



# Engineering Specification

## PC-80-P-\*S-T-KDER\* Pool Conditioner

Pool Room Dehumidifier with Air or Pool Water Heat Recovery  
GEN2 Control System



Maritime Geothermal Ltd.  
P.O. Box 2555, 170 Plantation Road  
Petitcodiac, NB E4Z 6H4  
(506) 756-8135



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002303SPC-03

# Model Nomenclature

PC—80—P—1S—T—KDE—RS—xx

**Series:**

PC = Pool Conditioner

**Nominal Size:**

45 = 031 compressor  
55 = 042 compressor  
65 = 054 compressor  
75 = 061 compressor  
80 = 072 compressor

**Refrigerant:**

P = R410a

**Voltage Code:**

1 = 208/230-1-60  
2 = 208-3-60  
4 = 460-3-60  
6 = 220-1-50  
7 = 380-3-50

**Compressor:**

S = single stage scroll

**Revision:**

01, 02 etc.

**Air Discharge:**

S = Side (end)  
T = Top (up)  
D = Down

**Air Return:**

R = Right Side

**Blower Motor:**

E = ECM (Variable Speed)

**Blower Type:**

D = Direct Drive

**Air Coil:**

K = Coated

**Indoor Loop (Pool)**

**Exchanger:**

T = Titanium

AC2—80—P—1/6—KDE—xx

**Series:**

AC2 = PC Outdoor Condenser

**Nominal Size:**

45 = for PC-45  
55 = for PC-55  
65 = for PC-65  
75 = for PC-75  
80 = for PC-80

**Revision:**

01, 02 etc.

**Blower Motor:**

E = ECM (Variable Speed)

**Blower Type:**

D = Direct Drive

**Air Coil:**

S = Standard  
K = Coated

**Voltage Code:**

1/6 = 220/230-1-50/60



APPLICATION TABLE - PC-SERIES INDOOR UNIT									
MODEL	REFRIGERANT	VOLTAGE	COMPRESSOR	INDOOR COIL	COILS/BLOWER/ AIR RETURN	AIR DISCHARGE	REVISIONS		
PC-80	P	1 2 4 6 7	S	T	K D E R	T S D	09	10	

APPLICATION TABLE - OPTIONAL AC2-SERIES OUTDOOR UNIT									
MODEL	REFRIGERANT	VOLTAGE	AIR COIL	BLOWER TYPE	BLOWER MOTOR	REVISIONS			
AC2-65/65/80	P	1/6	K	D	E	02			
This manual applies only to the models and revisions listed in this table.									

APPLICATION TABLE - OPTIONAL GROUND LOOP HEAT EXCHANGER / WATER COIL			
PC MODEL SIZE	ACCESSORY WATER COIL		CIRCULATOR
PC-80	03-7040	(BTSSC-84)	UP26-99/NRF-36 OR EQUIV

APPLICATION TABLE - FIRMWARE AND PC APP			
Firmware	Version*	Associated PC APP	Version
MGT GEN2 Bootload Firmware	V3.60+	MGT GEN2 PC APP	V2.00+

Maritime Geothermal Ltd. has a continuous improvement policy and reserves the right to modify specification data at any time without prior notice .

# Design Features

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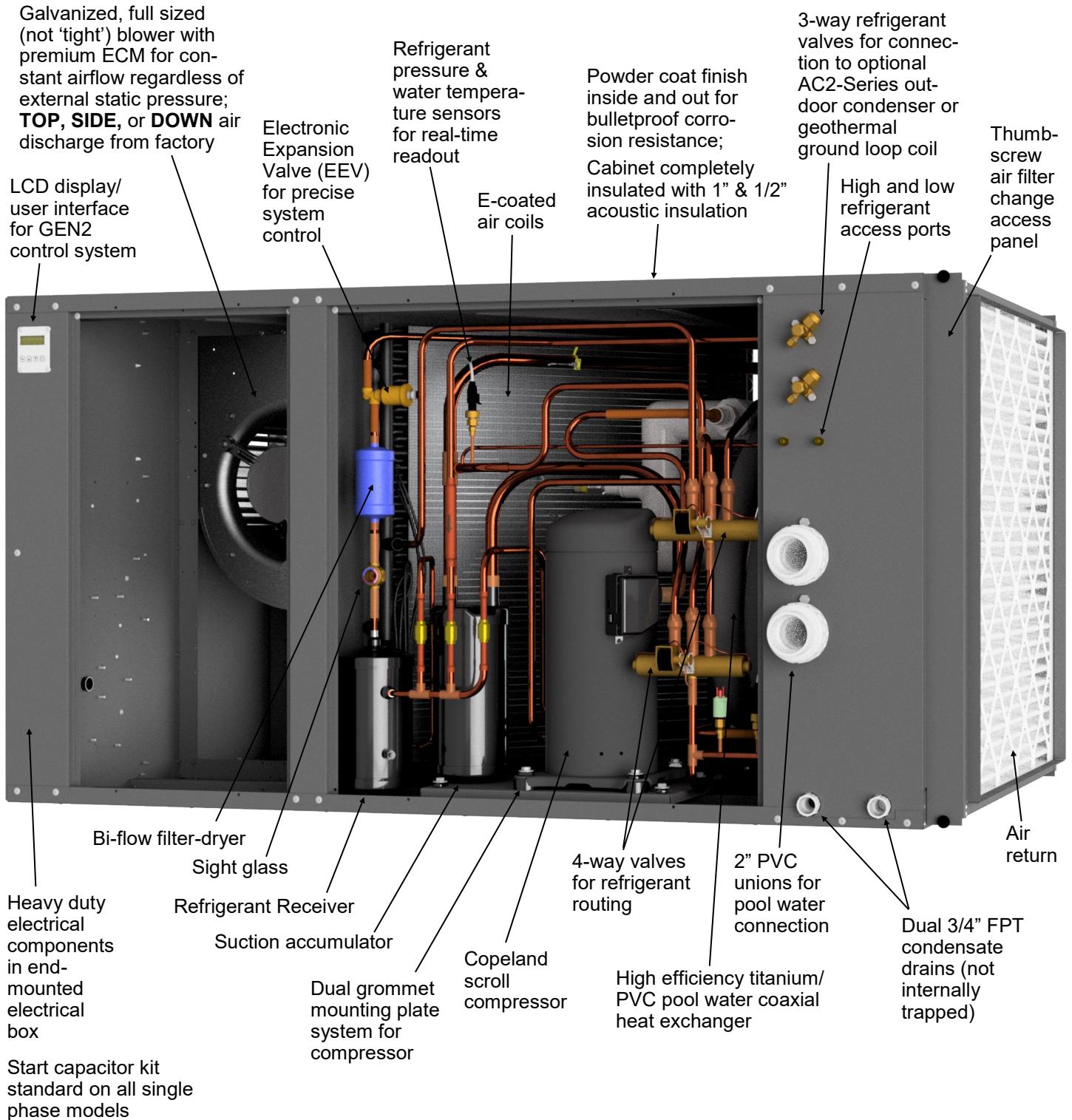
- Pool room dehumidifier, an energy efficient alternative to ventilating air for pool room humidity control
- Rejects its heat to pool water (providing all the heat for pool), pool room air, or optional outdoor unit / existing geothermal ground loop
- TUV certified for safety (CSA 22.2), CE certified
- Satin galvanized steel cabinet with powder coat finish, for corrosion resistance superior to stainless steel
- Acoustically insulated cabinet
- All connections located on front side
- Four access panels, requiring service access to front side only
- Component layout allows easy access for service
- Refrigeration service ports accessible from outside unit (1/4" Schrader)
- Titanium/PVC coaxial pool water heat exchanger, corrosion resistance superior to copper or CuNi
- 2" PVC unions for pool water connections, for quick and easy disconnect
- Galvanized, full sized (not 'tight') blower with premium ECM for constant airflow regardless of external static pressure
- TOP, SIDE, or DOWN air discharge from factory
- Dry contact to control pool pump, if required
- Scroll compressor with start capacitor kit on single phase models
- Control transformer with resettable breaker or fuse protection
- Dual-grommet-mounted compressor for reduced noise and vibration
- Suction line accumulator & refrigerant receiver
- Liquid line filter-dryer
- Liquid line sight glass
- Electronic Expansion Valve (EEV) for precise superheat control and maximum capacity
- 4-way (reversing) valves for refrigerant routing
- Refrigerant pressure/temperature & pool water temperature sensor with real-time readout
- Advanced control board with BACnet interface for remote operation and data access including all sensor data and alarm conditions, PWM outputs (or 0-10VDC), configurable analog inputs (0-5VDC or 4-20mA) with onboard 5VDC, 12VDC and 24VDC power supplies
- USB port for complete data access via free PC software including real-time charting, data logging, and diagnostic functionality with manual override operation
- 2 x 16 LCD display for control and data access
- Communicating air thermostat with temperature & humidity, with wire, included
- Onboard pool water temperature control means no external sensor or aquastat required

## Available Accessories

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- AC2-Series outdoor condenser, to enable air cooling when pool is already heated to desired setpoint
- Externally mounted flow switch, for applications where PC unit does not have control of pool pump
- Ground loop heat exchanger to reject heat to an existing geothermal ground loop, an alternative to using the AC2-Series outdoor unit
- Anti-vibration pad for under unit
- Compressor sound jacket
- Compressor Secure Start module
- Electric plenum heaters 5 / 7 / 10 / 15 / 20 kW, externally mounted—required for pool room air aux. heat
- Reusable, passive electrostatic air filter

# Design Features



TUV certified for electrical safety to CSA 22.2.

