AQUA AIR

MARINE AIR CONDITIONING SYSTEMS

Fan Coils

Digital Thermostats

Compact Chillers

Rack Chillers

PLC / Touchscreen Chiller Controls

Pumps

High Capacity Custom Chillers

Aqua-Air Manufacturing
James D. Nall Co., Inc.
1050 E. 9th Street
Hialeah, FL 33010 USA
Toll Free 800-328-1043
Phone 305-8848363
Fax 305-8838549
sales@aquaair.com
www.aquaair.com

Air Handlers

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

CHILLWATER FAN COIL WCW

FEATURES

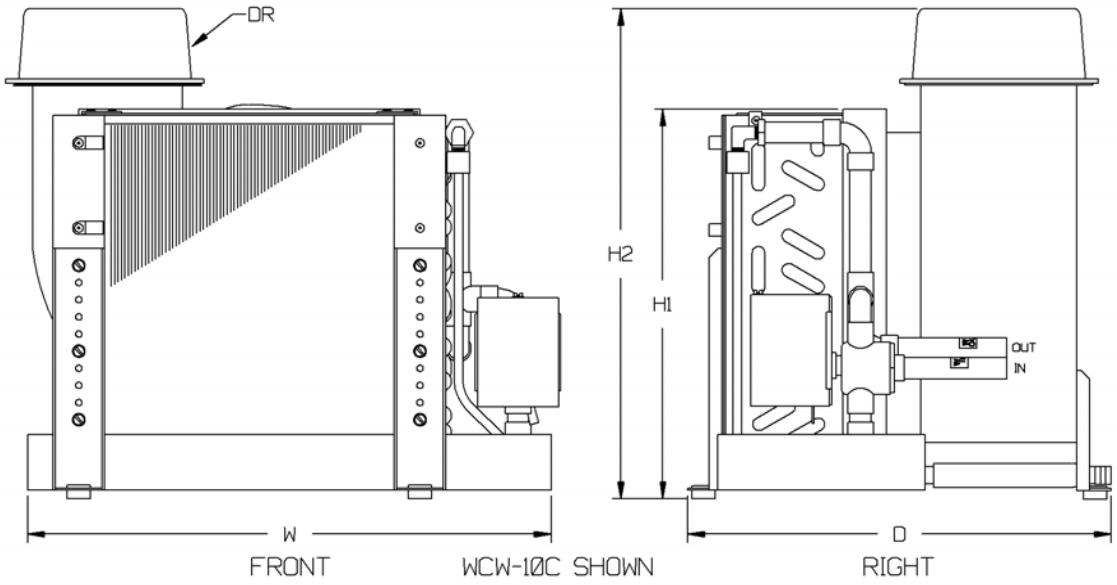
- ❏ High capacity motorized impeller squirrel cage blower is designed for quiet operation with flexible duct systems.
- ❏ Round flexible duct connector installed on the unit. This connector also adapts to Aqua-Air AT series adapter duct tees.
- ❏ Three way motorized Pop-Top water valve is pre-installed on the unit. One handed removal for ease of service
- ❏ Dual condensate outlets on the drain pan are factory connected into a common 1/2" hose barb tee for ease of installation.
- ❏ Anti-splash, anti-fungal foam media inside the drain pans prevent water splashing out even in the roughest seas

- ❏ Vertically adjustable mounting legs with rubber vibration pads and mounting screws.
- ❏ The air bleeder is mounted on the end of a 12" plastic tube for easy access during commissioning of the system.
- ❏ All surfaces that might have condensate form on them are covered with 1/8" thick foam insulation.
- ❏ Units available for 115/1/60 and 200-230/1/50-60 power inputs.
- ❏ Units available with optional 230-1 internal heating elements

Aqua-Air Manufacturing
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 sales@aquaair.com
www.aquaair.com

SPECIFICATIONS	WCW-05		WCW-07		WCW-10		WCW-12		WCW-16		WCW-18		WCW-20		WCW-24	
COOLING CAPACITY BTU/HR - KCAL/HR	5,000 1,250		7,000 1750		10,000 2,500		12,000 3,000		16,000 4,000		18,000 4,500		20,000 5,000		24,000 6,000	
AIR FLOW CAPACITY CFM / M³H	135	230	270	460	330	560	400	679	530	900	600	1020	600	1020	800	1360
WEIGHT Lbs / Kg	19	8.6	23	10.5	25	11.4	32	14.5	34	15.5	36	16.4	38	17.3	39	17.7
WIDTH in / mm W	15	384	14-1/4	362	16	406	17-1/2	445	17-1/2	445	21	533	22-7/8	581	23-1/8	587
DEPTH in / mm D	13	330	14	356	14-1/4	362	14-1/4	362	15	384	16	406	15-1/2	394	16-1/4	413
HEIGHT TO TOP OF COIL in / mm H1	9-1/2	241	10	254	11-1/2	292	13	330	13	330	14-1/4	362	15-1/4	387	16-1/4	413
MAXIMUM HEIGHT in / mm H2	12-1/4	311	13	330	14-1/4	362	15-1/2	394	15-1/2	394	15-7/8	403	16-5/8	422	16-5/8	422
FAN AMP DRAW 115 / 230	1.6 / 0.8		1.6 / 0.8		1.6 / 0.8		1.6 / 0.8		1.8/ 0/9		1.8 / 0.9		1.8 / 0.9		N.A. / 1.0	
POWER, WATTS	182		182		182		182		200		200		200		216	
MIN RETURN AIR in² / cm²	64	413	72	465	100	645	120	774	144	929	180	1161	200	1290	240	1548
MIN SUPPLY AIR in² / cm²	32	207	40	258	48	310	60	387	72	465	90	581	100	645	120	774
CHILLWATER IN & OUT OD in/mm	5/8	16	5/8	16	5/8	16	5/8	16	5/8	16	5/8	16	7/8	22	7/8	22
FLEX DUCT COLLAR OD in/mm DR	4	100	5"	125	5	125	6	150	6	150	7	175	7	175	7	175
INTERNAL HEATER (OPT) 230-1-60	1.0 kW		1.5 kW		1.5 kW		2.0 kW		2.0 kW		2.0 kW		3.0 kW		3.0 kW	
INTERNAL HEATER AMP DRAW AT 230-1-60	4.3		6.5		6.5		8.7		8.7		8.7		13.0		13.0	

ADD "C" TO THE END OF THE MODEL NUMBER FOR A 200-230/1/50-60 UNIT 80950.WPD



Model Number Examples

Unit without Internal Element Heater

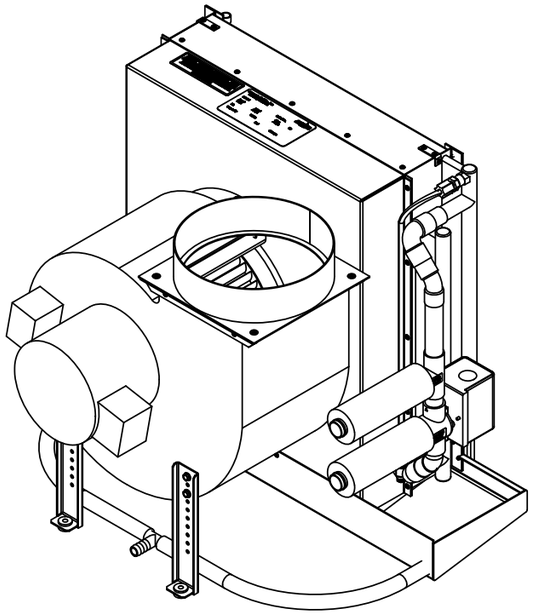
WCW-16C

16 = 16,000 BTU/HR **C** = 230-1-50/60

Unit with Internal Element Heater

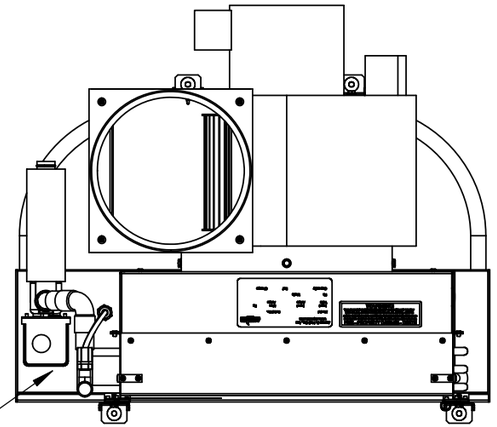
WCW-10C-1.5

10 = 10,000 BTU/HR **C** = 230-1-50/60 **1.5** = 1.5 kW 230-1 heater

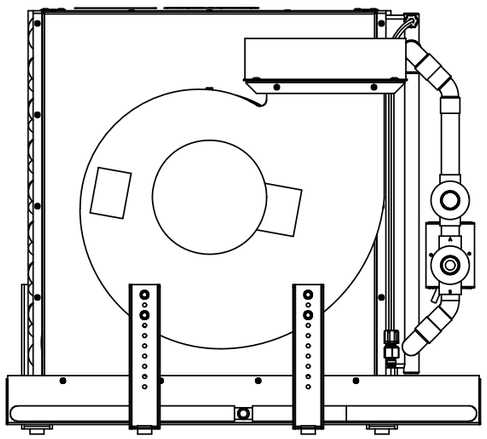


INSULATION NOT SHOWN
ON THIS VIEW

SEE NEXT PAGE FOR SPECIFICATIONS



INSULATION NOT SHOWN
ON THIS VIEW



INSULATION NOT SHOWN
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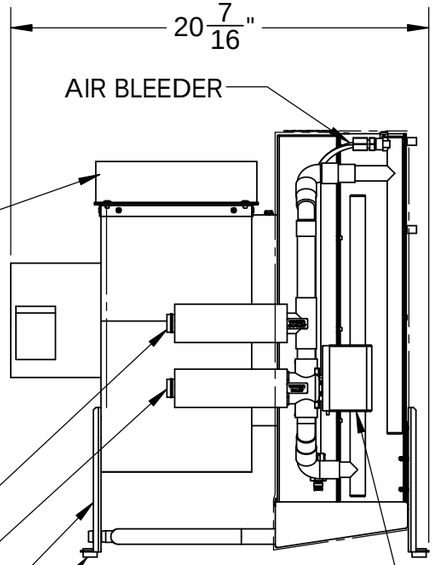
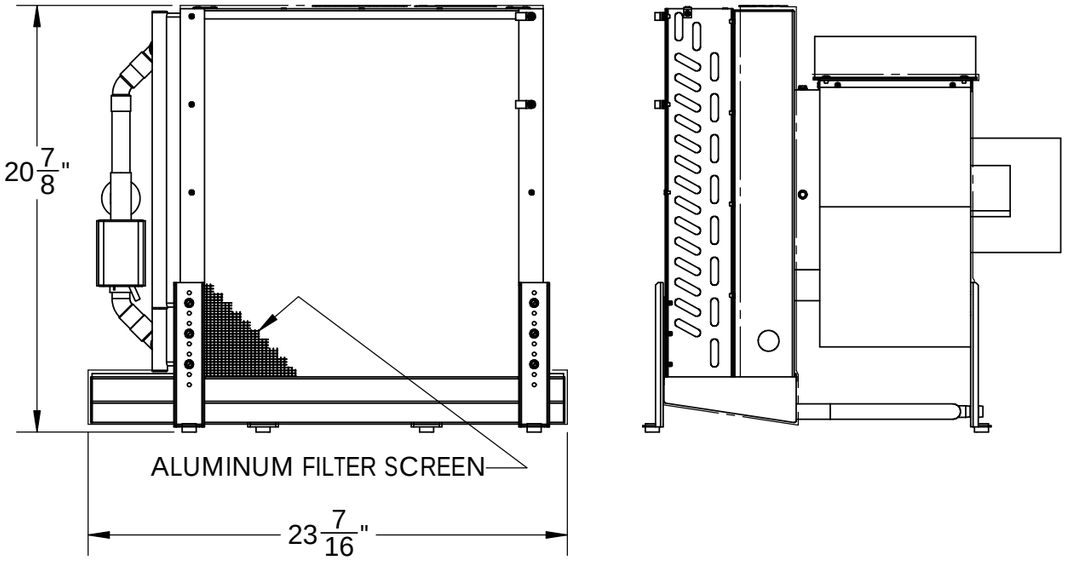




1/8" THICK INSULATION
NOT SHOWN FOR CLARITY

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

SIZE B

DRAWING NO. WCW-36C				
DWG. FOLDER: J:\Solidworks\Parts\WCW-36C\				
PART NUMBER: WCW-36C		MATERIAL:	LENGTH:	SCALE: 1:8
DRAWN BY: JN	DATE: 5/21/2015			SHEET 1 OF 11

SPECIFICATIONS		WCW-36	
COOLING CAPACITY BTU/HR - KCAL/HR		36,000 9,000	
AIR FLOW CAPACITY CFM / M^3H		1200	2040
WEIGHT Lbs / Kg		55	25
WIDTH in / mm	W	23-1/2	597
DEPTH in / mm	D	20-1/2	521
HEIGHT TO TOP OF COIL in / mm	H1	20-7/8	530
MAXIMUM HEIGHT in / mm	H2	20-7/8	530
FAN AMP DRAW 115 / 230		7.3 / 3.7	
POWER, WATTS		851	
MIN RETURN AIR in^2 / cm^2		360	2323
MIN SUPPLY AIR in^2 / cm^2		180	1161
CHILLWATER IN & OUT OD in/mm		7/8	23
FLEX DUCT COLLAR OD in/mm	DR	8	200
INTERNAL HEATER (OPT) 230-1-60		3.0 kW	
INTERNAL HTR AMP DRAW AT 230-1-60		12.9	

AQUA-AIR
MARINE AIR CONDITIONING SYSTEMS

CHILLWATER FAN COIL AQOCW

FEATURES

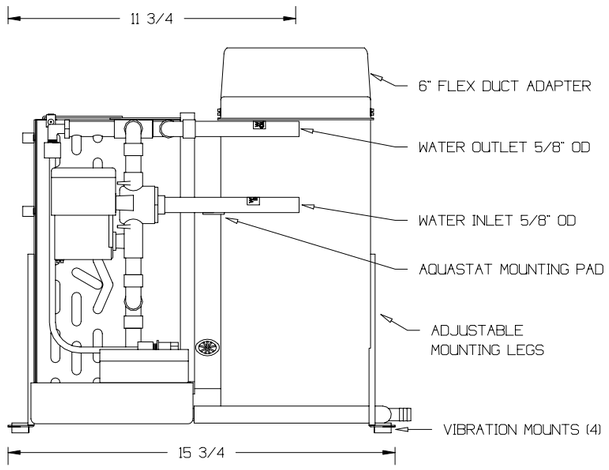
- High capacity squirrel cage blower is designed for quiet operation with flexible duct systems.
- Standard 6" flexible duct connector installed on the unit. This connector also adapts to Aqua-Air AT series adapter duct tees.
- Three way motorized water valve is pre-installed on the unit. A separate valve assembly is not necessary.
- Dual condensate outlets on the drain pan are factory connected into a common 1/2" hose barb tee for ease of installation.
- Vertically adjustable mounting legs with rubber vibration pads and mounting screws.
- The air bleeder is mounted on the end of a 12" plastic tube for easy access during commissioning of the system.
- All surfaces that might have condensate form on them are covered in 1/8" thick foam insulation.
- Units available for 115/1/60, 100/1/50, 208-230/1/60 and 200-220/1/50 power inputs.
- Aqua-Air BH series blower heaters bolt directly to the discharge of the blower.

SPECIFICATIONS	AQOCW-12	AQOCW-16
COOLING CAPACITY	12,000 BTU/HR 3,024 KCAL/HR	16,000 BTU/HR 4,032 KCAL/HR
AIR FLOW CAPACITY	400 CFM 680 M^3H	530 CFM 900 M^3H
WEIGHT	32 LBS 14.5 KGS	32 LBS 14.5 KGS
AMPERAGE DRAW	2.7 @ 115-1-60 1.4 @ 230-1-60	4.0 @ 115-1-60 2.0 @ 230-1-60
POWER CONSUMPTION	311 W	460 W
MINIMUM RETURN AIR GRILLE SIZE	120 in^2 774 cm^2	144 in^2 929 cm^2
MINIMUM SUPPLY AIR GRILLE SIZE	60 in^2 387 cm^2	72 in^2 465 cm^2
CHILLWATER INLET / OUTLET SIZE	5/8" OD 16 mm OD	5/8" OD 16 mm OD
MAXIMUM DUCT HEATER	2 Kw	3Kw

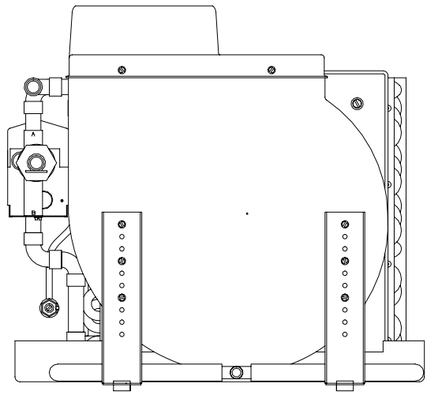
ADD "C" TO THE END OF THE MODEL NUMBER FOR A 208-230/1/60 UNIT, "CK" FOR A 200-220/1/50 UNIT 80940.WPD

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com

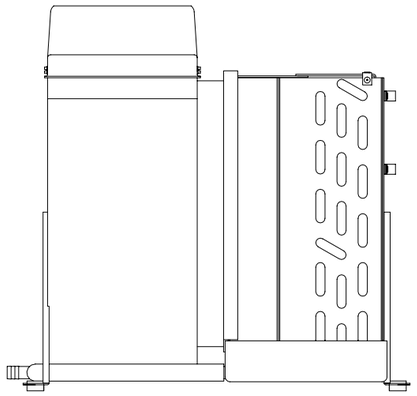
REVISION BLOCK			
REV.	DESCRIPTION	REV. BY	DATA
B	MODIFIED DRAIN PAN	LES	Ø9-19-96



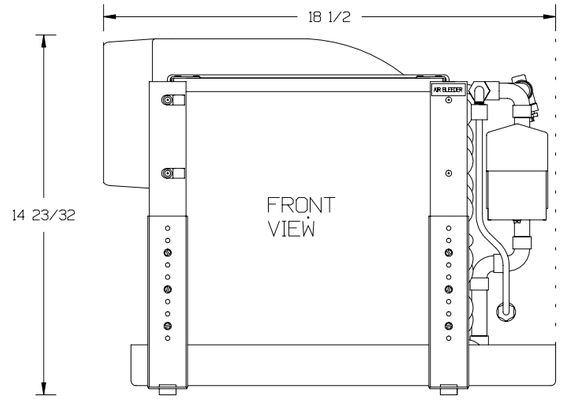
LEFT VIEW



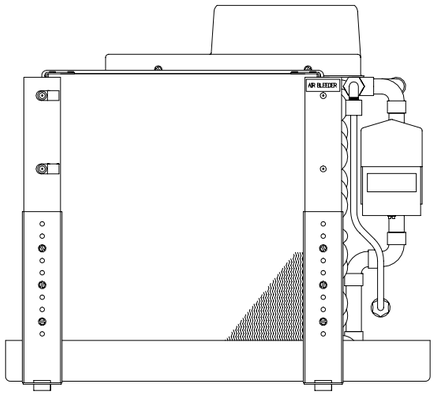
REAR VIEW



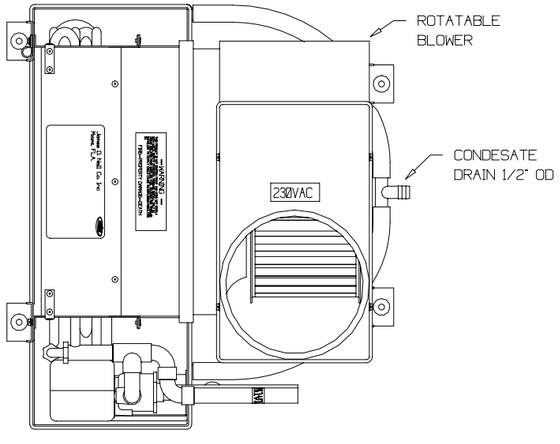
RIGHT VIEW



AQOCW-12.16 HORIZONTAL DISCHARGE BLOWER ROTATED 90

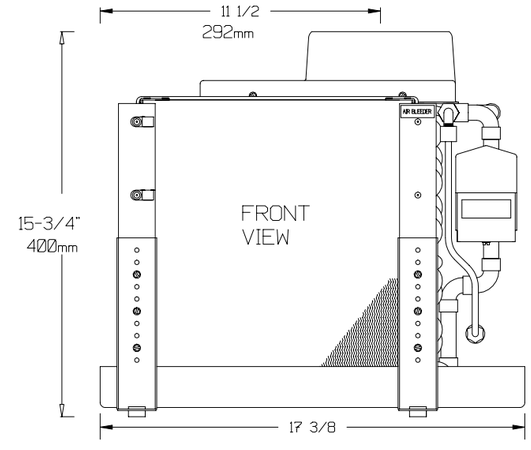


FRONT VIEW

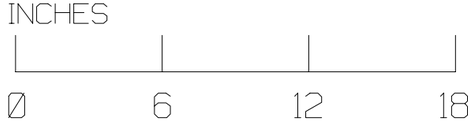


TOP VIEW

SPECIFICATION		AQOCW-12	AQOCW-16
CAPACITY	BTU/HR KCAL/HR	12.ØØØ 3,Ø24	16,ØØØ 4Ø32
AIR CAPACITY	CFM CMH	4ØØ 68Ø	533 9Ø6
WEIGHT	LBS KGS	32 14.5	32 14.5
AMPERAGE DRAW	115V 23ØV	2.7 1.4	4.Ø 2.Ø
POWER CONSUMPTION		311	311
MIN. RETURN AIR SIZE	SQ.IN. SQ.MM.	12Ø 774	144 929
MIN. SUPPLY AIR SIZE	SQ.IN. SQ.MM.	6Ø 387	72 465



AQOCW-12.16 VERTICAL DISCHARGE



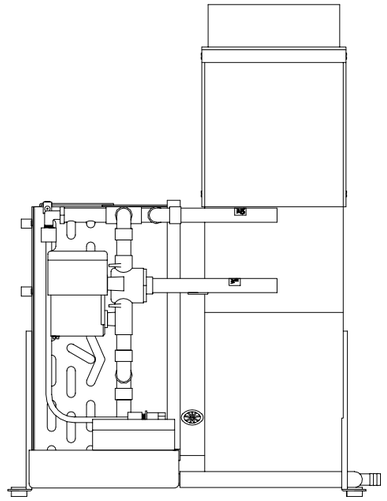
AQUA-AIR MARINE AIR CONDITIONING SYSTEM

AQOCW - 12 & 16
FAN COIL UNITS WITHOUT B. HEATER

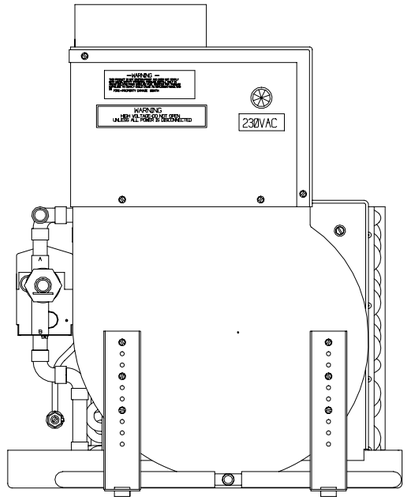
DRAWING NUMBER	DRAWN BY	DATE
AQOCW	LES	10-Ø4-95

SCALE	APPROVED BY	REVISION DATE	REV
NONE			B

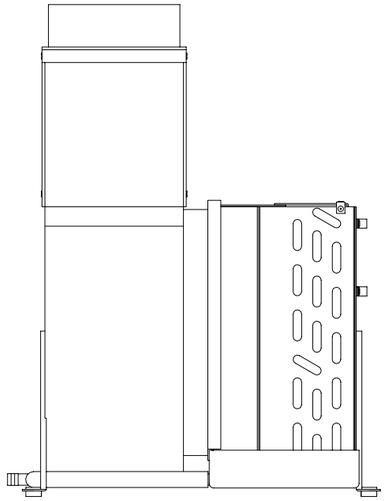
REVISION BLOCK			
REV.	DESCRIPTION	REV. BY	DATA
B	MODIFIED DRAIN PAN	LES	Ø9-19-96



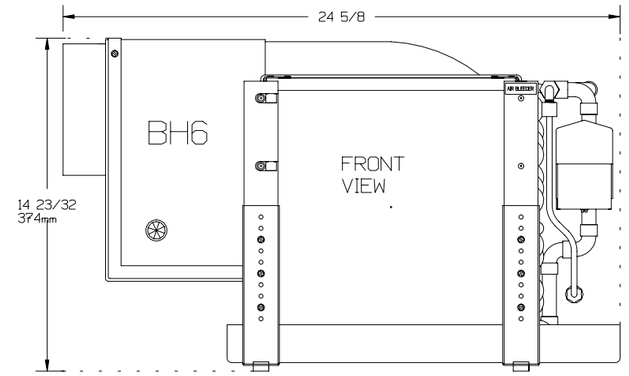
LEFT VIEW



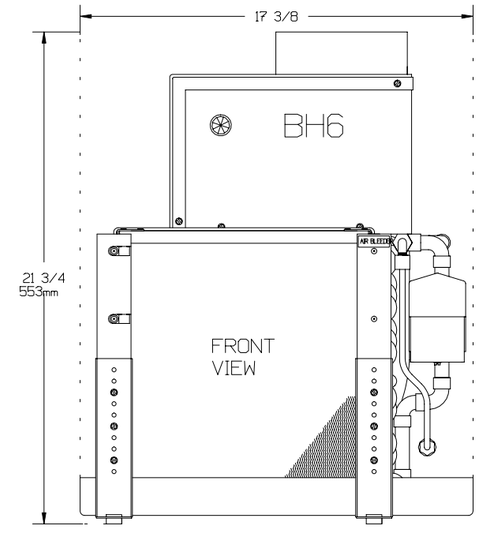
REAR VIEW



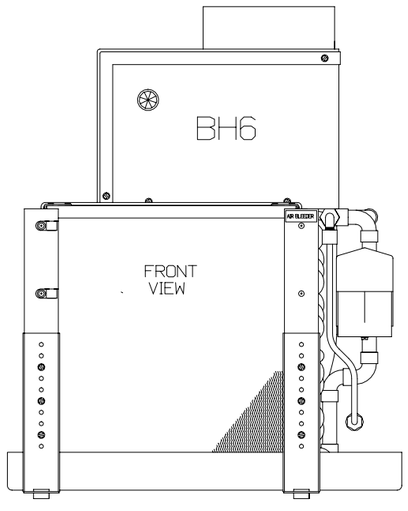
RIGHT VIEW



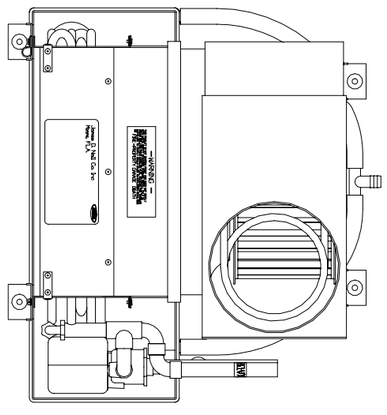
AQOCW-12,16 WITH BH6 BLOWER
HEATER BLOWER ROTATED 90
HORIZONTAL DISCHARGE



AQOCW-12,16 WITH BH6 SERIES
BLOWER HEATER
VERTICAL DISCHARGE



FRONT VIEW



TOP VIEW

SPECIFICATION		AQOCW-12	AQOCW-16
CAPACITY	BTU/HR KCAL/HR	12,000 3,024	16,000 4032
AIR CAPACITY	CFM CMH	400 680	533 906
WEIGHT	LBS KGS	32 14.5	32 14.5
AMPERAGE DRAW	115V 230V	2.7 1.4	4.0 2.0
POWER CONSUMPTION		311	311
MIN. RETURN AIR SIZE	SQ.IN. SQ.MM.	120 774	144 929
MIN. SUPPLY AIR SIZE	SQ.IN. SQ.MM.	60 387	72 465

AQUA-AIR MARINE AIR CONDITIONING SYSTEM

AQOCW - 12 & 16
FAN COIL UNITS WITH BLOWER HEATER

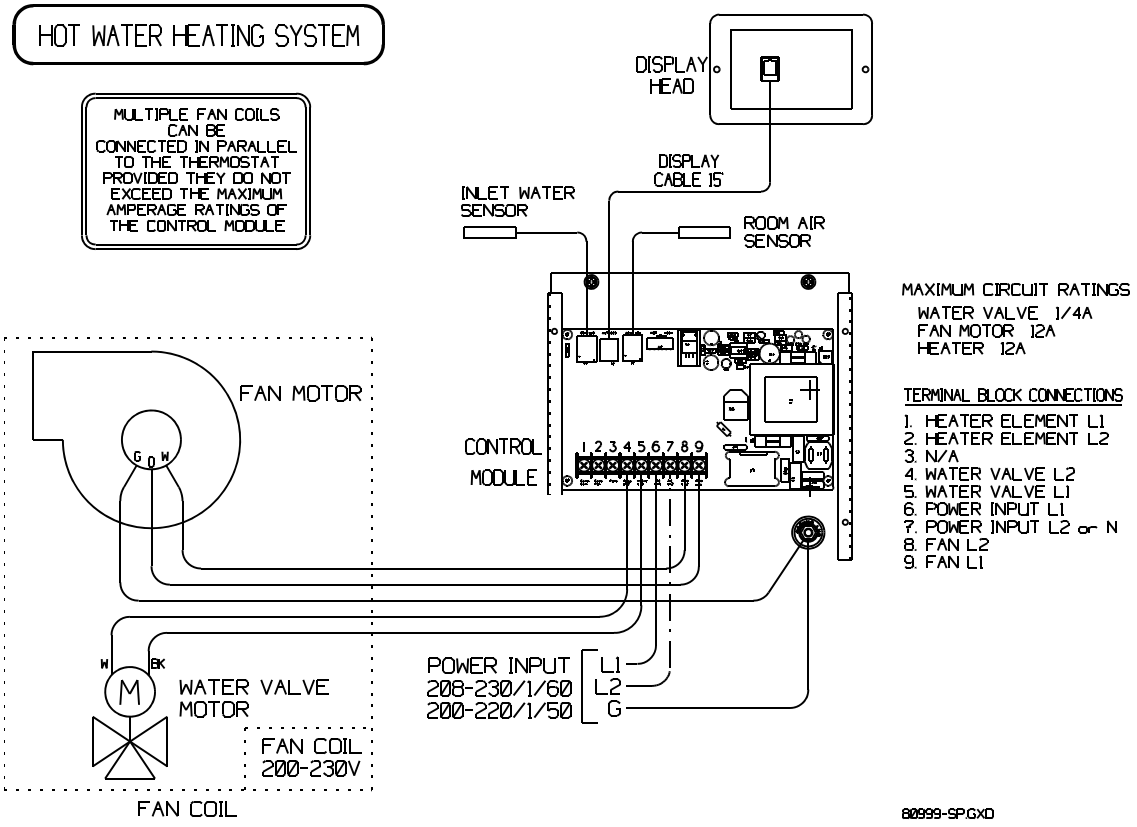
DRAWING NUMBER	DRAWN BY	DATE
AQOCW-BH	LES	10-03-96

SCALE	APPROVED BY	REVISION DATE	REV
NONE			B

WIRING SCHEMATICS

HOT WATER HEATING SYSTEM

MULTIPLE FAN COILS CAN BE CONNECTED IN PARALLEL TO THE THERMOSTAT PROVIDED THEY DO NOT EXCEED THE MAXIMUM AMPERAGE RATINGS OF THE CONTROL MODULE

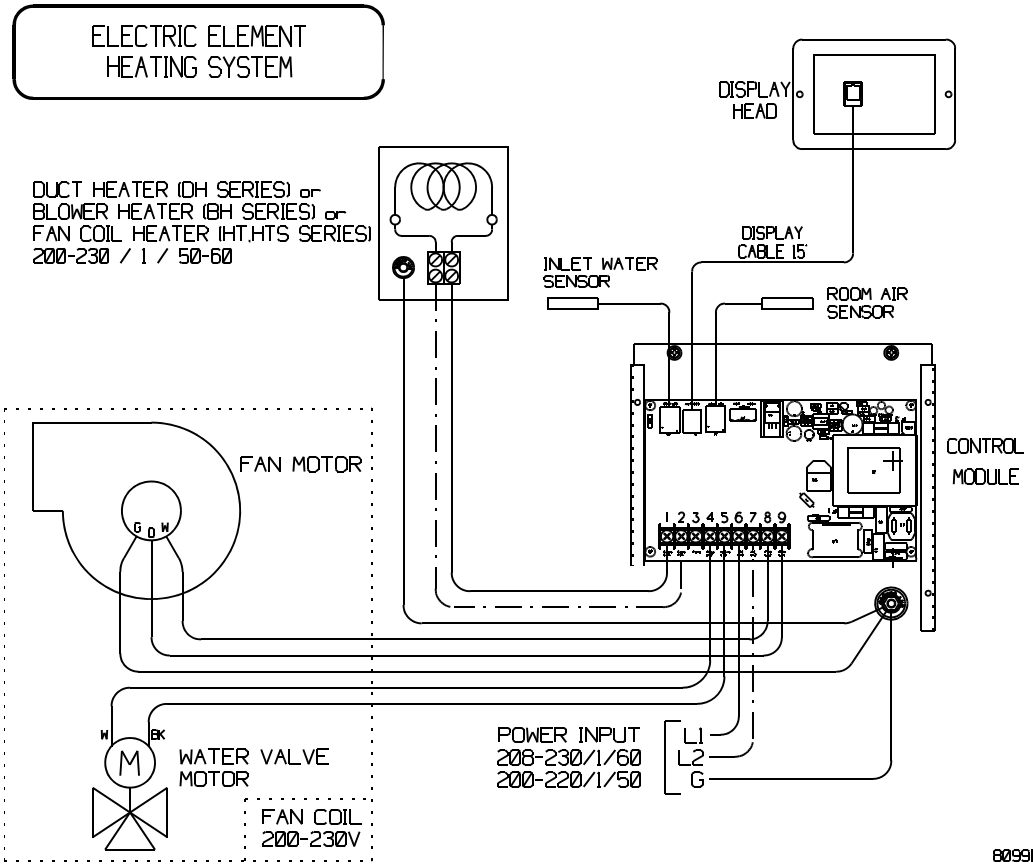


MAXIMUM CIRCUIT RATINGS
WATER VALVE 1/4A
FAN MOTOR 12A
HEATER 12A

TERMINAL BLOCK CONNECTIONS
1. HEATER ELEMENT L1
2. HEATER ELEMENT L2
3. N/A
4. WATER VALVE L2
5. WATER VALVE L1
6. POWER INPUT L1
7. POWER INPUT L2 or N
8. FAN L2
9. FAN L1

80999-SP.GXD

ELECTRIC ELEMENT HEATING SYSTEM



80999P-SP.GXD

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

CHILLWATER FAN COIL AQOHW

FEATURES

- High capacity squirrel cage blower is designed for quiet operation with flexible duct systems.
- Shaded pole motors for quiet operation on variable voltage fan controls
- Unit mounted terminal block for fan motor and water valve
- Three way motorized water valve is pre-installed on the unit. A separate valve assembly is not necessary.
- Dual condensate outlets on the drain pan are factory connected into a common 1/2" hose barb tee for ease of installation.
- Vertically adjustable mounting legs with rubber vibration pads and mounting screws.
- The air bleeder is mounted on the end of a 12" plastic tube for easy access during commissioning of the system.
- All surfaces that might have condensate form on them are covered in 1/8" thick foam insulation.
- A charcoal foam anti-slosh media is placed inside the drain pan to prevent water from splashing out in high seas.
- Units available for 115/1/60, 100/1/50, 208-230/1/60 and 200-220/1/50 power inputs.
- Aqua-Air HTS series blower heaters bolt directly to the discharge of the blower.
- Units can also be supplied in horizontal discharge models (AQOHW-24,36H)

SPECIFICATIONS	AQOHW-24 AQOHW-24H	AQOHW-36 AQOHW-36H
COOLING CAPACITY	24,000 BTU/HR 6,048 KCAL/HR	36,000 BTU/HR 9,072 KCAL/HR
AIR FLOW CAPACITY	800 CFM 1359 M^3H	1200 CFM 2039 M^3H
WEIGHT	64 LBS 29 KGS	66 LBS 30 KGS
AMPERAGE DRAW	6.5 @ 115-1-60 3.2 @ 230-1-60	8.5 @ 115-1-60 4.3 @ 230-1-60
POWER CONSUMPTION	748 W	978 W
MINIMUM RETURN AIR GRILLE SIZE	200 in^2 1290 cm^2	288 in^2 1858 cm^2
MINIMUM SUPPLY AIR GRILLE SIZE	120 in^2 774 cm^2	160 in^2 1032 cm^2
CHILLWATER INLET / OUTLET SIZE	5/8" OD 16 mm OD	5/8" OD 16 mm OD
MAXIMUM DUCT HEATER	4 kW	6 kW

ADD "C" TO THE END OF THE MODEL NUMBER FOR A 208-230/1/60 UNIT, "CK" FOR A 200-220/1/50 UNIT 80945.WPD

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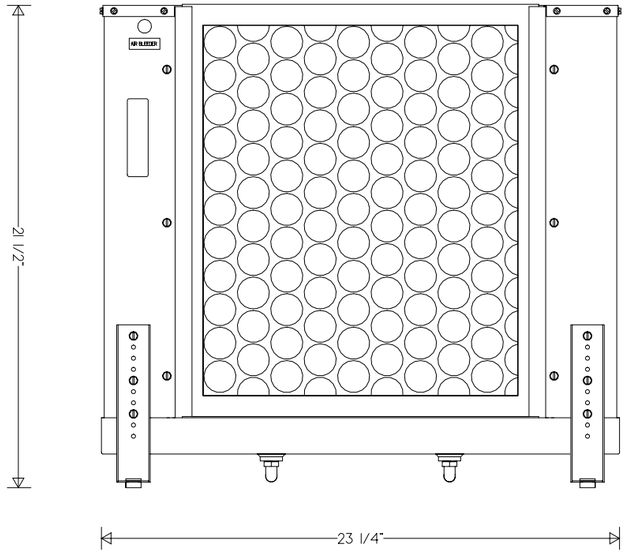
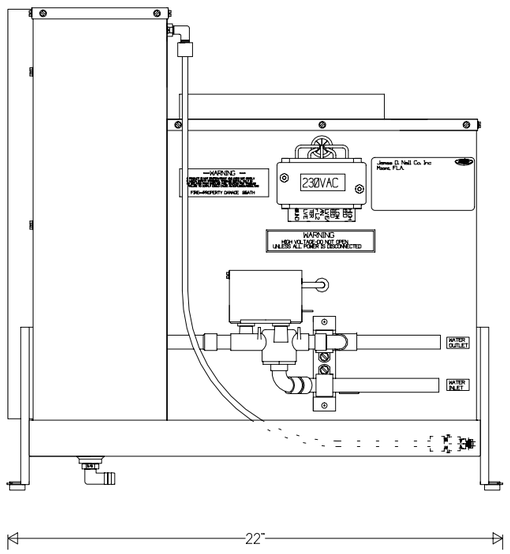
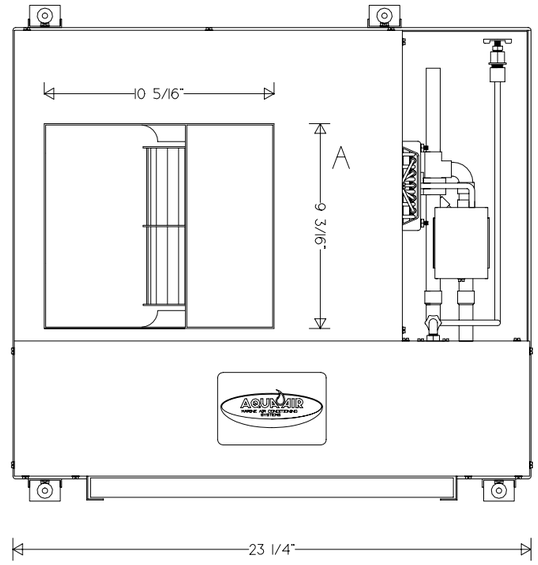
Ph. 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com



FRONT VIEW 24/36

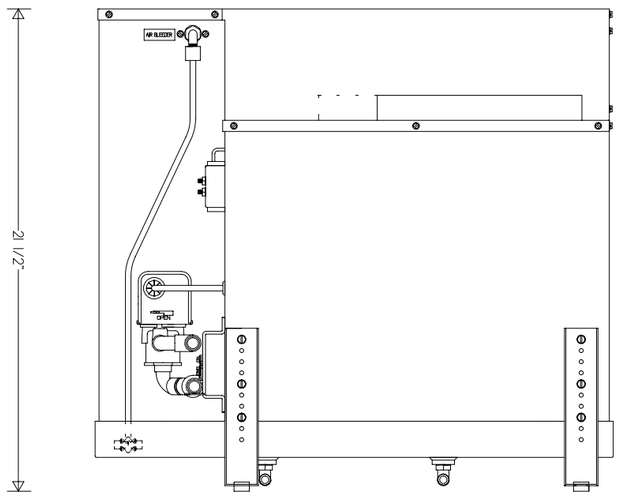


RIGHT VIEW 24

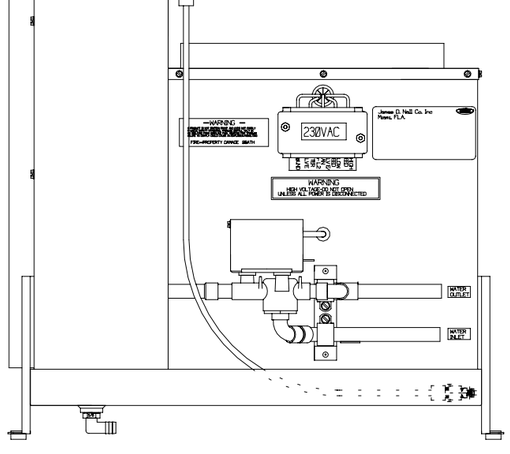


TOP VIEW 24

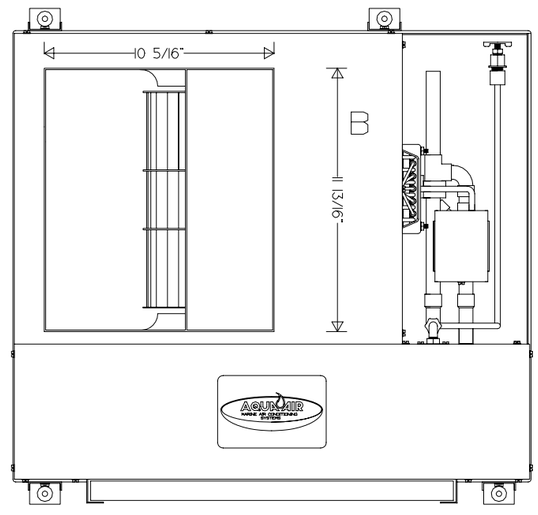
AQOHW-24: A=9-3/16"=9.18mm
AQOHW-36: B=11-13/16"=11.81mm



REAR VIEW 24/36



RIGHT VIEW 36



TOP VIEW 36

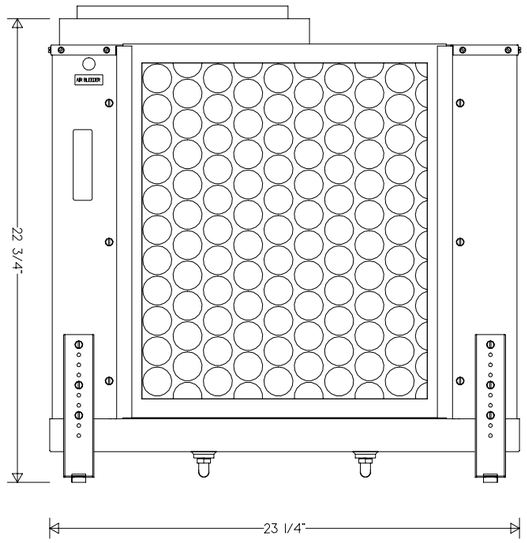
AQUA-AIR MARINE AIR CONDITIONING SYSTEM

AQOHW - 24 & 36
FAN COIL UNITS WITHOUT B. HEATER

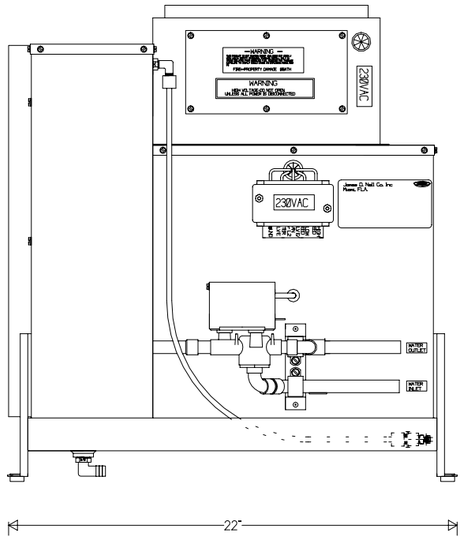
DRAWING NUMBER	DRAWN BY	DATE
AQOCW	LES	09-29-95

SCALE	APPROVED BY	REVISION DATE	REV
NONE			A

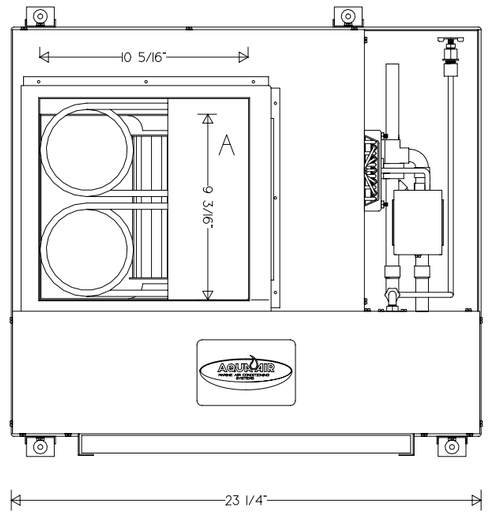
FRONT VIEW 24/36



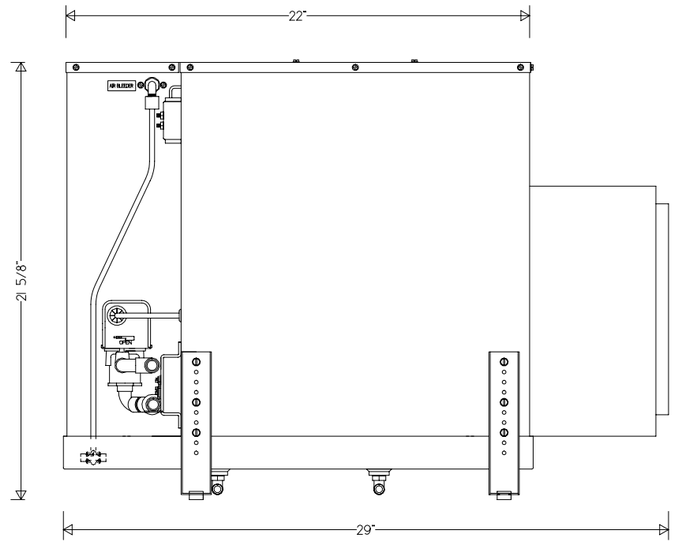
RIGHT VIEW 24



TOP VIEW 24

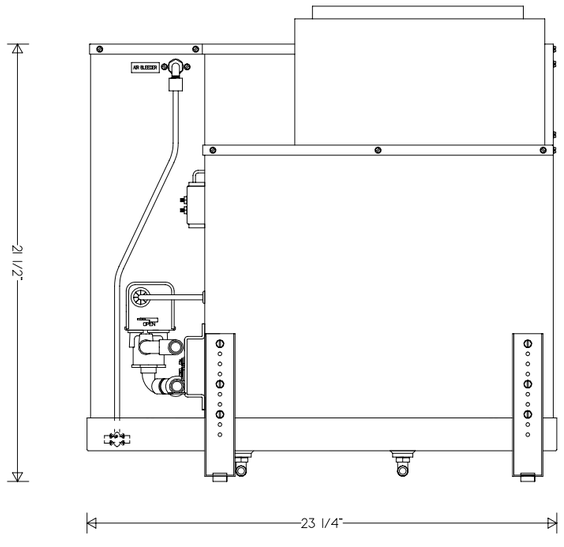


REAR VIEW 24 & 36

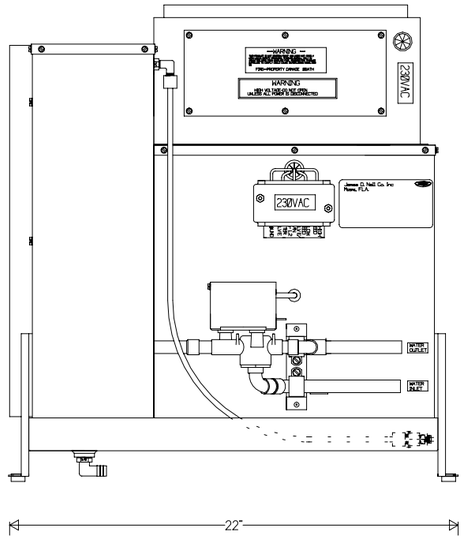


SHOWN BLOWER ROTATED 90
HORIZONTAL DISCHARGE

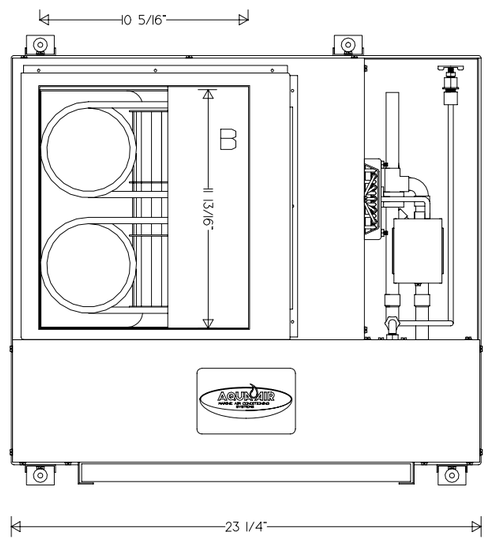
REAR VIEW 24/36



RIGHT VIEW 36



TOP VIEW 36



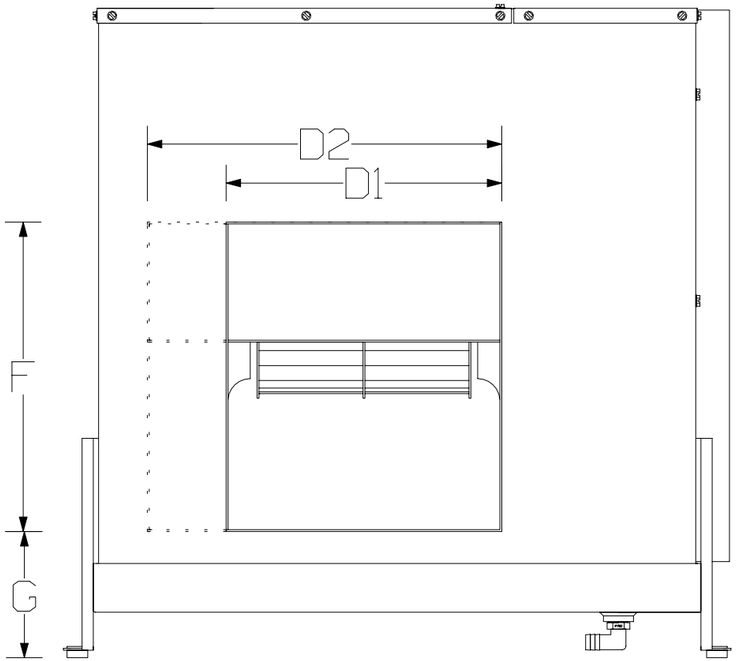
AQOHW-24: A=9-3/16"=9.18mm
AQOHW-36: B=11-13/16"=11.81mm

AQUA-AIR MARINE AIR CONDITIONING SYSTEM

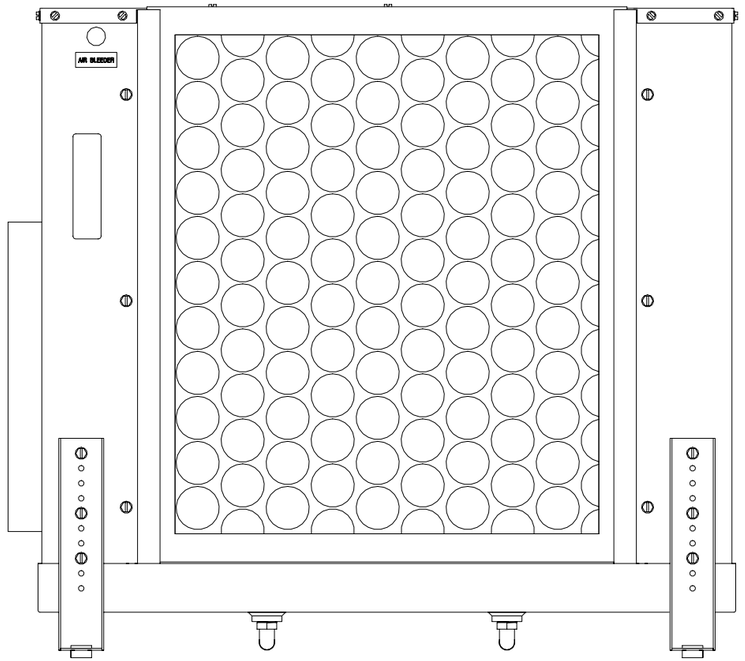
AQOHW - 24 & 36
FAN COIL UNITS WITH BLOWER HEATER

DRAWING NUMBER: AQOHW-BH	DRAWN BY: LES	DATE: 09-29-95	
SCALE: NONE	APPROVED BY:	REVISION DATE: A	REV:

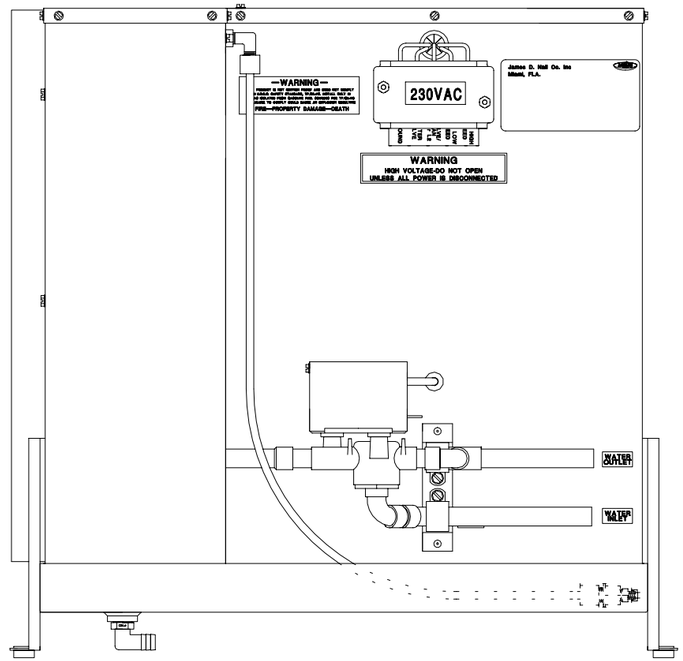
LEFT VIEW



FRONT VIEW



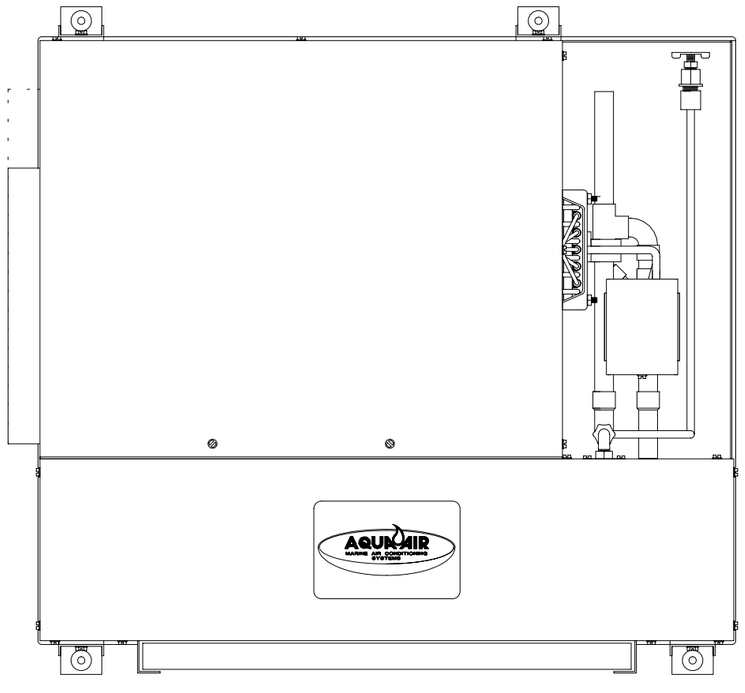
RIGHT VIEW



UNIT DIMENSIONS

A	23-1/4"	591mm	
B	22-1/4"	565mm	
C	21-3/4"	552mm	
D1	9-3/16"	233mm	AQOHW-24H
D2	11-13/16"	300mm	AQOHW-36H
E	7-5/8"	194mm	
F	10-5/16"	262mm	
G	4-3/16"	106mm	
H	1"	25mm	

TOP VIEW



AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

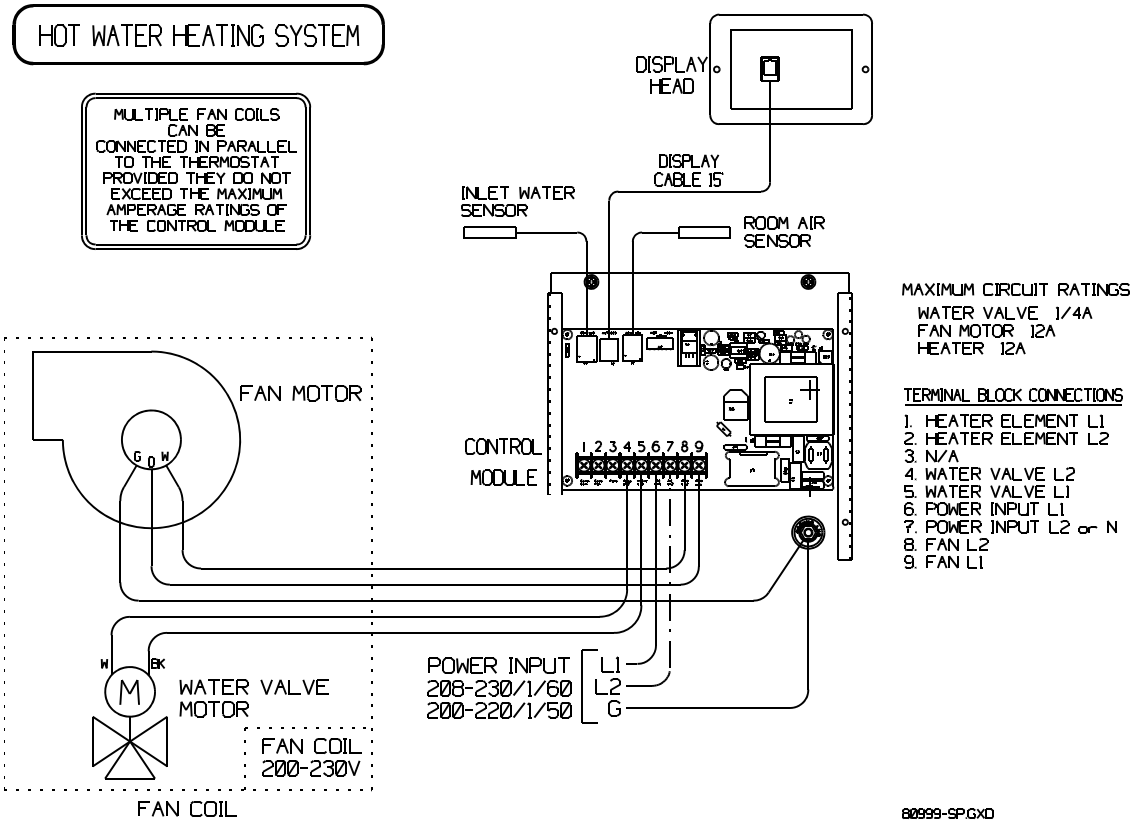
AQOHW-24,36H DIMENSIONAL HORIZONTAL DISCHARGE

DRAWING NUMBER: AQOHW-H	DRAWN BY: DN	DATE: 10-17-94	
SCALE: FULL	APPROVED BY:	REVISION DATE:	REV: A

WIRING SCHEMATICS

HOT WATER HEATING SYSTEM

MULTIPLE FAN COILS CAN BE CONNECTED IN PARALLEL TO THE THERMOSTAT PROVIDED THEY DO NOT EXCEED THE MAXIMUM AMPERAGE RATINGS OF THE CONTROL MODULE

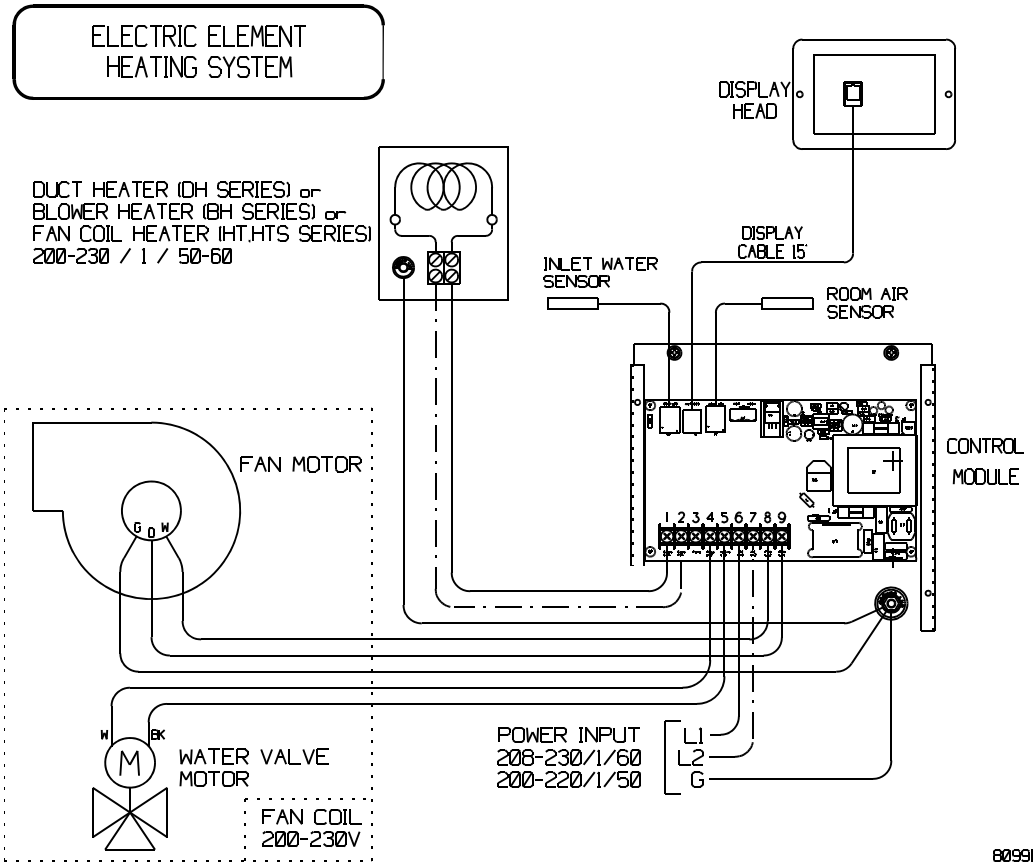


MAXIMUM CIRCUIT RATINGS
WATER VALVE 1/4A
FAN MOTOR 12A
HEATER 12A

TERMINAL BLOCK CONNECTIONS
1. HEATER ELEMENT L1
2. HEATER ELEMENT L2
3. N/A
4. WATER VALVE L2
5. WATER VALVE L1
6. POWER INPUT L1
7. POWER INPUT L2 or N
8. FAN L2
9. FAN L1

80999-SP.GXD

ELECTRIC ELEMENT HEATING SYSTEM



80999P-SP.GXD

AQUA-AIR
MARINE AIR CONDITIONING SYSTEMS

CHILLWATER FAN COIL AQBHW

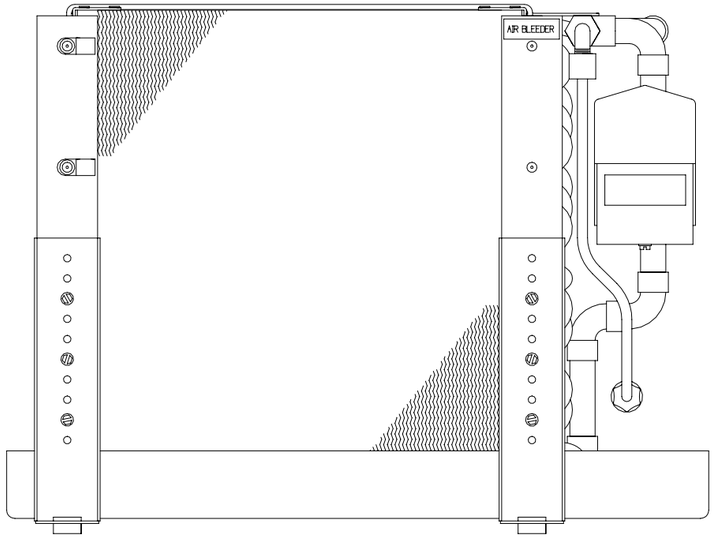
FEATURES

- High capacity squirrel cage blower is designed for quiet operation with flexible duct systems.
- Shaded pole blower motor for quiet operation on variable voltage fan speed controls
- Three way motorized water valve is pre-installed on the unit. A separate valve assembly is not necessary.
- Dual condensate outlets on the drain pan are factory connected into a common 1/2" hose barb tee for ease of installation.
- Vertically adjustable mounting legs with rubber vibration pads and mounting screws.
- The air bleeder is mounted on the end of a 12" plastic tube for easy access during commissioning of the system.
- All surfaces that might have condensate form on them are covered in 1/8" thick foam insulation.
- Units available for 115/1/60, 100/1/50, 208-230/1/60 and 200-220/1/50 power inputs.
- Aqua-Air BH series blower heaters bolt directly to the discharge of the blower.

SPECIFICATIONS	AQBHW-12	AQBHW-16
COOLING CAPACITY	12,000 BTU/HR 3,024 KCAL/HR	16,000 BTU/HR 4,032 KCAL/HR
AIR FLOW CAPACITY	400 CFM 680 M^3H	530 CFM 900 M^3H
WEIGHT	23 LBS 10.5 KGS	23 LBS 10.5 KGS
AMPERAGE DRAW	2.9 @ 115-1-60 1.5 @ 230-1-60	2.9 @ 115-1-60 1.5 @ 230-1-60
POWER CONSUMPTION	334 W	334 W
MINIMUM RETURN AIR GRILLE SIZE	120 in^2 774 cm^2	144 in^2 929 cm^2
MINIMUM SUPPLY AIR GRILLE SIZE	144 in^2 929 cm^2	144 in^2 929 cm^2
CHILLWATER INLET / OUTLET SIZE	5/8" OD 16 mm OD	5/8" OD 16 mm OD
MAXIMUM DUCT HEATER	2 Kw	3Kw

ADD "C" TO THE END OF THE MODEL NUMBER FOR A 208-230/1/60 UNIT, "CK" FOR A 200-220/1/50 UNIT 80910.WPD

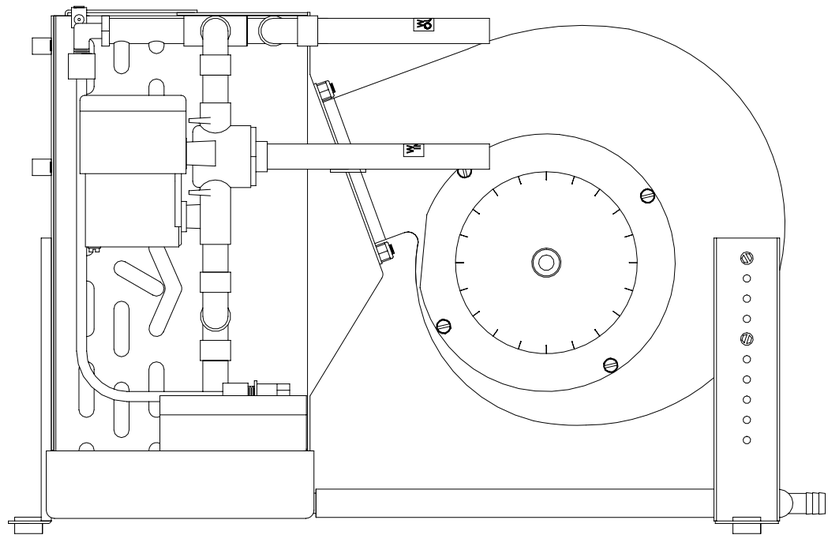
AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com



13-1/8"
333mm

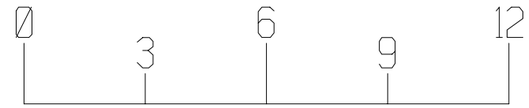
17-3/8"
442mm

FRONT VIEW

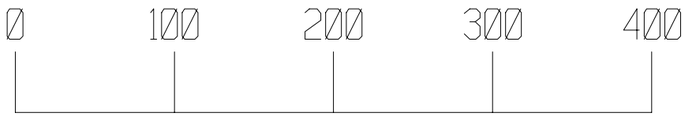


19-1/4"
489mm

LEFT VIEW

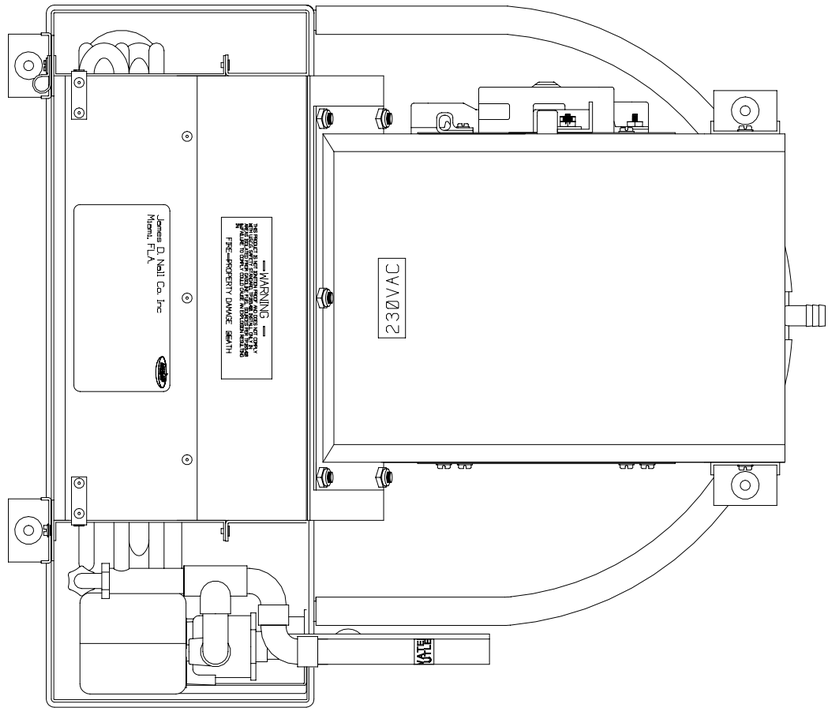


SCALE - INCHES



SCALE - MILLIMETERS

TOP VIEW



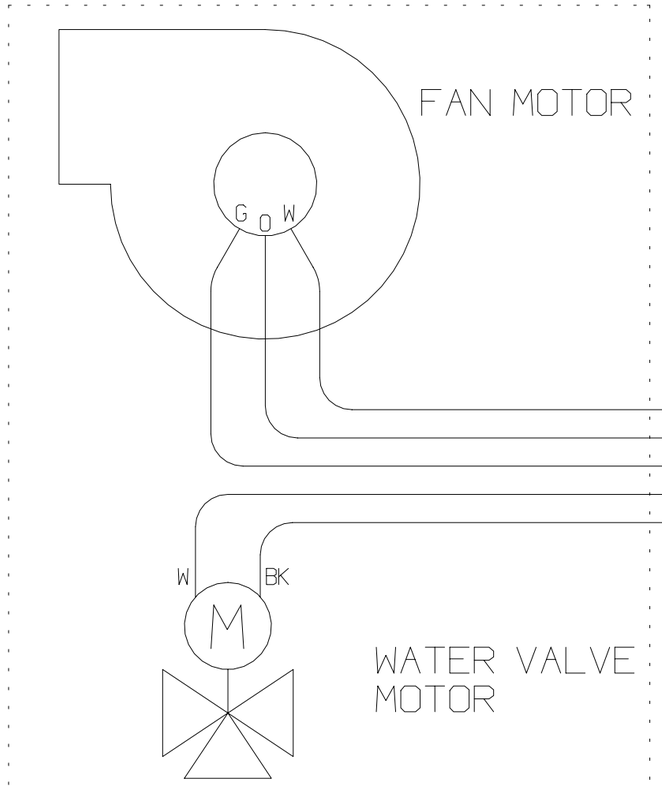
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

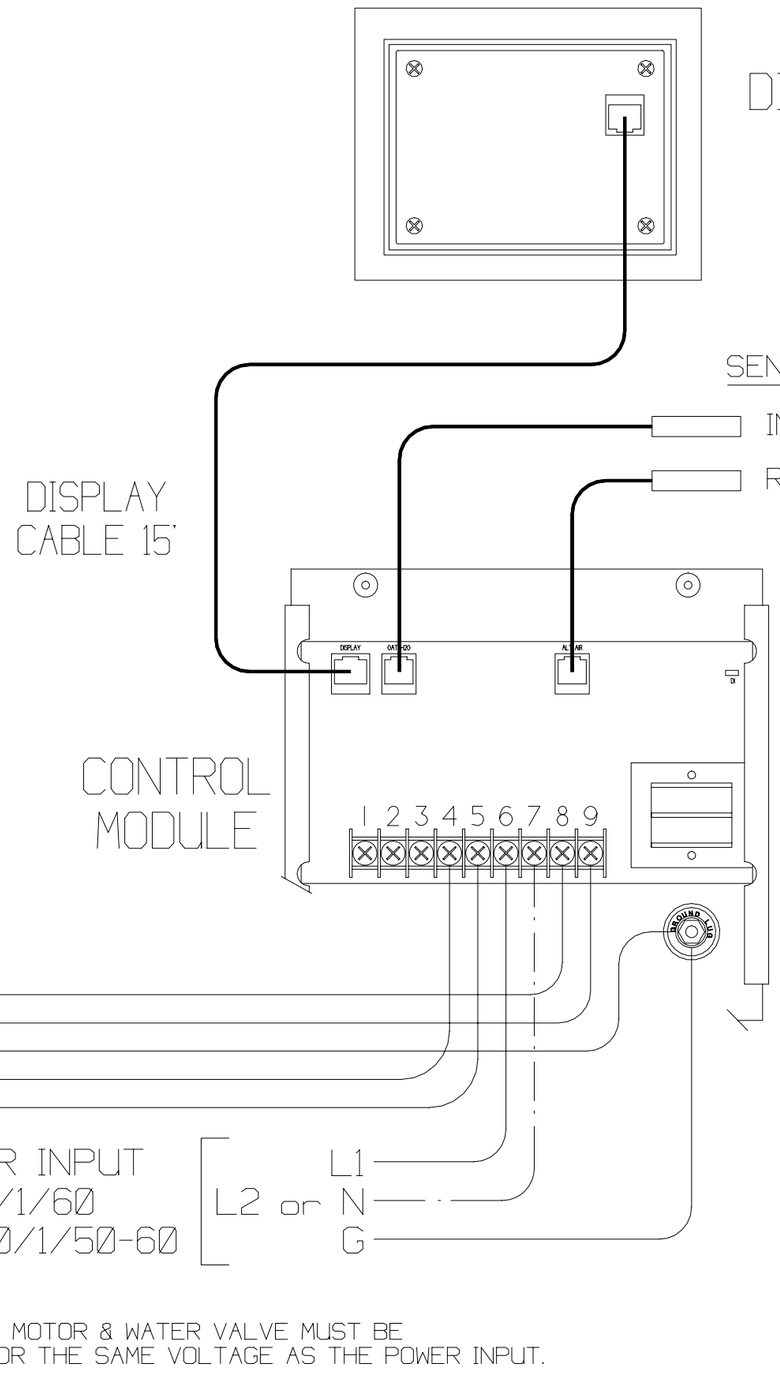
AQBHW SERIES CHILLWATER FAN COIL

DRAWING NUMBER	DRAWN BY	DATE
AQBHW	LES	10-13-95

SCALE	APPROVED BY	REVISION DATE	REV
		09-19-96	B

MULTIPLE FAN COILS
CAN BE
CONNECTED IN PARALLEL
TO THE THERMOSTAT
PROVIDED THEY DO NOT
EXCEED THE MAXIMUM
AMPERAGE RATINGS OF
THE CONTROL MODULE





NOTE: FAN COIL MOTOR & WATER VALVE MUST BE
RATED FOR THE SAME VOLTAGE AS THE POWER INPUT.

