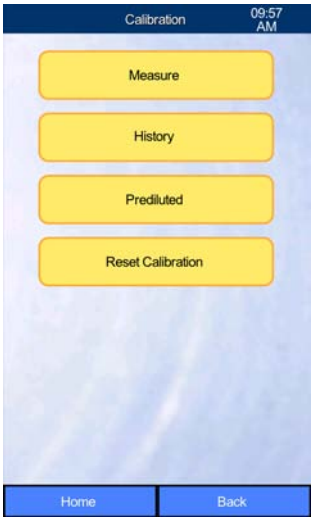
5.2.3 Calibration Procedure

Note: *Allow the normal control to reach room temperature before beginning. This takes about 15 minutes.*

Once opened, the control has a shelf life of 14 days. Do not calibrate with an expired control or a tube that has been opened more than 14 days.

The calibration process requires at least three sample runs using the HM5 Normal control material.

1. From the Home screen, select **Maintenance > Calibration**.



2. Select **Measure**.
3. Verify that **Prediluted** is set to **No** and that **Cal Sampling Depth** is set to **–2 mm**.
4. Select **Accept**.

5. If QC ranges are for the same control tube, select **Copy** to pull over the values from the QC menu. If QC values do not match the lot on the control tube being used for calibration, enter the lot number, expiration date in MM/DD/YYYY format, and target values from the HM5 control package insert.

6. Select **Accept**.

7. Select **Run Cal**.

   When prompted, mix the control, remove the cap, place the tube in the appropriate tube adapter.

8. Select **Run** to begin the first calibration run.

   When the analysis is complete, the results will appear on-screen.

9. Select **Run Cal** again. The analyzer will display a reminder to mix the sample. Mix control well by slowly rolling the tube flat between your hands 10 times, and then slowly inverting the tube 10-15 times.

10. Follow the on-screen directions, then select **Run**.

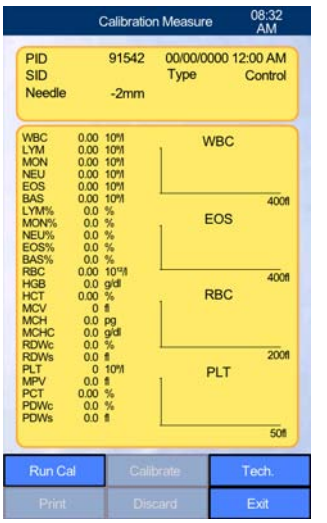
    When the second analysis is complete, the results will appear on-screen.

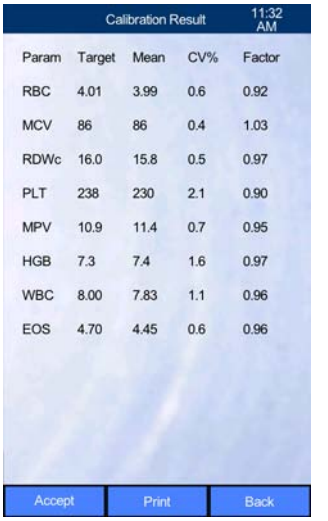
11. Select **Run Cal** for the third time. The analyzer will again display the mix reminder.

12. Select **Run**.

    The analyzer then displays the results of the third calibration.

13. Select **Calibrate**.





14. The analyzer then calculates and displays the new Calibration factors. Select **Accept** to complete the calibration.

Note: *If the analyzer displays the message* **1 or more of your factors are out of range**, *contact Abaxis Technical Support.*

15. Select **Exit**.
16. Perform a Quality Control run two or three times to verify that calibration was successful: see “Running a Quality Control Sample” on page 5-8.

5.2.4 View Calibration History

All calibration times and factors are saved, and can be viewed as follows:

1. From the Home screen, select **Maintenance > Calibration > History**.
2. Use the on-screen arrows to move through the history.

5.2.5 Resetting Calibration

If calibration fails repeatedly, call Abaxis Technical Support. If directed, use the Reset Calibration function as follows.

1. From the Home screen, select **Maintenance > Calibration > Reset Calibration**.
2. Select **OK**.
3. Calibrate the analyzer: see “Calibration Procedure” on page 5-11.

Section 6

Maintenance & Service

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6.1 Preventive Maintenance

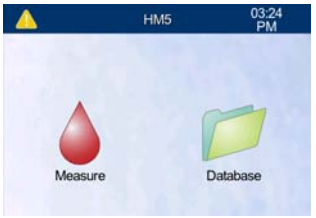
Always keep the analyzer and its immediate surroundings as clean as possible to help keep debris out of the system. Clean up any fluid spilled near the analyzer, and wipe up any spills on the sample rotor.

In addition, periodically performing certain preventive maintenance procedures will help keep the HM5 in optimal operating condition to ensure peak performance and high-quality results.

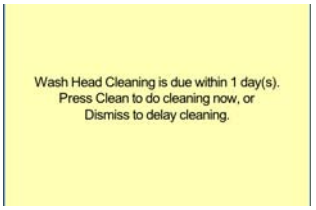
Preventive maintenance can be managed in two ways on the HM5: using the Scheduled Maintenance setting in the Admin Settings (accessible only to Admin users), or through default settings in the software.

The analyzer displays reminders when the two primary routine cleanings need to be performed:

- If Scheduling is disabled: a yellow triangle appears in the upper-left corner of the screen when cleaning is due. Select the triangle to see details.



- If Scheduling is enabled, you can adjust the cleaning frequency within allowed limits. Reminders appear three days, two days, and one day before cleaning is due. You can select **Next** in these messages to perform the cleaning, or **Dismiss** to postpone. Cleanings can also be performed by going to **Maintenance > Cleaning** and selecting the cleaning procedure desired from there.



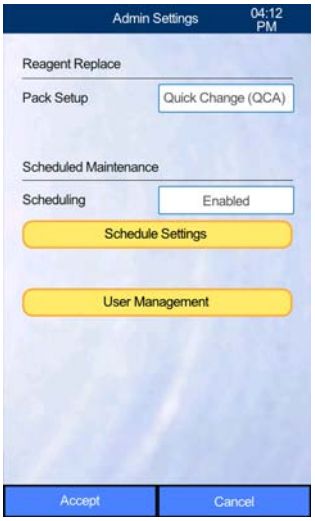
- On the date and time cleaning is due, the analyzer displays a cleaning due message.

Note: *Once the cleaning due message appears, cleaning **must** be performed before the next measurement is run. You will not be able to run samples until cleaning is performed.*

6.1.1 Scheduling Maintenance

The analyzer's maintenance reminder intervals are preset, but can be adjusted to best suit the particular needs of the clinic.

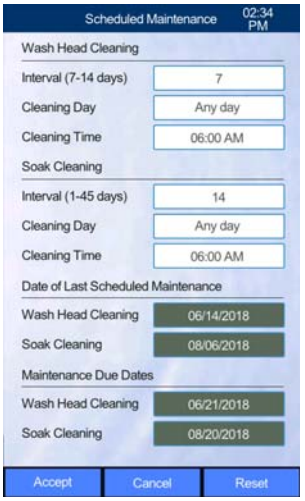
1. From the Home screen, select **Settings > Admin Settings**.
2. Selecting the **Scheduling** field changes the setting from **Enabled** to **Disabled** and vice versa. Set this to **Enabled**.



3. Select **Schedule Settings**.
4. As needed, select the appropriate fields to set the **Interval** and **Cleaning Day and Time** for the Wash Head and Soak Cleanings.

   Abaxis recommends these intervals:

   - Cleaning the Wash Head: 7 days
   - Soak Cleaning: 14 days



Note: *If your sample run rate will be less than 5 samples per day, you may set the Soak Cleaning Interval to 30 days.*

5. Select **Accept** for these settings then **Accept** again to confirm the Scheduling choice.

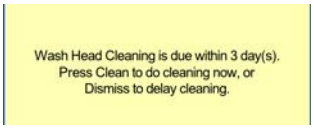
Note: *On installation, you can reset both timers to begin from the current date by pressing* **Reset**. *The next Scheduled Maintenance will then be a full interval away from the current date.*

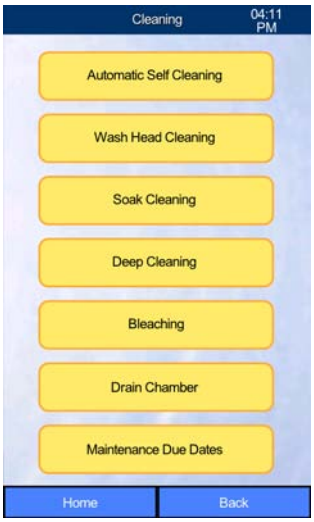
6.1.2 Cleaning the Wash Head

The Wash Head cleans the outer surface of the sample needle with a saline Diluent. If the Wash Head itself is not cleaned regularly, salt can accumulate on the bottom surface, leading to inaccurate test results, extra blanks being needed, and excess reagent use.

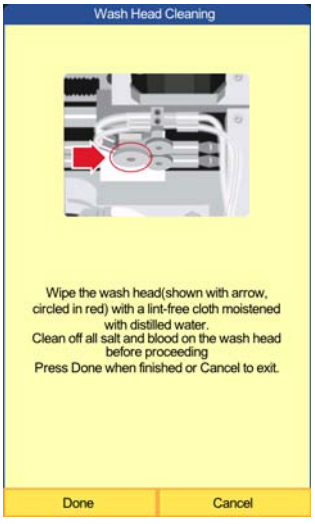
Note: *Do not clean the Wash Head without activating the HM5's software as described in this procedure. Otherwise, the needle assembly may not move correctly, and the analyzer will need to be restarted.*

1. If the analyzer displays a message that Wash Head cleaning is due, select **Clean** or **Next** to begin cleaning. If running this process manually (that is, without prompting by a pop-up), select **Maintenance** from the **Home screen > Cleaning > Clean the Wash Head.**





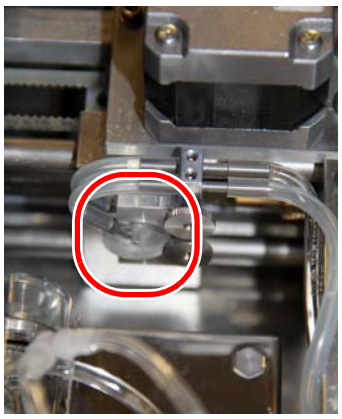
The analyzer then displays cleaning instructions, as detailed in the following steps.



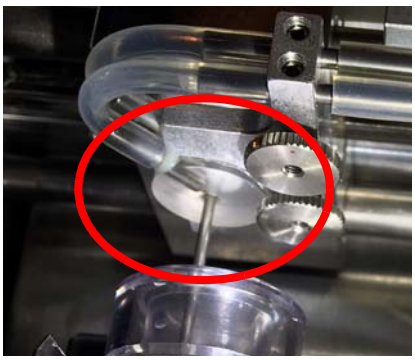
2. Open the door on the right side of the analyzer.

CAUTION: *Do not touch components inside the instrument except as specifically directed.*

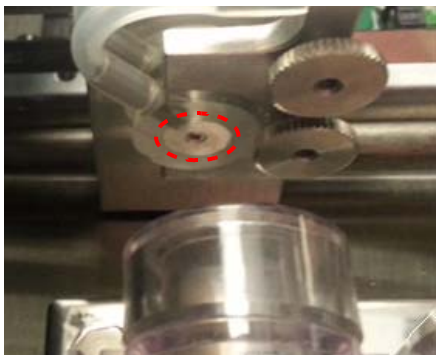
The Wash Head is located at the base of the needle, as shown at right.



3. Locate the Wash Head (Red Circle, see photo at right).
4. Visually inspect the Wash Head for any salt or blood build-up on its bottom surface. For best access, view from below. Refer to the following figures.



Clean Wash Head
No salt or blood build-up present on Wash Head's bottom surface

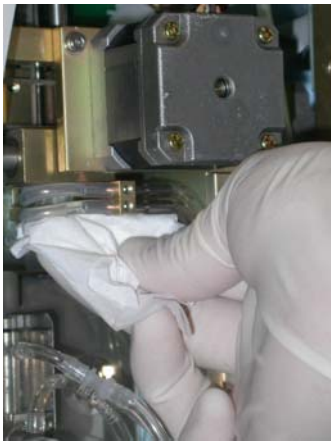


Wash Head with minor build-up

Wash Head with heavy build-up

- If minor salt or blood accumulation is visible on the Wash Head, clean the Wash Head: Use a soft, lint-free cloth and warm distilled water to gently wipe any build-up off the lower surface of the Wash Head.
- If the Wash Head has a great deal of accumulation on the bottom (as in the far right photo on previous page) or on the top (not shown), the Wash Head must first be removed for cleaning: see “Removing and Cleaning the Wash Head” on page 9-15.

  Upon removal, inspect the Wash Head for salt accumulation on the top *and* bottom surfaces.



5. Inspect the Wash Head to be sure it is clean before proceeding.
6. When finished, close the side door, then select **Done**.

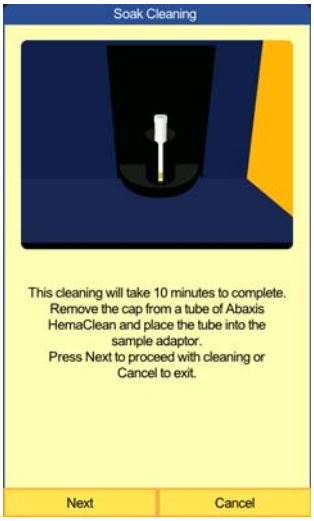
6.1.3 Soak Cleaning

Soak Cleaning helps dissolve organic build-up from all surfaces that contact blood samples inside the analyzer and is the best way to clean the needle, the dilution chamber, and the aperture. The Soak Cleaning process will require a new, unused tube of VetScan HemaClean.

Abaxis recommends a Soak Cleaning every 14 days (the default setting). Users who run fewer than 5 samples per day may set the Soak Cleaning Interval to 30 days. The user may schedule a preferred day and time to perform this cleaning (see “Admin Settings” on page 3-11).

1. The analyzer displays reminders when a Soak Cleaning is needed. When this occurs, select **Next** to begin cleaning. An instruction screen is then displayed.

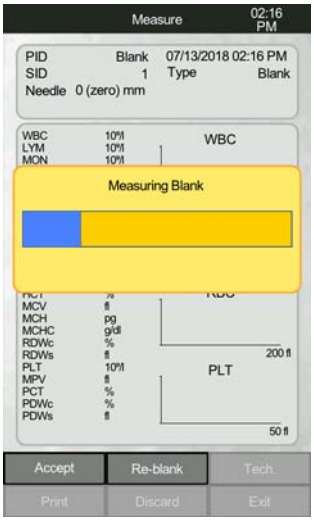
2. Remove the cap from a tube of HemaClean (Abaxis Part number: 790-1513) and place it on the HM5's holder.