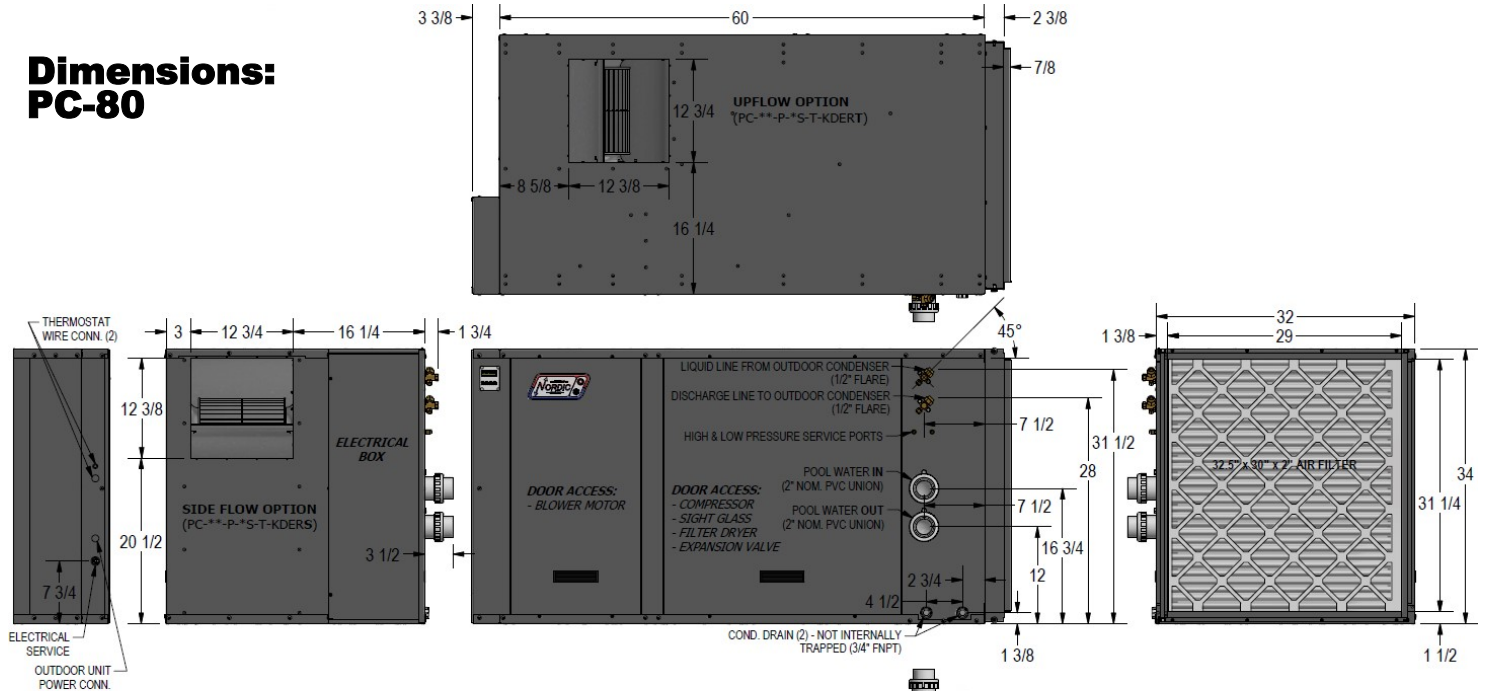


CE certified

# Dimensions

All dimensions in inches

## Dimensions: PC-80



### RECOMMENDED CLEARANCES

FRONT **2 FT**

LEFT SIDE **2 FT**

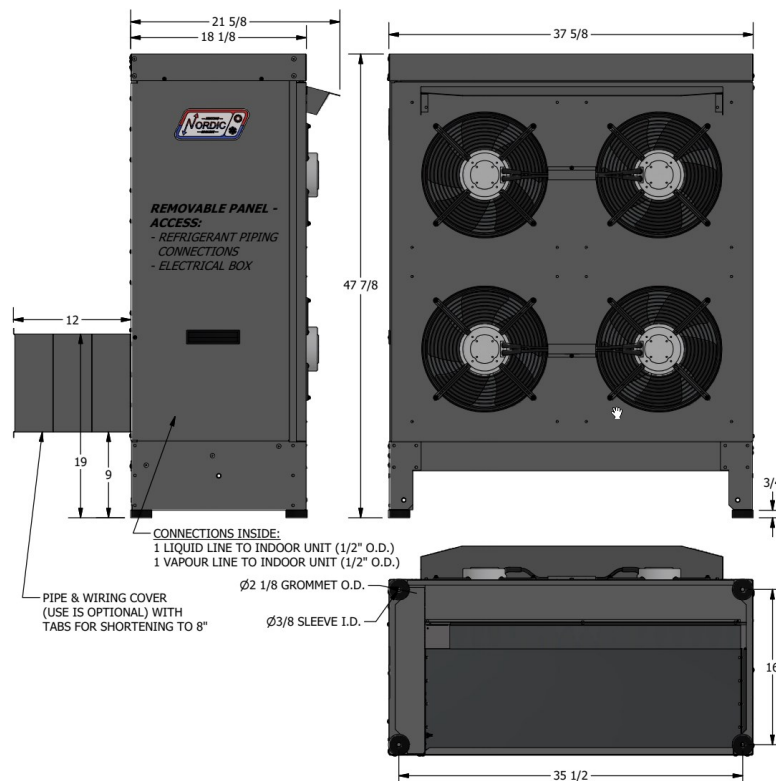
## Dimensions: AC2-80

### RECOMMENDED CLEARANCES

FRONT **10-16 FT**

BACK SIDE **12"**

LEFT SIDE **2 FT**



# Specifications

Shipping Information (PC)				
MODEL	WEIGHT	DIMENSIONS in (cm)		
	lb. (kg)	L	W	H
PC-80	610 (277)	70 (178)	44 (112)	40 (102)

Shipping Information (AC2 Outdoor Unit)				
MODEL	WEIGHT	DIMENSIONS in (cm)		
	lb. (kg)	L	W	H
AC2-80	295 (134)	36 (91)	70 (178)	56 (142)

Refrigerant Charge				
MODEL	lb	kg	Refrigerant	Oil Type
PC-80	12.0	5.4	R410a	POE

Control Temperature Limits			
Parameter	Device	MIN.	MAX.
Room Relative Humidity (RH)	Room Thermostat or BACnet	10%	80%
Room Air Temperature	Room Thermostat or BACnet	50°F (10°C)	95°F (35°C)
Pool Water Temperature	Internal Setpoint Control or optional aquastat or BACnet	70°F (21°C)	108°F (42°C)

AC2-Series Outdoor Unit Sound Levels (dBA)*								
MODEL	1 ft distance		3 ft distance		5 ft distance		10 ft distance	
	Front	Side	Front	Sides	Front	Sides	Front	Sides
AC2-80	71.7	66.8	68.7	63.7	65.7	61.2	60.0	57.1

\* At maximum fan speed. This occurs in heating mode, or in cooling mode with outdoor greater than ~27°C.

PC-Series Electrical Data										
MODEL	Nomenclature Identifier	Power Supply			Compressor		FLA	MCA	Maximum Fuse/Breaker	Minimum Wire Size
		V-ø-Hz	MIN	MAX	RLA	LRA	Amps	Amps	Amps	ga
PC-80	1	208/230-1-60	187	253	36.9	185	44.1	53.3	80	#4-2
	2	208-3-60	187	229	23.2	164	30.4	36.2	60	#6-3
	4	460-3-60	414	506	11.2	75	18.4	21.2	30	#10-3
	6	220-1-50	187	253	28.2	155	35.4	42.5	60	#6-2
	7	380-3-50	342	418	11.2	75	18.4	21.2	30	#10-3

Plenum Heater Electrical Data															
Size (kW)	(230-1-60)					(208-1-60)					(220-1-50)				
	Actual (kW)	FLA (A)	MCA (A)	Breaker (A)	Wire Size	Actual (kW)	FLA (A)	MCA (A)	Breaker (A)	Wire Size	Actual (kW)	FLA (A)	MCA (A)	Breaker (A)	Wire Size
5	5	20.8	26.0	30	#10	3.8	18.1	22.6	30	#10	4.2	19.1	19.1	30	#10
7	7	29.2	36.5	40	#8	5.3	25.3	31.6	40	#8	5.9	26.7	26.7	40	#6
10	10	41.7	52.1	60	#6	7.5	36.1	45.1	50	#6	8.4	38.1	38.1	50	#6
15	15	62.5	78.1	80	#4	11.3	54.2	67.7	80	#4	12.6	57.2	57.2	80	#3
20	20	83.3	104.2	100	#3	15.0	72.2	90.3	100	#3	16.8	76.3	76.3	100	#3

PC-Series Capacity Ratings										
MODEL	Power Supply (Hz)	Indoor (Pool) Flow		Indoor (Pool) Pressure Drop	Airflow	Input Energy	Capacity	Moisture Removal @ 50%RH	Moisture Removal @ 60%RH	Typical Pool Surface Area
		gpm	L/s							
PC-80	60	45	2.8	5.3 (37)	2400 (1130)	5790	103,300 (30.3)	32 (14)	38 (17)	1350 (130)
	50	45	2.8	5.3 (37)	2400 (1130)	5050	88,000 (25.8)	26 (12)	32 (14)	1,100 (102)

\*EWT (Tp)=80°F (26.7°C) and EAT (Ta)=82°F (27.8°C)

Required Water Flow Rates						
MODEL	POOL WATER FLOW		OPTIONAL GROUND LOOP HEAT REJECTION WATER COIL			
	gpm	L/s	MGL P/N	COIL	gpm	L/s
PC-80	45	2.8	03-7040	BTSSC-84	17	1.1

Pool Water Pressure Drop (all PC model sizes)		
Flow (gpm)	psi	kPa
20	1.5	10
25	2.2	15
30	2.9	20
35	3.8	26
40	4.7	32
45	5.8	40
50	6.9	48
60	9.5	66

PC-80 →

Pressure Drop for Optional Ground Loop Heat Rejection Coil			Water 104°F		Water 50°F		15% Methanol 32°F		35% prop. glycol 32°F	
	gpm	L/s	psi	kPa	psi	kPa	psi	kPa	psi	kPa
PC-80 (coil 03-7040)	11	0.69	2.9	20	3.2	22	4	28	5.3	36
	12	0.76	3.6	25	3.9	27	4.6	32	6.0	42
	13	0.82	4.1	28	4.4	30	5.2	36	6.8	47
	14	0.88	4.7	32	5	34	5.8	40	7.6	53
	15	0.95	5.5	38	5.7	39	6.5	45	8.5	59
	16	1.01	6.3	43	6.5	45	7.3	50	9.6	66
	17	1.07	7.1	49	7.3	50	8.1	56	10.7	74

Indoor Airflow												
Mode	Nominal		Range		Airflow Reduction - 20%		Airflow Reduction - 15%		Airflow Reduction - 10%		Airflow Reduction - 5%	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
NORMAL	2300	1085	1850-2500	873-1180	1840	870	1955	920	2070	980	2185	1030
AUX. HEAT	2300	1085	2100-2500	991-1180	1840	870	1955	920	2070	980	2185	1030
RECIRC.	1300	615	1050-1550	496-732	1040	490	1105	520	1170	550	1235	585

# BACnet Interface

The BACnet interface is an **MS/TP** connection via RS-485 twisted pair. BACnet **IP** is not available.

Recommended wire: 22-24 AWG single twisted pair, 100-120 Ohms impedance, 17pF/ft or lower capacitance, with braided or aluminum foil shield, such as Belden 9841 or 89841.

The connector on the control board is a three wire removable screw connector. The signals are as follows:

- A: Communications line (+) (right pin)
- B: Communications line (-) (middle pin)
- C: Ground connection (left pin)

If connecting multiple units to one RS-485 connection point, connect the signal cable from the master building controller to the first unit. Connect the second unit to the first unit (in same connector), connect the third unit to the second unit, and so on until all units are connected (daisy-chain). Remove the TERM jumper (located just above the BACnet connector on control board) from all units except the last one. The shield ground should be connected only to the GND pin of the unit for single unit installations. For multiple units, the shield ground should only be connected to the GND pin of the last unit. The shield grounds for intermediate units should be connected together. The shield ground should be left unconnected at the building controller end for all cases.

Vendor: Maritime Geothermal Ltd.  
Vendor ID: 260  
Model Name: MGT GEN2 Control Board

The following parameters can be set via the PC App's *Configuration Window*:

- 1) **Baud rate**  
9600, 19200, 38400, or 76800
- 2) **MAC address**  
Maximum value is 125.
- 3) **Instance number**  
Maximum value is 4194303.

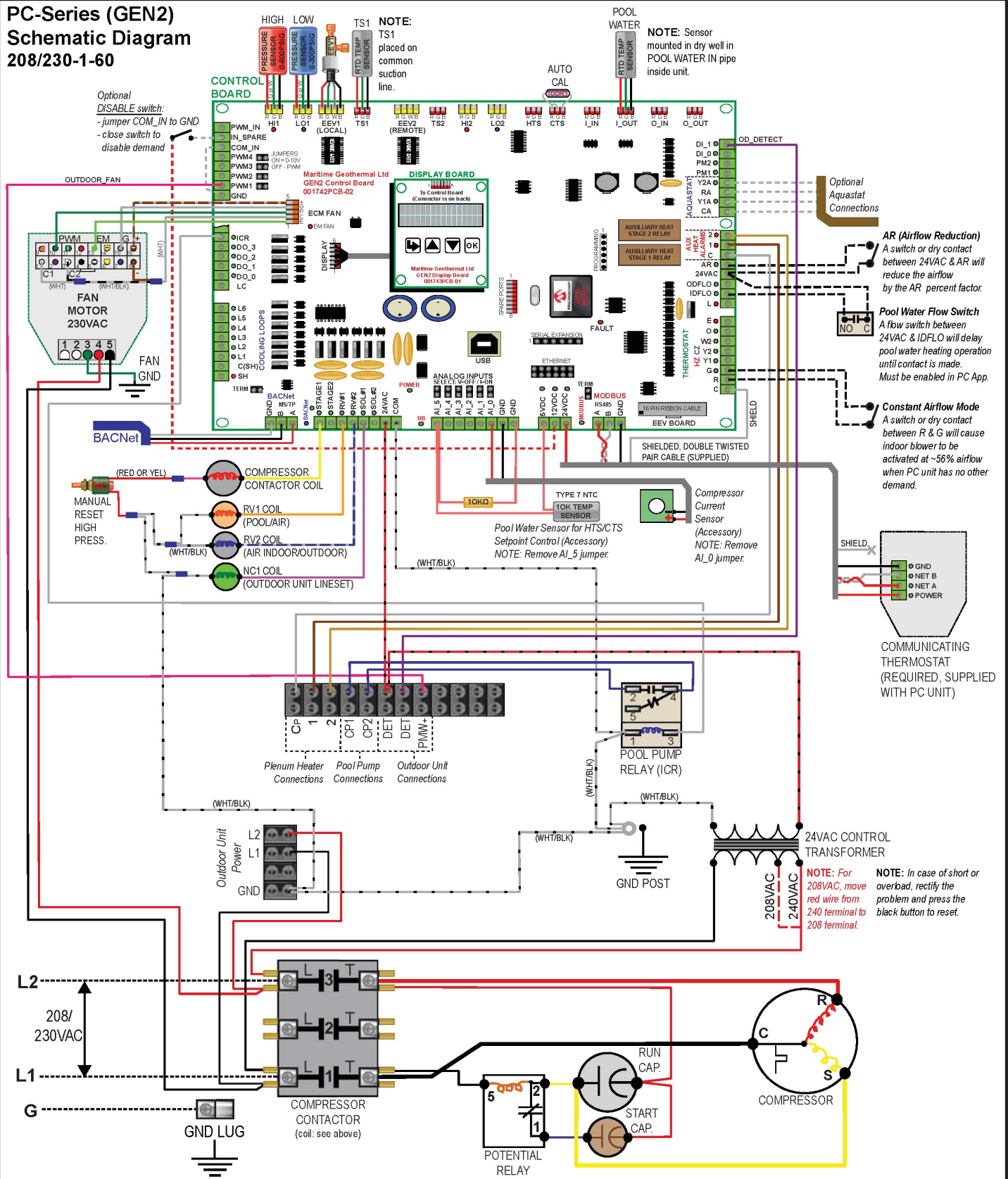
The BACnet parameter **Max\_Master** has a fixed value of **127** in this device.

BACnet data is available regardless of the selected control method. In order to control the unit via the BACnet interface, set **Control Source** to **BACnet** either by using the PC App's configuration window or the LCD menus.