INLET WATER SENSOR NOTE

ATTACH SENSOR TO THE
WATER INLET LINE AT
FAN COIL WATER VALVE

MAXIMUM CIRCUIT RATINGS

WATER VALVE 1/4A
FAN MOTOR 6A
HEATER 20A

TERMINAL BLOCK CONNECTIONS

1. HEATER ELEMENT L1
2. HEATER ELEMENT L2
3. N/A
4. WATER VALVE L2
5. WATER VALVE L1
6. POWER INPUT L1
7. POWER INPUT L2 or N
8. FAN L2
9. FAN L1

NOTE: ALL L2's ARE COMMON
TO EACH OTHER

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

TW2W DIGITAL THERMOSTAT w/ SINGLE
AQBHW Series STYLE FAN COIL 115 or 230V
COOLING ONLY or with HOT WATER HEAT

DRAWING NUMBER	DRAWN BY	DATE
4008-34B	DN	991026

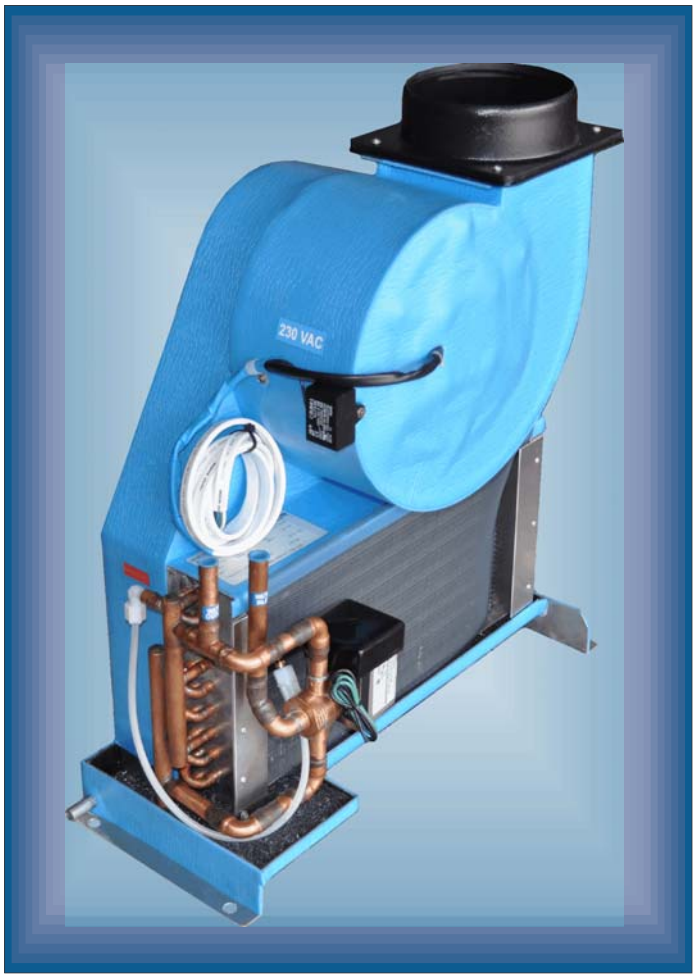
SCALE	APPROVED BY	REVISION DATE	REV
NONE			A

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

CHILLWATER FAN COIL DTV

FEATURES

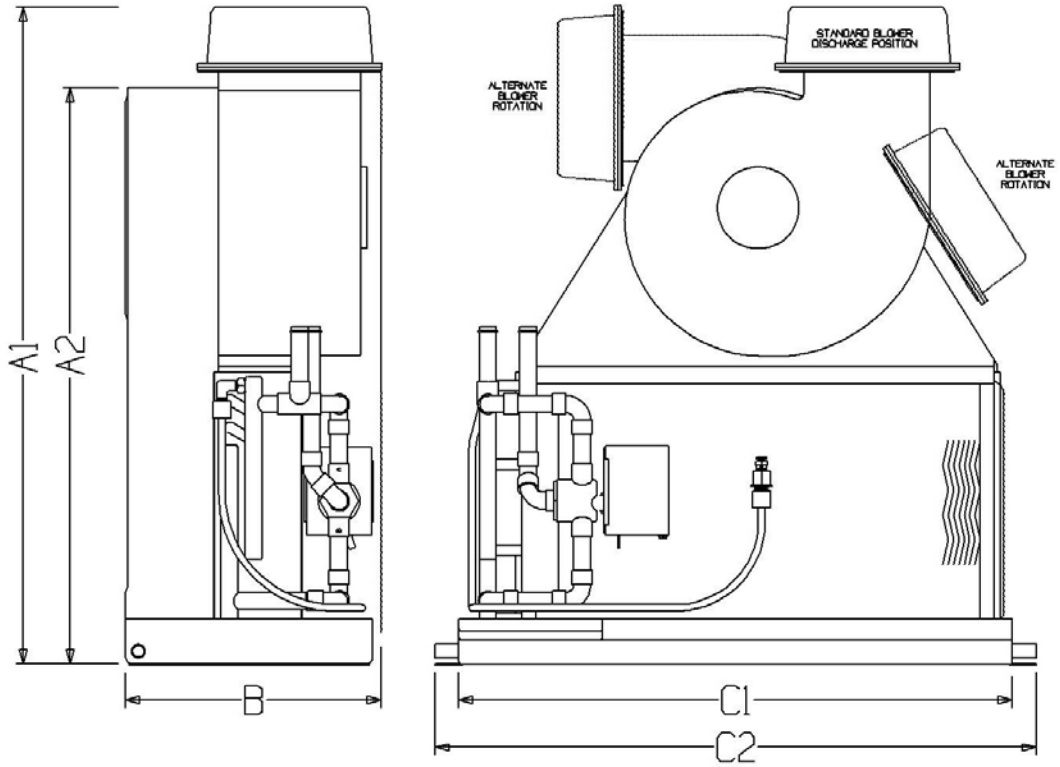
- ❏ High static motorized impeller blower is designed for quiet operation with flexible duct systems.
- ❏ Narrow depth excellent for shallow depth sidewall areas
- ❏ Blower is easily rotated 180° for left, right and vertical discharge
- ❏ Flexible duct connector installed on the unit. This connector also adapts to Aqua-Air AT series adapter duct tees.
- ❏ Three way motorized water valve is pre-installed on the unit.
- ❏ Mounting legs with rubber vibration pads and mounting screws.
- ❏ The air bleeder is mounted on the end of a 12" plastic tube for easy access during commissioning of the system.
- ❏ All surfaces that might have condensate form on them are covered in 1/8" thick foam insulation.



AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 sales@aquaair.com
www.aquaair.com

SPECIFICATIONS	DTV-12	DTV-16	DTV-36
COOLING CAPACITY	12,000 BTU/HR 3,024 KCAL/HR	16,000 BTU/HR 4,032 KCAL/HR	36,000 BTU/HR 9,072 KCAL/HR
AIR FLOW CAPACITY	400 CFM 680 M^3H	530 CFM 900 M^3H	800 CFM 1,360 M^3H
WEIGHT	32 LBS 14.5 KGS	35 LBS 15.9 KGS	45 LBS 20.5 KGS
AMPERAGE DRAW	1.2 @ 115-1-60 0.9 @ 230-1-60	1.9 @ 115-1-60 0.95 @ 230-1-60	0.96 @ 230-1-60
POWER CONSUMPTION	135 W	200 W	216 W
MINIMUM RETURN AIR GRILLE SIZE	120 in^2 774 cm^2	144 in^2 929 cm^2	288 in^2 1858 cm^2
MINIMUM SUPPLY AIR GRILLE SIZE	60 in^2 387 cm^2	72 in^2 465 cm^2	160 in^2 1,032 cm^2
FLEX DUCT CONNECTOR	6" / 150mm	6" / 150mm	7" / 178mm
CHILLWATER INLET / OUTLET SIZE	5/8" OD 16 mm OD	5/8" OD 16 mm OD	7/8" OD 22 mm OD
MAXIMUM DUCT HEATER	2 Kw	2 Kw	3 Kw
A1	24" / 610mm	25-3/4" / 654mm	38" / 965mm
A2	21" / 533mm	23-1/4" / 591mm	35-1/2" / 902mm
B	9-3/8" / 238mm	9-3/8" / 238mm	11-3/4" / 299mm
C1	20-1/4" / 514mm	20-1/4" / 514mm	23-3/4" / 604mm
C2	22" / 559mm	22" / 559mm	26-1/2" / 673mm

ADD "C" TO THE END OF THE MODEL NUMBER FOR A 208-230/1/50-60 UNIT



AQUA-AIR
MARINE AIR CONDITIONING SYSTEMS

CHILLWATER FAN COIL AQBVW

FEATURES

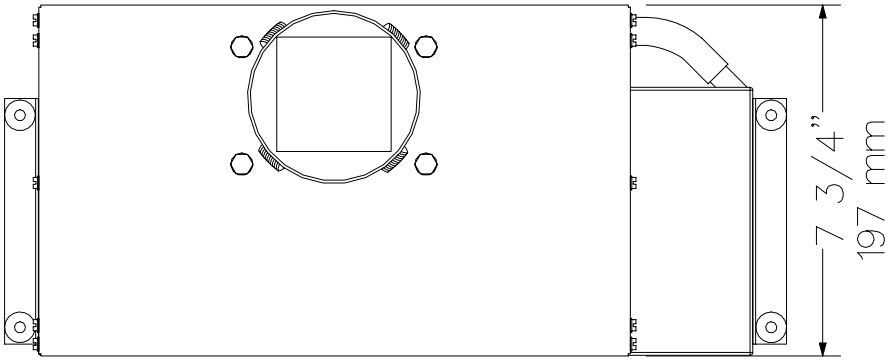
- High capacity squirrel cage blower is designed for quiet operation with flexible duct systems.
- Blower discharge is easily rotated from the top to the front or rear of the unit
- Shaded pole blower motor for quiet operation on variable voltage fan speed controls
- Standard 4" flexible duct connector installed on the unit. This connector also adapts to Aqua-Air AT series adapter duct tees.
- Three way motorized water valve is pre-installed on the unit. A separate valve assembly is not necessary.
- Dual condensate outlets on the drain pan are factory connected into a common 1/2" hose barb tee for ease of installation.
- Four vibration isolation mounting points, two per side.
- The air bleeder is mounted on the end of a 12" plastic tube for easy access during commissioning of the system.
- All surfaces that might have condensate form on them are covered in 1/8" thick foam insulation.
- Units available for 115/1/60, 100/1/50, 208-230/1/60 and 200-220/1/50 power inputs.

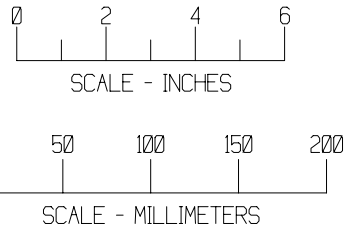
SPECIFICATIONS	
COOLING CAPACITY	3,000 BTU/HR 756 KCAL/HR
AIR FLOW CAPACITY	100 CFM 170 M^3H
WEIGHT	20 LBS 9.1 KGS
AMPERAGE DRAW	1.02 @ 115-1-60 0.51 @ 230-1-60
POWER CONSUMPTION	80 W
MINIMUM RETURN AIR GRILLE SIZE	40 in^2 260 cm^2
MINIMUM SUPPLY AIR GRILLE SIZE	15 in^2 100 cm^2
CHILLWATER INLET / OUTLET SIZE	1/2" FPT
MAXIMUM DUCT HEATER	1 Kw

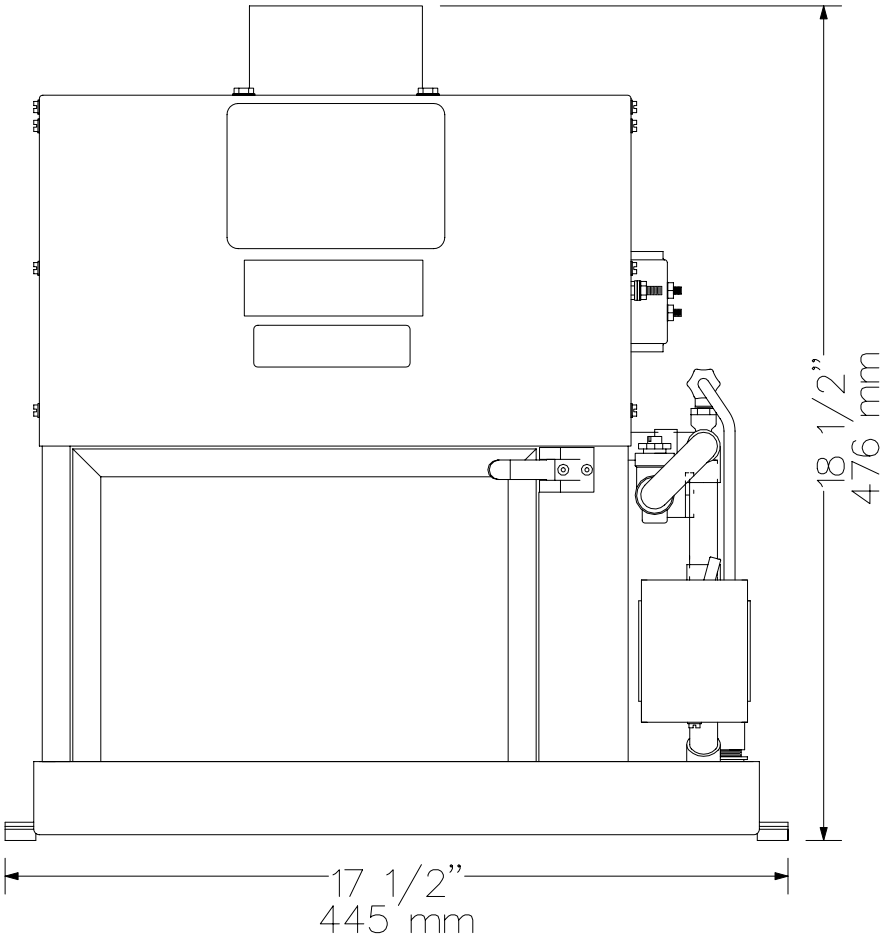
ADD "C" TO THE END OF THE MODEL NUMBER FOR A 208-230/1/60 UNIT, "CK" FOR A 200-220/1/50 UNIT

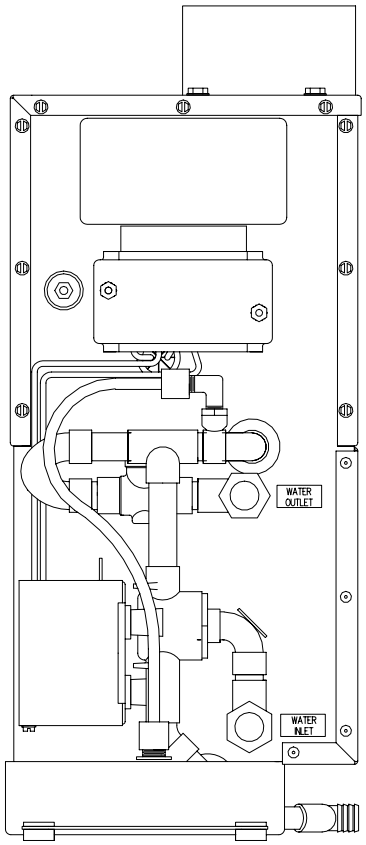
80915.WPD

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com







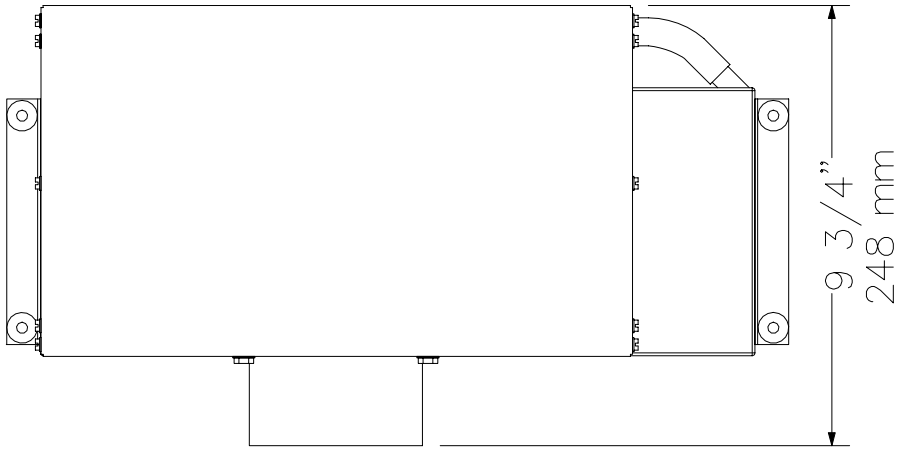


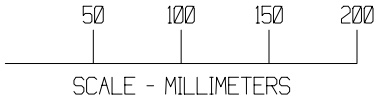
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

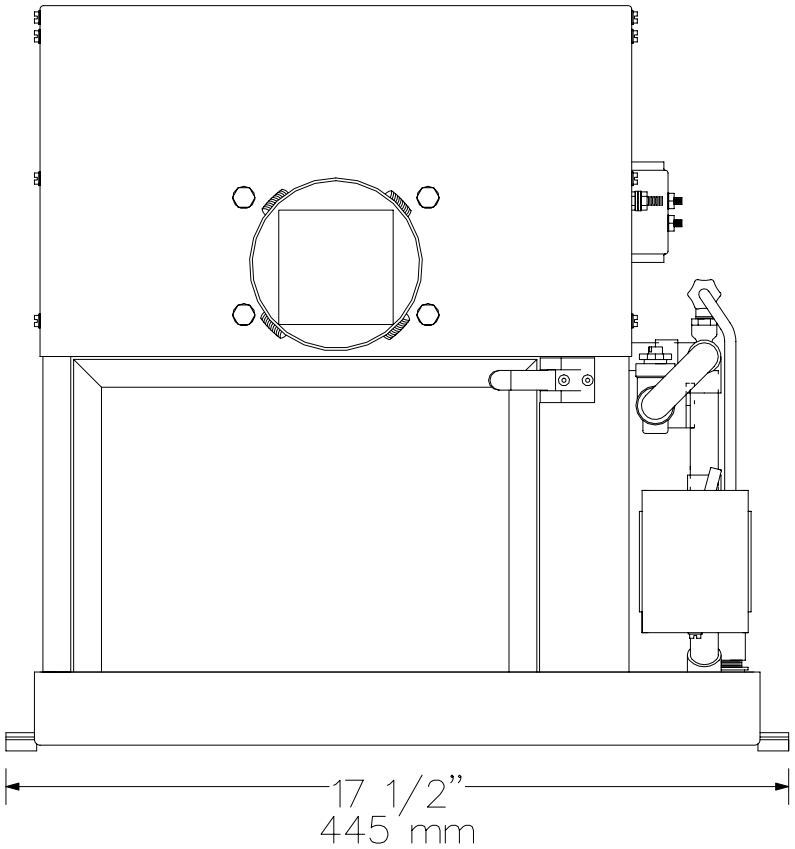
AQBVW-01 FAN COIL
TOP DISCHARGE CONFIGURATION

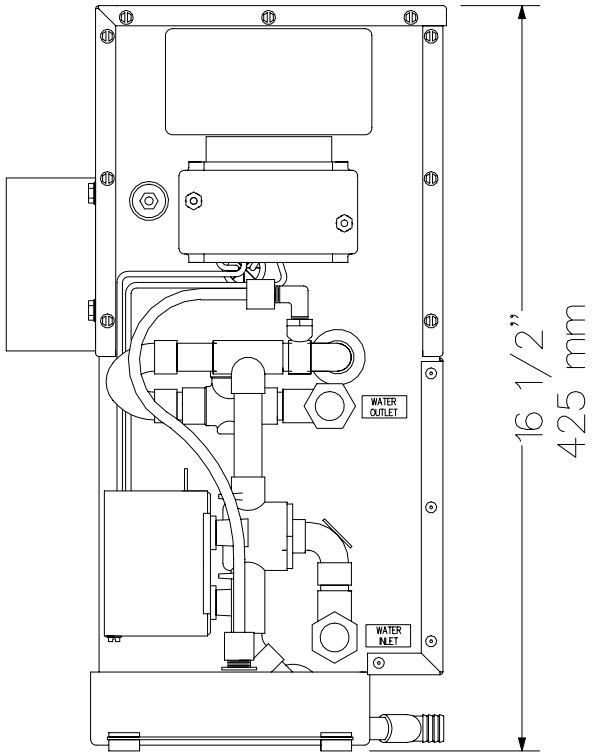
DRAWING NUMBER	DRAWN BY	DATE
AQBVW-01a	DN	4-01

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A





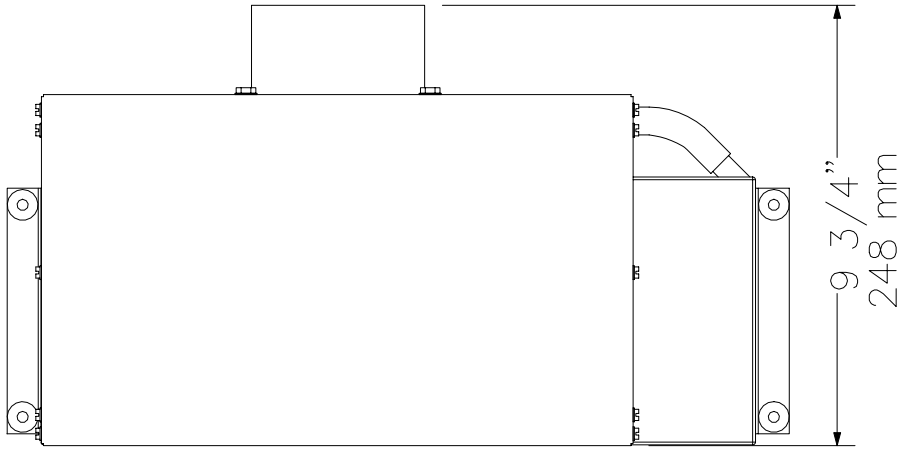


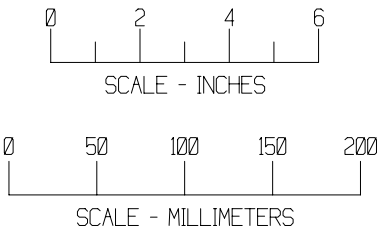


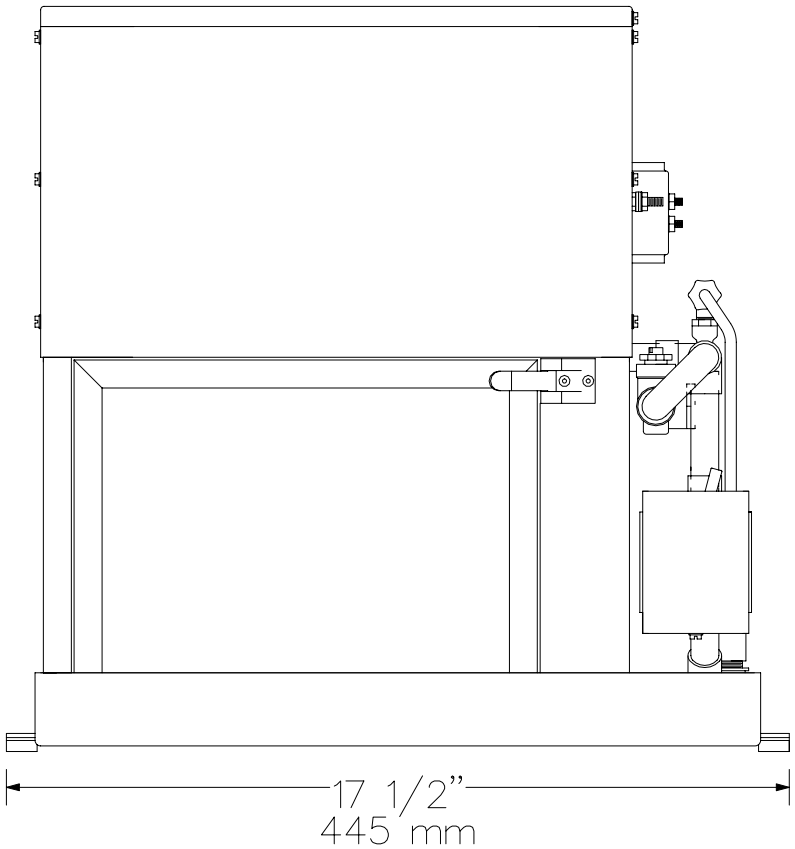
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

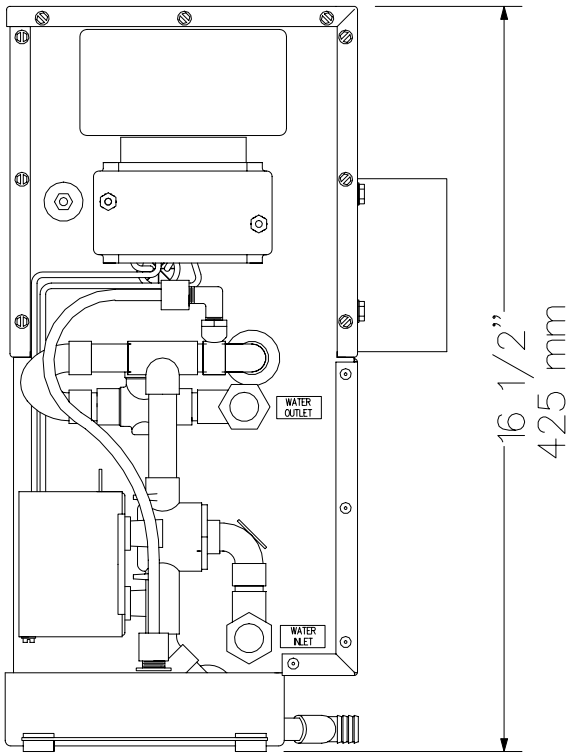
AQBVW-01 FAN COIL
FRONT DISCHARGE CONFIGURATION

DRAWING NUMBER	DRAWN BY	DATE	SCALE	APPROVED BY	REVISION DATE	REV
AQBVW-016	DN	4-01	FULL			A







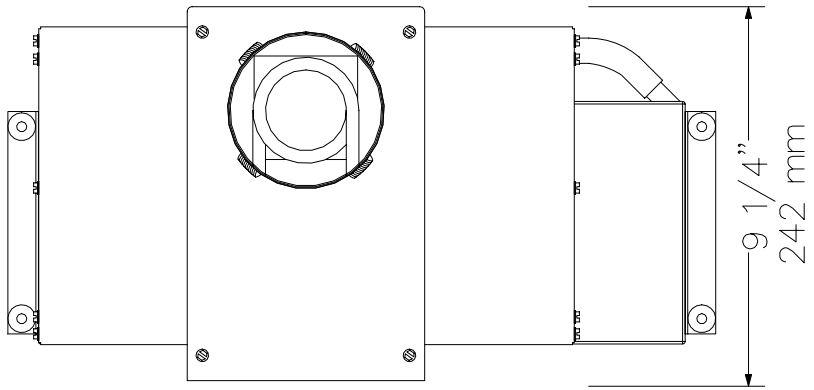


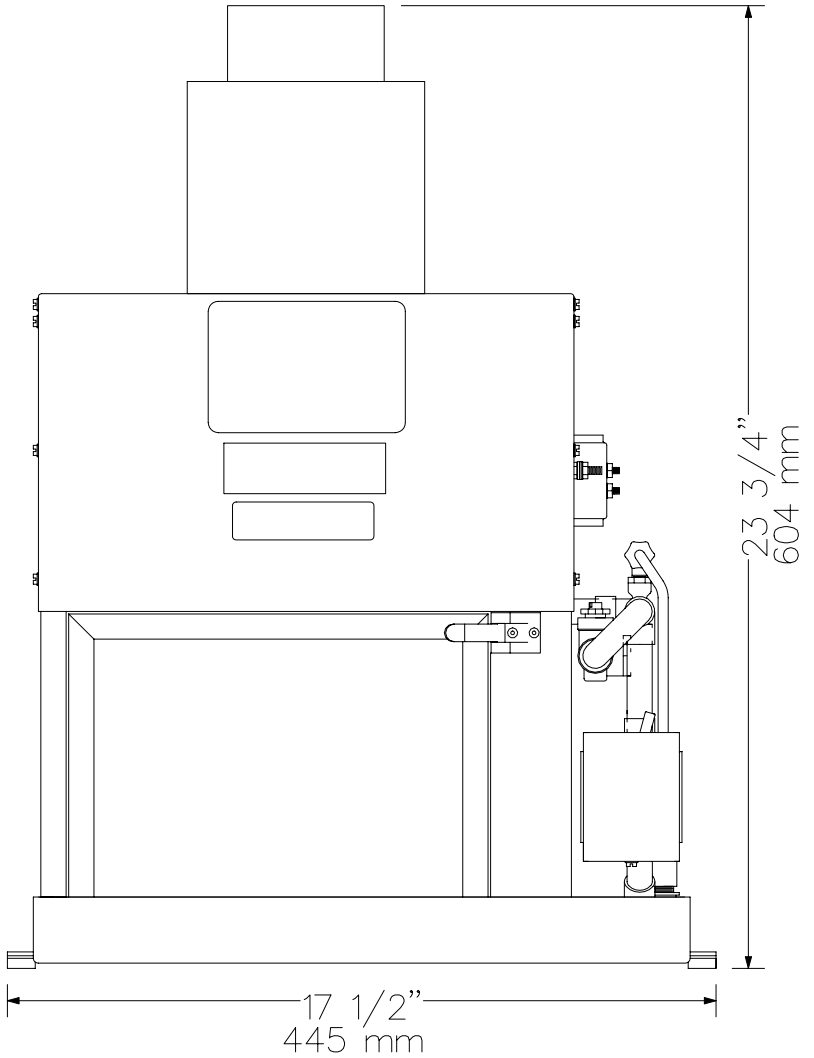
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

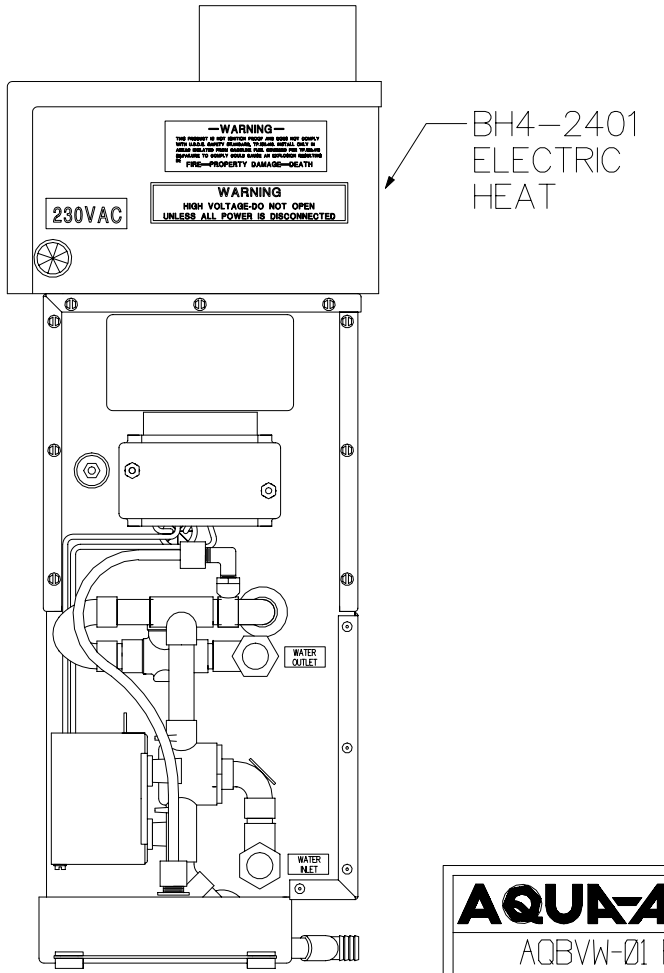
AQBVW-01 FAN COIL
REAR DISCHARGE CONFIGURATION

DRAWING NUMBER	DRAWN BY	DATE
AQBVW-01c	DN	4-01

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A







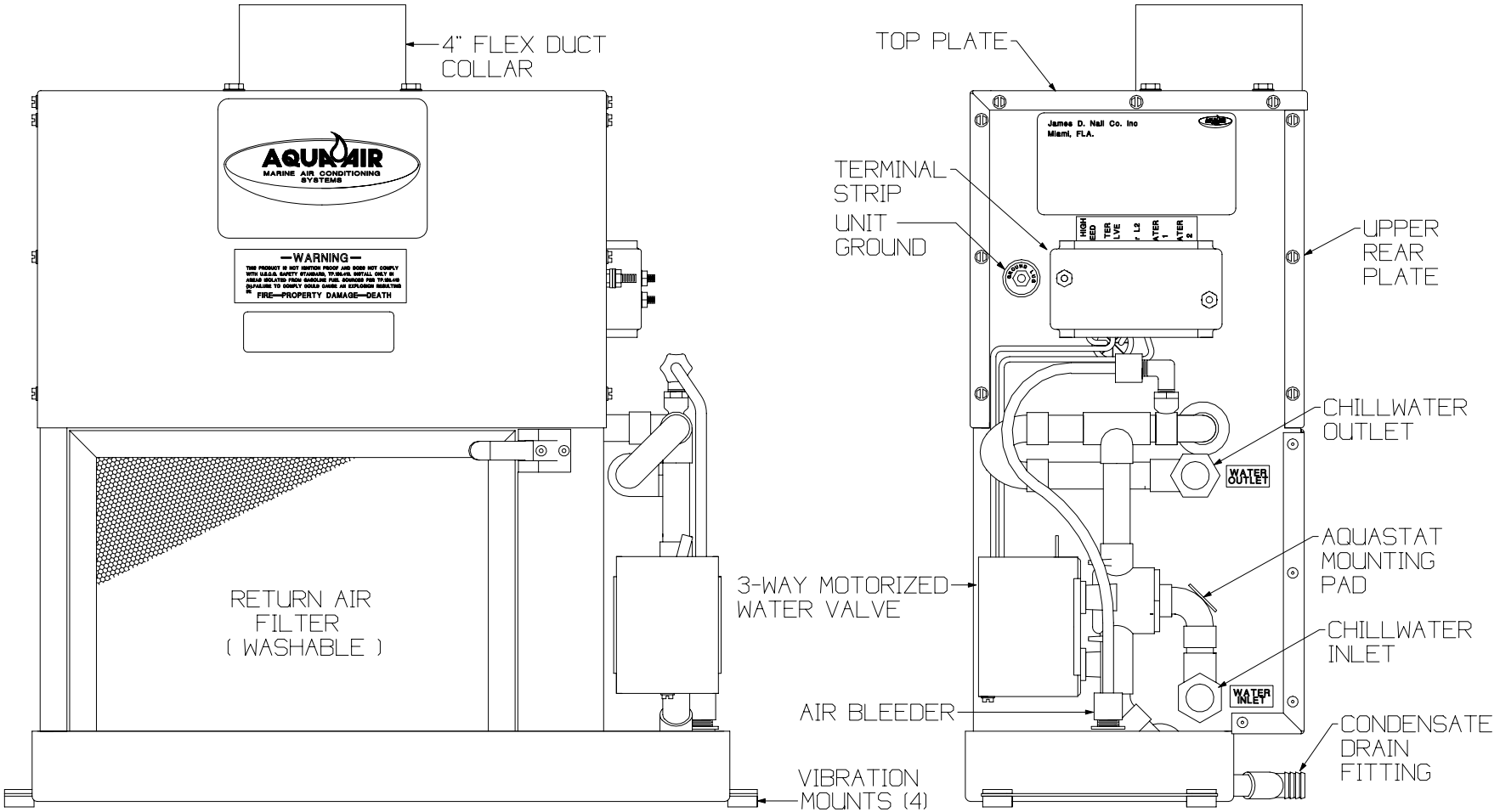
BH4–2401
ELECTRIC
HEAT

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

AQBVW-01 FAN COIL w/ BH4-2401
SERIES ELECTRIC HEAT

DRAWING NUMBER	DRAWN BY	DATE
AQBVW-01d	DN	4-01

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A



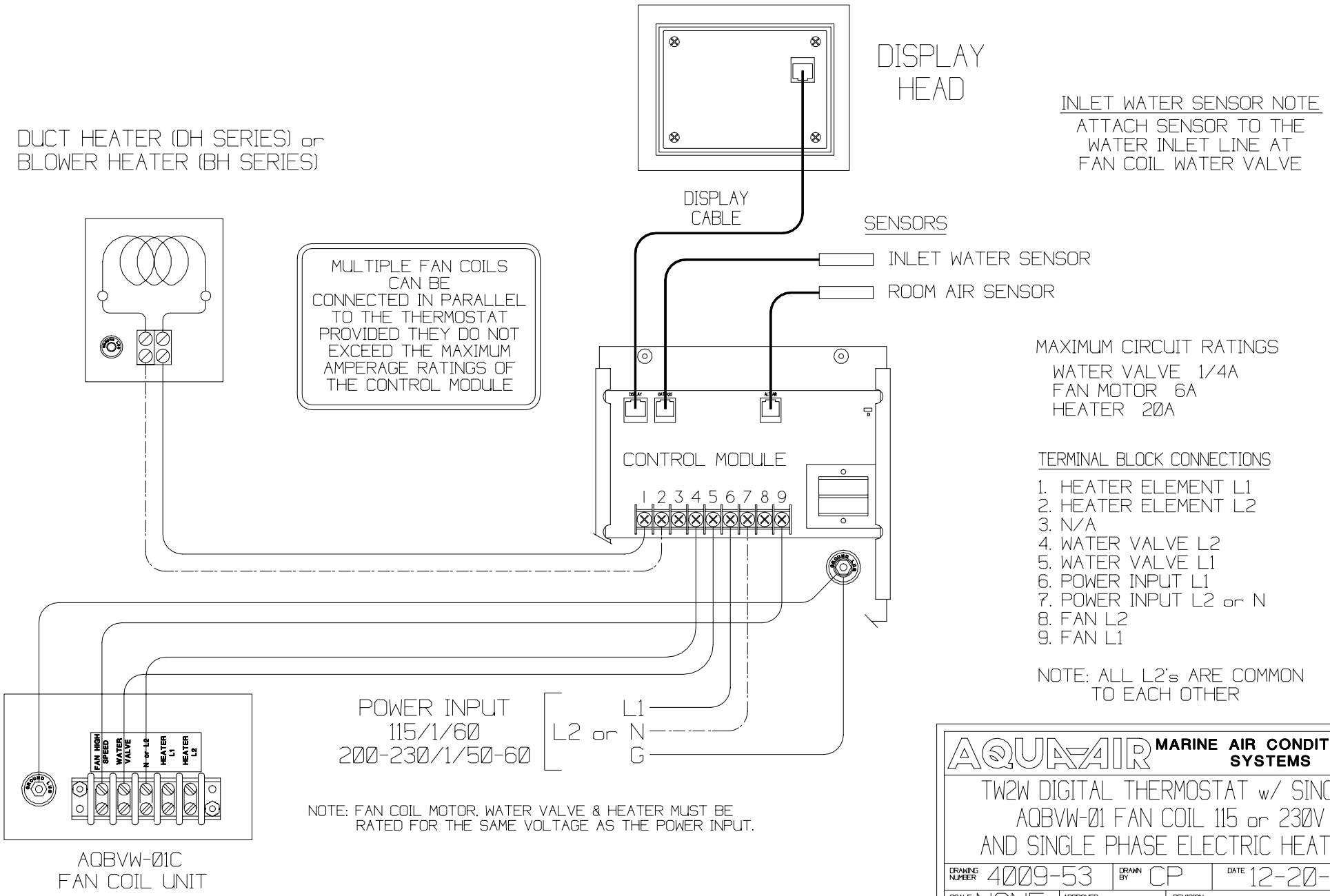
SPARE PARTS

110526-08	DRAIN FITTING TEE 1/2"
201213-00	FAN MOTOR/BLOWER ASSEMBLY 115V
201213-01	FAN MOTOR/BLOWER ASSEMBLY 230V
203507-00	MOTORIZED WATER VALVE BLACK CAP
207828-00	RETURN AIR FILTER, ALUMINUM
212606-00	MOTORIZED WATER VALVE MOTOR 115V
212608-00	MOTORIZED WATER VALVE MOTOR 230V
216080-03	AIR BLEEDER VALVE
220206-00	VIBRATION MOUNT, RUBBER
223519-10	VALVE MOTOR POP-TOP ASSEMBLY 115V
223519-20	VALVE MOTOR POP-TOP ASSEMBLY 230V
CCA-BVW-01	COIL ASSEMBLY, LESS VALVE
VA-04	WATER VALVE ASSEMBLY 115V
VA-04C	WATER VALVE ASSEMBLY 230V

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

AQBVW-01 SPARE PARTS LIST

DRAWING NUMBER 80915	DRAWN BY DN	DATE 4-01	
SCALE NONE	APPROVED BY	REVISION DATE	REV A



DUCT HEATER (DH SERIES) or
BLOWER HEATER (BH SERIES)

MULTIPLE FAN COILS CAN BE CONNECTED IN PARALLEL TO THE THERMOSTAT PROVIDED THEY DO NOT EXCEED THE MAXIMUM AMPERAGE RATINGS OF THE CONTROL MODULE

NOTE: FAN COIL MOTOR, WATER VALVE & HEATER MUST BE RATED FOR THE SAME VOLTAGE AS THE POWER INPUT.

INLET WATER SENSOR NOTE

ATTACH SENSOR TO THE WATER INLET LINE AT FAN COIL WATER VALVE

MAXIMUM CIRCUIT RATINGS

WATER VALVE 1/4A
FAN MOTOR 6A
HEATER 20A

TERMINAL BLOCK CONNECTIONS

1. HEATER ELEMENT L1
2. HEATER ELEMENT L2
3. N/A
4. WATER VALVE L2
5. WATER VALVE L1
6. POWER INPUT L1
7. POWER INPUT L2 or N
8. FAN L2
9. FAN L1

NOTE: ALL L2's ARE COMMON TO EACH OTHER

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

TW2W DIGITAL THERMOSTAT w/ SINGLE AQBVW-01 FAN COIL 115 or 230V AND SINGLE PHASE ELECTRIC HEATER

DRAWING NUMBER	DRAWN BY	DATE
4009-53	CP	12-20-99

SCALE	APPROVED BY	REVISION DATE	REV
NONE			A

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

CHILLWATER FAN COIL AQH, AQP and AQV

FEATURES

- Seven models to choose from ranging in size from 6,000 to 32,800 BTUH
- Units are constructed of corrosion resistant aluminum, stainless steel and ABS plastic
- 1050 RPM motors for quiet operation
- Panels insulated internally to prevent external condensation
- Field conversion of units from vertical to horizontal configuration (or vice versa) is possible through the use of interchangeable panel construction
- Washable return air filter is standard on the AQP and AQV series fan coils
- Optional internally mounted incoloy rod type heating elements available for either single or three phase input
- Three-way motorized water valve is standard and can be field mounted on either side of the fan coil
- Insulated and internally coated stainless steel drain pan with anti-slosh foam media inside
- Condensate outlets on both sides of the fan coil
- Fresh air makeup connection is standard on the AQP and AQV units
- ABS blower housings with aluminum impellers
- Adjustable mounting legs with rubber vibration pads and mounting screws.
- Supply duct mounted air bleeder for easy commissioning
- Units available for 115/1/60, 100/1/50, 208-230/1/60 and 200-220/1/50 power inputs.
- All unit coil assemblies are pressure tested to assure leak-proof performance
- All fan motors are test run to assure proper operation and air flow output

I:\wordpfct\80930.wpd

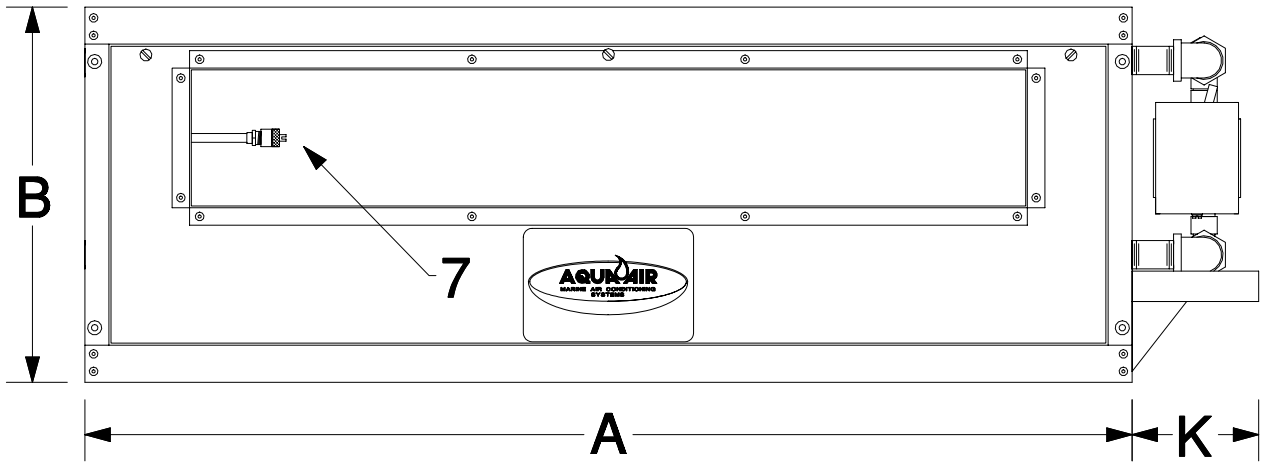
AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549

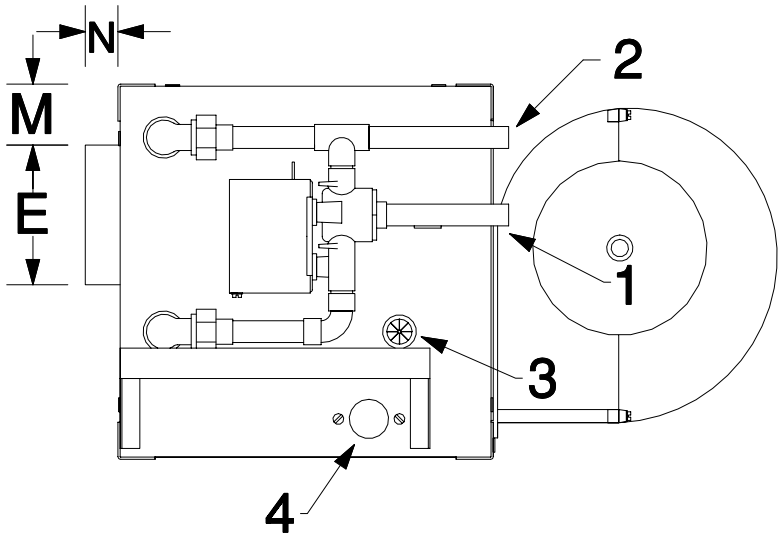
Fan Coil Specifications

Unit Size		2	3	4	6	8	10	12
Cooling Capacity	**BTU/HR** **KCAL/HR**	6,000 1,512	9,000 2,268	12,100 3,049	17,300 4,360	22,600 5,695	27,500 6,930	32,800 8,266
Air Flow Capacity	**CFM** **M^3H**	200 340	300 510	400 680	600 1,020	800 1,360	1,000 1,700	1,200 2,040
Fan Amperage	**115v** **230v**	2.70 1.35	2.70 1.35	2.70 1.35	2.70 1.35	5.40 2.70	5.40 2.70	5.40 2.70
Fan Wattage	**W**	311	311	311	311	621	621	621
Required Chillwater Flow	**GPM** **LPM**	1.2 4.5	1.8 6.8	2.4 9.1	3.6 13.6	4.8 18.2	6.0 22.7	7.2 27.3
Pressure Drop	**Ft/H_2O** **kPa**	2.10 6.28	5.00 14.95	3.70 11.06	6.20 18.54	8.50 25.42	11.40 34.09	17.0 50.83
Maximum Heater Size	**kW** **BTU/HR** **KCAL/HR**	1.0 3,415 861	1.5 5,123 1,291	2.0 6,830 1,721	3.0 10,245 2,582	4.0 13,660 3,442	5.0 17,075 4,303	6.0 20,490 5,164
Auxiliary Heater Size	**kW** **BTU/HR** **KCAL/HR**	1.0 3,415 861	1.0 3,415 861	1.0 3,415 861	1.5 5,123 1,291	2.0 6,830 1,721	3.0 10,245 2,582	3.0 10,245 2,582
Weight	**LBS** **KGS**	47 21.4	50 22.8	61 27.8	72 32.8	93 42.3	103 46.9	114 51.9
Minimum Supply Air Grille Size	**in^2** **cm^2**	56 361	72 464	96 619	128 826	160 1,032	200 1,290	240 1,548
Minimum Return Air Grille Size	**in^2** **cm^2**	84 542	108 697	144 929	192 1,238	240 1,548	300 1,935	360 2,322

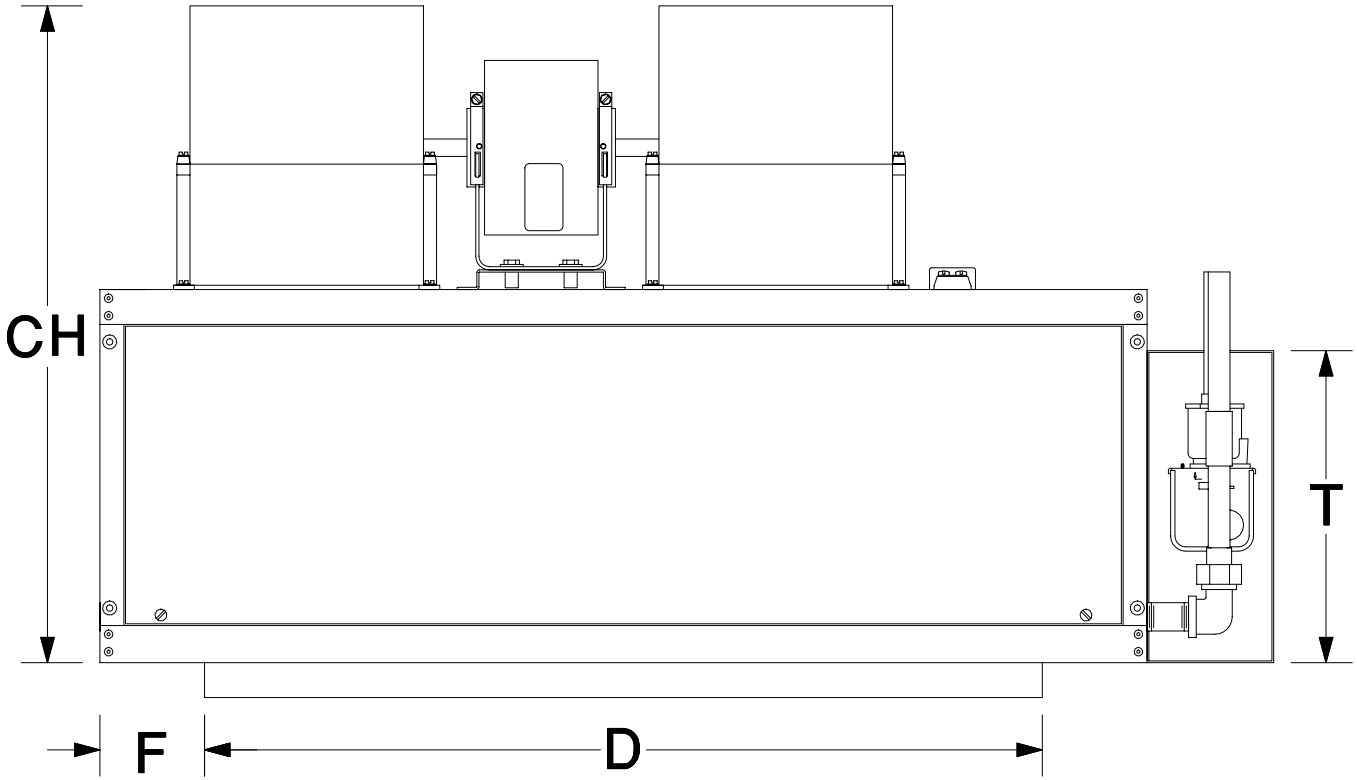
Fan Coil Dimensions

Unit Size			2	3	4	6	8	10	12
Length	**A**	**in/cm**	20 / 51	24 / 61	30 / 76	38 / 97	46 / 117	56 / 142	66 / 168
Depth	**B**	**in/cm**	10.8 / 27						
Height	**C**	**in/cm**	21 / 53						
Height (AQH only)	**CH**	**in/cm**	19 / 48						
Air outlet length	**D**	**in/cm**	14 / 36	18 / 46	24 / 61	32 / 81	40 / 102	50 / 127	60 / 153
Air outlet width	**E**	**in/mm**	4.0 / 102						
Unit Side to Air Outlet	**F**	**in/mm**	3.0 / 76						
Valve Package Width	**K**	**in/mm**	4 / 102						
Unit Front to Air Outlet	**M**	**in/mm**	1.75 / 44						
Air Outlet Collar Height	**N**	**in/mm**	1.0 / 25						
Valve Package Pan Length	**T**	**in/cm**	9.0 / 23						
Valve Package Pan Height	**V**	**in/cm**	12.50 / 32						
Chillwater Return, OD	**1**	**in/mm**	0.625 / 16						
Chillwater Supply, OD	**2**	**in/mm**	0.625 / 16						
Heater Electrical Inlet, ID	**3**	**in/mm**	0.7 / 18						
Drain, FPT	**4**	**in**	3/4						
Fresh Air Connection	**5**	**in/mm**	3.0 / 76						
Unit Wiring Entrance	**6**	**in/mm**	0.7 / 18						
Air Bleeder	**7**	**in**	1/4" Male Flare						



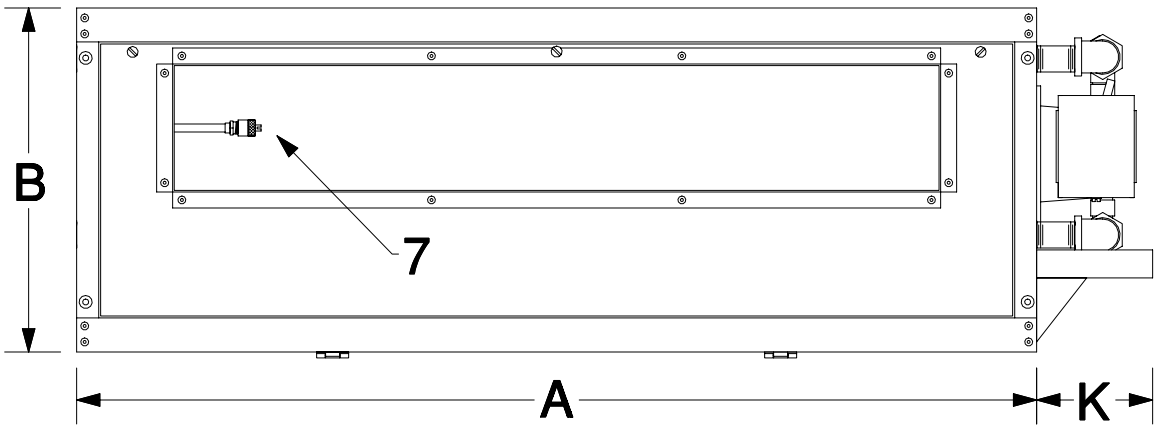


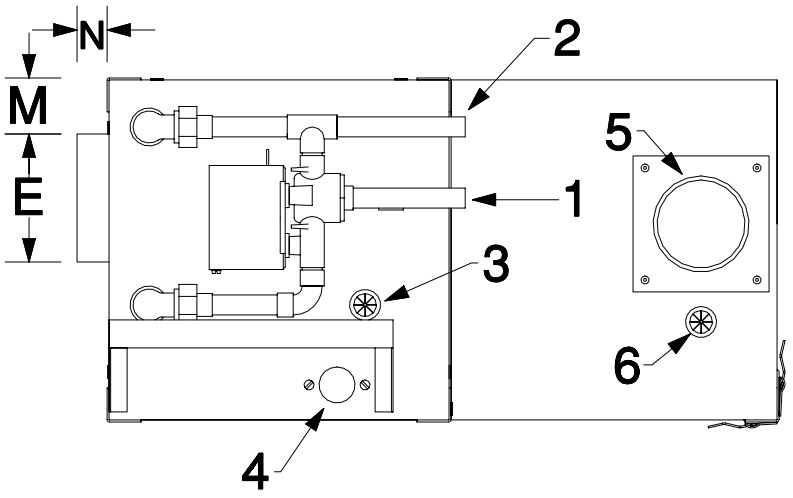
AQH-04 SHOWN



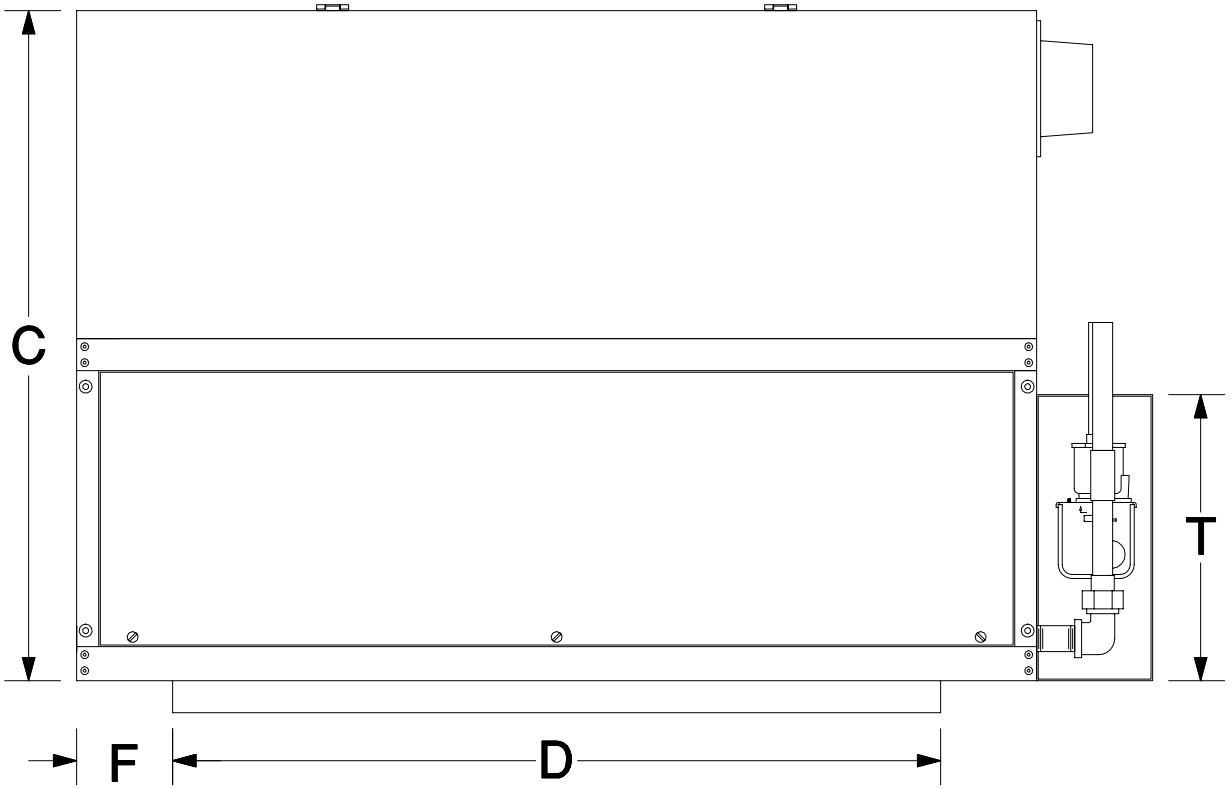
AQH

FAN COIL



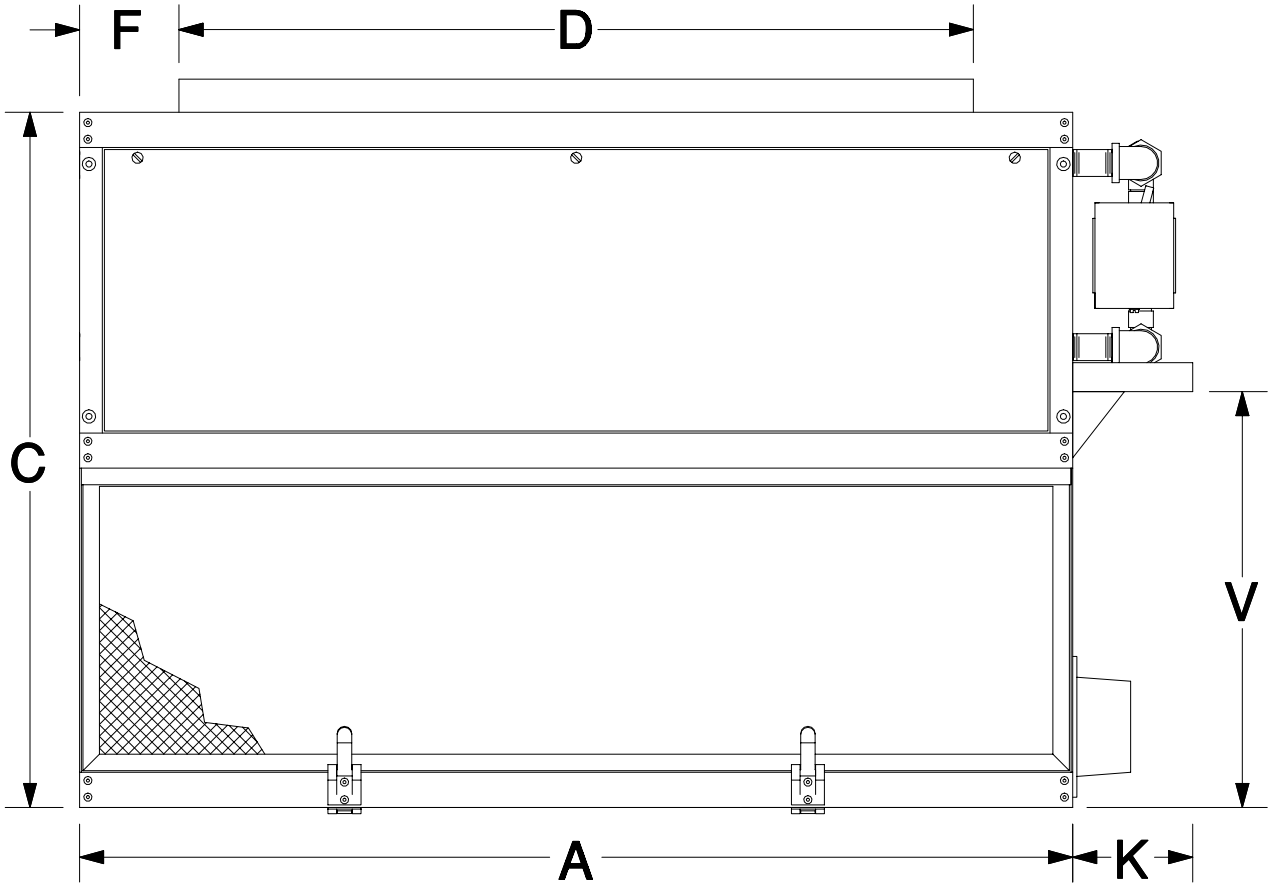


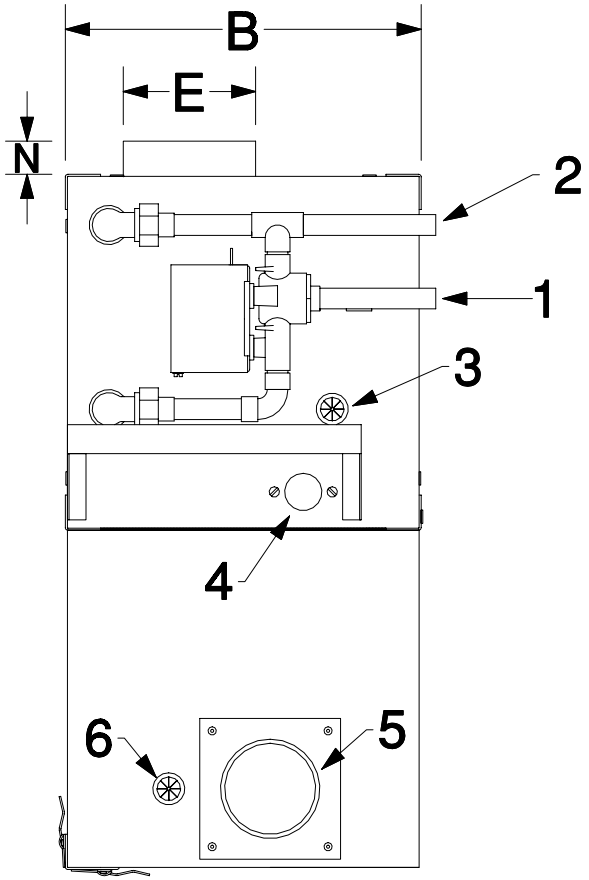
AQP-04 MODEL SHOWN



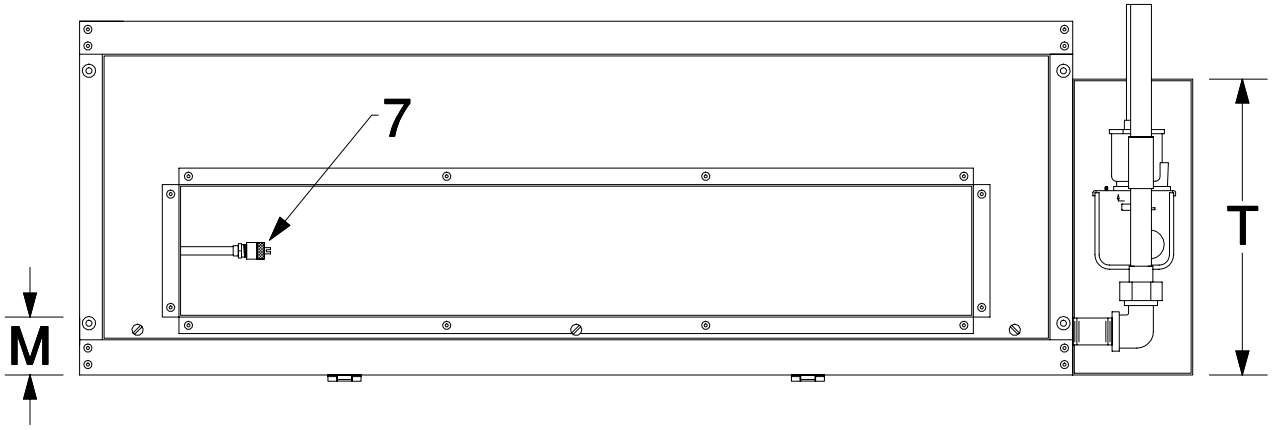
AQP

FAN COIL



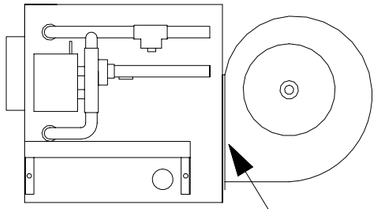


AQV-04 UNIT SHOWN



AQV

FAN COIL



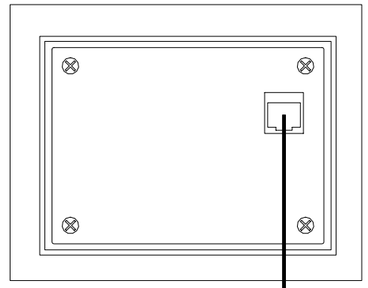
AQH
FAN COIL

FAN COIL #1

FAN HIGH SPEED
WATER VALVE
N or L2
HEATER L1
HEATER L2
GROUND LUG

TERMINAL STRIP FOR ALL AQH, AQP & AQV FAN COILS WILL BE LOCATED ON THE BLOWER MOTOR TRAY.

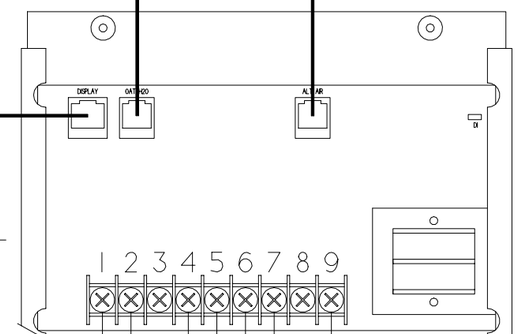
MULTIPLE FAN COILS CAN BE CONNECTED IN PARALLEL TO THE THERMOSTAT PROVIDED THEY DO NOT EXCEED THE MAXIMUM AMPERAGE RATINGS OF THE CONTROL MODULE



DISPLAY HEAD

DISPLAY CABLE 15'

CONTROL MODULE



INLET WATER SENSOR NOTE

ATTACH SENSOR TO THE WATER INLET LINE AT FAN COIL WATER VALVE

SENSORS

INLET WATER SENSOR

ROOM AIR SENSOR

MAXIMUM CIRCUIT RATINGS

WATER VALVE 1/4A
FAN MOTOR 6A
HEATER 20A

TERMINAL BLOCK CONNECTIONS

1. HEATER ELEMENT L1
2. HEATER ELEMENT L2
3. N/A
4. WATER VALVE L2
5. WATER VALVE L1
6. POWER INPUT L1
7. POWER INPUT L2 or N
8. FAN L2
9. FAN L1

NOTE: ALL L2's ARE COMMON TO EACH OTHER

POWER INPUT
115/1/60
200-230/1/50-60

L1
L2 or N
G

NOTE: FAN COIL MOTOR, WATER VALVE & HEATER MUST BE RATED FOR THE SAME VOLTAGE AS THE POWER INPUT.

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

TW2W DIGITAL THERMOSTAT w/ SINGLE AQH/AQP/AQV STYLE FAN COIL 115 or 230V w/ SINGLE PHASE ELECTRIC HEATERS

DRAWING NUMBER	DRAWN BY	DATE
4008-48	DN	2-26-98

SCALE	APPROVED BY	REVISION DATE	REV
NONE			A

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

FAN COIL - BLOW THRU BTW SERIES

FEATURES

- Seven models to choose from ranging in size from 6,000 to 36,000 BTUH
- Universal horizontal or vertical use
- Units are constructed of corrosion resistant aluminum and ABS plastic
- 1050 RPM motors for quiet operation
- Panels insulated internally to prevent external condensation
- Optional internally mounted incoloy rod type heating elements available for single phase input
- Three-way motorized water valve is standard with Pop-Top motor assembly
- Insulated and internally coated aluminum drain pan with anti-slosh foam media inside
- Condensate outlets (3/4") on both corners of the drain pan
- ABS blower housings with aluminum impellers
- Integral air bleeder for easy commissioning
- Units available for 115/1/60, 100/1/50, 208-230/1/60 and 200-220/1/50 power inputs.
- All unit coil assemblies are pressure tested to assure leak-proof performance
- All fan motors are test run to assure proper operation and air flow output

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com

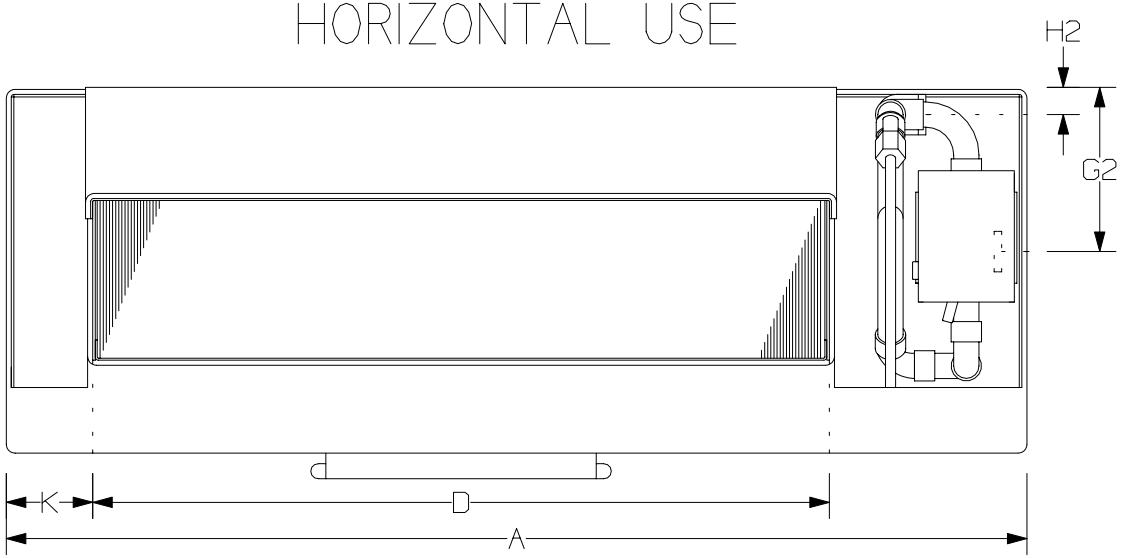
Technical Specifications

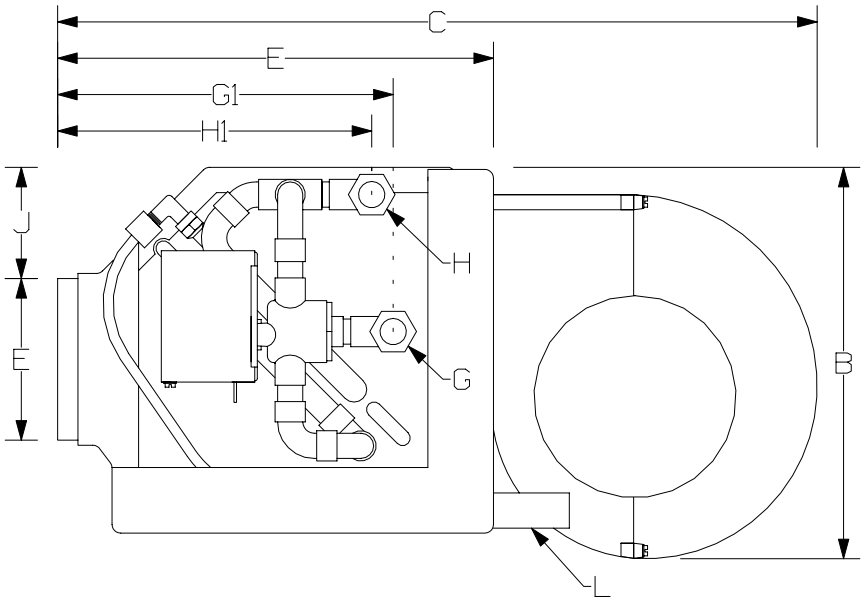
Unit Size		06	09	12	18	24	30	36
Cooling Capacity	BTU/HR KCAL/HR	6,000 1,512	9,000 2,268	12,000 3,024	18,000 4,536	24,000 6,048	30,000 7,560	36,000 9,072
Air Flow Capacity	CFM M^3H	200 340	300 510	400 680	600 1,020	800 1,360	1,000 1,700	1,200 2,040
Fan Amperage	115v 230v	2.70 1.35	2.70 1.35	2.70 1.35	2.70 1.35	5.40 2.70	5.40 2.70	5.40 2.70
Fan Wattage	W	311	311	311	311	621	621	621
Required Chillwater Flow	GPM LPM	1.2 4.5	1.8 6.8	2.4 9.1	3.6 13.6	4.8 18.2	6.0 22.7	7.2 27.3
Pressure Drop	Ft/H_2O kPa	2.7 8.1	6.5 19.4	4.8 14.3	6.2 18.5	7.6 22.7	9.4 28.1	11.1 33.1
Maximum Heater Size	kW BTU/HR KCAL/HR	1.0 3,415 861	1.5 5,123 1,291	2.0 6,830 1,721	3.0 10,245 2,582	4.0 13,660 3,442	5.0 17,075 4,303	6.0 20,490 5,164
Auxiliary Heater Size	kW BTU/HR KCAL/HR	1.0 3,415 861	1.0 3,415 861	1.0 3,415 861	1.5 5,123 1,291	2.0 6,830 1,721	3.0 10,245 2,582	3.0 10,245 2,582
Weight	LBS KGS	30.0 13.6	34.0 15.5	38.0 17.3	42.0 19.1	45.0 20.5	55.0 25.0	65.0 29.5
Minimum Supply Air Grille Size	in^2 cm^2	56 361	72 464	96 619	128 826	160 1,032	200 1,290	240 1,548
Minimum Return Air Grille Size	in^2 cm^2	84 542	108 697	144 929	192 1,238	240 1,548	300 1,935	360 2,322

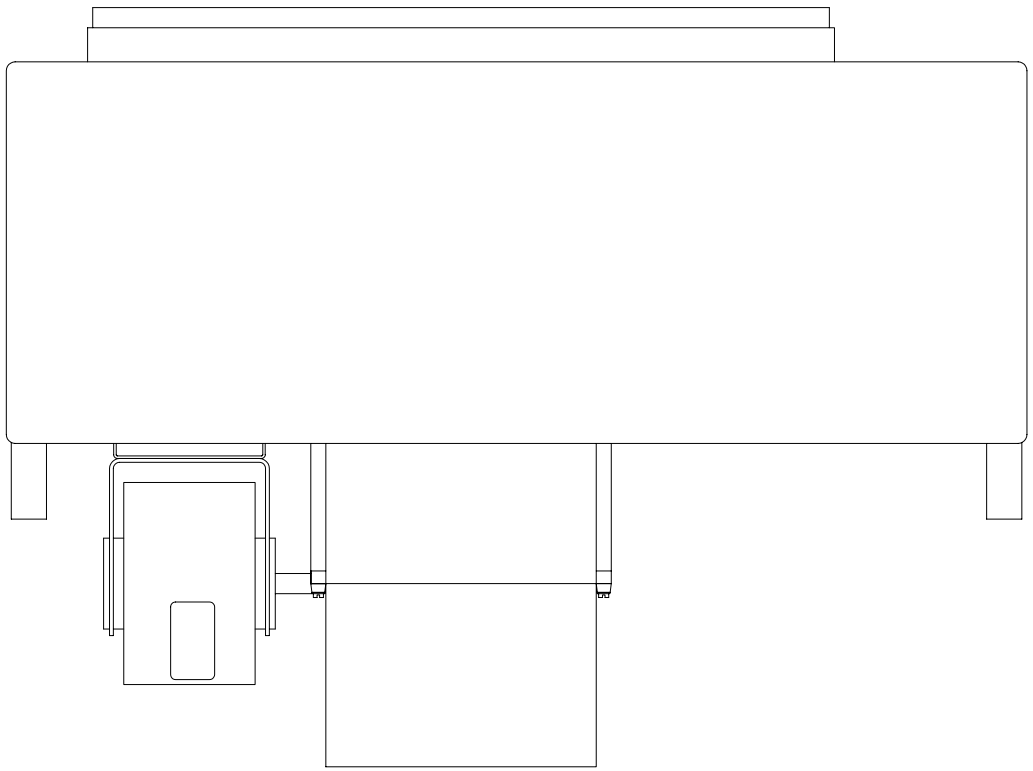
Unit Dimensions

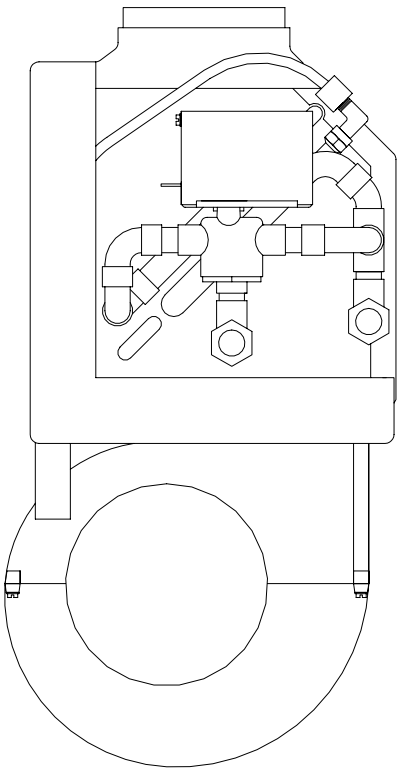
Unit Size	06	09	12	18	24	30	36
A	21" 534mm	25" 635mm	31" 788mm	39" 991mm	47" 1194mm	57" 1448mm	67" 1702mm
B	9-11/16" / 246mm						
C	18-13/16" / 478mm						
D	14-1/4" 362mm	18-1/4" 464mm	24-1/4" 616mm	32-1/4" 819mm	40-1/4" 1022mm	50-1/4" 1276mm	60-1/4" 1530mm
E	4" / 102mm						
F	10-13/16" / 275mm						
G	½" FPT Water Inlet						
G1	8-1/4" / 210mm						
G2	4-1/16" / 103mm						
H	½" FPT Water Outlet						
H1	7-3/4" / 197mm						
H2	11/16" / 18mm						
J	2-3/4" / 70mm						
K	1-7/8" / 48mm						
L	7/8" / 22mm Drain O.D.						