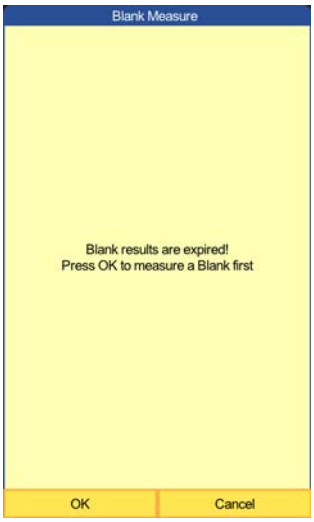
3. Select **Next**. The cleaning cycle will last approximately 10 minutes.

Note: *If Soak Cleaning is needed for troubleshooting outside of scheduled maintenance, select* ***Maintenance > Cleaning > Soak Cleaning****, and follow the on-screen instructions, as above.*

4. After the Soak Cleaning, a blank is required to verify that the background counts are within specification. The software will automatically prompt the user to run a blank when a measurement is attempted after a Soak Cleaning. From the Home screen, select **Measure**, and then **Run**.



5. If the blank results are expired and this screen appears, select **OK** to run a blank. If the screen does not appear, you MUST run a new blank anyway. Select **Run**, and then **Blank**.



6. When the blank has run, verify that the results are acceptable (shown in black) or unacceptable (shown in red, with + or * signs, indicating too high).
7. If acceptable, select Accept. The analyzer is now ready to run Quality Control. If not, proceed to "Blank Flags" on page 9-2.
8. Run Quality Control using a new, unopened HM5 normal control. For detailed instructions go to "Quality Control" on page 5-2. If any warning message pops up, contact Abaxis Technical Support.
9. If two out of three Quality Control runs are within target range, the analyzer is ready to run blood work. If two out of three runs fall out of target range or have any error warnings, call Abaxis Technical Support at (844) 247-5271.

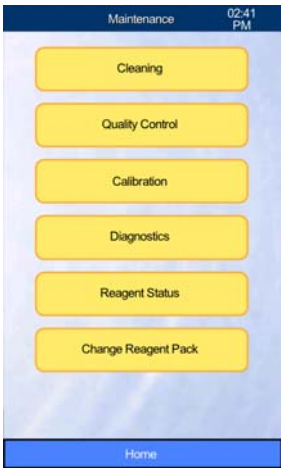
6.2 Automatic Self-Cleaning

After each measurement, the analyzer automatically cleans the measurement area. The software also provides a process to clear the measurement system of any debris when needed:

- when the blank is high for platelets or RBC
- to correct p, b, c, or C warnings after other cleaning procedures have failed
- following other cleaning procedures, such as Soak Cleaning, to ensure the aperture is clean

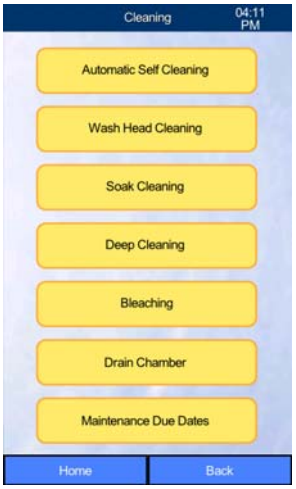
No additional cleaning solution is needed for this process: the HM5 uses the Cleaner and Rinse from the reagent pack.

1. From the Home screen, select **Maintenance**.
2. Select **Cleaning**.



3. Select **Automatic Self-Cleaning**.

   The analyzer then runs the cleaning process, and returns to the Maintenance menu when finished.



6.3 Changing the Reagent Pack

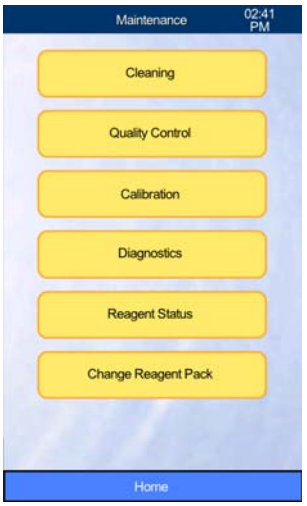
Note: *Abaxis recommends wearing protective eyewear and a lab coat when working directly with reagents (such as changing the reagent pack). In addition, users with sensitive skin should wear latex or nitrile gloves.*

The HM5 tracks the liquid levels in the reagent pack (Abaxis part no. 770-9000), and displays the message **The reagent volumes are running low** when one or more levels is low. When this occurs, change the reagent pack as follows.

1. Make sure you have the following:
   - ❑ New reagent pack
   - ❑ New HM5 Normal Quality Control
2. Remove the control from the refrigerator so it can warm to room temperature before use.
3. Select and follow the appropriate procedure below according to the reagent pack setup.

6.3.1 For QCA Tubing Setup

Use these instructions if the HM5 is set up with a QCA.



1. From the Home screen, select **Maintenance > Change Reagent Pack.**
2. Follow the displayed instructions and prompts.
3. Place the new reagent pack next to the current pack, then select **Next**.
4. Remove the new reagent pack from its shipping box, open the pack lid, then select **Next**.
5. Remove the foam from the pack, unscrew the bottle caps, remove any white foam liners from the bottle caps, and save the bottle caps.
6. Select **Next**.
7. Lift the QCA by the frame, and place it over the new pack. Align the kickstand posts next to the Diluent bottle. Select **Next**.
8. Make sure the frame is centered on each of the bottle seals, then select **Next**.
9. Verify that the colors on the reagent tubes, dip tube heads, QCA frame, and reagent pack all match.
10. One at a time, grasp each dip tube head, and push the tube through its white heat seal and into the same-colored bottle. Repeat until all dip tubes are through the bottle seals and touching the bottom of the bottles.
11. Select **Next**.
12. Dispose of the waste per local regulations. The original white waste bottle or the emptied Diluent bottle with the red cap that came with the initial shipment may be used as the waste container.
13. Select **Next**.
14. Make sure all reagent lines are securely connected to the back of the analyzer and the dip tube heads, and that the reagent tubes are not kinked.
15. Select **Next**. The HM5 will prime all of the reagent tubes.
16. Run a QC sample to make sure the new reagent pack is properly installed and the analyzer is in calibration. The system will prompt you to run a blank before running the control. Confirm that the blank results are within range before running the control: see “Running a Quality Control Sample” on page 5-8.
17. Select **Next**.

6.3.2 For Bottle Caps Tubing

This procedure requires a new reagent pack and a control.

1. From the Home screen, select **Maintenance > Change Reagent Pack**.
2. Follow the on-screen instructions.

Note: *In the following steps, do not touch the tubing with your bare hands, or you may contaminate the reagents. Wear latex or nitrile gloves.*

3. Place the new reagent pack next to the current pack, then select **Next**.
4. Remove the foam from the pack, unscrew and save the bottle caps, then select **Next**.
5. With a clean blade, cut an **X** into the heat seal, then fold down the four flaps to open the bottle.
6. Select **Next**.
7. One by one, remove the reagent caps with the drip-down tubing from the old reagent bottles, and place them on their color-matching bottles in the new reagent pack.

CAUTION: *To avoid contamination, avoid touching the flexible drop down tubes with bare hands.*

8. Make sure the small air vent on each cap is not blocked, so air can flow freely.
9. Empty the waste container, or set up the empty Diluent container from the old reagent pack as the new waste container.
10. Reconfirm that the colors on the reagent tubes, the back of the analyzer, the bottle caps, and the reagent pack all match. Make sure all reagent tubes are firmly attached to the bottle tops and the back of the analyzer, and that there are no kinks in the tubing.
11. Press **Next** to prime the reagents.
12. Press **Next** to proceed the Quality Control menu.
13. Run a QC sample to make sure the new reagent pack is properly installed: see "Running a Quality Control Sample" on page 5-8.

6.3.3 Disposing of Reagent

When it is time to change the reagent pack, there will always be reagent left in the bottles in the old reagent pack. Dispose of this remaining reagent as follows.

CAUTION: *Never pour reagent from a bottle in the old reagent pack into any bottle in the new pack. Doing so could drastically reduce the effectiveness of the new reagents, and could contaminate the new reagents.*

- Dispose of unused reagents and waste in an environmentally friendly manner. Check the local county regulations for proper disposal requirements.
- MSDS are available at in the Resource Center at www.abaxis.com/reference-center.

6.4 Software Upgrades

Abaxis will periodically provide a software upgrade for the HM5. Abaxis can send these upgrades preloaded on a USB drive, and they can be downloaded from www.abaxis.com and copied to a USB drive. Follow the instructions on the Abaxis website.

Upgrade from the USB drive as follows:

1. Power off the analyzer.
2. Plug the USB drive containing the software into a USB port on the analyzer.
3. Power on the analyzer and select **Upgrade**.

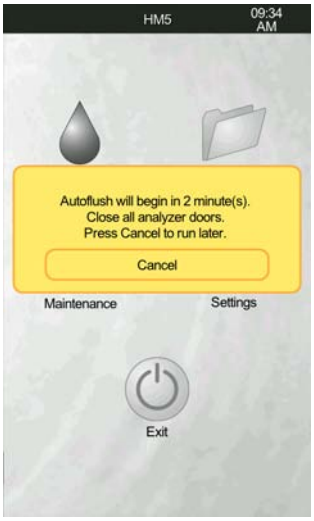
Note: *Do not select* **Erase/Format** *unless directed by Abaxis Technical Support. Doing so will erase all settings, patient data, and control data from the analyzer, and require it to be recalibrated.*

4. When prompted, unplug the USB drive and select **OK**.

The analyzer then automatically reboots to complete the software upgrade.

6.5 Auto Maintenance Flush

If the HM5 has been powered on but not used for 4 days, it will perform an Auto Maintenance routine to flush itself out to prevent salt build-up within its internal tubing. If the notification appears, select **OK** to begin maintenance immediately. Otherwise, the flush begins automatically within 2 minutes.



6.6 Peristaltic Pump Tubing Replacement

The analyzer's peristaltic pump is designed to be maintenance-free. However, after long periods of non-use, the pump tubing can become flattened and eventually needs to be "massaged" back into shape, or replaced. A spare tube is included in the accessories kit.

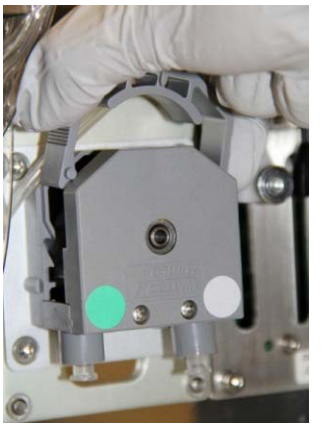
Although replacement is a simple process, Abaxis strongly recommends contacting Abaxis Technical Support before beginning. They will verify the need for pump tube replacement, and provide guidance through the process if necessary.

Note: *Wear latex or nitrile gloves during this procedure.*

Replace the peristaltic pump tube assembly as follows.

1. Open the analyzer's back door, and locate the peristaltic pump at the lower left of the rear compartment.
2. Disconnect the green and white color-coded tubes attached to the base of the pump housing, by twisting the luer connectors as shown.

3. Use your thumb and forefinger to grasp the middle of the serrated band, then squeeze and lift the band straight up.



4. Grasp the bottom left tube connector (green band) and push it to the left. The connector slides out, freeing the left end of the tube.

5. Grasp the bottom right tube connector (white band) and push it to the right. The connector slides out, freeing the right end of the tube.

6. Slide the gray attachments toward the center of the yellow pump tube.

7. Disconnect the tube from the clear tube connectors.

8. Place the two gray attachments onto the new pump tube. Connect either end of the new yellow pump tube to the clear connectors.
9. Slide the gray attachments down onto the clear connectors so that the connectors fit snugly into the gray pieces.

10. Using one hand to guide the tubing, slide one of the gray pieces on the pump tube into the right side of the pump. Stretch the yellow pump tube over the top of the pump, then slide the remaining gray piece into the left side of the pump until it snaps into place.

11. Reconnect the appropriate color tubes to the bottom of the pump.
12. Grasp the gray cover and slide it down over the pump.
13. Once the notches on the side are in place, push down on the top of the cover until it snaps into place.
14. Wipe up any spilled fluids from the base of the instrument.

Section 7

User Permissions

This section describes how to provide three different levels of user access to the VetScan HM5.

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7.1.2 Advanced Level *7-2*
7.1.3 Admin Level (Default) *7-2*
7.2 Adding Users and Passwords *7-3*
7.3 Logging In *7-4*
7.4 Automatic Login Set *7-4*

7.1 User Permission Levels

The HM5 software provides for three levels of users: Basic, Advanced, and Admin.

7.1.1 Basic Level

Basic users can perform the following:

- Measure blanks and run CBCs
- Perform scheduled maintenance
- Change reagent packs
- Run QC control on previously entered QC lots
- View, print, and save CBC results

7.1.2 Advanced Level

Advanced users can perform all functions available to Basic Users, as well as the following:

- Load new QC lot values
- Calibrate the analyzer
- Adjust all settings other than Admin settings (schedule maintenance)

7.1.3 Admin Level (Default)

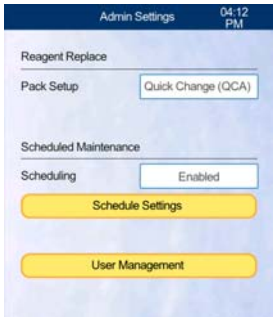
Admin users can view and operate all functions in the analyzer, and have access to all settings. The default user level is Admin.

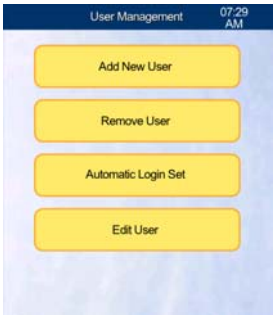
7.2 Adding Users and Passwords

Each user may have a unique login and password or multiple users of a given level may also share a login and password.

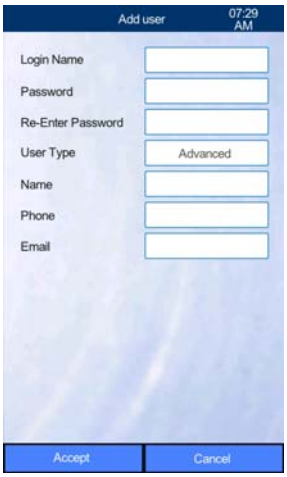
Add new users and their passwords as follows.