**Refer to *Application, Installation, & Service Manual* for BACnet objects (read and write).**



# PC-Series (GEN2) Schematic Diagram 208/230-1-60



Drawn By C. GEDDES Checked By C. GEDDES Eng. Approved By C. GEDDES Mfg. Approved By Approved By				Date 20-Oct-2011 Date 20-Oct-2011 Date 20-Oct-2011 Date Date	MARITIME GEOTHERMAL LTD. P.O. Box 2555 170 Plantation Rd. Pettitcodiac, NB CANADA E4Z 6H4			
03	ISSUE 04	D. RHEAULT	D. RHEAULT	21-Sep-2023	Drawing Name PC-**-P-1S-T-KDER* Schematic Diagram			
03	ISSUE 03	D. RHEAULT	D. RHEAULT	17-May-2023				
03	ISSUE 02	D. RHEAULT	D. RHEAULT	27-Sep-2021	Size LET Drawing Number 001423SCH Drawing Rev 03(14) Sheet 1 / 1			
03	000271	D. RHEAULT	D. RHEAULT	6-Mar-2019				
REV	ECO#	IMPL BY	APVD BY	DATE				



# Electrical Box Layout (208/230-1-60)

## PC-Series Electrical Box Diagram 208/230VAC Single Phase 60 Hz

### THERMOSTAT/ROOM SENSOR (REQUIRED)

Connect the communicating thermostat directly to board with supplied shielded, double twisted pair cable:  
24VDC - power supply to thermostat

- A - communication: use **one twisted pair**  
B - GND - ground (connect in other twisted pair w/ 24VDC)

### OPTIONAL CONTROL BY BACnet OR SIGNALS

BACnet Object	Signal	Activation
SYSTEM_G	-	Fan Recirculation Mode
SYSTEM_Y1	-	Air Reheat/Aux.Heat or Air Cool Demand
SYSTEM_O	-	Air Heating (OFF) / Air Cooling (ON)
SYSTEM_Y1A	Y1A	Pool Water Heat Demand
SYSTEM_DH	-	Air Dehumidify Demand

### OPTIONAL CONTROL CONNECTIONS (24VAC)

To use optional external aquastat, use 18-3 cable to connect to terminals on the right side of control board:

- CA - 24VAC Common  
RA - 24VAC Hot  
Y1A - Pool Water Heat Demand (compressor stage1)  
A dry contact connection between RA and Y1A will request pool water heating.

### BACnet INTERFACE CONNECTIONS (MS/TP RS-485)

Use a shielded, twisted pair cable to connect the BACnet connections to the control board connector.

- A - communication: use **one twisted pair**  
B - GND - Ground

### OUTDOOR UNIT SIGNAL CONNECTIONS (24VAC)

Use an 18-3 **outdoor rated** cable to connect the outdoor unit signal connections to the matching Outdoor Unit signal connections in the pool conditioner electrical box.

### OUTDOOR UNIT POWER CONNECTIONS (230VAC)

Use a 14-2 outdoor rated cable to connect the power supply terminals of the outdoor unit to the matching terminals of the Outdoor Unit Power terminal strip in the electrical box of the pool conditioner.

### 208/230V POWER SUPPLY CONNECTIONS

Wire	Colour	Contactor (Label)
Line 2	Red	L2
Neutral*	-	no connection
Line 1	Black	L1

Connect "GND" to Gnd.Lug

### PLENUM HEATER CONTROL (24VAC)

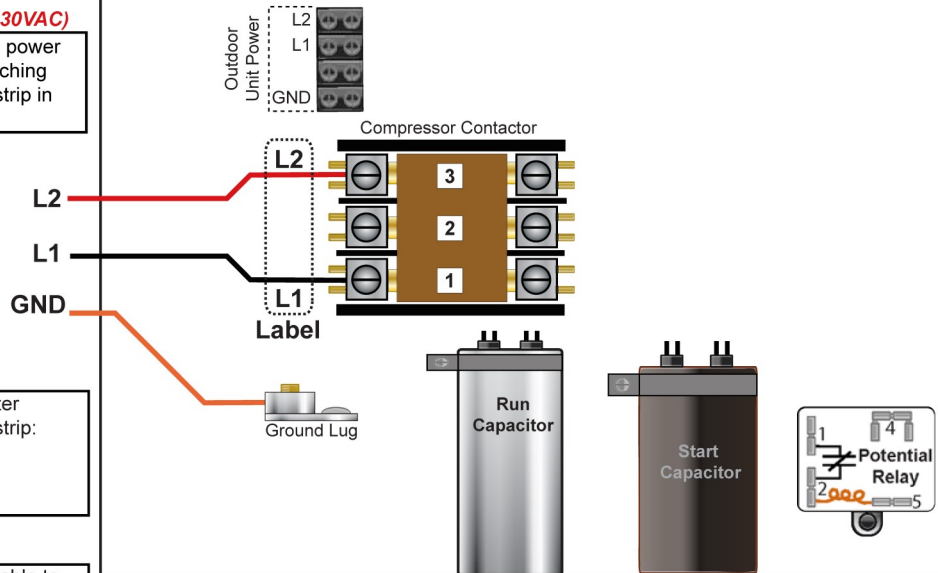
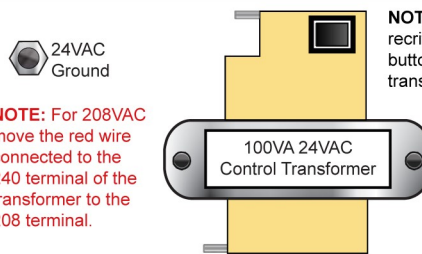
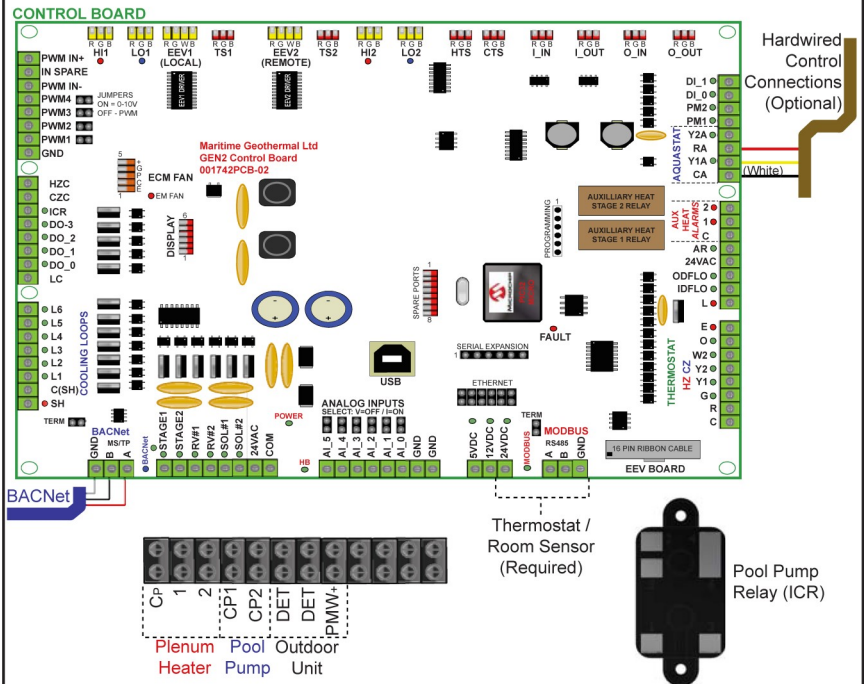
Use an 18-3 cable to connect the plenum heater control board to the pool conditioner terminal strip:

- CP - 24VAC Common  
1 - electric heat stage 1  
2 - electric heat stage 2

### POOL PUMP CONTROL (24VAC)

If pool pump control is required, use an 18-2 cable to relay a 24VAC signal to activate an external contactor:

- CP1 - dry contacts for pool pump  
CP2 -

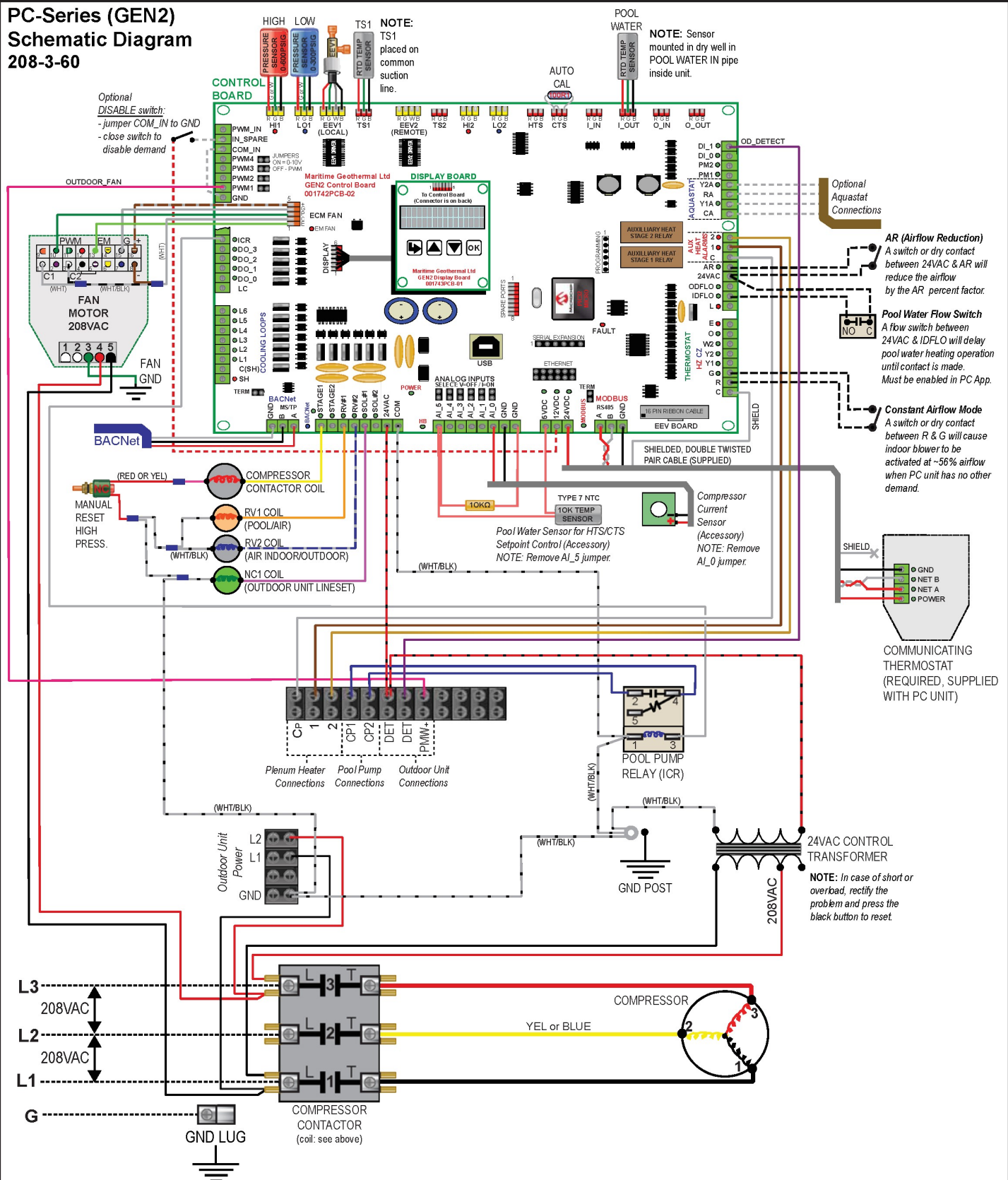



02	000236	D. RHEULT	D. RHEULT	11-Apr-2018
01	Initial Release	C. GEDDES	C. GEDDES	20-Oct-2011
REV	ECO#	IMPL BY	APVD BY	DATE

Drawn By	C.GEDDES	Date	20-Oct-2011
Checked By	C.GEDDES	Date	20-Oct-2011
Eng. Approved By	C.GEDDES	Date	20-Oct-2011
Mfg. Approved By		Date	
Approved By		Date	

MARITIME GEOTHERMAL LTD.		P.O. Box 2555 170 Plantation Rd. Pettitcodiac, NB CANADA E4Z 6H4	
Drawing Name PC-**-P-1S-T-*DE** Electrical Box Diagram			
Size	Drawing Number	Drawing Rev	Sheet
LET	001424ELB	02	1 / 1

## PC-Series (GEN2) Schematic Diagram 208-3-60



					Drawn By <b>C. GEDDES</b>	Date <b>22-Jan-2014</b>	<div>  <div>             P.O. Box 2555              170 Plantation Rd.              Petitcodiac, NB CANADA E4Z 6H4           </div> </div>			
					Checked By <b>C. GEDDES</b>	Date <b>22-Jan-2014</b>	Drawing Name  <b>PC-**-P-2S-T-KDER*</b>  <b>Schematic Diagram</b>			
03	ISSUE 04	D. RHEAULT	D. RHEAULT	21-Sep-2023	Eng. Approved By <b>C. GEDDES</b>	Date <b>22-Jan-2014</b>				
03	ISSUE 03	D. RHEAULT	D. RHEAULT	17-May-2023	Mfg. Approved By	Date				
03	ISSUE 02	D. RHEAULT	D. RHEAULT	27-Sep-2021						
03	000271	D. RHEAULT	D. RHEAULT	6-Mar-2019	Approved By	Date	Size	Drawing Number	Drawing Rev	Sheet
REV	ECO#	IMPL BY	APVD BY	DATE			LET	001825SCH	03(14)	1 / 1



Electrical Box Layout (208-3-60)

PC-Series Electrical Box Diagram  
208VAC Three Phase 60 Hz

Thermostat/Room Sensor (REQUIRED)

Connect the communicating thermostat directly to board with supplied shielded, double twisted pair cable:  
24VDC - power supply to thermostat  
A - communication: use **one twisted pair**  
B - ground (connect in other twisted pair w/ 24VDC)

OPTIONAL CONTROL BY BACnet OR SIGNALS

BACnet Object	Signal	Activation
SYSTEM_G	-	Fan Recirculation Mode
SYSTEM_Y1	-	Air Reheat/Aux.Heat or Air Cool Demand
SYSTEM_O	-	Air Heating (OFF) / Air Cooling (ON)
SYSTEM_Y1A	Y1A	Pool Water Heat Demand
SYSTEM_DH	-	Air Dehumidify Demand

OPTIONAL CONTROL CONNECTIONS (24VAC)

To use optional external aquastat, use 18-3 cable to connect to terminals on the right side of control board:  
CA - 24VAC Common  
RA - 24VAC Hot  
Y1A - Pool Water Heat Demand (compressor stage1)  
A dry contact connection between RA and Y1A will request pool water heating.