BTW-09 SHOWN
HORIZONTAL USE





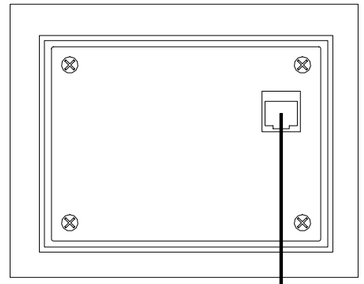




BTW-09
SHOWN

VERTICAL
USE

MULTIPLE FAN COILS
CAN BE
CONNECTED IN PARALLEL
TO THE THERMOSTAT
PROVIDED THEY DO NOT
EXCEED THE MAXIMUM
AMPERAGE RATINGS OF
THE CONTROL MODULE



DISPLAY
HEAD

INLET WATER SENSOR NOTE

ATTACH SENSOR TO THE
WATER INLET LINE AT
FAN COIL WATER VALVE

SENSORS

INLET WATER SENSOR

ROOM AIR SENSOR

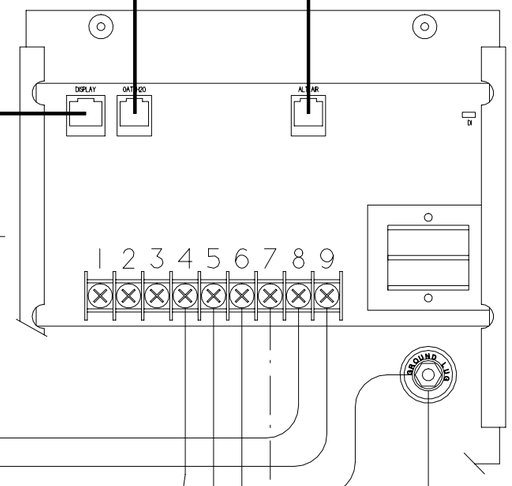
DISPLAY
CABLE 15'

FAN COIL

FAN MOTOR

G O W

CONTROL
MODULE



MAXIMUM CIRCUIT RATINGS

WATER VALVE 1/4A
FAN MOTOR 6A
HEATER 20A

TERMINAL BLOCK CONNECTIONS

1. HEATER ELEMENT L1
2. HEATER ELEMENT L2
3. N/A
4. WATER VALVE L2
5. WATER VALVE L1
6. POWER INPUT L1
7. POWER INPUT L2 or N
8. FAN L2
9. FAN L1

NOTE: ALL L2's ARE COMMON
TO EACH OTHER

W BK

M

WATER VALVE
MOTOR

POWER INPUT
115/1/60
200-230/1/50-60

L1
L2 or N
G

NOTE: FAN COIL MOTOR & WATER VALVE MUST BE
RATED FOR THE SAME VOLTAGE AS THE POWER INPUT.

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

TW2W DIGITAL THERMOSTAT w/ SINGLE
BTW Series STYLE FAN COIL 115 or 230V
COOLING ONLY or with HOT WATER HEAT

DRAWING NUMBER	DRAWN BY	DATE
4008-34B	DN	991026

SCALE	APPROVED BY	REVISION DATE	REV
NONE			A

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

FRESH AIR MAKEUP UNIT AQFAH SERIES

FEATURES

- Four models to choose from ranging in size from 200 to 900 CFM
- Units are constructed of corrosion resistant aluminum
- Hi-static fan motors for extensive fresh air ducting networks
- Removable access panels on both the top and sides are insulated internally to prevent external condensation
- Washable air inlet filter
- Internally mounted INCOLOY rod type heating elements for cold weather operation down to 23 deg Fahrenheit (-5 deg Centigrade)
- Modulating chillwater flow valve for precise air temperature control in the cooling mode
- Modulating SCR heater element control for precise air temperature control in the heating mode
- Insulated and internally coated aluminum drain pan with ant-slosh foam media inside
- Condensate outlets on both sides of the fan coil
- All unit coil assemblies are pressure tested to assure leak-proof performance
- All units are test run to assure proper operation and air flow output

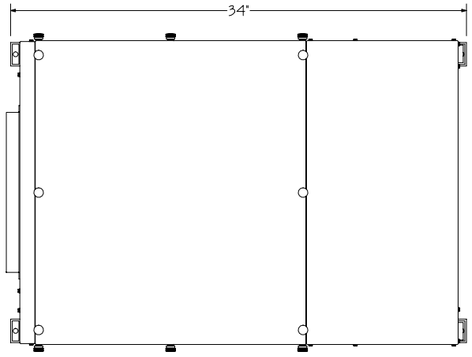
AQFAH UNIT SPECIFICATIONS

SPECIFICATION		02	04	06	09
NOMINAL CAPACITY	**CFM** **CMH**	200 340	400 680	600 1020	900 1530
WEIGHT	**LBS** **KGS**	45.0 20.5	55.0 25.0	59.0 26.8	63.0 28.6
LENGTH	**IN** **MM**	34 864			
WIDTH	**IN** **MM**	23-3/4 603			
HEIGHT	**IN** **MM**	11-3/4 299	21-3/16 538		
POWER SUPPLY		208-230 / 1/ 60 200-220 / 1 / 50			
AMP DRAW @ 230-1-60		10.4	19	28	42
POWER	**W**	2460	4437	6644	10056
STANDARD HEATER SIZE	**KW**	2	4	6	9
CHILLWATER INLET / OUTLET	**FPT**	1/2"	3/4"	1"	1"
CHILLWATER FLOW	**GPM** **LPM**	5.3 19.9	10.5 39.8	15.8 59.8	23.7 89.7
DUCT CONNECTION	**IN** **MM**	5-7/8 x 10-1/4 149 x 260	10-7/16 x 11-15/16 265 x 303		
MINIMUM INTAKE GRILLE	**IN^2** **CM^2**	60 390	120 775	180 1160	270 1740
DRAIN FITTING	**FPT**	3/4" 2 / UNIT			
MAIN BREAKER SIZE		15A	25A	35A	50A

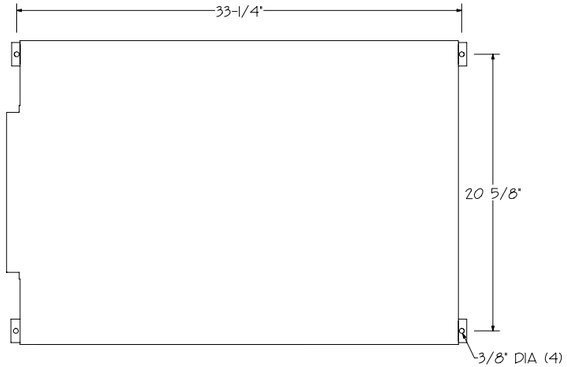
80948.WPD

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com

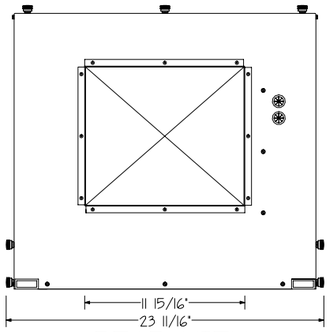
AQFAH-04 to 09 FRESH AIR MAKE-UP UNIT 4-900 CFM NOM.



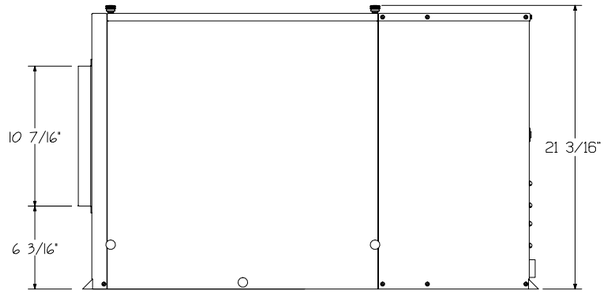
TOP VIEW



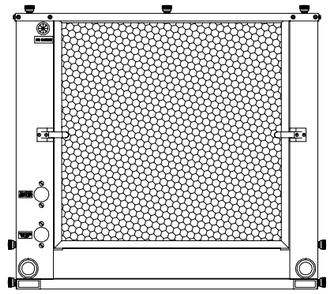
FOOTPRINT



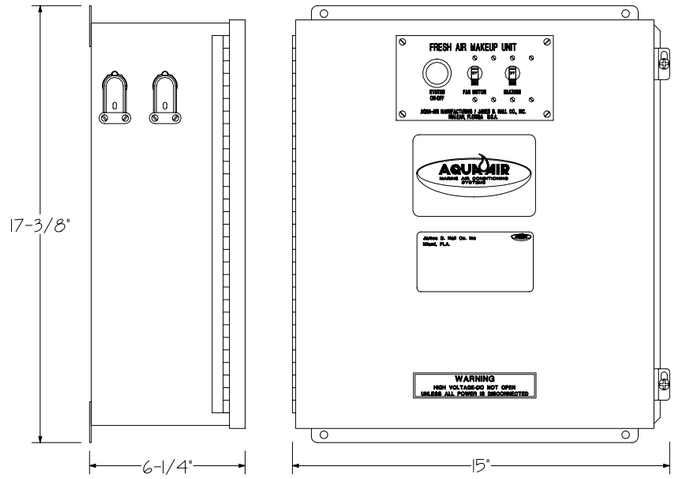
REAR VIEW



SIDE VIEW



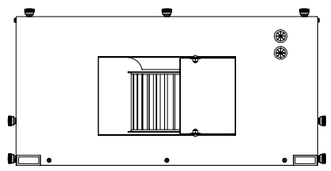
FRONT VIEW



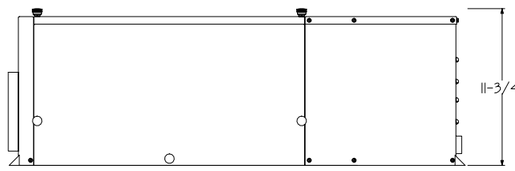
ELECTRICAL BOX FOR AQFAH SERIES UNITS

NOT TO SCALE

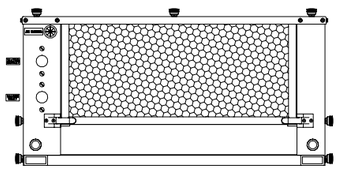
AQFAH-02 FRESH AIR MAKE-UP UNIT 200 CFM NOM.



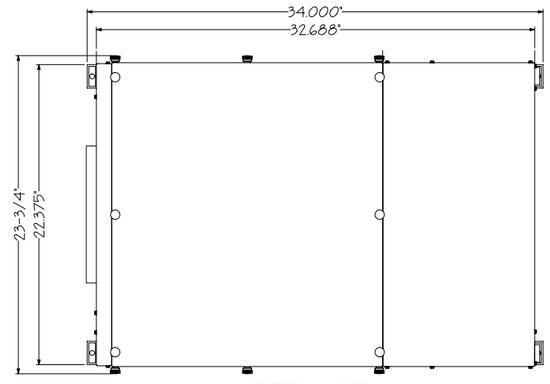
REAR VIEW



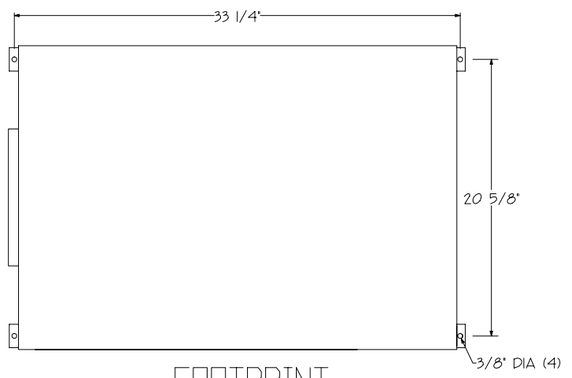
SIDE VIEW



FRONT VIEW



TOP VIEW



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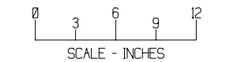


AQUA-AIR **MARINE AIR CONDITIONING SYSTEMS**

AQFAH-02 to 09 FRESH AIR MAKEUP UNITS

DRAWING NUMBER	AQFAH	DRAWN BY	DN	DATE	2-95
SCALE		APPROVED BY		REVISION DATE		REV	A

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

WINDOW DEFOGGER **DF SERIES**

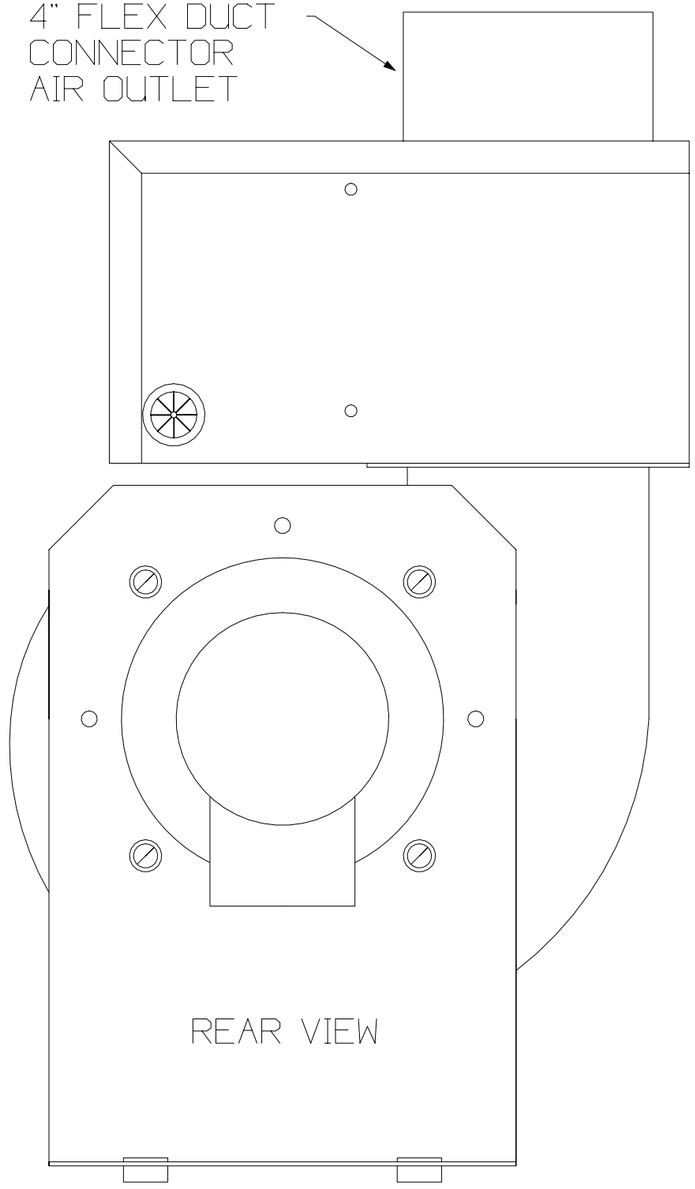
FEATURES

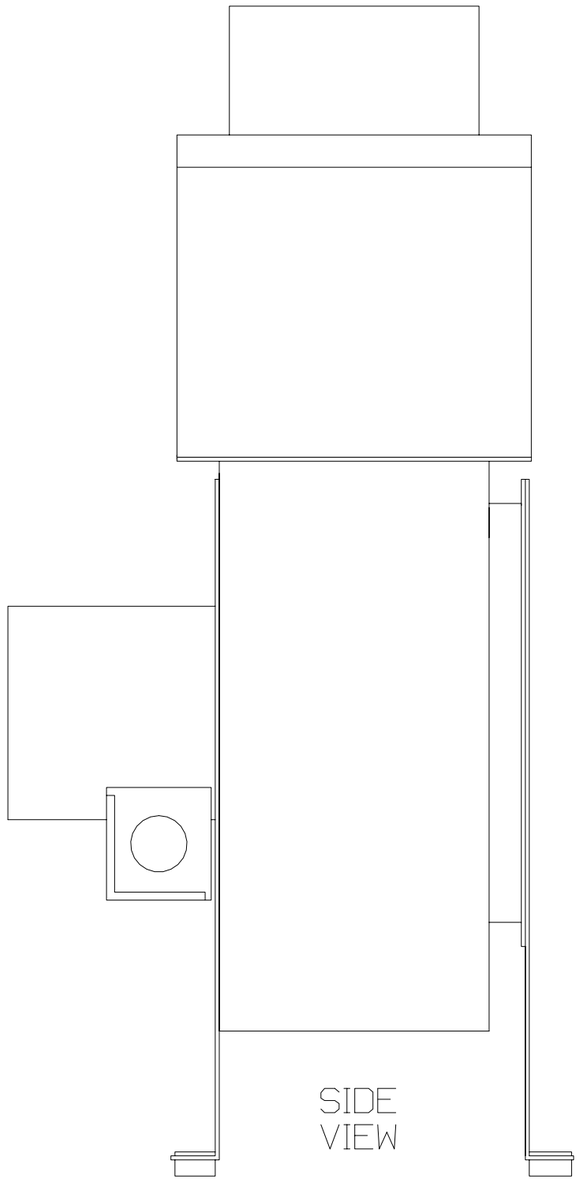
- Two models to choose from ranging in size from 250 to 500 CFM
- Rotatable blower for installation in virtually any location
- Unit can be operated in the fan only mode or the heating mode
- 1050 RPM motors for quiet operation
- Remote panel for control of operating mode and fan speed
- Round duct collar for ease in connecting to flex duct
- Rubber mounting feet to prevent vibration from transferring to the deck

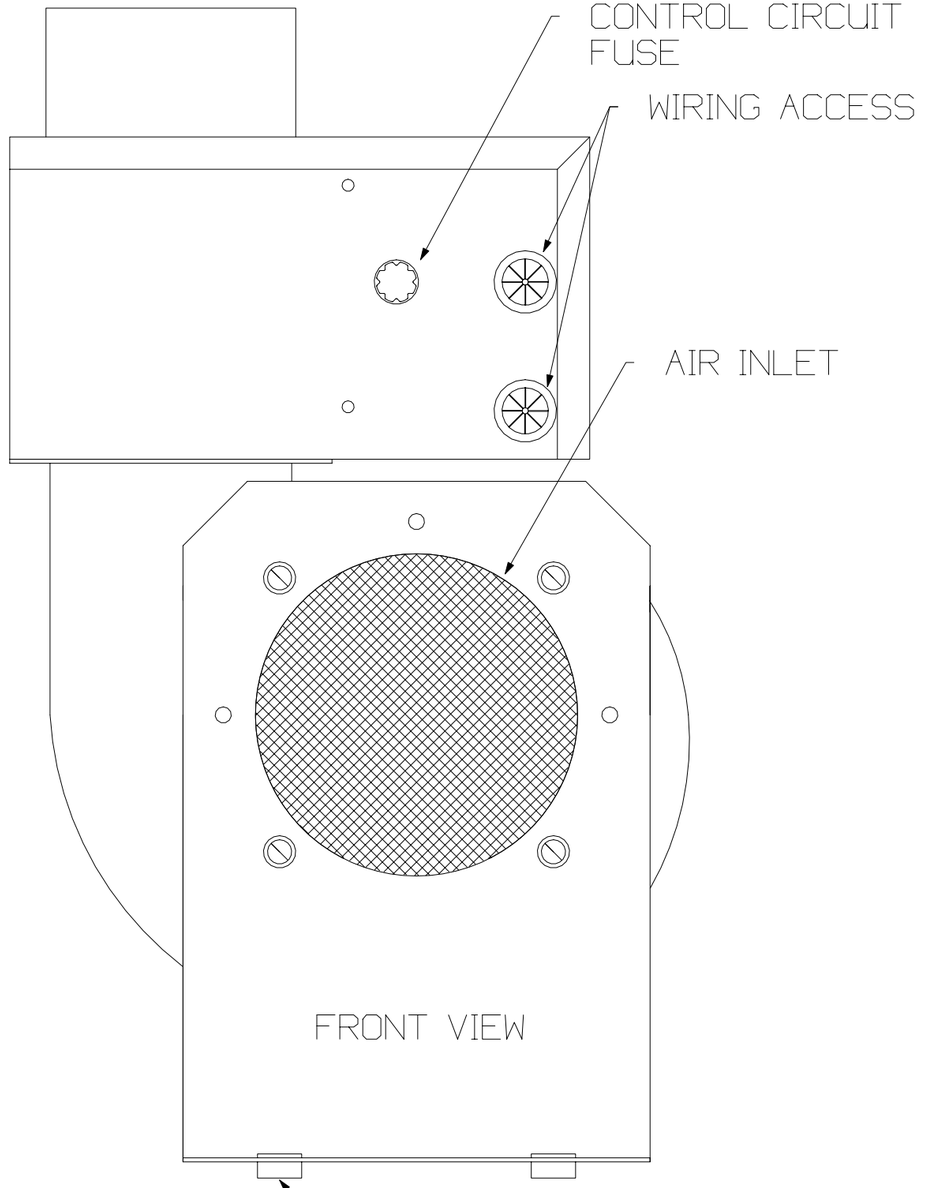
SPECIFICATIONS	DF-250C	DF-500C
HEATING CAPACITY	3,415 BTU/H 861 KCAL/H	6,830 BTU/H 1,721 KCAL/H
AIR FLOW CAPACITY	250 CFM 425 M^3H	500 CFM 850 M^3H
WEIGHT	23 POUNDS 10.5 KGS	27 POUNDS 12.3 KGS
CURRENT DRAW , AMPS @ 230-1-60	5.3	10.2
POWER CONSUMPTION	1,127	2,460
MINIMUM RETURN AIR	64 IN^2 413 CM^2	144 IN^2 929 CM^2
MINIMUM SUPPLY AIR	25 IN^2 161 CM^2	72 IN^2 464 CM^2
FLEX DUCT COLLAR	4" 100mm	6" 150mm
STANDARD HEATER SIZE, kW	1.0	2.0

I:\wordpfct\80950.wpd

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549







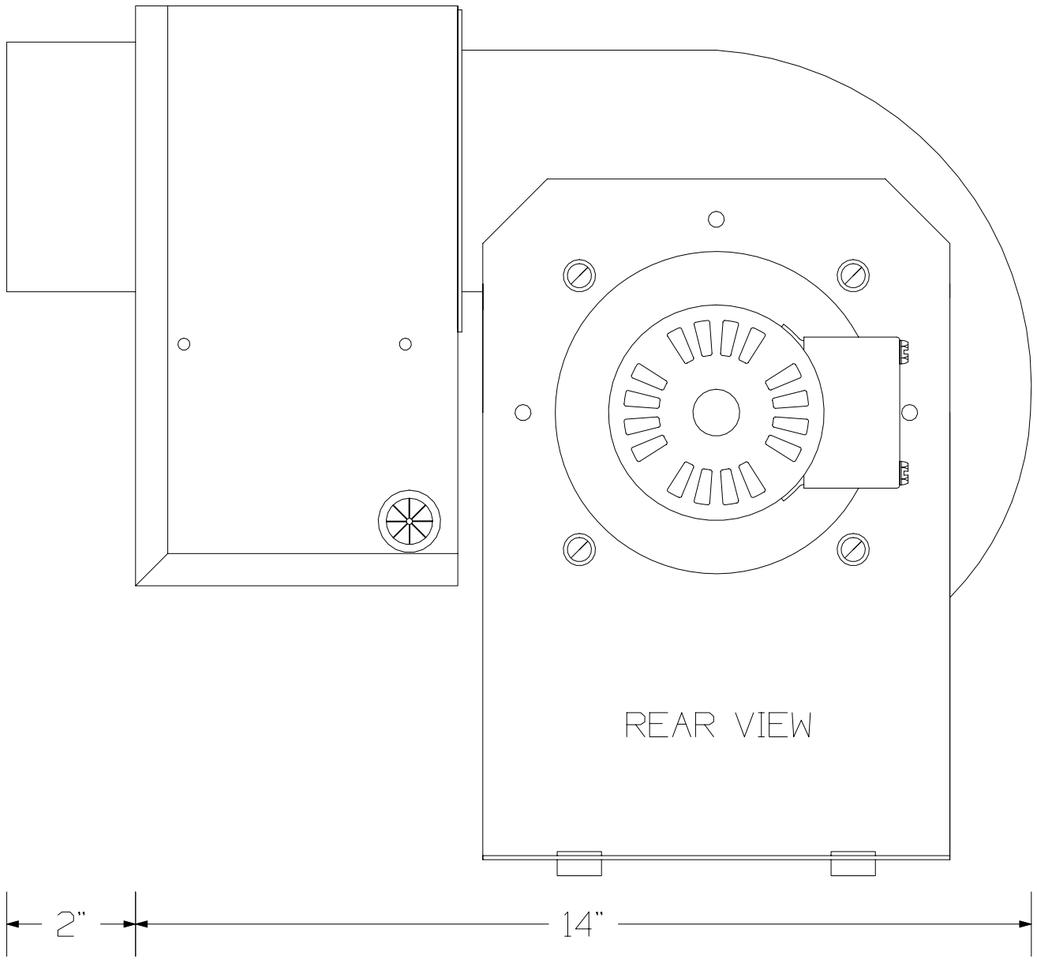
BLOWER IS ROTATABLE

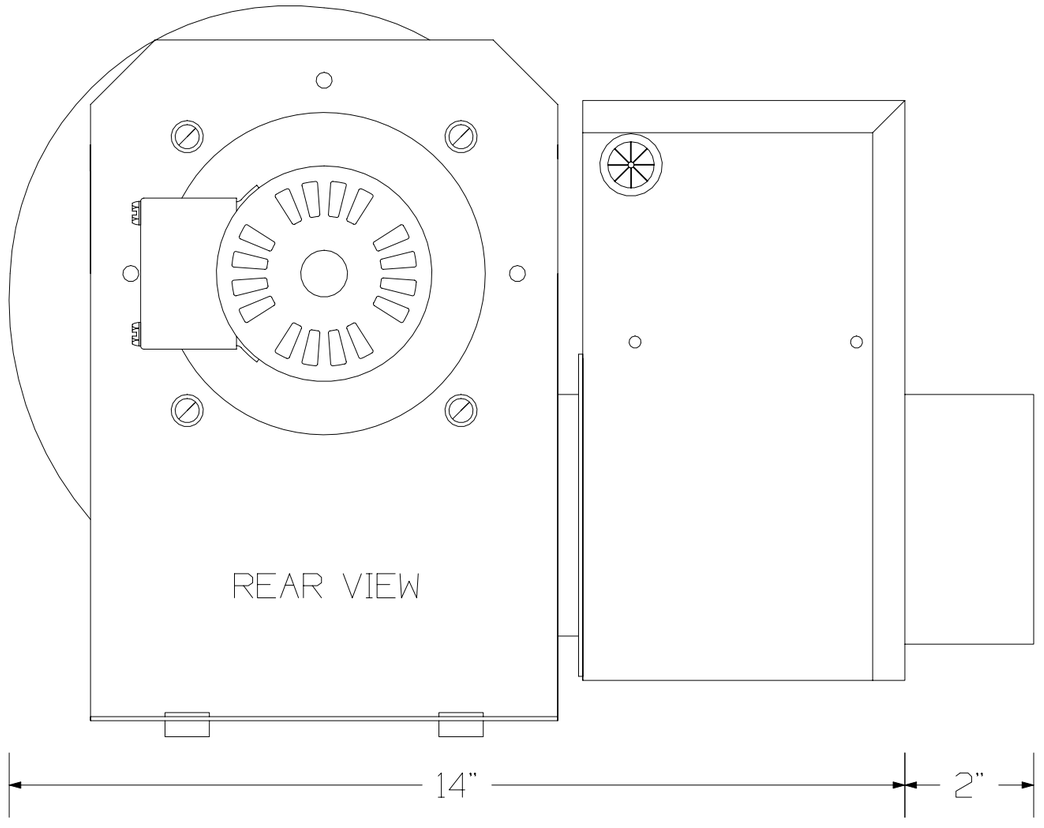
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

DF-250 DEFOGGER UNIT

DRAWING NUMBER	DRAWN BY	DATE
DF-250	DN	1-95

APPROVED BY	REVISION DATE	REV
		A





13-1/2"

11-3/8"

2"

14"

14"

2"

0 1 2 3

SCALE - INCHES

0 25 50 75 100

SCALE - MILLIMETERS

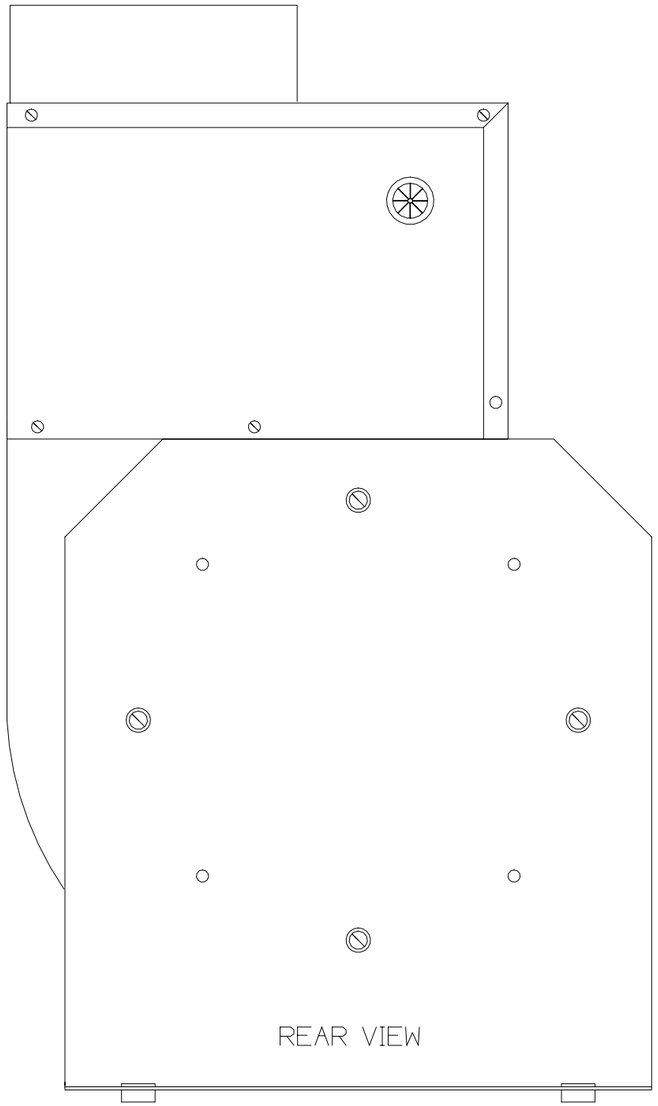
BLOWER IS ROTATABLE

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

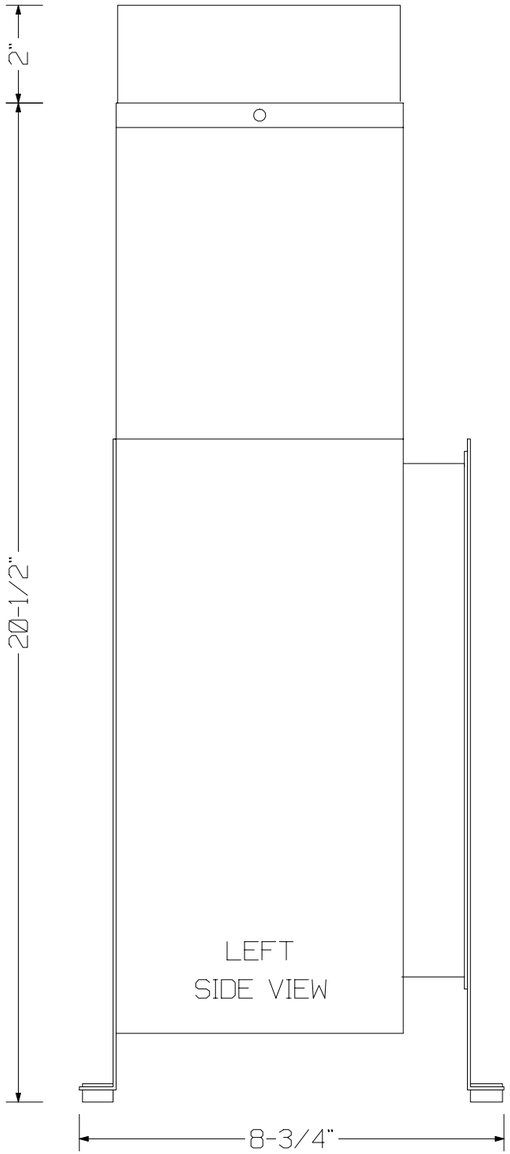
DF-250 DEFOGGER UNIT ROTATION OPTIONS

DRAWING NUMBER	DRAWN BY	DATE
DF-250	DN	1-95

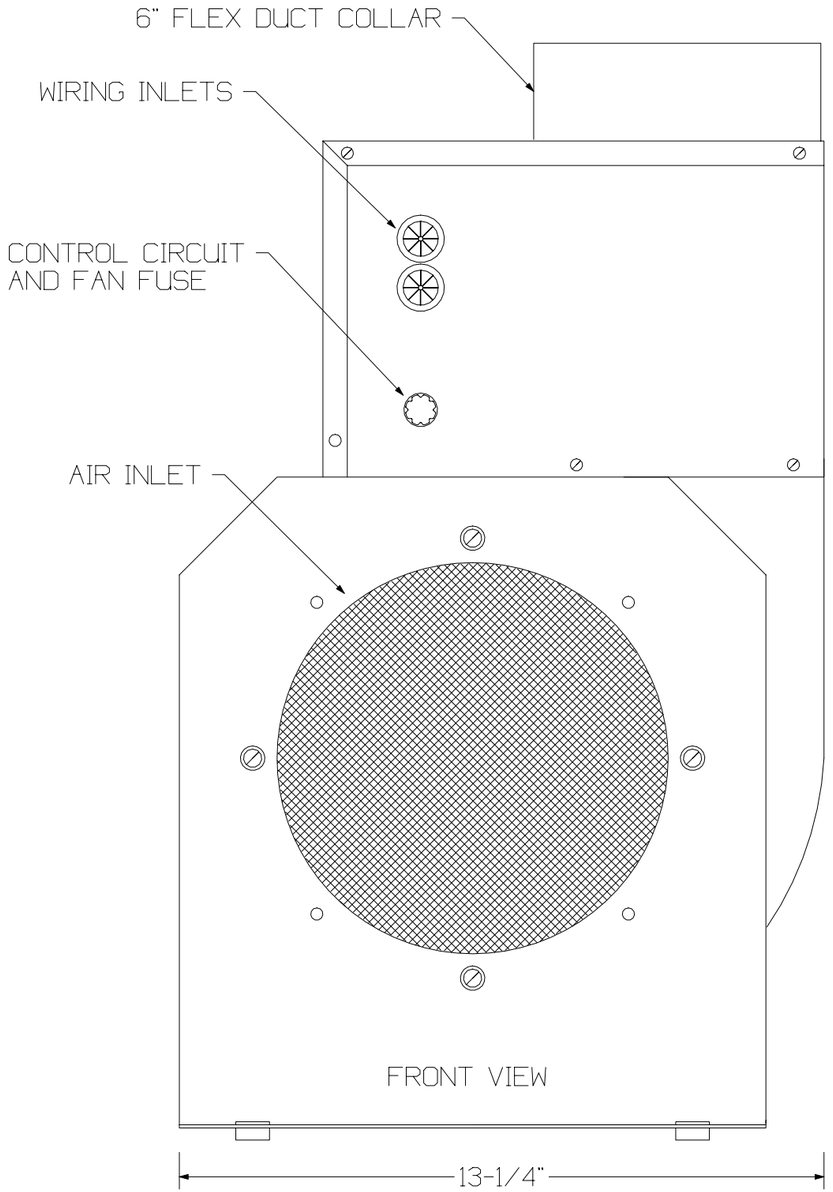
APPROVED BY	REVISION DATE	REV
		A



REAR VIEW

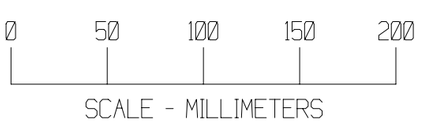


LEFT
SIDE VIEW



FRONT VIEW

SCALE - INCHES



SCALE - MILLIMETERS

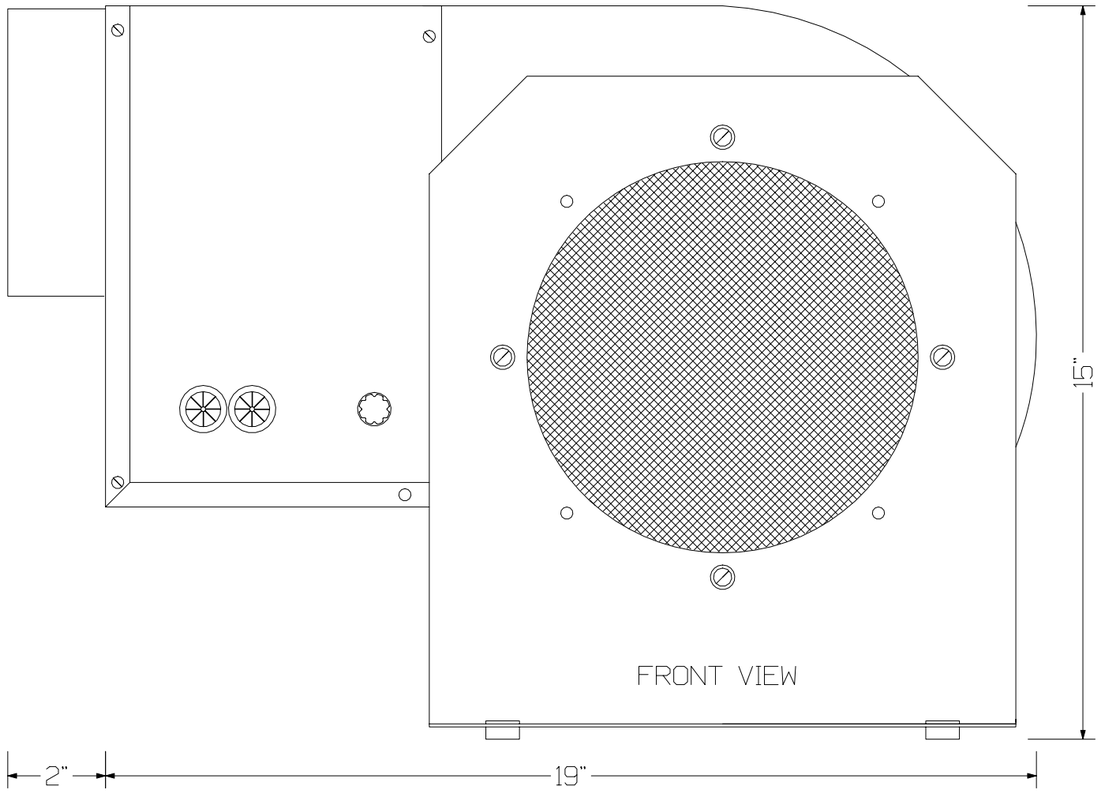
BLOWER IS
ROTATABLE

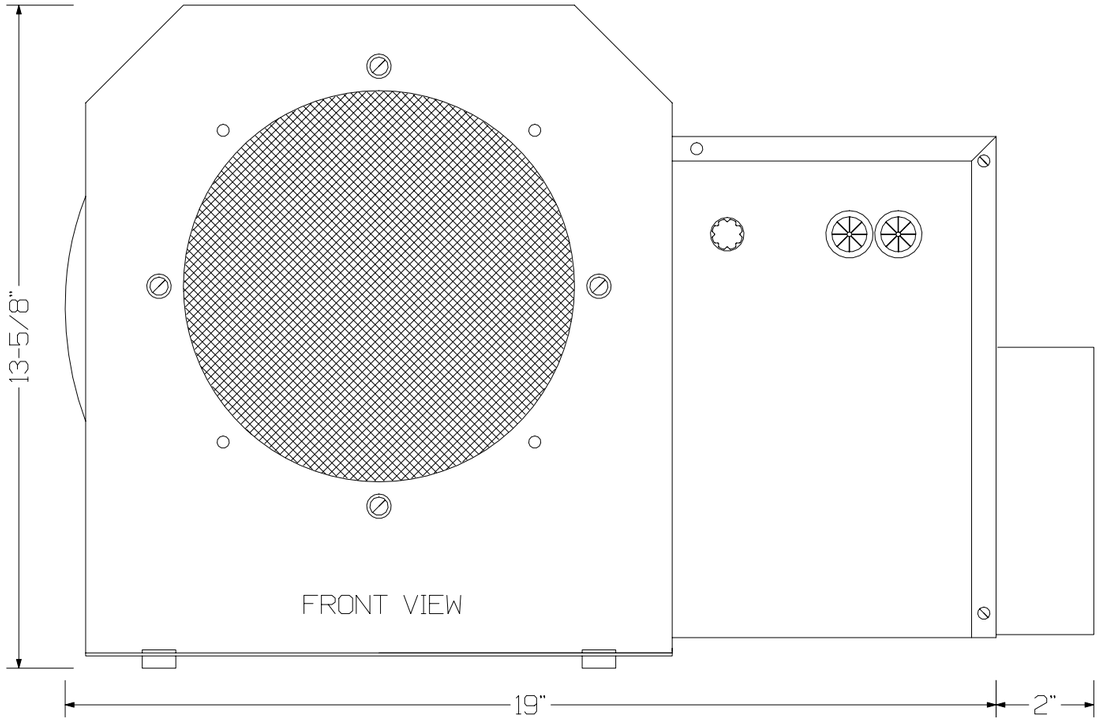
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

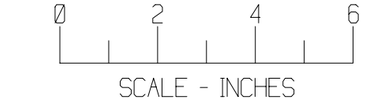
DF-500 DEFOGGER UNIT

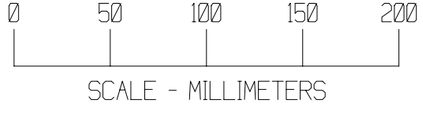
DRAWING NUMBER	DRAWN BY	DATE
DF-500	DN	1-95

SCALE	APPROVED BY	REVISION DATE	REV
NONE			A







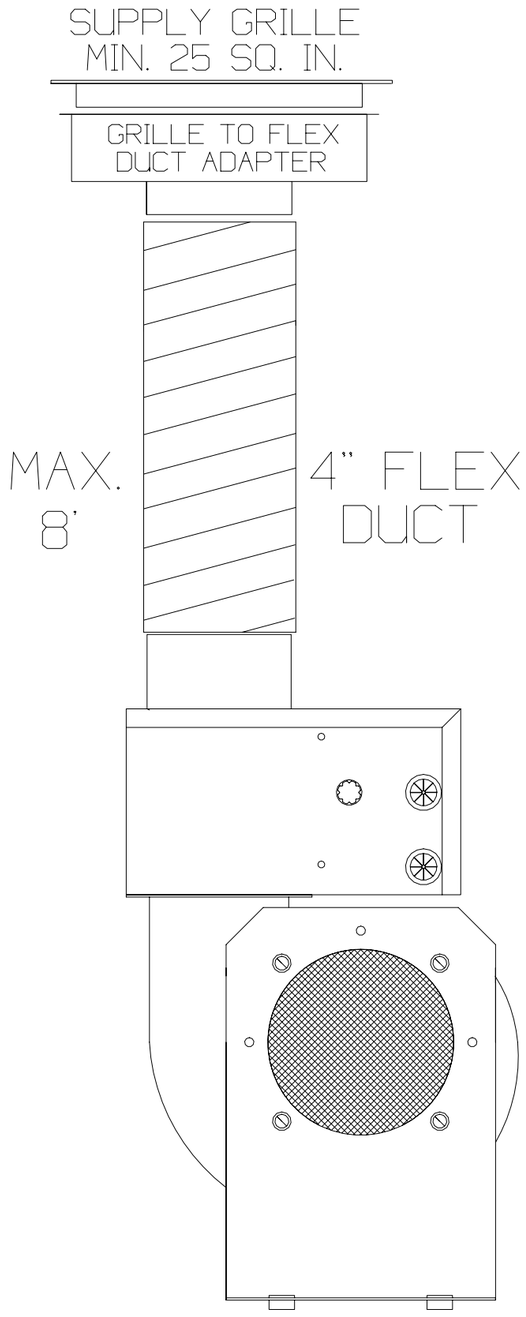


BLOWER IS
ROTATABLE

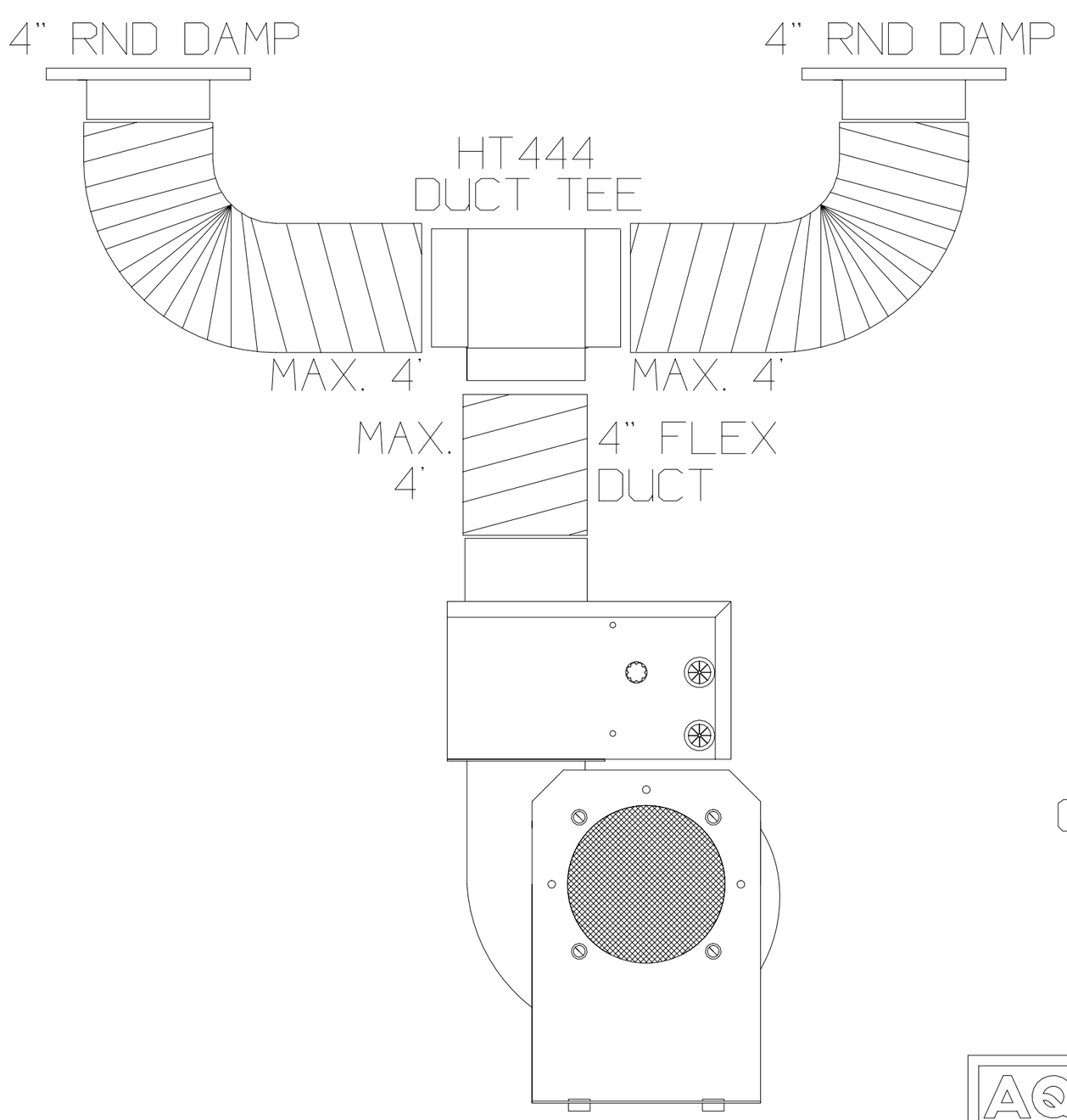
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

DF-500 DEFOGGER UNIT
ROTATION OPTIONS

DRAWING NUMBER DF-500	DRAWN BY DN	DATE 1-95	
SCALE NONE	APPROVED BY	REVISION DATE	REV A



SINGLE
OUTLET



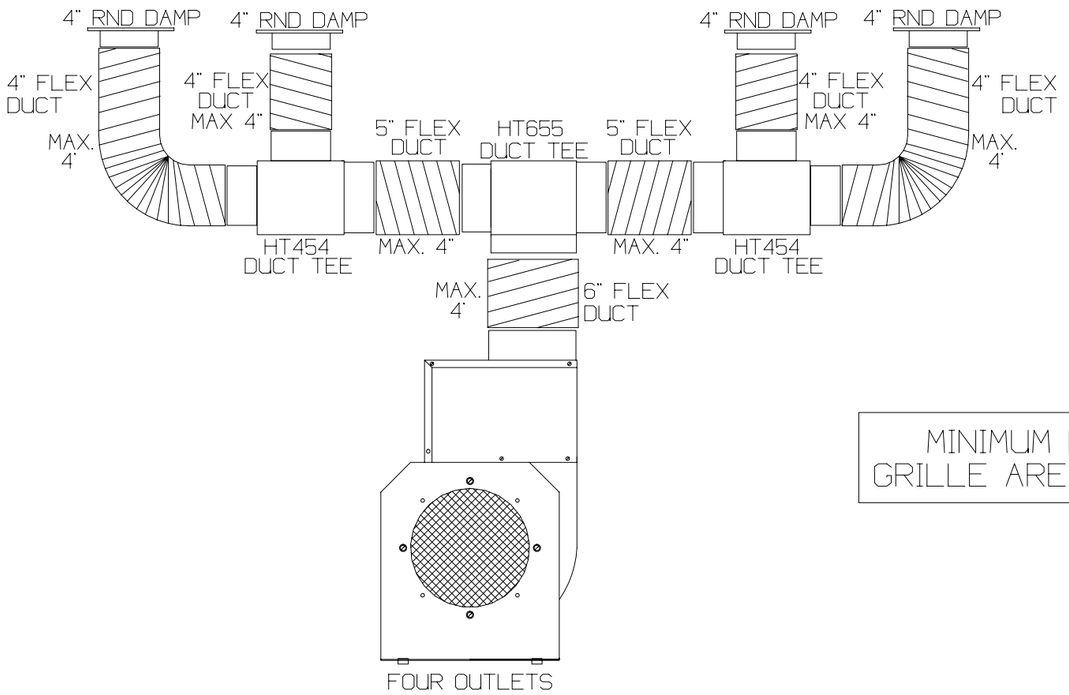
DUAL
OUTLET

RETURN AIR
GRILLE REQUIRED
MIN. 64 SQ. IN.

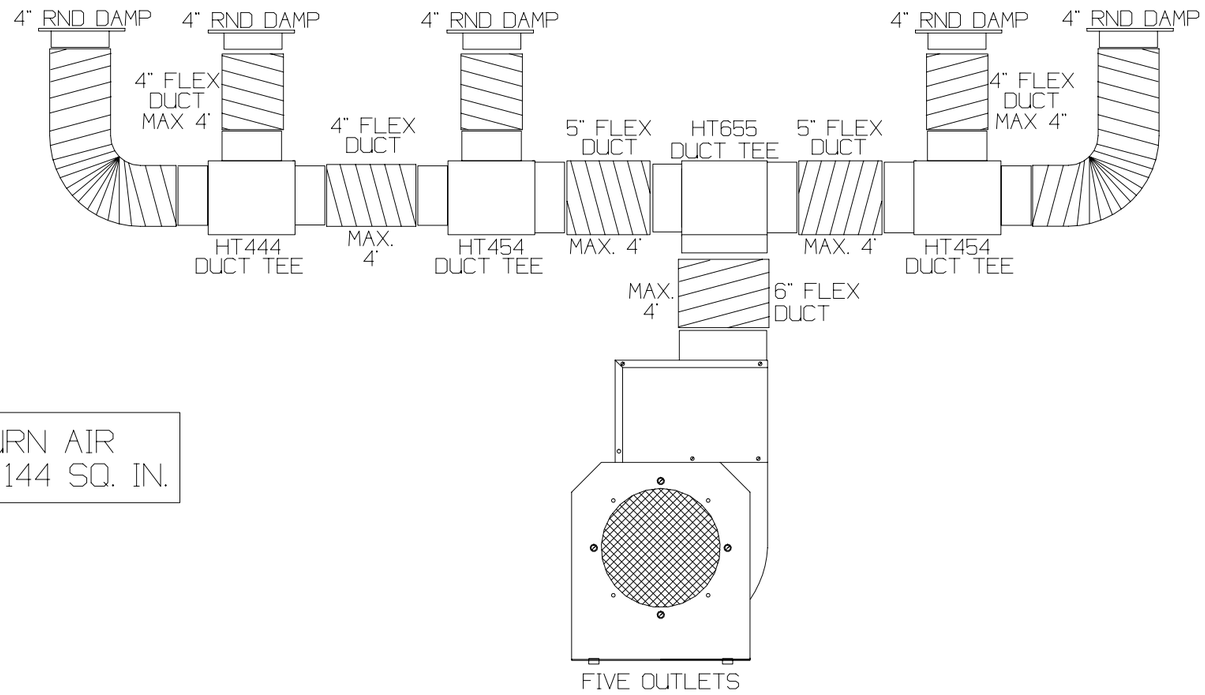
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

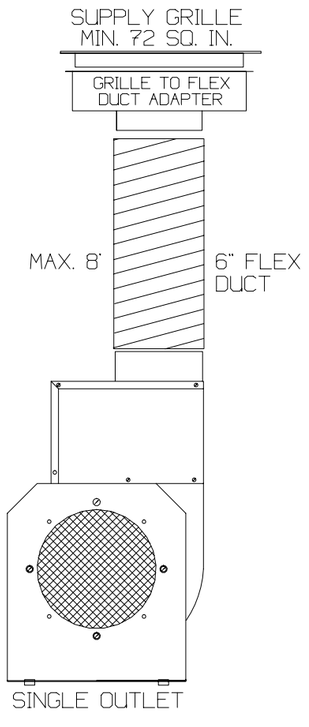
DF-250 SERIES DEFOGGER UNIT
APPLICATIONS

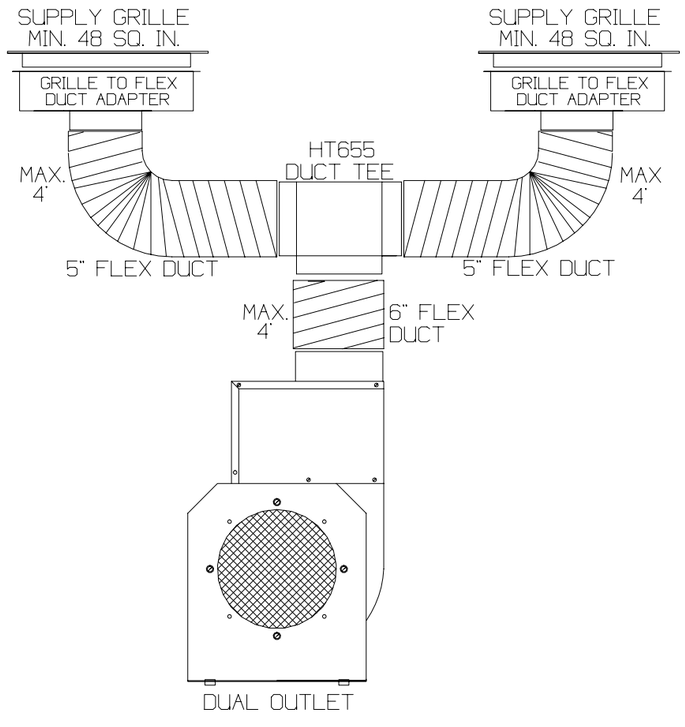
DRAWING NUMBER 1012-16	DRAWN BY DN	DATE 10-14-91	
SCALE NONE	APPROVED BY	REVISION DATE	REV A

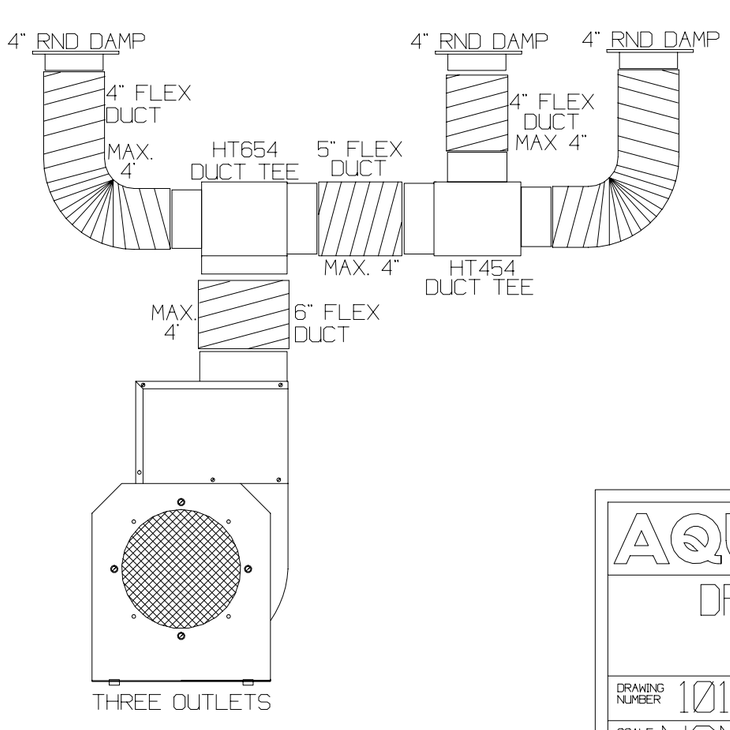


MINIMUM RETURN AIR GRILLE AREA IS 144 SQ. IN.









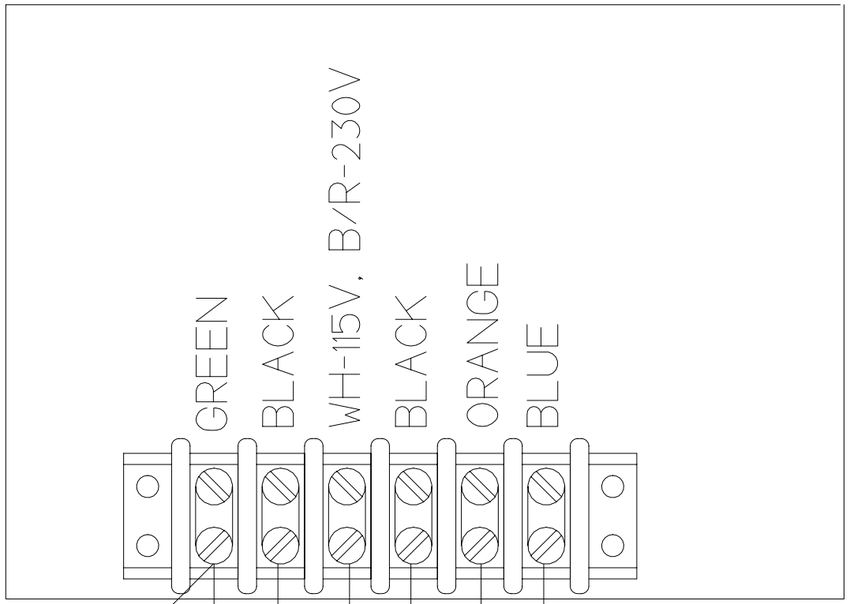
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

DF-500 SERIES DEFOGGER UNIT APPLICATIONS

DRAWING NUMBER	DRAWN BY	DATE
1012-17	DN	10-15-91

SCALE	APPROVED BY	REVISION DATE	REV
NONE			B

DF SERIES ELECTRICAL JUNCTION BOX



POWER INPUT

GROUND

L1

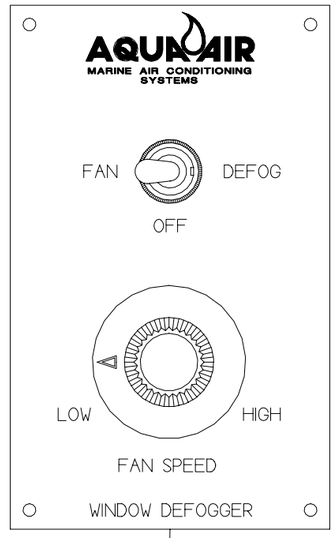
L2 or N

VOLTAGE		WIRE SIZE
DF250	115V	14ga
DF250C	230V	14ga
DF500	115V	10ga
DF500C	230V	14ga

16ga WIRE (4)

DFSW CONTROL SWITCH

DFSW 115V
DFSWC 230V



AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

DF SERIES DEFOGGER UNIT
EXTERNAL WIRING TO DFSW(C) SWITCH
115 or 230V

DRAWING NUMBER	DRAWN BY	DATE
4005-02A	DN	10-14-91

SCALE	APPROVED BY	REVISION DATE	REV
NONE			A

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

FlexAir Air Handlers

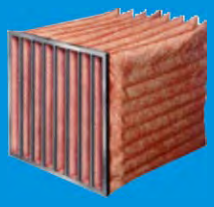
The Aqua-Air FlexAir series of Marine Grade Central Station Air Handlers is the culmination of years of research and experience in the Megayacht HVAC field. The highest quality materials and processes are used in the custom assembly of each and every air handler. Some of the standard features found on FlexAir units are:

Copper fin coils or Aluminum fins with Electrofin phenolic coating, Copper Tubes and Stainless Steel casings standard

Forward Curved, High Static Blowers and Industrial Grade Motors Vibration Mounted and Isolated from the Frame

Mist eliminators on high air velocity units to prevent moisture carryover. Drain Pans are Stainless Steel and internally coated. Four drain outlets assure drainage under all conditions.

Choice of filters types:
pleated, cartridge or bag type



Incoloy electric element heaters

Awlgrip Paint is standard on all units

Brass Modulating Valves, 4-20mA Controlled

The Aqua-Air FlexAir Central Station Air Handlers are comprised of two different series of units:

FX10 Series Product Range: 350-6,150 CFM (486-10,332 cmh)

FX15 Series Product Range: 280-18,550 CFM (378-30,996 cmh)

Units can be built in either a Vertical or Horizontal Configuration with an unlimited number of combinations of modules and air discharges. Shown below are some typical units we have built in the past. To view a larger picture click on the picture.

FlexAir
FX10 Series
Air Handler
Horizontal

FlexAir
FX15 Series
Air Handler
Horizontal

FlexAir
FX15 Series
Air Handler
Vertical

FlexAir
FX15 Series
Air Handler
Custom

This FlexAir Unit was custom built to fit in a storage area underneath a stairwell. No matter what your space constraints are we can design a unit to fit!

For most yacht applications a Variable Air Volume (VAV) / Terminal Reheat System is utilized in conjunction with the Air Handlers. Further information on this type of system can be found here.

Aqua-Air Manufacturing
division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010
Phone: 305-884-8363
National: 800-328-1043
Fax: 305-883-8549

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

SAPPHIRE DIGITAL THERMOSTAT TSVW

Sapphire -The most advanced, aesthetically pleasing, rugged digital thermostat to grace the marine air conditioning industry yet. The technology, features and benefits address all our predecessors and those of the competition.

- Sapphire blue LED display
- Virtually unlimited choice of Vimar® bezels
- Largest fan and heater circuit rating in the business.
- User friendly programming
- Unique fuse protection for circuits.

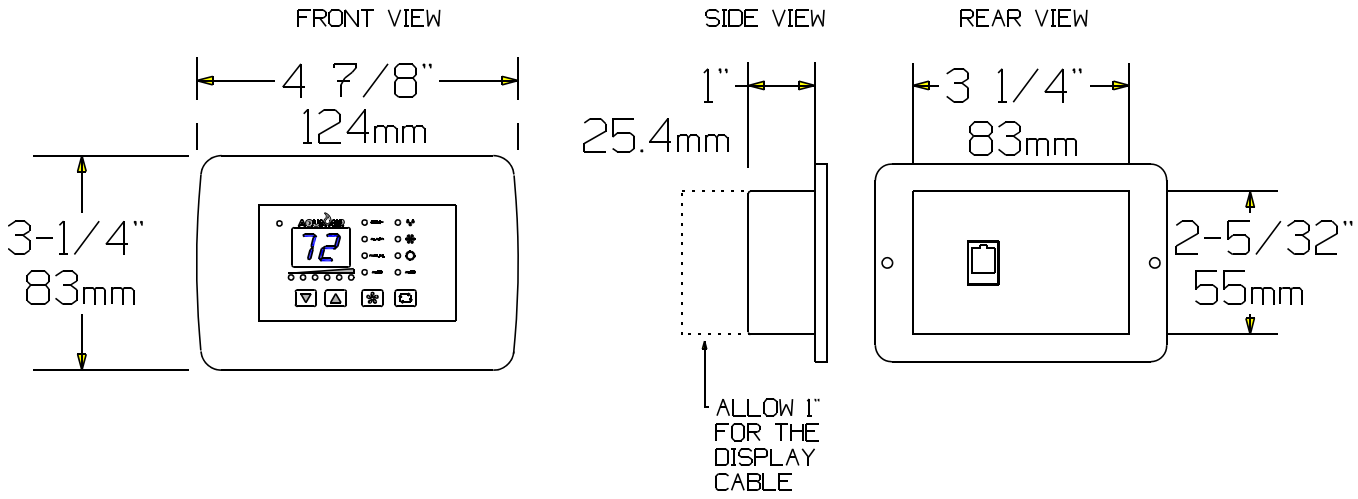
TSVW Sapphire Digital Thermostat
Shown with VIMAR VB-Nickel Bezel
Actual Size

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 E-mail sales@aquaair.com

Tempwise Sapphire Features

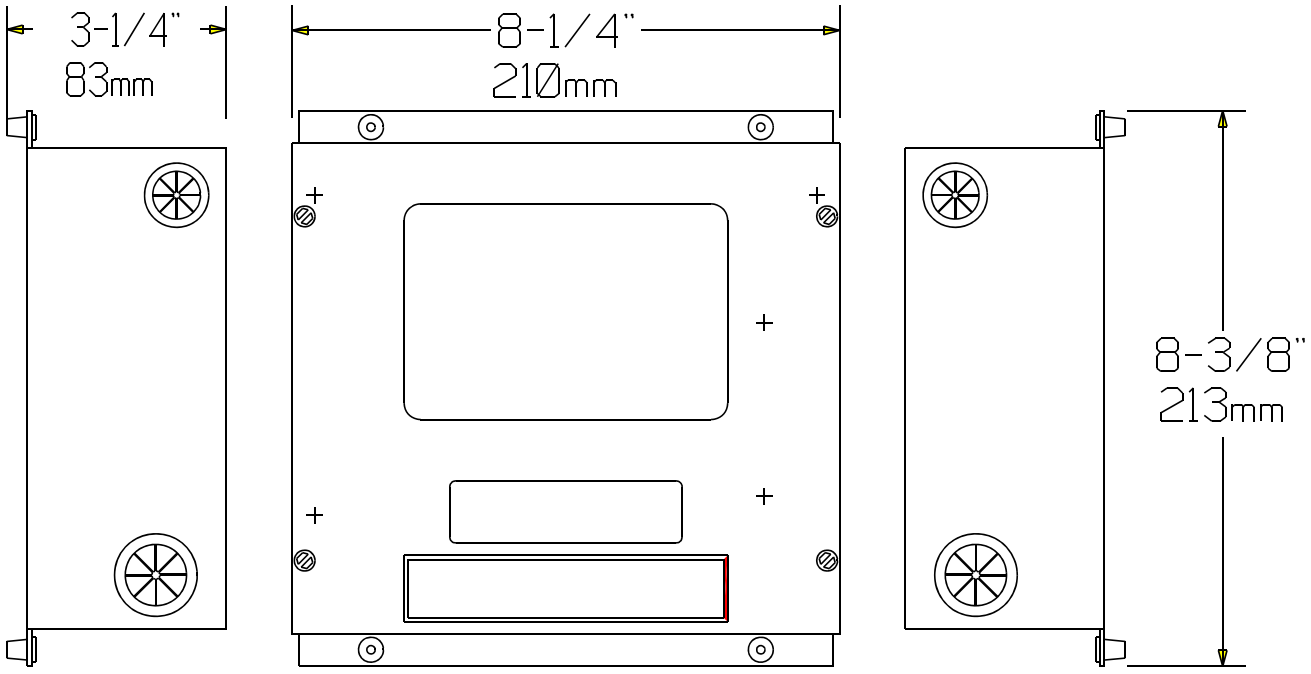
- Highest fan circuit rating in the industry…12 AMPS !!
- Sapphire Blue LED's with brightness control
- Dual voltage 115/230 capability
- Display cables are 50% smaller in diameter than the competitions making routing a snap
- Field replaceable fuse protection
- Modular plug connection for high and low pressure switches
- Uses less bulky 4 pin plugs for the display cable instead of the competitions 8
- Continuous room temperature display with one touch set point temperature display or change
- Maintains room temperature to within 2 degrees of set point
- Remote temperature sensing bulb or faceplate air temperature sensor can be used
- Fahrenheit or Centigrade temperature display
- Automatic or six manually selected fan speeds
- High speed and low speed fan limit settings
- LED bar graph visually indicates fan speed
- Fan can be set to run continuous or to cycle on and off as the room reaches the set point
- Dehumidification mode controls room temperature and humidity level
- Non-volatile EEPROM memory. Controller will not lose settings in memory due to power interruptions
- Electric element heaters up to 12A can be operated directly from the controller

THERMOSTAT DIMENSIONS



SAPPHIRE DISPLAY

CONTROL MODULE

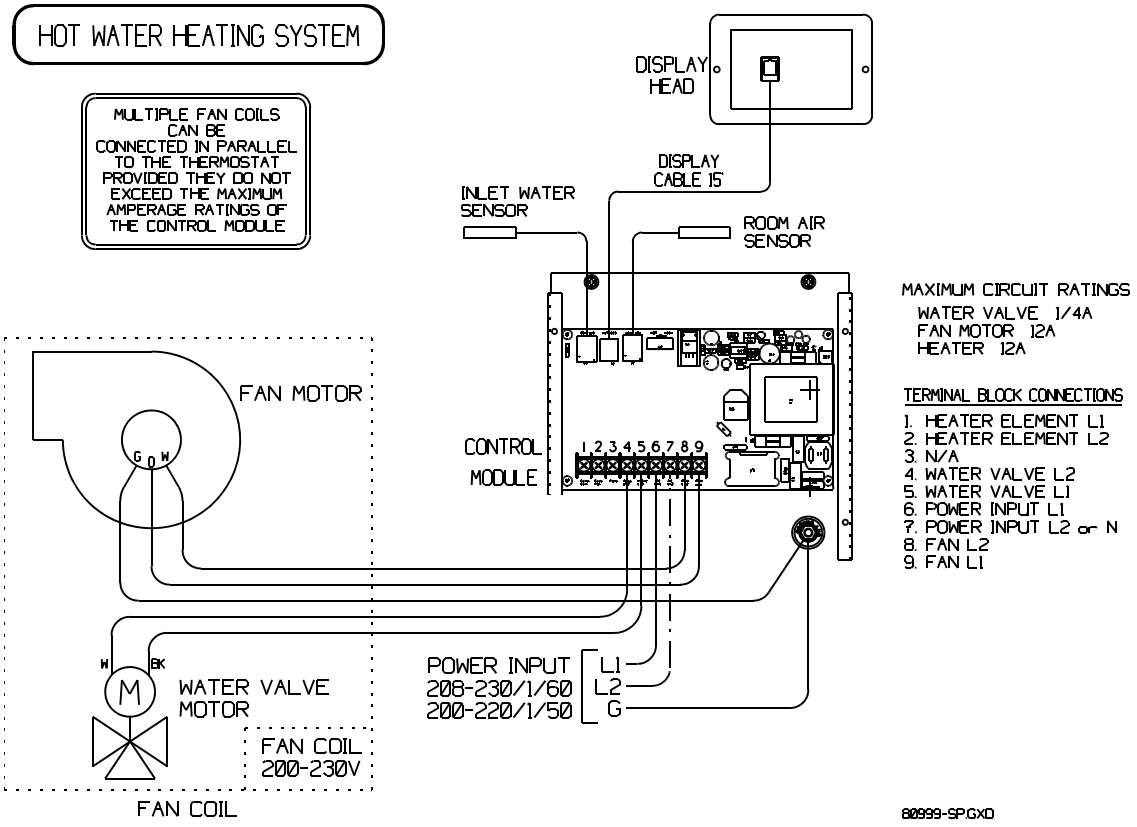


80999-SP.GXD

WIRING SCHEMATICS

HOT WATER HEATING SYSTEM

MULTIPLE FAN COILS CAN BE CONNECTED IN PARALLEL TO THE THERMOSTAT PROVIDED THEY DO NOT EXCEED THE MAXIMUM AMPERAGE RATINGS OF THE CONTROL MODULE

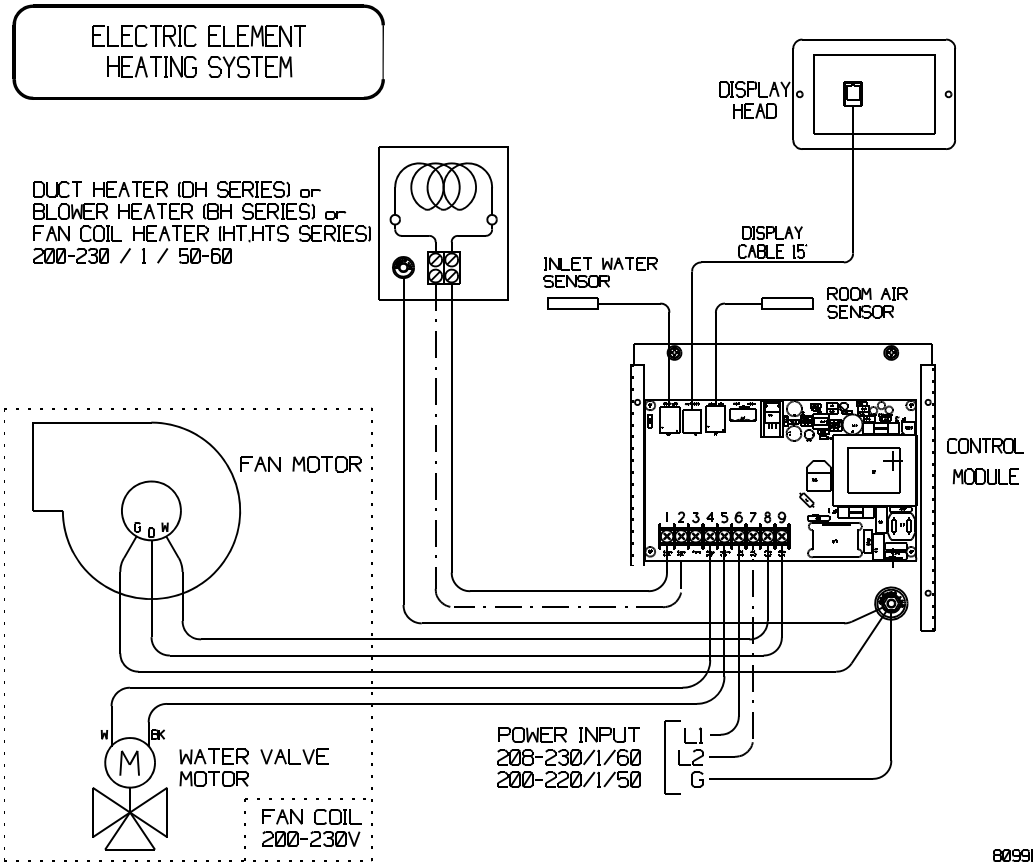


MAXIMUM CIRCUIT RATINGS
WATER VALVE 1/4A
FAN MOTOR 12A
HEATER 12A

TERMINAL BLOCK CONNECTIONS
1. HEATER ELEMENT L1
2. HEATER ELEMENT L2
3. N/A
4. WATER VALVE L2
5. WATER VALVE L1
6. POWER INPUT L1
7. POWER INPUT L2 or N
8. FAN L2
9. FAN L1

80999-SP.GXD

ELECTRIC ELEMENT HEATING SYSTEM



80999P-SP.GXD

Vimar Bezels for TSV Thermostats

Standard VIMAR Idea Series Bezels Stocked by Aqua-Air

VB-BLACK
VIMAR 16753-11

VB-CHROME
VIMAR 16753.3**6**

VB-GOLD
VIMAR 16753.32

VB-NICKEL
VIMAR 16753.33

VB-WHITE
VIMAR 16753.01

The Bezel must be ordered in addition to the Sapphire Thermostat

Vimar Bezel before installation
on Sapphire TSV-01 Display Head

Vimar Bezel after installation
on Sapphire TSV-01 Display Head

You can see all of the different Vimar Idea Series Bezels on the Daniel R. Smith & Associates webpage located here.