1. From the Home screen, select **Settings > Admin Settings > User Management > Add New User**.





2. Select fields and enter the **Login Name** and **Password**, then **Re-Enter Password**.



3. Select **User Type** until the desired permission level is displayed.
4. If desired, enter **Name**, **Phone**, and **Email**.
5. Select **Accept**.

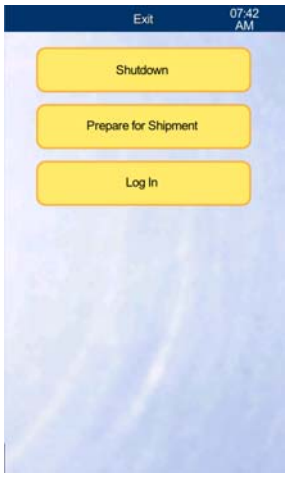
7.3 Logging In

Log into the HM5 as follows.

1. From the Home screen, select **Exit.**

2. Select **Log Out Admin**.

3. Select **Log In**, then enter your login name and password.



4. When the advanced or admin-level maintenance is complete, be sure to **Exit** and **Log Out** again to return the analyzer to its basic mode.

7.4 Automatic Login Set

Automatic login set allows the VetScan HM5 to revert to a specific user whenever rebooted.

1. Select **Settings > Admin Setting > User Management**.
2. Select **Automatic Login Set** and select the default user.

Section 8 Shutdown

This section describes how to shut down the VetScan HM5 analyzer.

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8.1.1 Temporary Shutdown 8-2

8.1.2 Longer Term Shutdown or Storage 8-3

8.1.3 Powering Off for Troubleshooting 8-3

8.1 Shutting Down the Analyzer

The HM5 is designed to be left on at all times, except when it will not be used for long periods. During such periods, shutdown functions are used to properly maintain the analyzer

- If the analyzer will be unused or powered off for more than a week, use the **Temporary Shutdown** option: see below.
- If the analyzer will be unused or turned off for more than two weeks, or will be shipped, use the **Prepare for Shipment** option: see "Longer Term Shutdown or Storage" on page 8-3.

CAUTION: ***Always*** *follow the instructions in this section when turning off the analyzer.*

The analyzer uses an isotonic saline solution in its fluidic system. When the analyzer is shut down properly, as described below, it rinses its fluidic system to remove this solution. Simply turning off power does not allow it to perform this rinse, which can lead to salt build-up in the system.

CAUTION: *If an emergency occurs, turn off the analyzer using the power switch on the back of the instrument, and unplug the power cord from its outlet.*

8.1.1 Temporary Shutdown

If the analyzer will not be used for 7-14 days, shut it down as follows:

1. On the Home screen, select **Exit > Shutdown**.
2. Select **OK** to confirm.
3. When the analyzer displays a message and sounds a tone, power it off using the power switch on the rear panel. The off position is marked by the **O** symbol.

8.1.2 Longer Term Shutdown or Storage

If the analyzer will be unused for more than two weeks, or will be shipped, use the **Prepare for Shipment** option as follows.

CAUTION: *If this is not done before the analyzer is powered off for long periods, salt crystals can form blockages in the tubing.*

Required materials:

- Distilled water, 200 ml
- 1-liter flask, polypropylene (from Abaxis) or an equivalent container

1. From the Home screen, select **Exit**.
2. Select **Prepare for Shipment**.
3. Follow the instructions that appear on the display.

   The procedure drains the reagents from the analyzer, and flushes the Diluent from the internal tubing. An alarm sounds when it is safe to turn off the analyzer using the power switch on the back panel.

8.1.3 Powering Off for Troubleshooting

On occasion, the analyzer may freeze or require a reboot for troubleshooting. In these situations, proceed as follows:

1. Turn the analyzer off using the power switch on its back panel.
2. Turn the analyzer on.

Section 9 Troubleshooting

Use the information in this section to help diagnose and solve problems with the VetScan HM5.

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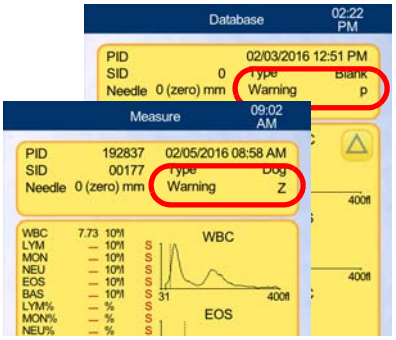
9.1 Warning Indicators

This section lists warning indicators (flags) that can appear in test results, along with possible solutions for each.



Capital-letter warning flags (**B**, **C, Z**, etc.) indicate WBC-related parameters, while lower-case flags (**b**, **c**, **p**, etc.) indicate RBC- or PLT-related parameters. This is true for *all* measurement cycles.

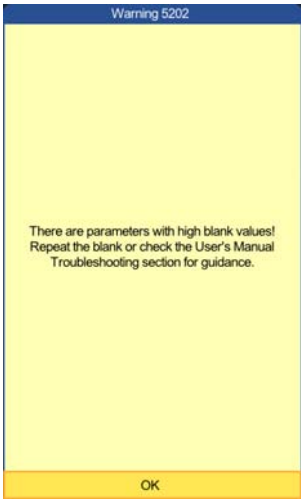
Warning flags appear at the top right of the blank or sample results screen.

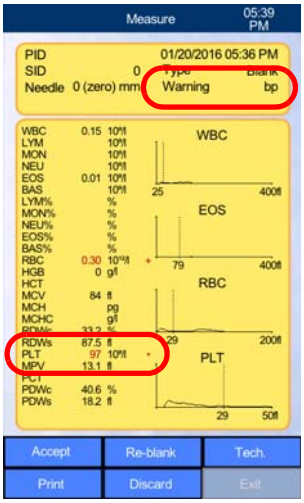
9.1.1 Blank Flags

A blank must be run at the beginning of each day before running samples, controls, or calibrations, or every 12 hours for 24-hour clinics. The blank measures the cleanliness of the analyzer and the purity of the reagents.

- If there are no warning flags and no values highlighted in red (accompanied by **+** or *****), accept the blank. The analyzer is then ready to run patient samples.
- If there are issues with the blank, the warning shown at right appears. Click **OK** to view the actual blank results on the blank results screen.

  Elevated values are shown in red.





High values for the following parameters cause the blank to fail and display these warning flags:

Parameter	High Blank Warning Flag	Blank Value Limit
WBC	B	0.50 x 10^9/l
EOS	X	0.20 x 10^9/l
RBC	b	0.05 x 10^12/l
HGB	H	10 g/dl
PLT	p	27 x 10^9/l

Other warning flags may be seen on a blank, such as c, C, and S.

9.1.1.1 High Blanks

CAUTION: *If the high blank value warning appears, accept or discard the blank and rerun it, but* ***do not begin running samples****. Instead, follow the troubleshooting procedures below according to the flags that appear in the results.*

There are parameters with high blank values! Repeat the blank or check the User's Manual Troubleshooting section for guidance.

If any high blanks are accepted without correcting causes, the blank flags will appear in the sample results, and the results for that parameter will not be reported, until the next acceptable blank is run and accepted. The analyzer will not allow QC or Calibration runs to be performed until the blank is acceptable.

A red **S** in the results indicates that a result was not displayed since an error occurred (such as a blank flag).

9.1.1.2 p, b Warning Flags

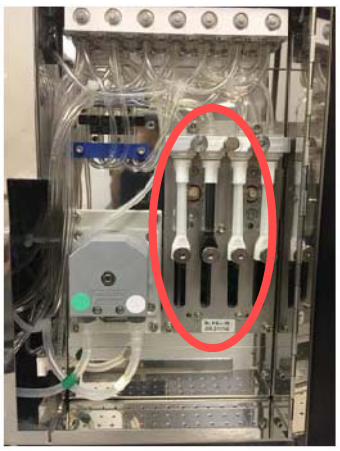
p and **b** flags can indicate salt and/or blood build-up. If either of these appears, do the following:

1. Visually inspect the Wash Head and dilution chamber below to make sure there is no salt or build-up. For the best view, examine from below. For details, see "Cleaning the Wash Head" on page 6-4.
   - ❑ If the Wash Head has significant accumulation, the Wash Head must be removed for cleaning: see "Removing and Cleaning the Wash Head" on page 9-15. While the Wash Head is removed, clean the area around the Wash Head mounting point if there is salt build-up there.
   - ❑ If the Wash Head is clean, perform a Soak Cleaning: see "Soak Cleaning" on page 6-6 then repeat the blank.
2. Check for blood debris in the dilution chamber. If debris is found, manually clean this area while performing Deep Cleaning (see "Deep Cleaning" on page 9-18) then rerun a blank.
3. If the **p** or **b** flags persist, perform a Soak Cleaning: see "Soak Cleaning" on page 6-6. Then repeat the blank.
4. If the **p** or **b** flags remain, contact Abaxis Technical Support.

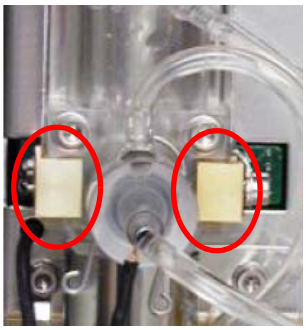
9.1.1.3 X Warning Flags

X warning flags can indicate severe salt or blood build-up, or possible leaks in the Lyse 2 and/or Diluent reagent tubing. If an X flag appears, do the following:

1. Visually inspect the Wash Head and the dilution chamber below for salt or blood debris. For best access, view from below. See “Cleaning the Wash Head” on page 6-4. If debris is found, follow the directions for cleaning the Wash Head. Rerun the blank.
2. If the X flag persists, perform an Soak Cleaning: see “Soak Cleaning” on page 6-6, then rerun the blank.
3. If the issue has not been resolved, perform “Deep Cleaning” on page 9-18, then rerun the blank.
4. If the blank is still high for EOS, perform “Removing and Cleaning the Wash Head” on page 9-15. Remove blood debris from the dilution chamber while the Wash Head is pulled to the right during the cleaning process. Rerun the blank.
5. For continued X flags, check the Lyse 2 (orange) and Diluent (green) reagent tubing for bubbles or leaks. If either are found, attach the tubing more firmly to the analyzer, dip head or bottle cap. If the attachment is loose, cut 3-5 mm off the end of the tube and reattach. Then prime: **Maintenance > Reagent Status > Prime** and select Lyse 2 and/or Diluent.
6. If the flag persists, Remove the Lyse 2 (orange) and Diluent (green) reagent tubes from the back of the analyzer and hold them up so all of the fluids drain back into the bottles. Reattach the reagent tubes and prime them once: from the Home screen, select **Maintenance > Reagent Status > Prime** for Lyse 2 and/or Diluent. Run the blank.
7. If the EOS value is still high, open the analyzer’s back door, and examine the black syringe for any signs of salt residue on or near it. If salt or leaking fluid is present, contact Abaxis Technical Support.
8. If the **X** flag persists, contact Abaxis Technical Support.



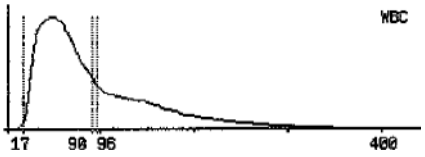
9.1.1.4 B, H Warning Flags

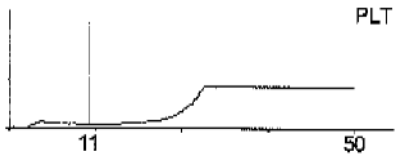
Warning Flag	Meaning	Solution
B	WBC blank is high	• **If B is the only flag:** check the Lyse (yellow) reagent tube for loose connections on the back of the analyzer and where the tubing connects to the bottle cap or dip head. If the tubing has stretched out at either location, cut the bulge off the tubing and reattach, then prime the Lyse. (From the Home screen, select **Maintenance > Reagent Status > Prime** for the Lyse.) • If **B** is accompanied by other flags (such as p, X or b), follow the troubleshooting process for those flags.
H	HGB blank is high	• Check for moisture, salt or blood debris on the HGB head (in the side door area, circled in red) and dry/clean if any is found. Reboot the HM5 then rerun the blank.  • Run Soak Cleaning or Deep Cleaning, then rerun the blank. • Run a self-test: from the Home screen, select **Maintenance > Diagnostics > Self-Test > Start**. If the self-test fails, call Abaxis Technical Support.

9.1.2 Result Warning Flags

Warning flags can appear in sample results as well as blanks. See the following chart to troubleshoot these flags.

Flag	Meaning	Description / Recommended action
E	No sample detected.	• If no values are shown (the results resemble blank results), verify that the sample tube is filled at least halfway. • If needed, lower the needle to -2 mm to reach the sample, and/or insert a sponge disk to raise the tube. See “Measurement Settings” on page 3-4. • Make sure the correct tube holder is being used for that size tube. • Run Soak Cleaning. • If the error persists, redraw the sample, making sure to fill the tube at least halfway, then rerun. If the error persists further, contact Abaxis Technical Support.

Flag	Meaning	Description / Recommended action
S	Particular value is too high or low to be measured.	• Check for other warnings, such as **X**, **p**, **m**, **M**, **c**, or **C**, and troubleshoot those to resolve the **S** flag.
M, **N**	WBC values are too high.	• This can occur with inadequate Lyse (yellow bottle) delivery. Make sure the Lyse tube (yellow) connects securely to the Lyse bottle and the reagent port on the back of the analyzer (if the connection is too loose, cut the bulge from the ends of the tube and reattach), then prime the Lyse and rerun the sample: from the Home screen, select **Maintenance > Reagent Status > Prime** for Lyse. • If the **M** flag persists, verify that the Lyse reagent tube is connected to the correct port on the back of the analyzer and to the correct bottle within the reagent pack. If bottles have been swapped, remove the reagent tubes from the back of the analyzer and hold the tubing up so all of the fluids drain back into the bottles then attach the tubing correctly and prime the tubes affected. • The **M** flag can also occur with legitimate very high WBC counts, as with leukemias: see the figure at right. Check the Lyse delivery system, and if no problems exist, perform a manual smear to verify the WBC count.  • If the **M** flag persists and the manual smear does not indicate a high WBC count, call Abaxis Technical Support.
c, **C**, **q**	Analyzer's aperture is clogged.	• Run 2-3 automatic self-cleanings (see "Automatic Self-Cleaning" on page 6-8). • Redraw a sample, making sure to transfer the sample into the tube immediately and mix well, then rerun. • If visible clots are seen in the original sample, perform a Deep Cleaning. If no visible clots, run a Soak Cleaning and rerun a new, well-mixed sample • Verify the software version is 2.3 or higher. • If the problem persists, call Abaxis Technical Support.
m	• RBC and/or PLT measurement exceeds the linearity limit. • A very dirty analyzer, contaminated reagent pack, or severely dehydrated patient.	• Make sure the sample is properly mixed, to prevent settling. • Visually inspect the Wash Head. If very dirty, remove and clean the Wash Head (see "Removing and Cleaning the Wash Head" on page 9-15), then rerun the sample. • If sample is hemolyzed, redraw and rerun. • Perform Soak Cleaning. If the warning persists, repeat the Soak Cleaning. • If the patient is severely dehydrated and fluid administration is indicated, discard the run and redraw after fluids have been absorbed. • If the **m** flag persists, call Abaxis Technical Support.