BACnet INTERFACE CONNECTIONS (MS/TP RS-485)

Use a shielded, twisted pair cable to connect the BACnet connections to the control board connector.  
A - communication: use **one twisted pair**  
B - Ground

OUTDOOR UNIT SIGNAL CONNECTIONS (24VAC)

Use an 18-3 outdoor rated cable to connect the outdoor unit signal connections to the matching Outdoor Unit signal connections in the pool conditioner electrical box.

OUTDOOR UNIT POWER CONNECTIONS (230VAC)

Use a 14-2 outdoor rated cable to connect the power supply terminals of the outdoor unit to the matching terminals of the Outdoor Unit Power terminal strip in the electrical box of the pool conditioner.

208V POWER SUPPLY CONNECTIONS

Wire	Colour	Contactor (Label)
Line 3	Red	L3
Line 2	Blue	L2
Line 1	Black	L1

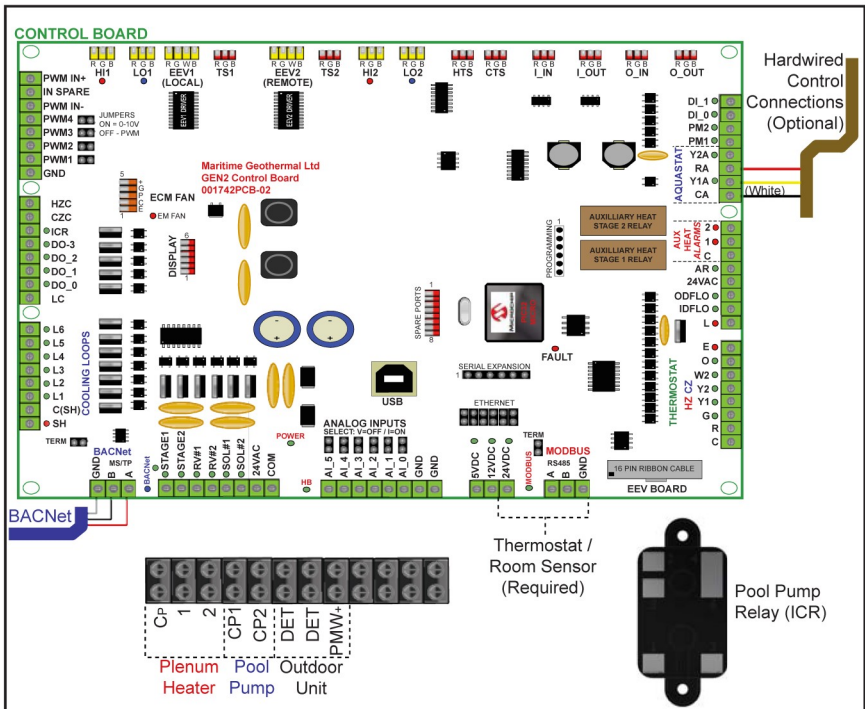
Connect "GND" to ground lug.

PLENUM HEATER CONTROL (24VAC)

Use an 18-3 cable to connect the plenum heater control board to the pool conditioner terminal strip:  
CP - 24VAC Common  
1 - electric heat stage 1  
2 - electric heat stage 2

POOL PUMP CONTROL (24VAC)

If pool pump control is required, use an 18-2 cable to relay a 24VAC signal to activate an external contactor:  
CP1 - dry contacts for pool pump  
CP2 -

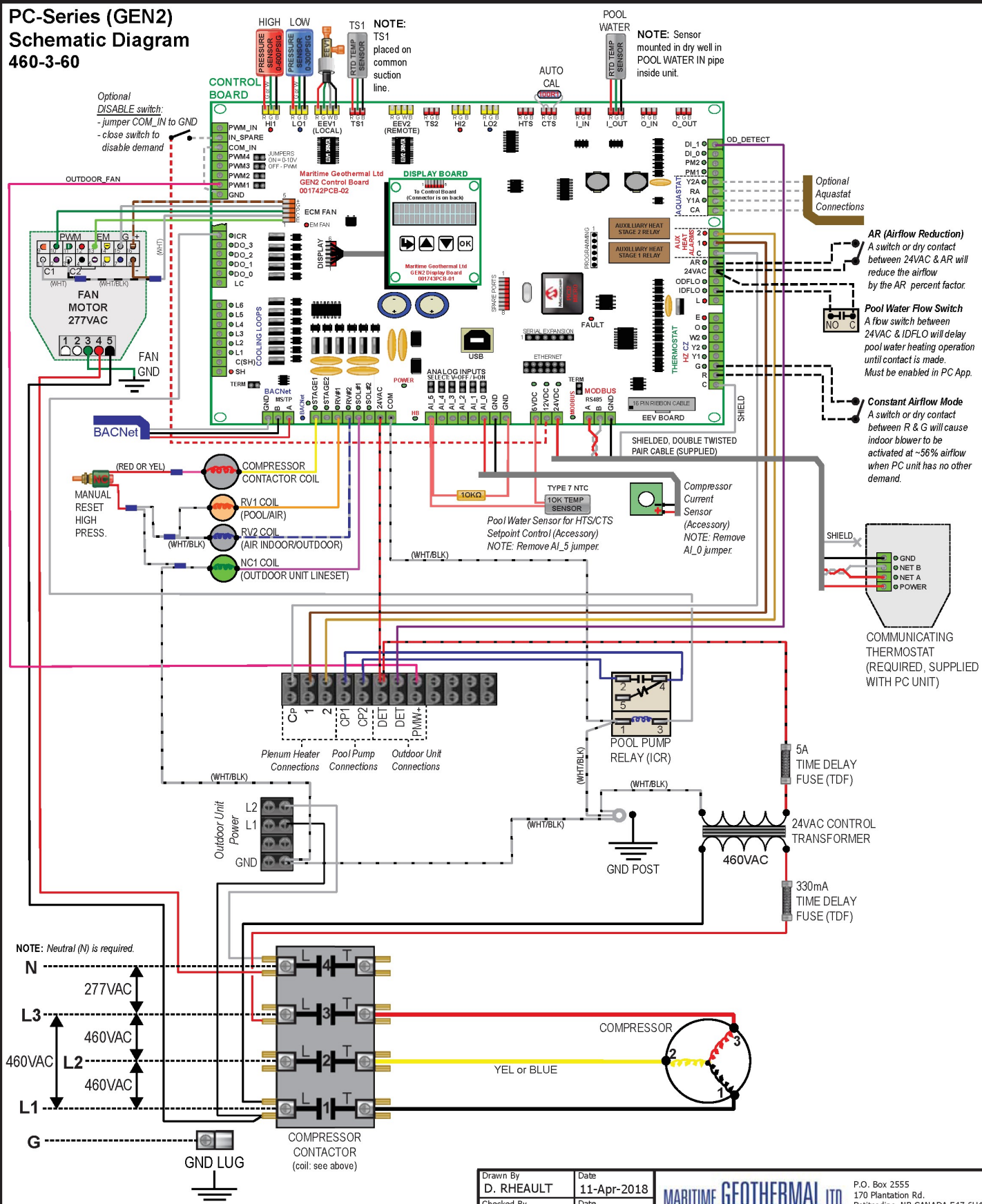


NOTE: In case of short or overload, rectify the problem and press the black button on the transformer to reset the built-in breaker.

IMPORTANT NOTE FOR 3 PHASE POWER  
If on initial startup the compressor is noisy and not pumping, reverse L1 and L2 supply wires.

					C.GEDDES	22-Jan-2014	Drawing Name  PC-**-P-2S-T-*DE** Electrical Box Diagram					
					Eng. Approved By C.GEDDES	Date 22-Jan-2014						
02	000236	D. RHEULT	D. RHEULT	11-Apr-2018	Mfg. Approved By	Date						
01	Initial Release	C. GEDDES	C. GEDDES	22-Jan-2014			Size		Drawing Number		Drawing Rev	Sheet
REV	ECO#	IMPL BY	APVD BY	DATE	Approved By	Date	LET	001826ELB		02	1 / 1	

## PC-Series (GEN2) Schematic Diagram 460-3-60

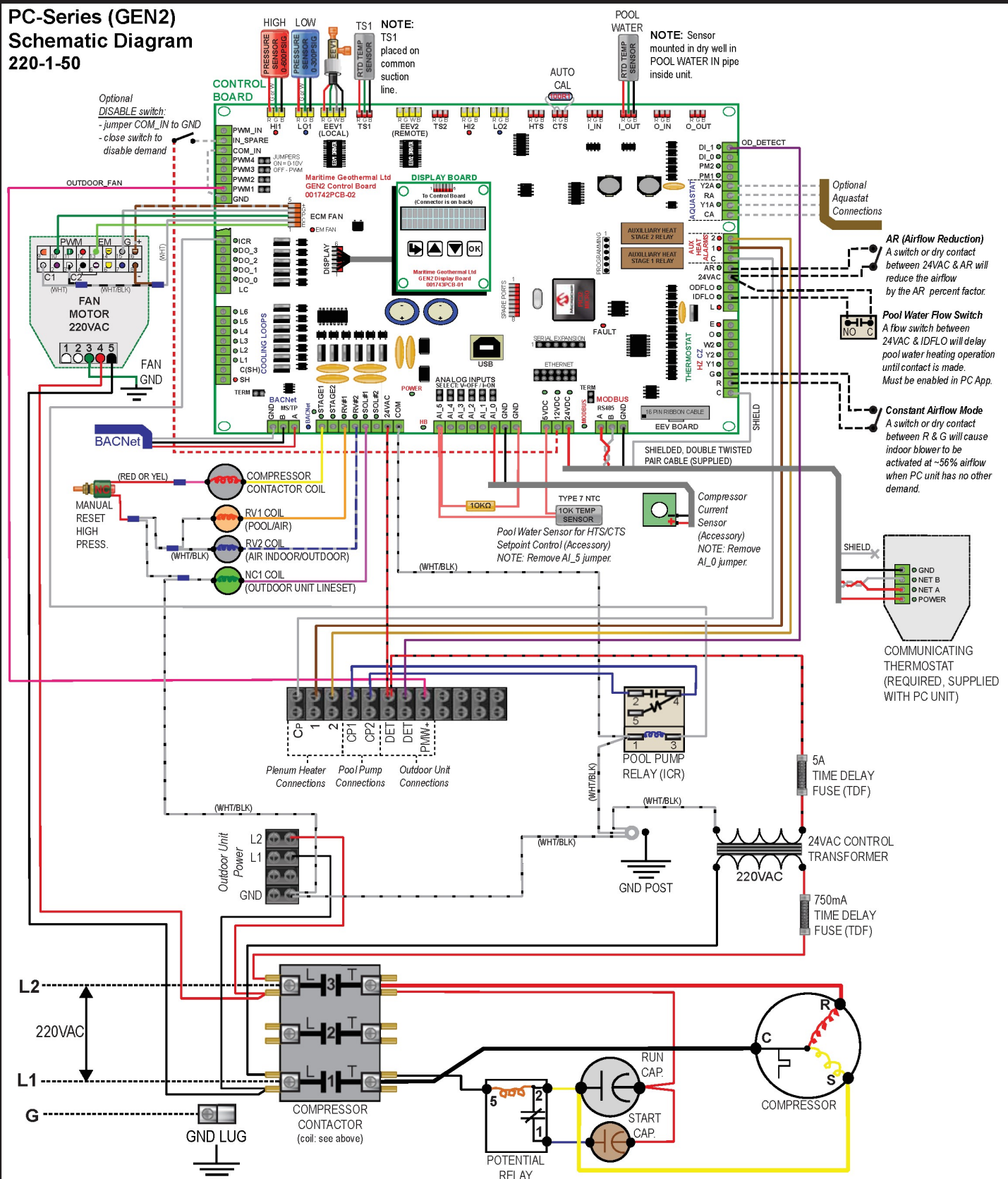



03	ISSUE 04	D. RHEAULT	D. RHEAULT	21-Sep-2023	D. RHEAULT	11-Apr-2018	Drawing Name PC-**-P-4S-T-KDER* Schematic Diagram			
02	ISSUE 03	D. RHEAULT	D. RHEAULT	17-May-2023	Eng. Approved By D. RHEAULT	Date 11-Apr-2018				
02	ISSUE 02	D. RHEAULT	D. RHEAULT	27-Sep-2021	Mfg. Approved By	Date				
02	00021	D. RHEAULT	D. RHEAULT	6-Mar-2019	Approved By	Date				
REV	ECO #	IMPL BY	APVD BY	DATE			Size LET	Drawing Number 002292SCH	Drawing Rev 02(14)	Sheet 1 / 1