Aqua-Air Manufacturing
1050 E. 9th St., Hialeah, FL 33010
Phone 305-884-8363 Tollfree 800-328-1043 Fax 305-883-8549
www.aquaair.com sales@aquaair.com

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

Aqua Touch DIGITAL THERMOSTAT AT Series

Introducing the *Aqua Touch* Touch Screen Digital Thermostat

- User friendly & intuitive 2.5" touch screen display
- Uses Vimar Eikon Series bezels
- Numerous programmable parameters to customize the control
- User friendly programming

AT Series Aqua Touch Digital Thermostat
with Vimar Eikon Stainless Steel Bezel
Actual Size

Aqua-Air Manufacturing, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 E-mail sales@aquaair.com

SPECIFICATIONS

OPERATIONAL

Set Point Operating Range (single)	65°F to 85°F (18°C to 30°C)
Set Point Operating Range (dual, cool mode)	65°F to 95°F (18°C to 35°C)
Set Point Operating Range (dual, heat mode)	55°F to 85°F (13°C to 30°C)
Ambient Temperature Operating Range Displayed	5°F to 150°F (-15°C to 65°C)
Sensor Accuracy	± 2°F @ 77°F (±1.0°C @ 25°C)
Low Voltage Processor Reset	50 VAC
Line Voltage	100 to 240 VAC
Frequency	50 or 60 Hz
Fan Output	6 Amps @ 115 VAC
Fan Output	Amps @ 230 VAC
Valve Output	1/4 Amp @ 115/230 VAC
Heater Output (using valve relay)	15 Amps @ 115 VAC
Heater Output (using valve relay)	10 Amps @ 230 V
Pump Output	1/4 HP @ 115 VAC
Pump Output	1/2 HP @ 230 VAC
Compressor Output	1 HP @ 115 VAC
Compressor Output	2 HP @ 230 VAC
Minimum Operating Temperature	0°F (-18°C)
Maximum Ambient Operating Temperature	180°F (82°C)
Maximum Rh Conditions	99% Non-Condensing
Power Consumption	Less Than 5 Watts

DIMENSIONS

Display Panel	4.309” (109mm) X 2.874" (73mm)
Panel Cut Out	2.90" (74mm) X 2.165" (55mm)
Bezel Type Required	Vimar® Eikon or Vimar® Eikon EVO

CABLE LENGTHS

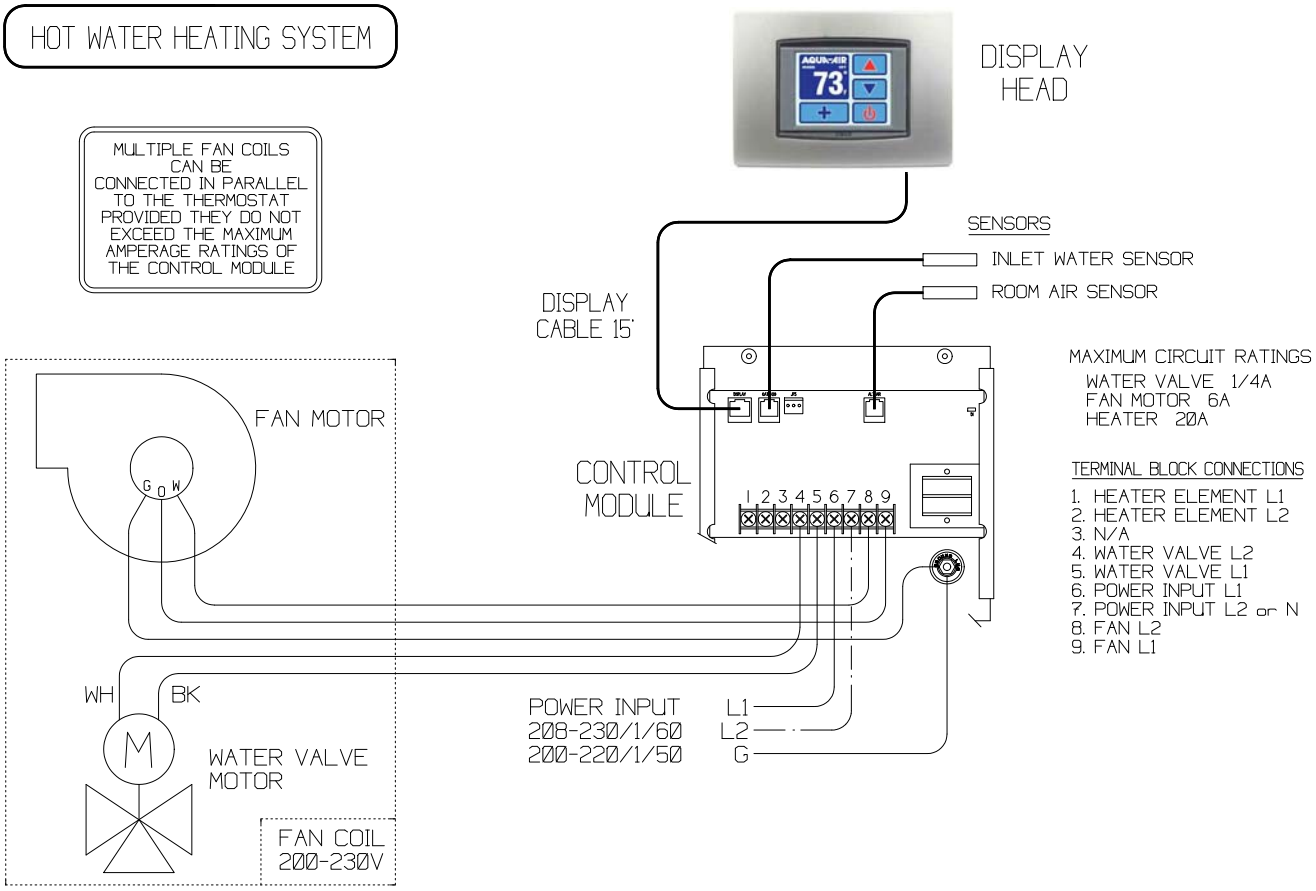
Display Cable Self Contained	15' (4.6m) Standard
Display Cable Split System	30' (9.1m) Standard
Maximum Display Cable Length	75' (22.9m) Maximum
Alternate Air Sensor (optional)	7' (2.1m) Standard
Alternate Air Sensor Split System (optional)	30' (9.1m) Standard
Outside Air Sensor (optional)	15' (4.6m) Standard
Maximum Temperature Sensor Cable Length	75' (22.9m) Maximum
Combo Inside Temperature/Humidity Sensor (optional for FX2 only)	7' (2.1m) Standard
Maximum Combo Inside Temperature/Humidity Sensor Cable Length	15' (4.6m) Maximum

SYSTEM INPUTS

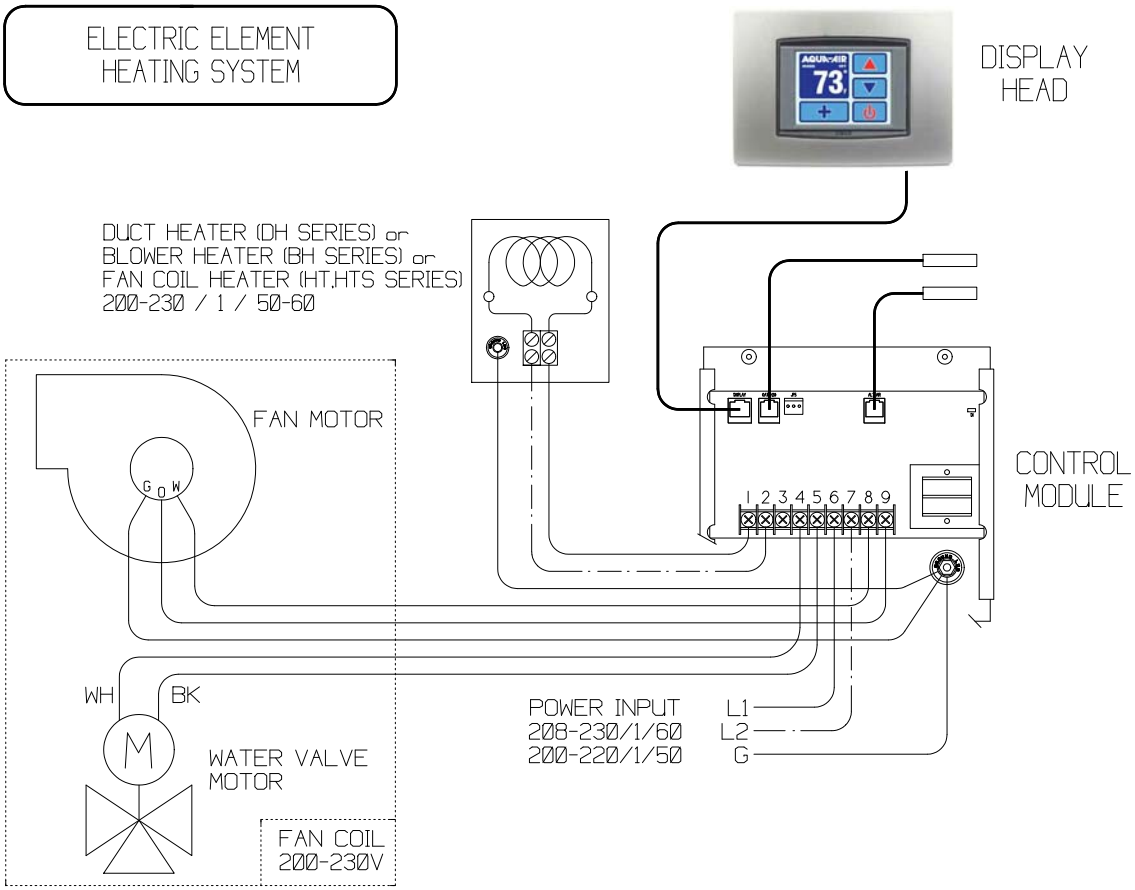
Inside Air Temperature Sensor (built into display)	1
High Refrigerant Pressure	1
Low Refrigerant Pressure (optional)	1
Alternate Inside Air Temperature Sensor (optional)	1
Combo Inside Temperature/Humidity Sensor (optional for FX2 only)	1
Outside Air Temperature Sensor (optional)	
Pump Sentry Condenser Coil Sensor (optional)	1

WIRING SCHEMATICS

HOT WATER HEATING SYSTEM



ELECTRIC ELEMENT HEATING SYSTEM



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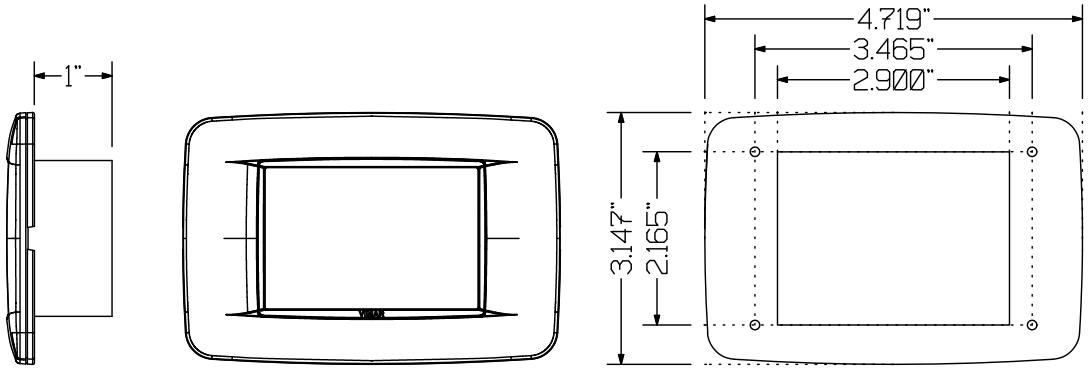
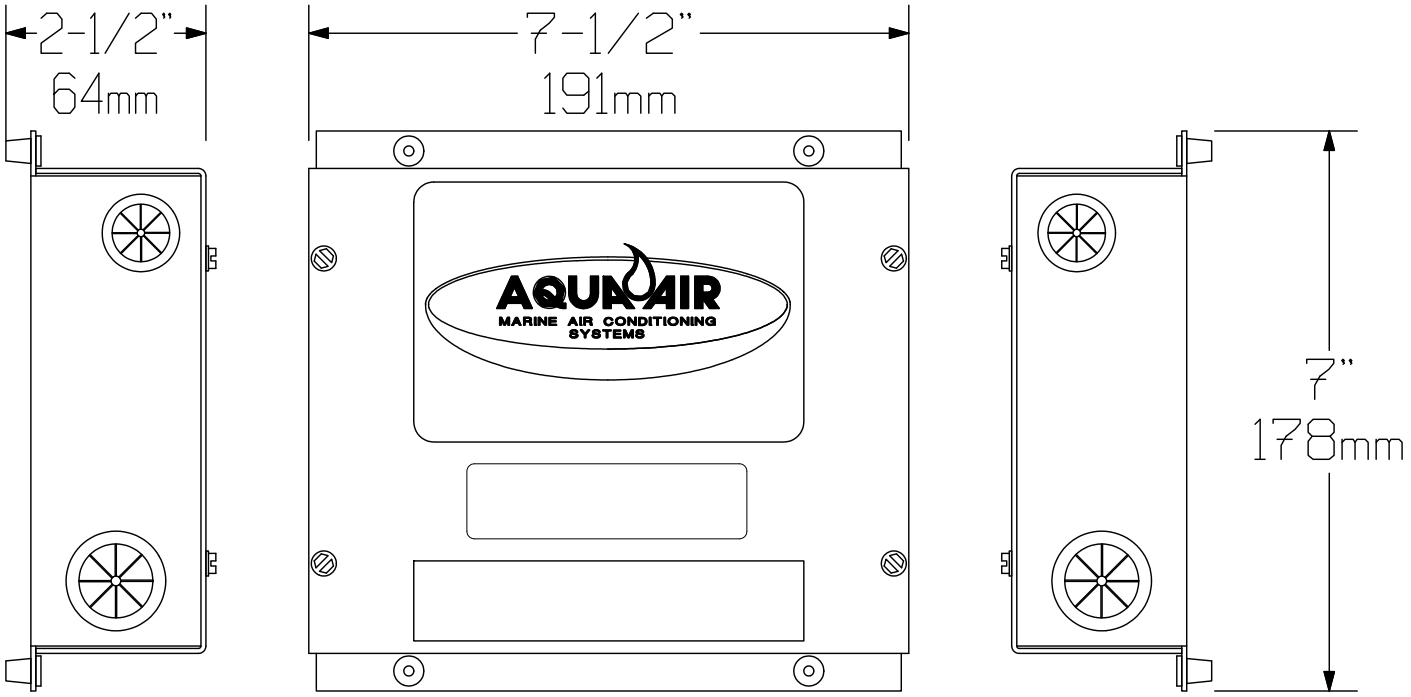
THERMOSTAT DIMENSIONS





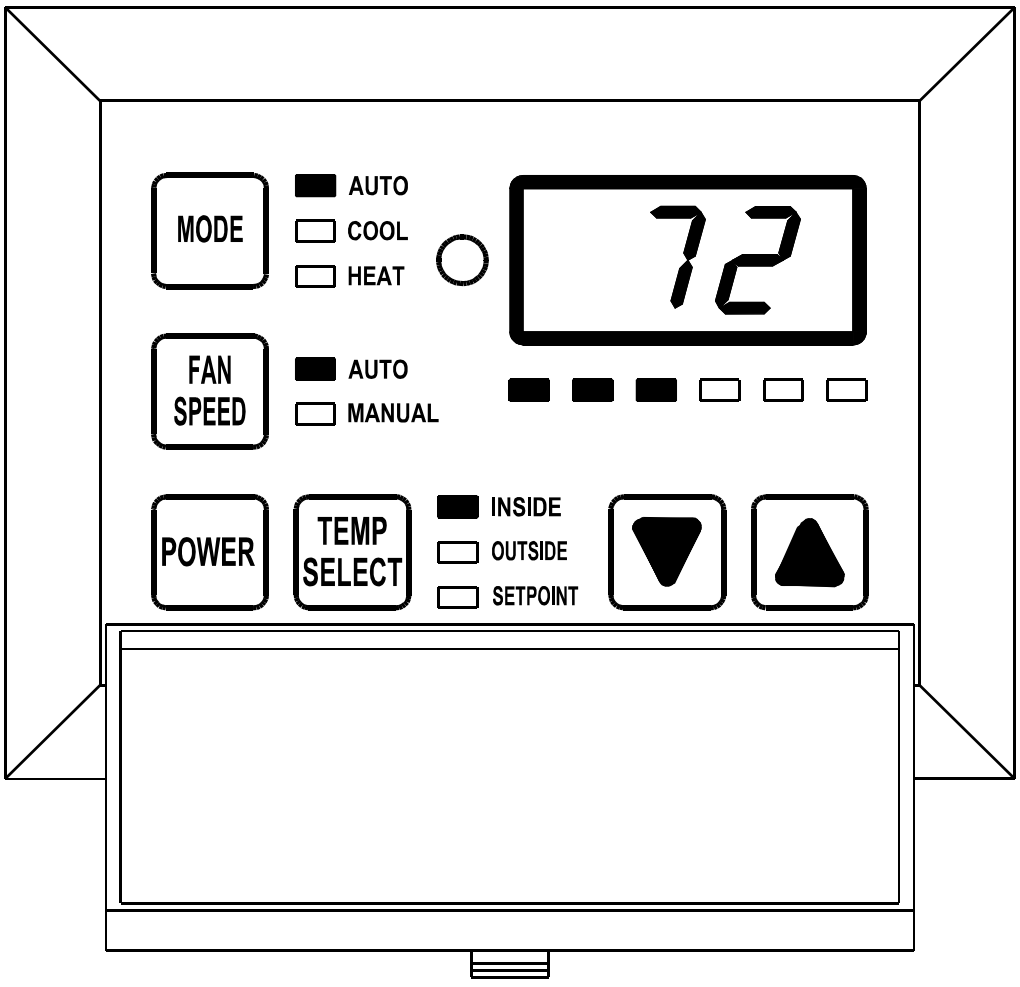
CONTROL MODULE

80998-21

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

DIGITAL THERMOSTAT TW2W

The new ***Tempwise 2001 Designer Series*** Chillwater Digital Thermostat represents the next generation of Tempwise microprocessor based room temperature controllers. In addition to the user friendly features found in the current Tempwise 2000, this new thermostat comes housed in an acrylic display panel with hinged cover that can be painted to match the surrounding decor.



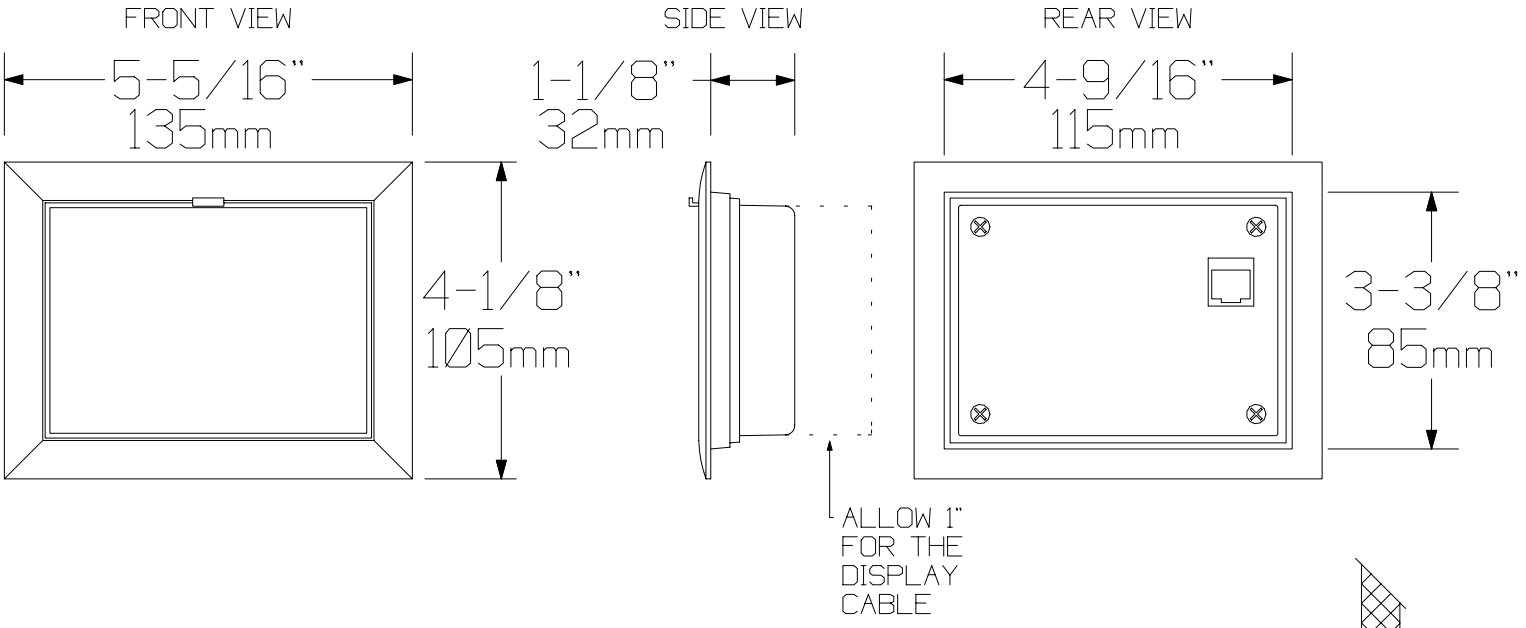
TEMPWISE 2001 DISPLAY PANEL
SHOWN AT FULL SIZE

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 E-mail sales@aquaair.com

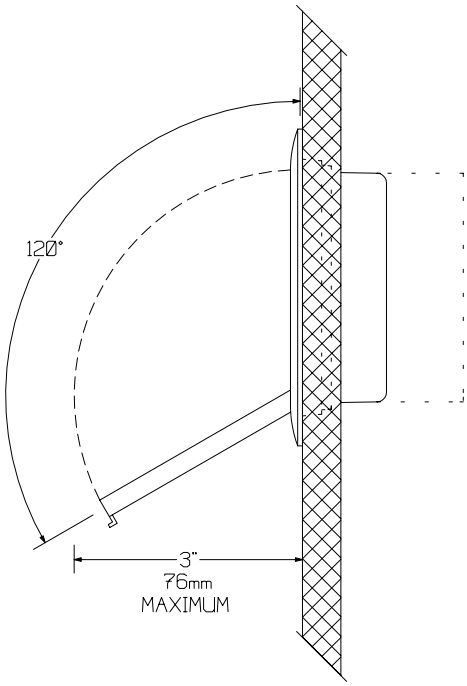
Tempwise 2001 FEATURES

- Paintable face plate cover with recess for matching wall covering insert
- Continuous room temperature display with one touch set point temperature display or change
- Displays Inside Air Temperature, Setpoint and Chillwater Temperature at the inlet to the fan coil
- Maintains room temperature to within 2 degrees of set point
- Remote temperature sensing bulb
- Fahrenheit or Centigrade temperature display
- Operates on all voltage and frequency inputs between 115-250 VAC, 50 or 60 Hz
- Automatic or six manually selected fan speeds
- Fan speeds automatically compensate for changes in incoming power supply
- High speed and low speed fan limit settings
- LED bar graph visually indicates fan speed
- Fan can be set to run continuous or to cycle on and off as the room reaches the set point
- Dehumidification mode controls room temperature and humidity level
- Non-volatile EEPROM memory. Controller will not lose settings in memory due to power interruptions
- Electric element heaters up to 20A can be operated directly from the controller
- Controller is encased in a drip-proof, aluminum housing
- Low voltage display panel offers the optimum in operator safety
- Easy installation and connection of all components utilizing telephone type wire and jacks

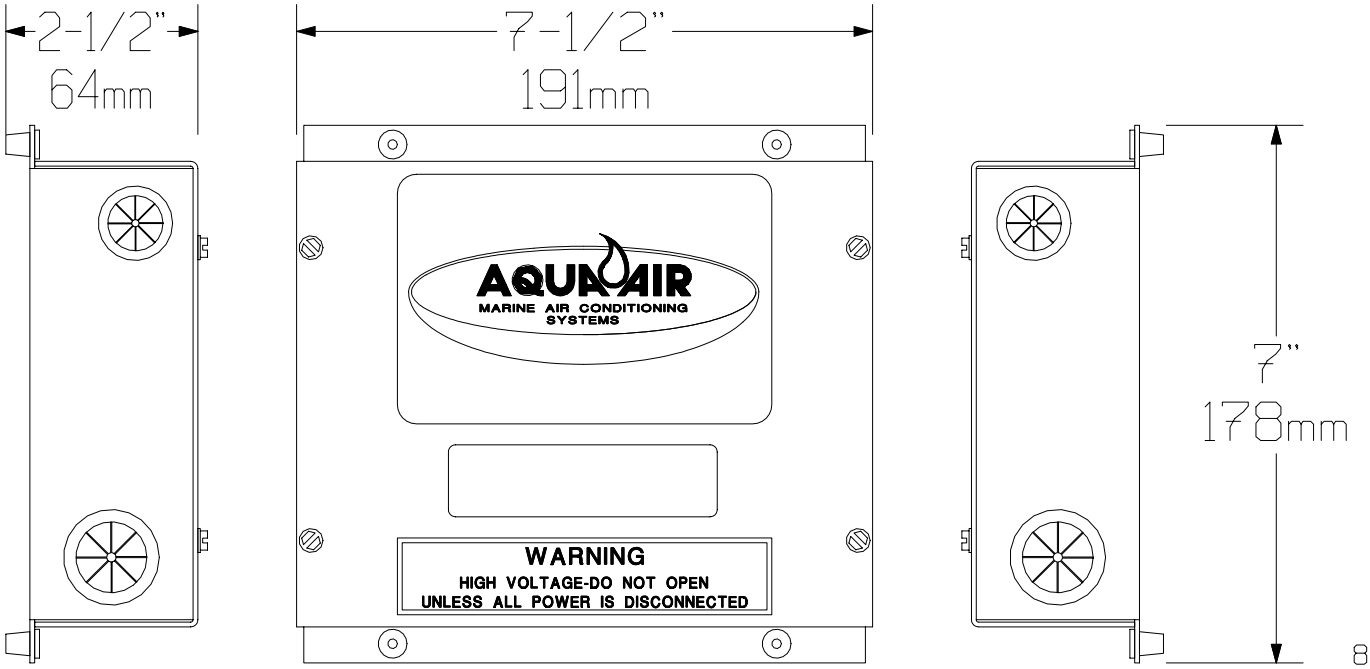
THERMOSTAT DIMENSIONS



TEMPWISE 2001 DISPLAY PANEL INSTALLED IN A TYPICAL 1/2" (13mm) BULKHEAD.



CONTROL MODULE



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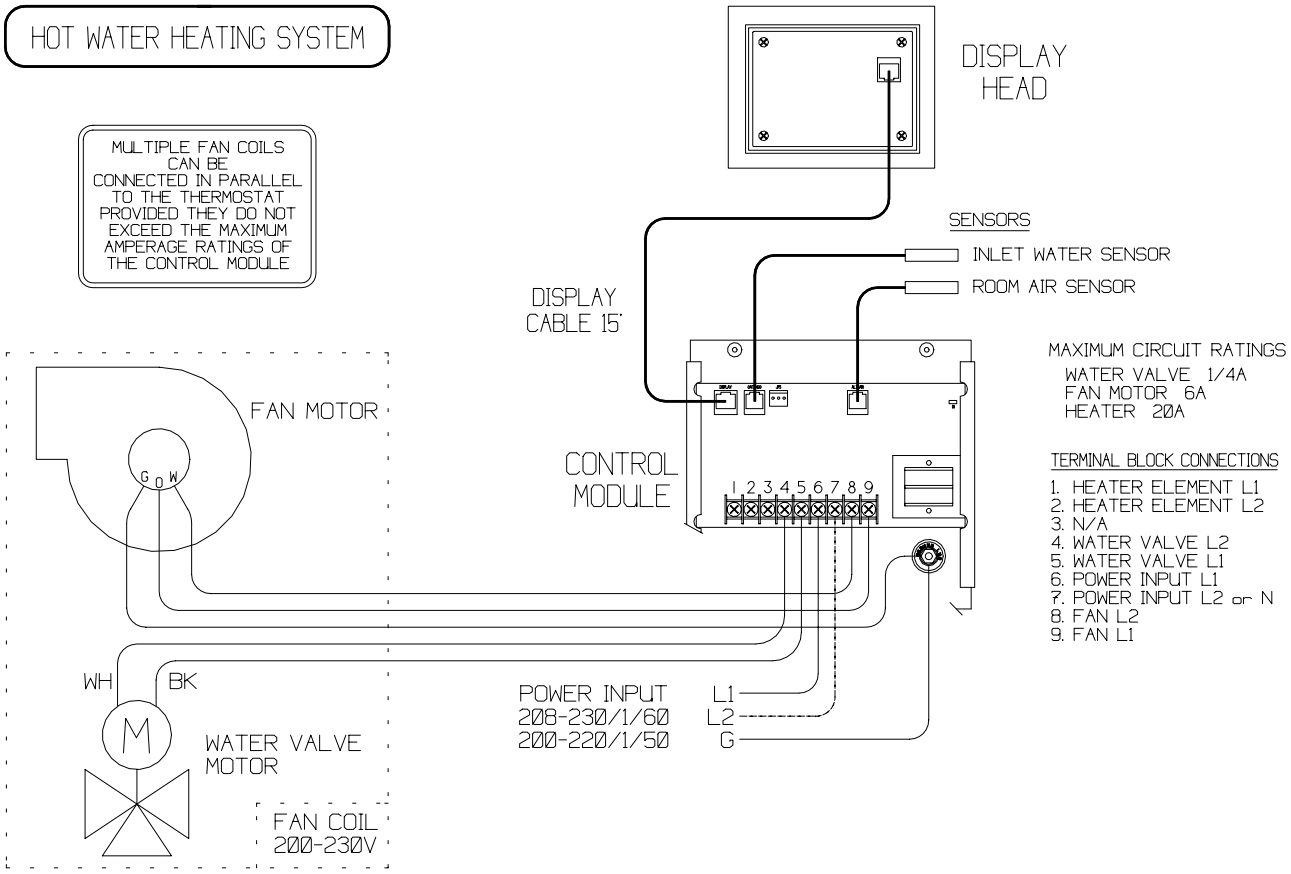
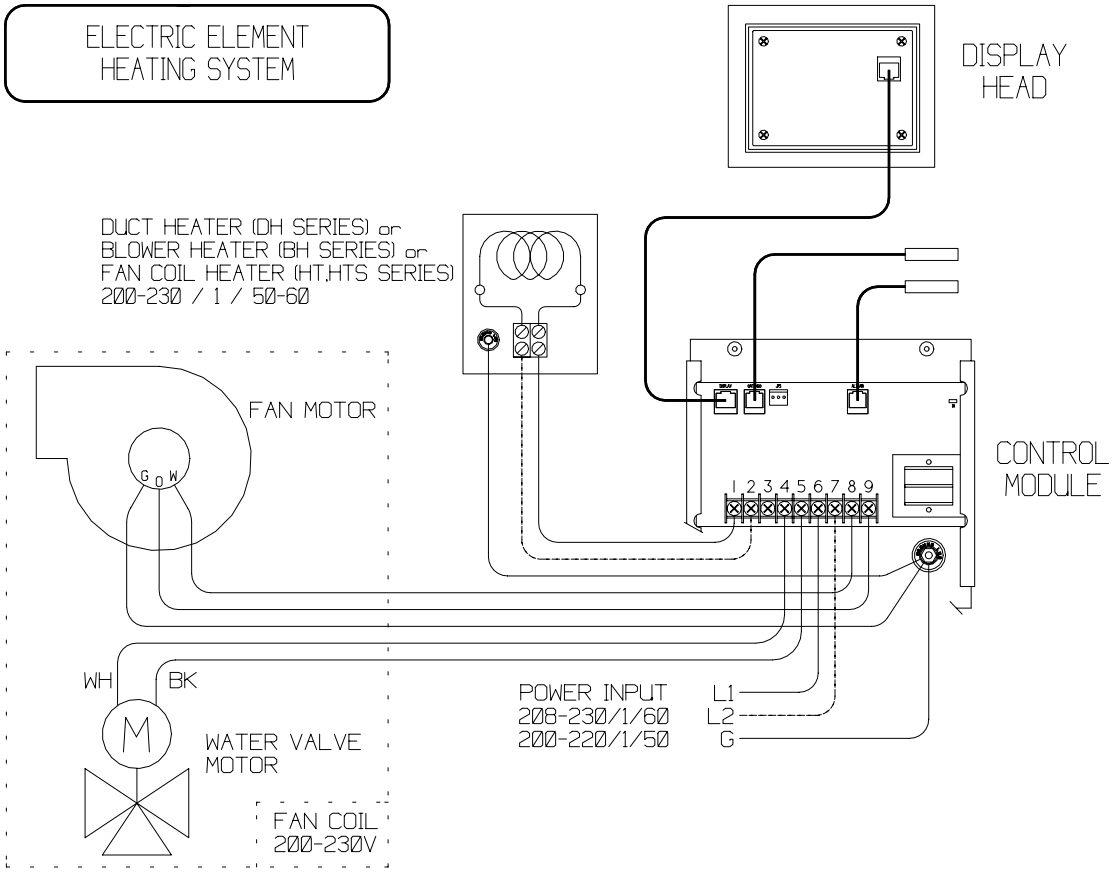
WIRING SCHEMATICS

HOT WATER HEATING SYSTEM



ELECTRIC ELEMENT HEATING SYSTEM



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AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

ALPHA COMPACT TITANIUM CHILLER SERIES

The Alpha Series Compact Chiller Module is the largest selling chiller in the megayacht industry today. Over the last decade more Alpha's have been installed in yachts than all other brands combined. Since its introduction in 1993 it has constantly evolved. Alpha's shipped today feature 308 stainless steel chassis' and fasteners, scroll compressors and TITANIUM inner tube condensers all finished with Awlgrip® coatings. What has not changed is the compactness and unrivaled reliability. In recent comparisons to other brands, the Alpha was on an average 22% lighter and 38% smaller in volume. This means major weight and space savings when the units are racked. Alpha's are built in capacities from 24,000 to 72,000 BTU/H (19-60,000 BTU/H 50 Hz) and all share the same chassis dimensions. Should a vessels BTU requirements exceed 72,000 BTU/H, multiple chillers can be racked together for a larger total capacity.

Features

- Copeland Scroll compressors
- Stainless Steel chassis and fasteners
- Awlgrip® Matterhorn White finish
- Available in either Reverse Cycle or Cooling Only units
- Access ports for high and low refrigerant pressure
- High and low automatic reset refrigerant pressure switches
- Titanium inner tube seawater condensers
- Stainless steel plate chiller
- Electrical box can be remote mounted
- Honeywell digital temperature controller with integral time delay
- Freeze prevention thermostat
- 3 phase units can be used with Variable Frequency Drives (VFD's)
- All units performance tested before shipping
- R-407C environmentally friendly refrigerant

AT	5	H	G	D	Model Number Nomenclature	
					C	208-230 / 1 / 60
					CK	200-220 / 1 / 50
					D	208-230 / 3 / 60
					DK	200-220 / 3 / 50
					E	440-480 / 3 / 60
					EK	380-415 / 3 / 50
					G	R-407C Refrigerant
					BLANK	COOLING ONLY
					H	REVERSE CYCLE
					CAPACITY, IN TONS, AT RATED VOLTAGE	
					ALPHA SERIES TITANIUM MODULAR CHILLER SERIES	

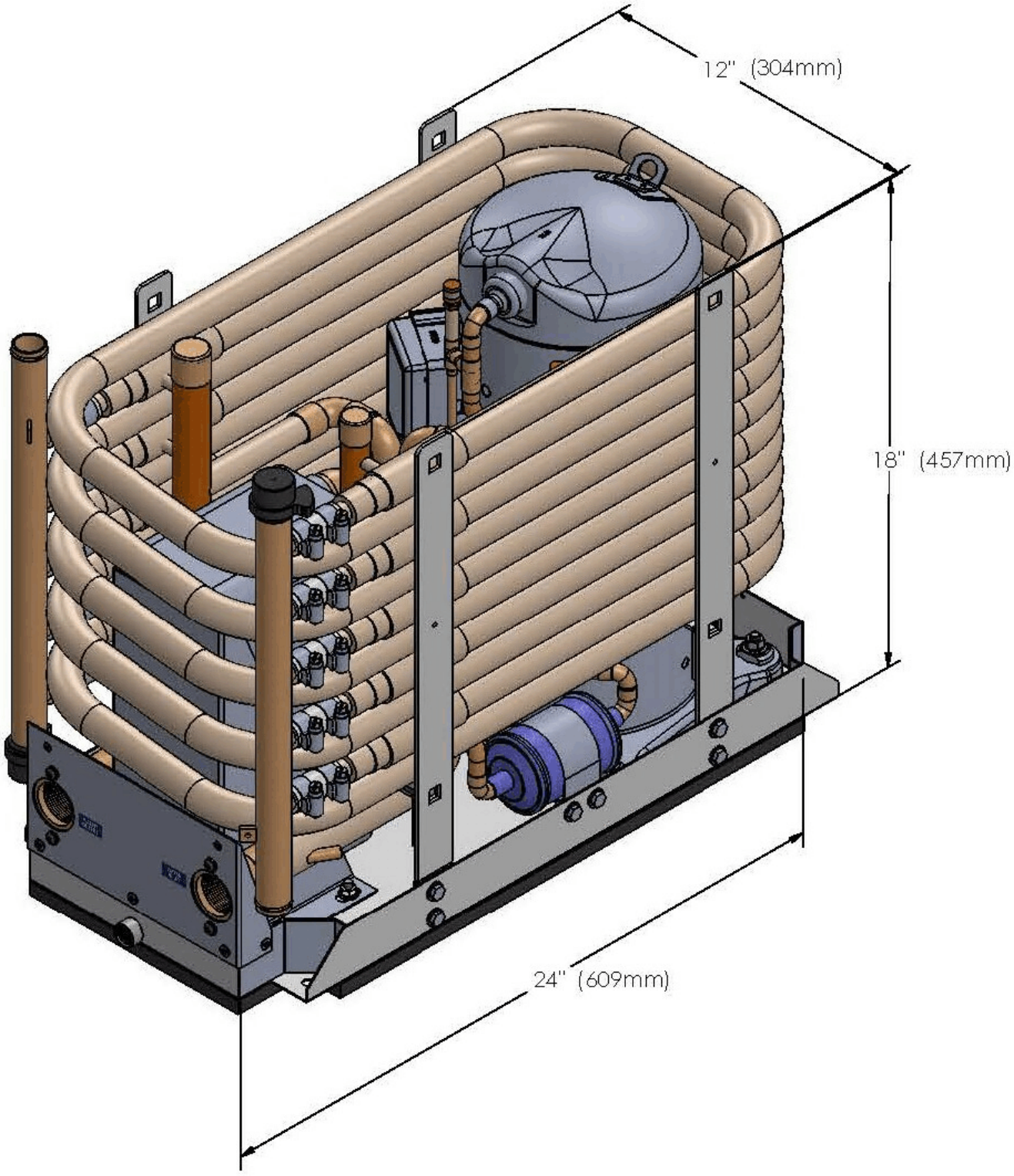
Physical Specifications

MODEL	CAPACITY BTU/HR	AVAILABLE VOLTAGES	WEIGHT		CHILLWATER INLET / OUTLET	MINIMUM CHILLWATER FLOW		SEAWATER INLET / OUTLET	MINIMUM SEAWATER FLOW	
			LBS	KGS		GPM	LPM		GPM	LPM
AT1.7*	19,920	200-220 / 1 / 50	140	64	½" FPT	4.0	15.3	5/8" OD	6.8	25.9
AT2*	24,000	208-230 / 1 / 60 208-230 / 3 / 60 460 / 3 / 60 380-415 / 3 / 50	140	64	½" FPT	4.8	18.3	5/8" OD	8.0	31.0
AT2.5*	30,000	200-220 / 1 / 50 208-230 / 1 / 60 208-230 / 3 / 60 460 / 3 / 60 380-415 / 3 / 50	157	71	3/4" FPT	6.0	22.9	1" OD	10.0	38.1
AT3*	36,000	208-230 / 1 / 60 208-230 / 3 / 60 460 / 3 / 60 380-415 / 3 / 50	157	71	3/4" FPT	7.2	27.4	1" OD	12.0	45.8
AT3.3*	40,000	200-220 / 1 / 50	161	73	1" FPT	7.9	30.1	1" OD	13.2	50.3
AT4*	48,000	208-230 / 1 / 60 208-230 / 3 / 60 460 / 3 / 60 380-415 / 3 / 50	161	73	1" FPT	9.6	36.5	1" OD	16.0	61.0
AT5*	60,000	208-230 / 1 / 60 208-230 / 3 / 60 460 / 3 / 60 380-415 / 3 / 50	161	73	1-1/4" FPT	12.0	45.6	1" OD	20.0	76.3
AT6*	72,000	208-230 / 3 / 60 460 / 3 / 60	165	85	1-1/4" FPT	14.4	54.5	1" OD	24.0	90.8

* See Model Number Nomenclature chart above for additional letter codes

Performance Specifications

MODEL	CAPACITY			POWER SUPPLY			FULL LOAD AMPS FLA	POWER INPUT W	LOCKED ROTOR AMPS LRA
	BTU/HR	KCAL/HR	TONS	VOLTAGE	PHASE	Hz			
AT1.7(H)GCK	19,920	4,980	1.7	200-220	1	50	6.3	1158	47
AT2(H)GC	24,000	6,000	2.0	208-230	1	60	6.7	1550	56
AT2(H)GD	24,000	6,000	2.0	208-230	3	60	5.9	1630	45
	19,920	4,980	1.7	200-220	3	50	6.1	1380	48
AT2(H)GE	24,000	6,000	2.0	460	3	60	1.4	1690	23
	19,920	4,980	1.7	380-415	3	50	3.0	1460	24
AT2.5(H)GC	30,000	7,500	2.5	208-230	1	60	7.3	1590	87
AT2.5(H)GCK	30,000	7,500	2.5	200-220	1	50	8.9	1989	87
AT2.5(H)GD	30,000	7,500	2.5	208-230	3	60	6.7	2025	73
AT2.5(H)GE	30,000	7,500	2.5	460	3	60	3.4	2025	38
AT2.5(H)GEK	30,000	7,500	2.5	380-415	3	50	4	2137	40
AT3(H)GC	36,000	9,000	3.0	208-230	1	60	11.8	2550	88
AT3(H)GD	36,000	9,000	3.0	208-230	3	60	8.1	2460	77
	30,000	7,500	2.5	200-220	3	50	7.1	2100	76
AT3(H)GE	36,000	9,000	3.0	460	3	60	4.5	2700	39
	30,000	7,500	2.5	380-415	3	50	4.5	2260	38
AT3(H)GEK	36,000	9,000	3.0	380-415	3	50	4.6	2450	44
AT3.3(H)GCK	40,000	10,000	3.3	200-220	1	50	11.9	2536	107
AT4(H)GC	48,000	12,000	4.0	208-230	1	60	16.2	3410	129
AT4(H)GCK	48,000	12,000	4.0	200-220	1	50	16.6	3430	140
AT4(H)GD	48,000	12,000	4.0	208-230	3	60	11	3350	120
	40,000	10,000	3.3	200-220	3	50	9.5	2830	88
AT4(H)GE	48,000	12,000	4.0	460	3	60	5.3	3320	60
	40,000	10,000	3.3	380-415	3	50	5.5	2830	44
AT4(H)GEK	48,000	12,000	4.0	380-415	3	50	5.7	3005	58
AT5(H)GC	60,000	15,000	5.0	208-230	1	60	19.8	4230	169
AT5(H)GD	60,000	15,000	5.0	208-230	3	60	13.4	4120	137
	50,000	12,500	4.0	200-220	3	50	10.8	3370	115
AT5(H)GE	60,000	15,000	5.0	460	3	60	6.4	4120	85
	50,000	12,500	4.0	380-415	3	50	6.3	3370	58
AT5(H)GEK	60,000	15,000	5.0	380-415	3	50	7.4	3615	43
AT6(H)GD	72,000	18,000	6.0	208-230	3	60	14.5	4780	156
	60,000	14,000	4.7	200-220	3	50	14.4	3970	172
AT6(H)GE	72,000	18,000	6.0	460	3	60	7.2	4780	75
	60,000	14,000	4.7	380-415	3	50	7.2	3970	74



AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com
www.aquaair.com www.aquaair.eu

AQUA-AIR
MARINE AIR CONDITIONING SYSTEMS

ALPHA SERIES MULTI-STAGE RACK CHILLER UNITS 7-20 TONS

The Alpha Series Multi-Stage Rack Chiller Units are available in 2,3 and 4 stage models from 7 to 20 tons in capacity and in voltages from 230-1-60 to 380-3-50. Four and five ton (3.5 and 4.3 ton @ 50 Hz) Alpha series modules are manifolded together on both the seawater and chillwater circuits to form the units. The chillers and chillwater pump are then mounted on a common aluminum base for ease of installation. A remotely mounted electrical box provides for easy access to critical electrical components

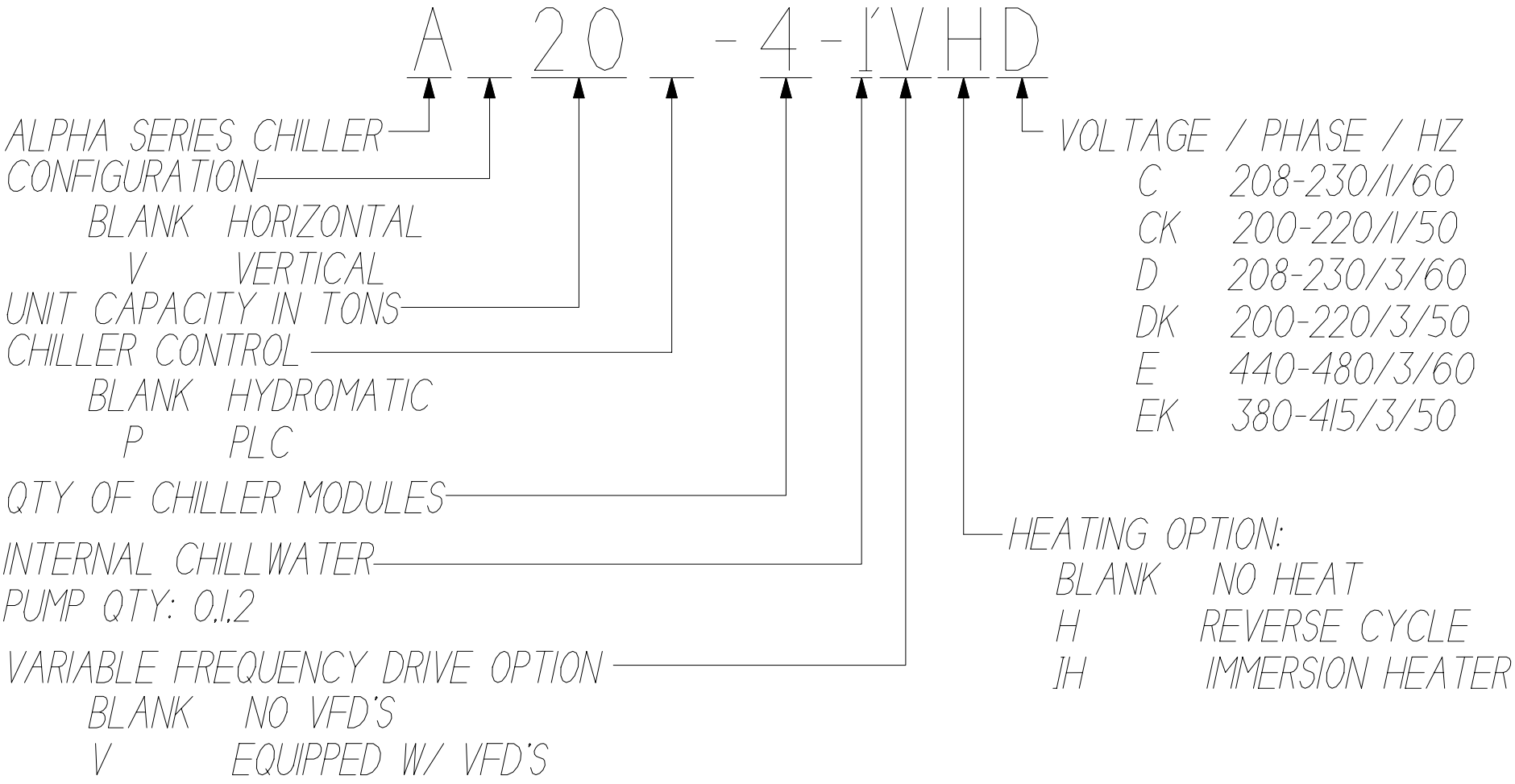
Unit Features

- Available in 8, 10, 12, 15, 16 and 20 ton capacities for 60 Hz applications and 7, 8.5, 10.5, 13, 14 and 17 ton capacities for 50 Hz applications.
- Available in 230-1, 230-3 and 460-3 for 60 Hz and 220-3 and 380-3 for 50 Hz.
- Available in cooling only, reverse cycle and immersion heat models.
- Available in vertical 2 & 3 stage models.
- Available with Variable Frequency Drives (VFD's) to provide for surgeless compressor startup.
- Integral chillwater pump with ODP motor and drain pan to catch condensate from the pump head.
- Integral chillwater flow switch.
- Chiller unit freeze stats are located on each chiller module.
- Seawater condensers constructed of 90-10 cupronickel inner tube and copper outer shell for corrosion resistance
- Chiller modules constructed of stainless steel with stainless steel fasteners
- Chiller modules utilize high performance stainless steel plate heat exchangers
- Chillwater manifolds constructed of copper with 1/2" (13mm) wall insulation to prevent condensation. Manifolds are connected to the individual chiller modules through unions.
- High quality brass isolation ball valves are located on the inlet and outlet of the manifolds to allow isolation of the modules for repair purposes.
- Seawater manifolds are constructed of corrosion resistant Sch 80 PVC. Connections to the cupronickel condenser manifolds on the individual chiller modules is via a double braid hose connection.
- Aluminum frames that are primed and painted with Awlgrip Matterhorn White.
- Individual chiller modules are vibration mounted to the main frame. Mounting points (4-6) are available on the frame. Vibration mounts provided as standard.
- Remote mount electrical control panels featuring the Hydromatic Chiller Controller system
- Custom configurations are available. Contact the factory for engineering assistance.

80964.wpd

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 E-mail sales@aquaair.com

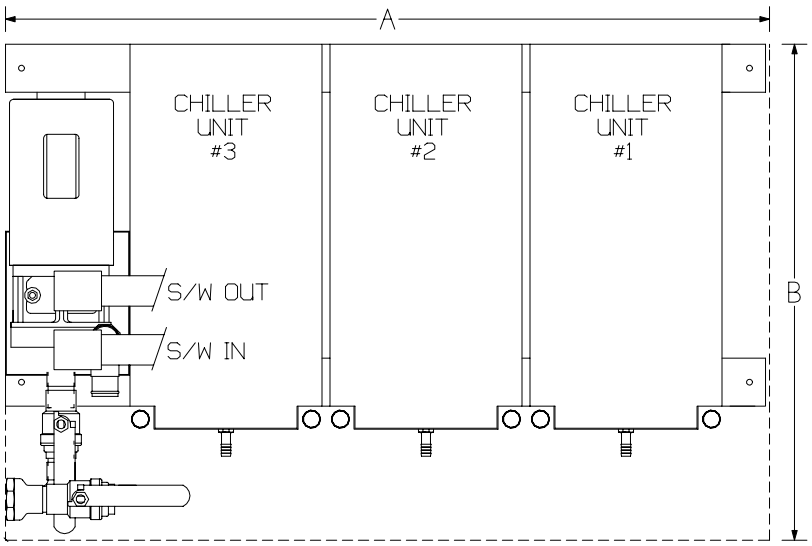
ALPHA SERIES RACK CHILLERS
MODEL NUMBER DESCRIPTION



EXAMPLE: A20-4-IVHD 20 TON, HORIZONTAL RACK, 4 STAGE, 1 CHILLWATER PUMP, VARIABLE FREQUENCY DRIVES, REVERSE CYCLE HEATING, 208-230/3/60 POWER INPUT.

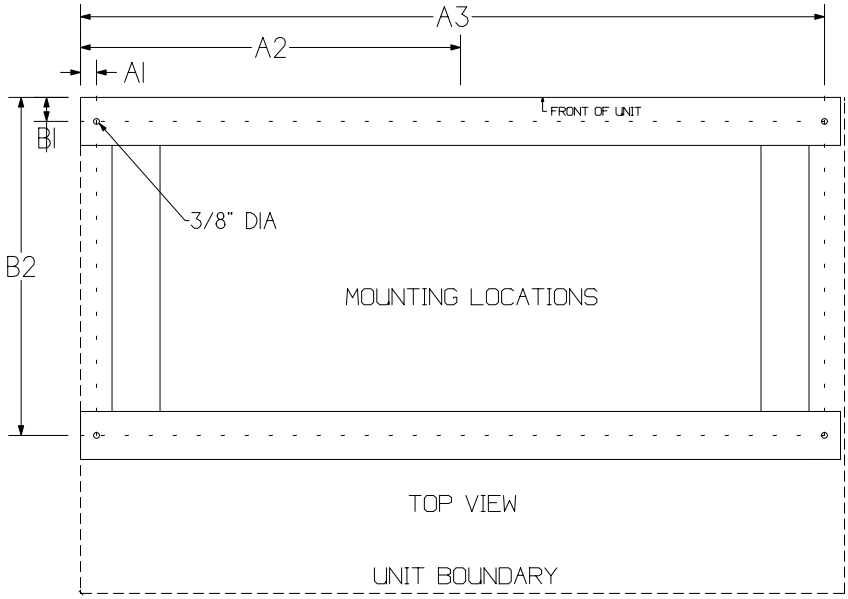
ALPHA SERIES MODULAR CHILLER RACKS
COOLING ONLY & REVERSE CYCLE SYSTEMS

DIMENSIONS		A7-2-1 A8-2-1 A8.5-2-1 A10-2-1	A10.5-3-1 A12-3-1 A13-3-1 A15-3-1	A14-4-1 A16-4-1 A17-4-1 A20-4-1
A	inch	35-3/4"	47-3/4"	60"
	mm	908	1213	1524
B	inch	30"	31"	31"
	mm	762	787	787
C	inch	21"	25"	25"
	mm	533	635	635
A1	inch	1"	1"	1"
	mm	25	25	25
A2	inch	-	-	29-7/8"
	mm	-	-	759
A3	inch	34-1/2"	46-1/2"	58-3/4"
	mm	876	1181	1492
B1	inch	1-1/2"	1-1/2"	1-1/2"
	mm	38	38	38
B2	inch	21-1/8"	21-1/8"	21-1/8"
	mm	537	537	537
CHILLWATER INLET/OUTLET		1-1/4" FPT	2" FPT	2" FPT
SEAWATER INLET/OUTLET		1-1/4" FPT	1-1/2" FPT	2" FPT
WEIGHT w/o VFD's	lbs	491	904	1154
	kg	223	411	525
WEIGHT w/ VFD's	lbs	540	979	1250
	kg	245	445	568

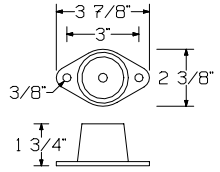


TOP VIEW

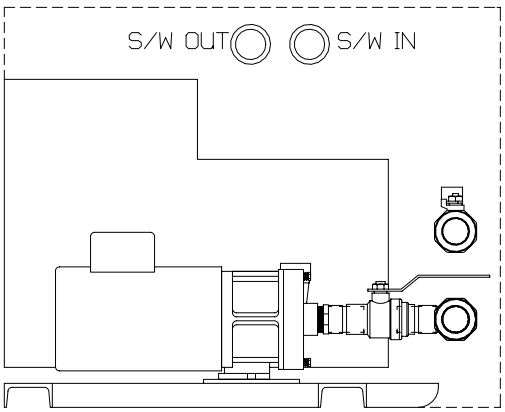
A15-3-1 SHOWN



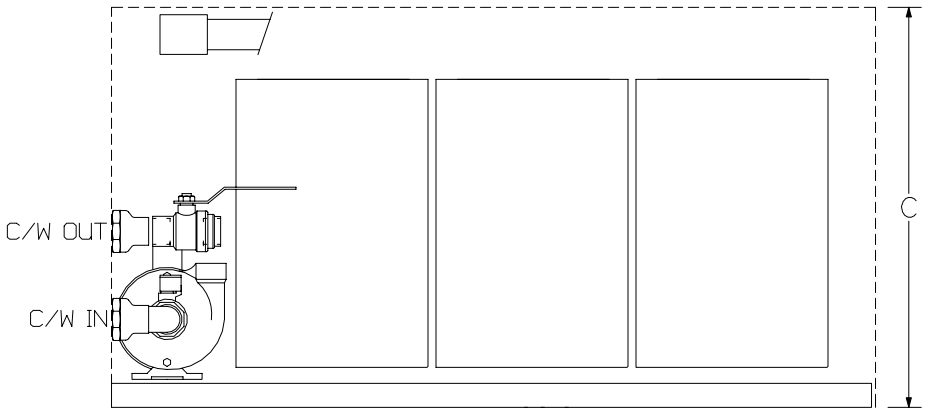
TOP VIEW



220207-05
STANDARD VIBRATION MOUNT
(NOT SHOWN TO SCALE)



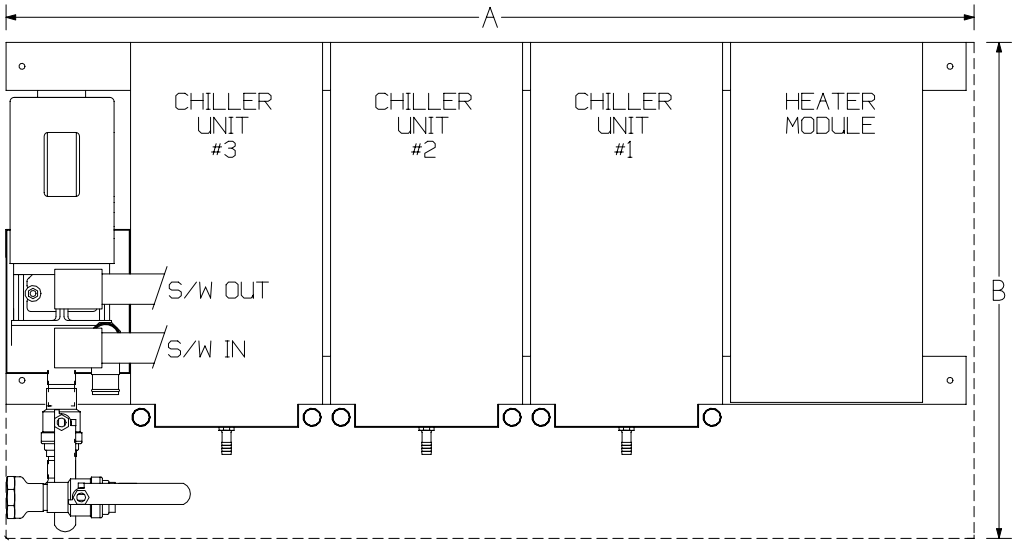
RIGHT SIDE VIEW



REAR VIEW

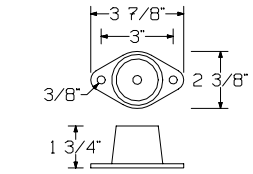
ALPHA SERIES MODULAR CHILLER RACKS
COOLING ONLY CHILLERS w/ IMMERSION HEAT

DIMENSIONS		A7-2-1IH A8-2-1IH A8.5-2-1IH A10-2-1IH	A10.5-3-1IH A12-3-1IH A13-3-1IH A15-3-1IH	A14-4-1IH A16-4-1IH A17-4-1IH A20-4-1IH
A	inch	49"	60"	73-1/2"
	mm	1245	1524	1867
B	inch	30"	31"	31"
	mm	762	787	787
C	inch	21"	25"	25"
	mm	533	635	635
A1	inch	1"	1"	1"
	mm	25	25	25
A2	inch	-	30"	36-1/4"
	mm	-	762	921
A3	inch	47-1/2"	59"	71-1/2"
	mm	1207	1499	1816
B1	inch	1-1/2"	1-1/2"	1-1/2"
	mm	38	38	38
B2	inch	21-1/8"	21-1/8"	21-1/8"
	mm	537	537	537
CHILLWATER INLET/OUTLET		1-1/4" FPT	2" FPT	2" FPT
SEAWATER INLET/OUTLET		1-1/4" FPT	1-1/2" FPT	2" FPT
WEIGHT w/o VFD's	lbs	586	999	1249
	kg	266	454	568
WEIGHT w/ VFD's	lbs	635	1074	1345
	kg	289	488	611

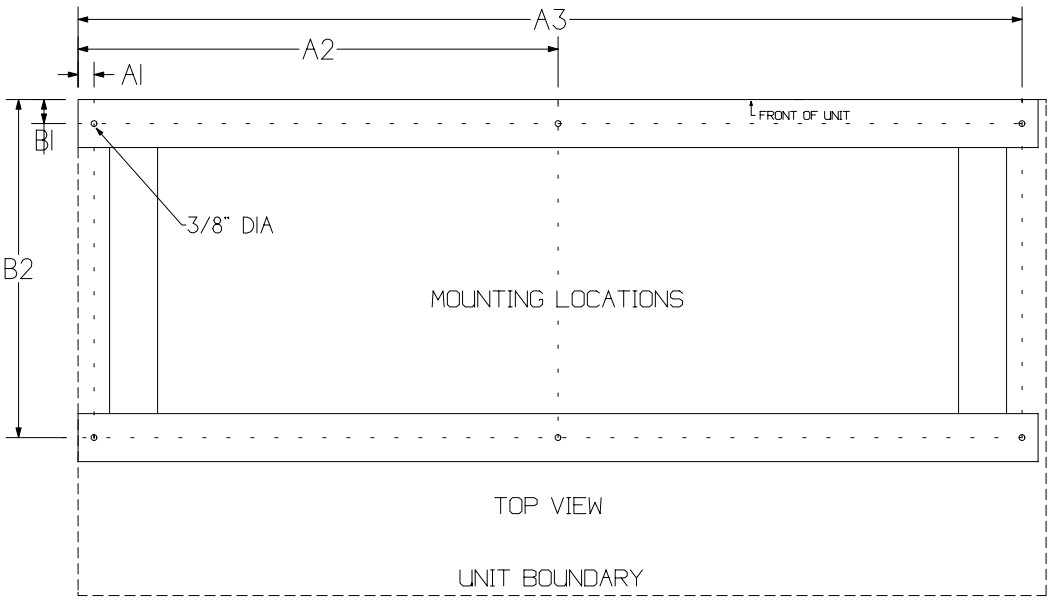


TOP VIEW

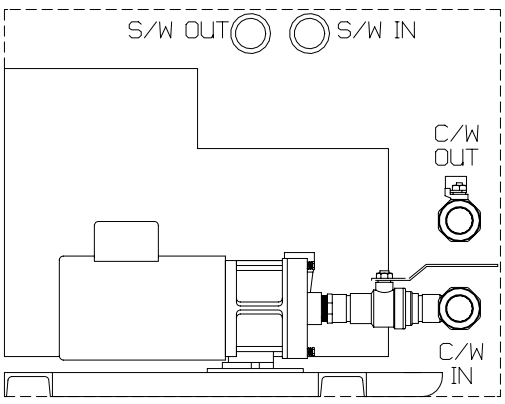
A15-3-1IH SHOWN



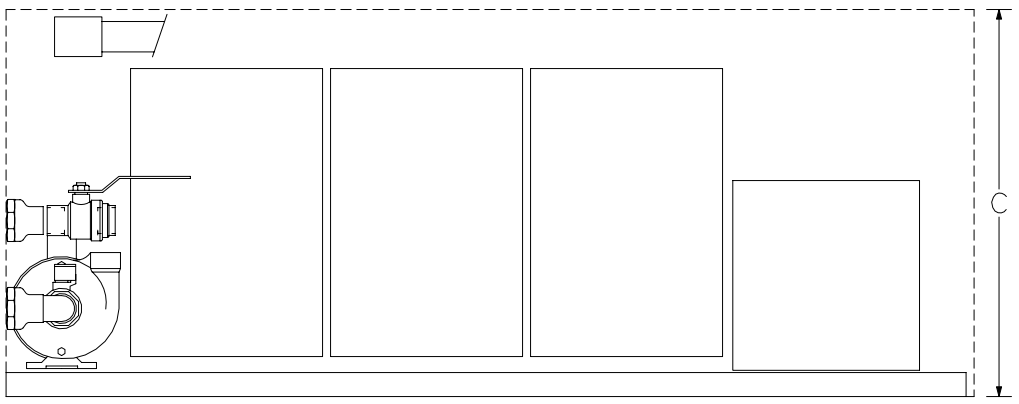
220207-05
STANDARD VIBRATION MOUNT
(NOT SHOWN TO SCALE)



TOP VIEW

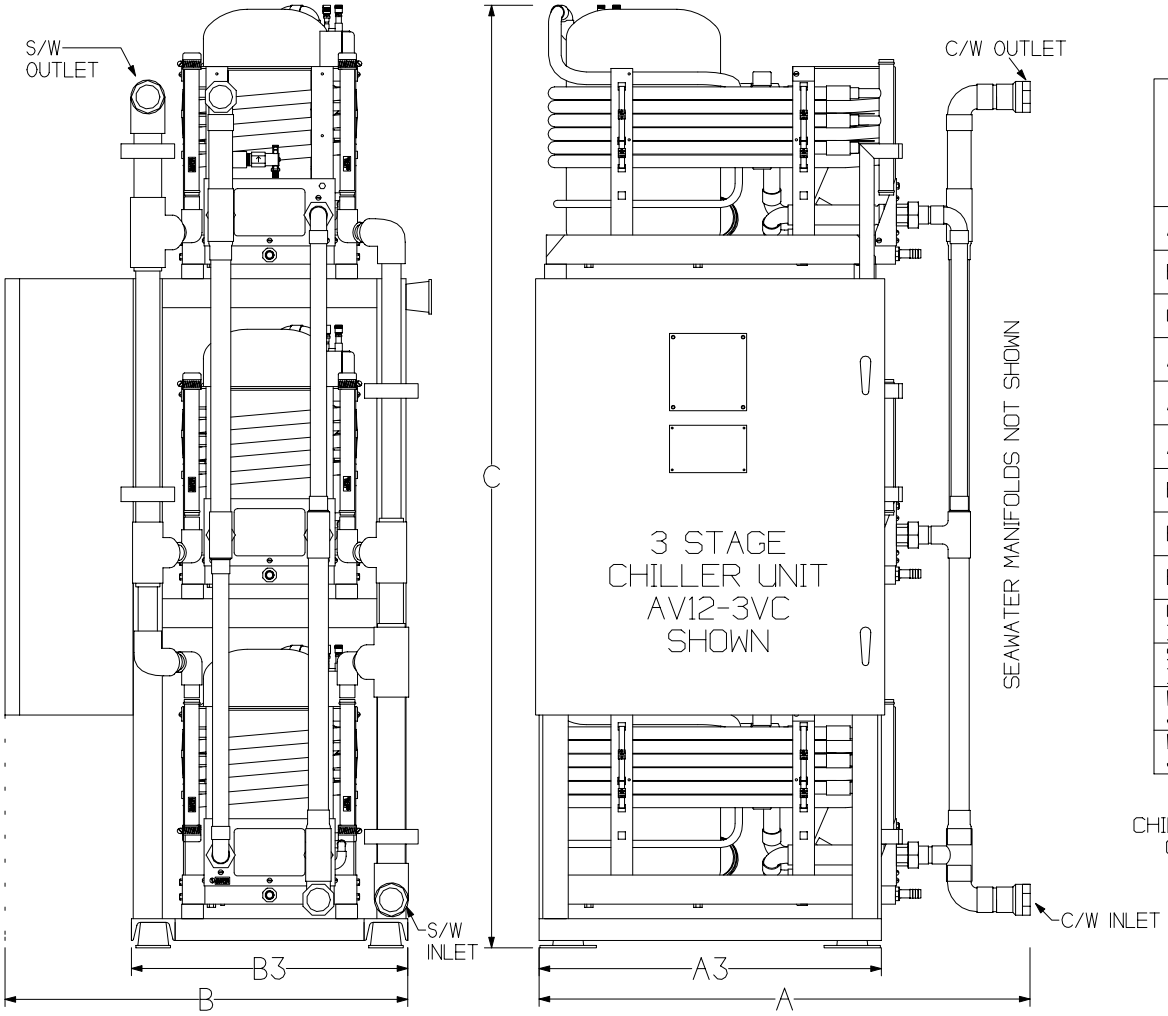


RIGHT SIDE VIEW



REAR VIEW

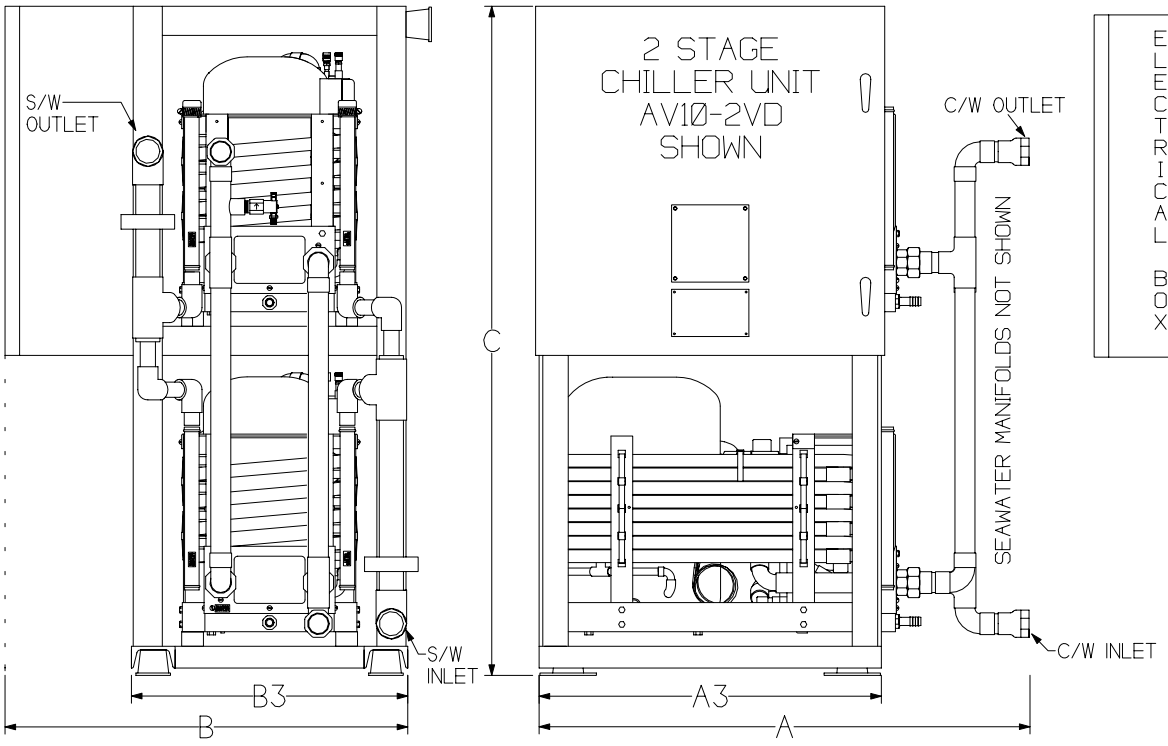
ALPHA SERIES VERTICAL MODULAR CHILLER RACKS
COOLING ONLY & REVERSE CYCLE CHILLERS

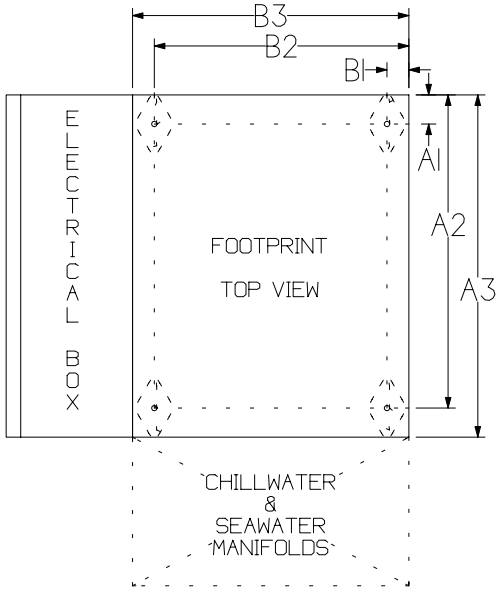


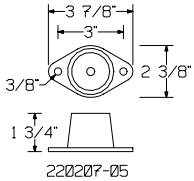
RIGHT VIEW FRONT VIEW

DIMENSIONS		2 STAGE	3 STAGE
		AV7-2 AV8-2 AV8.5-2 AV10-2	AV10.5-3 AV12-3 AV13-3 AV15-3
A	inch	33-3/4"	
	mm	857	
B	inch	27-3/4"	
	mm	705	
C	inch	46"	65"
	mm	1169	1651
A1	inch	2"	
	mm	51	
A2	inch	21-9/16"	
	mm	548	
A3	inch	23-9/16"	
	mm	598	
B1	inch	1-1/2"	
	mm	38	
B2	inch	17-1/2"	
	mm	445	
B3	inch	19"	
	mm	483	
CHILLWATER INLET/OUTLET		1-1/4" FPT	2" FPT
SEAWATER INLET/OUTLET		1-1/4" FPT	1-1/2" FPT
WEIGHT w/o VFD's	lbs	461	867
	kg	210	394
WEIGHT w/ VFD's	lbs	509	942
	kg	231	428

NOTE:
CHILLWATER PUMP IS REMOTELY MOUNTED
OPTIONAL REMOTE ELECTRICAL BOX





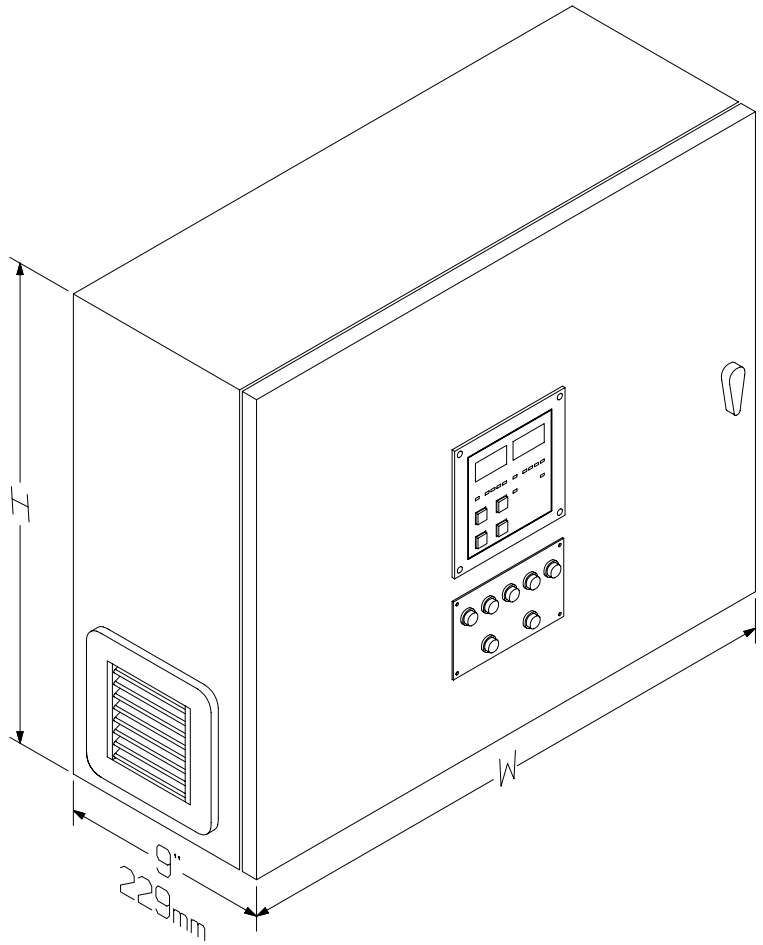


220207-05
STANDARD VIBRATION MOUNT
(NOT SHOWN TO SCALE)

ALPHA SERIES MODULAR CHILLER REMOTE ELECTRICAL BOX

CHILLER UNIT MODEL NUMBER	ELECTRICAL BOX DIMENSIONS 16×16 (406×406)	20×16 (508×406)	20×20 (508×508)	24×20 (610×508)	24×24 (610×610)	30×24 (762×610)	30×30 (762×762)	30×36 (762×915)	36×36 (915×915)
2 STAGE									
C, HC, HCK, E, EK, HE, HEK		●							
IHC, IHE, IHEK		●							
VC, VHC, VE, VEK, VHE, VHEK					●				
VIHC					●				
D, DK, HD, HDK	●								
IHD, IHDK		●							
VD, VDK, VHD, VHDK					●				
VIHD, VIHDK, VIHE, VIHEK						●			
3 STAGE									
C, HC, E, EK, HE, HEK			●						
IHC, IHE, IHEK, HCK				●					
VC, VHC, VE, VEK, VHE, VHEK						●			
VIHE, VIHEK							●		
VIHC						●			
D, DK, HD, HDK	●								
IHD, IHDK		●							
VD, VDK, VHD, VHDK						●			
VIHD, VIHDK						●			
4 STAGE									
C, HC, E, EK, HE, HEK				●					
HCK					●				
IHC, IHE, IHEK						●			
VC, VHC									●
VIHC								●	
D, DK, HD, HDK		●							
IHD, IHDK				●					
VD, VHD, VE, VHE								●	
VIHD, VIHDK, VIHE, VIHEK								●	

ALL DIMENSIONS WIDTH × HEIGHT (W × H)
DIMENSIONS IN INCHES (MILLIMETERS)



ALLOW 6" (150mm) ON THE LEFT, RIGHT & BOTTOM OF THE ELECTRICAL BOX FOR VENTILATION AND ACCESS TO THE ELECTRICAL CONNECTIONS AND GLAND PLATE

ALPHA SERIES RACK CHILLERS
8-20 TONS
230-1-60, 230-3-60 and 460-3-60

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

A8-2-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
C, VC	230-1-60	96,000 BTU/H 8 TONS 24,192 KCAL/H	N/A	34	N/A	7328	N/A	63
D, VD	230-3-60			24		7293		40
E, VE	460-3-60			12		7293		20
HC, VHC	230-1-60		60,000 BTU/H 5 TONS 15120 KCAL/H	34	37	7328	8102	63
HD, VHD	230-3-60			24	26	7293	8061	40
HE, VHE	460-3-60			12	13	7293	8061	20
IHC, VIHC	230-1-60		40,980 BTU/H 12 kW 10,327 KCAL/H	34	55	7328	12756	63
IHD, VIHD	230-3-60			24	32	7293	12781	40
IHE, VIHE	460-3-60			12	16	7293	12781	20

A10-2-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
C, VC	230-1-60	120,000 BTU/H 10 TONS 30,240 KCAL/H	N/A	42	N/A	9084	N/A	70
D, VD	230-3-60			30		9031		63
E, VE	460-3-60			15		9031		32
HC, VHC	230-1-60		75,000 BTU/H 6.2 TONS 18,731 KCAL/H	42	46	9084	10064	70
HD, VHD	230-3-60			30	33	9031	10003	63
HE, VHE	460-3-60			15	17	9031	10003	32
IHC, VIHC	230-1-60		51,225 BTU/H 15 kW 12,909 KCAL/H	42	68	9084	15756	80
IHD, VIHD	230-3-60			30	39	9031	15781	63
IHE, VIHE	460-3-60			15	20	9031	15781	32

A12-3-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
C, VC	230-1-60	144,000 BTU/H 12 TONS 36,288 KCAL/H	N/A	51	N/A	11001	N/A	80
D, VD	230-3-60			35		10883		63
E, VE	460-3-60			18		10883		32
HC, VHC	230-1-60		90,000 BTU/H 7.5 TONS 22,680 KCAL/H	51	56	11001	12162	80
HD, VHD	230-3-60			35	39	10883	12035	63
HE, VHE	460-3-60			18	20	10883	12035	32
IHC, VIHC	230-1-60		61,470 BTU/H 18 kW 15,490 KCAL/H	51	83	11001	19143	90
IHD, VIHD	230-3-60			35	47	10883	19115	63
IHE, VIHE	460-3-60			18	24	10883	19115	32

A15-3-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
C, VC	230-1-60	180,000 BTU/H 15 TONS 45,360 KCAL/H	N/A	63	N/A	13635	N/A	100
D, VD	230-3-60			44		13490		70
E, VE	460-3-60			22		13490		40
HC, VHC	230-1-60		111,600 BTU/H 9.3 TONS 28,123 KCAL/H	63	56	13635	15077	100
HD, VHD	230-3-60			44	48	13490	14948	70
HE, VHE	460-3-60			22	24	13490	14948	40
IHC, VIHC	230-1-60		71,715 BTU/H 21 kW 18,072 KCAL/H	63	96	13635	19143	100
IHD, VIHD	230-3-60			44	55	13490	22115	70
IHE, VIHE	460-3-60			22	28	13490	22115	40

A16-4-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
C, VC	230-1-60	192,000 BTU/H 16 TONS 48,384 KCAL/H	N/A	68	N/A	14706	N/A	100
D, VD	230-3-60			47		14586		70
E, VE	460-3-60			24		14586		40
HC, VHC	230-1-60		120,000 BTU/H 10 TONS 30,240 KCAL/H	68	75	14706	16254	100
HD, VHD	230-3-60			47	52	14586	16122	70
HE, VHE	460-3-60			24	26	14586	16122	40
IHC, VIHC	230-1-60		81,960 BTU/H 24 kW 20,654 KCAL/H	68	111	14706	25562	125
IHD, VIHD	230-3-60			47	63	14586	25562	70
IHE, VIHE	460-3-60			24	32	14586	25562	40