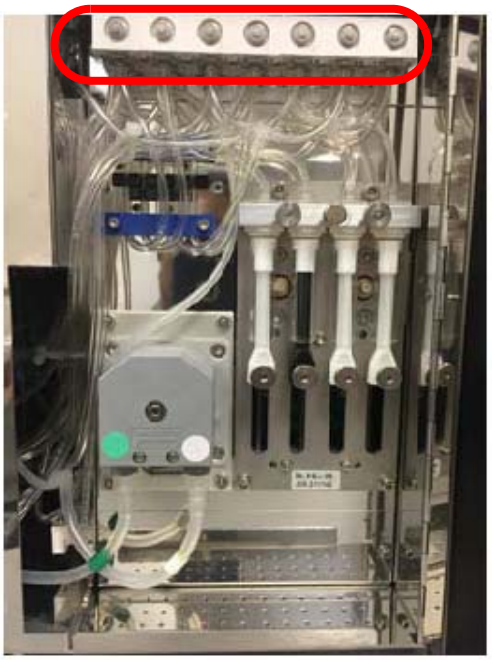
Flag	Meaning	Description / Recommended action
L	Insufficient Lyse reagent delivered to burst all RBCs (or lyse-resistant RBCs), platelet clumping or large platelets for a Cavalier King Charles Spaniel.	• If patient is a Cavalier King Charles Spaniel or other breed with known predisposition to macro-platelets, perform a manual smear. • If the draw was difficult, the platelets are low, or there were delays in filling the tube, redraw and rerun. • Make sure the Lyse tube (yellow) has no kinks, or bends and that nothing is compressing the tubing. • Check for bubbles in the Lyse tube. If found, prime the Lyse: see “Check Tubing” on page 4-4. • If no Lyse issues are found, rerun the sample with increased Lyse +0.1 ml, then if needed with +0.2 ml: see “Adjusting the Lyse Volume” on page 4-9. • If the L Flag still persists, draw a new sample, aiming for a clean needle puncture and fast transfer to the EDTA tube. • If the **L** flag still persists, call Abaxis Technical Support.
W	Severe platelet clumping or very large WBCs.	• If the cat platelet histogram resembles the diagram at right, redraw the sample, reduce delays in filling the tube, and mix well with at least 10-15 inversions immediately.  • If the **W** flag persists, call Abaxis Technical Support.
Y	• Reagent tubing connected to incorrect port or bottle, clogging, or insufficient Lyse 2 delivered. • If the **Y** flag is accompanied by many other warnings (**c**, **C**, **E**, **B**, **Y**), call Abaxis Technical Support.	• Make sure the Lyse 2 tube (orange) is connected to the Lyse 2 bottle. If not, disconnect the incorrectly connected tubes from the analyzer, and hold them up so the liquid in them flows back into the bottles. Connect tubes to the correct connections on the analyzer, bottle caps or dip tubes by color-matching the tubes, analyzer port, and bottle caps or dip tube heads, then prime Lyse 2. • If the tubing is already correctly connected, check the Lyse 2 tubing connections at the analyzer and the bottle cap/dip head. Make sure the tube is securely connected to the connector. If this reagent pack was newly installed, prime the Lyse 2 twice, then rerun the sample. • If the Lyse 2 tube is securely connected, run 1-3 automatic self-cleanings (see “Automatic Self-Cleaning” on page 6-8), then rerun the sample or blank that gave the **Y** warning. • If the **Y** flag persists, call Abaxis Technical Support.
Z	Lyse 2 delivery issues, or a dirty Wash Head or aperture.	• Check the Lyse 2 tube as described above for the **Y** flag. • If the Lyse 2 tube connected correctly, inspect the Wash Head and clean as needed (see “Cleaning the Wash Head” on page 6-4), then run 1-3 automatic self-cleanings (see “Automatic Self-Cleaning” on page 6-8). Rerun the sample. • If the **Z** flag persists, call Abaxis Technical Support.

9.2 Error Messages

9.2.1 Reagent Supply Errors

If a first Reagent Supply Error is displayed, proceed as follows before pressing **Prime**:

1. Check reagent tubing for loose connections for the reagent mentioned, in particular:
   - ❑ Where the tubing attaches to the rear of the analyzer.
   - ❑ Where the tubing attaches to the bottle cap or dip tube head (top of QCA).
2. If any connections are loose, attach more firmly by pushing the tubing further onto the hose barbs, bottle cap or dip tube head.
3. If tugging lightly on the affected clear tubes causes it to pop off of the attachment point, cut 3-5 mm off of the tip of the tubing, and reattach it to make a better seal.
4. Straighten the tubing if kinked or severely bent or being compressed by anything such as the foot of the analyzer.
5. Make sure the reagent bottle is not empty.
6. Prime the reagent tube by pressing the **Prime** button on the pop-up.
7. If a second Reagent Supply Error is displayed, open the door on the back of the analyzer, and check for any loose or disconnected tubes. Examine the seven white valves (circled in red) closely to see if any tubes have detached from them. Touch the tubes to help determine if they are tightly attached. Reconnect any tubes that are detached or loose, then select **Re-prime.**



8. If a third Reagent Supply Error appears, select **Abort** and contact Abaxis Technical Support.
9. If the reagent priming is successful, select **Back** and repeat the step before the Reagent Error appeared. If the reagent sensor was turned off during the error process, from the Home screen, select **Maintenance > Reagent Status**, and turn the sensor back **ON**.
10. Select **Calibrate Sensors**.
11. If the issue persists, call Abaxis Technical Support.

9.2.2 Fluid Sensor Error

If a screen shows a sensor calibration error, the system has turned off that reagent sensor.

1. Go through troubleshooting for "Reagent Supply Errors," on the previous page.
2. From the Home screen, select **Maintenance > Reagent Status**, and turn the sensor back **ON**.
3. Select **Calibrate Sensors** to recalibrate the failed sensor.
4. If the issue persists, call Abaxis Technical Support

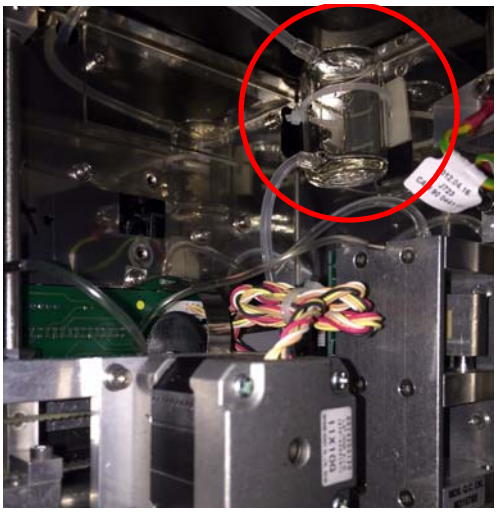
9.2.3 Drain Pressure Error

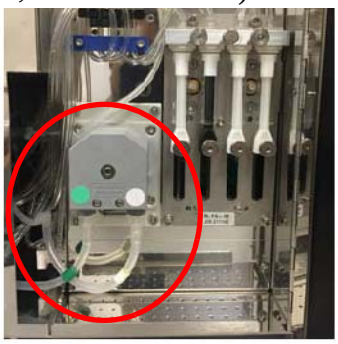
Pressure errors occur when the analyzer is unable to empty its waste. This error can result from a kink in the waste tube, a full waste bottle, a salt or blood clot, or disconnected tubing in the analyzer.

1. Check the waste tube (red band) for pinching or kinks and straighten if necessary. Empty the waste bottle if needed.
2. Select **Drain**.

   The analyzer will make a series of clicking noises while it attempts the draining.
3. If the pressure error continues, touch **Re-Drain** and the analyzer will try again to clear the error by flushing fluids through the internal tubing.
4. If problem persists, open the analyzer's side door.

   a. Look for any debris in the tubing, especially around the puffer chamber (side door in the upper right, circled at right) and the tubing around the peristaltic pump (rear door lower left, as shown below).



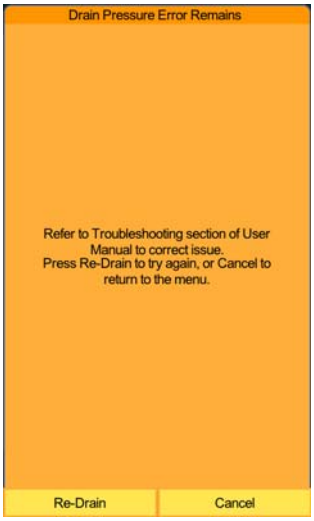


   b. Check the puffer chamber drain tube for clots, and massage out any clots if possible.

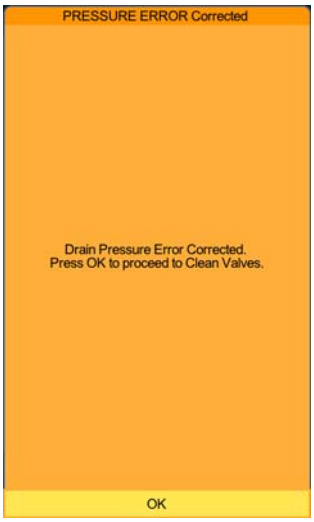
c. Check all tubing visible from the side door for clots, and remove and flush any tubing that has visible clots.

Note: *If any visible clot is found, after the warning is resolved, it is advisable to draw a fresh sample from the last patient.*

d. Make sure all internal tubing is properly connected to the correct ports, and no loose tubing ends are visible. Press **Re-Drain**.



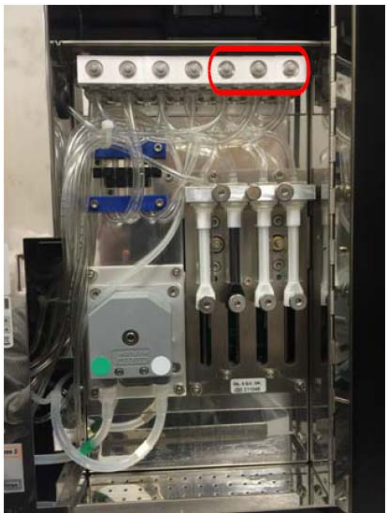
5. If the problem is not yet resolved, check whether the peristaltic pump tube has been overly flattened or is sticking to itself: see “Peristaltic Pump Tubing Replacement” on page 6-13.
6. Attempt to run a blank.
7. If the screen message indicates that the pressure error has resolved AND the blockage was due to clots in the valves, perform Valve Cleaning (only in software v2.3 and higher). The Valve Cleaning cycle will take about 20 minutes. Otherwise, select **Cancel**.
8. If the pressure error still persists, contact Abaxis Technical Support.



9.2.4 Vacuum Error

Vacuum errors can occur if a reagent bottle is empty, the Wash Head is moved without going through the on-screen prompts or one of the tubes inside the analyzer's back door becomes disconnected.

1. Open the analyzer's back door and look for any disconnected tubing and reconnect them. In particular, check the valves in the back door area as shown.



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Note: *If the tube falls off again immediately when the sample or blank run is attempted, the analyzer must be serviced: contact Abaxis Technical Support.*

2. Make sure no reagent bottles are empty.
3. Press each valve button several times to determine if any are stuck. Buttons should easily depress and pop back out. If a valve is stuck, contact Abaxis Technical Support.
4. Open the analyzer's side door to see if any liquid has spilled on the floor of the analyzer. Wipe up any liquid and power the analyzer off then on to re-home the needle. Run a blank to verify that the issue is resolved.
5. If the issue persists, open the analyzer's side door and look for any detached tubing. Dry and reconnect if any are found.
6. Grasp the measuring tube (shown at right) and push it in firmly while slightly rotating it to the right and left to be sure it is firmly seated.

7. Run a sample or blank to see if the issue is resolved.
8. If the issue persists, contact Abaxis Technical Support.

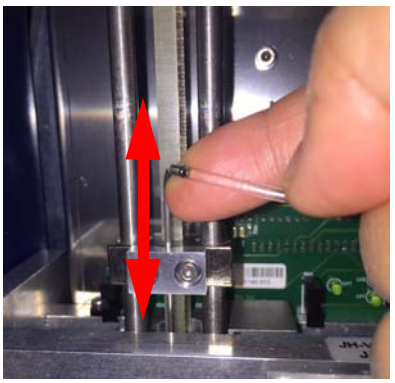
9.2.5 Needle Motor Errors

Sampling and Horizontal Needle Motor errors occur if the needle inside the analyzer's side door cannot move up and down or side to side, respectively.

9.2.5.1 Sampling Errors

Try the following in the order shown.

1. Open the side door, and locate the sampling needle (the thin tube which passes through the Wash Head).
    a. If the needle is bent or damaged, call Abaxis Technical Support.
    b. Move the needle away from any part it may be touching. If you move the needle, reboot the analyzer using the switch on the back of the analyzer.
    c. Make sure the Wash Head thumbscrews are tight (see picture of screws on the next page). Tighten them if they are loose and select **Retry**.
2. If the error repeats:
    a. Turn the analyzer off.
    b. Grasp the needle and move it up and down as far as able 3-4 times to relubricate the guide bars.
    c. Turn the analyzer back on and run a blank.



If the error continues, call Abaxis Technical Support.

9.2.5.2 Horizontal Needle Motor Errors

Try the following in the order shown.

1. Examine the area to the right and left of the needle and Wash Head assembly for any blockage (including salt build-up) preventing left and right motions. If anything is found:
    a. Remove the obstruction and/or clean the salt debris.
    b. Select **Retry**, or turn the analyzer off and on again, then attempt to run a blank.
    c. If the issue repeats, call Abaxis Technical Support.
2. If no obstruction is found:
    a. Turn the analyzer off.
    b. Move the needle out of the dilution chamber (if it is in the down position) then move the whole assembly left and right 3-4 times to redistribute the lubricant on the horizontal bars.
    c. Turn the analyzer back on and run a blank.
    d. If the issue repeats, call Abaxis Technical Support.