**PC-Series (GEN2)  
Schematic Diagram  
220-1-50**



					Drawn By C. GEDDES	Date 28-Feb-2011	 <div style="float: right; text-align: right;"> P.O. Box 2555  170 Plantation Rd.  Petitcodiac, NB CANADA E4Z 6H4 </div>			
					Checked By C. GEDDES	Date 28-Feb-2011				
03	ISSUE 04	D. RHEAULT	D. RHEAULT	21-Sep-2023	Eng. Approved By C. GEDDES	Date 28-Feb-2011	Drawing Name  PC-**-P-6S-T-KDER*  Schematic Diagram			
03	ISSUE 03	D. RHEAULT	D. RHEAULT	17-May-2023	Mfg. Approved By	Date				
03	ISSUE 02	D. RHEAULT	D. RHEAULT	27-Sep-2021						
03	000271	D. RHEAULT	D. RHEAULT	6-Mar-2019						
REV	ECO#	IMPL BY	APVD BY	DATE	Approved By	Date	Size LET	Drawing Number 001425SCH	Drawing Rev 03(4)	Sheet 1 / 1



Electrical Box Layout (220-1-50)

PC-Series Electrical Box Diagram  
220VAC Single Phase 50 Hz

THERMOSTAT/ROOM SENSOR (REQUIRED)

Connect the communicating thermostat directly to board with supplied shielded, double twisted pair cable:  
24VDC - power supply to thermostat  
A - communication: use **one twisted pair**  
B - ground (connect in other twisted pair w/ 24VDC)

OPTIONAL CONTROL BY BACnet OR SIGNALS

BACnet Object	Signal	Activation
SYSTEM_G	-	Fan Recirculation Mode
SYSTEM_Y1	-	Air Reheat/Aux.Heat or Air Cool Demand
SYSTEM_O	-	Air Heating (OFF) / Air Cooling (ON)
SYSTEM_Y1A	Y1A	Pool Water Heat Demand
SYSTEM_DH	-	Air Dehumidify Demand

OPTIONAL CONTROL CONNECTIONS (24VAC)

To use optional external aquastat, use 18-3 cable to connect to terminals on the right side of control board:  
CA - 24VAC Common  
RA - 24VAC Hot  
Y1A - Pool Water Heat Demand (compressor stage1)  
A dry contact connection between RA and Y1A will request pool water heating.

BACnet INTERFACE CONNECTIONS (MS/TP RS-485)

Use a shielded, twisted pair cable to connect the BACnet connections to the control board connector.  
A - communication: use **one twisted pair**  
B - ground

OUTDOOR UNIT SIGNAL CONNECTIONS (24VAC)

Use an 18-3 **outdoor rated** cable to connect the outdoor unit signal connections to the matching Outdoor Unit signal connections in the pool conditioner electrical box.

OUTDOOR UNIT POWER CONNECTIONS (230VAC)

Use a 14-2 outdoor rated cable to connect the power supply terminals of the outdoor unit to the matching terminals of the Outdoor Unit Power terminal strip in the electrical box of the pool conditioner.

220V POWER SUPPLY CONNECTIONS

Wire	Colour	Contactor (Label)
Line 2	Red	L2
Neutral*	-	no connection
Line 1	Black	L1

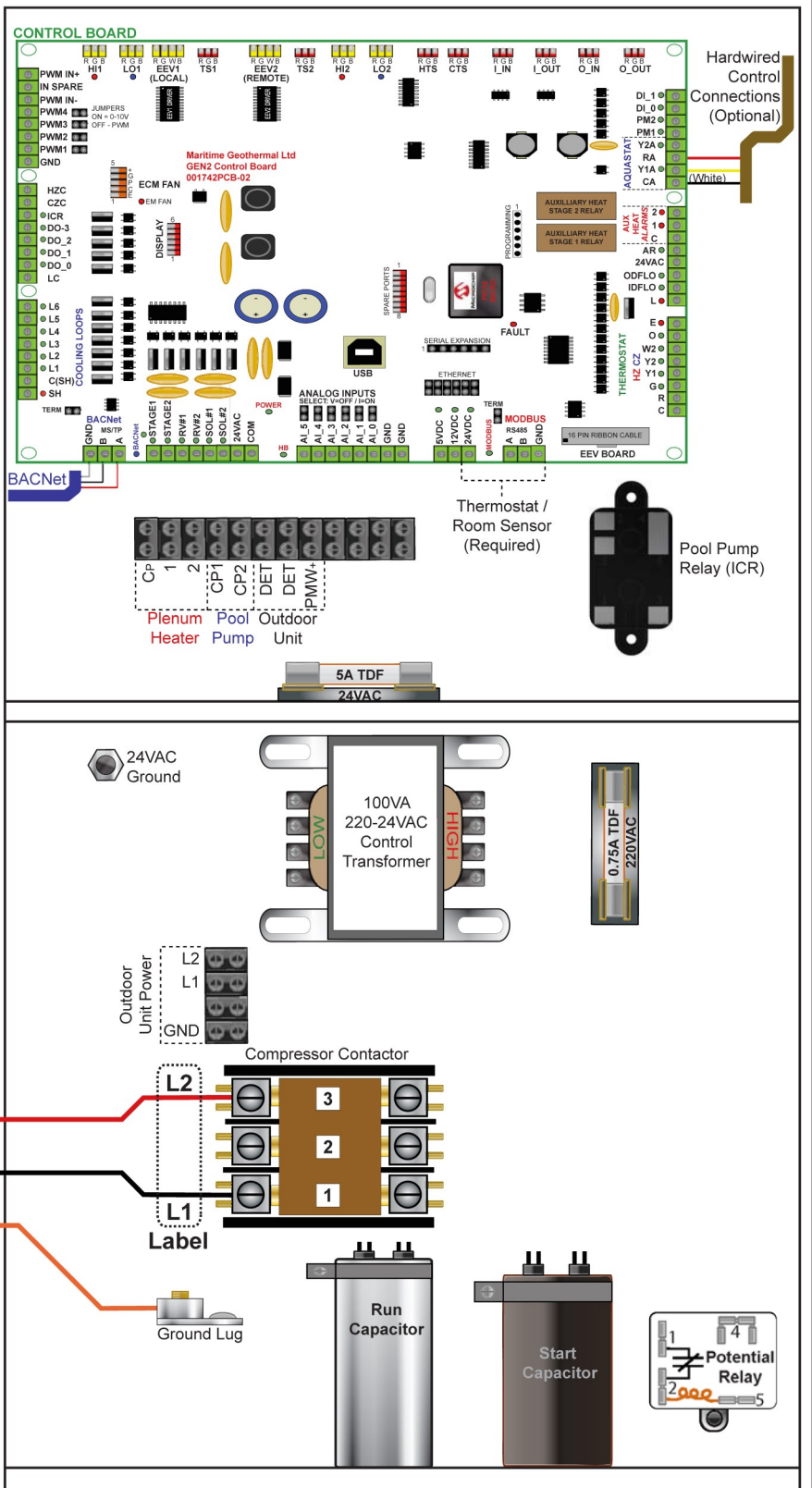
Connect "GND" to Gnd.Lug

PLENUM HEATER CONTROL (24VAC)

Use an 18-3 cable to connect the plenum heater control board to the pool conditioner terminal strip:  
CP - 24VAC Common  
1 - electric heat stage 1  
2 - electric heat stage 2

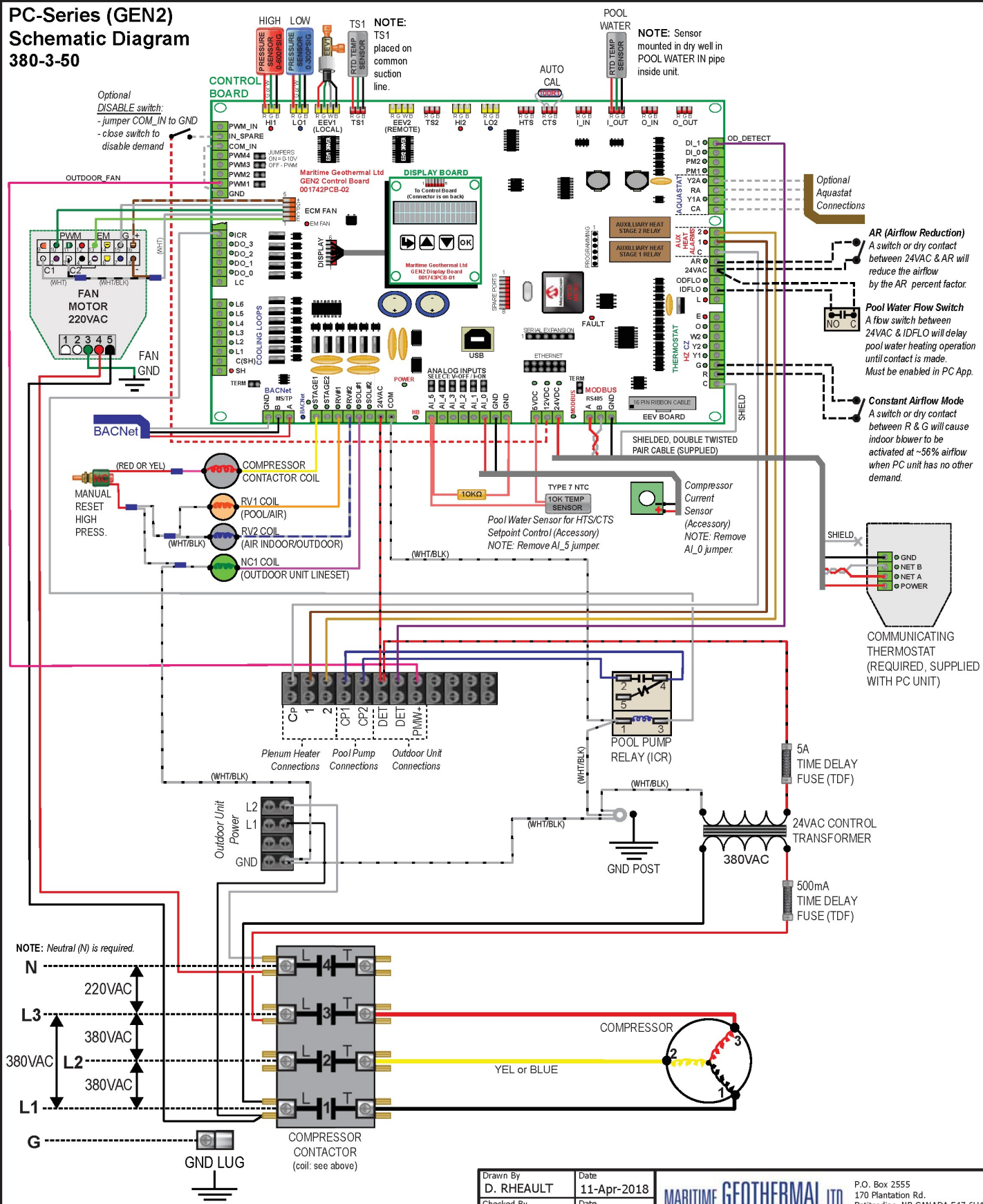
POOL PUMP CONTROL (24VAC)

If pool pump control is required, use an 18-2 cable to relay a 24VAC signal to activate an external contactor:  
CP1 - dry contacts for pool pump  
CP2 - dry contacts for pool pump



					C.GEDDES	28-Feb-2011	Drawing Name  PC-**-P-6S-T-*DE** Electrical Box Diagram						
					Eng. Approved By C.GEDDES	Date 28-Feb-2011							
02	000236	D. RHEULT	D. RHEULT	11-Apr-2018	Mfg. Approved By	Date							
01	Initial Release	C. GEDDES	C. GEDDES	28-Feb-2011			Size		Drawing Number		Drawing Rev		Sheet
REV	ECO#	IMPL BY	APVD BY	DATE	Approved By	Date	LET		001426ELB		02		1 / 1