A20-4-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
C, VC	230-1-60	240,000 BTU/H 20 TONS 60,480 KCAL/H	N/A	84	N/A	18218	N/A	125
D, VD	230-3-60			59		18062		90
E, VE	460-3-60			30		18062		50
HC, VHC	230-1-60		144,000 BTU/H 12 TONS 36,288 KCAL/H	84	92	18218	20178	125
HD, VHD	230-3-60			59	64	18062	20006	90
HE, VHE	460-3-60			30	32	18062	20006	50
IHC, VIHC	230-1-60		92,205 BTU/H 27 kW 23,236 KCAL/H	84	124	18218	28562	125
IHD, VIHD	230-3-60			59	71	18062	28562	90
IHE, VIHE	460-3-60			30	36	18062	28562	50

ALPHA SERIES RACK CHILLERS
7-17 TONS
220-3-50 and 380-3-50

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

A7-2-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
DK, VDK	220-3-50	84,000 BTU/H 7 TONS 21,168 KCAL/H	N/A	23	N/A	6186	N/A	40
EK, VEK	380-3-50			12		6186		20
HDK, VHDK	220-3-50		50,752 BTU/H 4.2 TONS 12,790 KCAL/H	23	25	6186	6838	40
HEK, VHEK	380-3-50			12	12.5	6186	6838	20
IHDK, VIHDK	220-3-50		30,735 BTU/H 9 kW 7,745 KCAL/H	23	26.3	6186	9650	40
IHEK, VIHEK	380-3-50			12	15	6186	9650	20

A8.5-2-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
DK, VDK	220-3-50	102,000 BTU/H 8.5 TONS 25,704 KCAL/H	N/A	26.2	N/A	7662	N/A	50
EK, VEK	380-3-50			14.1		7662		32
HDK, VHDK	220-3-50		63,000 BTU/H 5.2 TONS 15,876 KCAL/H	26.2	28.3	7662	8488	50
HEK, VHEK	380-3-50			14.1	15.5	7662	8488	32
IHDK, VIHDK	220-3-50		40,980 BTU/H 12 kW 10,327 KCAL/H	26.2	34.2	7662	12650	50
IHEK, VIHEK	380-3-50			14.1	15	7662	12650	32

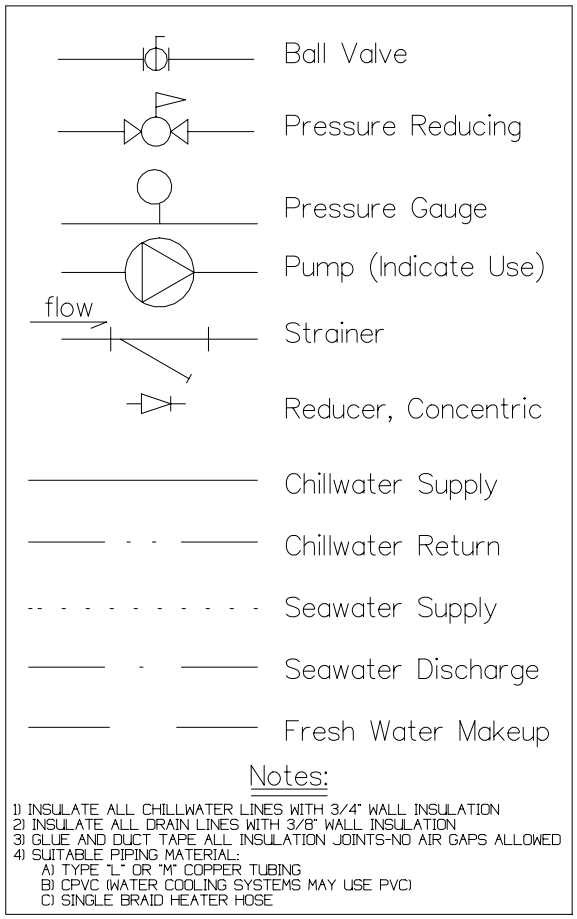
A10.5-3-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
DK, VDK	220-3-50	126,000 BTU/H 10.5 TONS 31,752 KCAL/H	N/A	34.2	N/A	9229	N/A	50
EK, VEK	380-3-50			18.9		9229		25
HDK, VHDK	220-3-50		76,000 BTU/H 6.3 TONS 19,152 KCAL/H	34.2	37.8	9229	10207	50
HEK, VHEK	380-3-50			18.9	18.7	9229	10207	25
IHDK, VIHDK	220-3-50		51,225 BTU/H 15 kW 12,909 KCAL/H	34.2	43.3	9229	15925	50
IHEK, VIHEK	380-3-50			18.9	24.7	9229	15925	25

A13-3-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
DK, VDK	220-3-50	156,000 BTU/H 13 TONS 39,312 KCAL/H	N/A	38	N/A	11443	N/A	63
EK, VEK	380-3-50			21		11443		40
HDK, VHDK	220-3-50		95,000 BTU/H 7.9 TONS 23,940 KCAL/H	38	43	11443	12682	63
HEK, VHEK	380-3-50			21	24	11443	12682	40
IHDK, VIHDK	220-3-50		61,470 BTU/H 18 kW 15,490 KCAL/H	38	51	11443	18925	63
IHEK, VIHEK	380-3-50			21	30	11443	18925	40

A14-4-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
DK, VDK	220-3-50	168,000 BTU/H 14 TONS 42,336 KCAL/H	N/A	45	N/A	12368	N/A	63
EK, VEK	380-3-50			23		12368		32
HDK, VHDK	220-3-50		102,000 BTU/H 8.5 TONS 25,704 KCAL/H	45	50	12368	13672	63
HEK, VHEK	380-3-50			23	25	12368	13672	32
IHDK, VIHDK	220-3-50		71,715 BTU/H 21 kW 18,072 KCAL/H	45	60	12368	21296	63
IHEK, VIHEK	380-3-50			23	34	12368	21296	32

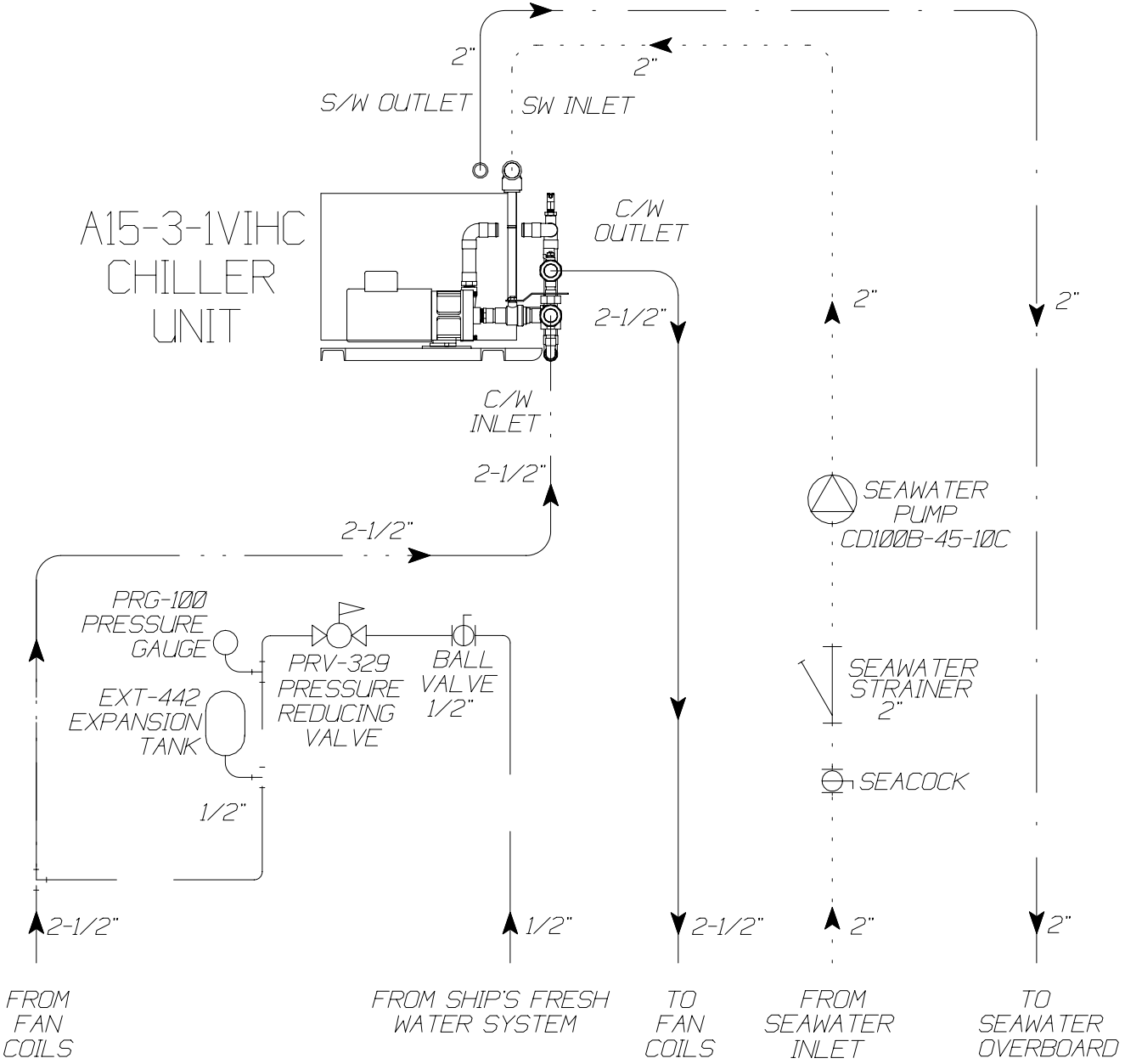
A17-4-1 Series								
MODELS	**POWER SUPPLY**	**CAPACITY**		**AMP DRAW**		**WATTAGE**		**MAIN BREAKER SIZE**
		COOL	**HEAT**	**COOL**	**HEAT**	**COOL**	**HEAT**	
DK, VDK	220-3-50	204,000 BTU/H 17 TONS 51,408 KCAL/H	N/A	50	N/A	15320	N/A	80
EK, VEK	380-3-50			30		15320		50
HDK, VHDK	220-3-50		126,000 BTU/H 10.5 TONS 31,752 KCAL/H	50	56	15320	16972	80
HEK, VHEK	380-3-50			30	31	15320	16972	50
IHDK, VIHDK	220-3-50		81,960 BTU/H 24 kW 20,654 KCAL/H	50	68	15320	25296	80
IHEK, VIHEK	380-3-50			30	39	15320	25296	50

TYPICAL CHILLER UNIT PIPING



Notes:

1) INSULATE ALL CHILLWATER LINES WITH 3/4" WALL INSULATION
2) INSULATE ALL DRAIN LINES WITH 3/8" WALL INSULATION
3) GLUE AND DUCT TAPE ALL INSULATION JOINTS-NO AIR GAPS ALLOWED
4) SUITABLE PIPING MATERIAL:
   A) TYPE "L" OR "M" COPPER TUBING
   B) CPVC (WATER COOLING SYSTEMS MAY USE PVC)
   C) SINGLE BRAID HEATER HOSE



AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

CHILLER UNIT **A10, A15, A20**

Features

- High Efficiency Scroll Compressors
- Stainless steel, copper brazed plate heat exchangers
- Multi-circuit 90-10 cupronickel inner tube heat exchanger
- Compact design
- Full perimeter steel frame
- Low and high refrigerant pressure access ports
- Low and high refrigerant pressure safety switches
- Unit mounted electrical component enclosure
- All units are precharged and fully run tested
- Solid state digital temperature controllers
- R-407C Environmentally friendly refrigerant
- Available in 208/230-3-60, 460-3-60, 220-3-50 and 380/415-3-50 power input

		A10GD		A10GE		A15GD		A15GE	
Capacity	**BTU/H**	120,000	96,000	120,000	96,000	180,000	149,400	180,000	149,400
	Kcal/H	30,000	24,900	30,000	24,900	45,000	37,350	45,000	37,350
Nominal Tons		10	8.3	10	8.3	15	12.5	15	12.5
Length	**inches**	29.00							
	mm	737							
Width	**inches**	29.00							
	mm	737							
Height	**inches**	26.00				31.00			
	mm	660				781			
Weight	**lbs**	376				570			
	kg	171				259			
Power Supply		208-3-60	220-3-50	460-3-60	380-3-50	208-3-60	220-3-50	460-3-60	380-3-50
Amp Draw		27.0	26.6	13.5	13.3	40.5	40.0	20.2	20.0
Power	**kW**	9.1	7.8	9.1	7.8	13.8	11.8	13.8	11.8
Minimum Chillwater Flow Rate	**GPM**	24	20	24	20	36	30	36	30
	LPM	91	76	91	76	137	114	137	114
Chillwater Inlet/Outlet	**FPT**	2"							
Minimum Seawater Flow Rate	**GPM**	40	33	40	33	60	50	60	50
	LPM	152	125	152	125	228	190	228	190
Seawater Inlet/Outlet	**FPT**	1-1/4"				1-1/2"			

20 Ton Models Next Page

		A20GD		A20GE	
Capacity	**BTU/H**	240,000	196,000	240,000	196,000
	Kcal/H	60,000	49,000	60,000	49,000
Nominal Tons		20	16.3	20	16.3
Length	**inches**	29.00			
	mm	737			
Width	**inches**	29.00			
	mm	737			
Height	**inches**	30.50			
	mm	775			
Weight	**lbs**	974			
	kg	442			
Power Supply		208-3-60	220-3-50	460-3-60	380-3-50
Amp Draw		49.8	49.2	22.8	22.5
Power	**kW**	15.1	12.3	15.1	12.3
Minimum Chillwater Flow Rate	**GPM**	48	40	48	40
	LPM	182	151	182	151
Chillwater Inlet/Outlet	**FPT**	2"			
Minimum Seawater Flow Rate	**GPM**	80	65	80	65
	LPM	303	246	303	246
Seawater Inlet/Outlet	**FPT**	2"			

A15GD Chiller Unit Shown

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AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com
www.aquaair.com

AQUA-AIR
MARINE AIR CONDITIONING SYSTEMS

COMPACT CHILLER UNIT **ACT07 AND ACT10**

Features

- High Efficiency Scroll Compressors
- Stainless steel, copper brazed plate heat exchangers
- Multi-circuit Titanium inner tube seawater condenser
- Compact design
- Stainless steel drain pan/base
- Low and high refrigerant pressure access ports
- Low and high refrigerant pressure safety switches
- Unit mounted electrical component enclosure
- All units are precharged and fully run tested with R-407C Refrigerant
- Solid state digital temperature controller
- Available in 208/230-3-60, 460-3-60, 220-3-50 and 380/415-3-50
- Available in Cooling Only or Reverse Cycle configuration

Specifications		ACT07 (H)GD	ACT07 (H)GDK	ACT07 (H)GE	ACT07 (H)GEK	ACT10 (H)GD	ACT10 (H)GDK	ACT10 (H)GE	ACT10 (H)GEK
Capacity	**BTU/H**	90,000				120,000			
	Kcal/H	22,500				30,000			
	Tons	7.5				10			
Length	**inches**	27.00							
	mm	686							
Width	**inches**	17.50							
	mm	445							
Height	**inches**	28-1/4"				30-5/8"			
	mm	718				778			
Weight	**lbs**	260				280			
	kg	118				127			
Power Supply		208-3-60	220-3-50	460-3-60	380-3-50	208-3-60	220-3-50	460-3-60	380-3-50
Amp Draw		21.0	22	10	11	27.0	30.4	13.4	15.2
Power	**Watts**	5,370	5,240	5,750	5,240	7,770	8,050	7,770	8,050
Minimum Chillwater Flow Rate	**GPM**	18				24			
	LPM	68				91			
Chillwater Inlet/Outlet		1-3/8" OD Male hose connection				1-5/8" OD Male hose connection			
Minimum Seawater Flow Rate	**GPM**	30				40			
	LPM	114				152			
Seawater Inlet/Outlet		1-5/8" OD Male hose connection				1-5/8" OD Male hose connection			

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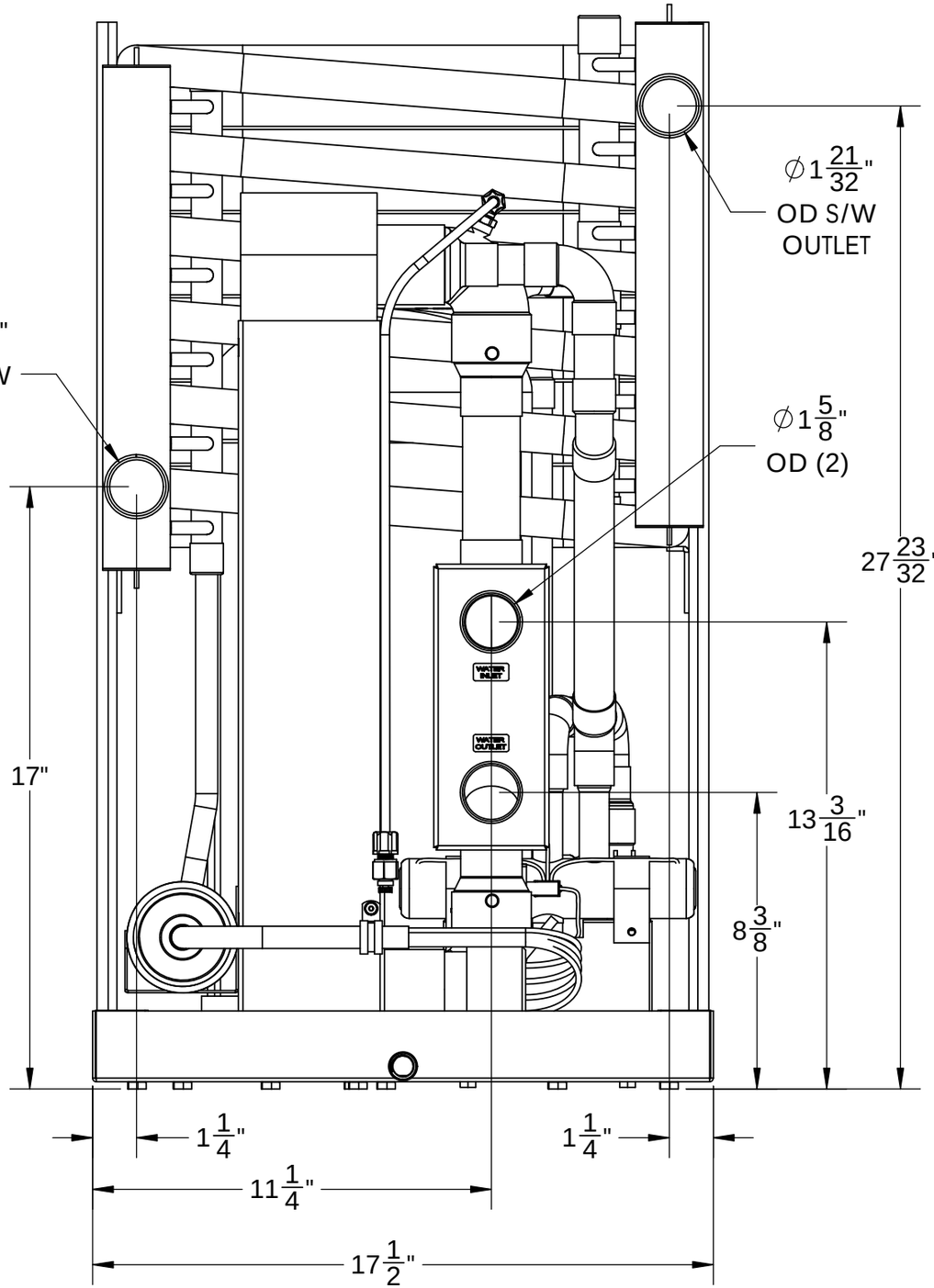
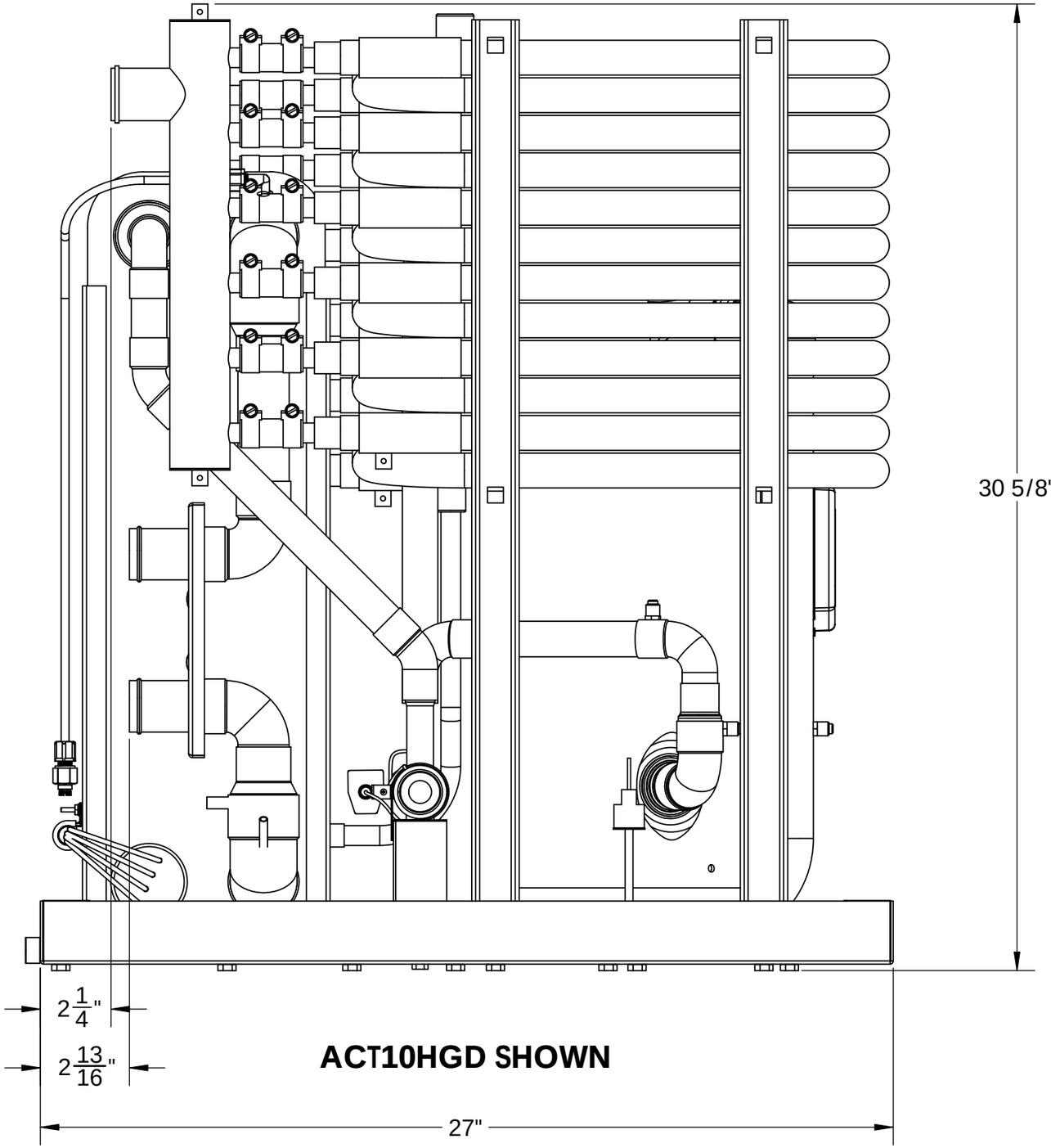
AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 800-328-1043 305-884-8363 Fax 305-883-8549
sales@aquaair.com www.aquaair.com





ACT10HGD SHOWN

AQUAAIR

MARINE AIR CONDITIONING SYSTEMS

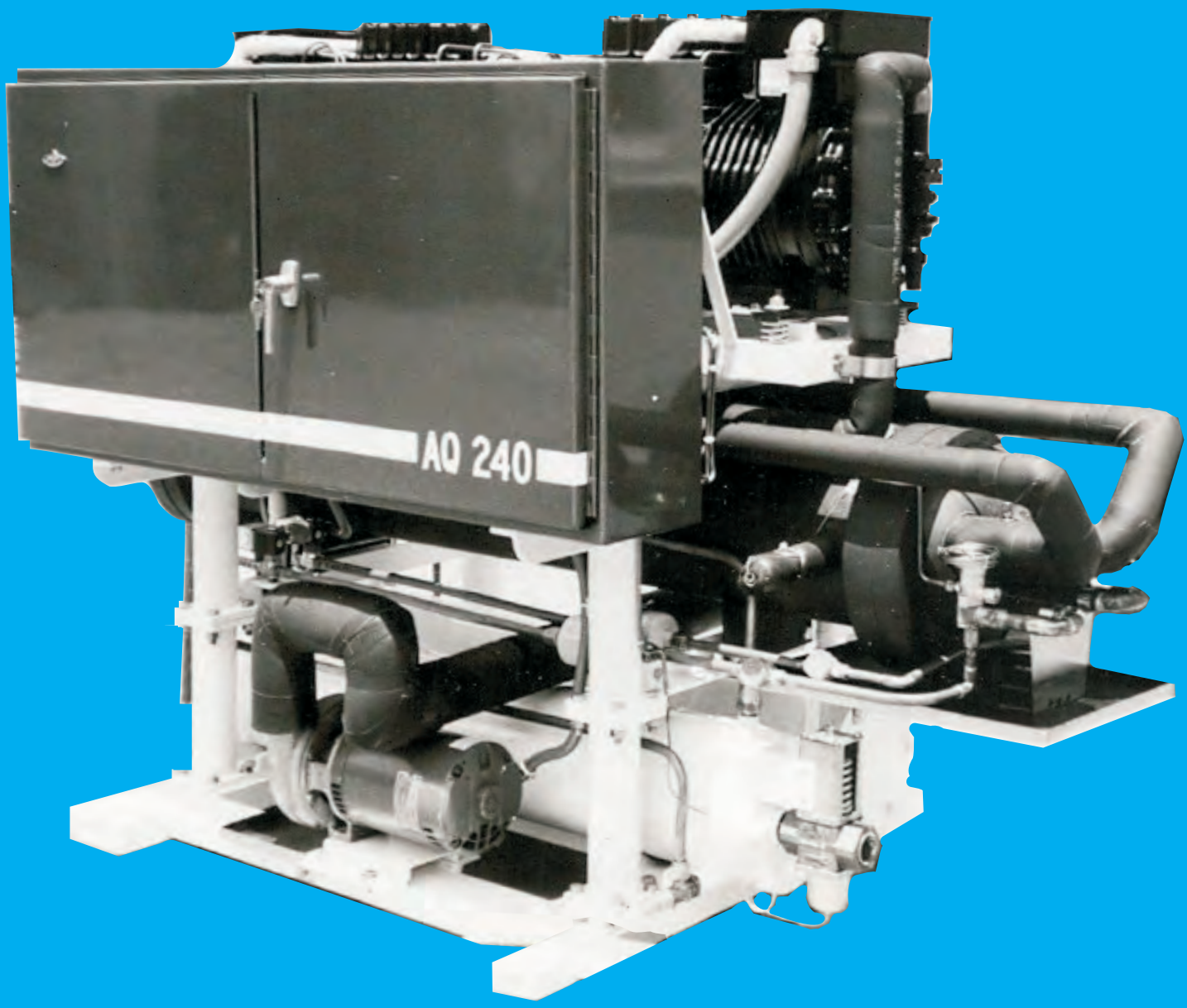
High Capacity Chiller Systems

AQUAAIR

MARINE AIR CONDITIONING SYSTEMS

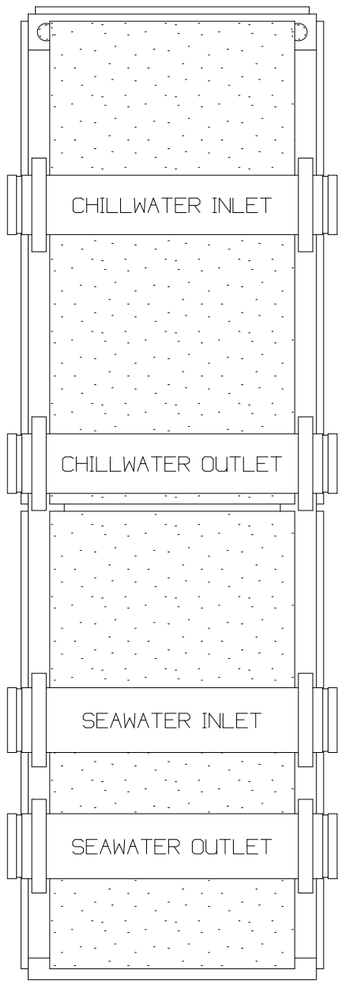
20 Ton Chillers

A20-1E
20 Ton (240,000 BTU/H)
Single Stage Open Drive Compressor
Custom designed for use by the
Brazilian Navy
2 Units / Frigate

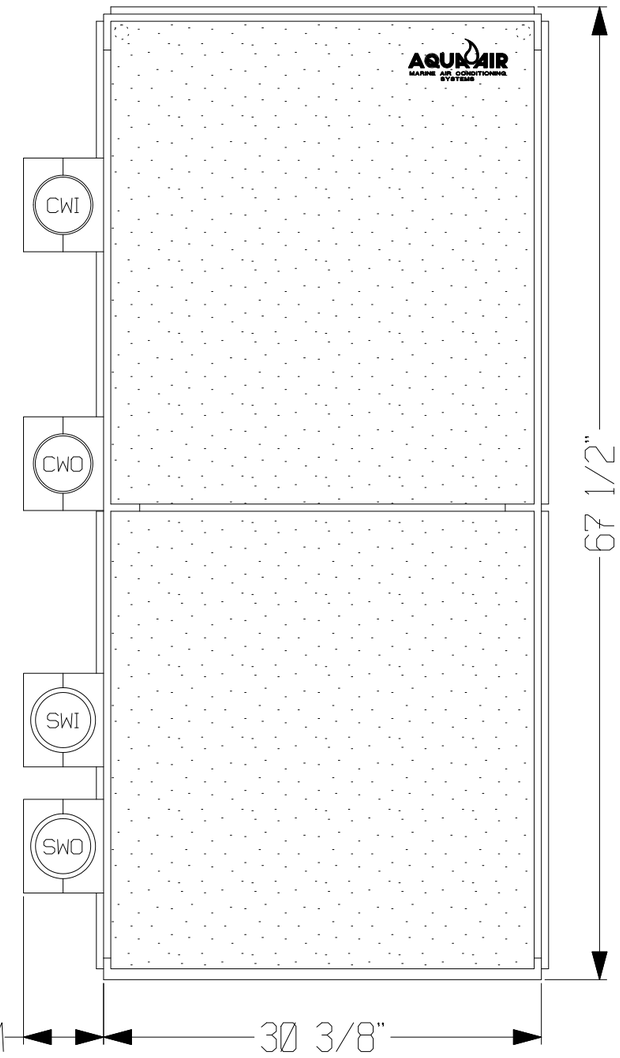


AQ-240
20 Ton (240,000 BTU/H)
2 Stage Semi-hermetic Compressors

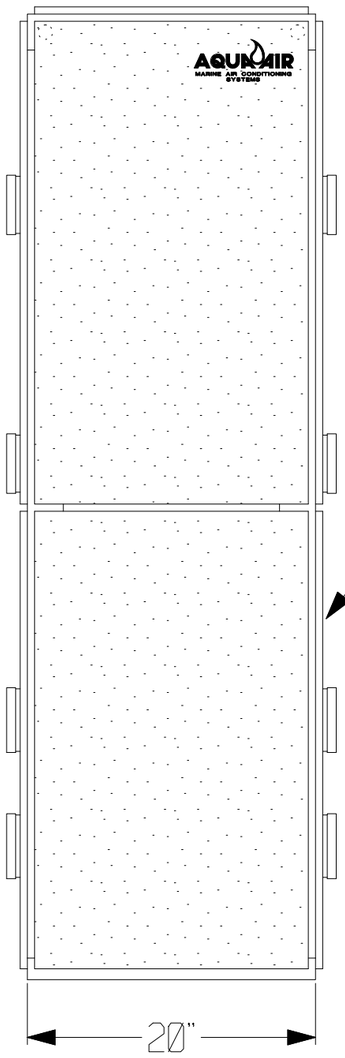
REAR VIEW



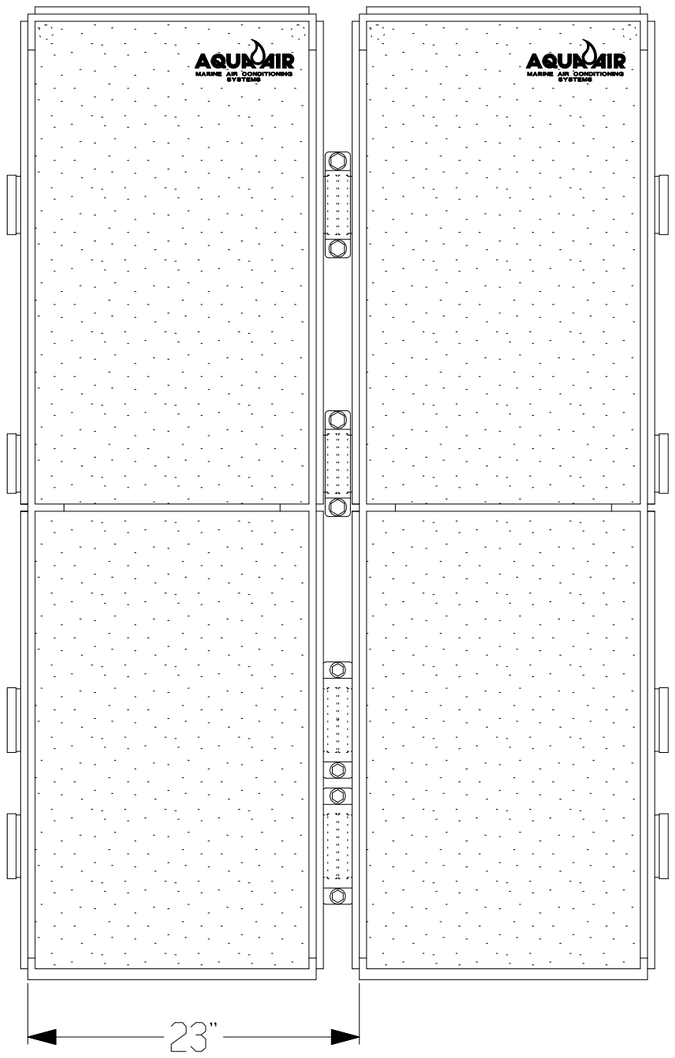
LEFT VIEW



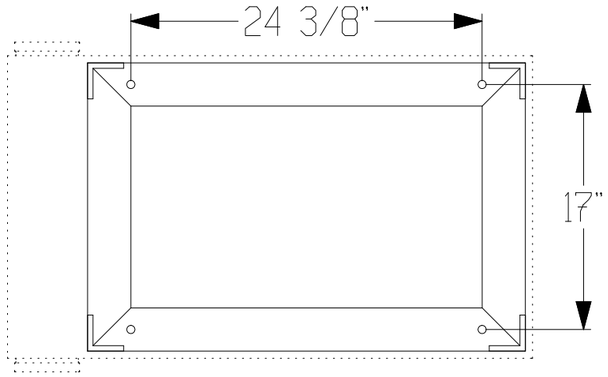
FRONT VIEW



FRONT VIEW MULTI-CHILLER SYSTEM



SPACING BETWEEN CHILLERS WHEN MANIFOLDED TOGETHER IN A MULTI-CHILLER SYSTEM



NOTE
MANIFOLDS SHOWN ARE 4" . GOOD UP TO 60 TONS OF MANIFOLDED CHILLER (M=6") LARGER CAPACITIES WILL REQUIRE LARGER MANIFOLDS. PLEASE CONSULT THE FACTORY FOR EXACT "M" DIMENSIONS BASED ON SPECIFIC APPLICATIONS

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

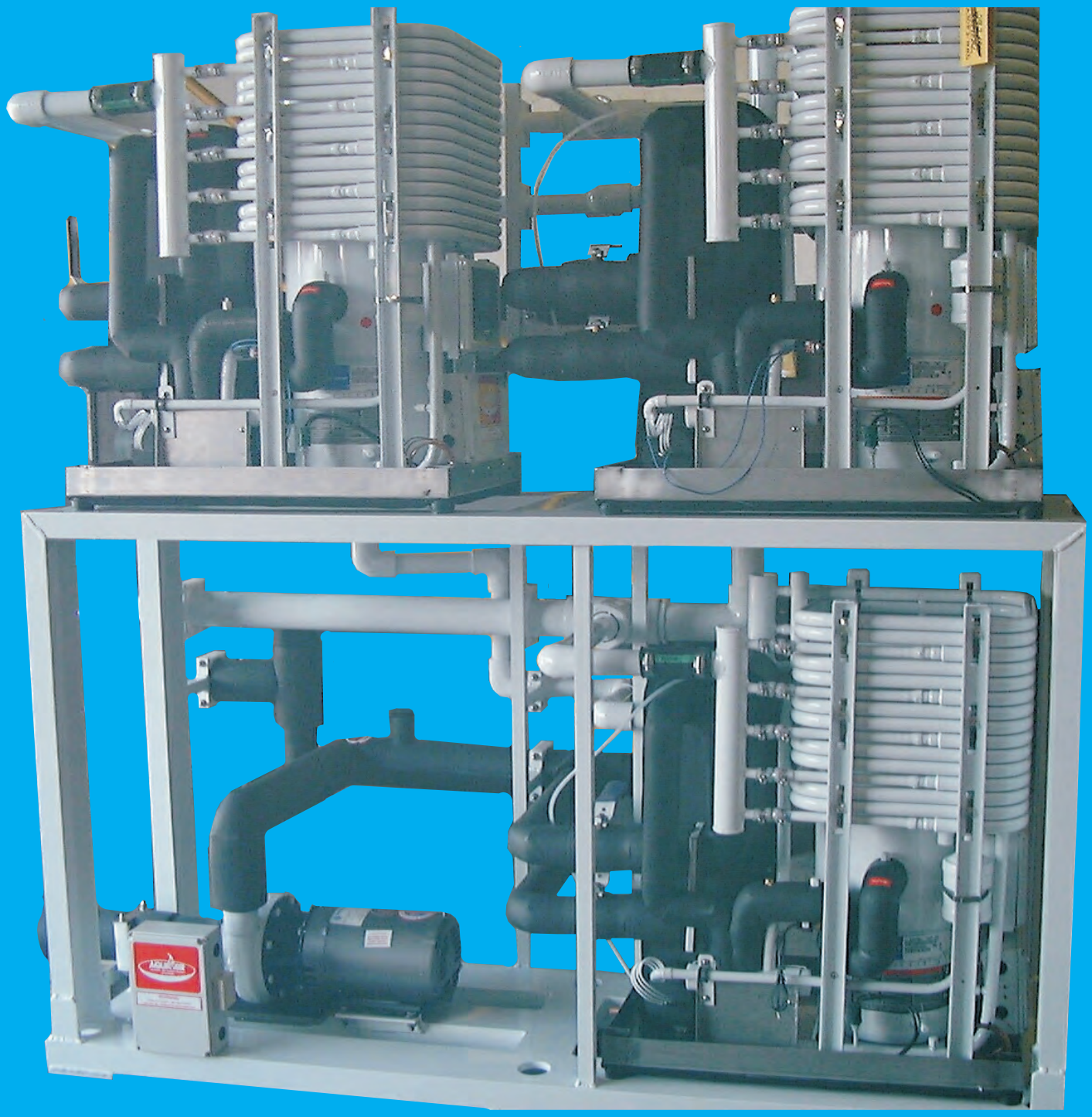
AST-20 MODULAR CHILLER
20 TONS (240,000 BTU/H)

DRAWING NUMBER AST-20D	DRAWN BY DN	DATE 20040608	
SCALE FULL	APPROVED BY	REVISION DATE	REV A

AQUAAIR

MARINE AIR CONDITIONING SYSTEMS

30 Ton Chillers



AV30P3-1VHD
30 Ton (360,000 BTU/H)
3x10 Ton AC10HD Series Chillers with Integral Chillwater Pump

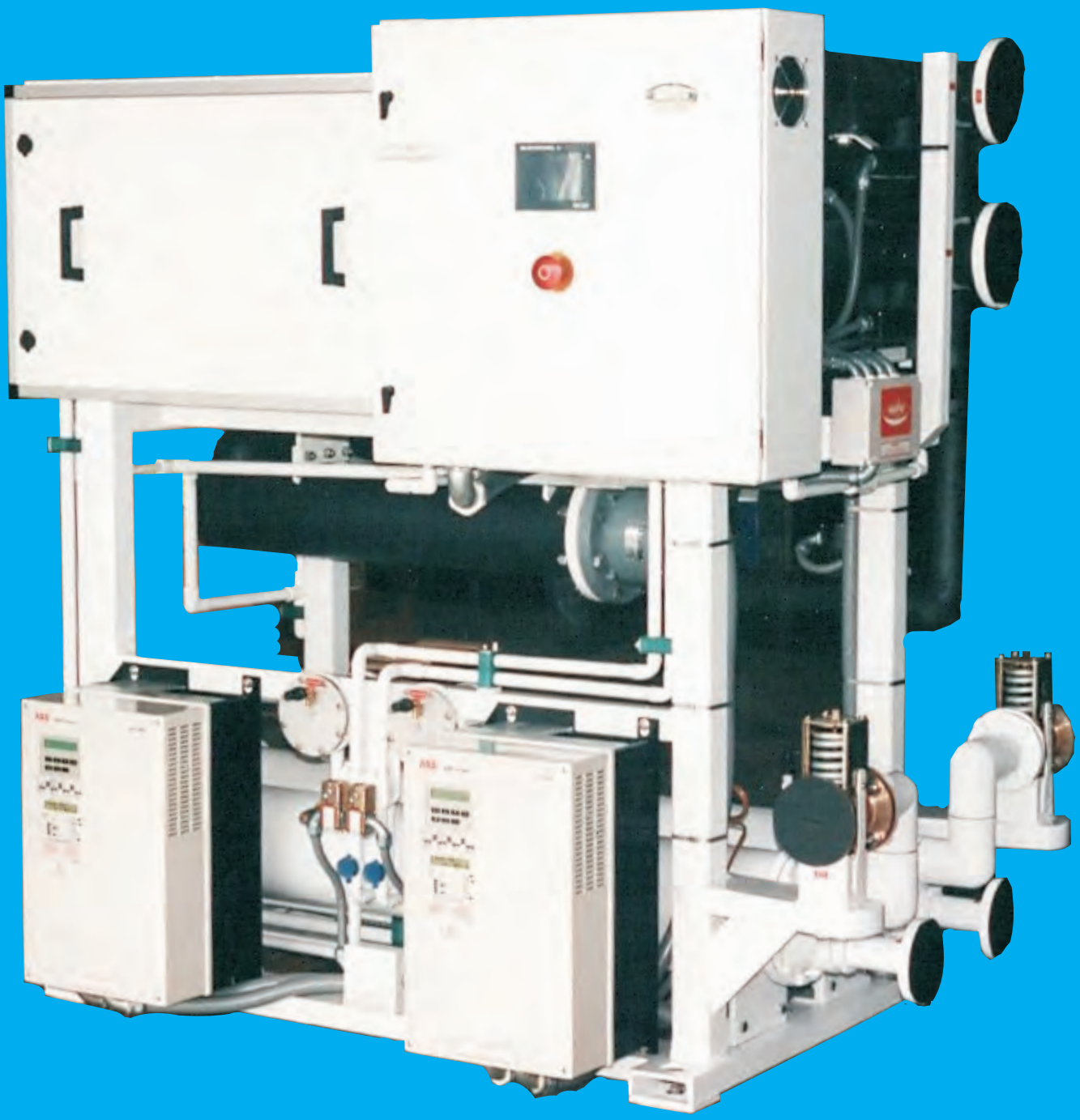
AQUAAIR

MARINE AIR CONDITIONING SYSTEMS

40 Ton Chillers

AV40P4-VHD
40 Ton (480,000 BTU/H)
4x10 Ton AC10HD Series
Chiller Modules

OM40-2VIHD
40 Ton (480,000 BTU/H)
2 Stage Semi-hermetic Compressors
Integral Immersion heater



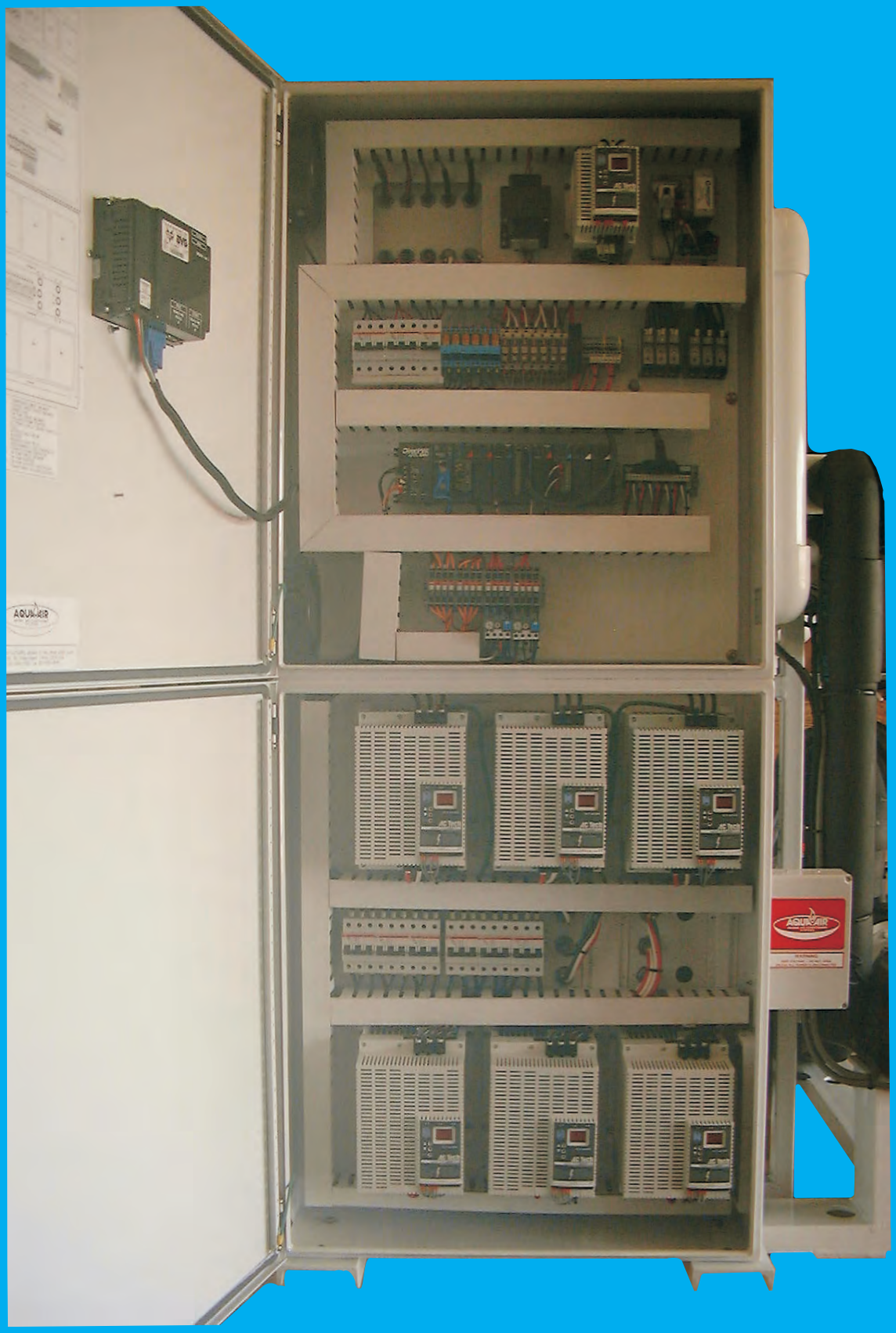
OM40P2-VIHD
40 Ton (480,000 BTU/H)
2 Stage Semi-hermetic Compressors
PLC / Touchscreen Control
Integral Immersion Heater

AQUAAIR

MARINE AIR CONDITIONING SYSTEMS

60 Ton Chillers

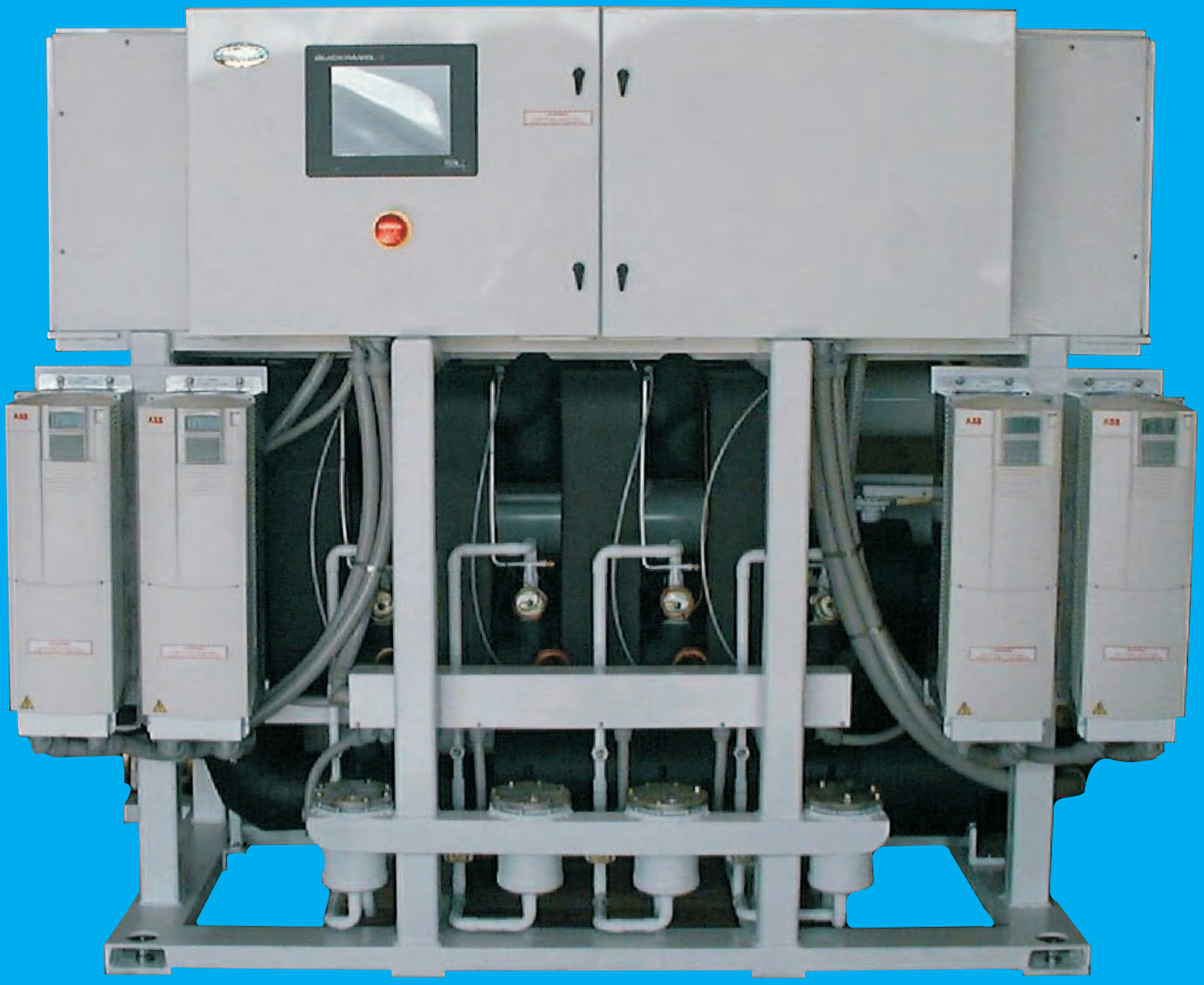
AV60P6-2VHD
60 Ton (720,000 BTU/H)
6x10 Ton AC10HD Series Chiller Modules
Integral Electric Box with
PLC / Touchscreen Control
Variable Frequency Drives
Integral Chillwater Pumps (2)



AV60P6-2VHD
60 Ton (720,000 BTU/H)
Electrical Panel

AV60P6-2VHD
60 Ton (720,000 BTU/H)
Rear View Showing Manifolding &
Integral Chillwater Pumps

AQ-720
60 Ton (720,000 BTU/H)
4 Stage Semi-hermetic Compressors



A60P4-VIHD
60 Ton (720,000 BTU/H)
4 Stage, Semi-hermetic Compressors
PLC / Touchscreen Control
Variable Frequency Drives
Integral Immersion Heater

CHILLER UNIT SPECIFICATION

OM60-4VIHD

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

COOLING CAPACITY: 60 tons [720,000 BTU/H] [180,000 KCAL/H] at 45˚ F (7.2˚ C) leaving water temperature and 55˚ F (12.8˚ C) returning water temperature. Chiller unit flow rate will be approximately 180 gpm. Condenser flow rate (each) is to be approximately 60 gpm entering at a maximum temperature of 90˚ F (32˚ C). All ratings are at a fouling factor of 0.0005 .

HEATING CAPACITY: 54 Kw [184,410 BTU/H] [46,103 KCAL/H] of total heating capacity at 120˚ F (48.9˚ C) leaving water temperature and 100˚ F (37.8˚ C) returning water temperature.

CONSTRUCTION & RATINGS: The chiller unit shall be constructed in accordance with ARI Standard 590-86 and shall comply with all applicable NEC and ASME codes for water cooled chillers.

COMPRESSORS: The chiller unit will have four, 15 ton Bitzer semi-hermetic compressors. Each compressor will be equipped with suction and discharge valves. Input voltage to the compressor motor will be 208-3-60. Power consumption of each compressor is approximately 14.1 kW each. Refrigerant to be used is R-22 .

CAPACITY CONTROL: Chiller unit capacity control will be achieved through the use of four variable frequency drive (VFD) units, one for each compressor. The VFD will vary the compressor motor speed from a maximum of 100% of capacity to a minimum of 70%. The VFD requires an input power supply of 208-3-60. The maximum output power will be 208-3-60 to the compressor motor. The VFD output will be regulated by a 4-20ma signal to the VFD from the PLC. The VFD voltage/frequency output will be varied based upon chilled water outlet temperature. The VFD will also control the compressor motor so that there is no current inrush, during starting, above the motor's standard running amperage.

COOLER: The unit is equipped with four plate style heat exchangers, each of 15 tons capacity. Each plate heat exchanger has a single water and refrigerant circuit. Construction of the unit is of #316 stainless steel. The material used to braze the plates together is copper. Maximum test pressure for both circuits is 635 psig. Each plate will be individually insulated with 1/2" thick closed cell insulation.

CONDENSER: The unit is equipped with four shell and tube marine condensers. The shell is constructed of ASME spec SA-53 steel pipe. Shells are shot blasted and cleaned before assembly. Tubes are high performance enhanced surface seamless 90/10 Cupro-Nickel tubes to ASME spec SB-359. Tubes are roller expanded into double grooved tubesheets to assure tight joints. Tubesheets are 90/10 Cupro-Nickel to ASME spec SB-171 Alloy 706. Tube supports are quality steel plug welded to the shell. Heads are cast bronze with integral pass partitions, ASME spec SB-62. Gaskets are die-cut providing effective sealing between tubesheets and machined heads. The refrigerant side is constructed and tested in accordance with Section VIII, Division 1 of ASME Code for unfired pressure vessels. Shell side design pressure (refrigerant side) is 350 psig at 250˚ F. Tube side (water side) is 150 psig at 150˚ F. Every condenser is tested per ASME Code prior to shipment. Seawater connections are 2" Class 150 PVC schedule 80 flanges. Water flow to the condenser will be regulated by a compressor discharge pressure actuated water regulating valve. A pressure relief valve (set for 350 psig) on the shell is standard.

IMMERSION HEATER ELEMENTS: The unit is equipped with a three stage, 18 element, 54 Kw 5" flange style immersion heating element. The heater elements are rated at full wattage on 208-3-60 power input. The elements are constructed of copper with a maximum watt density of 50 watts per square inch. The element heater tank will be constructed of steel pipe to ASME specifications. All welds will be by MIG welding procedure. The tank will be equipped with a 5" 150lb ANSI raised face welding neck flange to accept the 5" flange style immersion heater. The tank design rating pressure is 150 psig at 200˚ Fahrenheit. The tank will be equipped with a ASME water pressure relief valve.

REFRIGERANT CIRCUIT: Each of the four refrigerant circuits shall include a discharge line check valve, liquid line ball valve, replaceable core liquid line filter drier with access fitting for refrigerant charging, combination moisture indicator and sight glass, liquid line solenoid and thermal expansion valve. All suction lines will be covered with a minimum of 1/2" closed cell insulation.

CONTROL PANEL / ELECTRICAL BOX: The unit will have a NEMA 12 type enclosure for all of the electrical components. The chiller unit will be controlled by a programmable logic controller (PLC). The user interface for this PLC will consist of a touch screen mounted on the front of the electrical box. This touch screen will perform the following switching functions:

System mode switch
Compressor On-Off switch (4)
Heating stage On-Off Switch (3)

The touch screen will also display the following information

Digital refrigerant pressure readouts (suction and discharge) for each compressor

Digital temperature display, in Fahrenheit, for the chillwater inlet and outlet temperatures

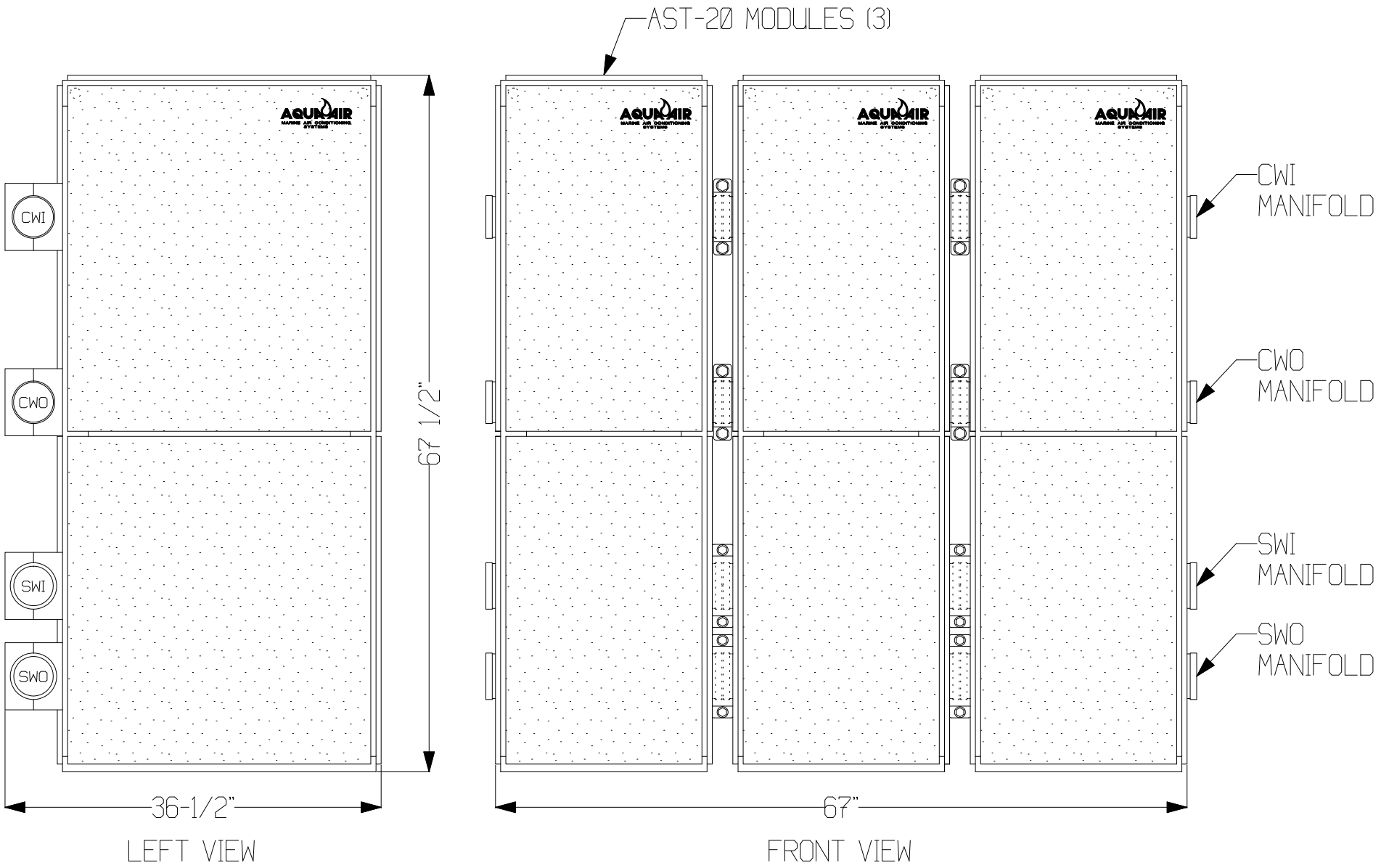
Elapsed time meters showing the run times for all compressors, pumps and heater stages
Chillwater pump motor fault indication
Compressor inverter operational (4)
Cooling stage engaged (4)
Cooling mode
Chiller freeze thermostat engaged
Low chillwater flow through the chiller
Low compressor refrigerant pressure (4)
High compressor refrigerant pressure (4)
Compressor motor overload (4)
High compressor discharge temperature (4)
Compressor inverter fault indicator (4)
Heating mode
Heating stage engaged (3)

A phone communication modem will be included that will allow the PLC to be accessed remotely for diagnostic purposes.

Circuit breakers will be provided for the compressors (4), seawater pumps (4), heater stages (3), chillwater pump and control circuitry. All wiring on the unit external to the electrical box will be enclosed in liquid-tite conduit or other approved protective sheathing.

FRAME: The frame for the unit will be constructed of appropriately sized steel channel, square tube and angle. All welds will be by MIG welding procedure. Completed frame will be primed with a red lead based primer and then painted to meet 500 hour salt spray requirement. Paint to be used will be Awlgrip Matterhorn White. Stainless steel drain pans with a non-corrosive internal coating will be installed under any condensate producing components.

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 E-mail sales@aquaair.com

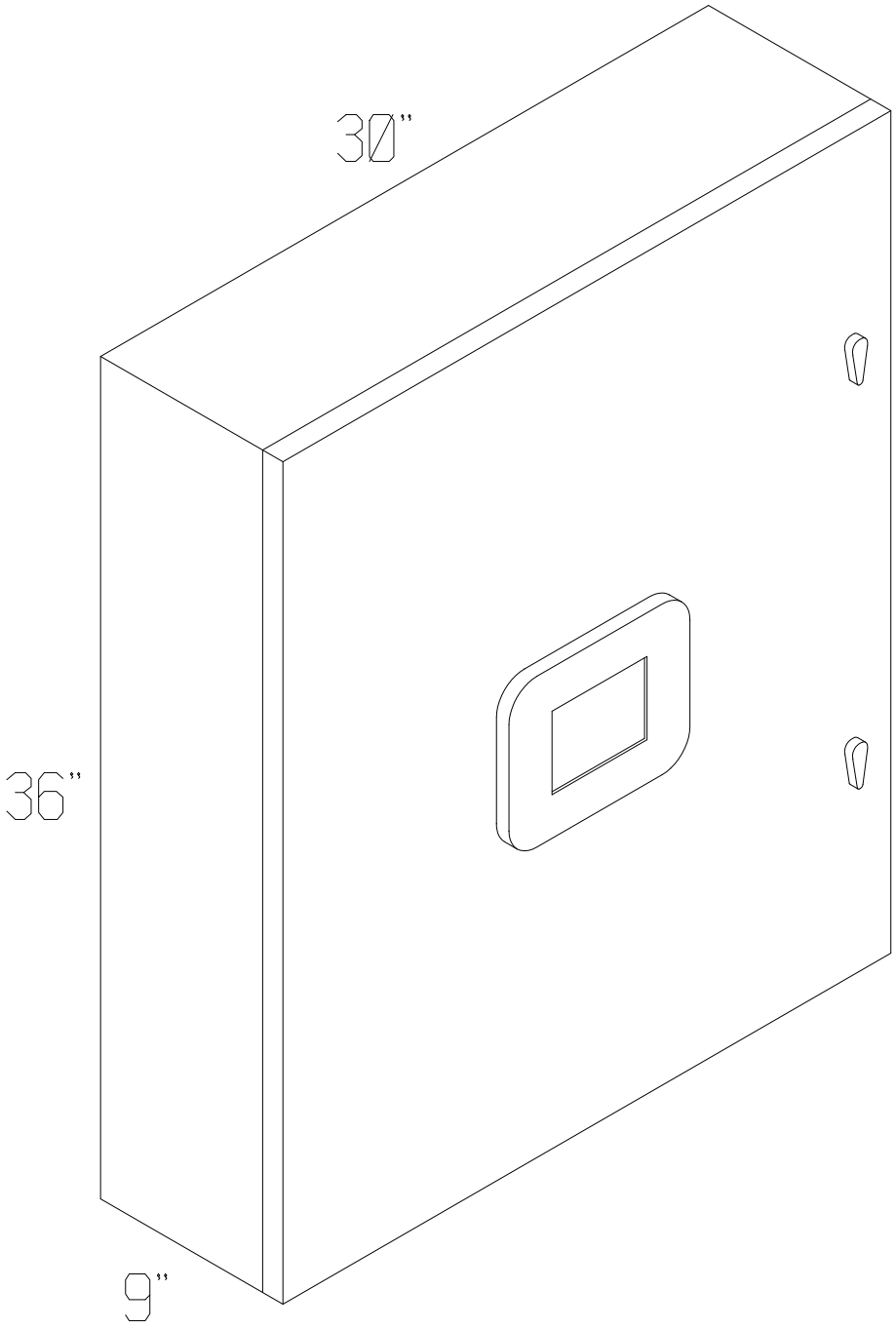


AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

AST60-3 CHILLER SYSTEM
60 TON 3 STAGE

DRAWING NUMBER	DRAWN BY	DATE
AST-20D	DN	20040608

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A



AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

AST60-3V CHILLER CONTROL PANEL
w/ VFD's & PLC/TOUCHSCREEN

DRAWING NUMBER	DRAWN BY	DATE
AST-20D	DN	20040608

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A

AQUAAIR

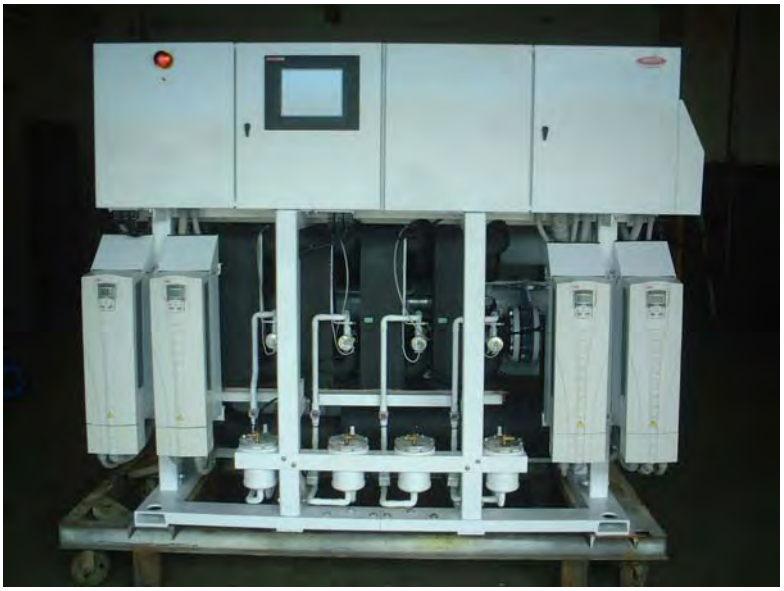
MARINE AIR CONDITIONING SYSTEMS

75 Ton Chillers

OM75P-4VIHD 75 ton Chiller Motoryacht "Gallant Lady"

In April of 2008, Aqua Air Manufacturing was commissioned by the owners of the 172' Feadship motoryacht "Gallant Lady" to provide a replacement chiller for the existing 15 year old Aqua-Air AQ900HD 75 ton, 4 stage chiller unit.

Aqua-Air has project records dating back to the early 1980's detailing the equipment that we have supplied for all of our large projects. One of the requirements of this project was for the chiller to fit in the same exact position and connect up to the existing chillwater piping. With our extensive CAD drawings for this project it was very easy to be assured this unit would fit exactly!



The Omega Series OM75P-4VIHD Chiller Unit is the culmination of many years experience in the design and manufacture of large tonnage yacht chiller systems.

Some of the OM75P-4VIHD notable features are semi-hermetic compressors, stainless steel plate heat exchangers, shell and tube condensers, variable frequency drives for compressors and seawater pumps, three stage immersion heater, touchscreen control interface, PLC control and remote monitoring capability.

The unit is also equipped with a highly innovative Manual Bypass System for the PLC which allows the crew to still control the chiller in the unlikely event that there is a catastrophic failure of the touchscreen or PLC. You can see more pictures and read a complete specification on our website www.aquaair.com

Touchscreen Main Screen

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

Aqua-Air Manufacturing
1050 E. 9th St.
Hialeah, FL 33010 USA
Phone 305-884-8363
Toll Free 800-328-1043
Fax 305-883-8549
Email sales@aquaair.com

www.aquaair.com

CHILLER UNIT SPECIFICATION

OM75P-4VIHD

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

COOLING CAPACITY: 75 tons [900,000 BTU/H] at 45˚ F leaving water temperature and 55˚ F returning water temperature. Chiller unit flow rate will be approximately 225 gpm. Condenser flow rate (each) is to be approximately 75 gpm entering at a maximum temperature of 90˚ F. All ratings are at a fouling factor of 0.0005 .

HEATING CAPACITY: 42 Kw [143,430 BTU/H] of total heating capacity at 120˚ F leaving water temperature and 100˚ F returning water temperature.

CONSTRUCTION & RATINGS: The chiller unit shall be constructed in accordance with ARI Standard 590-86 and shall comply with all applicable NEC and ASME codes for water cooled chillers. **The entire unit will be constructed in such a way that it can be disassembled at the job site, carried into the vessel and reassembled in place. Instructions for the recommended disassembly method will be included.**

COMPRESSORS: The chiller unit will have four, 18.75 ton Bitzer semi-hermetic compressors. Each compressor will be equipped with suction and discharge valves. Input voltage to the compressor motor will be 208-3-60. Power consumption of each compressor is approximately 16 kw each. Refrigerant to be used is R-22 .

CAPACITY CONTROL: Chiller unit capacity control will be achieved through the use of four variable frequency drive (VFD) units, one for each compressor. The VFD will vary the compressor motor speed from a maximum of 100% of capacity to a minimum of 70%. The VFD requires an input power supply of 208-3-60. The maximum output power will be 208-3-60 to the compressor motor. The VFD output will be regulated by a 4-20ma signal to the VFD from the PLC. The VFD voltage/frequency output will be varied based upon chilled water outlet temperature. The VFD will also control the compressor motor so that there is no current inrush, during starting, above the motor's standard running amperage.

COOLER: The unit is equipped with four plate style heat exchangers, each of 18.75 tons capacity. Each plate heat exchanger has a single water and refrigerant circuit. Construction of the unit is of #316 stainless steel. The material used to braze the plates together is copper. Maximum test pressure for both circuits is 635 psig. Each plate will be individually insulated with 1/2" thick closed cell insulation.

CONDENSER: The unit is equipped with four shell and tube marine condensers. The shell is constructed of ASME spec SA-53 steel pipe. Shells are shot blasted and cleaned before assembly. Tubes are high performance enhanced surface seamless 90/10 Cupro-Nickel tubes to ASME spec SB-359. Tubes are roller expanded into double grooved tubesheets to assure tight joints. Tubesheets are 90/10 Cupro-Nickel to ASME spec SB-171 Alloy 706. Tube supports are quality steel plug welded to the shell. Heads are cast bronze with integral pass partitions, ASME spec SB-62. Gaskets are die-cut providing effective sealing between tubesheets and machined heads. The refrigerant side is constructed and tested in accordance with Section VIII, Division 1 of ASME Code for unfired pressure vessels. Shell side design pressure (refrigerant side) is 350 psig at 250˚ F. Tube side (water side) is 150 psig at 150˚ F. Every condenser is tested per ASME Code prior to shipment. Seawater connections are 2" Class 150 PVC schedule 80 flanges. **Water flow to the condenser will be regulated by using VFD's to modulate the speed of the seawater pumps based upon the individual compressor discharge pressure. This provides for less system erosion and better discharge pressure control. It also eliminates the large brass water regulating valves that are inherently problematic in the seawater circuit.** A pressure relief valve (set for 350 psig) on the shell is standard.

IMMERSION HEATER ELEMENTS: The unit is equipped with a three stage, 18 element, 42 kW 5" flange style immersion heating element. The heater elements are rated at full wattage on 208-3-60 power input. The elements are constructed of copper with a maximum watt density of 50 watts per square inch. The element heater tank will be constructed of steel pipe to ASME specifications. All welds will be by MIG welding procedure. The tank will be equipped with a 5" 150lb ANSI raised face welding neck flange to accept the 5" flange style immersion heater. The tank design rating pressure is 150 psig at 200˚ Fahrenheit. The tank will be equipped with a ASME water pressure relief valve.

REFRIGERANT CIRCUIT: Each of the four refrigerant circuits shall include a discharge line check valve, liquid line ball valve, replaceable core liquid line filter drier with access fitting for refrigerant charging, combination moisture indicator and sight glass, liquid line solenoid and thermal expansion valve. All suction lines will be covered with a minimum of 1/2" closed cell insulation. **All refrigerant pressure transducers, switches and controls will be installed with isolation valves.**

CONTROL PANEL / ELECTRICAL BOX: The unit will have a NEMA 12 type enclosure for all of the electrical components. The chiller unit will be controlled by a programmable logic controller (PLC). The user interface for this PLC will consist of a touch screen mounted on the front of the electrical box. This touch screen will perform the following switching functions:

System mode switch
Compressor On-Off switch (4)
Heating stage On-Off Switch (3)

The touch screen will also display the following information

Digital refrigerant pressure readouts (suction and discharge) for each compressor
Digital temperature display, in Fahrenheit, for the chillwater inlet and outlet temperatures
Digital temperature display, in Fahrenheit, for the seawater outlet temperatures on each condenser
Elapsed time meters showing the run times for all compressors, pumps and heater stages
Chillwater pump motor fault indication
Compressor inverter operational (4)
Cooling stage engaged (4)
Cooling mode
Chiller freeze thermostat engaged
Low chillwater flow through the chiller
Low compressor refrigerant pressure (4)
High compressor refrigerant pressure (4)
Compressor motor overload (4)
High compressor discharge temperature (4)
Compressor inverter fault indicator (4)
Heating mode
Heating stage engaged (3)

As a precautionary measure there will be a hard-wired fail-safe emergency backup system. This will enable the engineer to operate the chiller unit in case of a failure of the PLC system.

Circuit breakers will be provided for the compressors (4), seawater pumps (4), heater stages (3), chillwater pump and control circuitry. All wiring on the unit external to the electrical box will be enclosed in liquid-tite conduit or other approved protective sheathing.

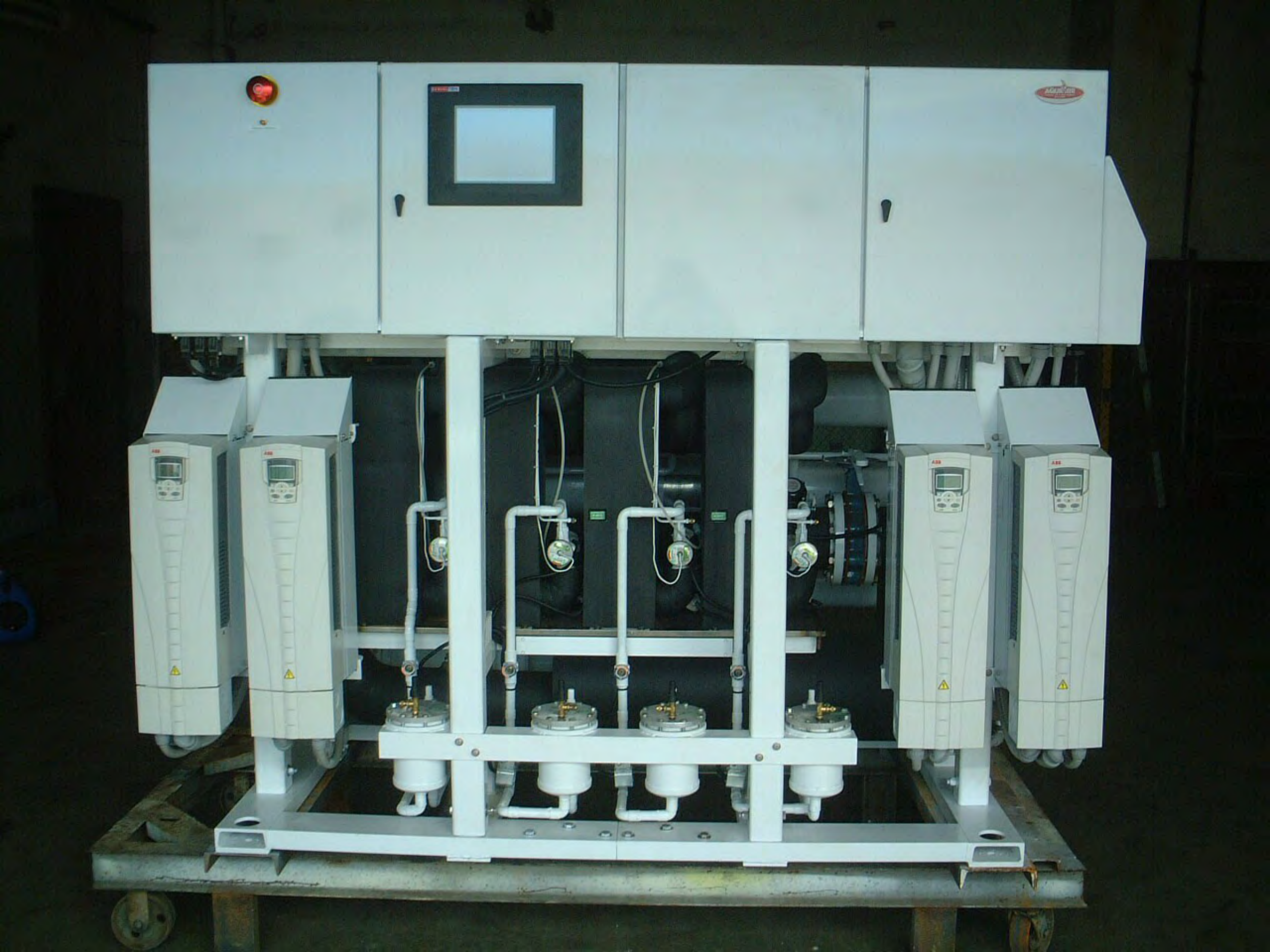
The control panel will be built in two sections: control circuit components (PLC, DC power supplies, control relays, etc.) on the left and main power feed components (circuit breakers and contactors) on the right side.

The control panel will have quick-connect electrical connectors for all control circuit items external to the control panel. This will eliminate any wiring problems during the assembly phase at the shipyard and also significantly decrease the overall number of labor hours necessary to install the unit. All main power feeds for compressors, pumps and heaters will still need to be hardwired.