9.2.6 Sample Rotor Errors

The sample rotor turns the door to deliver the sample tube to the internal needle during a measurement. The Sample Rotor error indicates a blockage preventing the sample door from turning or an issue with the sample rotor motor.

Correct this error as follows:

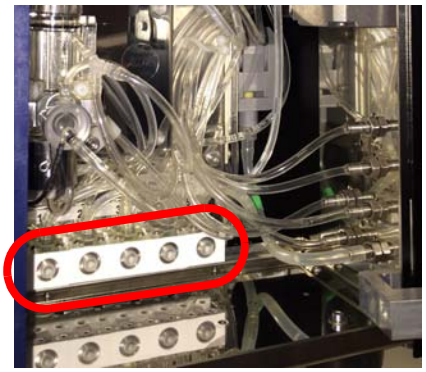
1. Open the door on the analyzer's right side.
2. Make sure the two thumbscrews holding the Wash Head bracket in place are tight. If they aren't, tighten them.
3. Look for and remove anything that may be blocking the sample door from rotating.
4. Select **Retry** or reboot the analyzer then attempt to run a blank to determine if the issue is resolved.
5. If the issue repeats, call Abaxis Technical Support.

9.2.7 MValve Errors

The MValve error occurs when the controlling computer board fails or if a valve is stuck.

Correct this error as follows:

1. Open the analyzer's back and side doors.
2. Push the clear button on the front of each of the 12 valves (valves 1-5 circled at right) 2-3 times.
3. If debris is visible in one of the tubes attached to the valves, detach and remove that tube and attempt to massage the debris out of the tube.
4. Reattach the tube to its connection point.
5. Select **Retry**.
6. If the issue persists, turn the analyzer off and then on again, then attempt to run a blank.



9.2.8 MicroDilutor Motor Error

A MicroDilutor Motor error indicates an issue with the motor that draws blood into the sample needle.

Correct this error as follows:

1. Turn the analyzer off and open its side door.
2. Locate the cylinder (circled), place a finger on it and spin it back and forth several times.
3. Turn the analyzer back on and attempt to run a blank.
4. If the blank runs, perform an Soak Cleaning.

9.2.9 Diluent and Lyse Dilutor Motor Errors

These errors refer to the motors that move the syringes in the back of the analyzer.

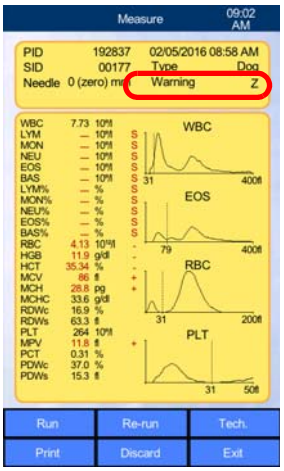
Correct this error as follows:

1. Check for kinks in the reagent tubing from the analyzer to the bottle caps or dip tube heads.
2. If no kinking is found, turn the analyzer off, open the back door of the analyzer and manually move the syringes up and down a few times.
   - ❑ If they move, turn the analyzer back on and attempt to run a blank.
   - ❑ If they do not move or appear to be damaged, call Abaxis Technical Support.

9.3 Evaluating Unexpected Results

If the analyzer results do not support the observed clinical symptoms, try the following steps:

1. Look for warning flags on the analyzer screen.

   If a flag is found, go to the troubleshooting procedure for that particular flag.

Note: *When viewing results through a practice management software, keep in mind that some PMS systems do not show the flags from the analyzer patient file.*

2. Examine the platelet histogram for signs of clumping.

   For details, see "Cat: Clumped PLT, Increased LYM" on page D-10 for interpretation. Redraw and rerun if the PLT histogram indicates clumping.

3. Open the side door of the analyzer and look for any salt or blood debris. If any is found, clean the area necessary. Go to "Additional Cleanings and Processes" on page 9-15 for various cleaning procedures which can be run.

4. Run a new blank then rerun the sample to see if results now clinically fit.

5. If results are still not supporting the clinical symptoms, call Abaxis Technical Support

9.4 Additional Cleanings and Processes

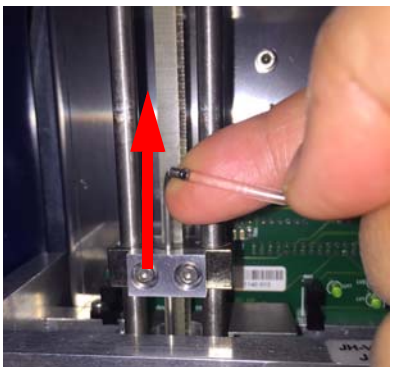
9.4.1 Removing and Cleaning the Wash Head

If salt or blood build-up on the Wash Head cannot be removed by merely wiping the surface or if salt debris is seen above the Wash Head, remove the Wash Head for more thorough cleaning.

1. Power off the analyzer using the switch on its back panel.

2. Open the door on the right side of the analyzer.

3. If the needle is not in the highest position, place a finger under the bend in the needle and push up until the needle will no longer rise.

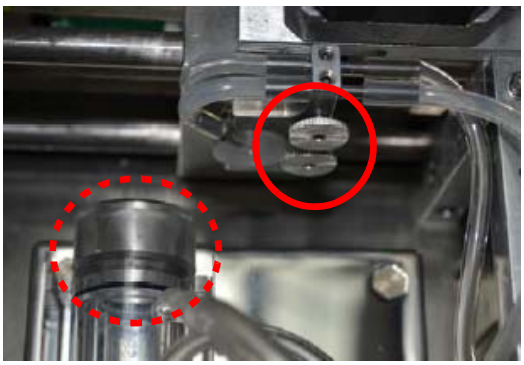


CAUTION: *Take care not to bend the needle in the dilution chamber below.*

4. Move the Wash Head assembly to the right (arrow) until it stops.

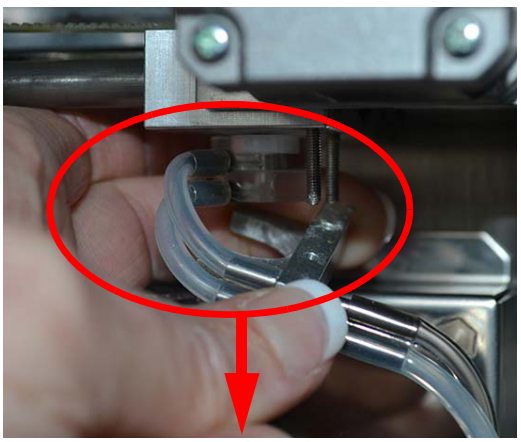
.

5. Loosen the thumbscrews (solid circle), and remove both completely. Take care not to drop them into the counting chamber (dashed circle).



6. Gently pull the Wash Head bracket (circled) straight down, then pull the Wash Head straight down.

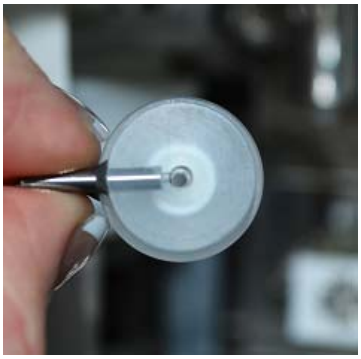
   If the needle is pulled down with the Wash Head, hold the needle in place from above so it doesn't descend with the Wash Head.



7. Remove the Wash Head from the tubing, and submerge it in a container of warm distilled water.

8. If the two tubes from the Wash Head bracket are dirty or clogged, remove them from the bracket and submerge them as well.

9. Holding the metal tube connectors on the Wash Head, swing the Wash Head back and forth while submerged in the warm distilled water to increase flow through the central hole.



CAUTION: *Do not insert anything through the center of the Wash Head, as the Teflon there is easily damaged.*

10. After it has soaked for a couple of minutes, clean the top and bottom surfaces of the Wash Head by wiping thoroughly with a moist, lint-free tissue to remove all salt residue. Large, hard salt residues may require longer soaking times.

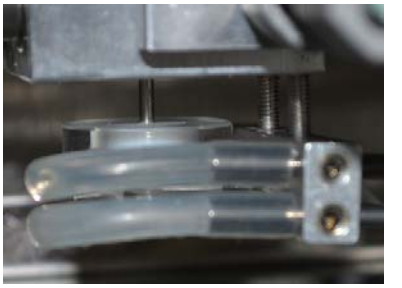
11. Inspect the Wash Head to make sure it is free of salt and blood build-up.

12. Reconnect the two tubes from the Wash Head bracket.

13. Make sure the Wash Head is right-side up, with the white disk facing upward as shown at right, and reinsert it into the round opening in the Wash Head bracket.

14. Slide the bottom of the Wash Head into the crescent-shaped notch, as shown.

15. Align the Wash Head with the needle, and the bracket with the two thumbscrew posts, as shown at right.
16. Push the Wash Head/bracket set upwards into place.
17. Screw on both thumbscrews tightly.

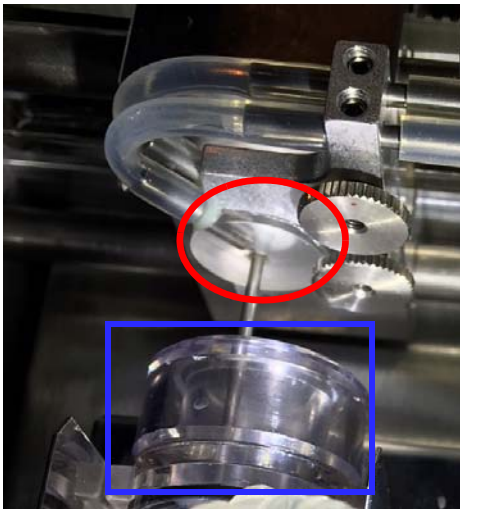


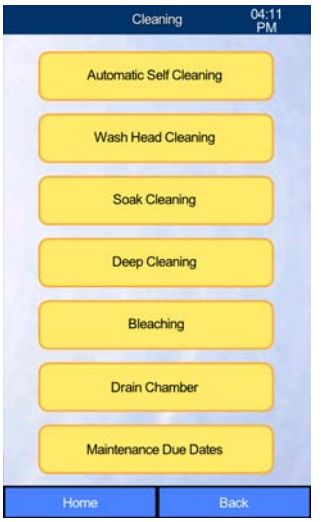
9.4.2 Deep Cleaning

Deep Cleaning should be performed as an emergency cleaning procedure when an analyzer is displaying a trend of high HCT (particularly due to increasing MCV), even when routine Soak Cleaning has been regularly performed. This procedure will perform a more thorough cleaning of the HM5. Call Abaxis Technical Support before performing this procedure.

This procedure requires a lint-free cloth moisturized with distilled water, a new tube of HemaClean and an in-date (not expired) unopened HM5 normal control.

1. Open the side door and identify the Wash Head (Red Circle) and the dilution chamber (Blue Rectangle).
2. If salt or blood debris is found on the Wash Head proceed to clean the Wash Head: See “Cleaning the Wash Head” on page 6-4.
3. Navigate to **Maintenance > Deep Cleaning**.





4. Remove the cap from a new tube of HemaClean and place the tube on the tube holder at the front of the analyzer.
5. Select **Next** to start the cleaning. The Deep Cleaning will be complete in approximately 20 minutes.
6. Run Quality Control using a new, unopened HM5 control. For detailed instructions, go to "Quality Control" on page 5-2. If any warning message pops up, contact Abaxis Technical Support.

Note: *The analyzer will prompt to run a Blank before the first QC measurement.*

7. If two out of three Quality Control runs are within target range, the analyzer is ready to run blood work. If two out of three runs fall out of target range or have any error warnings, call Abaxis Technical Support at (844) 247-5271 for help in calibrating the instrument.

9.4.3 Removing and Cleaning the Aperture

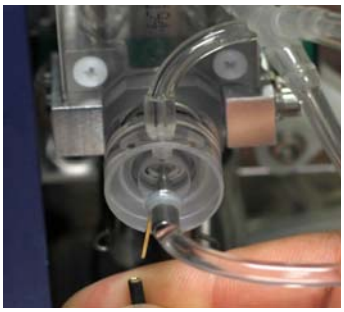
The analyzer's aperture may get clogged or collect debris over time. If Soak Cleaning or Deep Cleaning does not resolve the problem, the aperture may need a more thorough cleaning or replacement.

Clean the aperture as follows:

1. First remove the fluid from the dilution chamber by selecting **Maintenance > Cleaning > Drain Chamber**.

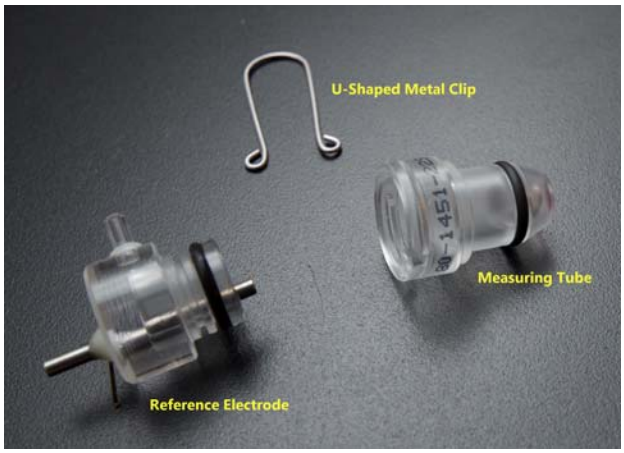
2. Open the door on analyzer's right side, and locate the measuring tube which contains the aperture (circled at right).

3. Disconnect the black wire from the left side of the measuring tube assembly by sliding it down and to the left.



4. Grasp the measuring tube and pull while slightly twisting left and right, until it comes off. This is a push-fit part so it should pull straight out.

5. Disconnect the tubing and pull off the U-shaped clip so the two pieces can be separated.



6. Place the measuring tube on a clean counter with the red or pink aperture facing up. Drop two drops of bleach onto the aperture and let it soak for ten minutes.

7. Rinse off the bleach with distilled water.

8. Put the reference electrode and measuring tube back together, and slide the U-shaped clip back into place.

9. Push the probe back into the body of the dilution chamber and reattach tubing.

10. Reattach the black wire.
11. Run a blank.
12. If the blank displays flags and results in red, contact Abaxis Technical Support.