## PC-Series (GEN2) Schematic Diagram 380-3-50



03	ISSUE 04	D. RHEAULT	D. RHEAULT	21-Sep-2023	D. RHEAULT	11-Apr-2018	Drawing Name PC-**-P-7S-T-KDER* Schematic Diagram				
02	ISSUE 03	D. RHEAULT	D. RHEAULT	17-May-2023	Eng. Approved By	Date					11-Apr-2018
02	ISSUE 02	D. RHEAULT	D. RHEAULT	27-Sep-2021	Mfg. Approved By	Date					
02	000271	D. RHEAULT	D. RHEAULT	6-Mar-2019							
REV	ECO#	IMPL BY	APVD BY	DATE	Approved By	Date	Size	Drawing Number	Drawing Rev	Sheet	
							LET	002294SCH	02(4)	1 / 1	



# Electrical Box Layout (380-3-50)

## PC-Series Electrical Box Diagram 380VAC Three Phase 50 Hz

### THERMOSTAT/ROOM SENSOR (REQUIRED)

Connect the communicating thermostat directly to board with supplied shielded, double twisted pair cable:  
24VDC - power supply to thermostat

- A - communication: use **one twisted pair**  
B - GND - ground (connect in other twisted pair w/ 24VDC)

### OPTIONAL CONTROL BY BACnet OR SIGNALS

BACnet Object	Signal	Activation
SYSTEM_G	-	Fan Recirculation Mode
SYSTEM_Y1	-	Air Reheat/Aux.Heat or Air Cool Demand
SYSTEM_O	-	Air Heating (OFF) / Air Cooling (ON)
SYSTEM_Y1A	Y1A	Pool Water Heat Demand
SYSTEM_DH	-	Air Dehumidify Demand

### OPTIONAL CONTROL CONNECTIONS (24VAC)

To use optional external aquastat, use 18-3 cable to connect to terminals on the right side of control board:  
CA - 24VAC Common  
RA - 24VAC Hot  
Y1A - Pool Water Heat Demand (compressor stage1)  
A dry contact connection between RA and Y1A will request pool water heating.

### BACnet INTERFACE CONNECTIONS (MS/TP RS-485)

Use a shielded, twisted pair cable to connect the BACnet connections to the control board connector.

- A - communication: use **one twisted pair**  
B - GND - Ground

### OUTDOOR UNIT SIGNAL CONNECTIONS (24VAC)

Use an 18-3 **outdoor rated** cable to connect the outdoor unit signal connections to the matching Outdoor Unit signal connections in the pool conditioner electrical box.

### OUTDOOR UNIT POWER CONNECTIONS (230VAC)

Use a 14-2 outdoor rated cable to connect the power supply terminals of the outdoor unit to the matching terminals of the Outdoor Unit Power terminal strip in the electrical box of the pool conditioner.

### 380/220V POWER SUPPLY CONNECTIONS

\*NOTE: Neutral (N) is required.

Wire	Colour	Contactor (Label)
Neutral*	White	N*
Line 3	Red	L3
Line 2	Blue	L2
Line 1	Black	L1

Connect "GND" to ground lug.

### PLENUM HEATER CONTROL (24VAC)

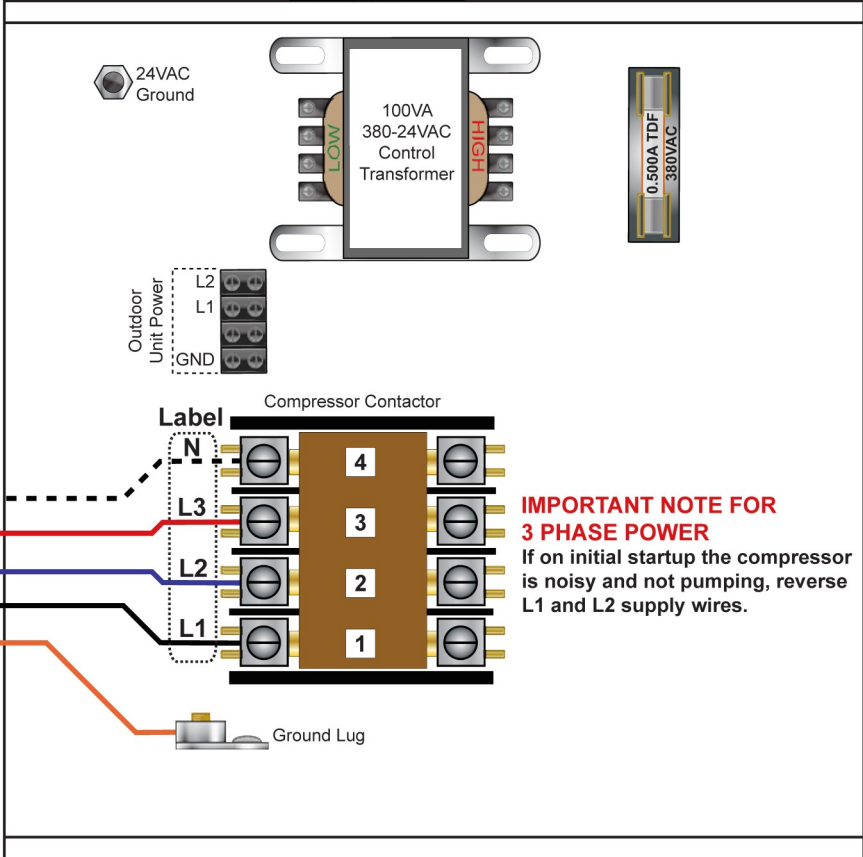
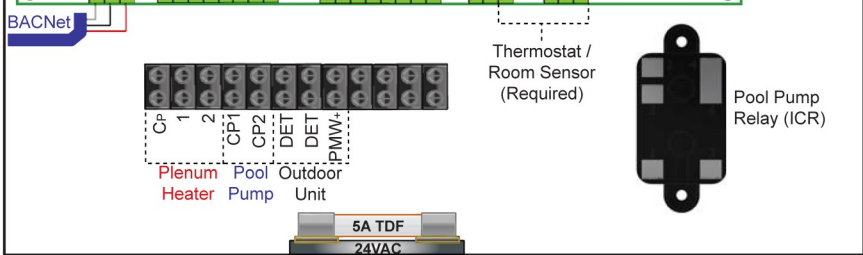
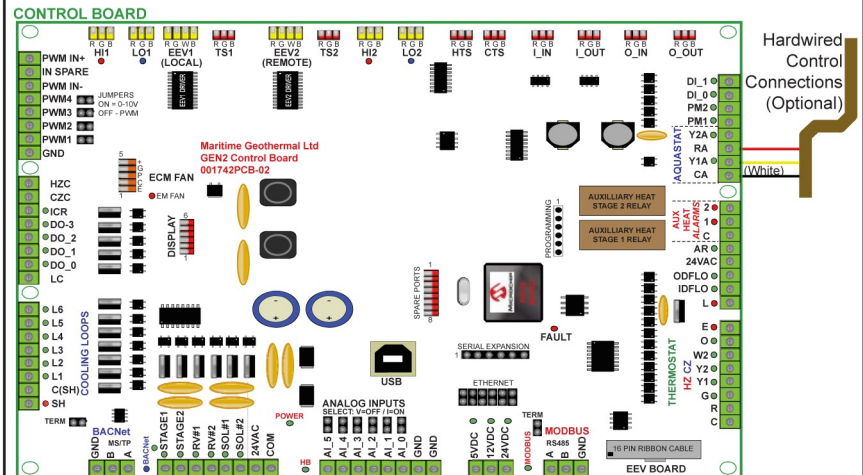
Use an 18-3 cable to connect the plenum heater control board to the pool conditioner terminal strip:

- CP - 24VAC Common  
1 - electric heat stage 1  
2 - electric heat stage 2

### POOL PUMP CONTROL (24VAC)

If pool pump control is required, use an 18-2 cable to relay a 24VAC signal to activate an external contactor:

- CP1 - dry contacts for pool pump  
CP2 -

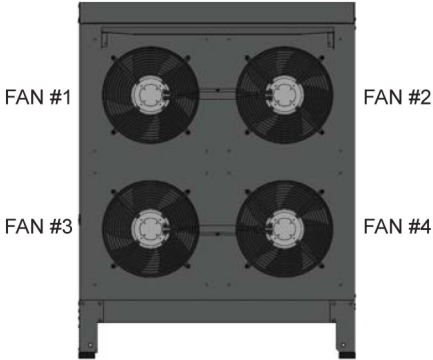
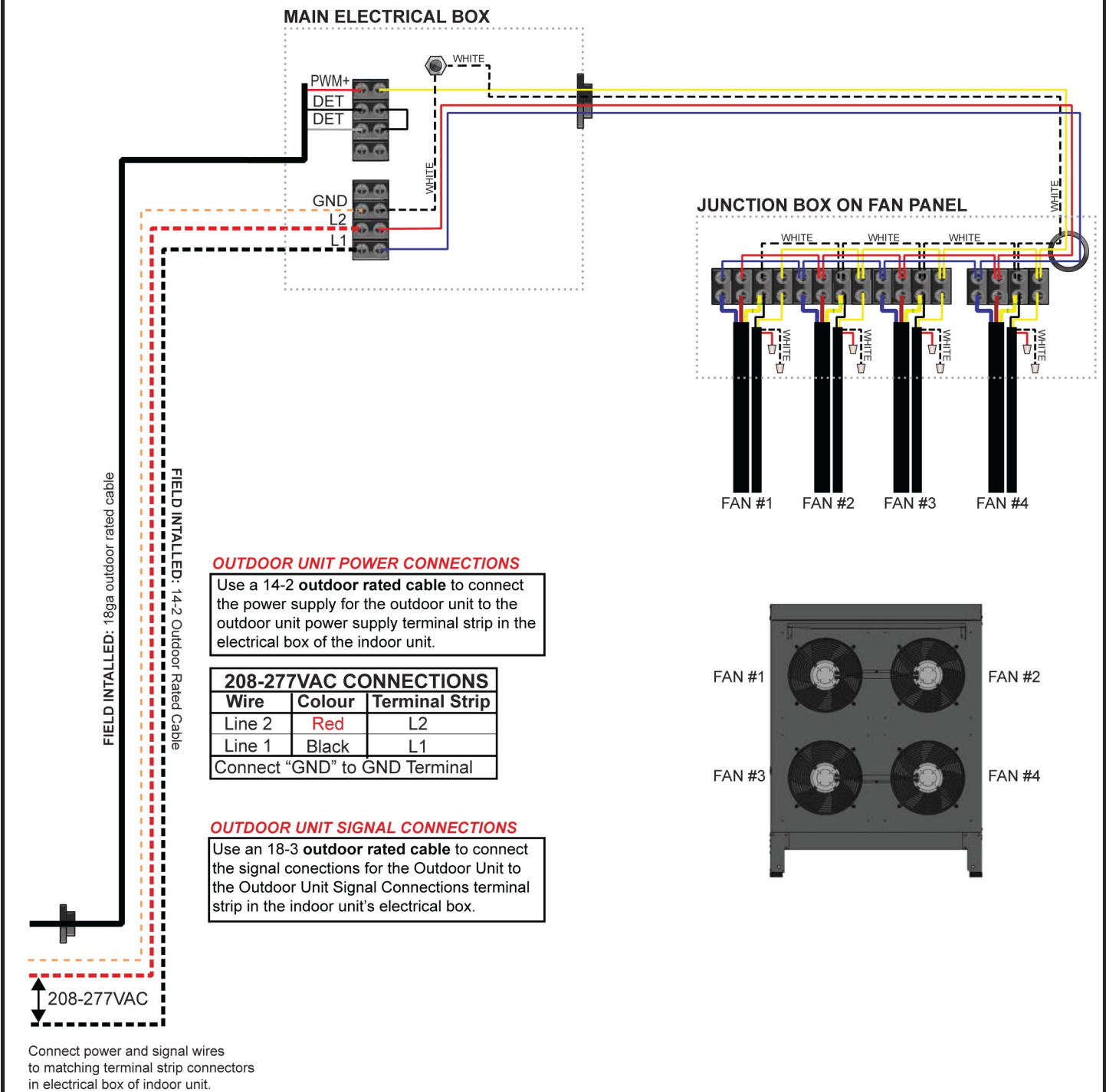


**IMPORTANT NOTE FOR 3 PHASE POWER**  
If on initial startup the compressor is noisy and not pumping, reverse L1 and L2 supply wires.