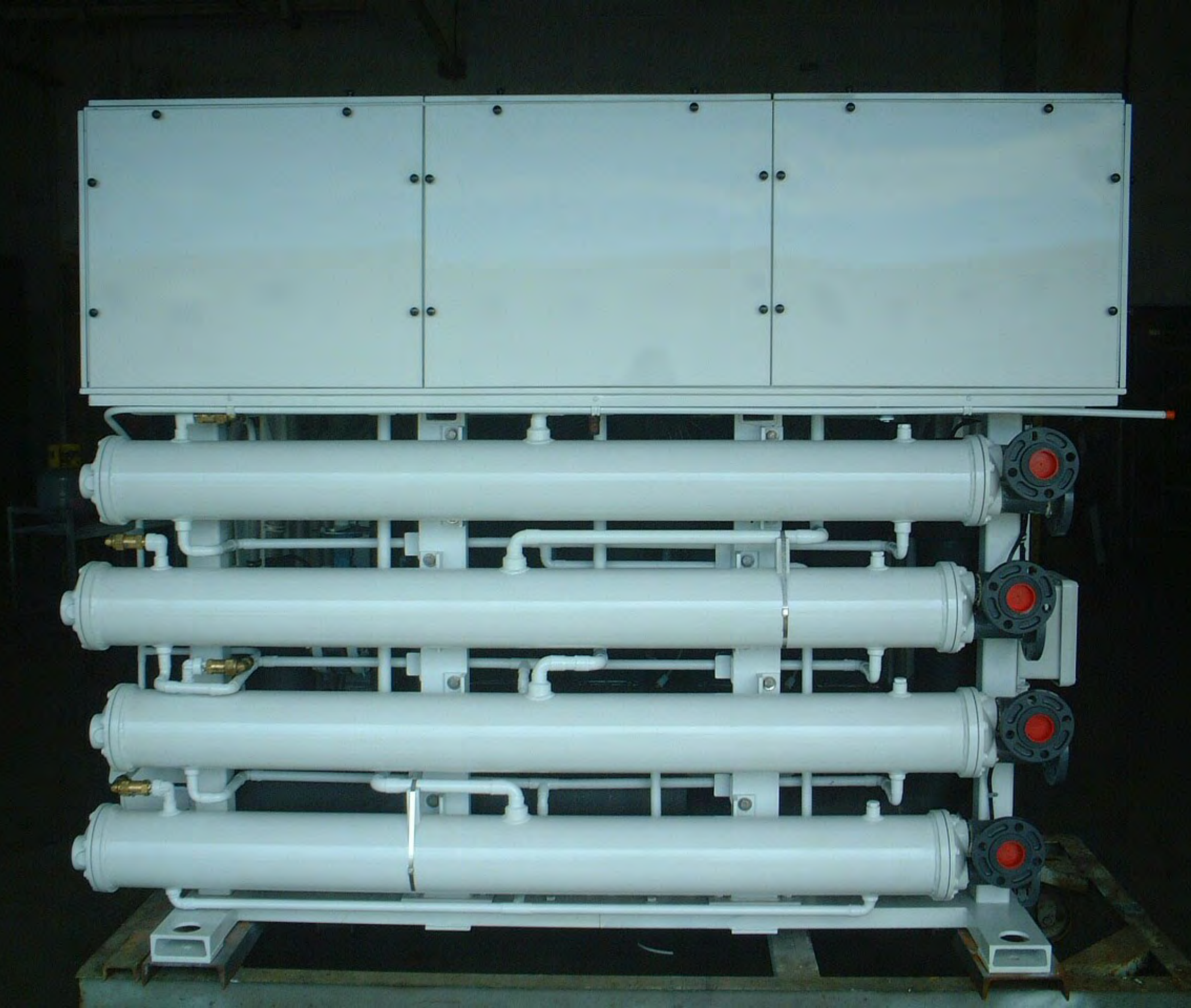
FRAME: The frame for the unit will be constructed of appropriately sized steel channel, square tube and angle. All welds will be by MIG welding procedure. Completed frame will be primed with a red lead based primer and then painted to meet 500 hour salt spray requirement. Color will be the standard Aqua-Air white enamel finish. Stainless steel drain pans with a non-corrosive internal coating will be installed under any condensate producing components. The compressors will be enclosed in an aluminum sound shield to reduce the noise from the compressors. **The frame will be built in such a way as to allow it to be disassembled and carried into the vessel through the standard ship's doorways.**

i:\wordpfct\aq900hdr2008c.wpd

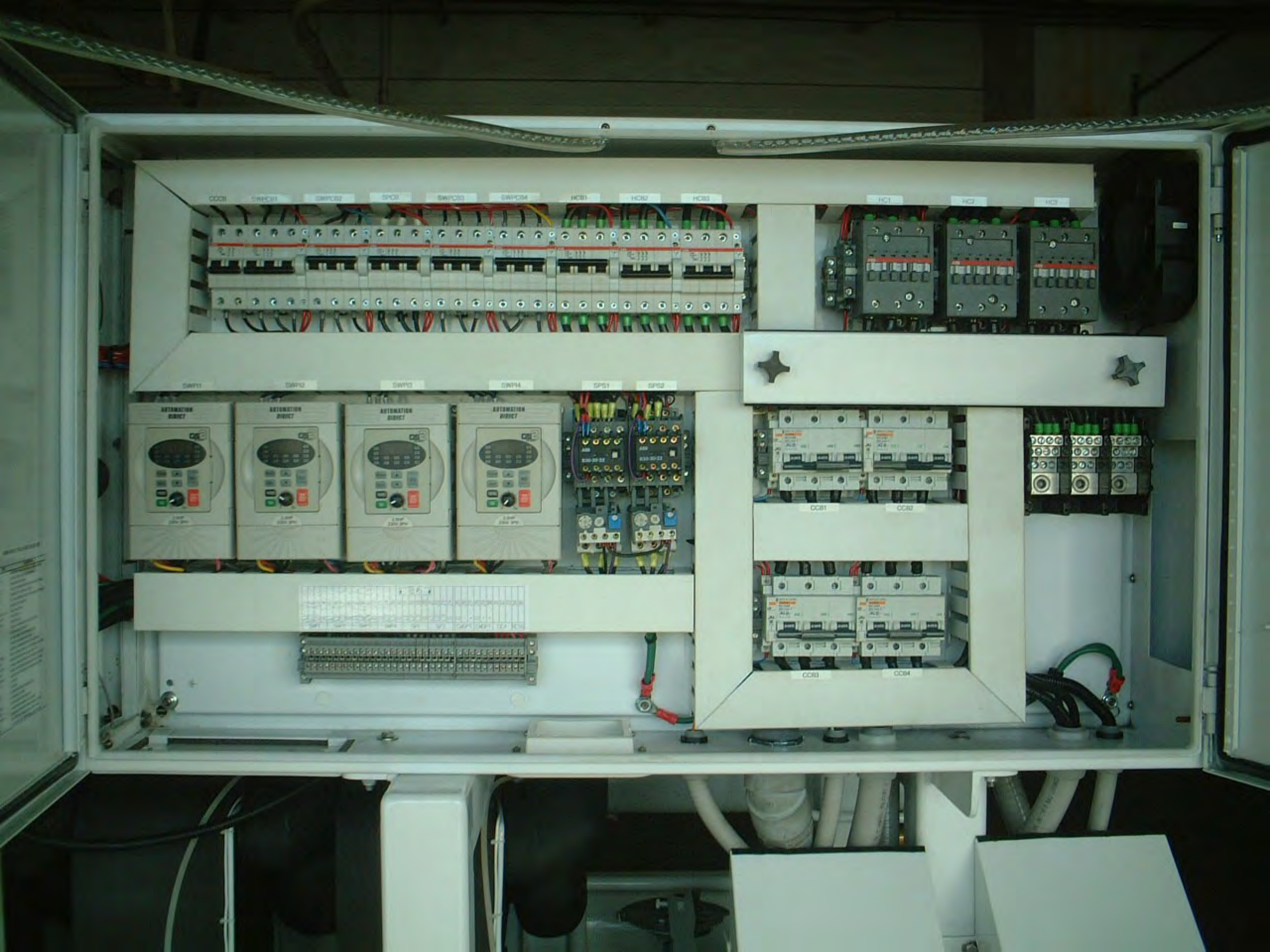
AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 E-mail sales@aquaair.com




AQUAIR




COOLING
HEATING
MANUAL BYPASS SYSTEM
Honeywell
Honeywell
ABB
ABB


CCB1
SWPCB1
SWPCB2
SPCB
SWPCB3
SWPCB4
HCB1
HCB2
HCB3
HC1
HC2
HC3
SWP1
SWP2
SWP3
SWP4
SPS1
SPS2
CC81
CC82
CC83
CC84


EMERGENCY STOP SWITCH
STAGE
SEAWATER PUMP BYPASS
COMPRESSOR
COOLING STAGE
FREEZE FAULT
OIL PRESSURE FAULT
LOW REFRIGERANT PRESSURE FAULT
HIGH REFRIGERANT PRESSURE FAULT
COMPRESSOR ON
COOLING
1
2
3
4
OFF
ON
HEATING
STAGE
HEATER
HEATING STAGE
HEATER ON
MANUAL BYPASS SYSTEM
SYSTEM PUMPS
PLC
MAN
HEATING FLOW
SYSTEM MODE
HEAT
COOL
COOLING FLOW
FAULT
PLC0
FZT1
FZT2

AQUAIR

MARINE AIR CONDITIONING SYSTEMS

INSTALLATION
OPERATION
MAINTENANCE

M/Y “Gallant Lady”
DeVries 651
OM75P-4VIHD
Chiller Retrofit
Touchscreen

ALARM HISTORY TOTAL OF 0 ALARMS

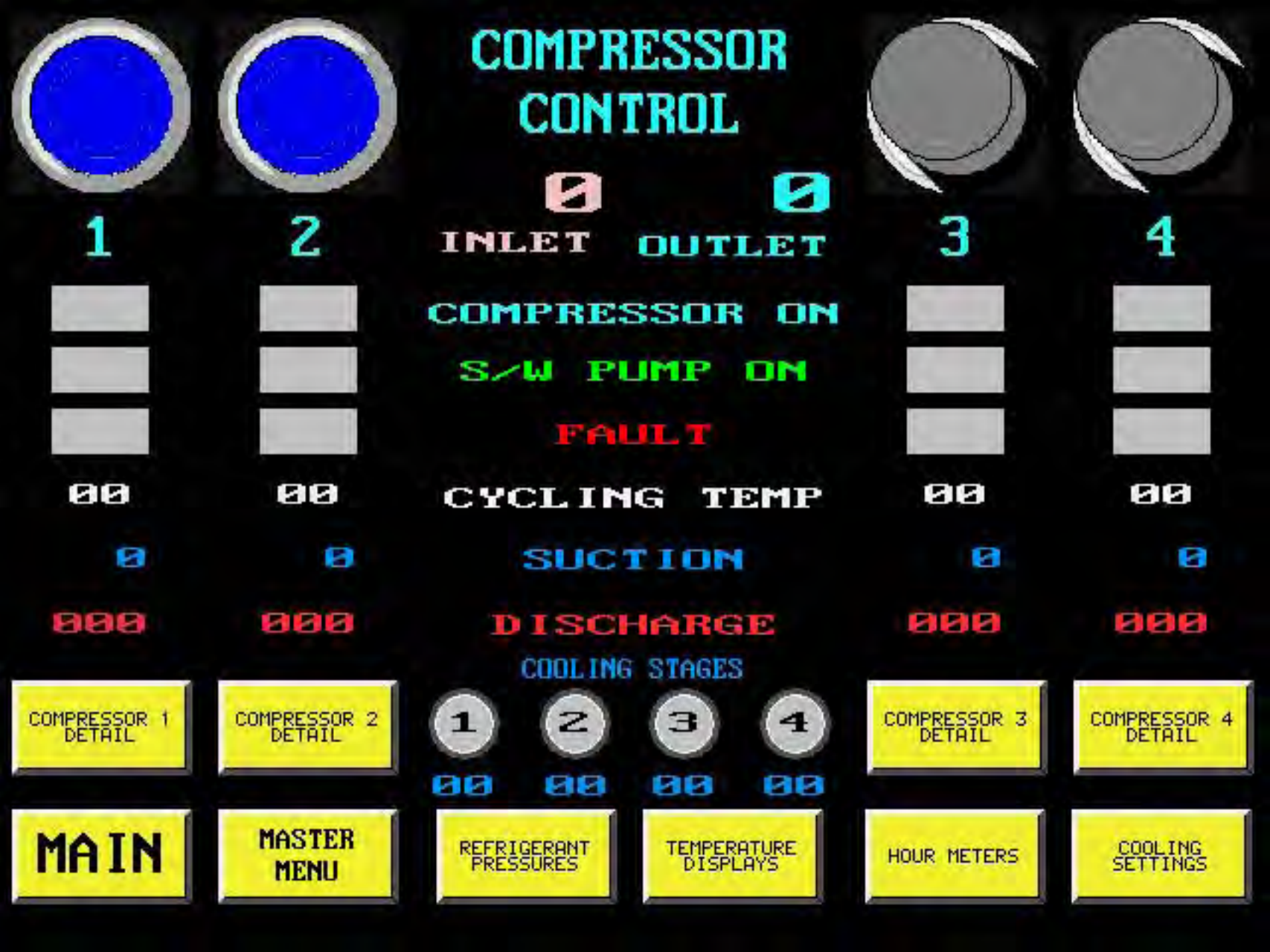
ENTRY	MESSAGE

ALARM COUNT	PAGE UP	PAGE DOWN	LINE UP	LINE DOWN	DETAILS	CLEAR ALL	EXIT

COMPRESSOR ALTERNATING SEQUENCE SETTINGS

0.0	ALTERNATING PERIOD, HOURS
MANUAL	ALTERNATING SEQUENCE MODE
0	CURRENT LEAD COMPRESSOR
0000	CURRENT ALTERNATING SEQUENCE
0.0	TIME REMAINING IN CURRENT SEQUENCE, HOURS
0	MAXIMUM NUMBER OF COMPRESSORS THAT CAN BE OPERATED

MAIN | MASTER MENU | REFRIGERANT PRESSURES | TEMPERATURE DISPLAYS | HOUR METERS | COMPRESSOR CONTROL


COMPRESSOR CONTROL
0
0
INLET
OUTLET
1
2
3
4
COMPRESSOR ON
S/W PUMP ON
FAULT
00
00
CYCLING TEMP
00
00
0
0
SUCTION
0
0
000
000
DISCHARGE
000
000
COOLING STAGES
1
2
3
4
00
00
00
00
COMPRESSOR 1 DETAIL
COMPRESSOR 2 DETAIL
COMPRESSOR 3 DETAIL
COMPRESSOR 4 DETAIL
MAIN
MASTER MENU
REFRIGERANT PRESSURES
TEMPERATURE DISPLAYS
HOUR METERS
COOLING SETTINGS


COMPRESSOR 1
COMPRESSOR RUNNING
INVERTER MODULATING COMPRESSOR OUTPUT
LIQUID LINE SOLENOID ON
CRANKCASE HEATER ON
COMPRESSOR THERMAL OVERLOAD MODULE ON
COMPRESSOR INVERTER FAULT
COMPRESSOR CIRCUIT BREAKER OFF
FREEZE THERMOSTAT FAULT
COMPRESSOR HIGH TEMPERATURE FAULT
LOW REFRIGERANT PRESSURE FAULT
LOW LUBE OIL PRESSURE FAULT
HIGH REFRIGERANT PRESSURE FAULT
POWER
MAIN
MASTER MENU
<< BACK
S/W PUMP RUNNING
S/W PUMP INVERTER FAULT
S/W PUMP CIRCUIT BREAKER OFF
S/W CONDENSER INLET TEMP
000
S/W CONDENSER OUTLET TEMP
000
CYCLING TEMPERATURE
00
SUCTION PRESSURE
0
DISCHARGE PRESSURE
000
LUBE OIL PRESSURE
000
SYSTEM INLET TEMPERATURE
0
SYSTEM OUTLET TEMPERATURE
0
PLATE CHILLER OUTLET TEMPERATURE
0

COMPRESSOR 2

COMPRESSOR RUNNING

INVERTER MODULATING COMPRESSOR OUTPUT

LIQUID LINE SOLENOID ON

CRANKCASE HEATER ON

COMPRESSOR THERMAL OVERLOAD MODULE ON

COMPRESSOR INVERTER FAULT

COMPRESSOR CIRCUIT BREAKER OFF

FREEZE THERMOSTAT FAULT

COMPRESSOR HIGH TEMPERATURE FAULT

LOW REFRIGERANT PRESSURE FAULT

LOW LUBE OIL PRESSURE FAULT

HIGH REFRIGERANT PRESSURE FAULT

POWER

MAIN

MASTER MENU

<< BACK

S/W PUMP RUNNING

S/W PUMP INVERTER FAULT

S/W PUMP CIRCUIT BREAKER OFF

S/W CONDENSER INLET TEMP 000

S/W CONDENSER OUTLET TEMP 000

CYCLING TEMPERATURE 00

SUCTION PRESSURE 0

DISCHARGE PRESSURE 000

LUBE OIL PRESSURE 000

SYSTEM INLET TEMPERATURE 0

SYSTEM OUTLET TEMPERATURE 0

PLATE CHILLER OUTLET TEMPERATURE 0

COMPRESSOR 3

COMPRESSOR RUNNING

INVERTER MODULATING COMPRESSOR OUTPUT

LIQUID LINE SOLENOID ON

CRANKCASE HEATER ON

COMPRESSOR THERMAL OVERLOAD MODULE ON

COMPRESSOR INVERTER FAULT

COMPRESSOR CIRCUIT BREAKER OFF

FREEZE THERMOSTAT FAULT

COMPRESSOR HIGH TEMPERATURE FAULT

LOW REFRIGERANT PRESSURE FAULT

LOW LUBE OIL PRESSURE FAULT

HIGH REFRIGERANT PRESSURE FAULT

POWER

MAIN

MASTER MENU

<< BACK

S/W PUMP RUNNING

S/W PUMP INVERTER FAULT

S/W PUMP CIRCUIT BREAKER OFF

S/W CONDENSER INLET TEMP 000

S/W CONDENSER OUTLET TEMP 000

CYCLING TEMPERATURE 00

SUCTION PRESSURE 0

DISCHARGE PRESSURE 000

LUBE OIL PRESSURE 000

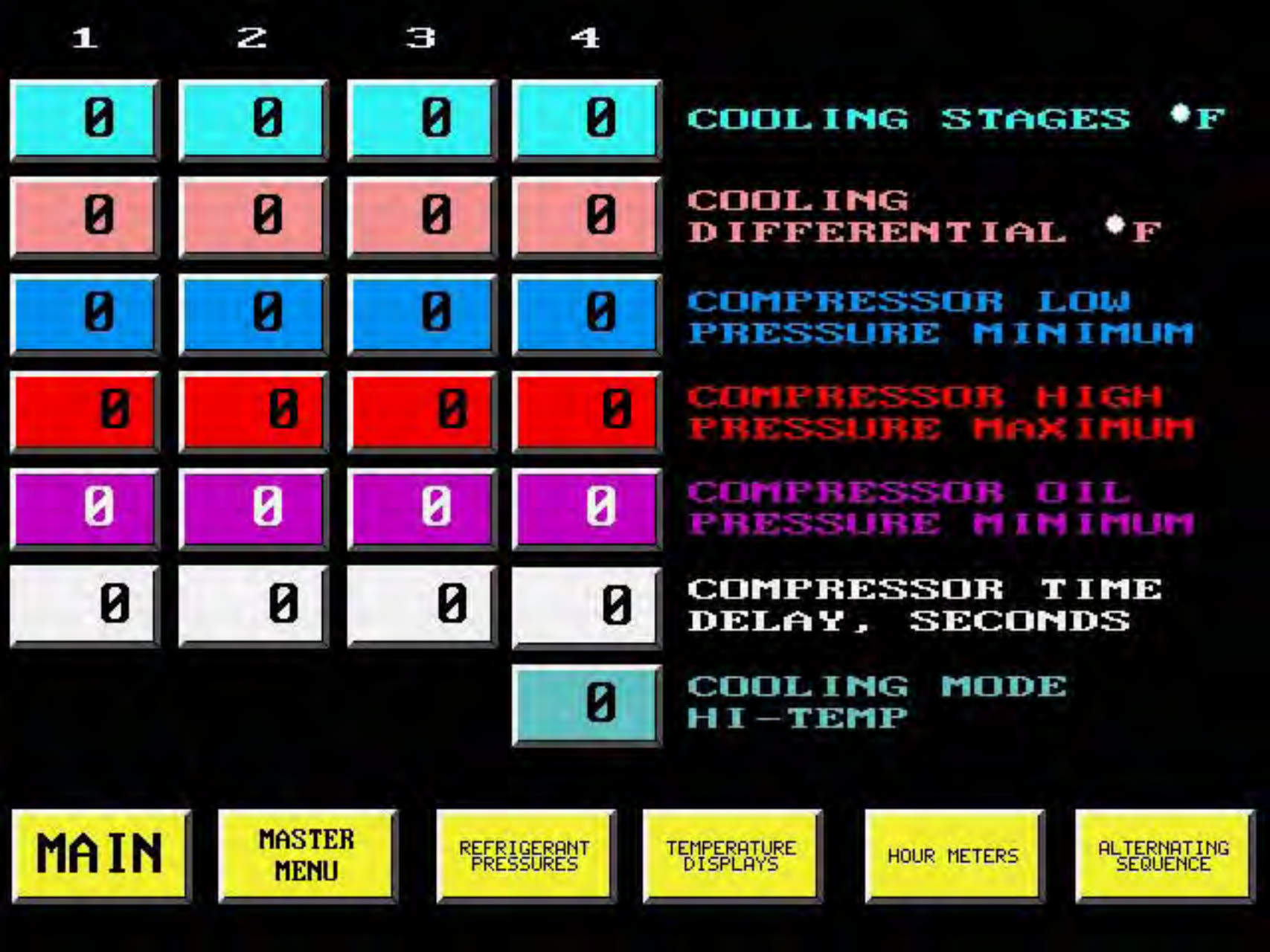
SYSTEM INLET TEMPERATURE 0

SYSTEM OUTLET TEMPERATURE 0

PLATE CHILLER OUTLET TEMPERATURE 0


COMPRESSOR
4
COMPRESSOR RUNNING
INVERTER MODULATING COMPRESSOR OUTPUT
LIQUID LINE SOLENOID ON
CRANKCASE HEATER ON
COMPRESSOR THERMAL OVERLOAD MODULE ON
COMPRESSOR INVERTER FAULT
COMPRESSOR CIRCUIT BREAKER OFF
FREEZE THERMOSTAT FAULT
COMPRESSOR HIGH TEMPERATURE FAULT
LOW REFRIGERANT PRESSURE FAULT
LOW LUBE OIL PRESSURE FAULT
HIGH REFRIGERANT PRESSURE FAULT
POWER
MAIN
MASTER MENU
<< BACK
S/W PUMP RUNNING
S/W PUMP INVERTER FAULT
S/W PUMP CIRCUIT BREAKER OFF
S/W CONDENSER INLET TEMP
000
S/W CONDENSER OUTLET TEMP
000
CYCLING TEMPERATURE
00
SUCTION PRESSURE
0
DISCHARGE PRESSURE
000
LUBE OIL PRESSURE
000
SYSTEM INLET TEMPERATURE
0
SYSTEM OUTLET TEMPERATURE
0
PLATE CHILLER OUTLET TEMPERATURE
0


MODULATE INVERTER OUTPUT
RAMP DOWN START TEMP deg F & 0-4095
INVERTER SPEED REF H2 & 0-4095
INVERTER MODULATION INFORMATION
1
OFF
00
00.0
0000
0000
2
OFF
00
00.0
0000
0000
3
OFF
00
00.0
0000
0000
4
OFF
00
00.0
0000
0000
MAIN
MASTER MENU
COMPRESSOR CONTROL
COOLING SETTINGS


1
2
3
4
0
0
0
0
COOLING STAGES °F
0
0
0
0
COOLING DIFFERENTIAL °F
0
0
0
0
COMPRESSOR LOW PRESSURE MINIMUM
0
0
0
0
COMPRESSOR HIGH PRESSURE MAXIMUM
0
0
0
0
COMPRESSOR OIL PRESSURE MINIMUM
0
0
0
0
COMPRESSOR TIME DELAY, SECONDS
0
COOLING MODE HI-TEMP
MAIN
MASTER MENU
REFRIGERANT PRESSURES
TEMPERATURE DISPLAYS
HOUR METERS
ALTERNATING SEQUENCE

FACTORY SETTINGS

1	2		3	4
		BYPASS THE LP-HP-OP TRANSDUCERS		
		COMPRESSOR MANUAL RUN		

UNIT INLET SENSOR (UIS) BYPASS

0

BYPASS SETTING

UNIT OUTLET SENSOR (UOS) BYPASS

0

BYPASS SETTING

0 LOW REFRIGERANT PRESSURE TIME DELAY, secs

0 LUBE OIL PRESSURE TIME DELAY, secs

0 NUMBER of DEGREES IN MODULATING STAGE

FACTORY DEFAULT SETTINGS

PRESS TO LOAD

MAIN

MASTER MENU

ADJUST TIME & DATE

11:30
25-SEP-08

HEATER CONTROL

1 2 3

OFF OFF OFF

HEATERS

HEATING STAGES

SYSTEM INLET 0

1 2 3

000 000 000

SYSTEM OUTLET 0

MAIN | MASTER MENU | TEMPERATURE DISPLAYS | HOUR METERS | HEATING SETTINGS

HEATER SETTINGS

1	2	3	
0	0	0	HEATING STAGES °F
0	0	0	HEATING DIFFERENTIAL °F
0	0	0	HEATER TIME DELAY, secs
		0	HEATING MODE LOW TEMPERATURE ALARM

MAIN | MASTER MENU | HEATING CONTROL | TEMPERATURE DISPLAYS | HOUR METERS

HOUR METER DISPLAY & ADJUSTMENT

POWER

AQUAAIR

MARINE AIR CONDITIONING SYSTEMS

COOL MODE
HEAT MODE

SYSTEM PUMPS

S/W PUMPS

COMPRESSORS

HEATERS

COMPRESSOR CONTROL SCREEN

HEATER CONTROL SCREEN

TEMPERATURE DISPLAY SCREEN

SYSTEM PUMPS

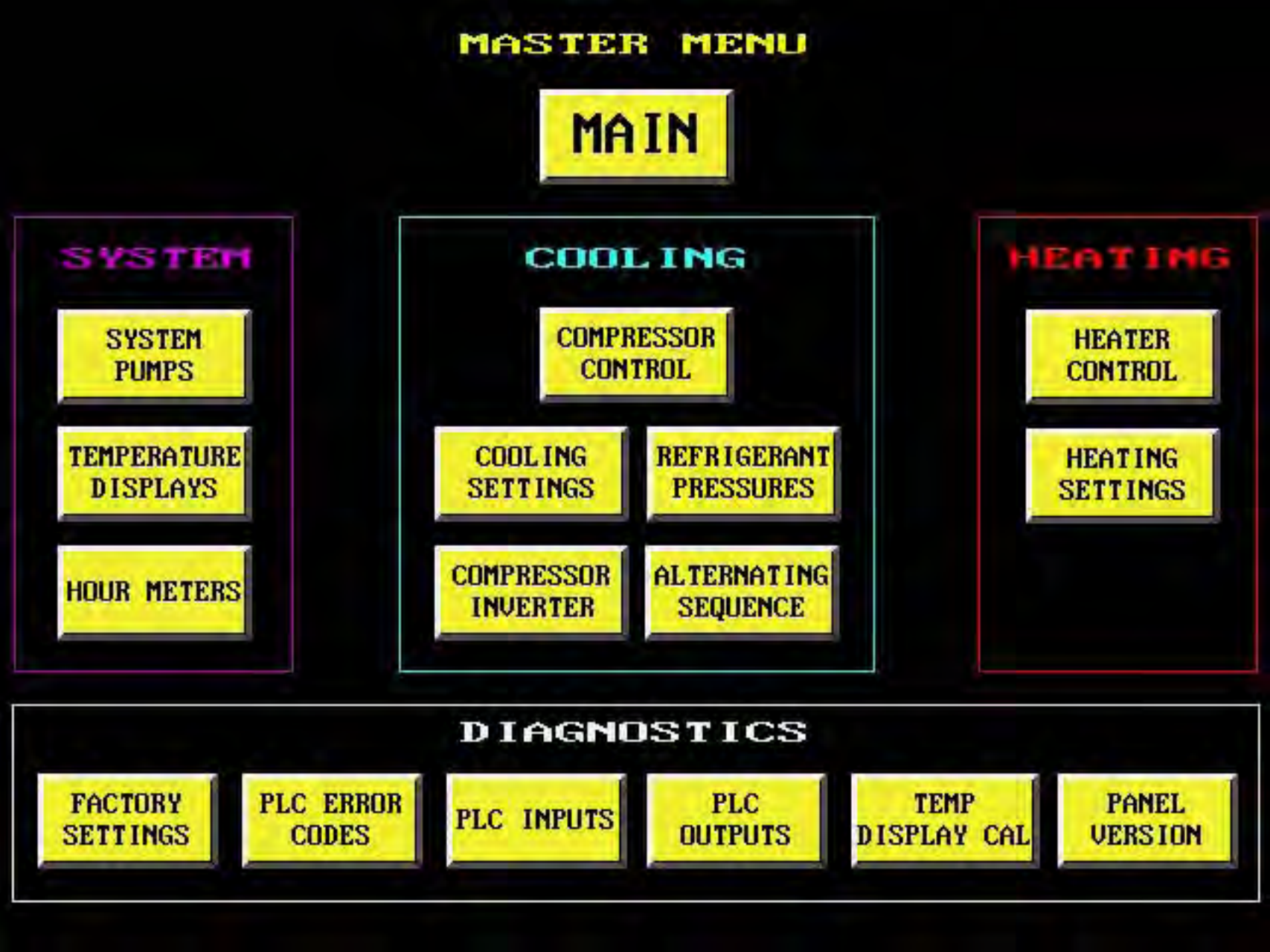
ALARM HISTORY

MASTER MENU

INLET

SYSTEM TEMPERATURES °F

OUTLET


MASTER MENU
MAIN
SYSTEM
SYSTEM PUMPS
TEMPERATURE DISPLAYS
HOUR METERS
COOLING
COMPRESSOR CONTROL
COOLING SETTINGS
REFRIGERANT PRESSURES
COMPRESSOR INVERTER
ALTERNATING SEQUENCE
HEATING
HEATER CONTROL
HEATING SETTINGS
DIAGNOSTICS
FACTORY SETTINGS
PLC ERROR CODES
PLC INPUTS
PLC OUTPUTS
TEMP DISPLAY CAL
PANEL VERSION

AQUA-AIR MANUFACTURING
1050 E. 9th St. Hialeah, Florida 33010

305-884-8363 800-328-1043
www.aquaair.com

Version EZA10.1 Project 08020401

MASTER MENU

PLC CPU INFORMATION

0000 FATAL ERROR CODE V7755

0000 MAJOR ERROR CODE V7756

00000000 MODULE ERROR - BASE & SLOT NUMBER V7760

0000 MODULE ERROR - ERROR CODE V7762

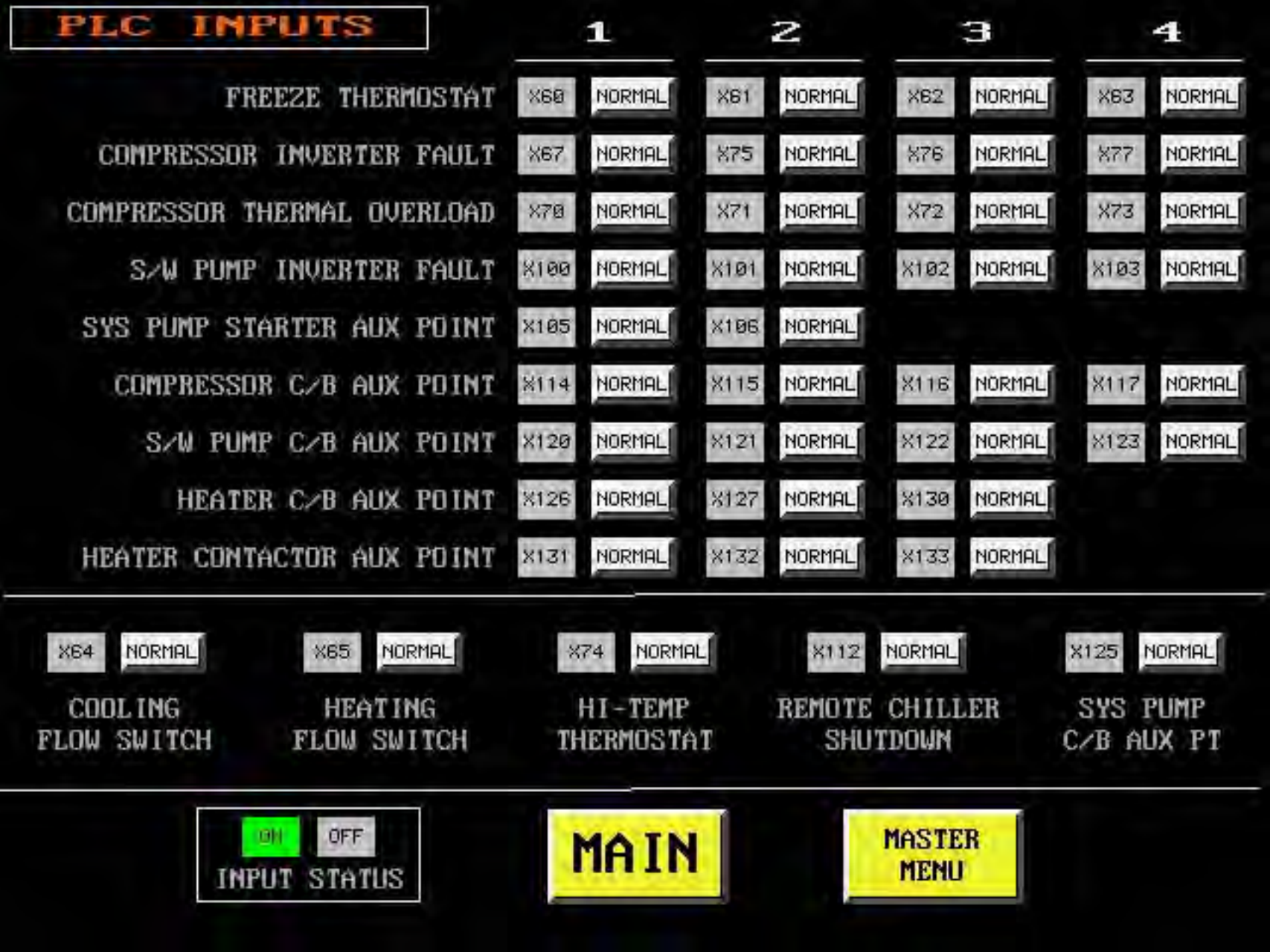
0000 CURRENT SCAN TIME, ms V7775

0000 MINIMUM SCAN TIME, ms V7776

0000 MAXIMUM SCAN TIME, ms V7777

MAIN

MASTER MENU


PLC INPUTS
1
2
3
4
FREEZE THERMOSTAT
X60 NORMAL
X61 NORMAL
X62 NORMAL
X63 NORMAL
COMPRESSOR INVERTER FAULT
X67 NORMAL
X75 NORMAL
X76 NORMAL
X77 NORMAL
COMPRESSOR THERMAL OVERLOAD
X70 NORMAL
X71 NORMAL
X72 NORMAL
X73 NORMAL
S/W PUMP INVERTER FAULT
X100 NORMAL
X101 NORMAL
X102 NORMAL
X103 NORMAL
SYS PUMP STARTER AUX POINT
X105 NORMAL
X106 NORMAL
COMPRESSOR C/B AUX POINT
X114 NORMAL
X115 NORMAL
X116 NORMAL
X117 NORMAL
S/W PUMP C/B AUX POINT
X120 NORMAL
X121 NORMAL
X122 NORMAL
X123 NORMAL
HEATER C/B AUX POINT
X126 NORMAL
X127 NORMAL
X130 NORMAL
HEATER CONTACTOR AUX POINT
X131 NORMAL
X132 NORMAL
X133 NORMAL
X64 NORMAL
COOLING FLOW SWITCH
X65 NORMAL
HEATING FLOW SWITCH
X74 NORMAL
HI-TEMP THERMOSTAT
X112 NORMAL
REMOTE CHILLER SHUTDOWN
X125 NORMAL
SYS PUMP C/B AUX PT
ON
OFF
INPUT STATUS
MAIN
MASTER MENU

PLC OUTPUTS

	1		2		3		4	
LIQUID LINE SOLENOIDS	Y0	NORMAL	Y1	NORMAL	Y2	NORMAL	Y3	NORMAL
HEATER CONTACTORS	Y4	NORMAL	Y5	NORMAL	Y6	NORMAL		
CRANKCASE HEATERS	Y10	NORMAL	Y11	NORMAL	Y12	NORMAL	Y13	NORMAL
COMPRESSOR OVERLOAD	Y14	NORMAL	Y15	NORMAL	Y16	NORMAL	Y17	NORMAL
GENERAL CHILLER ALARM OUTPUT	Y20	NORMAL						
S/W PUMP INVERTER START RELAY	Y21	NORMAL	Y22	NORMAL	Y23	NORMAL	Y24	NORMAL
SYSTEM PUMP STARTER	Y26	NORMAL	Y27	NORMAL				
COMPRESSOR INVERTER START RELAY	Y30	NORMAL	Y31	NORMAL	Y32	NORMAL	Y33	NORMAL

MAIN

MASTER MENU

REFRIGERANT PRESSURES

	SUCTION PRESSURE	DISCHARGE PRESSURE	OIL PRESSURE	
1	OFF	OFF	OFF	1
2	OFF	OFF	OFF	2
3	OFF	OFF	OFF	3
4	OFF	OFF	OFF	4

MAIN

MASTER MENU

COMPRESSOR CONTROL

SYSTEM PUMPS

0000

SUCTION
PRESSURE

0000

DISCHARGE
PRESSURE

MAIN

MASTER
MENU

COMPRESSOR
CONTROL

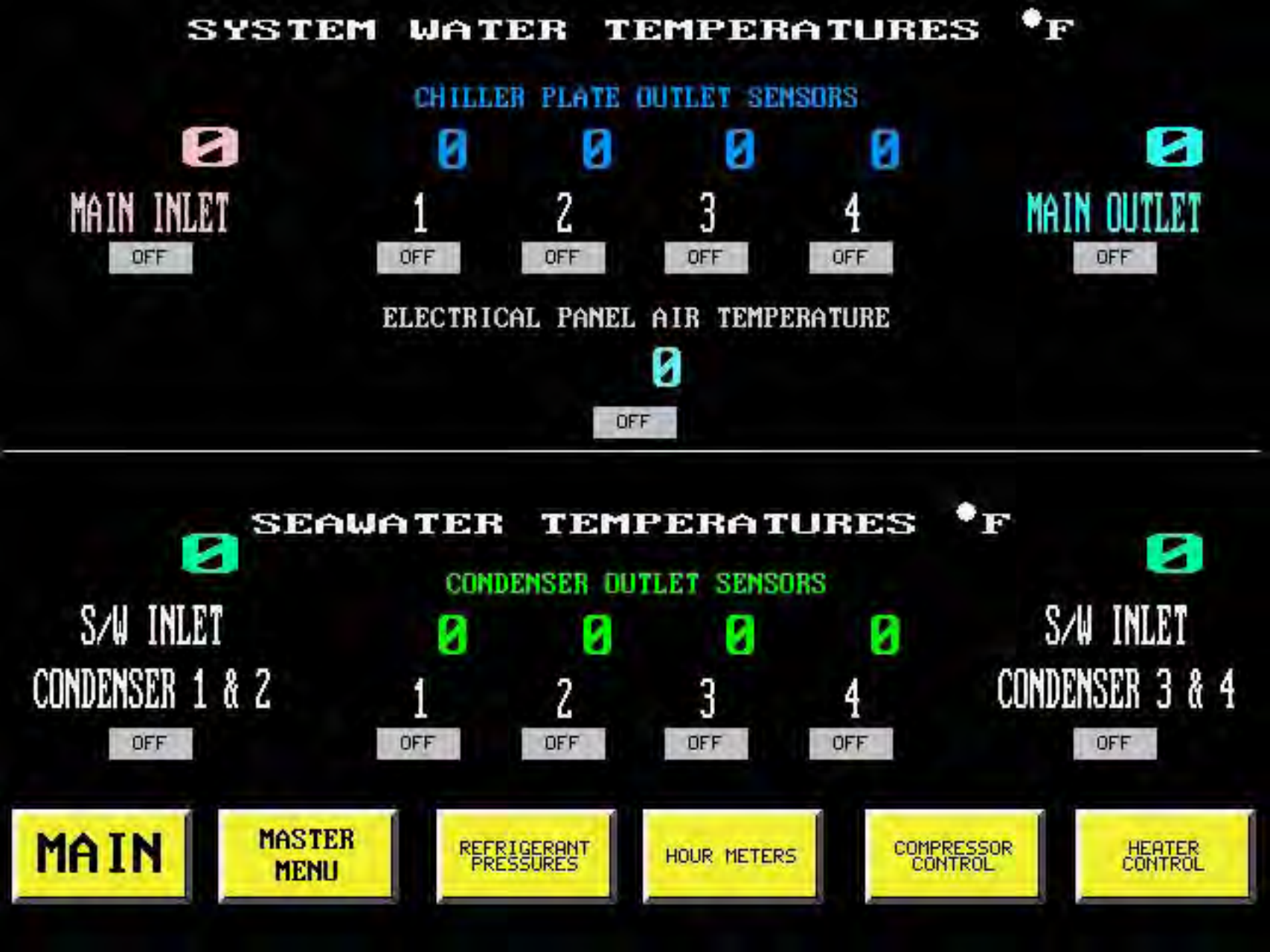
HEATER
CONTROL

SYSTEM WATER TEMPERATURE SENSOR CALIBRATION

	ACTUAL SENSOR TEMP		AMOUNT TO ADD		AMOUNT TO SUBTRACT		DISPLAYED TEMPERATURE
MAIN INLET OFF	0	+	0	−	0	=	0
MAIN OUTLET OFF	0	+	0	−	0	=	0

ALL TEMPERATURES DISPLAYED ARE IN °F

MAIN | MASTER MENU | TEMPERATURE DISPLAYS


SYSTEM WATER TEMPERATURES °F
CHILLER PLATE OUTLET SENSORS
0
0
0
0
MAIN INLET
1
2
3
4
MAIN OUTLET
OFF
OFF
OFF
OFF
OFF
OFF
ELECTRICAL PANEL AIR TEMPERATURE
0
OFF
SEAWATER TEMPERATURES °F
CONDENSER OUTLET SENSORS
0
0
0
0
S/W INLET
CONDENSER 1 & 2
1
2
3
4
S/W INLET
CONDENSER 3 & 4
OFF
OFF
OFF
OFF
OFF
OFF
MAIN
MASTER MENU
REFRIGERANT PRESSURES
HOUR METERS
COMPRESSOR CONTROL
HEATER CONTROL

TIME AND DATE ADJUSTMENT

TIME

00000000

ENTER THE NEW TIME HERE IN THE FOLLOWING FORMAT:
00HHMMSS

00 = 00 (2 ZEROES, NOT USED)
HH = HOUR, 1-23
MM = MINUTES, 1-59
SS = SECONDS, 1-59

EXAMPLES
10:13am 00101300
4:49pm 00164900

Press to Update TIME

CURRENT TIME
13:17:52
09/25/08
CURRENT DATE

MAIN

MASTER MENU

DATE

00000000

ENTER THE NEW DATE HERE IN THE FOLLOWING FORMAT:
YYMMDDdw

YY = YEAR, 0-99
MM = MONTH, 1-12
DD = DAY, 1-31
dw = Day of Week, 0-6 (0=Sunday, 1=Monday, 2=Tuesday), etc

EXAMPLE
Friday, August 22, 2008 = 08082205

Press to Update DATE

AQUAAIR

MARINE AIR CONDITIONING SYSTEMS

100 Ton Chillers

CHILLER UNIT SPECIFICATION
OM100-4E

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

COOLING CAPACITY: 100 tons [1,200,000 BTU/H] [300,000 KCAL/H] at 40˚ F (7.2˚ C) leaving water temperature and 50˚ F (12.8˚ C) returning water temperature. Chiller unit flow rate will be approximately 300 gpm. Condenser flow rate (each) is to be approximately 100 gpm entering at a maximum temperature of 90˚ F (32˚ C). All ratings are at a fouling factor of 0.0005 .

CONSTRUCTION & RATINGS: The chiller unit shall be constructed in accordance with ARI Standard 590-86 and shall comply with all applicable NEC and ASME codes for water cooled chillers.

COMPRESSORS: The chiller unit will have four, 25 ton Bitzer semi-hermetic reciprocating compressors. Each compressor will be equipped with suction and discharge valves. Input voltage to the compressor motor will be 460-3-60. Power consumption of each compressor is approximately 21.1 kW each. Refrigerant to be used is R-22

CHILLER BARREL: The unit is equipped with a four circuit, 100 ton shell and tube chiller barrel. The shell is constructed of steel per ASME specification SA-53, Grade B. The shells are shot blasted and cleaned before assembly. The tubes are high performance seamless copper tube to ASME specs. Tubes are roller expanded into double grooved tube sheets. The tube sheets are ASME grade carbon steel. The baffles are hot rolled steel, terne plated for added corrosion resistance. The heads are ASME grade steel fabricated ring and cover type steel heads. Gaskets are die-cut medium density elastomer in conformance with relevant specifications. The chillwater connections are 5" 150lb ANSI raised face flanges (2). The refrigerant side is constructed in accordance with the latest edition of Section VIII, Division I of ASME Code for pressure vessels and stamped accordingly. Tube side (refrigerant side) design pressure is 200 PSIG at 100 ˚F. Shell side (fluid side) design pressure is 150 PSIG at 120 ˚F. The entire shell is covered with 3/4" (19mm) thick Armaflex foam rubber insulation.

CONDENSERS: The unit is equipped with four 25 ton shell and tube marine condensers. The shell is constructed of ASME spec SA-53 steel pipe. Shells are shot blasted and cleaned before assembly. Tubes are high performance enhanced surface seamless 90/10 Cupro-Nickel tubes to ASME spec SB-359. Tubes are roller expanded into double grooved tubesheets to assure tight joints. Tubesheets are 90/10 Cupro-Nickel to ASME spec SB-171 Alloy 706. Tube supports are quality steel plug welded to the shell. Heads are cast bronze with integral pass partitions, ASME spec SB-62. Gaskets are die-cut providing effective sealing between tubesheets and machined heads. The refrigerant side is constructed and tested in accordance with Section VIII, Division 1 of ASME Code for unfired pressure vessels. Shell side design pressure (refrigerant side) is 350 psig at 250˚ F. Tube side (water side) is 150 psig at 150˚ F. Every condenser is tested per ASME Code prior to shipment. Seawater connections are 2" FPT.

Water flow to the condenser will be regulated by a discharge pressure actuated water regulating valve. A pressure relief valve (set for 350 psig) on the shell is standard.

REFRIGERANT CIRCUIT: Each of the four refrigerant circuits shall include a liquid line ball valve, replaceable core liquid line filter drier with access fitting for refrigerant charging and refrigerant isolation valves, combination moisture indicator and sight glass, liquid line solenoid and thermal expansion valve. All suction lines will be covered with a minimum of 1/2" closed cell insulation.

***CONTROL PANEL / ELECTRICAL BOX*:** The unit will have a single NEMA 12 type electrical box. The panel will be comprised of the following main components:

- Main Control:Hydro-Matic microprocessor based control system with the following primary features:
- On-Off control of chiller compressors
- Display of chillwater inlet and outlet temperatures for the entire unit
- Display of seawater outlet temperatures for each fifteen ton module
- Monitors refrigerant high and low pressure faults, freeze thermostats and flow switch
- Automatic sequencing of compressors to achieve equal run times
- Service LED indicates fault condition
- Temperatures can be displayed in either Fahrenheit or Celsius
- Compressor LED's indicate operating status of each compressor

CONTROL PANEL / ELECTRICAL BOX (cont)

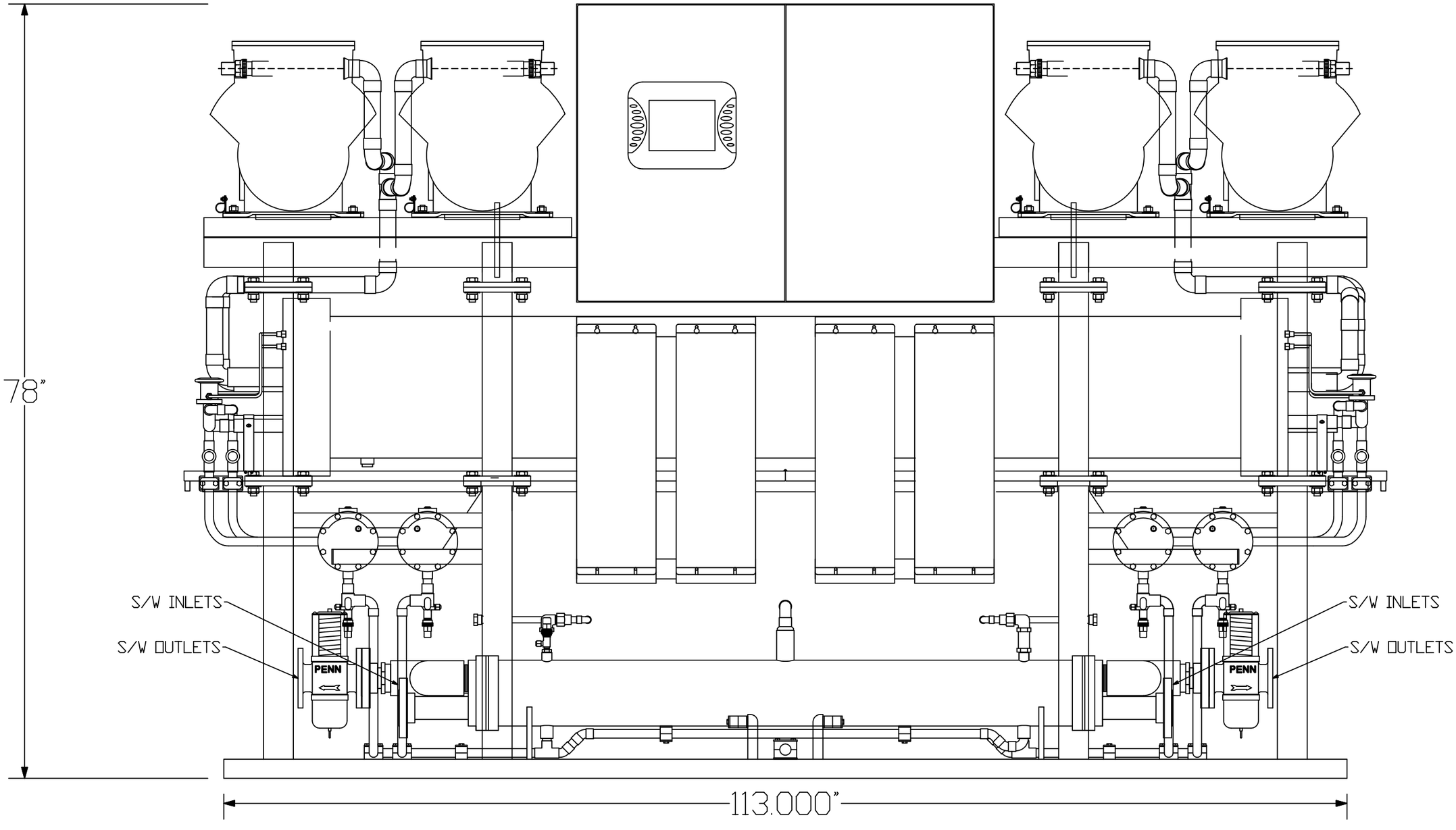
- Incoming power is checked for low and high voltage conditions

Motor starters will be provided for the compressors, chillwater and seawater pumps (2). A selector switch will be provided on the front of the panel to select between the primary and standby seawater pumps.

Circuit breakers will be provided for each compressor (5), seawater pump, chillwater pump and control circuitry. Circuit breakers will be rated for use on 480/3/60 power input.

FRAME: The frame for the unit will be constructed of appropriately sized steel channel, square tube and angle. All welds will be by MIG welding procedure. Completed frame will be primed and then painted to meet 500 hour salt spray requirement using ***Awlgrip Matterhorn White paint.*** Stainless steel drain pans with a non-corrosive internal coating will be installed under any condensate producing components.

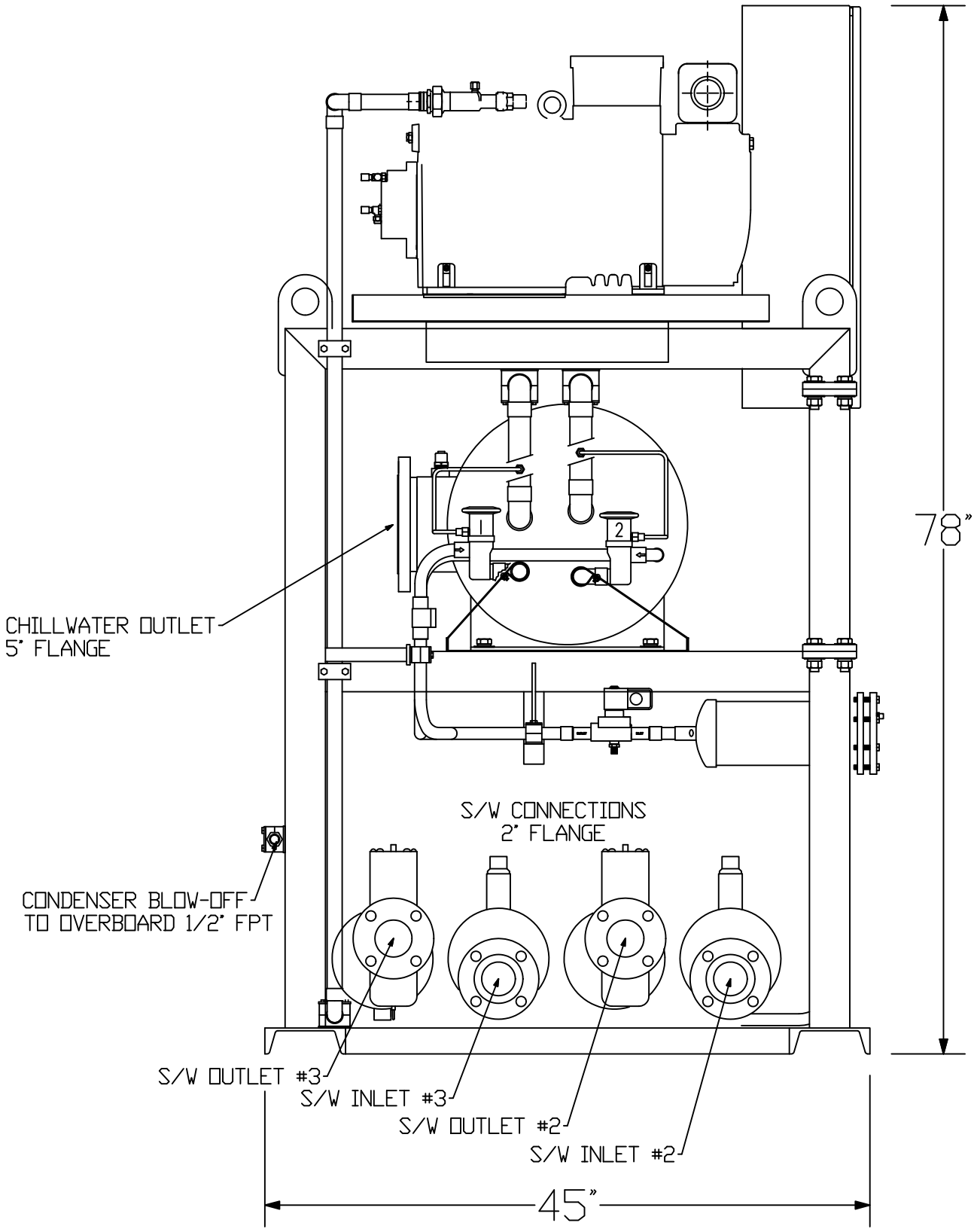
i:\wordpfct\om1004e.wpd



AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

OM100P4VEK CHILLER UNIT
100 TON, 4 STAGE 380-3-50

DRAWING NUMBER OM100P4VEK6	DRAWN BY DN	DATE 11-13-03	
SCALE FULL	APPROVED BY	REVISION DATE	REV A



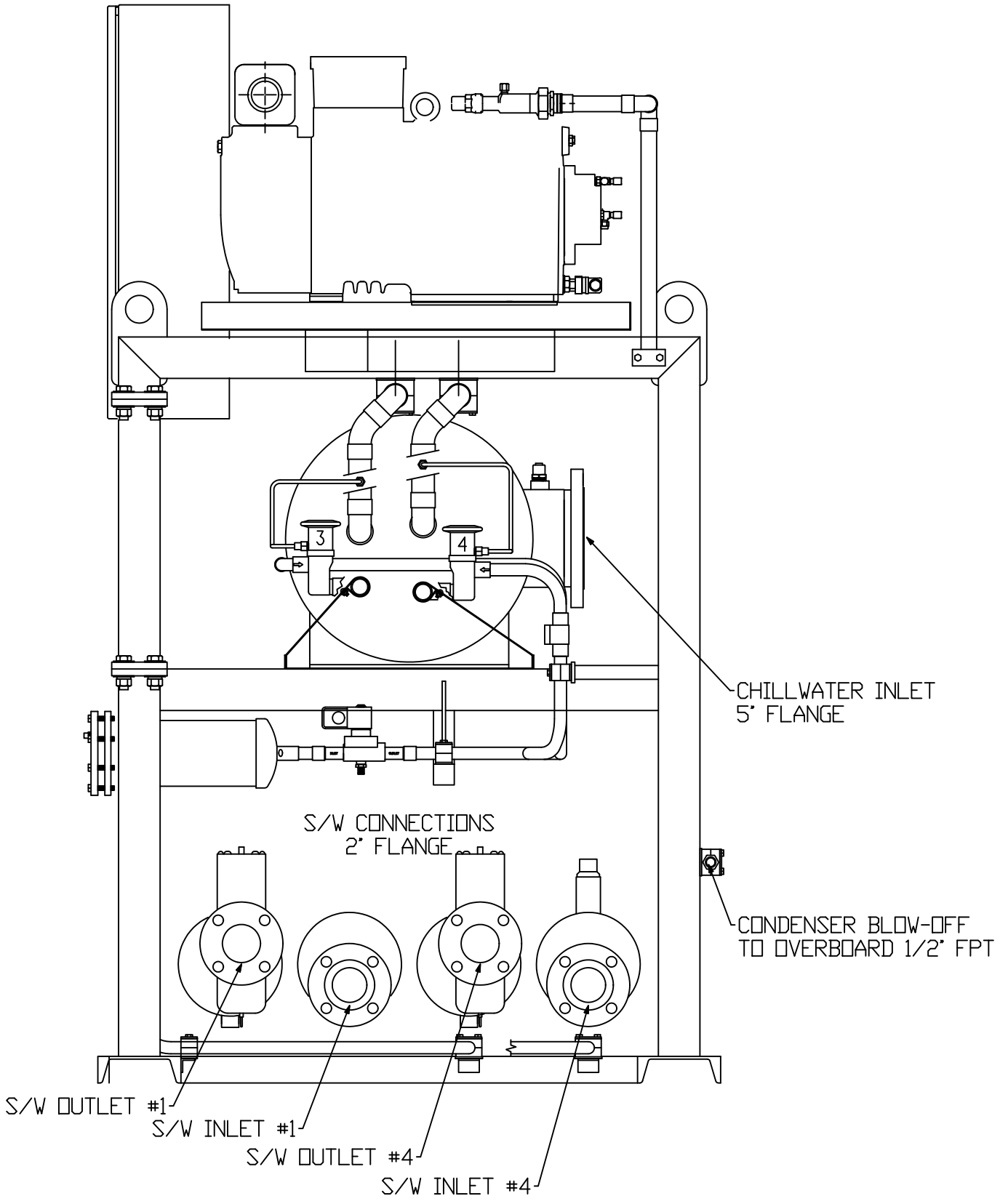
LEFT
VIEW

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

OM100P4VEK CHILLER UNIT
100 TON, 4 STAGE 380-3-50

DRAWING NUMBER	DRAWN BY	DATE
OM100P4VEKa	DN	11-13-03

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A



RIGHT
VIEW

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

OM100-4VIHE CHILLER UNIT
100 TON, 4 STAGE 380-3-50

DRAWING NUMBER	DRAWN BY	DATE
OM100P4VEKc	DN	11-13-03

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A

CHILLER UNIT SPECIFICATION

OM100-4VIHE

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

COOLING CAPACITY: 100 tons [1,200,000 BTU/H] [300,000 KCAL/H] at 40˚ F (7.2˚ C) leaving water temperature and 50˚ F (12.8˚ C) returning water temperature. Chiller unit flow rate will be approximately 300 gpm. Condenser flow rate (each) is to be approximately 100 gpm entering at a maximum temperature of 90˚ F (32˚ C). All ratings are at a fouling factor of 0.0005 .

HEATING CAPACITY: 108 kW [368,511 BTU/H] [92,863 KCAL/H] of total heating capacity at 140˚ F (60˚ C) leaving water temperature and 120˚ F (48.8˚ C) returning water temperature.

CONSTRUCTION & RATINGS: The chiller unit shall be constructed in accordance with ARI Standard 590-86 and shall comply with all applicable NEC and ASME codes for water cooled chillers.

COMPRESSORS: The chiller unit will have four, 25 ton Bitzer semi-hermetic reciprocating compressors. Each compressor will be equipped with suction and discharge valves. Input voltage to the compressor motor will be 460-3-60. Power consumption of each compressor is approximately 21.1 kW each. Refrigerant to be used is R-407C .

CAPACITY CONTROL: Chiller unit capacity control will be achieved through the use of three variable frequency drive (VFD) units, one for each compressor. The VFD will vary the compressor motor speed from a maximum of 100% of capacity to a minimum of 70%. The VFD requires an input power supply of 460-3-60. The maximum output power will be 460-3-60 to the compressor motor. The VFD output will be regulated via the RS-485 network between the VFD and the chiller unit PLC. The VFD voltage/frequency output will be varied based upon chilled water outlet temperature. The VFD will also control the compressor motor so that there is no current inrush, during starting, above the motor's standard running amperage.

CHILLER BARREL: The unit is equipped with a four circuit, 100 ton shell and tube chiller barrel. The shell is constructed of steel per ASME specification SA-53, Grade B. The shells are shot blasted and cleaned before assembly. The tubes are high performance seamless copper tube to ASME specs. Tubes are roller expanded into double grooved tube sheets. The tube sheets are ASME grade carbon steel. The baffles are hot rolled steel, terne plated for added corrosion resistance. The heads are ASME grade steel fabricated ring and cover type steel heads. Gaskets are die-cut medium density elastomer in conformance with relevant specifications. The chillwater connections are 5" 150lb ANSI raised face flanges (2). The refrigerant side is constructed in accordance with the latest edition of Section VIII, Division I of ASME Code for pressure vessels and stamped accordingly. Tube side (refrigerant side) design pressure is 200 PSIG at 100 ˚F. Shell side (fluid side) design pressure is 150 PSIG at 120 ˚F. The entire shell is covered with 3/4" (19mm) thick Armaflex foam rubber insulation.

CONDENSERS: The unit is equipped with four 25 ton shell and tube marine condensers. The shell is constructed of ASME spec SA-53 steel pipe. Shells are shot blasted and cleaned before assembly. Tubes are high performance enhanced surface seamless 90/10 Cupro-Nickel tubes to ASME spec SB-359. Tubes are roller expanded into double grooved tubesheets to assure tight joints. Tubesheets are 90/10 Cupro-Nickel to ASME spec SB-171 Alloy 706. Tube supports are quality steel plug welded to the shell. Heads are cast bronze with integral pass partitions, ASME spec SB-62. Gaskets are die-cut providing effective sealing between tubesheets and machined heads. The refrigerant side is constructed and tested in accordance with Section VIII, Division 1 of ASME Code for unfired pressure vessels. Shell side design pressure (refrigerant side) is 350 psig at 250˚ F. Tube side (water side) is 150 psig at 150˚ F. Every condenser is tested per ASME Code prior to shipment. Seawater connections are 2" FPT.

Water flow to the condenser will be regulated by a discharge pressure actuated water regulating valve. A pressure relief valve (set for 350 psig) on the shell is standard.

IMMERSION HEATER ELEMENTS: The unit is equipped with a three stage, 12 element, 108 kW immersion heating tank assembly. The heater elements are rated at full wattage on 460-3-60 power input. The elements are constructed of Incoloy with a maximum watt density of 100 watts per square inch. The element heater tank will be constructed of plate steel to ASME specifications. All welds will be by MIG welding procedure. The tank design rating pressure is 150 psig at 200˚ Fahrenheit. The tank will be equipped with a ASME water pressure relief valve.

REFRIGERANT CIRCUIT: Each of the four refrigerant circuits shall include a liquid line ball valve, replaceable core liquid line filter drier with access fitting for refrigerant charging and refrigerant isolation valves, combination moisture indicator and sight glass, liquid line solenoid and thermal expansion valve. All suction lines will be covered with a minimum of 1/2" closed cell insulation.

CONTROL PANEL / ELECTRICAL BOX: The unit will have a NEMA 12 type enclosure for all of the electrical components. The chiller unit will be controlled by a programmable logic controller (PLC). The user interface for this PLC will consist of a touch screen mounted on the front of the electrical box. This touch screen will perform the following switching functions:

System mode switch
Compressor On-Off switch (4)
Heating stage On-Off Switch (3)

The touch screen will also display the following information

Digital refrigerant pressure readouts (suction and discharge) for each compressor

Digital temperature display, in Fahrenheit, for the chillwater inlet and outlet temperatures

Elapsed time meters showing the run times for all compressors, pumps and heater stages
Chillwater pump motor fault indication
Compressor inverter operational (4)
Cooling stage engaged (4)
Cooling mode
Chiller freeze thermostat engaged
Low chillwater flow through the chiller
Low compressor refrigerant pressure (4)
High compressor refrigerant pressure (4)
Compressor motor overload (4)
High compressor discharge temperature (4)
Compressor inverter fault indicator (4)

Heating mode

Heating stage engaged (3)

A complete description of the functions of the PLC / Touchscreen system can be found in the document following this specification.

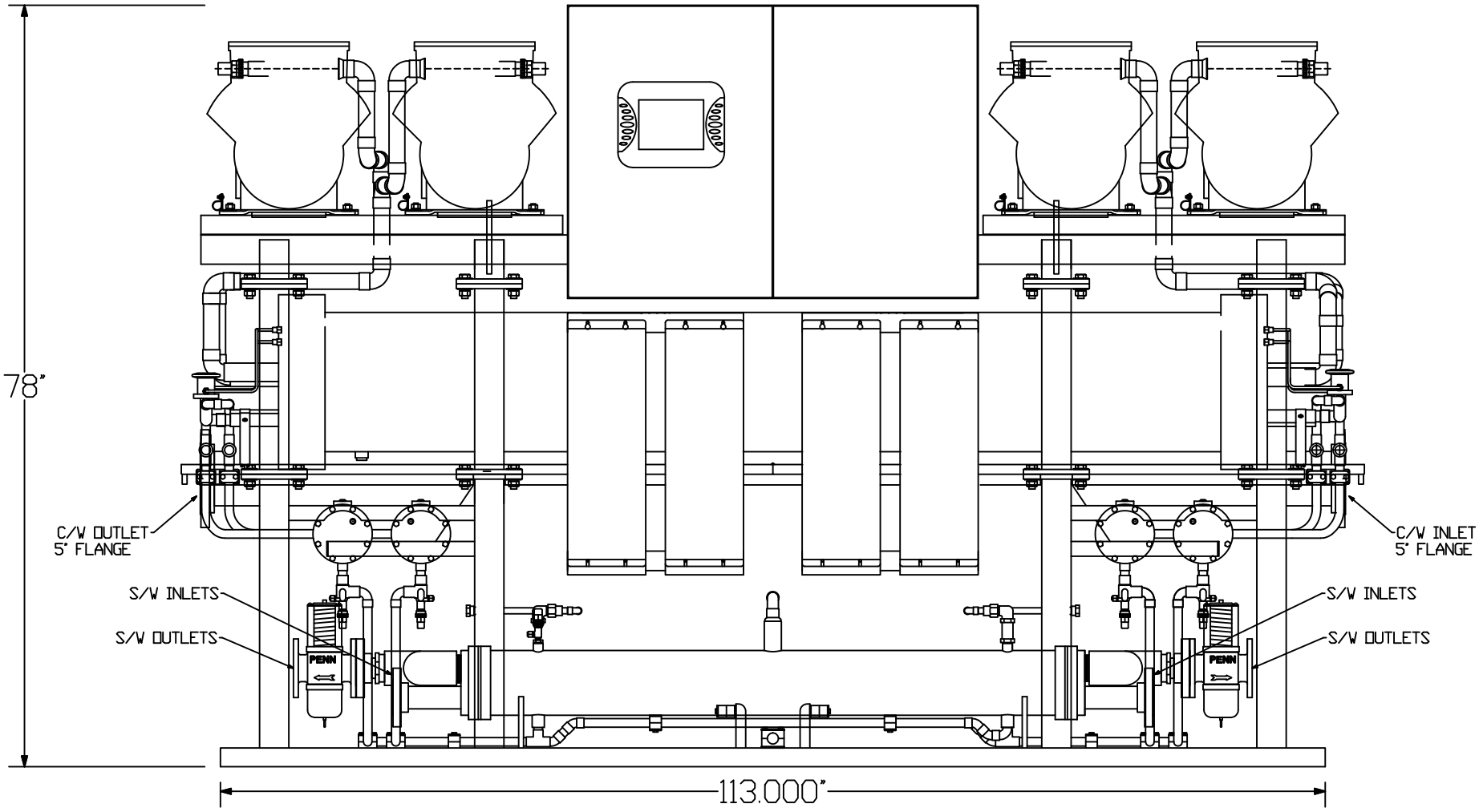
A phone communication modem will be included that will allow the PLC to be accessed remotely for diagnostic purposes.

An Ethernet card will allow communication (via MODBUS) between the chiller and the five air handler control panels as well as with the ships' monitoring system.

Circuit breakers will be provided for the compressors (4), seawater pumps (4), heater stages (3), chillwater pump and control circuitry. All wiring on the unit external to the electrical box will be enclosed in liquid-tite conduit or other approved protective sheathing.

FRAME: The frame for the unit will be constructed of appropriately sized steel channel, square tube and angle. All welds will be by MIG welding procedure. Completed frame will be primed and then painted to meet 500 hour salt spray requirement using Awlgrip Matterhorn White paint. Stainless steel drain pans with a non-corrosive internal coating will be installed under any condensate producing components.

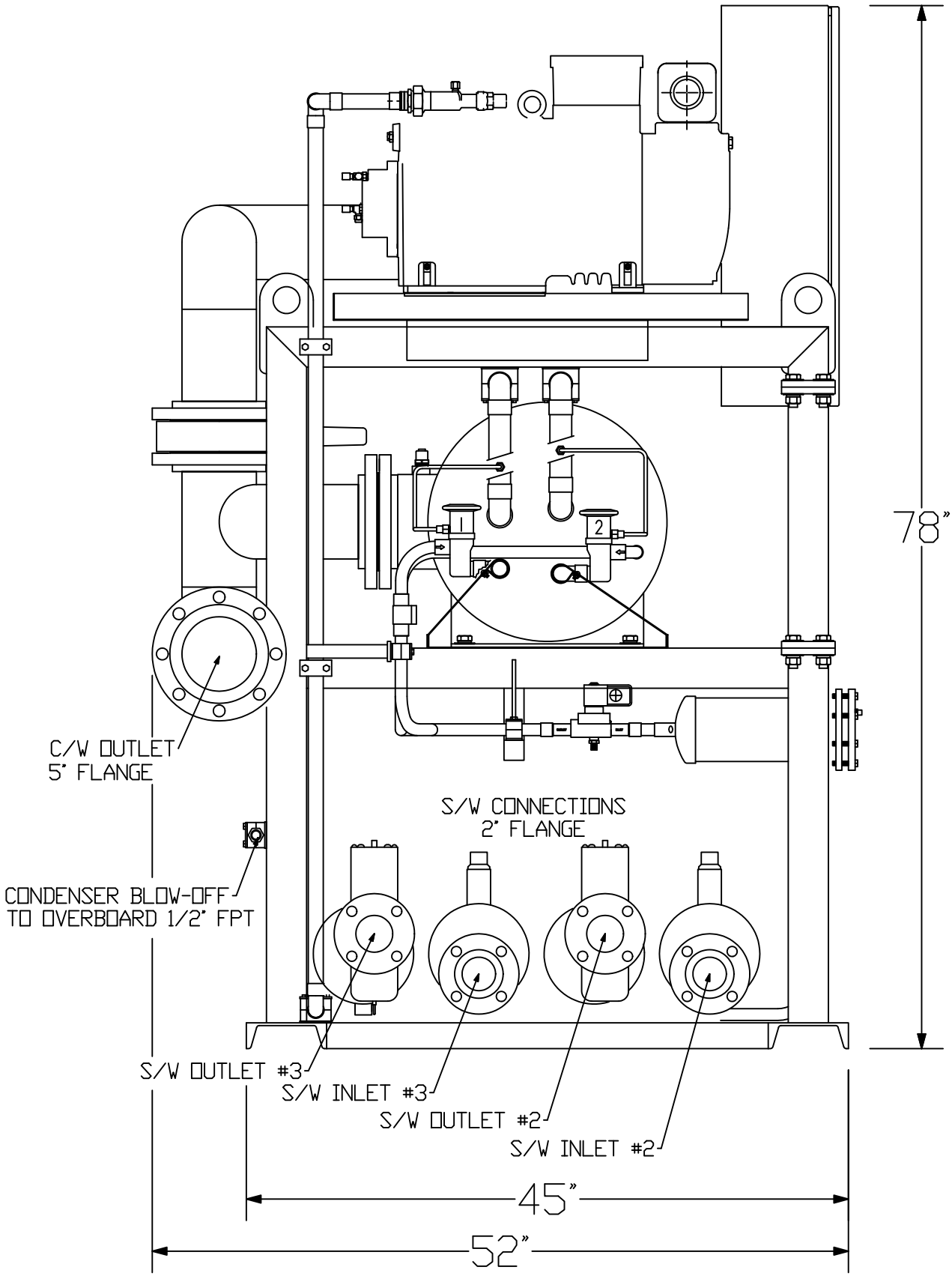
AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 E-mail sales@aquaair.com



AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

OM100-4VIHE CHILLER UNIT
100 TON, 4 STAGE w/ 108 kW IMMERSION HEAT

DRAWING NUMBER: OM100-4VIHE6	DRAWN BY: DN	DATE: 03-17-03
SCALE: FULL	APPROVED BY:	REVISION DATE:
		REV: A



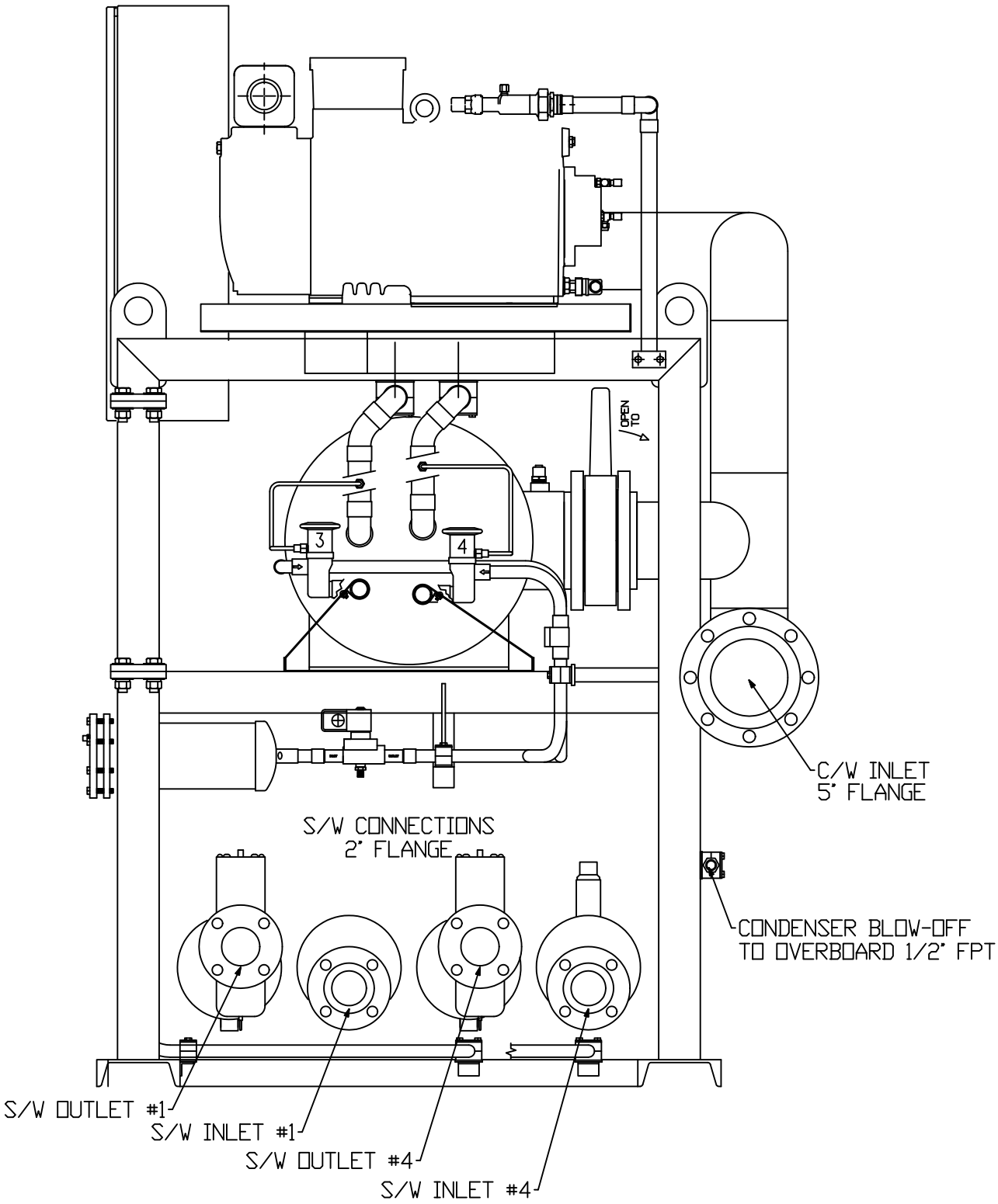
LEFT VIEW

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

OM100-4VIHE CHILLER UNIT
100 TON, 4 STAGE w/ 108 kW IMMERSION HEAT

DRAWING NUMBER	DRAWN BY	DATE
OM100-4VIHEa	DN	3-17-03

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A



RIGHT VIEW

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

OM100-4VIHE CHILLER UNIT
100 TON, 4 STAGE w/ 108 kW IMMERSION HEAT

DRAWING NUMBER	DRAWN BY	DATE
OM100-4VIHEc	DN	3-17-03

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A

AQUAAIR

MARINE AIR CONDITIONING SYSTEMS

170 Ton Chillers

CHILLER UNIT SPECIFICATION

OM170P-2VEK

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

COOLING CAPACITY: 170 tons (2,040,000 BTU/H) { 600 kW } at 35° F { 2° C } leaving water temperature and 45° F { 7° C } returning water temperature. Chiller unit flow rate will be approximately 418 gpm { 95 m^3h }. Condenser flow rate (each) is to be approximately 340 gpm { 77 m^3h } entering at a maximum temperature of 90° F { 32° C }. All ratings are at a fouling factor of 0.0005

CONSTRUCTION & RATINGS: The chiller unit shall be constructed in accordance with ARI Standard 590-86 and shall comply with all applicable NEC and ASME codes for water cooled chillers.