9.4.4 Bleach Cleaning

If reagent pack contamination is suspected, use this procedure to decontaminate the analyzer and reagent tubing before attaching a new reagent pack. Soak Cleaning should be performed first to resolve any high values or blanks.

CAUTION: *Call Abaxis Technical Support before performing a Bleach Cleaning.*

This process requires distilled water (380 ml) and bleach (20 ml regular strength or 12 ml concentrated).

1. From the Home screen, select **Maintenance > Cleaning > Bleaching**.
2. Follow the on-screen directions.

   The analyzer drains the remaining fluids from inside the analyzer, then draws in the bleach solution. It then performs a soak for ten minutes. The bleach is then drained, and distilled water is pulled into the analyzer to soak for six minutes. The distilled water is then drained and the analyzer is ready for a new reagent pack to be installed.

9.5 Printer Troubleshooting

The analyzer can print to its built-in printer (on top of the unit) or to certain external USB printers. Use these suggestions to solve problems with either printer.

9.5.1 Built-in Printer

If the analyzer's built-in printer is not printing, check the following in this order:

1. Is the lid closed properly? If the light is blinking, one side of the printer lid may not have snapped shut.
2. Is the paper roll inserted correctly? Make sure to lower the paper roll in with the paper coming up the front from the bottom of the roll. Pull 1 or 2 inches of paper out and snap the lid closed. If the paper is inserted upside down, the paper will feed but will be blank.
3. If the paper is inserted, but it is not rolling properly, open the printer lid and clean the roller with a lint-free tissue to remove any debris.
4. If nothing prints and the analyzer was previously connected to an external printer, from the Home screen select **Settings > Printer**, then set **Device** to built-in. If a USB cable is still attached to the external printer, disconnect the cable from the analyzer.

9.5.2 External Printer

The analyzer can print to selected external USB printers. For a list of current compatible printers, call Abaxis Technical Support.

If an external printer encounters a problem, it attempts to transmit an error message to the analyzer. If the HM5 is unable to interpret that information it may freeze. Try resolving the printer issue, then reboot the analyzer.

1. Make sure the external printer is powered on and that the ink cartridges are not low on ink, empty or expired. If no ink lights are blinking or solid, try resetting the printer by unplugging it from power for 60 seconds.
2. Make sure the printer does not have a paper jam.
3. Try printing a test page from the printer.
4. Check the printer settings in the analyzer: from the Home page, select **Settings > Printer > Device**. If the analyzer shows **USB** for this setting, it is probably not recognizing the printer attached. Try reseating the USB cable from the printer to the HM5 then reboot the analyzer. If the device setting still shows USB instead of the exact printer type, try to print a result to trigger the connection.
5. Check that the USB A-B cable is securely attached to the analyzer and to the printer. Most printers have an Ethernet and a USB B port. Make sure the USB B end of the cable is not inserted into the Ethernet port.

9.5.2.1 If Results Are Not Combining With the VS2

Try the following in the order shown.

1. Check that VS2 communication is enabled: from the Home page, select **Settings > Communication > VSx Communication**, then set **VSx Link** to **USB** and **VSx-HM5 Combining** as needed.
2. From the Home page, select **Settings > Printer > Device**, and make sure the paper size is set to the size of the paper being used.
3. Select **Printout** and make sure the margins are correct: top and left margin both = 0.5.
4. Select **Format** and make sure **VSx Separate Page** is set to **Disabled** to combine on one page.
5. Make sure the Patient ID matches that on the VS2.
6. Make sure the date is the same in both analyzers and that the **Combine Within** setting is inclusive of the dates of the run.
7. Check the USB A-B cable attaching the VS2 to the HM5: make sure the B (square) end is in the USB B port on the back of the VS2, and the A (flat) end is in a USB A port on the back of the HM5.

Section 10

Specifications

This section contains technical specifications for the VetScan HM5 system, and lists its linearity ranges.

Section Contents

10.1 VetScan HM5 Specifications 10-2
10.2 Linearity Ranges 10-3
10.3 Precision 10-4

10.1 VetScan HM5 Specifications

Sample volume	25 µl of whole blood in three-part mode, 50 µl of whole blood in five-part mode. 50 µl of whole blood in five-part prediluted mode of 1:6; 25 µl of prediluted blood in three-part prediluted mode of 1:6.
Chambers	1 unified chamber for diluting whole blood and counting.
Reagent system	VetScan HM5 Reagent pack.
Aperture diameter	80 µm.
Throughput	24–30 tests/hour in three-part mode, 16–20 tests/hour in five-part mode.
Sampling method	Open tube system with automatic sample rotor, support for all HM2 and VetScan HM5 test tubes.
Sample types	Five-part mode: dog, cat, horse, alpaca, llama, cynomolgus macaque, rhesus macaque, control. Dog2 and Cat2 are the dog and cat profiles, but may be adjusted for puppy and kitten reference ranges, if desired. Three-part mode: mouse, rat, rabbit, ferret, pig, cow, sheep, goat, guinea pig, primate (primate is research only).
Clog prevention	High-voltage pulse on aperture in each analysis cycle and chemical cleaning of the aperture using Cleaner reagent.
Cleaning procedure	High-voltage burn of the aperture, deep cleaning, chemical cleaning of the aperture.
Quality control	Support for five-part differential control blood. QC parameters include: mean, ± range, SD and CV for all measured and calculated parameters, 16- and 64-day Levy-Jennings charts, separate QC database.
Calibration	Three-measurement automatic calibration of WBC, HGB, RBC, PLT, MCV, RDWc, MPV, and EOS absolute.
Multi-user feature	Three-level multi-user operation with selective privilege levels, user identification with ID and password. Contact Abaxis for more information.
User interface	Easy-to-use, menu-driven touchscreen user interface with on-screen help.
Languages available	English, French, German, Italian, Spanish, Czech, Polish, Portuguese, and Russian. For other languages, contact Abaxis Technical Support — see page 1-3.
Data capacity	5000 results, including RBC, PLT, WBC three-part and five-part histograms on-board. Data can be saved to USB drive or downloaded to computer.
Host computer interface	Four USB A ports, one USB B port, and one Ethernet port. Support for ASCII-based communication protocol only (V3.1).
Data back-up method	Port for USB drive on side and back panels.
Software upgrade method	USB drive.
External printer interface	USB.
Built-in printer	“Easy Paper Operation” built-in thermal printer.
Display	240x128-dot, high-contrast, backlit, graphics liquid crystal diode.
External keyboard	Standard USB-compatible keyboard.
Power requirement	12V DC, 5 A, 60 W.
Power supply unit	External, auto-ranging power unit for 100–120 or 200–240 VAC, 50–60Hz.
Operating temperature	59–86 °F (15–30 °C). Optimal temperature is 77 °F (25 °C).
Dimensions (W x D x H)	12.6 x 10.2 x 14.4 in (320 x 260 x 365 mm).
Net weight	27 lbs (12.3 kg).

10.2 Linearity Ranges

The VetScan HM5 is guaranteed to provide specified accuracies within its linearity range when properly calibrated and maintained. Beyond this range, results may still be displayed, but accuracy is no longer guaranteed.

If the value is over the maximum range of guaranteed linearity, the instrument cannot measure it, and the result will be marked with an **E**, **m**, **M**, or **N** flag.

To measure a sample whose parameters exceed the maximum linear value indicated in the table below, predilution is recommended.

The following tables list the linearity ranges for primary parameters in normal measuring mode and prediluted mode.

Table 10-1: Linearity Ranges in Normal Measuring Mode

Parameter	Linearity Ranges	Maximum	Unit
WBC	0–100	150	10^9 cells/liter
EOS	0.2–3.0	10.0	10^9 cells/liter
RBC	0–15	20	10^{12} cells/liter
PLT	0–700	1000	10^9 cells/liter
HGB	0–250	400	g/l
HCT	0–100	—	%
MCV	30–150	—	Fl
MPV	3–30	—	Fl

Table 10-2: Linearity Ranges for Prediluted Mode

Parameter	Linearity Ranges	Maximum	Unit
WBC	2–200	300	10^9 cells/liter
EOS	0.2–3.0	10.0	10^9 cells/liter
RBC	1–30	40	10^{12} cells/liter
PLT	100–2000	3000	10^9 cells/liter

10.3 Precision

The following precision parameters were established using normal level control on one instrument, with ten replicate measurements performed in one day.

Table 10-3: Control Parameter Precision

Parameter	Mean	SD	%CV
WBC (10^3 cell/µl)	8.05	0.15	1.89%
RBC (10^6 cells/µl)	4.49	0.111	2.44%
EOS (10^3 cell/µl)	5.00	0.07	1.32%
HCT (%)	40.39	1.01	2.51%
HGB (g/L)	125.66	1.71	1.36%
MCV (fL)	90.03	0.50	0.56%
PLT (10^3 cell/µl)	248.36	18.30	7.37%
MPV (fL)	12.69	0.177	1.39%

Appendix A

Introduction to Veterinary Hematology

This appendix introduces several fundamental concepts of veterinary hematology. Having a basic knowledge of these concepts will help you better understand the results from the analyzer.

Appendix Contents

A.1 Function of Blood A-2
A.2 Composition of Blood. A-3
A.3 Blood Cell Parameters A-4
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A.3.2 White Blood Cells A-5
A.3.3 Automated WBC Classification A-5
A.3.4 Eosinophils A-6
A.3.5 Platelets A-6
A.4 Normal Hematology Ranges A-8
A.5 Veterinary Hematology References A-9

A.1 Function of Blood

Blood circulates in the body and acts as a transport medium that carries oxygen, essential nutrients, and other materials to the cells of the body. It also serves to transport waste products for disposal. Neurons, muscle cells, connective tissue cells, and epithelial cells draw their nourishment from interstitial spaces, and respond to the glucose and oxygen content of that environment. Fresh supplies of oxygen and glucose are exchanged with the blood circulating in the capillaries. Blood receives its oxygen from the lungs and glucose from the intestines and liver.

Normal cell function depends on the rapid removal of toxic metabolic products (CO_2 and NH_3) from the interstitial fluid environment. These waste products are taken up by the plasma and red blood cells, and eliminated as the blood passes through the kidneys and lungs. Blood also delivers hormones, lipids, amino acids, salts, and vitamins, and removes urea and conjugated acids.

Blood distributes the heat generated by metabolizing body cells, so that body temperature is maintained at a constant level. In the event of vascular injury, blood platelets and plasma coagulation mechanisms prevent blood loss by aggregating with other platelets to form large hemostatic plugs (clots).

White blood cells protect against infections by identifying and killing invasive bacteria.

The number, size and distribution of blood cells provide important information for clinical diagnosis and therapy.

A.2 Composition of Blood

Whole blood contains three cellular components:

- Red blood cells (erythrocytes, RBC)
- White blood cells (leukocytes, WBC)
- Platelets (thrombocytes, PLT)

Table A-1: Cell Composition of Whole Blood*

	Red Blood Cells	**White Blood Cells**	**Platelets**
Normal density	5–12 x 10^{12} cells/l	6–15 x 10^{9} cells/l	100–700 x10^{9} cells/l
Nucleated?	No **	Yes	No
Sub-populations and their percentages	RBC: 99.9% NRBC: ** (Nucleated RBC) 0.1%	GRAnulocytes: 65% NEUtrophil: 60% EOSinophil: 4% BASophil: 1% LYMphocytes: 32% MONocytes: 3%	
Shape, size	Biconcave (donut) shape diameter: 5–7 µm thickness: 1.8–2 µm	GRAnulocytes: 13–16 µm LYMphocytes: 8–15 µm MONocytes: 15–25 µm	Fragments with a diameter of 2–4 µm
Volume of cell	30–80 fl	50–1500 fl	5–15 fl
Volumetric% in whole blood	40–45%	0.1%	0.3%

* Data generated using whole human blood.
** Mature mammalian RBCs are non-nucleated.

A.3 Blood Cell Parameters

A.3.1 Red Blood Cells, Hemoglobin

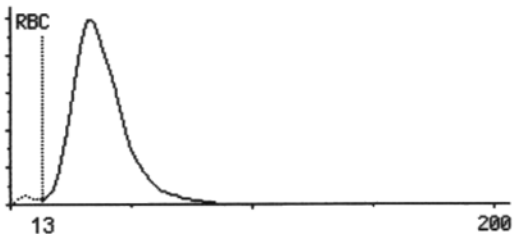
Red blood cells — RBC — are formed in the bone marrow. A mature dog red blood cell is non-nucleated, and has a mean corpuscular volume (MCV) of approximately 70 fl. RBCs are the most numerous cell type in blood. There are approximately 5–10 x 10^{12} cells/l in the blood of a healthy dog. RBC counts and MCV are directly measured primary parameters.

Hematocrit — HCT — is the ratio of the volume of RBCs to the total volume of blood. HCT is the simplest way to measure the degree of anemia, and is calculated from the RBC and MCV values:

$$HCT_{percent} = (RBC \times MCV) / 10$$

$$HCT_{absolute} = HCT_{percent} / 100$$

Red Blood Cell Distribution Width — RDW — is a measure of RBC anisocytosis, the degree of cell size variation. In a healthy sample, RBCs demonstrate a normal (Gaussian) distribution (bell curve), as shown at right. RDW can be characterized by a standard deviation (RDW-SD) or a coefficient of variation (RDW-CV) represented as a percentage.



Hemoglobin — HGB — is the main component of RBCs. It is a conjugated protein (with Fe), and its main function is to transport oxygen from the lungs to tissues and carbon dioxide from the tissues back to the lungs. HGB is the best measure of blood's oxygen-carrying capacity.

Mean Corpuscular Hemoglobin — MCH — is the average hemoglobin content of RBCs, and is calculated from RBC and HGB values:

MCH = (HGB / RBC) x 10, reported in picograms or fmol

Mean Corpuscular Hemoglobin Concentration — MCHC — is the concentration of HGB in an *average* RBC, calculated from the HGB and HCT values:

$MCHC = HGB / HCT_{absolute}$, reported in g/dl, g/l or mmol/l

Mean Corpuscular Volume — MCV — is the average size (volume) of red blood cells in the blood.

A.3.2 White Blood Cells

White Blood Cells — WBC — are formed in the bone marrow. During their maturation sequence they differentiate from the stem cells into mature sub-populations. WBCs are nucleated and classified as granulocytes (neutrophils, eosinophils, and basophils), lymphocytes, and monocytes. WBCs are equipped with all cell organelles necessary to perform vital protective functions in the body.