01	Initial Release	D. RHEAULT	D. RHEAULT	11-Apr-2018
REV	ECO#	IMPL BY	APVD BY	DATE

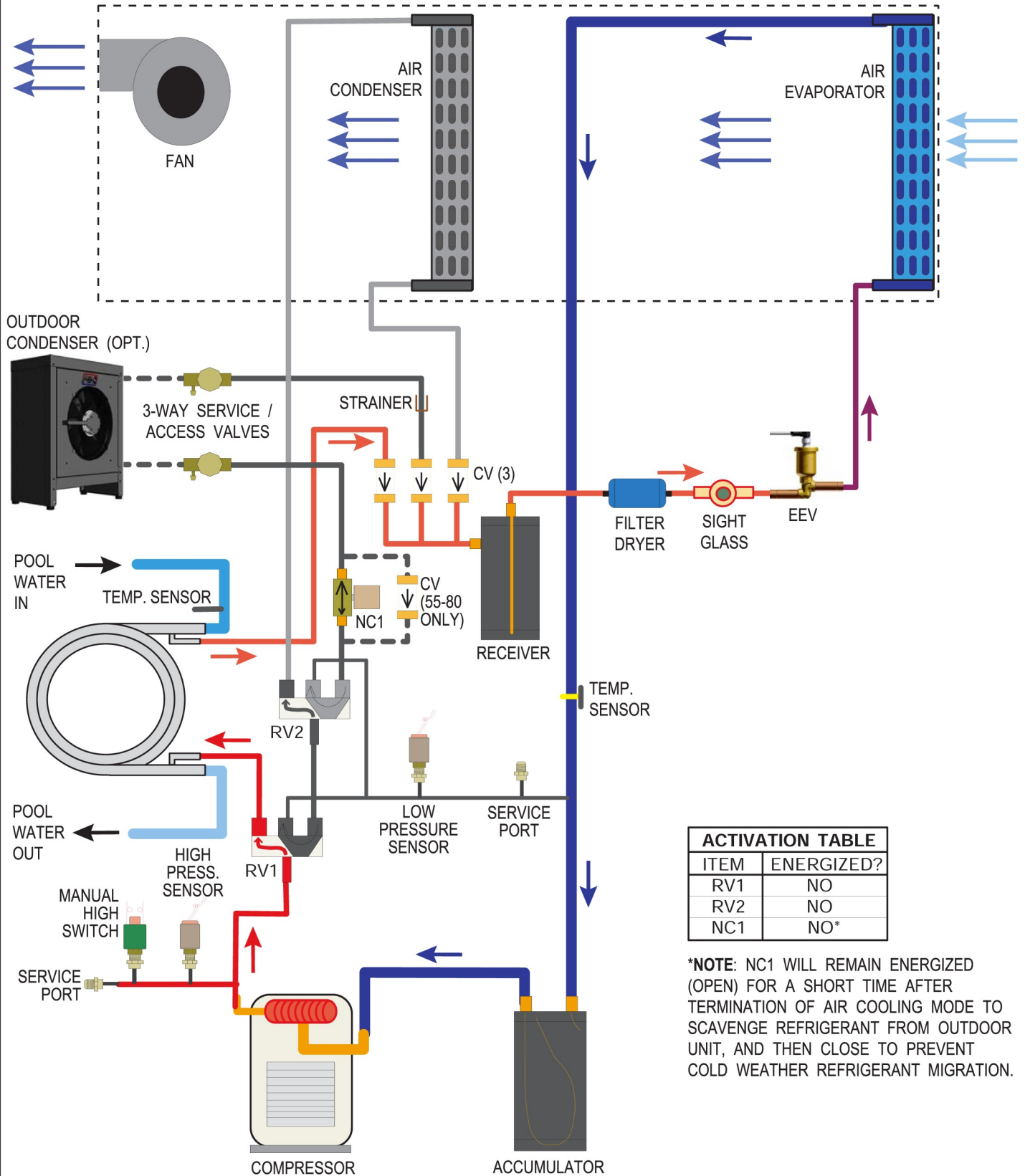
Drawn By D. RHEAULT	Date 16-Mar-2018	<div>MARITIME GEOTHERMAL LTD.</div> <div>P.O. Box 2555 170 Plantation Rd. Petitcodiac, NB CANADA E4Z 6H4</div>			
Checked By D. RHEAULT	Date 16-Mar-2018				
Eng. Approved By D. RHEAULT	Date 16-Mar-2018				
Mfg. Approved By	Date				
Approved By	Date	Drawing Name PC-**-P-7S-T-*DE** Electrical Box Diagram			
		Size LET	Drawing Number 002295ELB	Drawing Rev 01	Sheet 1 / 1

PC Outdoor Condenser (AC2-Series)  
4-Fan Schematic Diagram



					Drawn By D. RHEAULT	Date 19-Apr-2018	<div><div>MARITIME GEOTHERMAL LTD.</div><div>P.O. Box 2555 170 Plantation Rd. Petitcodiac, NB CANADA E4Z 6H4</div></div> <div>Drawing Name  AC2 4-Fan Schematic Diagram</div>			
					Checked By D. RHEAULT	Date 19-Apr-2018				
					Eng. Approved By D. RHEAULT	Date 19-Apr-2018				
					Mfg. Approved By	Date				
02	000275	D. RHEAULT	D. RHEAULT	1-Oct-2021	Approved By	Date	Size LET	Drawing Number 002262SCH	Drawing Rev 02	Sheet 1 / 1
01	Initial Release	D. RHEAULT	D. RHEAULT	19-Apr-2018						
REV	ECO#	IMPL BY	APVD BY	DATE						

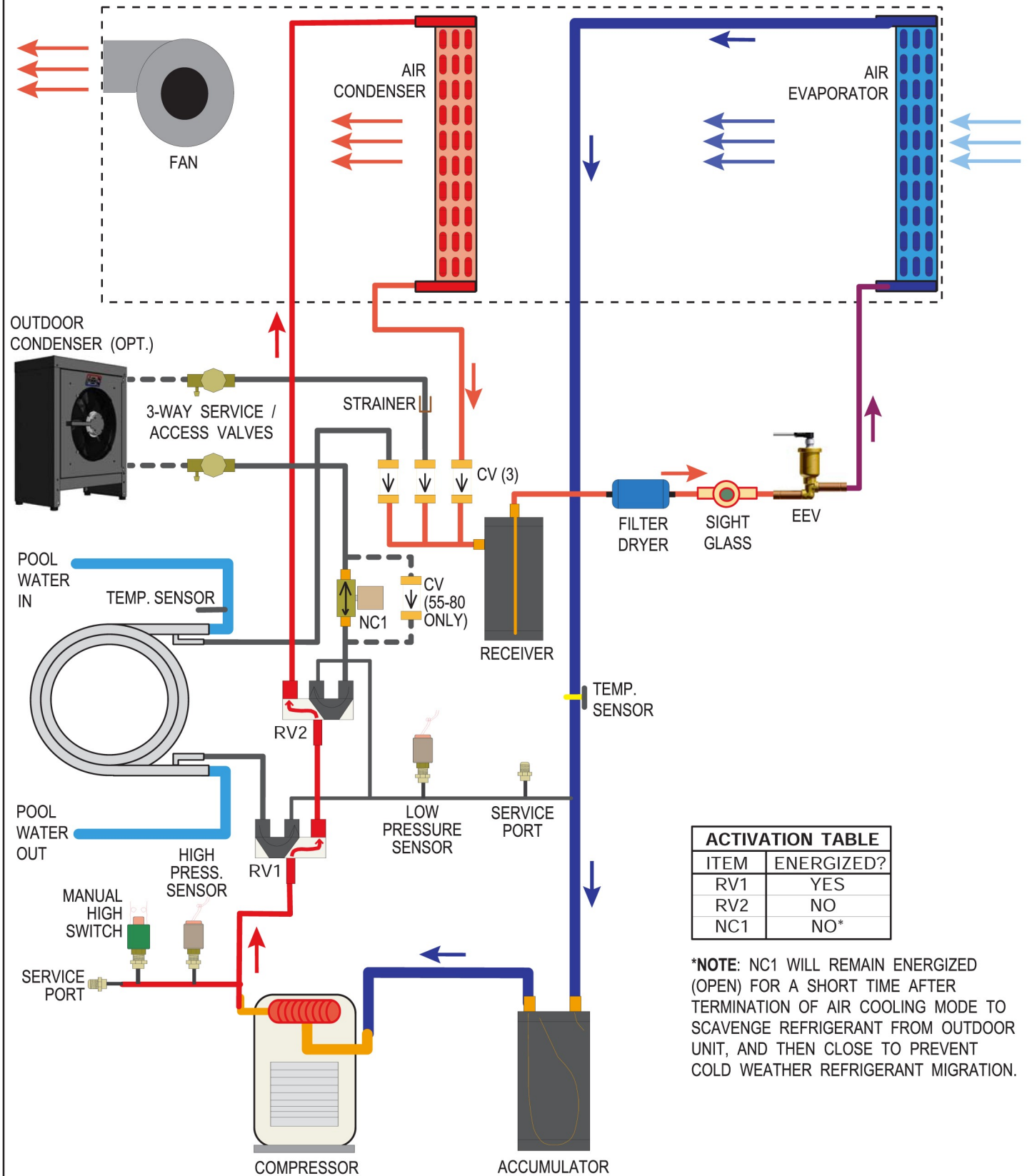
# PC-Series Refrigeration Circuit - Pool Water Heat Mode



					Drawn By Chris Geddes	Date 09 JAN 07	<b>MARITIME GEOTHERMAL LTD.</b> 170 Plantation Rd. Petitcodiac, NB E4Z 6H4		
04	000284	D. RHEAULT	D. RHEAULT	20 JAN 21	Checked By Chris Geddes	Date 09 JAN 07			
03	000271	D. RHEAULT	D. RHEAULT	06 MAR 19	Approved By (ENG)	Date 09 JAN 07	Drawing Name <b>PC-Series Refrigeration Circuit Diagram</b> - Pool Water Heat Mode		
02	000236	D. RHEAULT	D. RHEAULT	01 MAY 15	Approved By (MFG)	Date			
01	Initial Release	C. GEDDES	C. GEDDES	09 JAN 07	Approved By	Date	Size A	Drawing Number <b>000352RCD</b>	REV <b>04</b>
REV	ECO #	IMPL BY	APVD BY	DATE					SHEET <b>1 of 1</b>

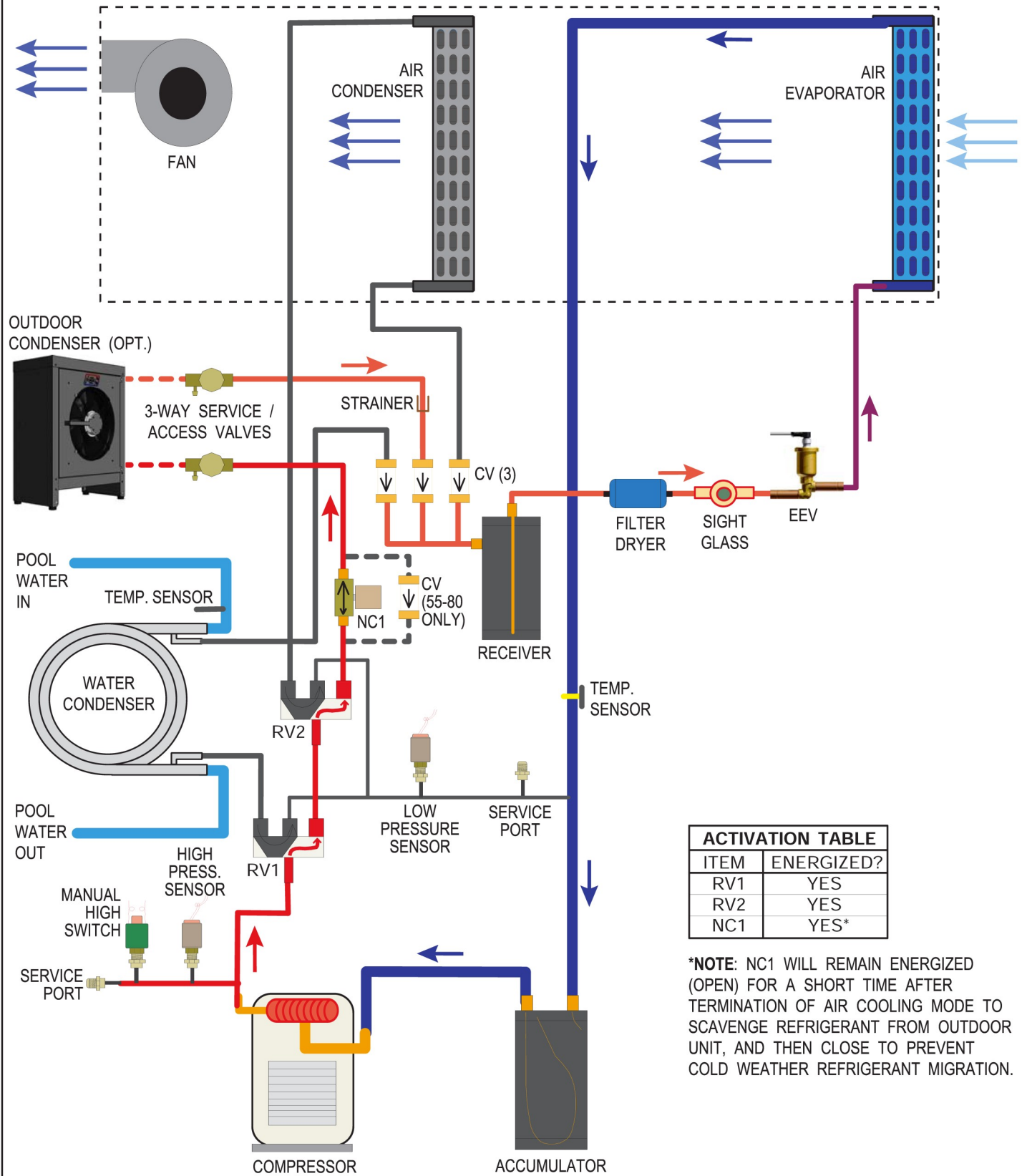


# PC-Series Refrigeration Circuit - Air Reheat Mode



04	000284	D. RHEAULT	D. RHEAULT	20 JAN 21	Drawn By Chris Geddes	Date 09 JAN 07	<b>MARITIME GEOTHERMAL LTD.</b> 170 Plantation Rd. Petitcodiac, NB E4Z 6H4
03	000271	D. RHEAULT	D. RHEAULT	06 MAR 19	Checked By Chris Geddes	Date 09 JAN 07	
02	000236	D. RHEAULT	D. RHEAULT	01 MAY 15	Approved By Chris Geddes (ENG)	Date 09 JAN 07	
01	Initial Release	C. GEDDES	C. GEDDES	09 JAN 07	Approved By (MFG)	Date	
REV	ECO #	IMPL BY	APVD BY	DATE	Approved By	Date	Drawing Name <b>PC-Series Refrigeration Circuit Diagram - Air Reheat Mode</b> Size <b>A</b> Drawing Number <b>000353RCD</b> REV <b>04</b> SHEET <b>1 of 1</b>