COMPRESSORS: The chiller unit will have two, 85 ton {300 kW} Bitzer semi-hermetic compact screw compressors. Each compressor will be equipped with suction and discharge valves. Input voltage to the compressor motor will be 380-3-50. Power consumption of each compressor is approximately 91 kW each. Refrigerant to be used is R-407C .

CAPACITY CONTROL: Infinite capacity control of each compressor will be achieved through the use of four unloaders on each compressor. These unloaders will be regulated by the PLC to maintain a consistent set point under changing load conditions. The unloaders will also allow the compressor to be started unloaded.
Each compressor will be connected to a Variable Frequency Drive (VFD). The VFD will control the compressor motor so that there is no current inrush, during starting, above the motor's standard running amperage. The VFD requires an input power supply of 380-3-50. The maximum output power will be 380-3-50 to the compressor motor.

COOLER: The unit is equipped with two plate style heat exchangers, each of 85 tons capacity. Each plate heat exchanger has a single water and refrigerant circuit. Construction of the unit is of #316 stainless steel. The material used to braze the plates together is copper. Maximum test pressure for both circuits is 635 psig. Each plate will be individually insulated with 1/2" {13mm} thick closed cell insulation. Water flow through each plate will be 209 gpm { 47.5 m^3h } at a pressure drop of 7.20 psi {0.50 bar }. The water in the chillwater look will require a 10% glycol mixture. Dowtherm SR-1 is recommended.

CONDENSER: The unit is equipped with two shell and tube marine condensers. The shell is constructed of ASME spec SA-53 steel pipe. Shells are shot blasted and cleaned before assembly. Tubes are high performance enhanced surface seamless 90/10 Cupro-Nickel tubes to ASME spec SB-359. Tubes are roller expanded into double grooved tubesheets to assure tight joints. Tubesheets are 90/10 Cupro-Nickel to ASME spec SB-171 Alloy 706. Tube supports are quality steel plug welded to the shell. Heads are cast bronze with integral pass partitions, ASME spec SB-62. Gaskets are die-cut providing effective sealing between tubesheets and machined heads. The refrigerant side is constructed and tested in accordance with Section VIII, Division 1 of ASME Code for unfired pressure vessels. Shell side design pressure (refrigerant side) is 350 psig at 250° F. Tube side (water side) is 150 psig at 150° F. Every condenser is tested per ASME Code prior to shipment. Seawater connections are 3" NPT. Water flow to the condenser will be regulated by using VFD's to modulate the speed of the seawater pumps based upon the individual compressor discharge pressure. This provides for less system erosion and better discharge pressure control. It also eliminates the large brass water regulating valves that are inherently problematic in the seawater circuit. A pressure relief valve (set for 350 psig) on the shell is standard.

REFRIGERANT CIRCUIT: Each of the two refrigerant circuits shall include a suction line ball valve, suction line filter, liquid line ball valve, replaceable core liquid line filter drier with access fitting for refrigerant charging, combination moisture indicator and sight glass, liquid line solenoid, refrigerant pressure transducers and thermal expansion valve. All suction lines will be covered with a minimum of 1/2" closed cell insulation. All refrigerant pressure transducers, switches and controls will be installed with isolation valves.

CONTROL PANEL / ELECTRICAL BOX: The unit will have a NEMA 12 type enclosure for all of the electrical components. The chiller unit will be controlled by a Programmable Logic Controller (PLC). The user interface for this PLC will consist of a touchscreen mounted on the front of the electrical box. This touchscreen will perform the following main switching functions in addition to numerous other minor controls:

System On-Off Switch
Compressor On-Off Switch (2)
Chillwater Pump Selector Switch

The touch screen will also display the following information

Digital refrigerant pressure readouts (suction and discharge) for each compressor

Digital temperature display for the chillwater inlet and outlet temperatures

Digital temperature display for the seawater outlet temperatures on each condenser

Elapsed time meters showing the run times for all compressors and pumps

Chillwater pump motor fault indication
Compressor inverter operational (2)
Cooling stage engaged (2)
Chiller freeze thermostat engaged
Low chillwater flow through the chiller
Low compressor refrigerant pressure (2)
High compressor refrigerant pressure (2)
Compressor motor overload (2)
High compressor discharge temperature (2)
Compressor inverter fault indicator (2)

A sample of the touchscreen displays (used on a four stage system) is included as an example.

As a precautionary measure there will be a hard-wired fail-safe emergency backup system. This will enable the engineer to operate the chiller unit in case of a failure of the PLC system.

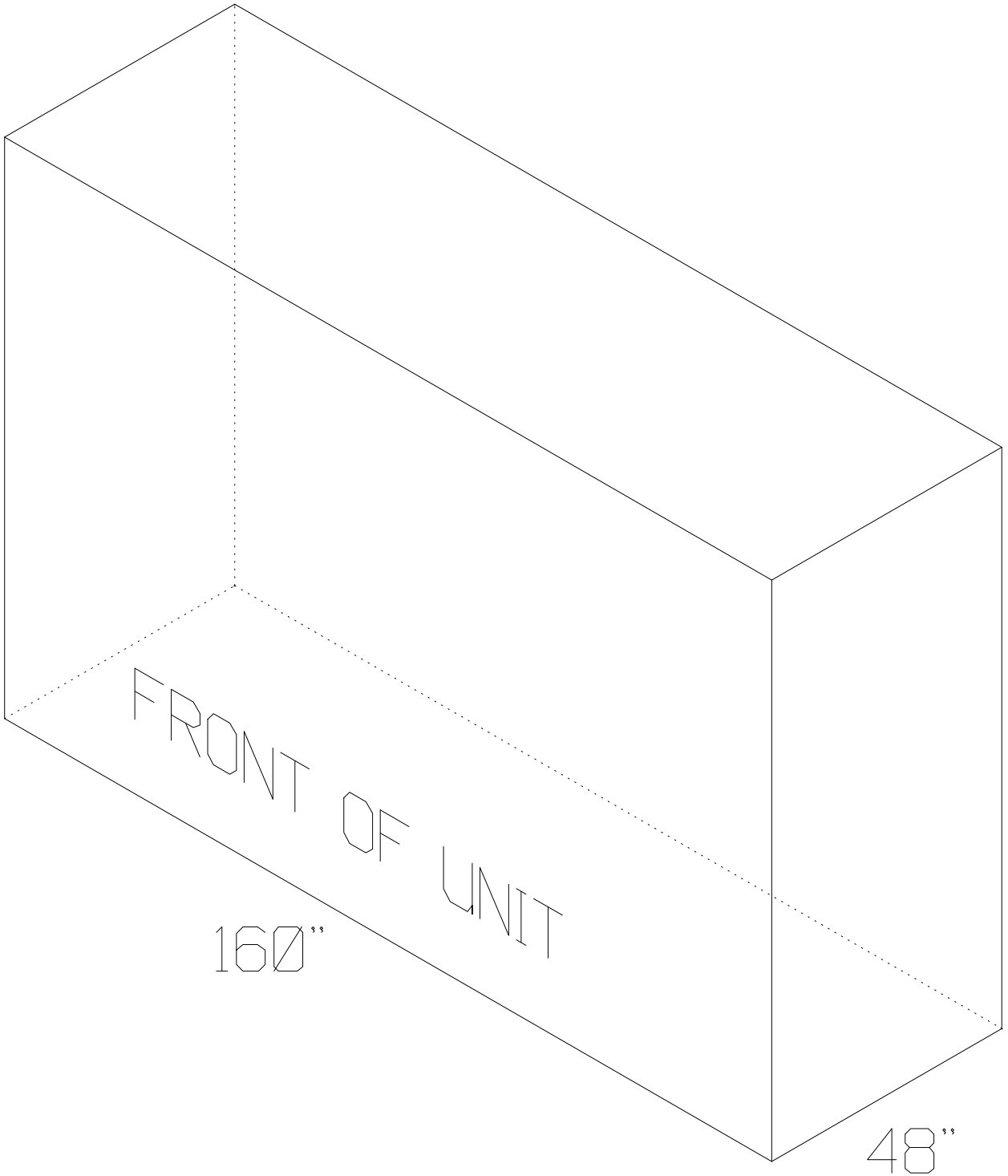
Circuit breakers will be provided for the compressors (2), seawater pumps (2), chillwater pump and control circuitry. All wiring on the unit external to the electrical box will be enclosed in liquid-tite conduit or other approved protective sheathing.

FRAME: The frame for the unit will be constructed of appropriately sized steel channel, square tube and angle. All welds will be by MIG welding procedure. Completed frame will be primed with a red lead based primer and then painted to meet 500 hour salt spray requirement. Paint will include a final topcoat of Awlgrip Matterhorn White. Stainless steel drain pans with a non-corrosive internal coating will be installed under any condensate producing components.

NET PRICE: The net price for each OM170P-2VEK is **$373,256.00** each. All prices are FOB our plant in Miami, FL. Delivery for each chiller is 16 weeks after receipt of order and deposit.

i:\wordpfct\OM170P-2VEK Sterling Yacht Vega 85m.wpd

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 E-mail sales@aquaair.com



AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

OM170P-2VEK
OVERALL DIMENSIONS

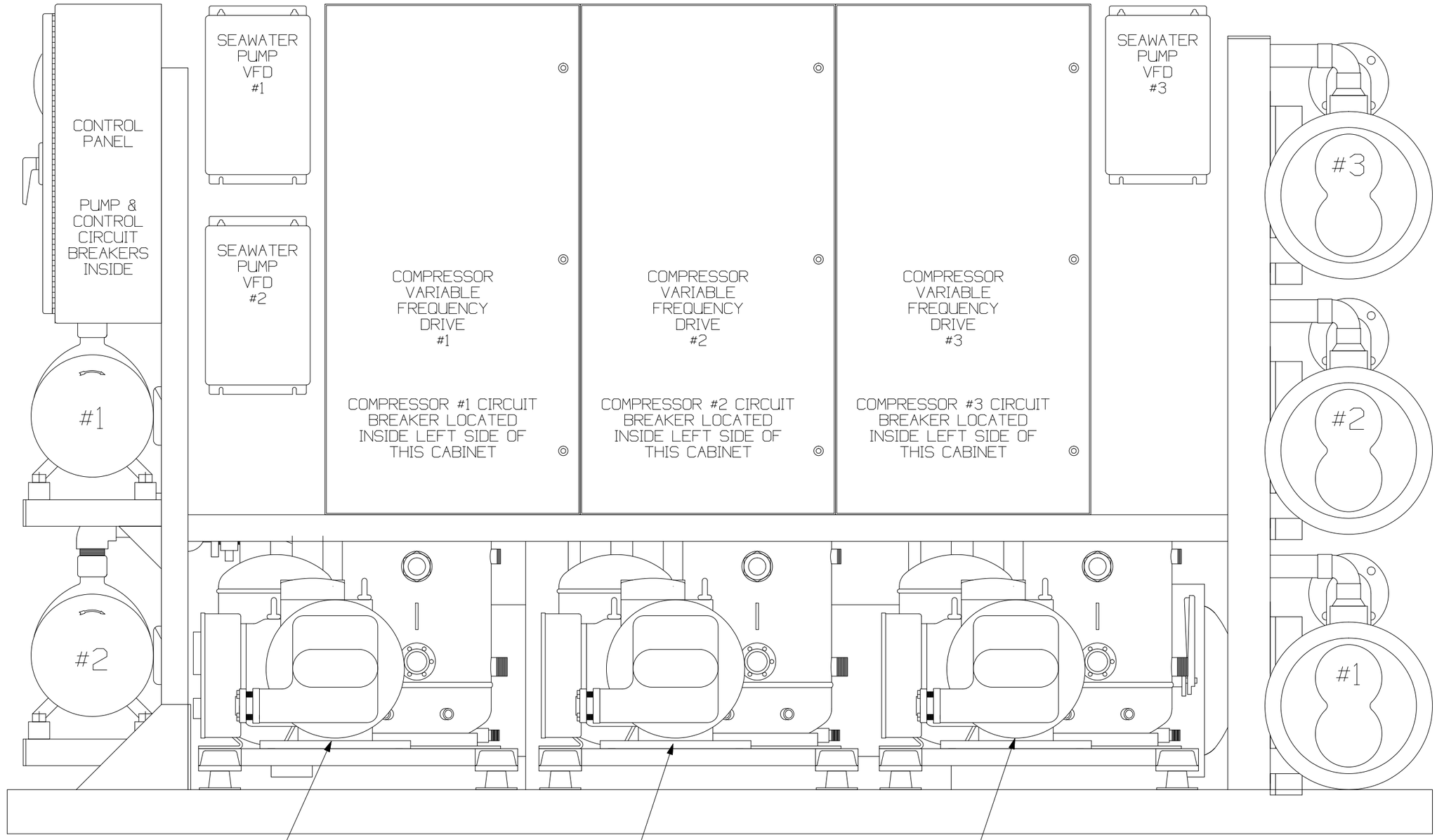
DRAWING NUMBER	DRAWN BY	DATE
OM170P-2VEK	DN	081204

SCALE	APPROVED BY	REVISION DATE	REV
FULL			A

AQUAAIR

MARINE AIR CONDITIONING SYSTEMS

210 Ton Chillers



0 6 12 18 24

SCALE - INCHES

0 200 400 600 800

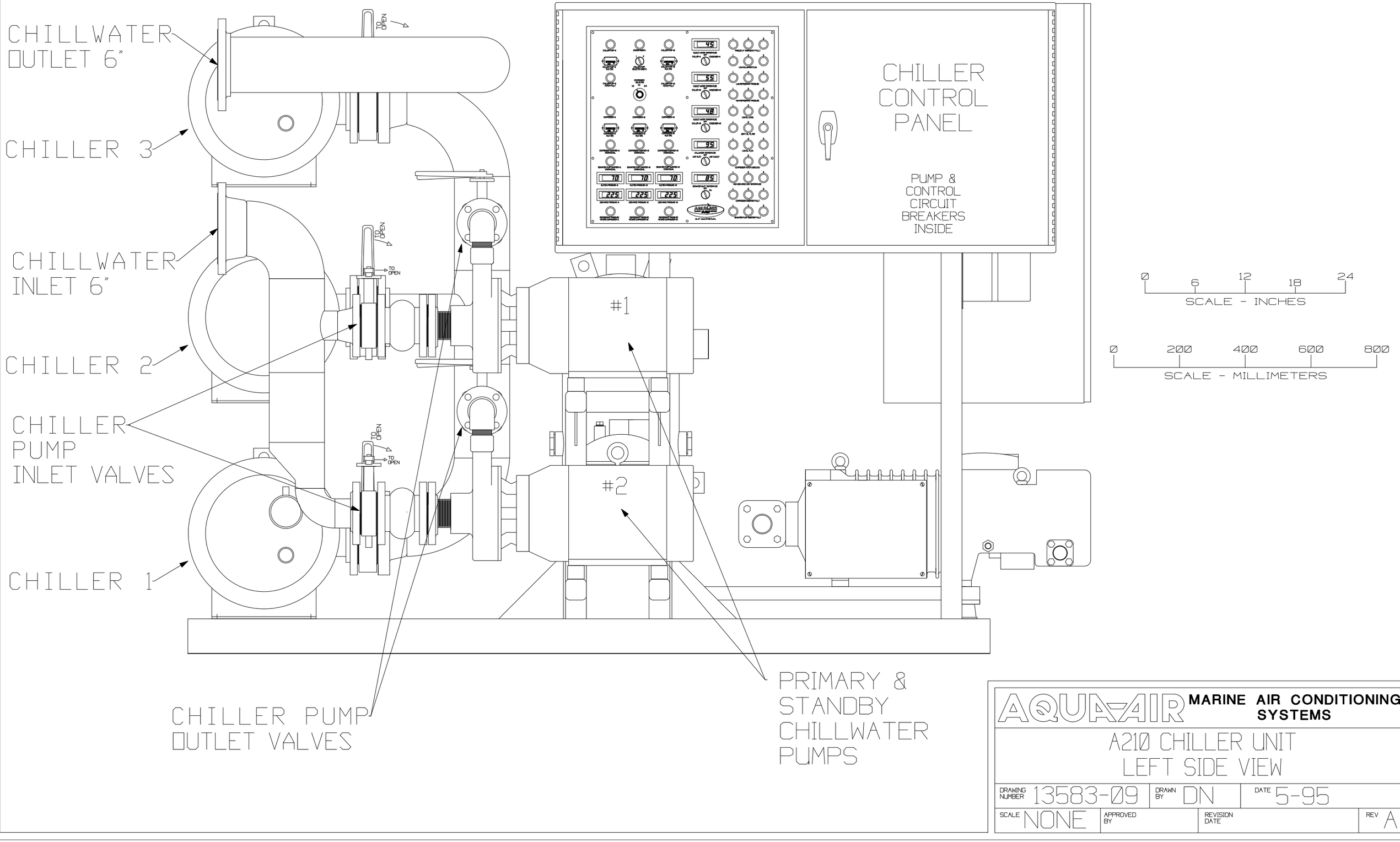
SCALE - MILLIMETERS

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

A210 CHILLER UNIT
FRONT VIEW

DRAWING NUMBER	DRAWN BY	DATE
13583-09	DN	5-95

SCALE	APPROVED BY	REVISION DATE	REV
NONE			A



0 6 12 18 24

SCALE - INCHES

0 200 400 600 800

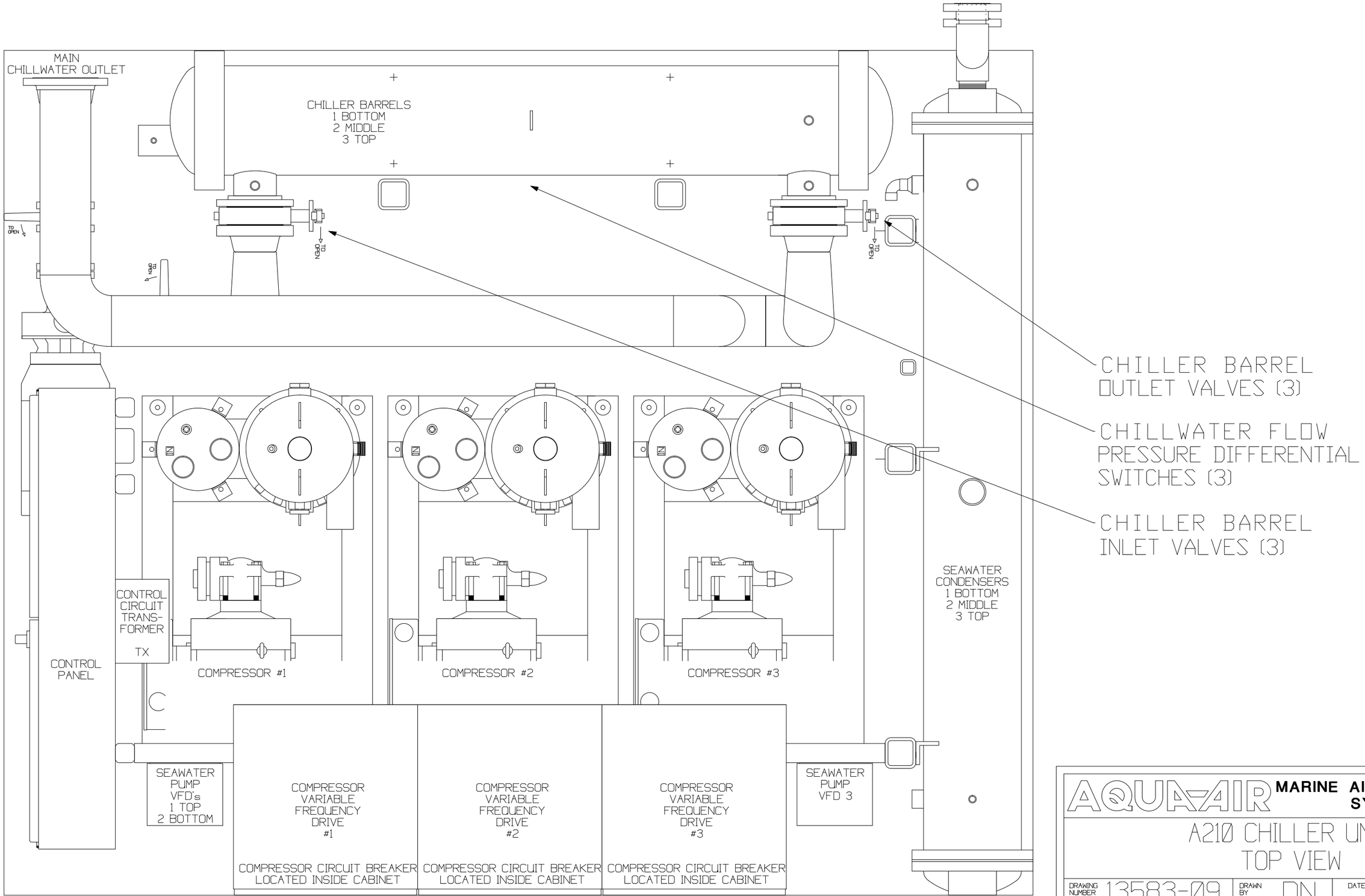
SCALE - MILLIMETERS

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

A210 CHILLER UNIT
LEFT SIDE VIEW

DRAWING NUMBER	DRAWN BY	DATE
13583-09	DN	5-95

SCALE	APPROVED BY	REVISION DATE	REV
NONE			A



AQUA-AIR **MARINE AIR CONDITIONING SYSTEMS**

A210 CHILLER UNIT
TOP VIEW

DRAWING NUMBER	DRAWN BY	DATE
13583-09	DN	5-95

SCALE	APPROVED BY	REVISION DATE	REV
NONE			A

CHILLER PUMP #1

SYSTEM SWITCH

CHILLER PUMP #2

CHILLER PUMP #1 RUN TIME

1 2

CHILLER PUMP SELECTOR SWITCH

CHILLER PUMP #2 RUN TIME

CHILLER PUMP #1 MOTOR FAULT

COMPRESSOR SELECTOR

1-2 1-3 2-3

CHILLER PUMP #2 MOTOR FAULT

COMPRESSOR #1

COMPRESSOR #2

COMPRESSOR #3

COMPRESSOR #1 RUN TIME

COMPRESSOR #2 RUN TIME

COMPRESSOR #3 RUN TIME

COMPRESSOR INVERTER #1 OPERATIONAL

COMPRESSOR INVERTER #2 OPERATIONAL

COMPRESSOR INVERTER #3 OPERATIONAL

SEAWATER PUMP INVERTER #1 OPERATIONAL

SEAWATER PUMP INVERTER #2 OPERATIONAL

SEAWATER PUMP INVERTER #3 OPERATIONAL

70

SUCTION PRESSURE #1

70

SUCTION PRESSURE #2

70

SUCTION PRESSURE #3

225

DISCHARGE PRESSURE #1

225

DISCHARGE PRESSURE #2

225

DISCHARGE PRESSURE #3

REFRIGERANT PRESSURE METERS COMPRESSOR #1

REFRIGERANT PRESSURE METERS COMPRESSOR #2

REFRIGERANT PRESSURE METERS COMPRESSOR #3

45

OUTLET WATER TEMPERATURE

OFF

CHILLER #1 CONDENSER #1

55

OUTLET WATER TEMPERATURE

OFF

CHILLER #2 CONDENSER #2

48

OUTLET WATER TEMPERATURE

OFF

CHILLER #3 CONDENSER #3

95

CHILLWATER TEMPERATURE

OFF

UNIT INLET UNIT OUTLET

85

SEAWATER INLET TEMPERATURE

OFF ON

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

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1 2 3

FREEZE-UP THERMOSTAT FAULT

LOW CHILLWATER FLOW

LOW REFRIGERANT PRESSURE

HIGH REFRIGERANT PRESSURE

LOW OIL LEVEL

DIRTY OIL FILTER

LOW OIL FLOW

COMPRESSOR MOTOR OVERLOAD

HIGH DISCHARGE GAS TEMPERATURE

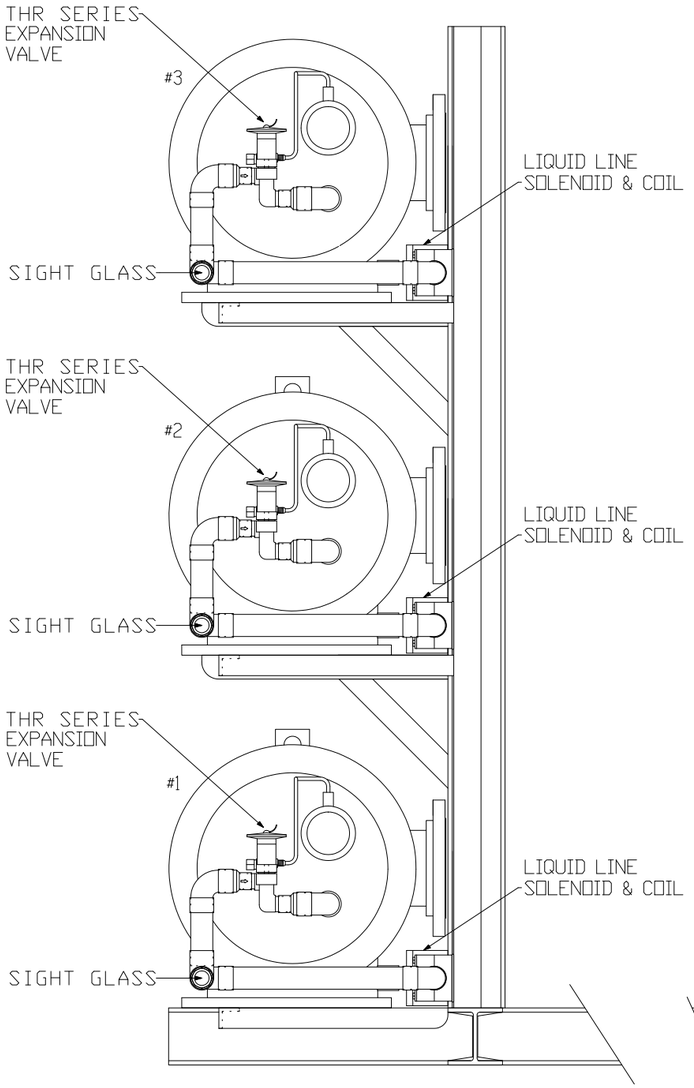
COMPRESSOR INVERTER FAULT

SEAWATER PUMP INVERTER FAULT

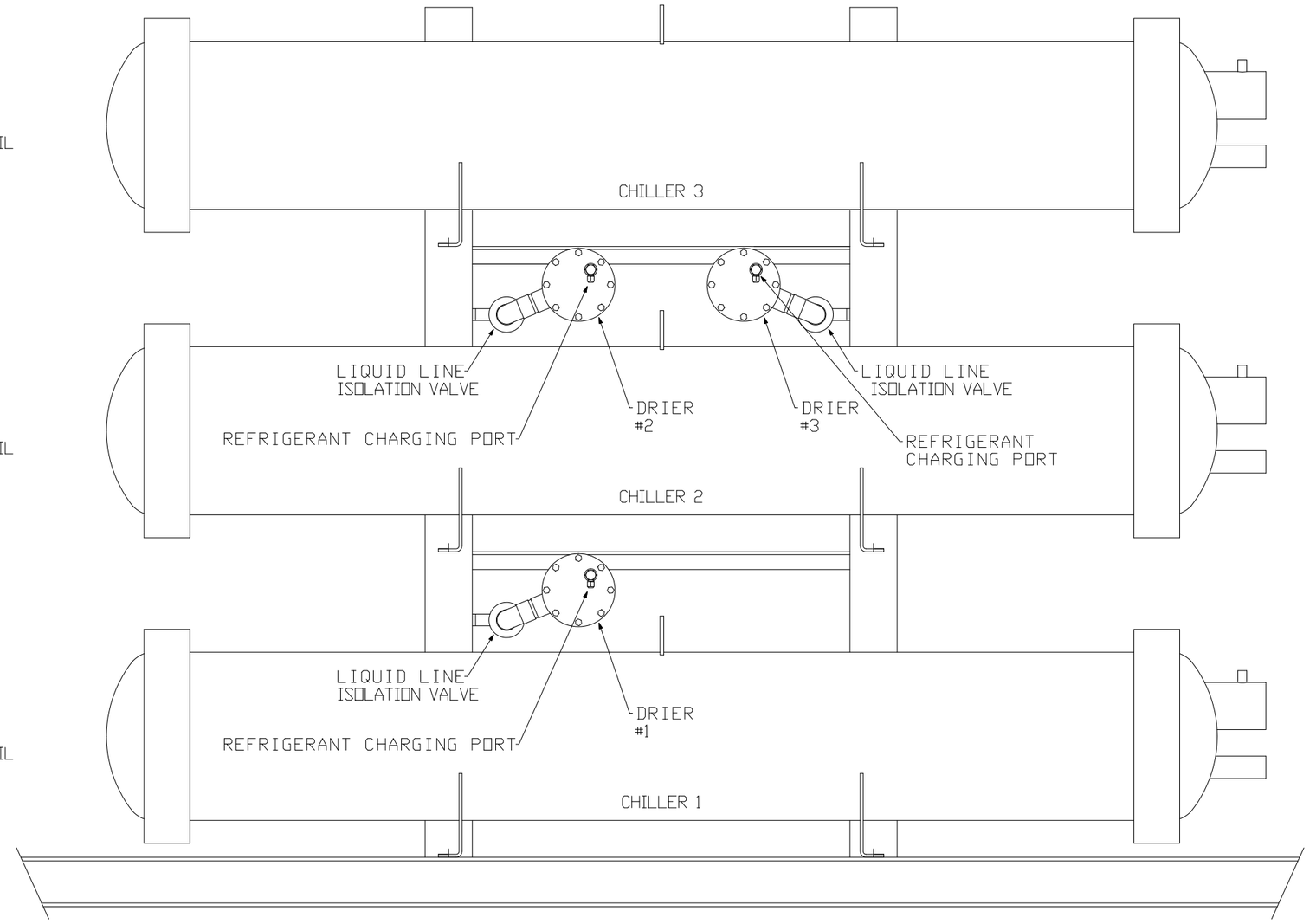
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

A210 CONTROL PANEL ITEM IDENTIFICATION

DRAWING NUMBER 13583-09	DRAWN BY DN	DATE 5-95	
SCALE NONE	APPROVED BY	REVISION DATE	REV A



LEFT VIEW



REAR VIEW

0 6 12 18 24

SCALE - INCHES

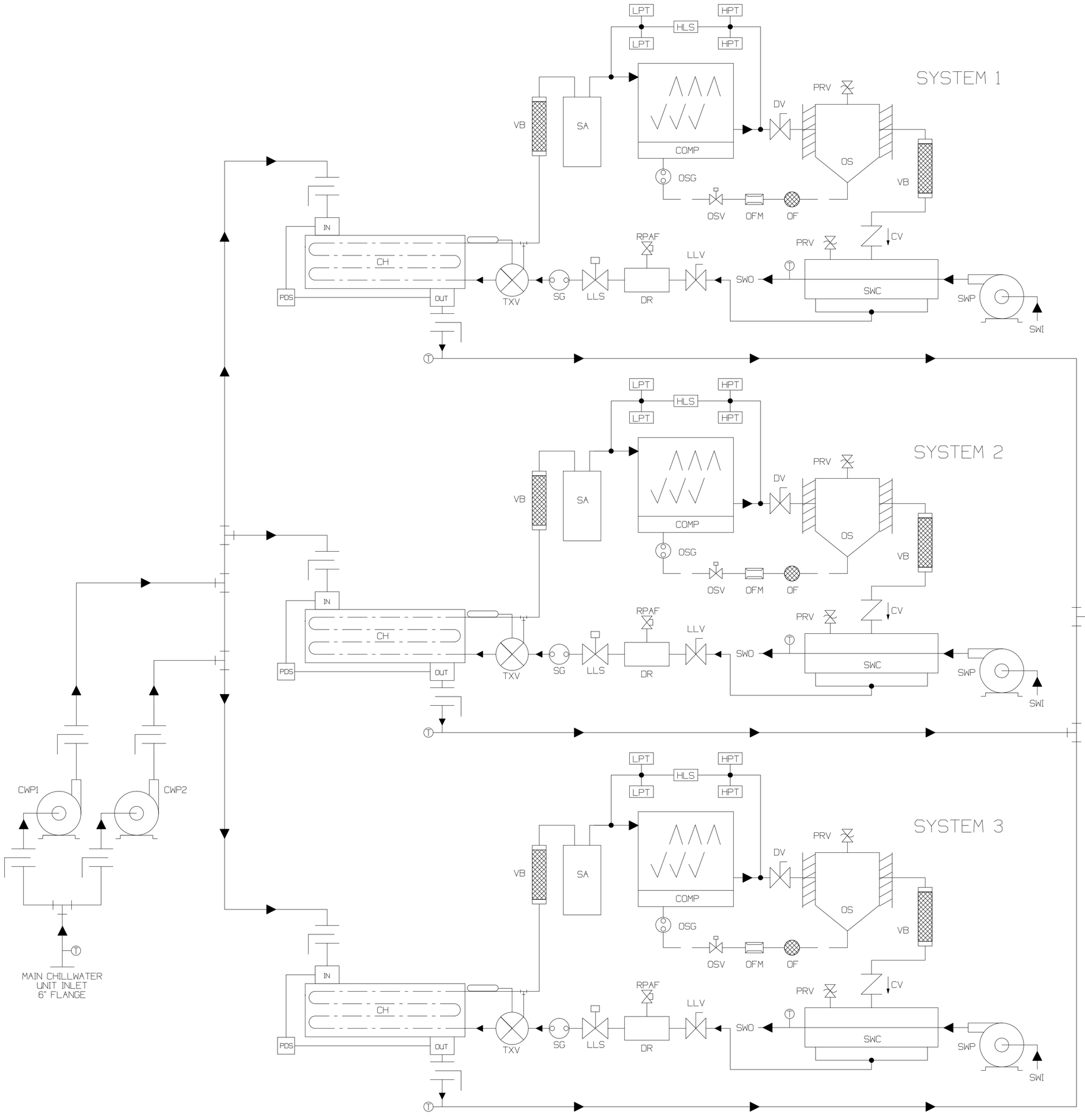
0 200 400 600 800

SCALE - MILLIMETERS

AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

A210 DRIER, TXV, SIGHT GLASS AND LIQUID LINE SOLENOID LOCATIONS

DRAWING NUMBER 13583-27	DRAWN BY DN	DATE 5-95	
SCALE NONE	APPROVED BY	REVISION DATE	REV A



CH	CHILLER BARREL
COMP	COMPRESSOR
CV	CHECK VALVE
CWP	CHILLWATER PUMP
DR	DRIER
DV	DISCHARGE VALVE
HLS	HI-LO PRESSURE SWITCH
HPT	HIGH PRESSURE TRANSDUCER
LLS	LIQUID LINE SOLENOID
LLV	LIQUID LINE VALVE
LPT	LOW PRESSURE TRANSDUCER
OF	OIL FILTER
OFM	OIL FLOW METER
OS	OIL SOLENOID
OSG	OIL SIGHT GLASS
OSV	OIL SOLENOID VALVE
PDS	PRESSURE DIFFERENTIAL SWITCH
PRV	PRESSURE RELIEF VALVE
RPAF	REFRIGERANT PRESSURE ACCESS
SA	SUCTION ACCUMULATOR
SG	SIGHT GLASS
SWC	SEAWATER CONDENSER
SWI	SEAWATER INLET
SWO	SEAWATER OUTLET
SWP	SEAWATER PUMP
T	TEMPERATURE SENSOR
TXV	THERMOEXPANSION VALVE
VB	VIBRATION ABSORBER

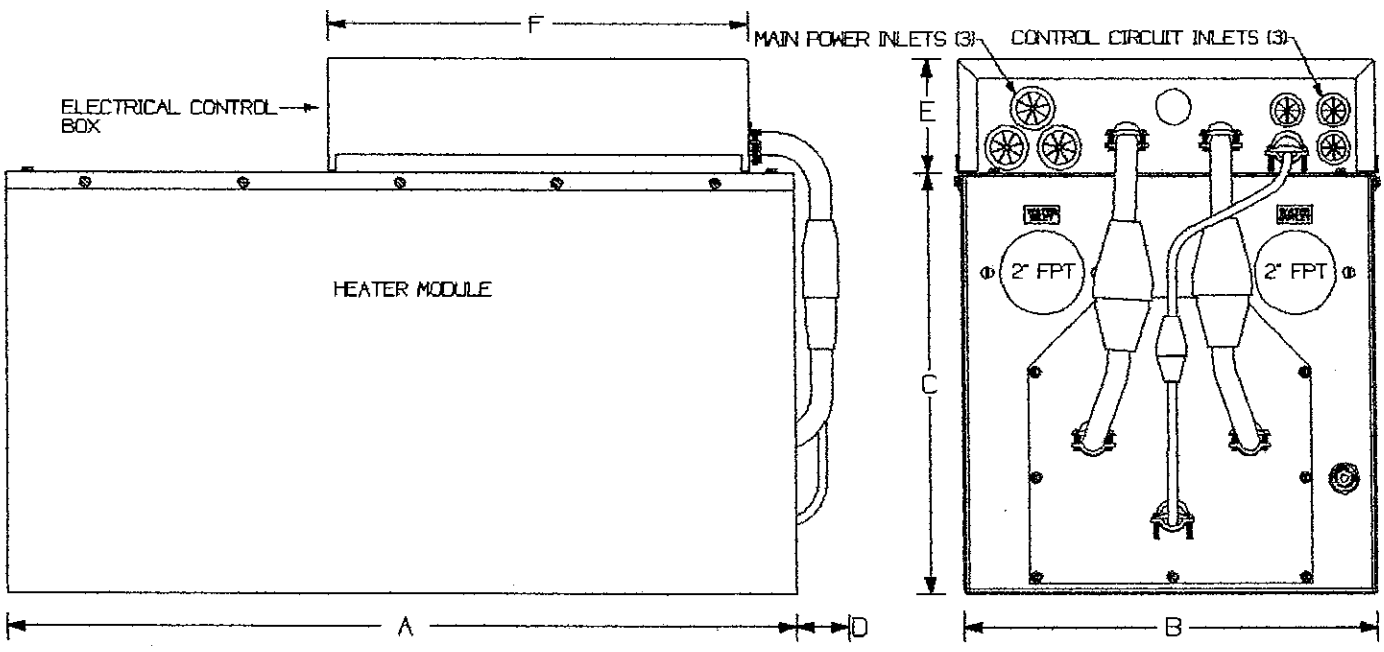
AQUA-AIR MARINE AIR CONDITIONING SYSTEMS

LURSSEN 13583 M/Y "LIMITLESS" A210-3 WATER & REFRIGERANT PIPING SCHEMATIC

DRAWING NUMBER 13583-58	DRAWN BY DN	DATE 2-95	
SCALE NONE	APPROVED BY	REVISION DATE	REV A

IH SERIES IMMERSION HEATER MODULE

The IH Series Immersion Heating Module has been specifically designed as a compact source of hot water heat for marine chilled water/heating systems. The heating provided from this unit is achieved through the use of electric heating elements. The system water is circulated through the heater module tank where it is heated by the electric elements. Water temperature is maintained automatically by a digital solid state temperature controller. The heater module can be operated as a stand-alone unit or in series or parallel with a single or multiple chiller system. The heater module housing has been designed to allow a Aqua-Air Alpha 2-5 ton chiller to be bolted directly to the top of the heater module. The heater module electric box can then be remotely mounted by using optional extension cables for the electrical connections. The wiring connections are all electrical quick-connect plugs that make remote mounting the electric box a simple operation.



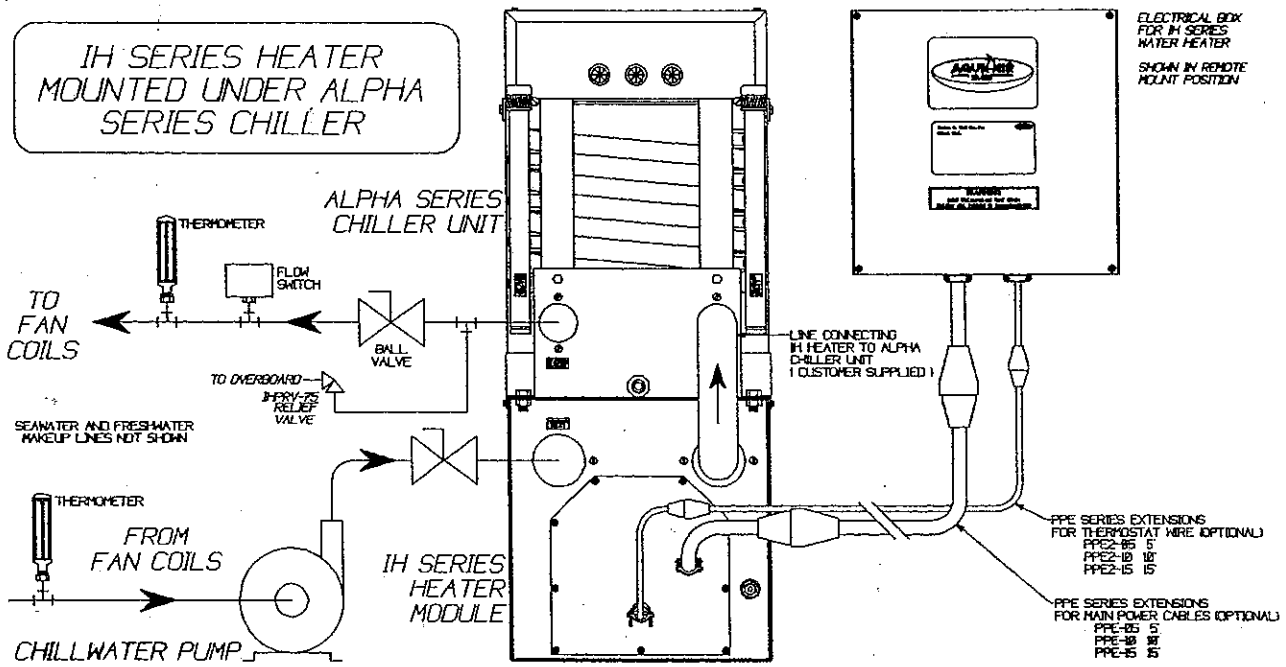
A	22-1/2" / 572mm	D	1-1/2" / 38mm
B	12" / 305mm	E	3-1/4" / 82.5mm
C	12" / 305mm	F	12" / 305mm

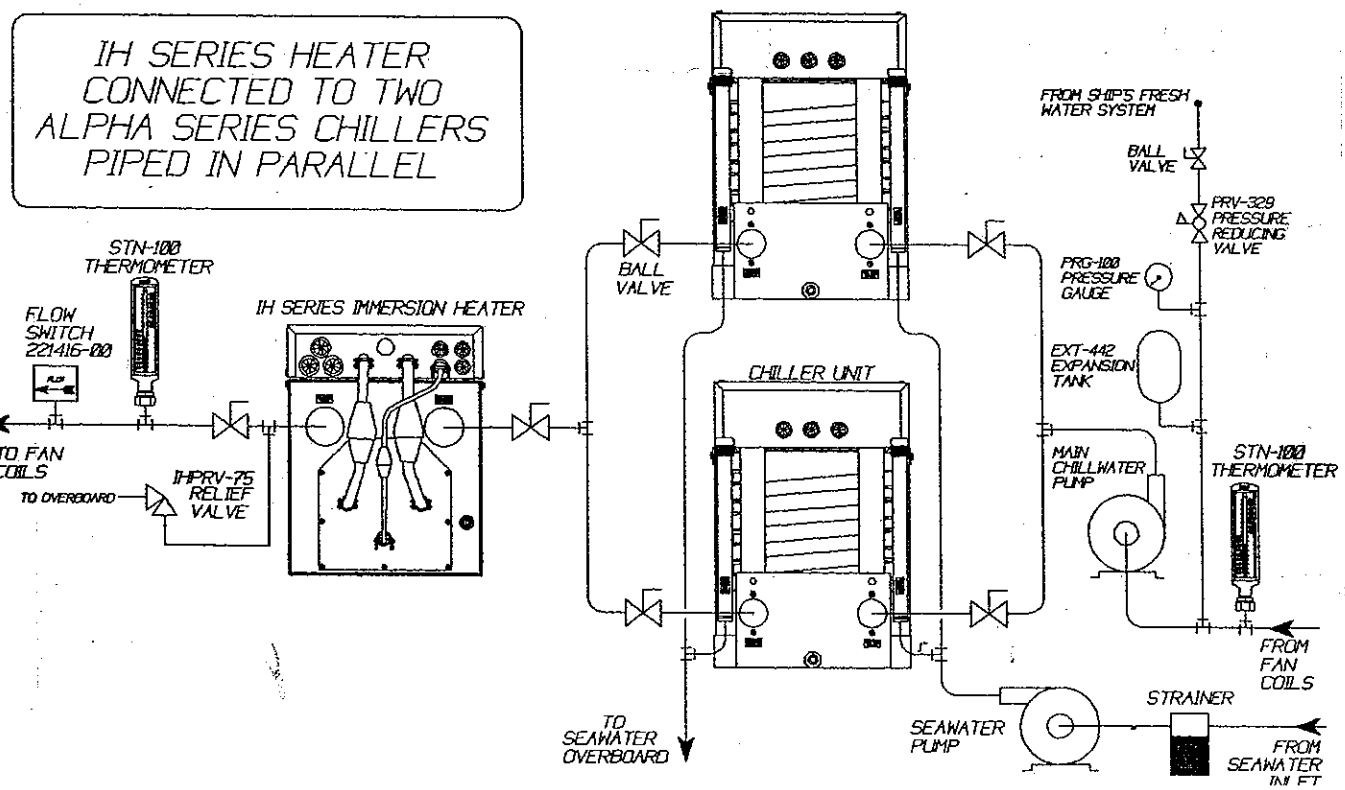
WEIGHT: 80 LBS. / 36.4 KG.

AQUA-AIR MANUFACTURING, div. of the James D. Nall Co., Inc.
1050 E. 9th Street Hialeah, Florida 33010 U.S.A.
PH. 305-884-8363 FAX 305-883-8549

ELECTRICAL SPECIFICATIONS

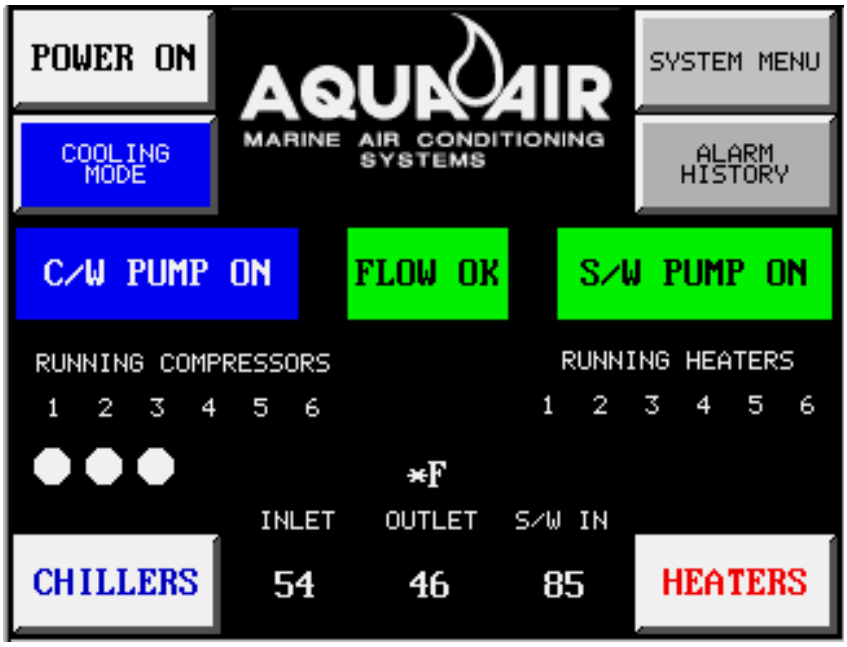
KW	BTUH	KCAL/H	240-1PH UNITS MODEL	AMPS	STAGES	240-3PH UNITS MODEL	AMPS	STAGES
6	20490	5123	IH-2401-061	26	1	IH-2403-061	15	1
9	30735	7684	IH-2401-091	38	1	IH-2403-091	22	1
			IH-2401-092	38	2			
12	40980	10245	IH-2401-122	51	2	IH-2403-122	29	2
			IH-2401-123	51	3			
15	51225	12806	IH-2401-152	64	2	IH-2403-152	36	2
			IH-2401-153	64	3			
18	61470	15368	IH-2401-182	76	2	IH-2403-182	44	2
			IH-2401-183	76	3			
21	71715	17929	IH-2401-212	89	2	IH-2403-212	52	2
			IH-2401-213	89	3			
24	81960	20490	IH-2401-243	100	3	IH-2403-242	58	2
27	92205	23051	IH-2401-273	114	3	IH-2403-272	65	2





AQUA-AIR
MARINE AIR CONDITIONING SYSTEMS

TOUCHSCREEN & PLC CHILLER CONTROL



The Aqua-Air® TS/PLC Touchscreen and PLC Control System, featured exclusively on Aqua-Air® chillers, is the latest revolutionary innovation in chiller technology by Aqua-Air®.

With in-house programming and renown Aqua-Air® chiller expertise you are assured of state-of-the-art control of your chiller unit.

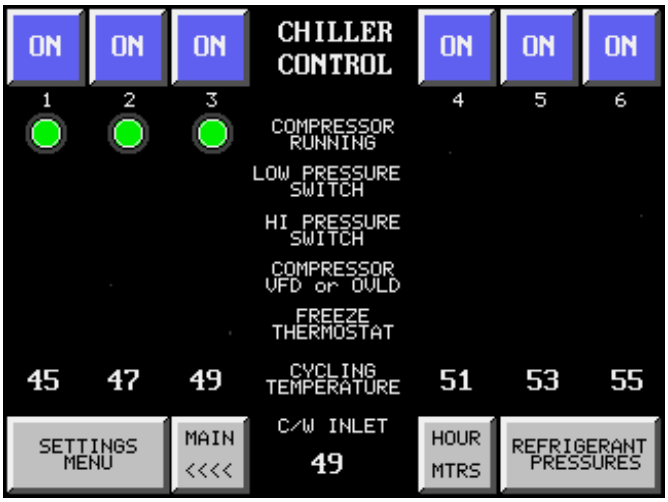
Utilizing industrial grade PLC's and touchscreens you are assured of years of trouble-free operation.

System Features

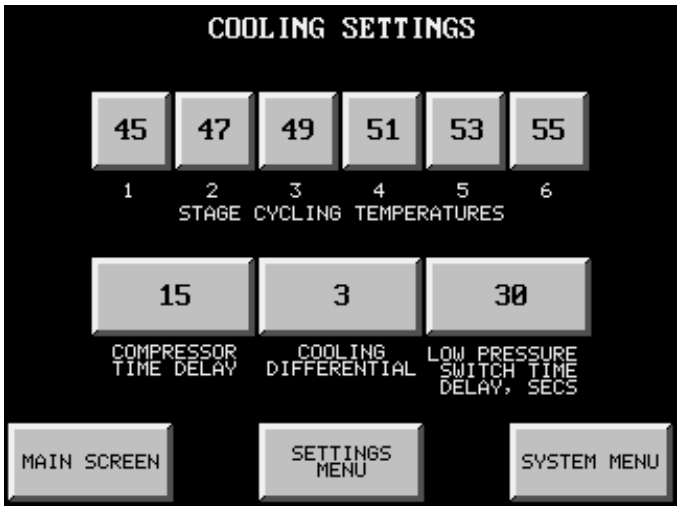
- User friendly graphical interface-no more cryptic two letter diagnostic codes
- Easy selection of system operating mode, cooling or heating
- Digital display of chillwater inlet and outlet temperatures
- Digital display of seawater inlet temperature
- Temperatures can be displayed in Fahrenheit or Centigrade
- Indicator lights showing the number of running compressors or heaters
- Running status of chillwater and seawater pumps
- Alarm History shows each alarm that has occurred with the most recent at the top
- Alarm Count lists all alarms and shows the total count for each one
- Alarms have date & time stamps showing alarm activation, when cleared, value at time of alarm, high and low limits and which limit was tripped
- Individual on-off control of each chiller and immersion heater element
- Digital display of chiller and heater cycling temperatures
- Indicator lights for low and high refrigerant pressure faults, freeze-up faults and compressor / variable frequency drive faults
- Hour meters for compressors, pumps and heaters
- Primary and secondary chillwater and seawater pump selection
- Optional seawater pump variable frequency drive control interface
- Factory default settings can be loaded at any time to return the system to a

standard baseline for troubleshooting purposes

< Individual stage cycling temperatures for both chillers and heaters
< Settings for compressor and heater time delays
< Automatic or manual alternating sequence selection
< Alternating sequence can be set to manually stay in any particular sequence
< Alternating period can be set from 1-999 hours
< Display of time remaining in current alternating sequence
< Touchscreen contrast is user adjustable for almost any lighting situation
< Diagnostics screen where you can individually energize all outputs and monitor all inputs
< Optional refrigerant suction and discharge pressure indication for each compressor
< Optional remote monitoring by the ships system via an Ethernet network utilizing the MODBUS protocol
< Optional remote touchscreen
< Optional color touchscreen
< Optional Global Link® Package allows Aqua-Air® engineers to remotely access your system via phone modem and aid in troubleshooting system problems.



Chiller Control Screen



Cooling Settings Screen

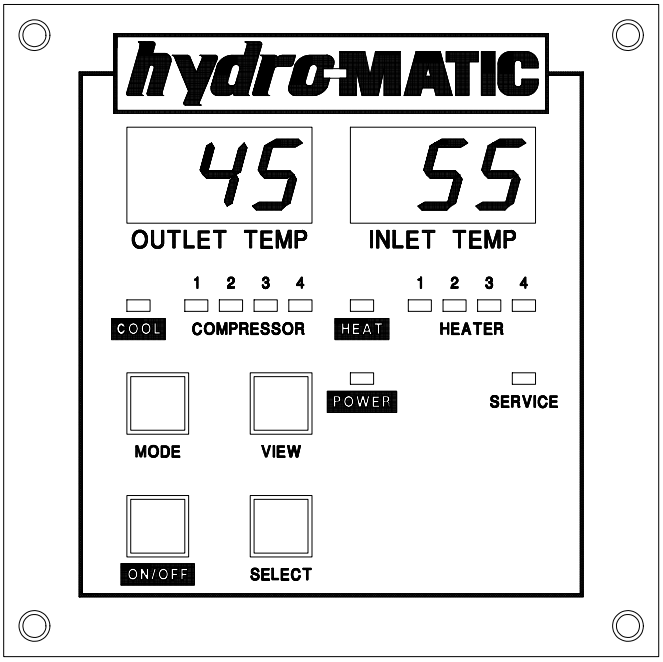
I:\WORDPFCT\TSPLC6-1COLOR-PDF.WPD

Aqua-Air Manufacturing, division of the James D. Nall Co., Inc.
1050 E. 9th Street, Hialeah, Florida 33010 U.S.A.
Ph 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com

AQUA-AIR
MARINE AIR CONDITIONING SYSTEMS

CHILLER UNIT CONTROL

The Aqua-Air Hydromatic Chiller Control is a microprocessor based control system for multiple compressor chiller units. The Hydromatic control monitors the reliability of the entire chiller unit system by providing component monitoring, programmable parameters and variable levels of protection. Operator control is made easy by the improved accuracy of the systems performance and quality of the information provided.



FEATURES

- **Display** - push button monitoring of system function and continuous display of chillwater inlet and outlet temperatures.
- **Temperature Monitors** - chillwater loop temperatures and individual chiller unit condenser water temperatures are monitored and controlled.
- **Compressor Circuit Analyzers** - provisions to monitor high and low side refrigerant pressure and freeze protection switches for each compressor circuit.
- **Programs** - fourteen programmable features provide precise control of the chiller.
- **Protection** - three separate levels of programmable protection upon fault detection.
- **Sequencing** - automatic sequencing for compressors and heaters to achieve equal operating time of components.
- **Service LED** - indicates a system malfunction requiring service.
- **View Mode** - provides digital readout of temperatures from sensors, status of safety controls on each compressor and areas of compressor malfunctions.
- **Control Board** - directly replaces all control circuit thermostats, relays and timers while increasing reliability and accuracy.
- **Control Override** - switches are standard on all boards.
- **Temperature Sensors** - shielded cables improve accuracy by preventing interference.
- **Remote Display** - a second display panel can be remotely located from the chiller to provide control and monitoring in the pilothouse or engineers station.

HYDROMATIC CHILLER CONTROL SETTINGS

PROGRAM NUMBER	PARAMETER		SET VALUE	RANGE	
				MINIMUM	MAXIMUM
P-1	HEAT SET POINT			95/ F 35/ C	118/ F 48/ C
P-2	COOL SET POINT			46/ F 8/ C	58/ F 14/ C
P-3	HEAT STAGING TEMPERATURE			1/ F 1/ C	6/ F 3/ C
P-4	COOL STAGING TEMPERATURE			1/ F 1/ C	6/ F 3/ C
P-5	STAGING TIME DELAY			30 secs	200 secs
P-6	SERVICE SENSOR HIGH TEMPERATURE LIMIT			120/ F 49/ C	145/ F 63/ C
P-7	SERVICE SENSOR LOW TEMPERATURE LIMIT			25/ F -4/ C	45/ F 7/ C
P-8	FAILSAFE LEVEL	0 = minimum 1 = display only 2 = maximum failsafe		0	2
P-9	SEAWATER PUMP OPERATION	0 = continuous 1 = cycle w/ compressor		0	1
P-10	NUMBER OF HEATERS EQUIPPED *			0 (1)	4 (2)
P-11	NUMBER OF COMPRESSORS EQUIPPED *			1	4 (2)
P-12	SENSORS EQUIPPED	see program description for details		0	7
P-13	LINE VOLTAGE LIMIT	110v System		80 v	100v
		220v System		180 v	200 v
P-14	TEMPERATURE UNITS	0 = / Fahrenheit		0	1
		1 = / Celsius			

* NUMBERS IN PARENTHESES INDICATE 2 STATION HYDROMATIC SETTINGS AND RANGES

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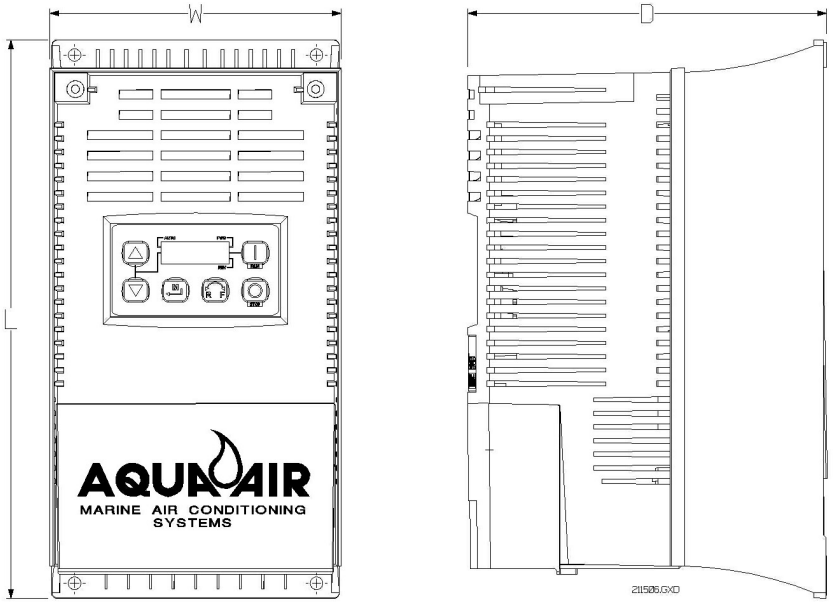
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

VARIABLE FREQUENCY DRIVE ESV SERIES

The ***ESV Series*** Variable Frequency Drive (VFD) modules are designed to operate with the Aqua-Air Alpha Series chillers in the 2-25 ton range. The purpose of the VFD is to eliminate the current spike produced by a compressor when it starts. The VFD starts the compressor by gradually increasing, in a linear manner, voltage and frequency to the compressor's motor. This keeps the amperage draw of the compressor, during starting, from ever exceeding its normal running amperage.

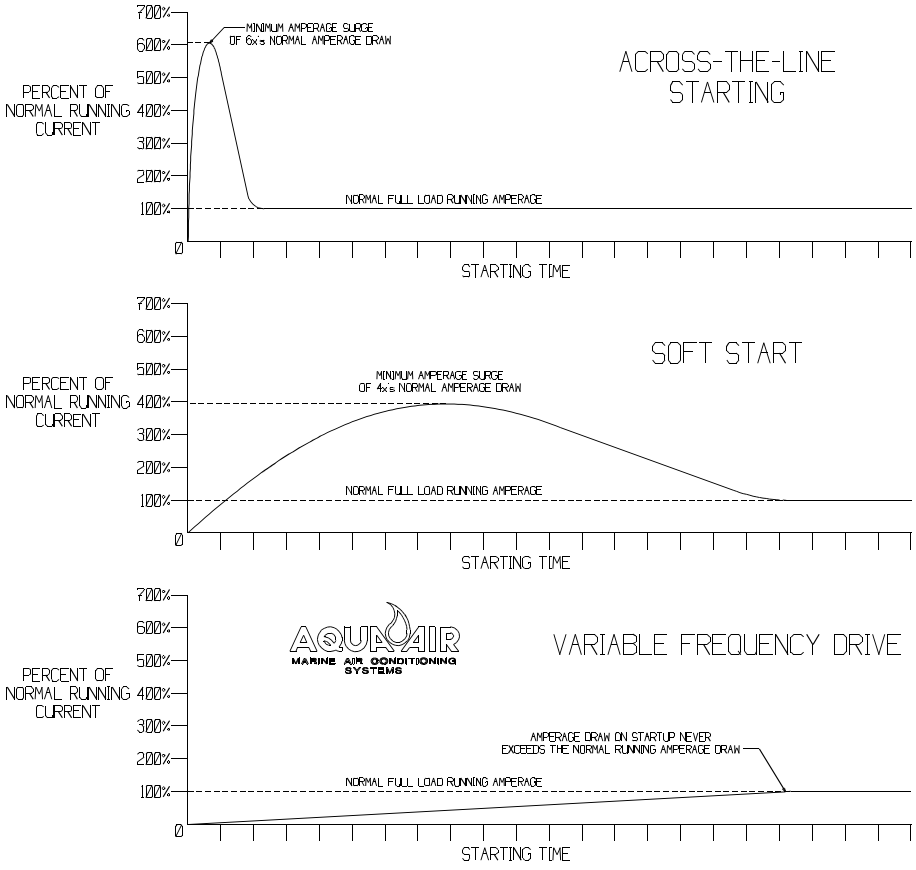
The ESV Series of VFD's are available in models that will accept voltages in the range from 200-240 volt, single or three phase, 50 or 60 cycles or 380-460 volt, three phase, 50 or 60 cycle. All chiller units that are used with the ESV modules must be equipped with three phase compressors.



MODEL NUMBER	POWER SUPPLY	HP	DIMENSIONS			WEIGHT
			L	W	D	
211506-07 211507-07	200-240 380-480	7.5	9-7/8" 250mm	5-1/8" 130mm	6-1/4" 160mm	6.0 lbs 2.0 kgs
211506-10 211507-10	200-240 380-480	10				
211506-15 211507-15	200-240 380-480	15	12-1/2" 318mm	7" 176mm	8-1/8" 205mm	13.6 lbs 6.2 kgs
211506-20 211507-20	200-240 380-480	20				
211507-25	380-480	25				
211507-30	380-480	30				

MODEL NUMBER	INPUT POWER SUPPLY	RATED OUTPUT CURRENT, AMPS	MAXIMUM CHILLER SIZE, TONS
211506-07 211507-07	240/1or3/50-60 380-480/3/50-60	23.0 12.6-11.0	4
211506-10 211507-10	240/1or3/50-60 380-480/3/50-60	29.0 16.1-14.0	6
211506-15 211507-15	240/1or3/50-60 380-480/3/50-60	42.0 24.0-21.0	10
211506-20 211507-20	240/1or3/50-60 380-480/3/50-60	54.0 31.0-27.0	15
211507-25	380-480/3/50-60	44.0-38.0	25
211507-30	380-480/3/50-60	46.0-40.0	30

THE GRAPHS BELOW SHOW THE DIFFERENCE IN STARTING AMPERAGE DRAW BETWEEN A COMPRESSOR THAT IS STARTED 1) ACROSS-THE-LINE 2) WITH A SOFT START MODULE AND 3) WITH THE AQUA-AIR VARIABLE FREQUENCY DRIVE (VFD)



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1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 Email sales@aquaair.com

Why do I need Variable Frequency Drives (VFD's) on my Aqua-Air Chillwater System?

Almost anyone who has been aboard an air conditioned yacht (or even in their own home) has experienced the annoying flickering electrical "brownout" when an air conditioning compressor starts. This condition is due to the sudden large electrical demand of the compressor as it starts.

Initial "in-rush" amperage draw of a compressors electrical motor (inductive electrical load) can be 4-8 times it's normal running amperage. This amperage surge or "spike" is only momentary but it can be severe enough to trip shorepower circuit breakers, overload generators or cause faults with sophisticated navigation electronics.

It is difficult to find marinas with enough dockside power to supply 100% of your yacht's electrical demand. In many cases it is necessary to sacrifice some comforts in order to continuously run the air conditioning system. All yachts are equipped with generators but it is usually not feasible to make them large enough to absorb the compressor surges without some noticeable effects.

In 1986, after extensive research, Aqua-Air succeeded in developing the first Variable Frequency Drive (VFD) marine chillers known as the G4 Series. Using VFD's, these chillers eliminated the amperage surge by slowly ramping the compressor up in speed by proportionally increasing both the voltage and frequency of the power supply to the compressor over a short period of time. On the back side of this brochure are two graphs that show the difference in amperage draw during the startup of a compressor with and without VFD's.

Since 1986 there have been many innovations in the VFD marketplace. They are now more reliable, more compact, have fewer harmonics and are more affordable. The benefits also extend beyond the surgeless start feature. The VFD also senses compressor overcurrent conditions and low voltage and high voltage conditions that could damage your compressor.

With all of the obvious benefits it makes sense to order your next Aqua-Air Chillwater System with Variable Frequency Drives! Contact us today for further information.

James D. Nall Co., Inc.
Serving the Yachting Public Since 1941

1050 E. 9th St. Hialeah, FL 33010 U.S.A.
Phone 305-884-8363 Toll Free 800-328-1043
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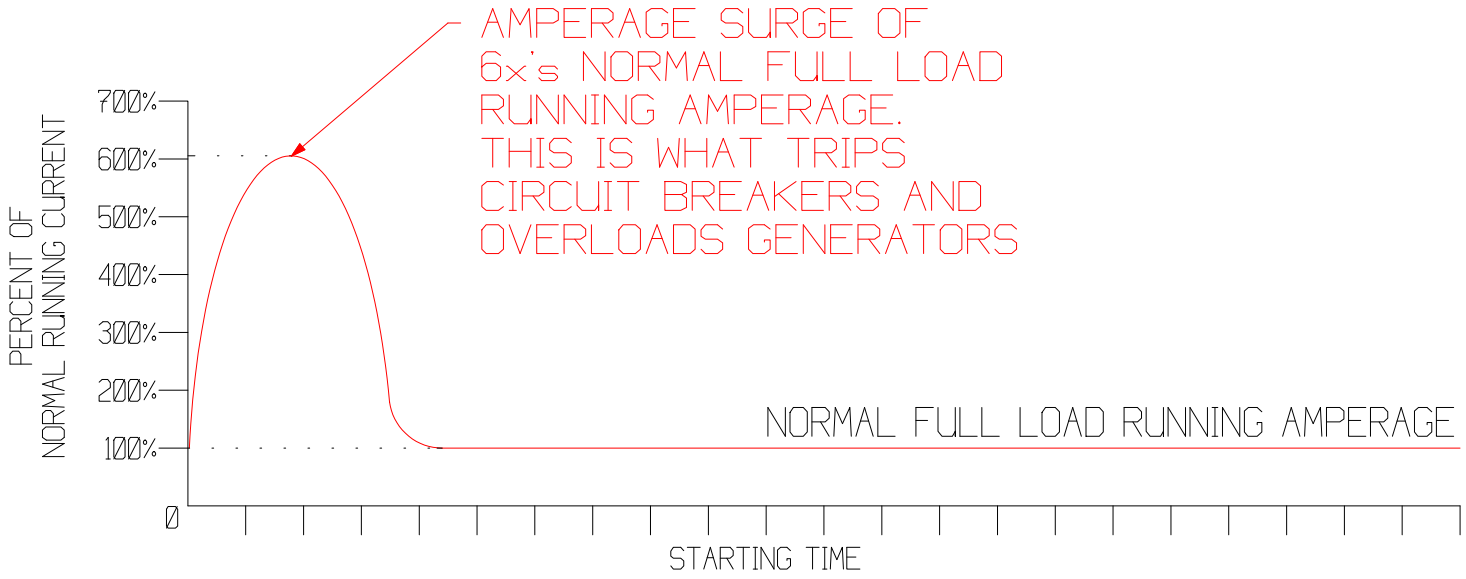
www.aquaair.com

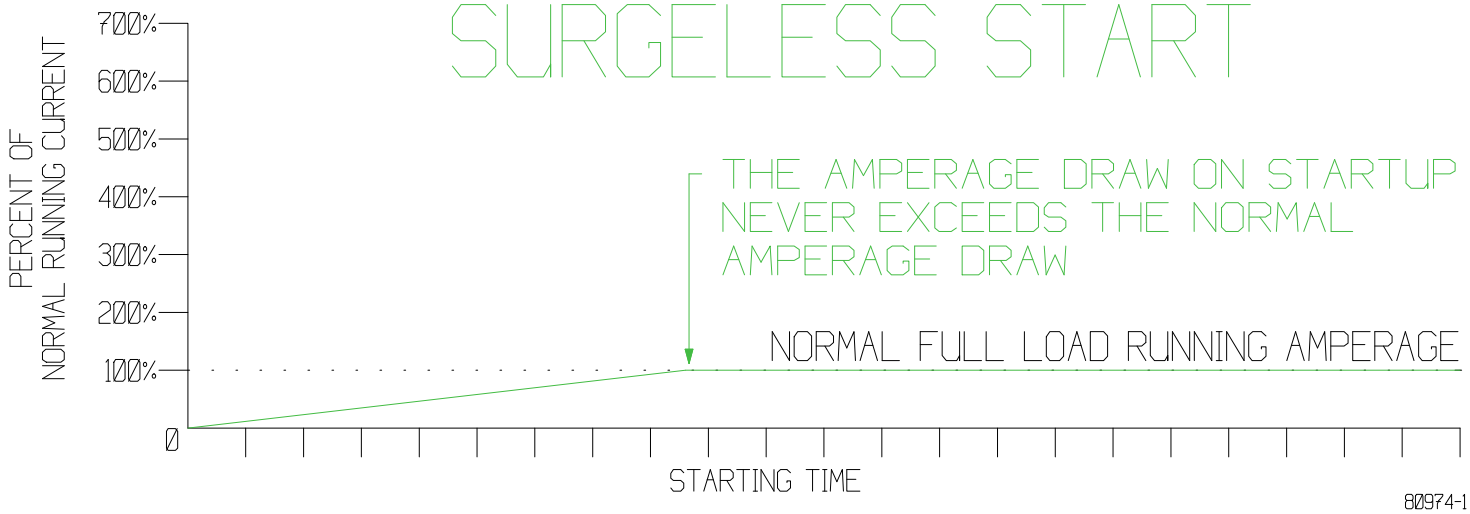
NORMAL COMPRESSOR STARTING



AQUAIR

MARINE AIR CONDITIONING SYSTEMS

VARIABLE FREQUENCY DRIVE
SURGELESS START



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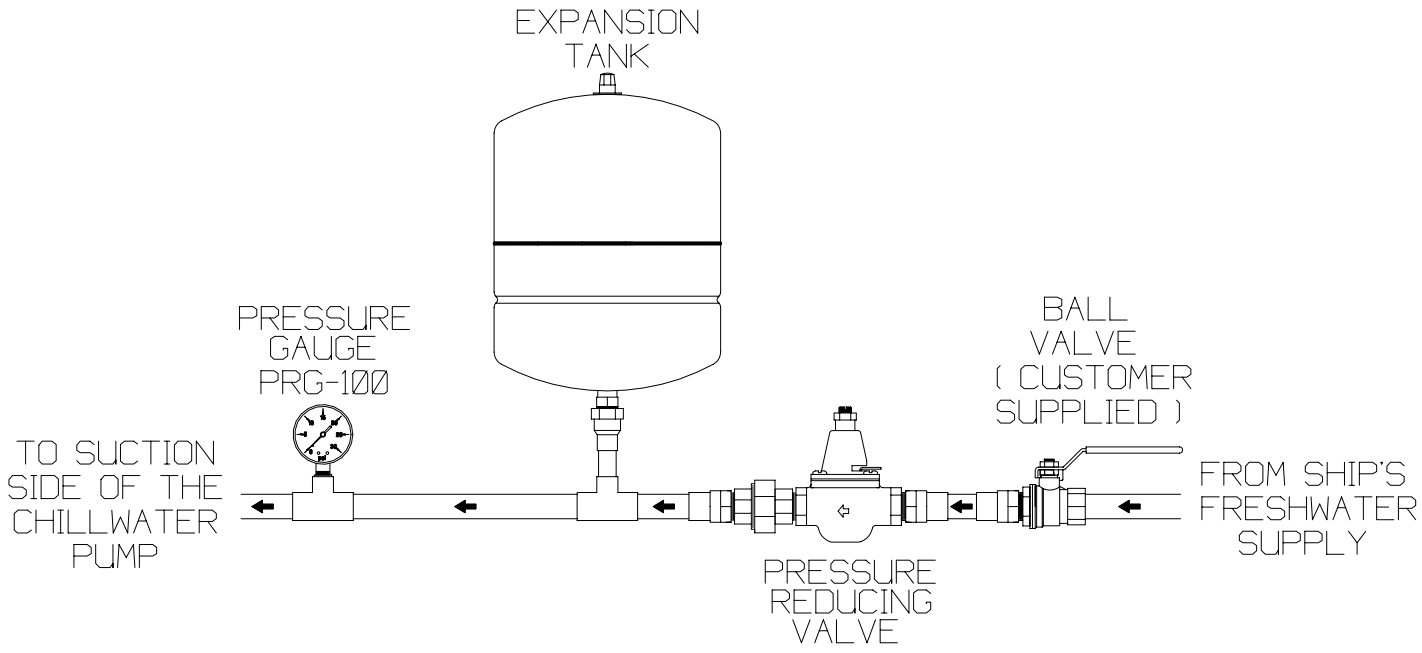
AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

FRESH WATER MAKEUP KITS WMK



WMK-1

FOR SYSTEMS LESS THAN OR EQUAL TO 20 TONS

EXT-442	EXPANSION TANK
PRV-329	PRESSURE REDUCING VALVE 1/2"
PRG-100	PRESSURE GAUGE

WMK-2

FOR SYSTEMS GREATER THAN 20 TONS

EXT-445	EXPANSION TANK
PRV-335	PRESSURE REDUCING VALVE 3/4"
PRG-100	PRESSURE GAUGE

FOR FURTHER INFORMATION SEE THE INDIVIDUAL PRODUCT BROCHURES.

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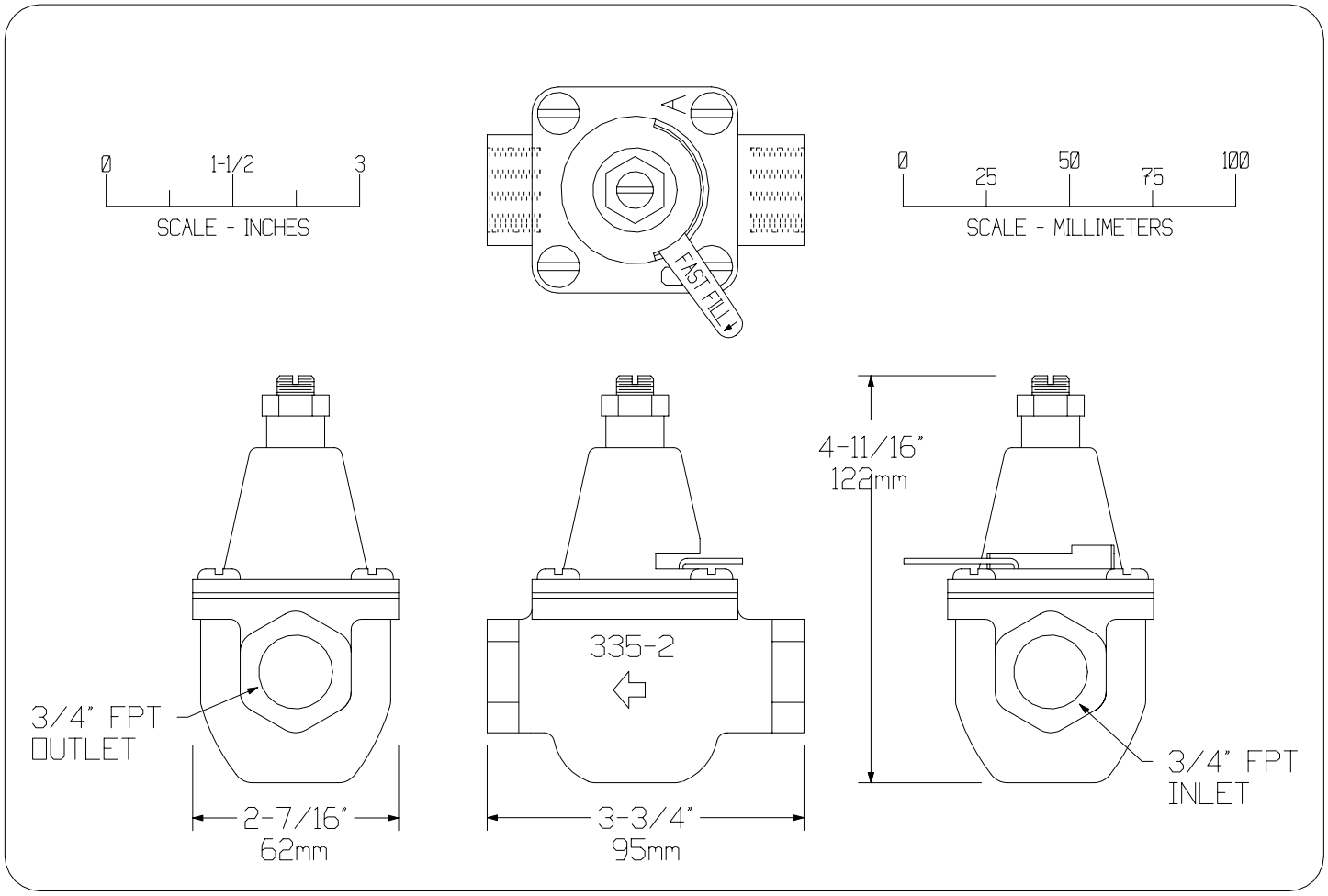
PH. 305-884-8363 FAX 305-883-8549

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

PRV-335 PRESSURE REDUCING VALVE

The PRV-335 pressure reducing valve reduces the ships' fresh water system pressure to the desired system pressure. It also automatically feeds water to the system when the system pressure drops below the appropriate setting. It is installed in the fresh water makeup line between the fresh water inlet and the expansion tank.