Normal WBC counts are a fraction of the RBC population. In pathological conditions, the WBC count can increase dramatically (up to 300 x 10^9 cells/l in extreme leukemia). In these cases, predilution of the sample is recommended for the most accurate results (see “Three-Part Differential Method” on page B-3).

Three-part differential histograms (volume distribution curves) of WBCs can be used as a simple, visual evaluation of the number and relative percentage of lymphocytes (LYM, LYM%), monocytes (MON, MON%), and granulocytes (GRA, GRA%).

WBC-related parameters are defined as follows:

WBC = LYM + MON + GRA

LYM% = LYM / WBC

MON% = MON / WBC

GRA% = GRA / WBC

NEU% = (GRA – EOS – BAS) / WBC

EOS% = EOS / WBC

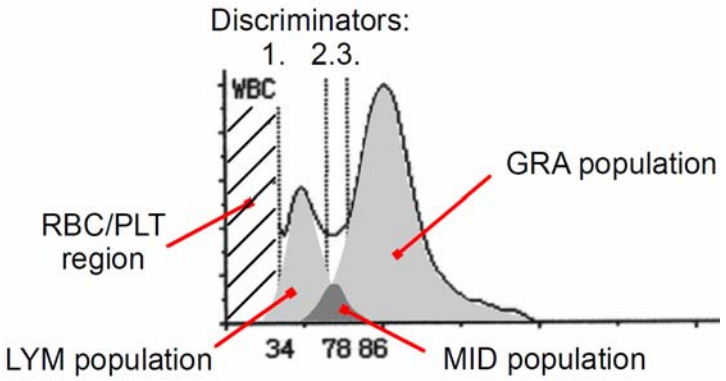
BAS% = BAS / WBC

Elevated WBC counts can affect other differential parameters. It is highly recommended that abnormal WBC and other cell differentials be confirmed by a manual blood smear, as is the case with all automated hematology analyzers.[1]

A.3.3 Automated WBC Classification

The analyzer evaluates each sample as a unique population, using dynamic cellular discriminators to assess the cellular distribution most accurately. To determine WBC sub-populations, the analyzer first sets “discriminator 1” at the limit of hemolysed RBCs + PLTs (on the left in the following graph) and LYM population, then fits normal distribution curves to the remaining WBC histogram (shown below in different shades of gray).

1. Bessman, JD. *Automated Blood Counts and Differentials. A Practical Guide.* (Baltimore: Johns Hopkins University Press, 1986), p. 107.

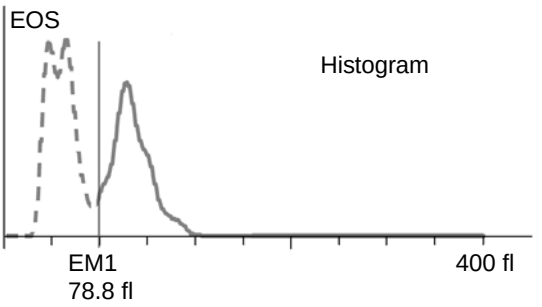


Eosinophilia is occasionally depicted as a peak between the MON and GRA classifications.

As with any automated system, good laboratory practice requires that all abnormal results be verified by slide (blood smear) review.

A.3.4 Eosinophils

Eosinophils — EOS — are granulocytes that are specialized to attack parasites, such as worms and protozoa. They are also the primary effector cells in allergic symptoms. In most species they can be identified morphologically by the presence of eosin-staining (red) granules.



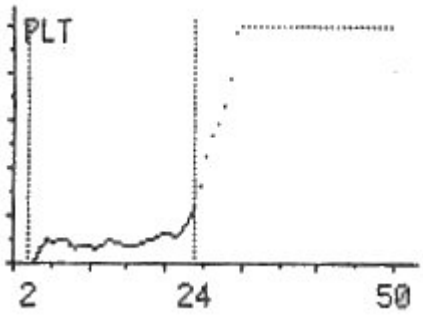
A.3.5 Platelets

Platelets — PLT — are non-nucleated fragments of the megakaryocyte in mammals. Note that platelets are formed by cellular fragmentation. Therefore, the platelet histogram normally has a logarithmic shape on the left side, and a normal shape on the right side ("log-normal" distribution).

Normal PLT concentrations range from 200–800 x 10^9 cells/l (for dogs), depending on the mean platelet volume (MPV), but can vary from 0–1000x10^9 cells/l under certain circumstances.

PLTs are relatively small compared to RBCs. The mean platelet volume — MPV — is approximately 10 fl, so in many species PLTs can effectively be separated from RBCs by their size.

Platelet aggregation is common, particularly in feline species, and is often depicted by a flattened, lumpy histogram, as shown at right. This effect can be minimized with proper sample collection and vortex mixing of the sample (up to 30 seconds) before analysis.



The analyzer calculates the volumetric ratio of PLTs in whole blood as follows:

$PCT_{percent}$ = (PLT x MPV) / 10

$PCT_{absolute}$ = $PCT_{percent}$ / 100

Typically, PCT = 0.003 = 0.3%

Platelet Distribution Width — PDW — is a measure of platelet anisocytosis, the degree of size variation. In a healthy sample, platelets demonstrate a Log normal distribution. PDW can be characterized by a standard deviation (PDW-SD) or a coefficient of variation (PDW-CV) represented as a percentage.

A.4 Normal Hematology Ranges

The following table summarizes normal ranges of blood cell parameters. Keep in mind that normal values vary from population to population, even geographically.

Parameter	Unit	Dog	Cat	Horse	Cow	Pig	Mouse	Rhesus–RUO*	Cyno–RUO*
WBC	10^9 cells/l	6–17	5.5–19.5	5.4–14.3	4–12	11–22	6–15	9.3-22.0	2.0-21.0
LYM	10^9 cells/l	1.00–4.80	1.5–7.0	1.50–7.70	2.50–7.50	5.5–11.1	3.40–7.44	4.0-13.86	0.94-9.26
MON	10^9 cells/l	0.2–1.50	0.0–1.50	0.0–1.50	0.0–0.84	0.66–1.32	0.0–0.6	0.0-0.76	0.01-0.57
NEU (or GRA)	10^9 cells/l	3.0–12.0	2.50–14.0	2.30–9.50	0.6–6.70	(5.0–10.0)	(0.5–3.80)	1.3-11.0	0.0-14.21
EOS	10^9 cells/l	0.0-0.8	0.0-1.0	0.0-1.0	0.1–1.0			0.0-0.25	0.00-0.23
RBC	10^{12} cells/l	5.5–8.5	5–10	6.8–12.9	5–10	5–8	7–12	4.4-6.2	5.0-6.5
HCT	%	37–55	24–45	32–53	24–46	32–50	35–45	36.0-48.0	38.0-52.0
MCV	fl	60–77	39–55	37–59	40–60	50–68	45–55	71-86	69-87
HGB	g/l	120–180	80–150	110–190	80–150	100–160	122–162	109-147	120-156
MCH	pg	19.5–24.5	12.5–17.5	12.3–19.7	11–17	17–21	11.1–12.7	21.8-26.2	21.4-26.2
MCHC	g/l	310–390	300–360	310–390	300–360	300–340	223–320	287-323	278-330
PLT	10^9 cells/l	165–500	300–800	100–400	100–800	325–715	200–450	216-502	261-629
MPV	fl	3.9–11.1	12–17						6.8-11.6

Parameter	Unit	Rat	Rabbit	Ferret	Guinea pig	Sheep	Goat
WBC	10^9 cells/l	2.1–19.5	3–11.5	2–10	5.0–17.0	4–12	4.0–13.0
LYM	10^9 cells/l	2.0–14.1	2.0–9.10	0.4–6.50	2.0–15.0	2.0–9.0	2.0–9.0
MON	10^9 cells/l	0.0–0.98	0.0–0.5	0.1–0.7	0.0–0.0	0.0–0.75	0.0–0.5
(GRA)	10^9 cells/l	(0.1–5.40)	(0.0–2.80)	(0.8–4.50)	(1.0–11.0)	(0.7–7.30)	(1.20–8.00)
RBC	10^{12} cells/l	5.3–10	5–9	7.8–13	4.8–6.3	9–15.8	5.5–8.5
HCT	%	35–52	36–50	36–56	30–44	27–45	37–55
MCV	fl	50–62	57–70	40–48	50–90	28–40	60–77
HGB	g/l	140–180	127–163	124–187	80–150	90–150	120–180
MCH	pg	16–23	17.5–23.5	13.5–16.5	12–13	8–12	19.5–24.5
MCHC	g/l	310–400	300–380	321–355	300–360	310–340	310–340
PLT	10^9 cells/l	500–1370	218–641	96–776	200–600	100–800	200–500
MPV	fl						

*RUO is Research Use Only

A.5 Veterinary Hematology References

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  Feldman, Bernard, et al, Lippincott Williams & Wilkins, 2000.
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Appendix B

Operating Principles

This appendix explains the basic operating principles of the analyzer.

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B.1 Complete Blood Count (CBC)

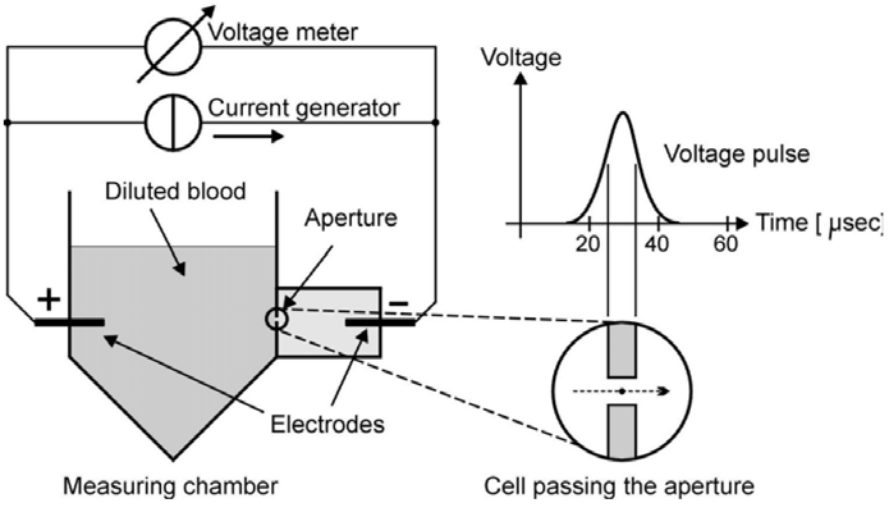
The analyzer utilizes impedance technology whereby electrically neutral blood cells pass through an electrically charged aperture thereby generating a “pulse.” Cell counts are determined by the number of pulses measured in a given volume of blood over a set period of time. The decrease in electrical conductance (degree of intensity) as measured is directly proportional to the cell volume. This size discrimination, along with susceptibility to various lysing agents distinguish the basic cell types (red, whites, platelets).

B.2 Measurement Methods

This section provides an overview of the hematology measurement methods used by the analyzer.

B.2.1 Volumetric Impedance Method

The analyzer uses a volumetric impedance method of counting blood cells. The following figure illustrates this method.

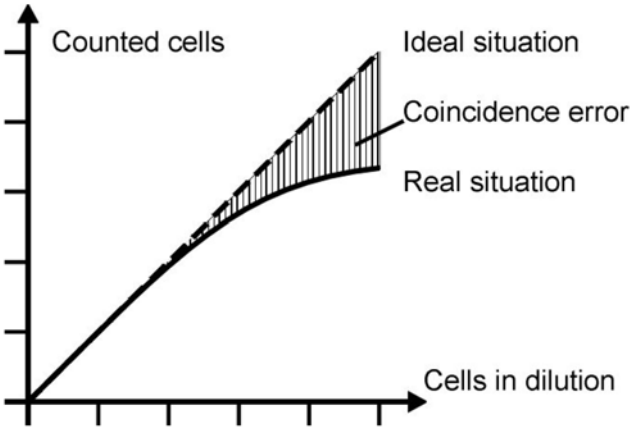


The principle of this method is that blood diluted with an isotonic solution (Diluent) conducts electric current by ionic conduction. A counting chamber made of an insulating material (plastic) holds this diluted blood, while a small circular hole (aperture) in this chamber allows the flow of diluted blood. (The analyzer aperture diameter and length is 80 µm — the optimal size for veterinary hematology.)

Placing two electrodes on the two sides of this aperture and applying constant electric current causes the isotonic solution to conduct electricity, and allows a voltage to be measured on the aperture.

Applying pressure to the diluted sample causes it to flow through the aperture. When a cell is passing the aperture, a small change in electric impedance occurs, so that the voltage rises somewhat and a small electric pulse occurs. The amplitude of this pulse is proportional to the ratio of the cell volume (size) and the aperture volume: the bigger the cell, the higher the pulse.

Proper counting (or differentiation) of cells requires passing of only one cell through the aperture at a time. To help ensure this, the blood samples must be diluted, since cell concentrations are otherwise too high.



Although diluted blood is used, in cases of extremely high concentrations (such as leukemia) WBC density can be 100x higher than normal, causing two or more cells to pass through the aperture at a time, generating one pulse instead of two (or more). This is called coincidence, and results in non-linear counting of cells. Flags **m**, **M**, and **N** appear in this case.

The WBC linearity range is 100 x 10^9 cells/l.

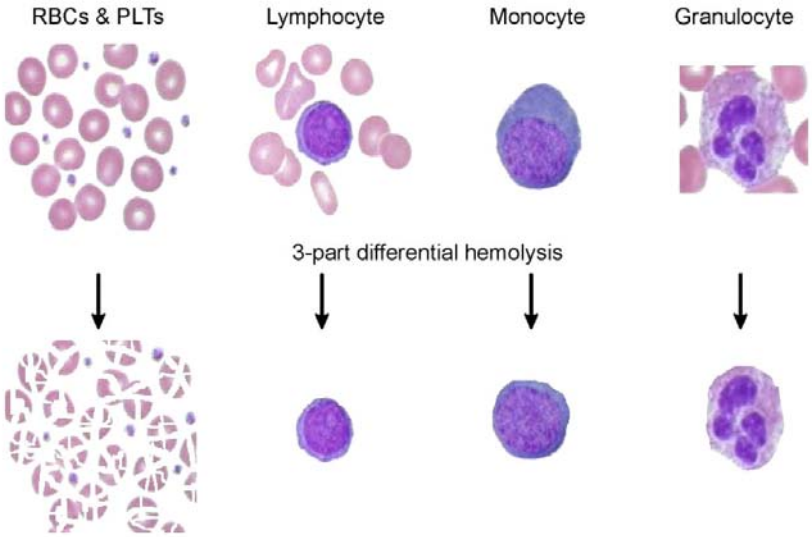
In cases of cell counts beyond the linear range, an external predilution of the sample is recommended.