# PC-Series Refrigeration Circuit - Heat Rejection Mode



04	000284	D. RHEAULT	D. RHEAULT	20 JAN 21	Drawn By Chris Geddes	Date 09 JAN 07	<b>MARITIME GEOTHERMAL LTD.</b> 170 Plantation Rd. Petitcodiac, NB E4Z 6H4	Drawing Name <b>PC-Series Refrigeration Circuit Diagram - Heat Rejection Mode</b>		
03	000271	D. RHEAULT	D. RHEAULT	06 MAR 19	Checked By Chris Geddes	Date 09 JAN 07				
02	000236	D. RHEAULT	D. RHEAULT	01 MAY 15	Approved By Chris Geddes (ENG)	Date 09 JAN 07				
01	Initial Release	C. GEDDES	C. GEDDES	09 JAN 07	Approved By (MFG)	Date				
REV	ECO #	IMPL BY	APVD BY	DATE	Approved By	Date	Size A	Drawing Number <b>000354RCD</b>	REV <b>04</b>	SHEET 1 of 1

# Engineering Guide Specifications

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## General

The pool conditioner shall be a single package indoor unit, with optional outdoor condenser unit or geothermal ground loop heat exchanger for outdoor heat rejection provided as an accessory. The pool conditioner shall be capable of cooling and dehumidifying indoor air, and rejecting heat to the indoor air, pool water, or optional outdoor condenser, with user-adjustable heating priority setting. The unit shall be listed by a nationally recognized safety-testing laboratory (NRTL) or agency, such as UL, CSA, TUV, or ETL. The package unit, as manufactured by Maritime Geothermal, Petitcodiac, New Brunswick, shall be designed to operate correctly within liquid temperature ranges specified on the "Control Temperature Limits" table in this engineering specification document.

## Factory Quality

Each unit shall be run tested at the factory with normal operating airflow and water circulating through the pool loop. Quality control system checks shall include: computerized nitrogen pressurized leak test, evacuation of refrigeration circuit to sustained vacuum, accurate system charge, detailed operating tests in pool water heat and air reheat modes, and quality cross check all operational and test conditions to pass/fail criteria. Units tested without air flow or without water flow are not acceptable. Units provided with optional outdoor condenser shall be run tested with outdoor condenser. The units shall be warranted by the manufacturer against defects in materials and workmanship in accordance with the warranty section at the end of this document. Optional extended factory warranty coverage may be available.

## Cabinet

Each unit shall be enclosed in a sheet metal cabinet. Cabinet shall be constructed of powder coated galvanized sheet metal of minimum 20 gauge. Sheet metal gauge shall be higher where structurally required. Design and construction of cabinet shall be such that it is rigid and passes the CSA/UL Loading Test requirements (200 lb roof test and 25 lb guard test). All panels shall be lined with minimum 1/2 inch [12.7 mm] thick acoustic type glass fiber insulation. All insulation shall meet the fire retardant provisions of NFPA 90A. This material shall also provide acoustical benefit. The unit must have a minimum of four access panels for serviceability of the compressor compartment. Units having only one access panel to compressor/heat exchangers/expansion device/refrigerant piping shall not be acceptable. The electrical box shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic grommets.

## Refrigerant Circuit

All units shall contain only one sealed refrigerant circuit, containing a hermetic motor scroll compressor, two coated air coils, pool water coaxial heat exchanger, electronic expansion valve (EEV), two 4-way reversing valves, high and low refrigerant pressure sensors, manual reset high pressure control, refrigerant service ports, liquid line filter-dryer, sight glass, refrigerant receiver, and suction accumulator.

Compressors shall be specified for pool heating duty with internal isolation consisting of rubber vibration isolators between the compressor and mounting plate, and rubber vibration isolators between the mounting plate and cabinet. Compressor motors shall have internal overload protection.

The water to refrigerant heat exchangers shall consist of a PVC outer jacket with twisted titanium inner tube, designed and certified for 600 psig [4136 kPa] working pressure on the refrigerant side and 75 psig [520 kPa] on the water side.

The refrigerant to air heat exchangers shall be of a multi-circuit design with copper tubing and aluminum fins with nozzle-style refrigerant distributor for evaporator service. They shall be designed and certified for 650 psig [4482kPa] working pressure on the refrigerant side, and shall be electro-coated ('e-coated' or 'i-coated') for corrosion protection.

The electronic expansion valve shall be of stepper-motor rather than pulsing type, and shall provide proper superheat control over the unit's operating range with minimal deviation from superheat setpoint. Superheat shall be determined through the suction pressure-temperature method. Externally mounted pressure controlled water regulating flow valves or thermostatic expansion valves (TXV's) in place of electronic expansion valves are not acceptable.

The suction accumulator shall be insulated with minimum 3/8" thick closed cell insulation to prevent condensation. The accumulator's internal oil return port shall be sized properly for the unit's operating range. To ensure proper oil return, suction accumulator shall not be 'oversized'.

## Fan/Blower

The blower shall be a squirrel cage type, constructed of corrosion resistant material, with unobstructed removable venturi to allow front-side-only servicing of fan motor. The air return shall be on the right when looking at the front of the unit. Top, side (left end), or down air discharge shall be provided as factory options. The fan motor shall be direct drive electrically commutated motor (ECM) with soft start, variable speed, and constant airflow functionality that maintains selected air flow up to a maximum external static of 0.5" WC.

## Auxiliary Heat (Plenum Heater)

An optional plenum heater shall be provided as an accessory and may be field installed in the discharge ductwork outside the unit. Two stages of the plenum heater shall be controlled by two provided dry contacts in the PC unit.

## Condensate Tray

The condensate tray shall be made of stainless steel and be large enough to catch any condensation that drips from the evaporator air coil during operation. There shall be two condensate drain connections provided for redundancy, of type PVC 3/4" FNPT.

## Piping and Connections

The unit shall have one set of primary water in and out connections for pool water. The primary connection type shall be 2" nominal PVC union with socket connection. All water connectors shall be rigidly mounted to cabinet with corrosion resistant fasteners to prevent relative movement.

The indoor unit shall be provided charged with sufficient refrigerant for the installed system to operate properly with up to 20 ft of interconnecting line set to optional outdoor unit. The indoor unit shall be equipped with two 3-way refrigerant access valves for connection to the outdoor unit, so that refrigerant does not need to be removed from the system during installation.

## Electrical

Controls and safety devices shall be factory wired and mounted within the unit. Controls shall include 24 volt alternating current (24VAC) activated compressor contactor, and 24VAC 100VA transformer with built in circuit breaker or fused on both primary and secondary sides. A terminal strip with screw in terminals shall be provided for field control wiring. Units shall be name-plated for use with time delay fuses or circuit breakers. Unit controls shall be 24VAC and provide heating as required by the remote thermostat or controller, or on-board controller. Unit shall provide remote fault indication to the control system via serial communications as well as provide fault messages on the front panel LCD display.

## Unit Control

The control system shall have the following features:

1. Anti-short cycle time delay on compressor operation. Time delay shall be a minimum of 5 minutes, for both thermostat demand and safety control reset starts. An override shall be provided to disable this delay for unit commissioning and testing purposes.
2. Random compressor start delay of 0-120 seconds on unit powerup to facilitate starting multiple units after a power failure.
3. Compressor shutdown for high or low refrigerant pressures, Loss of Charge (LOC), optional low flow conditions, and for optional phase protection faults on three phase models.
4. Automatic intelligent reset: after a trip, unit shall automatically restart when short cycle delay expires if the fault has cleared. Should a fault reoccur 2 times sequentially then permanent lockout shall occur, requiring cycling of the power to the unit in order to reset.
5. Manual reset high pressure in case of electronic board failure.
6. The low pressure shall not be monitored for the first 90 seconds after a compressor start to prevent nuisance safety trips.
7. 2 x 16 backlit Liquid Crystal Display (LCD) and four buttons provide basic configuration and data access.
8. Universal Serial Bus (USB) port for full data access and diagnostic information, including manual override of all inputs and outputs, data-logging and real-time charting.
9. Dry contact input for overall air flow reduction according to a user-adjustable parameter, e.g. 15%.

A communicating air thermostat that measures room temperature and humidity and allows adjustment of air setpoints shall be included with the PC unit, along with suitable twisted-pair connection wire. The PC unit shall have an on-board function for control of pool water temperature without external sensor or aquastat.

Maritime Geothermal works continually to improve its products. As a result, the design and specifications of any product may be changed without notice. Please contact Maritime Geothermal at 1-506-756-8135 or visit [www.nordicghp.com](http://www.nordicghp.com) for latest design and specifications. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of the job specification. Statements and other information contained herein are not express warranties and do not form the basis of any commercial contract or other agreement between any parties, but are merely Maritime Geothermal's statement of opinion regarding its products.

# LIMITED WARRANTY

MARITIME GEOTHERMAL LTD. warrants that its pool conditioners shall be free from defects in materials and workmanship for a period of ONE (1) YEAR after the date of installation or for a period of ONE (1) YEAR AND SIXTY (60) DAYS after the date of shipment, whichever occurs first. This warranty covers all internal components of the unit.

MARITIME GEOTHERMAL LTD. shall, at its option, repair or replace any part covered by this warranty. Defective parts shall be returned to MARITIME GEOTHERMAL LTD., transportation charges prepaid. Replacement of repaired parts and components are warranted only for the remaining portion of the original warranty period.

**This warranty is subject to the following conditions:**

1. The geothermal heat pump(s) must be properly installed and maintained in accordance with MARITIME GEOTHERMAL LTD.'s guidelines. Improper installation **includes but is not limited to** the following conditions:
  - Loop flow lower than listed in engineering specification or as expressly approved by MARITIME GEOTHERMAL LTD.
  - Operating unit either manually or with automated controls so that the unit is forced to function outside its normal operating range or in a fashion which directly or indirectly leads to failure of components or the entire unit
  - Disabling of safety controls
  - Fouled heat exchangers due to poor water or air quality
  - Failure to use filters or strainers, or failure to clean them regularly
  - Impact or physical damage sustained by the heat pump
  - Poor refrigeration maintenance practices, including brazing without nitrogen flow, or using wrong braze/flux
  - Incorrect voltage or missing phase supplied to unit
  - Unit modified electrically or mechanically from factory supplied condition
  - Water quality outside of recommended limits (e.g. salinity or pH)
  - Corrosion damage due to corrosive ambient environment
  - Failure due to excessive cycling caused by improper mechanical setup or improperly programmed external controller
  - Physical loads or pressures placed on unit from external equipment
2. The installer must complete the **Startup Record** and return it to MARITIME GEOTHERMAL LTD. within 21 days of unit installation.
3. For new construction, it is the responsibility of the building or general contractor to supply temporary heat to the structure prior to occupancy. Pool conditioners are designed to dehumidify and provide heat only to the completely finished and insulated structure. Startup of the unit shall not be scheduled prior to completion of construction and final duct installation for validation of this warranty.
4. It is the customer's responsibility to supply the proper quantity and quality of water.

MARITIME GEOTHERMAL LTD.'s sole and exclusive liability shall be, at its option, to repair or replace any part or component which is returned by the customer during the applicable warranty period set forth above, provided that (1) MARITIME GEOTHERMAL LTD. is promptly notified in writing upon discovery by the customer that such part or component fails or is defective (2) the customer returns such part or component to MARITIME GEOTHERMAL LTD., transportation charges prepaid, within (30) thirty days of failure, and (3) MARITIME GEOTHERMAL LTD.'s examination of such component discloses to its satisfaction that such part or component has failed or is defective and was not caused by one of the circumstances listed above. MARITIME GEOTHERMAL LTD. will not be responsible for any consequential damages or labour costs incurred. In addition, MARITIME GEOTHERMAL LTD. will not be responsible for the cost of replacement parts purchased from a third party.