MAXIMUM WORKING PRESSURE: 100 PSIG
FACTORY OUTLET PRESSURE SETTING: 12 PSIG
OUTLET PRESSURE SETTING RANGE: 5-25 PSIG
MAXIMUM WORKING TEMPERATURE: 212°F / 100°C
WEIGHT: 3.5 LBS / 1.6 KG

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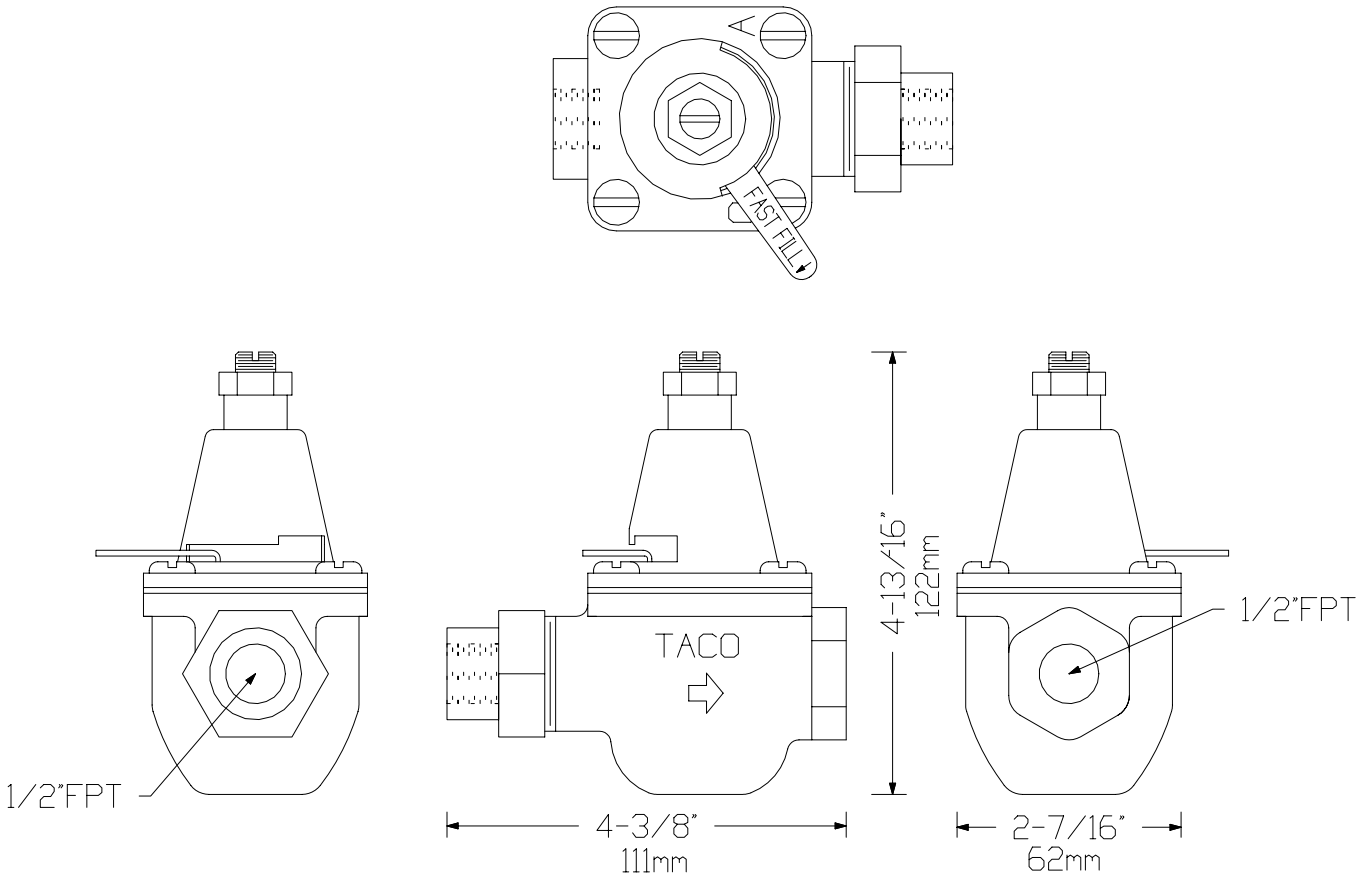

MAXIMUM WORKING PRESSURE: 100 PSIG
FACTORY OUTLET PRESSURE SETTING: 12 PSIG
OUTLET PRESSURE SETTING RANGE: 5-25 PSIG
MAXIMUM WORKING TEMPERATURE: 212°F / 100°C
WEIGHT: 2.2 LBS / 1.0 KG

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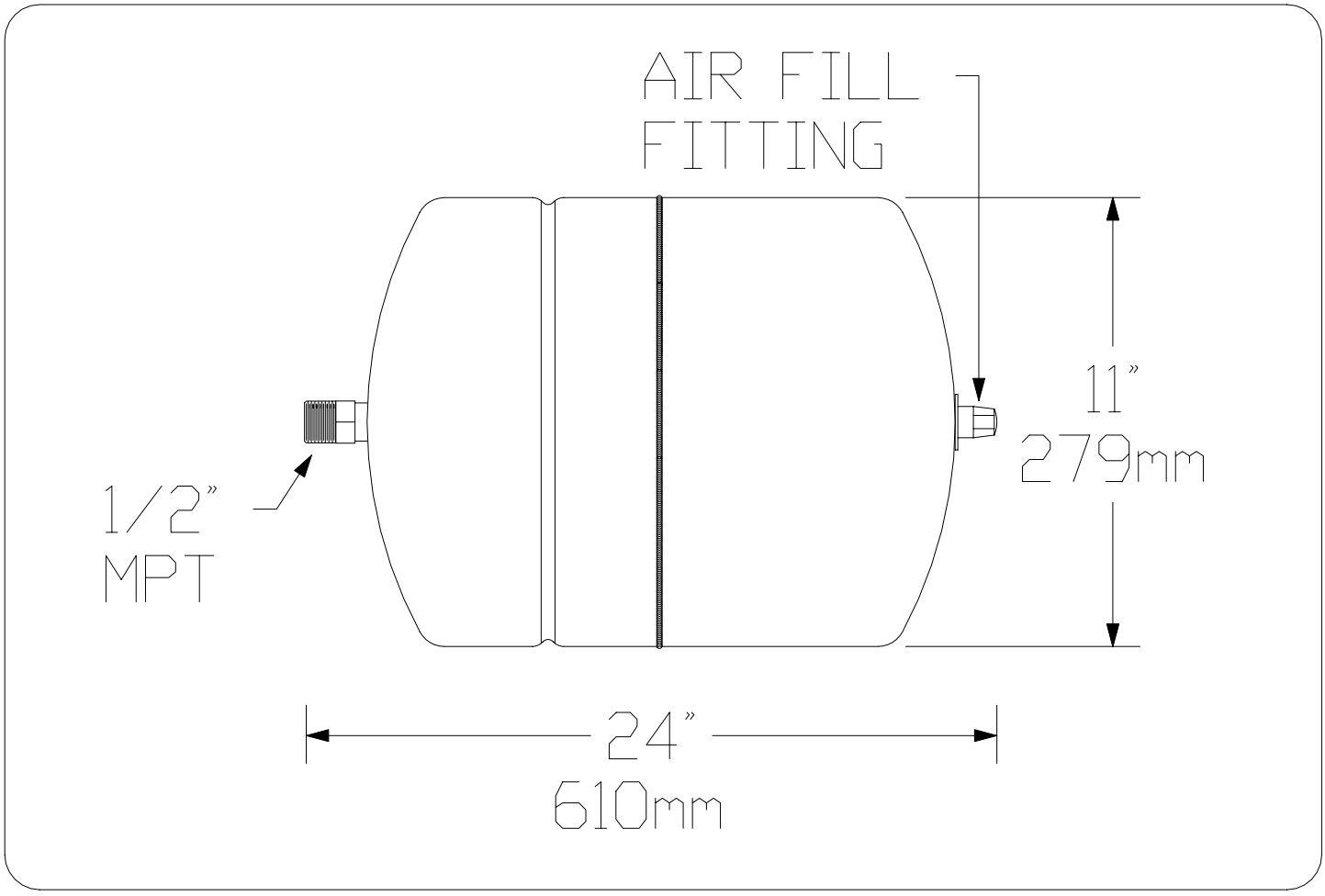
AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

EXT-445 EXPANSION TANK

The EXT-445 Expansion Tank allows for the expansion and contraction of water in a closed loop chillwater system. When water is heated in a closed loop system a provision must be made for expansion. The flexible diaphragm in the center of the expansion tank provides a barrier between the expanded water and the factory precharge of air. As the expanded water enters the tank the diaphragm exerts pressure on the precharged air, compressing it and increasing the tank pressure. The expanded water reenters the system when the system temperature decreases; thus, maintaining system pressure within defined limits.



MAXIMUM WORKING PRESSURE: 30 PSIG
MAXIMUM WORKING TEMPERATURE: 212°F / 100°C
WEIGHT: 5.0 LBS / 2.3 KG

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AQUA AIR
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EXT-442 EXPANSION TANK

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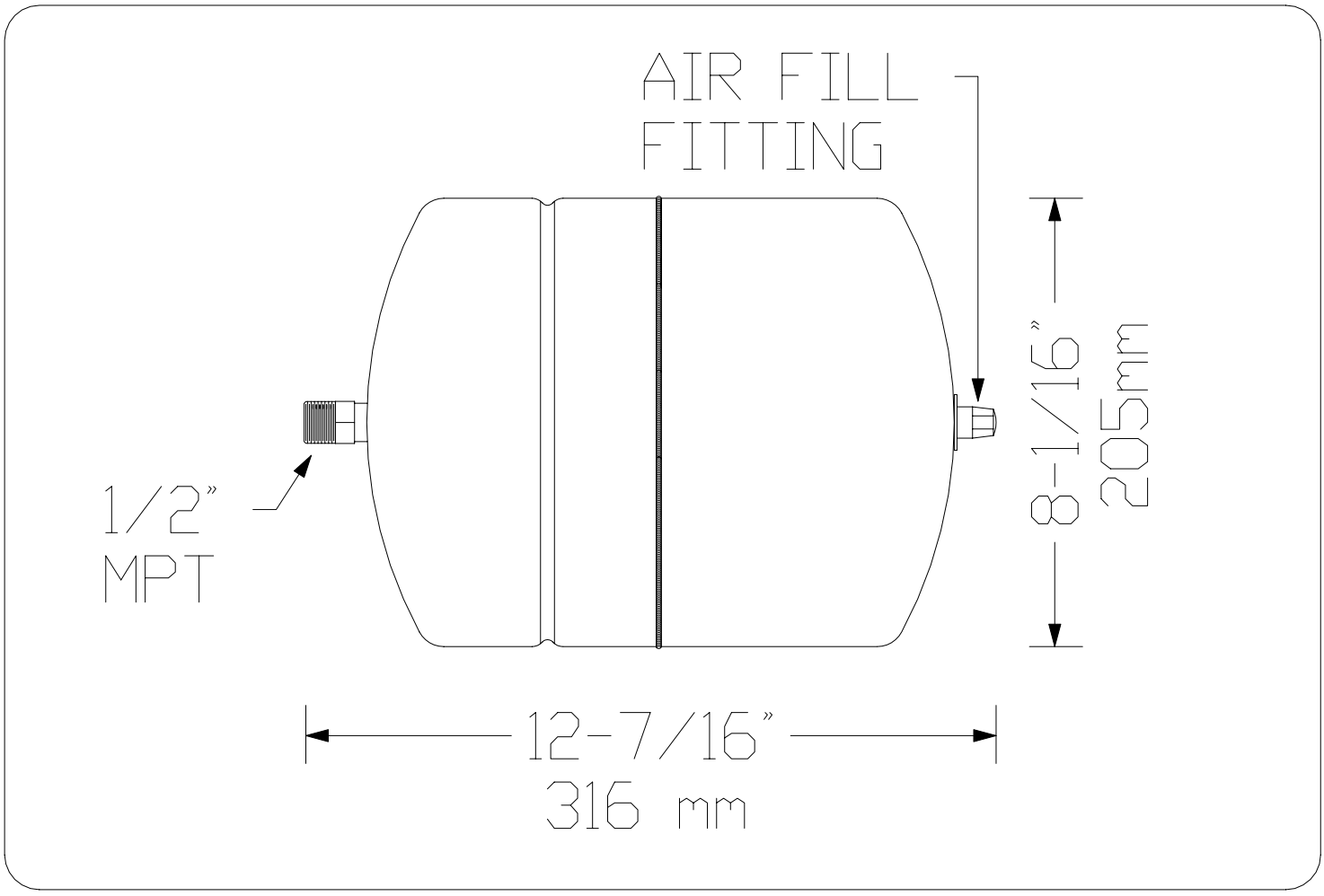

MAXIMUM WORKING PRESSURE: 100 PSIG
FACTORY PRE-CHARGE PRESSURE SETTING: 12 PSIG
MAXIMUM WORKING TEMPERATURE: 212°F / 100°C
WEIGHT: 5.0 LBS / 2.3 KG

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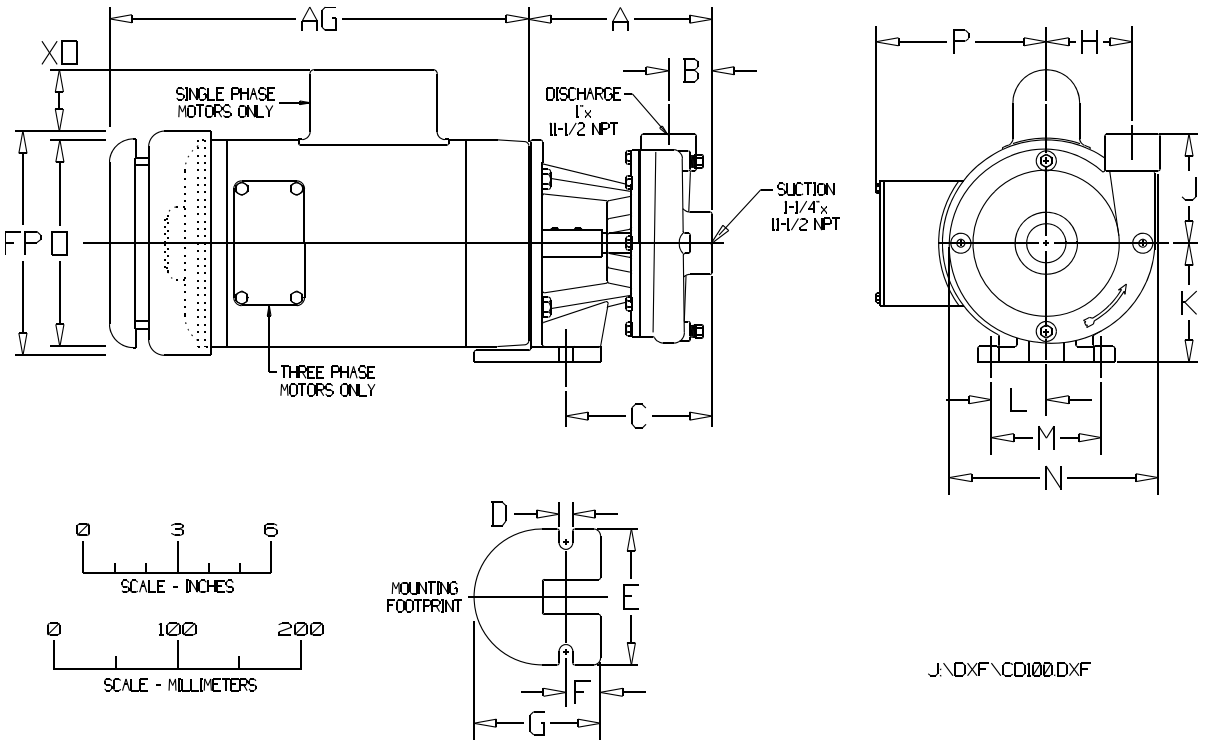
AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

CENTRIFUGAL PUMP CD100 SERIES

The CD100 Series Centrifugal Pump is available in bronze for seawater use, cast iron for chillwater use or stainless steel for special applications. Motors are available for all voltages, 50 and/or 60 Hertz, single or three phase. The standard motor style is ODP (Open Drip Proof). TEFC (Totally Enclosed, Fan Cooled) motors are available on special order. Flow rates up to 70 GPM and heads of 95' are available with this pump.



A	B	C	D	E	F	G	H	J	K	L	M	N	P
5.88" 149mm	1.38" 35mm	4.63" 118mm	0.44" 11mm	4.38" 111mm	1.13" 29mm	4.00" 102mm	2.75" 70mm	3.50" 89mm	3.81" 97mm	1.75" 44mm	3.50" 89mm	6.69" 170mm	5.44" 138mm

MOTOR SIZES			MOTOR END DIMENSIONS			
HP	RPM	FRAME	AG	FP	O	XO
1/4	1800	56C	7.75" / 197mm	6.13" / 156mm	5.38" / 137mm	2.06" / 52mm
1/3	3600	56C	8.50" / 216mm			
½	3600	56C	8.75" / 222mm			
3/4	3600	56C	9.25" / 235mm			
1	3600	56C	9.75" / 248mm			
1-1/2	3600	56C	10.50" / 267mm	7.19" / 183mm	6.88" / 175mm	2.25" / 57mm
2	3600	56C	11.13" / 283mm			

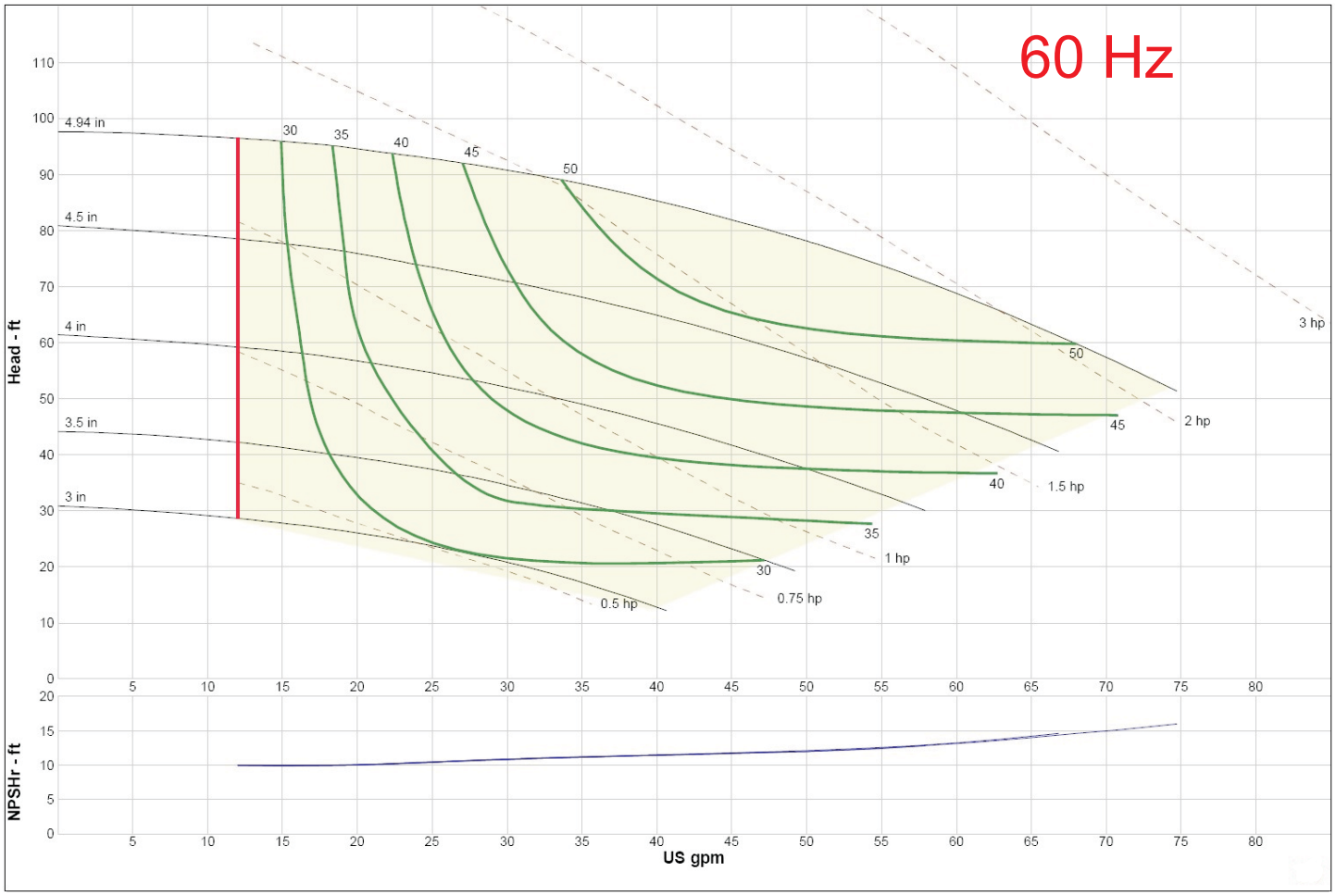
CD100 SERIES PUMP MODEL NUMBER DESCRIPTION

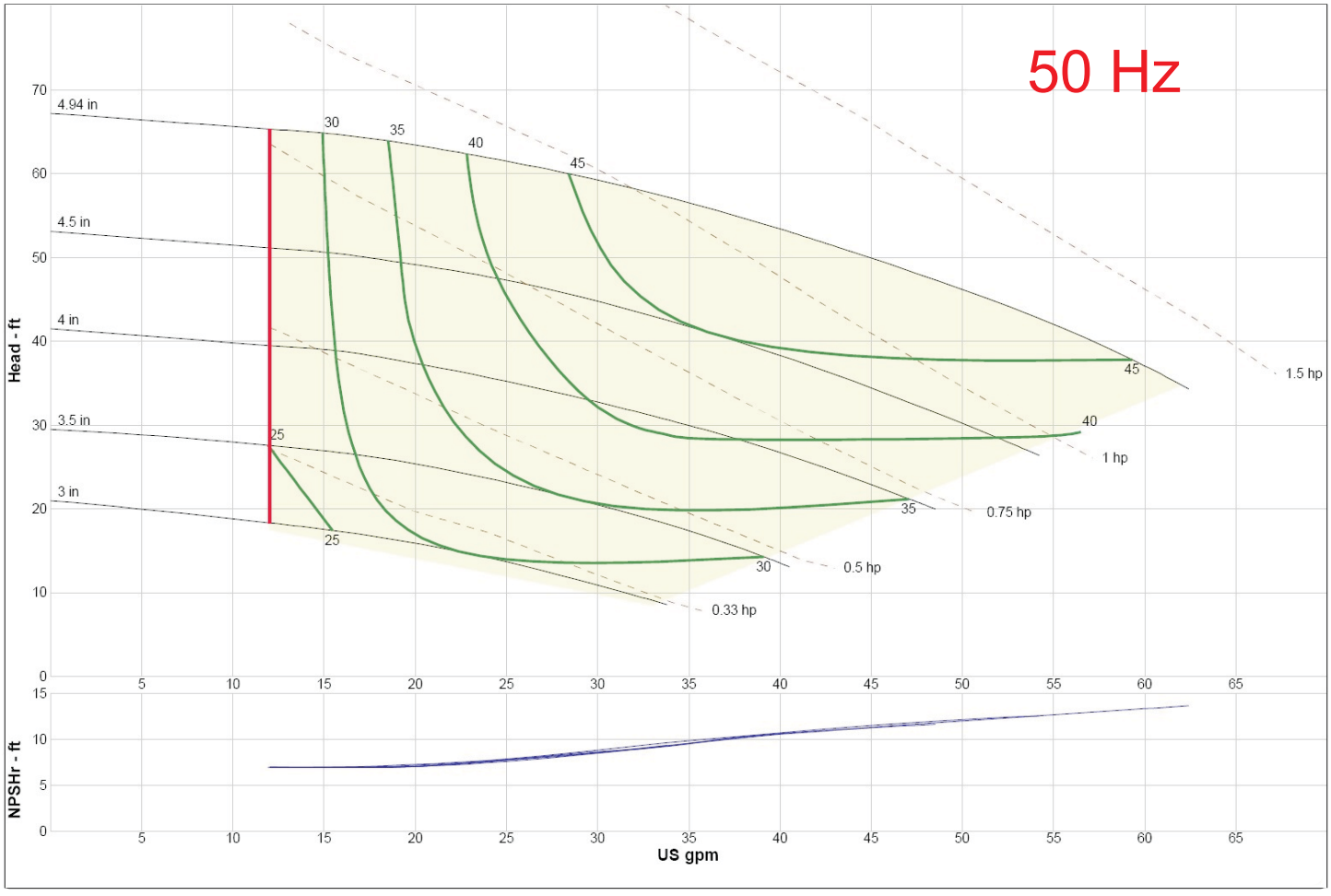
ITEM	CODE	DESCRIPTION	CD100	B	-	42	-	07	-	C
PUMP HEAD MATERIAL	B	BRONZE								
	I	CAST IRON								
	S	STAINLESS STEEL								
IMPELLER SIZE	30	3.00" DIAMETER								
	36	3.63" DIAMETER								
	40	4.00" DIAMETER								
	42	4.25" DIAMETER								
	45	4.50" DIAMETER								
	49	4.94" DIAMETER								
PUMP MOTOR HORSEPOWER	02	1/4 HP								
	03	1/3 HP								
	05	1/2 HP								
	07	3/4 HP								
	10	1 HP								
	15	1-1/2 HP								
	20	2 HP								
MOTOR TYPE	-	**O**pen **D**rip **P**roof								
	T	**T**otally **E**nclosed **F**an **C**ooled								
PUMP MOTOR POWER INPUT	C	115-230 / 1 / 60								
	K	100-220 / 1 / 50								
	F	230-460 / 3 / 60								
	J	220-380 / 3 / 50								

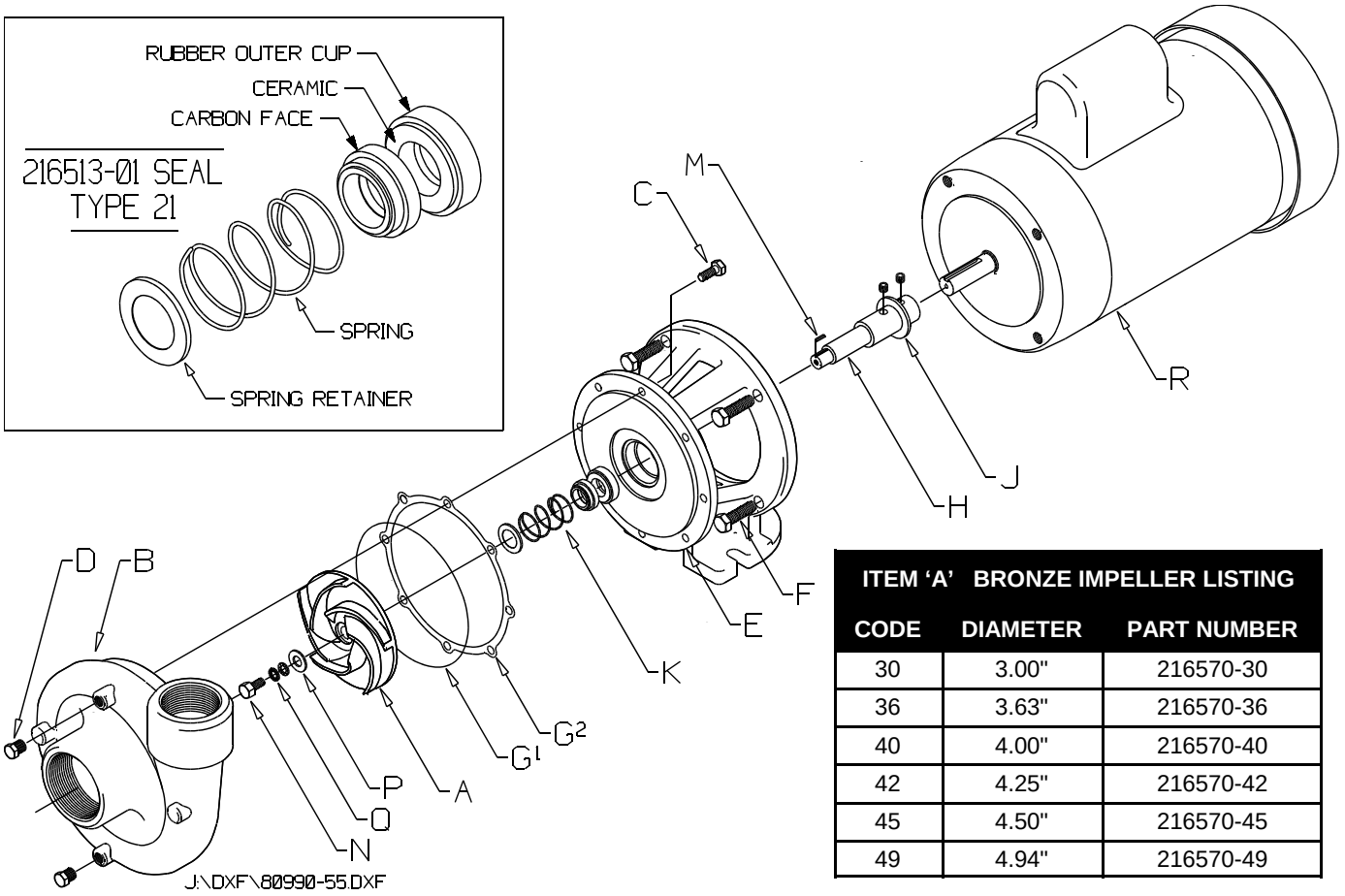
The example above is a CD100 series pump, bronze head and impeller, 4.25" diameter impeller, 3/4 horsepower, 115-230 / 1 / 60 power input, ODP motor. Custom impeller diameters available upon request at an extra charge

STANDARD PUMP MODEL NUMBERS

NEW MODEL	OLD MODEL
CD100B-49-02	E100-25B
CD100B-36-03	E100-33B
CD100B-40-05	E100-50B
CD100B-42-07	E100-75B
CD100B-45-10	E100-100B
CD100B-49-15	E100-150B
ADD MOTOR VOLTAGE CODE TO THE END OF THE NEW NUMBER TO FORM A COMPLETE PUMP MODEL NUMBER	


60 Hz
4.94 in
4.5 in
4 in
3.5 in
3 in
30
35
40
45
50
3 hp
2 hp
1.5 hp
1 hp
0.75 hp
0.5 hp
Head - ft
NPSHr - ft
US gpm


50 Hz
4.94 in
4.5 in
4 in
3.5 in
3 in
25
30
35
40
45
1.5 hp
1 hp
0.75 hp
0.5 hp
0.33 hp
Head - ft
NPSHr - ft
US gpm



ITEM 'A' BRONZE IMPELLER LISTING		
CODE	DIAMETER	PART NUMBER
30	3.00"	216570-30
36	3.63"	216570-36
40	4.00"	216570-40
42	4.25"	216570-42
45	4.50"	216570-45
49	4.94"	216570-49

PUMP PARTS LISTING		
ITEM	PART NUMBER	DESCRIPTION
A	SEE CHART	IMPELLER, BRONZE
B	216570-01	VOLUTE, BRONZE
C	216511-00	VOLUTE BOLT (4)
D	216540-00	PIPE PLUG 1/8" NPT
E	216570-04	BRACKET, BRONZE
F	216510-00	MOTOR BOLT (4)
G1	216526-01	O-RING
G2	216526-00	GASKET
H	216570-06	SHAFT w/ SET SCREWS
J	216570-07	SLINGER
K	216513-01	SEAL, TYPE T21
M	216570-05	IMPELLER KEY
N	216570-02	IMPELLER LOCKDOWN BOLT
P	216570-03	IMPELLER FLAT WASHER
Q	216570-08	IMPELLER LOCK WASHER
R	SEE CHART	PUMP MOTOR

ITEM 'R' MOTOR LISTING			
HP	115-230/1/60	230-460/3/60	MOTOR TYPE
1/4	212635-00	212636-00	ODP
1/3	212621-00	212637-00	ODP
1/2	212622-00	212631-00	ODP
3/4	212630-00	212632-00	ODP
1	212638-00	212639-00	ODP
1-1/2	212640-00	212641-00	ODP
2	212642-00	212643-00	ODP
1/4	212677-02	212678-02	TEFC
1/3	212677-03	212678-03	TEFC
1/2	212677-05	212678-05	TEFC
3/4	212677-07	212678-07	TEFC
1	212677-10	212678-10	TEFC
1-1/2	212677-15	212678-15	TEFC
2	212677-20	212678-20	TEFC

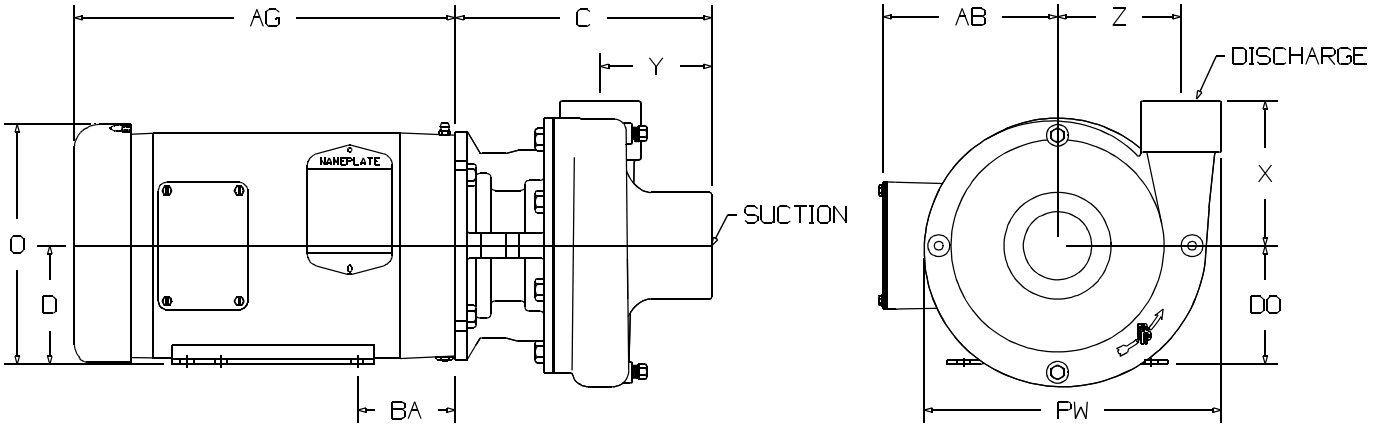
I:\WORDPFCT\80990-50.WPD

AQUA-AIR MANUFACTURING, division of the James D. Nall Co., Inc.
1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
Ph. 305-884-8363 Fax 305-883-8549 email sales@aquaair.com

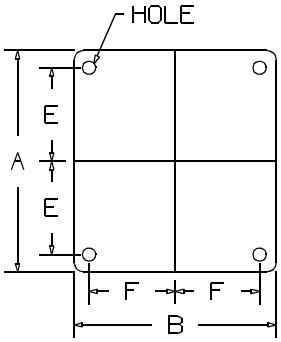
AQUA-AIR
MARINE AIR CONDITIONING SYSTEMS

CENTRIFUGAL PUMP XT SERIES

The XT Series Centrifugal Pump is available in bronze for seawater use, cast iron for chillwater use or stainless steel for special applications. Motors are available for all voltages, 50 and/or 60 Hertz, single or three phase. The standard motor style is TEFC (Totally Enclosed Fan Cooled). The ODP (Open Drip-Proof) style motor is available on special order. Flow rates up to 400 GPM and 160 feet of head are possible with this series of pumps.



XTPUMP.DXF



	PUMP END DIMENSIONS							
MODEL	C	DO	PW	X	Y	Z	DISCHARGE	SUCTION
XT100	6-5/8"	4"	8-3/8"	4"	2-3/8"	3-1/2"	1"x11-1/2	1-1/2"x11-1/2"
XT150	7-9/16"	4-1/8"	8-3/4"	4-1/4"	3-1/4"	3-5/8"	1-1/2"x11-1/2	2"x11-1/2
XT200	7-5/16"	4-7/16"	9-5/16"	4-1/2"	2-7/8"	3-3/4"	2"x11-1/2	3"x8

			JM MOTOR END DIMENSIONS									ODP		TEFC	
HP	RPM	FRM	A	B	D	E	F	HOLE	BA	O	P	AB	AG	AB	AG
1-1/2	3600	143JM	6-1/2"	5-15/16"	3-1/2"	2-3/4"	2"	11/32"	2-7/8"	6-7/8"	6-5/8"	5-1/4"	8-3/4"	6-3/4"	11-1/4"
2		145JM					2-1/2"								
3		145JM													
5		182JM	8-1/2"	6-1/2"	4-1/2"	3-3/4"	2-1/4"	13/32"	3-1/2"	8-7/16"	7-7/8"	5-7/8"	11-1/8"	7-3/8"	14-3/4"
7-1/2		184JM					2-3/4"								
10		213	9-1/2"	8"	5-1/4"	4-1/4"	3-1/2"	13/32"	3-1/8"	10-1/16"	9-9/16"	N/A		7-3/8"	14-7/16"
15		213													

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1050 East 9th Street, Hialeah, Florida 33010 U.S.A.
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PUMP MODEL NUMBER DESCRIPTION

XT150B-45-75F

PUMP SERIES

XT100	1"x1-1/2"
XT150	1-1/2"x2"
XT200	2"x3"

PUMP HEAD MATERIAL

B	BRONZE
I	CAST IRON
S	STAINLESS

IMPELLER SIZE

30	3.00"
35	3.50"
40	4.00"
45	4.50"
50	5.00"
55	5.50"
59	5.96"

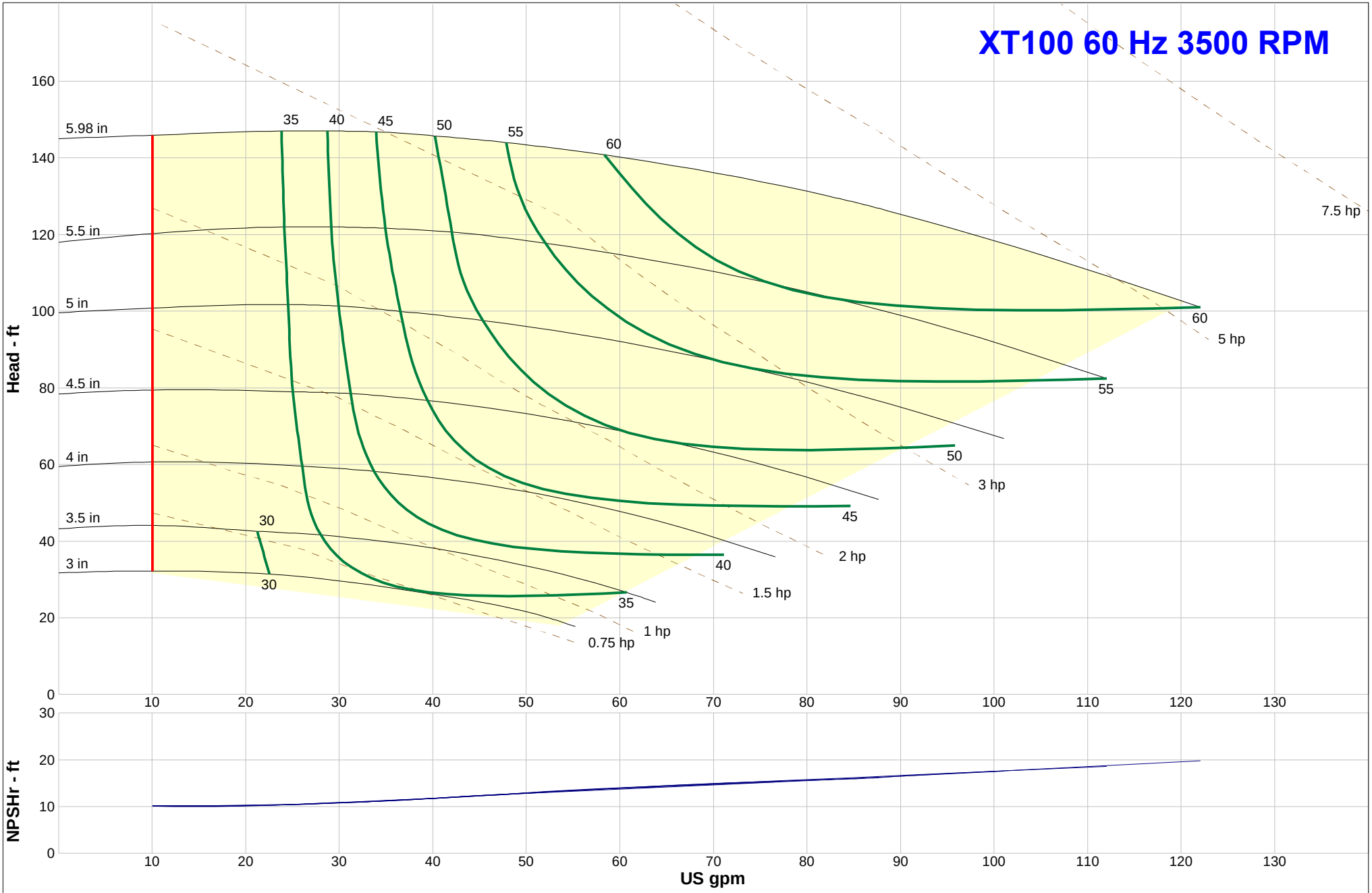
PUMP MOTOR VOLTAGE PHASE HZ

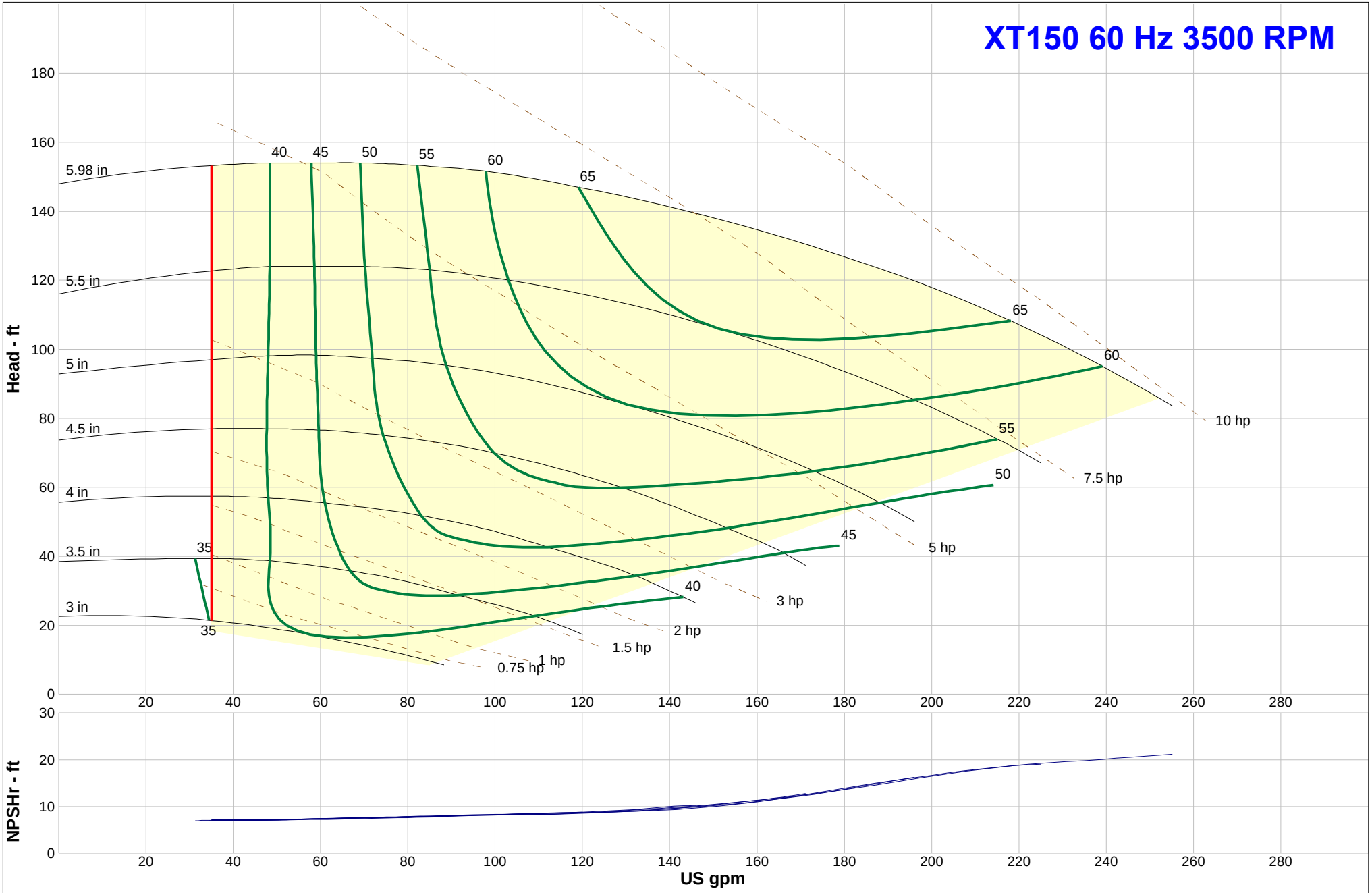
C	208-230/1/60
K	200-220/1/50
F	230-460/3/60
J	220-380/3/50

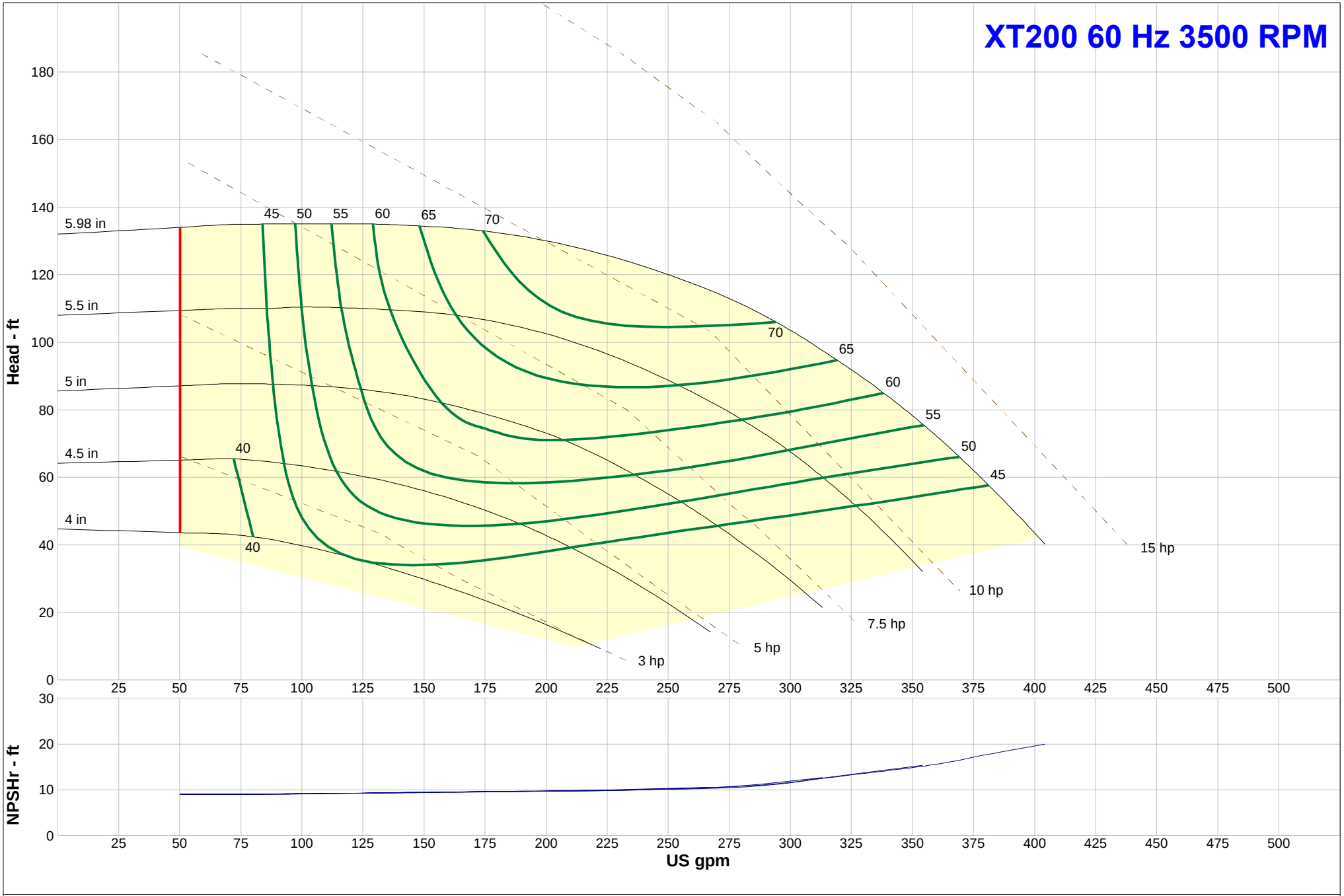
PUMP MOTOR HORSEPOWER

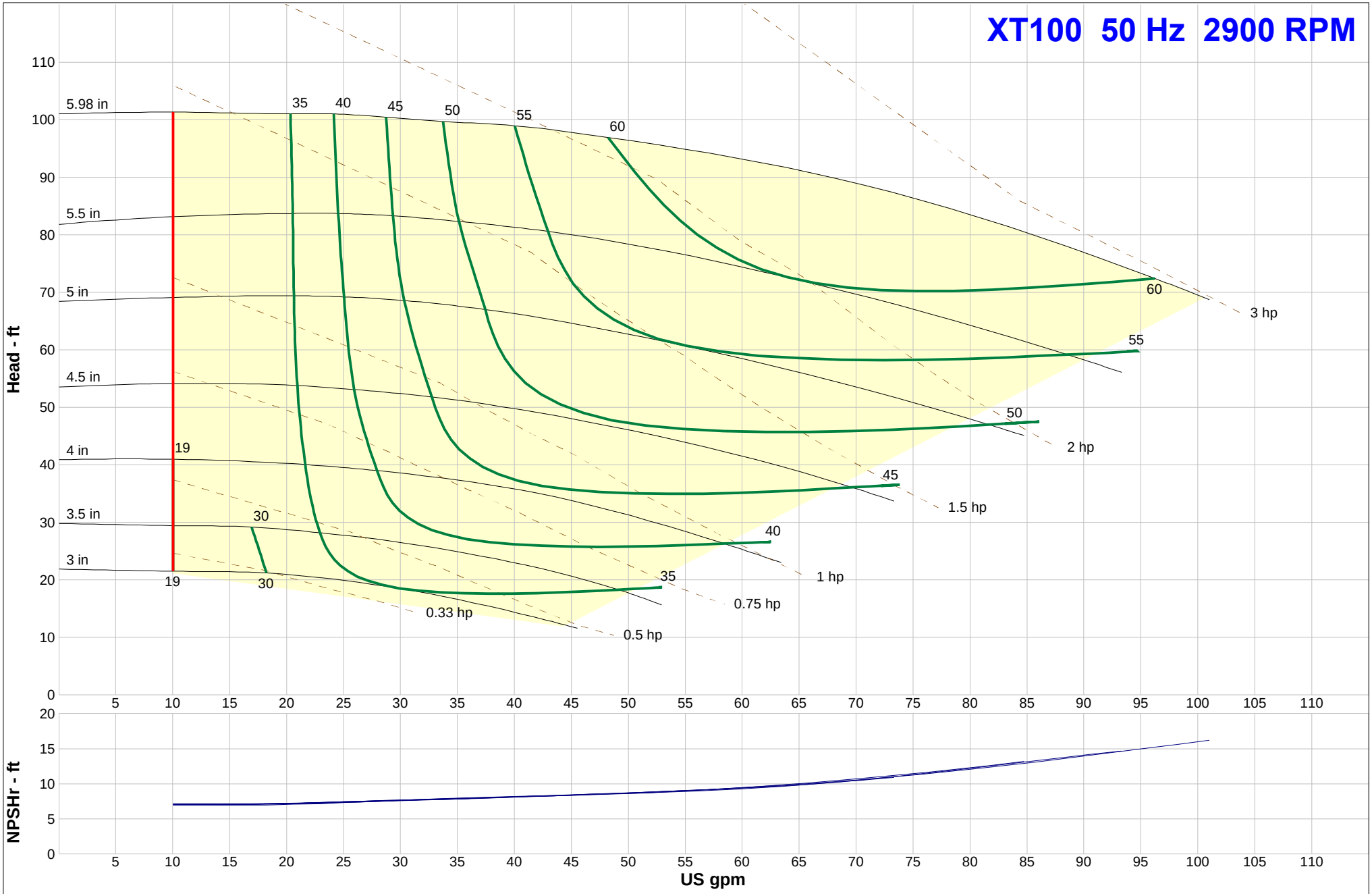
05	1/2
07	3/4
10	1
15	1-1/2
20	2
30	3
50	5
75	7-1/2
1X	10

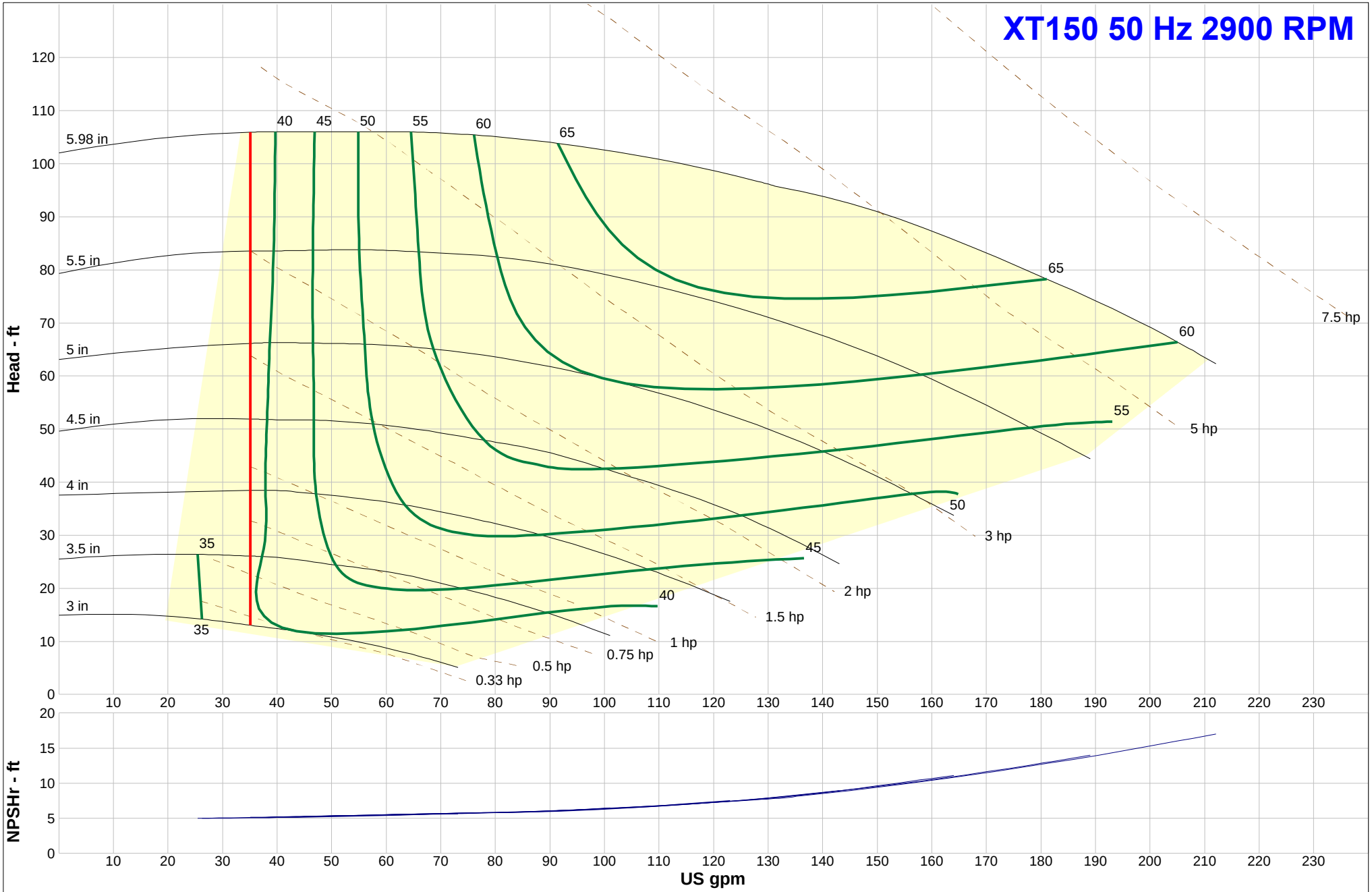
THE EXAMPLE ABOVE IS A XT150 SERIES PUMP HEAD, BRONZE CONSTRUCTION, 4.50" IMPELLER 7-1/2 HP MOTOR CAPABLE OF RUNNING ON EITHER 230 or 460 VOLT 3 PHASE, 60 HZ.

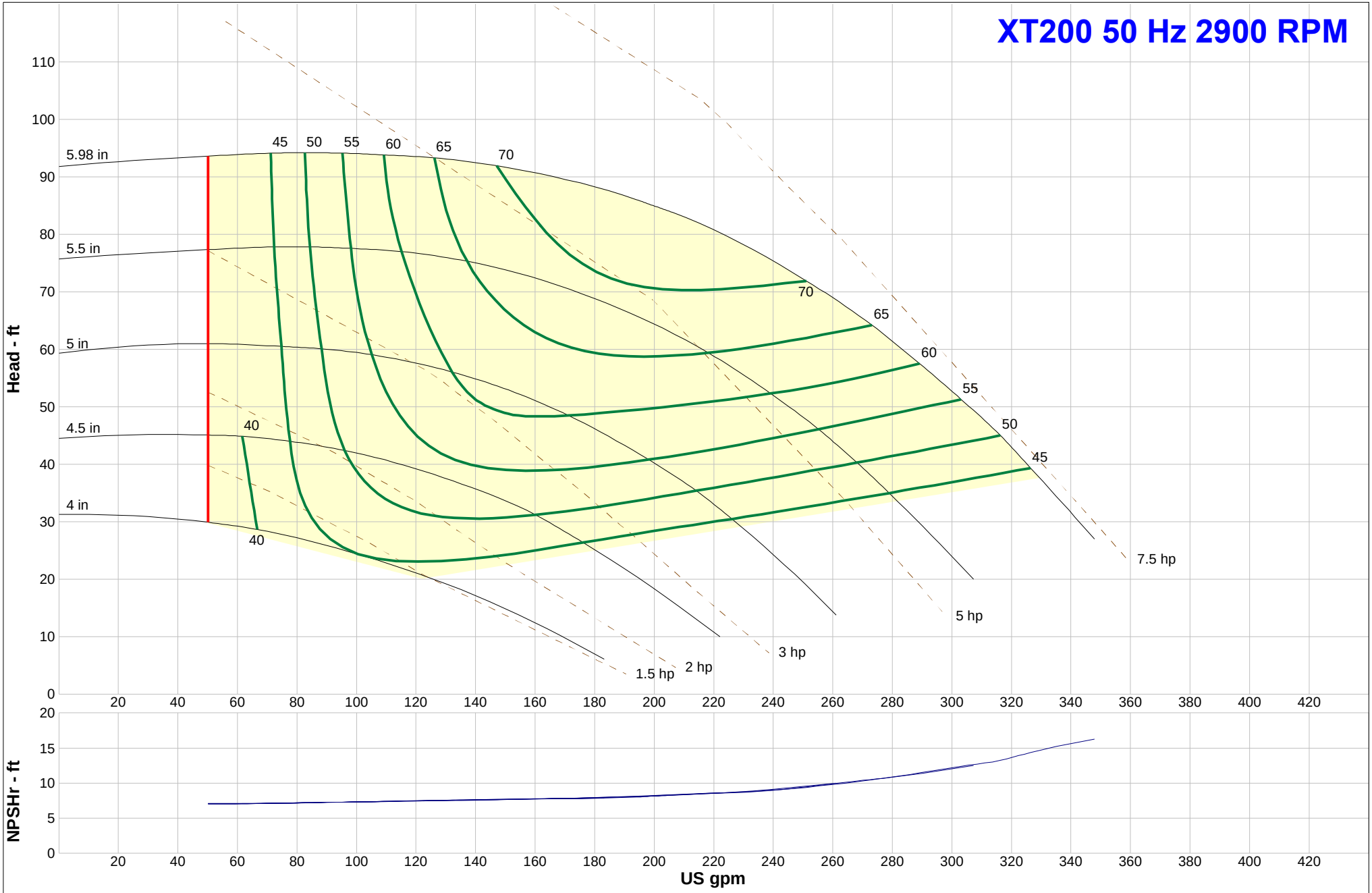

XT100 60 Hz 3500 RPM
Head - ft
NPSHr - ft
US gpm
5.98 in
5.5 in
5 in
4.5 in
4 in
3.5 in
3 in
35
40
45
50
55
60
30
30
7.5 hp
5 hp
3 hp
2 hp
1.5 hp
1 hp
0.75 hp
60
55
50
45
40
35
0 20 40 60 80 100 120 140 160
0 10 20 30
10 20 30 40 50 60 70 80 90 100 110 120 130

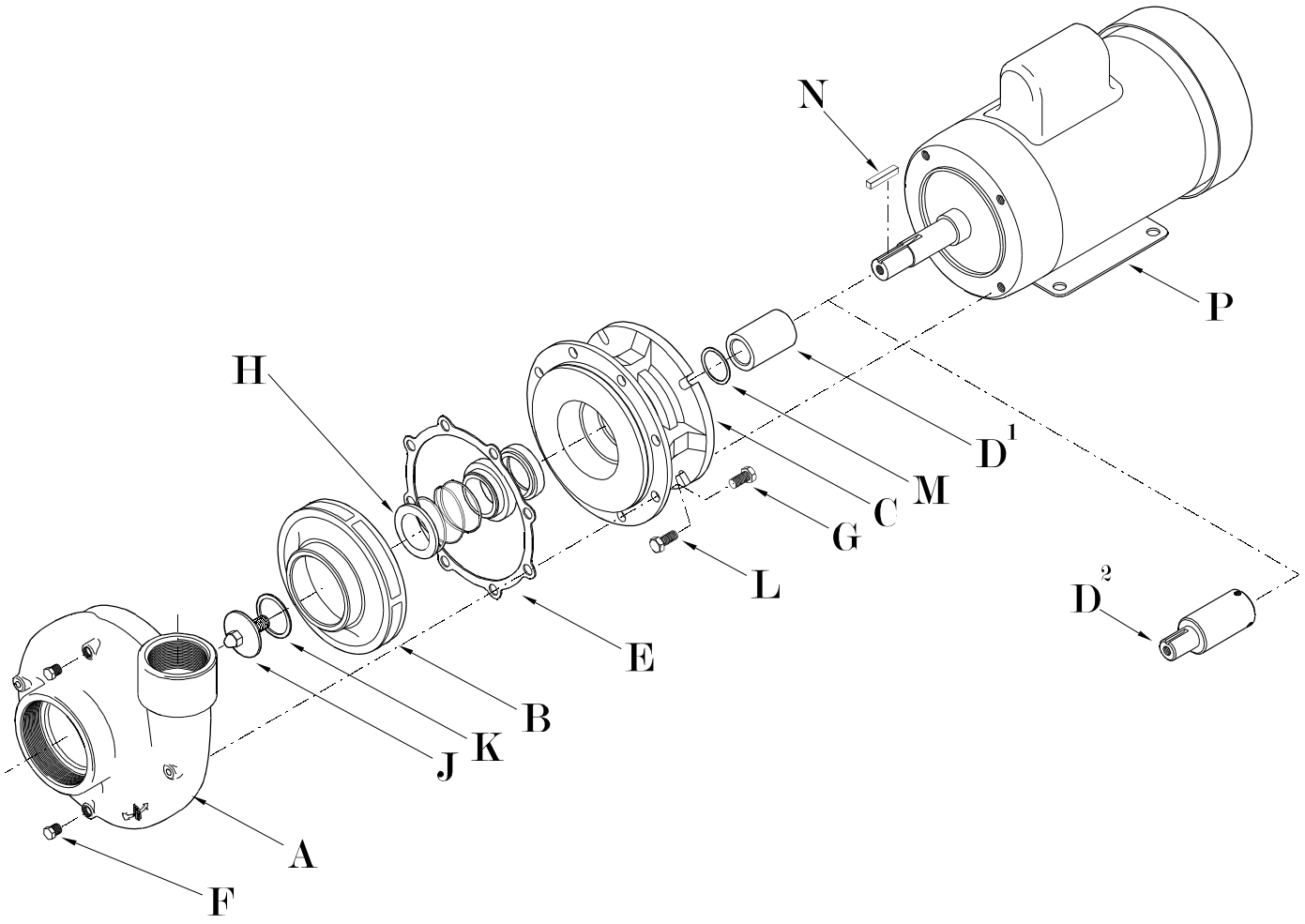

XT150 60 Hz 3500 RPM
Head - ft
NPSHr - ft
US gpm
5.98 in
5.5 in
5 in
4.5 in
4 in
3.5 in
3 in
40
45
50
55
60
65
35
10 hp
7.5 hp
5 hp
3 hp
2 hp
1.5 hp
1 hp
0.75 hp
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
0
10
20
30


XT200 60 Hz 3500 RPM
Head - ft
NPSHr - ft
US gpm
5.98 in
5.5 in
5 in
4.5 in
4 in
45
50
55
60
65
70
40
15 hp
10 hp
7.5 hp
5 hp
3 hp


XT100 50 Hz 2900 RPM
Head - ft
NPSHr - ft
US gpm
5.98 in
5.5 in
5 in
4.5 in
4 in
3.5 in
3 in
3 hp
2 hp
1.5 hp
1 hp
0.75 hp
0.5 hp
0.33 hp
35
40
45
50
55
60
19
30


XT150 50 Hz 2900 RPM
Head - ft
NPSHr - ft
US gpm
5.98 in
5.5 in
5 in
4.5 in
4 in
3.5 in
3 in
40
45
50
55
60
65
35
7.5 hp
5 hp
3 hp
2 hp
1.5 hp
1 hp
0.75 hp
0.5 hp
0.33 hp


XT200 50 Hz 2900 RPM
Head - ft
NPSHr - ft
US gpm
5.98 in
5.5 in
5 in
4.5 in
4 in
45
50
55
60
65
70
40
7.5 hp
5 hp
3 hp
2 hp
1.5 hp



ITEM	DESCRIPTION
A	Volute
B	Impeller
C	Bracket
D^1	Shaft Sleeve
D^2	Stub Shaft
E	Volute Gasket
F	Pipe Plug
G	Volute Bolts
H	Seal
J	Impeller Lockdown
K	Lockdown Gasket
L	Motor Bolts
M	Sleeve Gasket, Teflon
N	Impeller Shaft Key
P	Motor

ITEM 'P' MOTOR LISTING			
HP	115-230/1/60	230-460/3/60	MOTOR TYPE
1/2	212671-05	212673-05	TEFC
3/4	212671-07	212673-07	TEFC
1	212671-10	212673-10	TEFC
1-1/2	212671-15	212673-15	TEFC
2	212671-20	212673-20	TEFC
3	212671-30	212673-30	TEFC
5		212673-50	TEFC
7.5		212673-75	TEFC
10		212673-1X	TEFC

PUMP PARTS LISTING (BRONZE)

ITEM	PART NUMBER			DESCRIPTION
	XT100B	XT150B	XT200B	
A	216571-10	216571-15	216571-20	Volute
B	SEE CHART			Impeller
C	216571-30			Bracket
D[1]	216571-32			Shaft Sleeve
D[2]	216578-03 (56C MTR) 216578-04 (145TC MTR)			Stub Shaft
E	216578-02			Volute Gasket
F	216571-34			Pipe Plug
G	216571-35			Volute Bolts
H	216578-01			Seal
J	216571-37			Impeller Lockdown
K	216571-41			Lockdown Gasket
L	216571-38			Motor Bolts
M	216571-41			Sleeve Gasket, Teflon
N	216571-40			Impeller Shaft Key
P	SEE CHART			Motor

ITEM 'B' BRONZE IMPELLER LISTING

CODE	DIAMETER	PART NUMBER		
		XT100B	XT150B	XT200B
30	3.00"	216575-30	216576-30	
35	3.50"	216575-35	216576-35	
38	3.75"		216576-38	
40	4.00"	216575-40	216576-40	216577-40
45	4.50"	216575-45	216576-45	216577-45
50	5.00"	216575-50	216576-50	216577-50
55	5.50"	216575-55	216576-55	216577-55
59	5.96"	216575-59	216576-59	216577-59

PUMP PARTS LISTING (IRON)

ITEM	PART NUMBER XT100I	XT150I	XT200I	DESCRIPTION
A	216571-11	216571-16	216571-21	Volute
B	SEE CHART			Impeller
C	216571-31			Bracket
D[1]	216571-33			Shaft Sleeve
D[2]	216578-03 (56C MTR) 216578-04 (145TC MTR)			Stub Shaft
E	216578-02			Volute Gasket
F	216571-34			Pipe Plug
G	216571-36			Volute Bolts
H	216578-01			Seal
J	216571-37			Impeller Lockdown
K	216571-41			Lockdown Gasket
L	216571-39			Motor Bolts
M	216571-41			Sleeve Gasket, Teflon
N	216571-40			Impeller Shaft Key
P	SEE CHART			Motor

ITEM 'B' IRON IMPELLER LISTING

CODE	DIAMETER	PART NUMBER XT100I	XT150I	XT200I
40	4.00"		216580-40	216579-40
45	4.50"		216580-45	216579-45
50	5.00"	216581-50	216580-50	216579-50
55	5.50"		216580-55	216579-55
59	5.96"		216580-59	216579-59

Services

- New Installations
- Repairs
- Refits
- Engineering

Manufacturing

- Chiller Units, 2-300 ton
- Fan Coils, 5-48,000 BTU/H
- Air Handlers 1-15,000 CFM
- Split Systems 5-60,000 BTU/H
- Self Contained 5-24,000 BTU/H
- Custom Refrigeration Units
- PLC / Touchscreen Chiller Control packages
- Digital Thermostats

Sapphire Series Digital Thermostat

Chillwater Fan Coils

FlexAir Series Air Handlers for Ducted Systems & Fresh Air Makeup

PLC / Touchscreen Chiller Controls

Aqua-Air Manufacturing
James D. Nall Co., Inc.
1050 E 9th St., Hialeah, FL 33010
Phone 305-884-8363 800-328-1043
Fax 305-883-8549
Email sales@aquaair.com
www.aquaair.com

AQUA AIR
MARINE AIR CONDITIONING SYSTEMS

Marine Chillwater System Specialists

Modular Chiller Systems

75 Ton Semi-Hermetic 4 Stage Chiller 2008 Retrofit on 172' Motoryacht

AQUA-AIR

MARINE AIR CONDITIONING SYSTEMS

The **James D. Nall Company** has, since 1941, provided Yacht Owners with the highest quality Marine Air Conditioning Service and Equipment available.

In 1972 the company started manufacturing its now legendary Marine Chillwater Systems under the **Aqua-Air** brand name.

In 1983 the company began manufacturing a quality line of small direct expansion marine air conditioning systems.

In 2003 the **James D. Nall Company** renewed its commitment to full time dockside service support to the yachting community.

We are Committed to Providing the Highest Level of Quality Service Available !

The **James D. Nall Company** offers the following distinct advantages over all other marine air conditioning service companies:

- 66 years of experience in all facets of the marine air conditioning and refrigeration business
- Factory trained service technicians with the latest available troubleshooting technology
- Factory direct equipment sales offer the greatest value for your dollar.
- We maintain a library of ships' manuals for **Aqua-Air** customers dating back to the early 90's. Most of these are now available in digital PDF format.

New Installations

The company can provide a complete turnkey package for installing a new air conditioning system aboard your new project. Beginning with the design phase all the way through system commissioning . . . it's one stop shopping.

Repairs

We can provide service on all **Aqua-Air** systems and out-of-warranty service on **all** other brands of marine air conditioning equipment.

Refits

When it's time to replace the existing system aboard your yacht, we're the people to call. We'll replace your existing equipment with an **Aqua-Air** system specifically designed for your requirements.

Engineering

The backbone of our company is our engineering department. From piping, ducting and electrical schematics to final installation drawings, we can provide it all.

James D. Nall Co., Inc.
Aqua-Air Manufacturing
Limited Warranty

I. GENERALLY

A. This limited Warranty applies to any products manufactured by the James D. Nall Co., Inc., herein sometimes referred to as "COMPANY," "MANUFACTURER" or "AQUA-AIR." The Company furnishes this written notice that its products and systems are under a limited warranty to be free from design and manufacturing defects in material and workmanship under normal use and service or as otherwise authorized by the Manufacturer. The obligation of the Company is limited to replacing or repairing any component which will disclose defects within the time frames defined in section II (Warranty Period) and which, upon examination, may appear to the satisfaction of the Company to be defective or not as specified for its performance. Within thirty (30) days of the discovery a claim must be filed with the Company and the faulty component must be returned, transportation prepaid, to the Company. At the specific option of the Company it may, as an alternative to the return of the component, examine and inspect it in place at its usual location. Nothing herein contained will create any obligation of the Company to so examine or inspect the component away from the premises of the Manufacturer.

B. This Warranty will not apply to:
1. Failures resulting from abuse, fire or submergence.
2. Any part manufactured by the Company which will have been altered so as to impair original characteristics.
3. Any parts which fail as a result of misuse, improper application or improper installation.
4. Items not manufactured by the company, i.e., items which are purchased from another manufacturer and supplied as received by the Company without alteration or modification. The Company will disclose the existence of any warranty, limited or otherwise, if any, given by the manufacturer of any items not made by Aqua-Air.
5. Components or parts used by or applied by the purchaser as an integral part of products not manufactured by the Company.
6. The failure of the buyer to give the required notice or to comply with other conditions of this limited warranty.
7. Any brazed plate heat exchanger failures in a chillwater system where there is less than 15% glycol in the chillwater loop. Any components on the chiller damaged by the intrusion of water will also not be covered.

C. This limited warranty is made in lieu of all other express warranties, obligations or liabilities on the part of Aqua-Air. In addition, Aqua-Air disclaims, without limitation, any liabilities arising from incidental or consequential damages except as may occur while the product is being operated by and under the control of the Company. In such instances where a cash refund is made, the refund will effect the cancellation of the contract of sale with no subsequent reservations of rights being retained by the purchaser. The terms and conditions of this limited warranty will be governed by the laws of the State of Florida.

D. No dealer is the agent for Aqua-Air except for the purpose of administering this limited warranty to the extent herein provided. Aqua-Air does not authorize any dealer or other person to assume for Aqua-Air any liability in connection with this limited warranty or any liability or expense incurred in the replacement or repair of its products other than those expressly authorized herein.

E. The Company reserves the right to improve its products through changes in design or material without being obligated to incorporate such changes in products of prior manufacture and to make changes at any time in design, materials or part of units of any one year model, without obligation or liability to owners of units of the same year's model of prior manufacture.

F. This warranty gives you, the purchaser, specific legal rights. You also have implied warranty rights, including an implied warranty of merchantability, which means that your product must be fit for the ordinary purpose for which such goods are used. The duration of this implied warranty is limited to the duration of the expressed warranty as found in section II, WARRANTY PERIOD.

G. This warranty extends only to the original purchaser (other than for purposes of resale) of Aqua-Air warranty equipment and any other such person who is entitled, under applicable State law, to enforce against the warrantor the obligations of the warranty.

II. WARRANTY PERIOD

A. The limited warranty covers the following periods (whichever comes first):

1. Twelve (12) months from the date that the selling dealer puts the system into operation or

2. Eighteen (18) months from the date that the system is sold to the original purchaser.

In the case of factory installed equipment, the warranty period begins when the selling dealer first puts the equipment into operation. The warranty beginning date may be prior to the date of delivery to the retail purchaser. No warranty claim can be honored unless the owners' registration form is on file with the Company. This form, which is enclosed, should therefore be returned to Aqua-Air immediately upon purchase of items covered by this warranty.

B. All Aqua-Air components have a name plate on which there is a model and serial number. The serial number is date coded, indicating when the unit was originally sold.

C. To determine whether or not any Aqua-Air component is in warranty you may contact Aqua-Air at:

Aqua-Air Manufacturing, division of the James D. Nall Co., Inc
1050 E. 9th St., Hialeah, FL 33010
Phone: 305-884-8363 Fax: 305-883-8549 Email: service@aquaair.com

III. WARRANTY COVERAGE

The Aqua-Air warranty covers the basic component units manufactured by Aqua-Air. Installation and application of Aqua-Air components are not warranted by Aqua-Air because Aqua-Air has no control or authority over the selection, location, application or installation of these components. The following are installation or application considerations not covered by the Aqua-Air warranty:

1. Flare or solder joint leaks in the connecting copper tubing.
2. Condensate leakage resulting from the inadequately insulated connecting tubing or improperly installed condensate drains.
3. Water flow problems resulting from the improper plumbing considerations or inadequate filters or strainers.
4. Low voltage or loss of power as a result of inadequate wiring, circuit breakers, fuses or wire connectors.
5. Low capacity output resulting from improperly sized or located air grilles, vents, ducts, plenums or cooling units.
6. Inadequate cooling or heating capacity resulting from the selection of undersized equipment. Aqua-Air may make recommendations as to the capacity of the equipment for a specific installation, however, the final decision concerning exactly what equipment will be used and the responsibility for the effectiveness of the equipment selected lies solely with the purchaser. The only exception and only case in which Aqua-Air would assume full responsibilities would be in the event Aqua-Air were retained under a separate contract to make such determinations.
7. Inadequate cooling or heating resulting from systems being improperly charged with refrigerant gas.
8. Pump seal leakage due to the pumps being run with insufficient water in the head.

IV. LIMITED WARRANTY ALLOWANCES

Limited warranty allowances as outlined in publications F-104 and F-110 are also available to defer expenses incurred in the repair or replacement of all such components for the period of the system warranty. Replacement parts and components for out-of-warranty systems are also warranted for one year but no allowance to defer expenses incurred in the repair or replacement of such components is available. Components or parts not used as an integral part of an Aqua-Air system are not covered by the Company warranty.