B.2.2 Three-Part Differential Method

To perform a three-part WBC differential count, the RBCs must first be lysed since RBCs are typically 1000 times more numerous in normal blood than are WBCs and would interfere with WBC counting if left intact. Lysing also releases the hemoglobin stored in the RBCs for direct analysis in the solution.

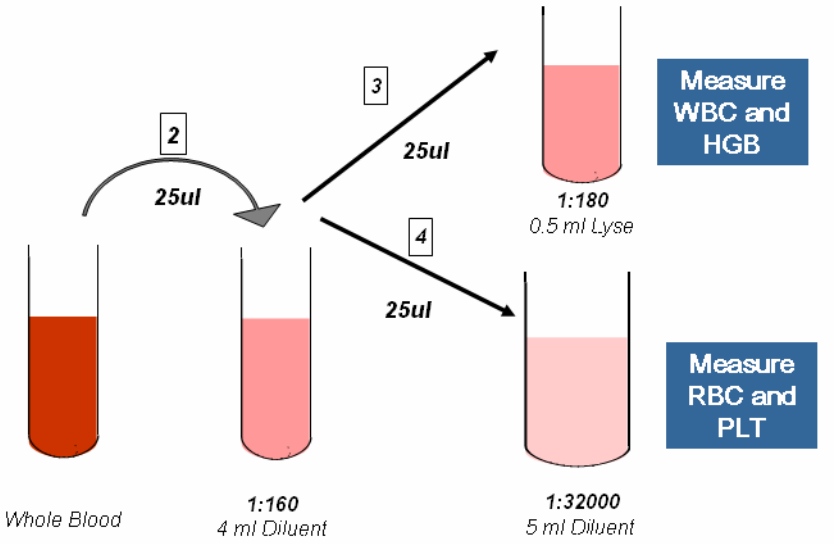
Therefore, a hemolysing reagent (Lyse) is used to dissolve cellular membranes, thus destroying RBCs, and creating a complex solution suitable for photometry of HGB and counting WBCs.

The following figure shows the changes in blood cell characteristics that occur during three-part differential hemolysis.



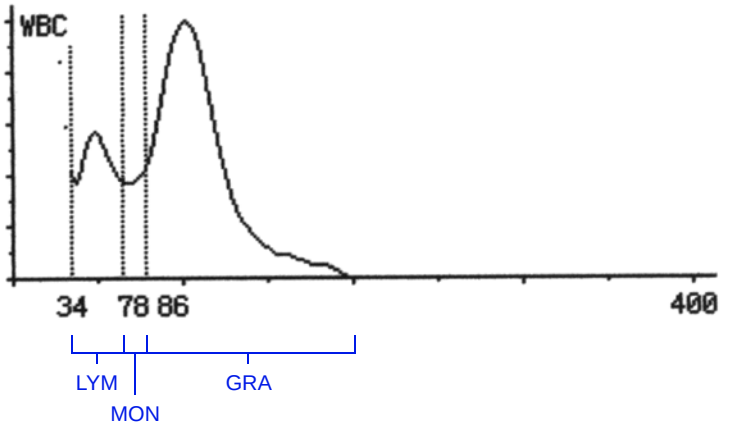
The membranes of the WBCs become selectively permeable, so that they begin to shrink down to their nuclei in the slightly hypertonic Lyse solution. Effectively hemolysed samples contain WBC particles in the 30–300 fl region (for veterinary species).

Three-Part Differential



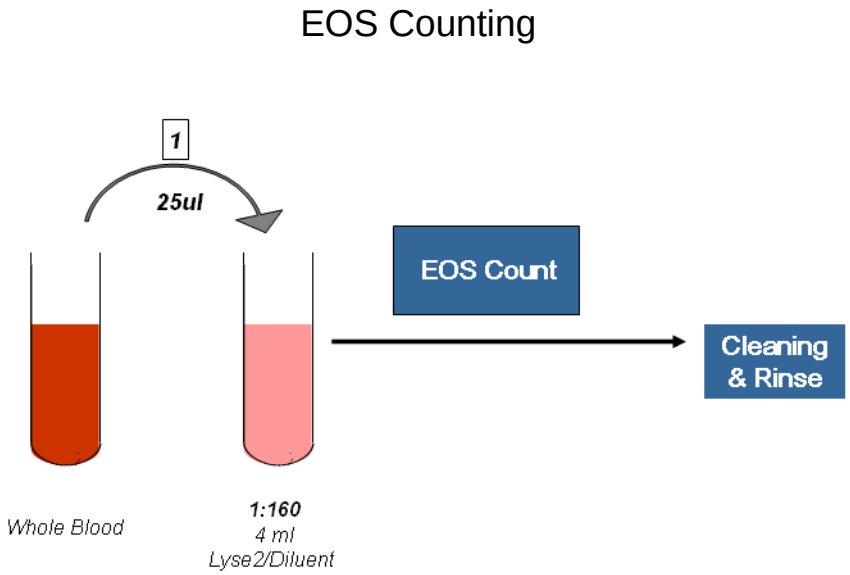
For the three-part counting, a primary dilution of 1:160 is created by diluting 25 µl of whole blood with 4 ml of Diluent into the chamber. After taking the RBC sample of 25 µl, the remaining diluted blood is treated with 0.5–0.7 ml of Lyse reagent — this depends on the animal profile selected — to destroy red blood cells. The remaining solution is suitable for photometric measurements of HGB, and counting of WBC. After these measurements are done, the software is able to determine HGB, WBC, LYM, LYM%, MON, MON%, total GRA, and GRA%. GRA contains all types of granulocytes: GRA = NEU + EOS + BAS, and GRA% = NEU% + EOS% + BAS%. Volume distribution of three-part measurement can be seen on the three-part histogram. The cells are separated in three regions depending on their sizes: LYM, MON, and GRA, from left to right, separated by discriminators.

The figure below shows a typical three-part differential WBC histogram of selective hemolysis (dog).



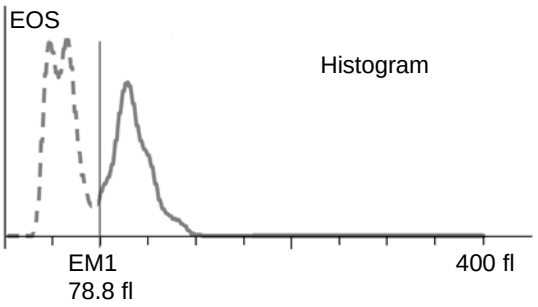
B.2.3 Five-Part WBC Differential Method

Five-part WBC differential results are determined using two separate dilutions, and two counting sessions. The first session is used to count EOS, while the second is the three-part differential and RBC counting described above. In three-part only measurements, the EOS counting is omitted.



To determine EOS, EOS% and BAS, BAS%, a second sample preparation and counting is required. 25 µl of whole blood sample is diluted with a species-dependent volume of Lyse 2 solution, a hemolytic reagent and Diluent, to form a 1:200 dilution. During the incubation time, white blood cells will be differentially hemolysed, so that eosinophils will retain a higher cellular volume.

After counting and sizing the cells, the software will interpret all cells above the discriminator as eosinophils. The user can observe the distribution of the cells on the EOS histogram.



The number and percentage of BAS cells will be calculated using EOS and other internal parameters using a mathematical formula.

The EOS count is then followed with a three-part differential count (described above) to provide the rest of the WBC count, the RBC and the PLT and related parameters.

B.3 Hemoglobin Determination

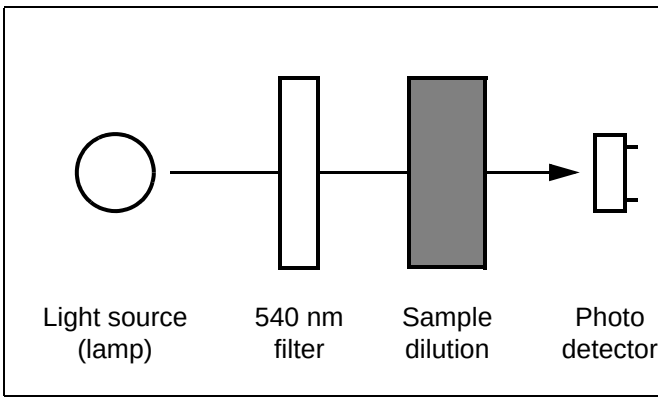
Hemoglobin is measured directly by means of the traditionally used cyanomethoglobin reaction, but the HM5 uses cyanide-free substances to reach the same endpoint.

Hemoglobin concentration is measured photometrically.

B.3.1 Hemoglobin Determination by Photometry

HGB determination is one of the most important hematology parameters, as it relates to the oxygen carrying capacity of blood.

The analyzer uses cyanide-free lysing reagents to minimize negative effects on user safety and the environment. The effect of cyanide-free Lyse is very similar to that of Lyse containing cyanide, but the chemical reaction is slightly different. The figure below illustrates the HGB measurement method.



HGB is measured by passing light (540 nm) through the WBC dilution, and measuring the transmitted light with a photo detector.

The light intensity (I) of the sample liquid is logarithmically proportional to the concentration of HGB:

$HGB \approx \log (I_{reference} / I_{sample})$

B.4 Measured and Calculated Parameters

Each sample is analyzed to produce a complete, 24-parameter, five-part differential blood count (CBC), including the following measured or calculated parameters:

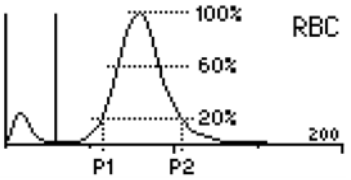
- WBC — total white blood cell count
- LYM — lymphocyte count
- MON — monocyte count*
- NEU — neutrophil count
- EOS — eosinophil count
- BAS — basophil count
- LYM% — lymphocyte percentage
- MON% — monocyte* percentage
- NEU% — neutrophil percentage
- EOS% — eosinophil percentage
- BAS% — basophil percentage
- RBC — red blood cell count
- HGB — hemoglobin
- HCT — hematocrit
- MCV — mean corpuscular volume
- MCH — mean corpuscular hemoglobin
- MCHC — mean corpuscular hemoglobin concentration
- RDWc, RDWs (std dev) — red cell distribution width, coefficient of variation
- PLT — platelet count
- PCT — platelet crit
- MPV — mean platelet volume
- PDWc, PDW (std dev) — platelet distribution width, coefficient of variation

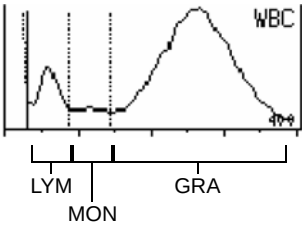
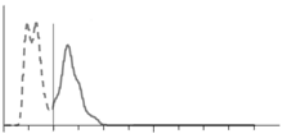
* The monocyte category consists primarily of monocytes. Impedance counters categorize white blood cell types (differential) according to size, and therefore a certain percentage of eosinophils may have a mass that falls in the normal range for monocytes (the exact percentage depends on the individual animal and is generally inconsequential due to the very low numbers of eosinophils in a healthy animal). Eosinophilias, however, can sometimes be visualized as a distinct peak between the monocyte range and the granulocyte peak on a histogram.

B.5 Measured and Calculated Values

The VetScan HM5 measures and calculates the following values from tested blood samples.

Table B-1: Measured and Calculated Values

Values	Definitions
White Blood Cells — **WBC** (reportable as: cells/l, cells/µl)	Total number of leukocytes (white blood cells).
Red Blood Cells — **RBC** (reportable as: cells/l, cells/µl)	Total number of erythrocytes (red blood cells).
Hemoglobin concentration — **HGB** (reportable as: g/dl, g/l, mmol/l)	Measured photometrically at 540 nm (see "Volumetric Impedance Method" on page B-2 for details). • $HGB = HGB_{cal} \times (HGB_{measured} - HGB_{blank})$
Mean Corpuscular Volume — **MCV** (fl)	Average volume of individual erythrocytes derived from the RBC histogram.
Hematocrit — **HCT** (reportable as: percentage, absolute)	Also known as Packed Cell Volume (**PCV**). Calculated from the RBC and MCV values: • $HCT_{percentage} = RBC \times MCV / 10$ • $HCT_{absolute} = HCT_{percentage} / 100$
Mean Corpuscular Hemoglobin — **MCH** (reportable as: picogram, fmol)	Average hemoglobin content of erythrocytes, calculated from RBC and HGB values: • MCH = HGB / RBC
Mean Corpuscular Hemoglobin Concentration — **MCHC** (reportable as: g/dl, g/l, mmol/l)	Calculated from the HGB and HCT values: • $MCHC = HGB / HCT_{absolute}$
Red Cell Distribution Width — (reportable as: **RDW-SD** [fl], **RDW-CV** [absolute])	Measure of the degree of RBC anisocytosis. Calculated using the distribution width of the erythrocyte or platelet population derived from the histogram at 20% of peak: 
Platelet — **PLT** (reportable as: cells/l, cells/µl)	Number of thrombocytes (platelets). • $PLT = PLT_{cal} \times$ (cells/l, cells/µl)
Mean Platelet Volume — **MPV** (fl)	Average volume of individual platelets derived from the PLT histogram.
Platelet Distribution Width — (reportable as: **PDW-SD** [fl], **PDW-CV** [absolute])	Measure of the degree of platelet anisocytosis.
Platelet Hematocrit (Thrombocrit) — **PCT** (reportable as: percentage, absolute)	Calculated from the PLT and MPV values: • $PCT_{percentage} = PLT \times MPV / 10$ • $PCT_{absolute} = PCT_{percentage} / 100$

Values	Definitions
White Blood Cell Differential: **LYM, LYM%:** lymphocytes **MON, MON%:** monocytes **GRA, GRA%:** neutrophil, eosinophil and basophil granulocytes	Absolute values counted in the channels determined by the three WBC discriminators:  Percentages calculated from the absolute WBC value.
Eosinophils — **EOS**, **EOS%** (reportable as: cells/l, cell/µl, %)	Absolute values counted in channels as determined by the EOS discriminator.  Percentage calculated from the absolute EOS and WBC values.
Basophils — **BAS**, **BAS%** (reportable as cells/l, cells/µl, %)	BAS is the absolute count of basophils. BAS% is the percentage of basophils in the total WBC.
Neutrophils — **NEU**, **NEU%** (reportable as cells/l, cells/µl, %)	NEU is the absolute count of neutrophils. NEU% is the percentage of neutrophils in the total WBC.