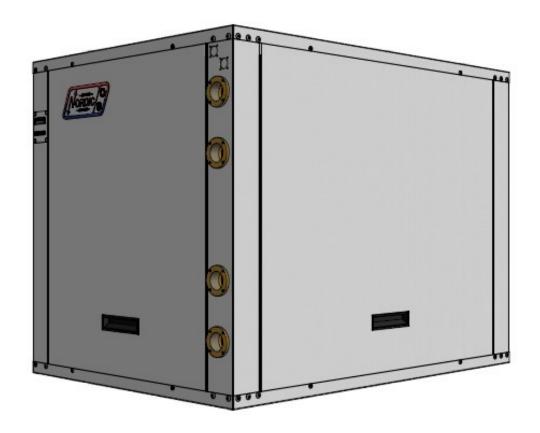


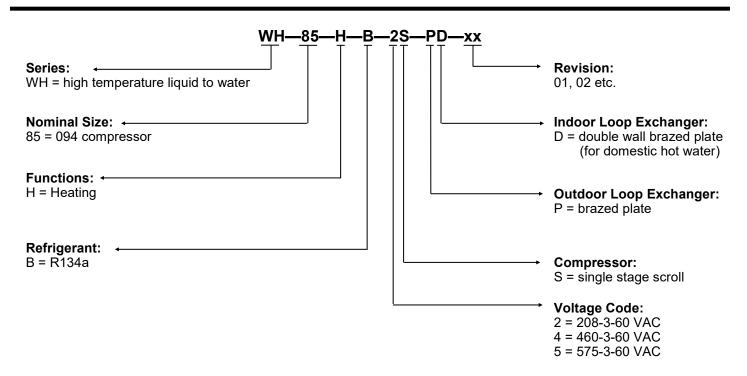
Engineering Specification

WH-85-H-B-*S-PD High Temperature Water to DHW Heat Pump 60 Hz





Model Nomenclature



| APPLICATION TABLE | | | | | | | | | | | | |
|-------------------|--|----------------|---------------|--------------------|---|---|----|--|--|---|--|--|
| MODEL SIZE | FUNCTION REFRIGERANT VOLTAGE COMPRESSOR OUTDOOR COIL REVISIONS | | | | | | | | | s | | |
| WH-85 | Н | В | 2 4 5 | S | Р | D | 04 | | | | | |
| This manua | l applies only to | the models and | revisions lis | ted in this table. | | | | | | | | |

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

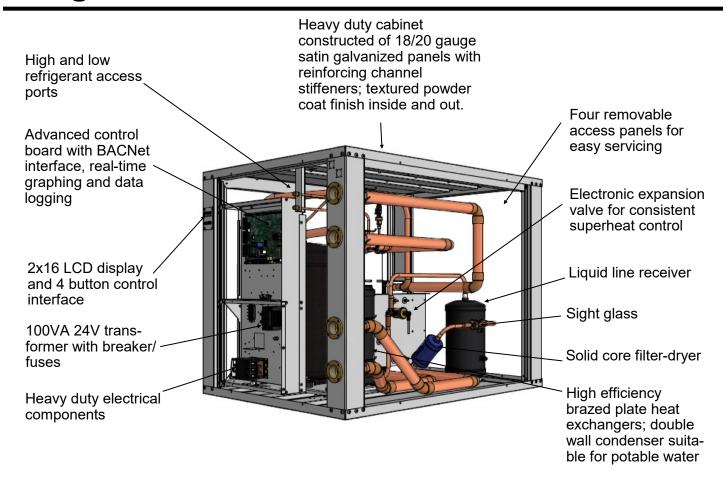
Design Features

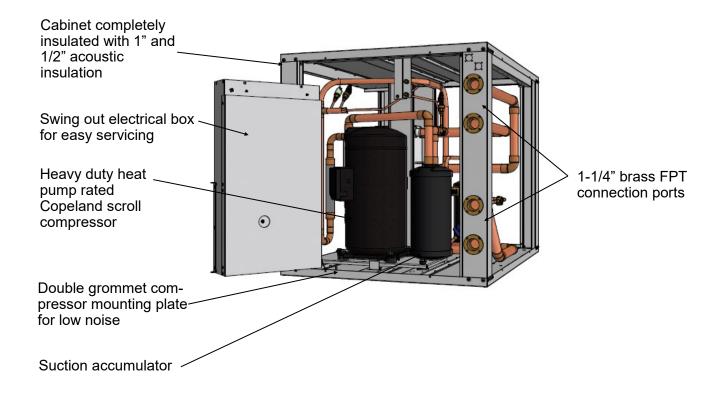
- TUV listed for electrical certification
- 18/20ga satin galvanized case with reinforcing channel stiffeners
- Powder coat finish
- Acoustically insulated cabinet (1" and 1/2" thick)
- Completely insulated heat exchangers and piping
- Four removable access panels
- Refrigeration service ports located inside unit (1/4" Schrader)
- Swing out electrical box for unobstructed access to compressor
- Component layout allows easy access for service
- 1-1/4" Brass FPT fittings for Outdoor Loop and Indoor Loop connections
- Single Copeland Scroll compressor
- Dual mounting system for compressor reduces noise and vibration
- Suction line accumulator
- Liquid line filter-dryer
- Liquid line sight glass
- Electronic Expansion Valve (EEV)
- Brazed plate heat exchanger for evaporator
- Double wall brazed plate heat exchanger for condenser (suitable for potable water)
- Refrigerant high and low pressure sensors
- Suction line temperature sensor
- Manual reset high pressure control
- Temperature sensors on all 4 water lines
- Control transformer with resettable breaker or fuse protection
- 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 including real-time charting, data logging, and diagnostic functionality with manual override operation
- 2 x 16 LCD display for control and data access; unit may be configured for standalone operation with outdoor reset functionality (requires outdoor temperature sensor accessory)
- Random start on power up (0-2 minutes)
- 24VAC and 115/230VAC outputs for external pump / water valve control

Available Accessories

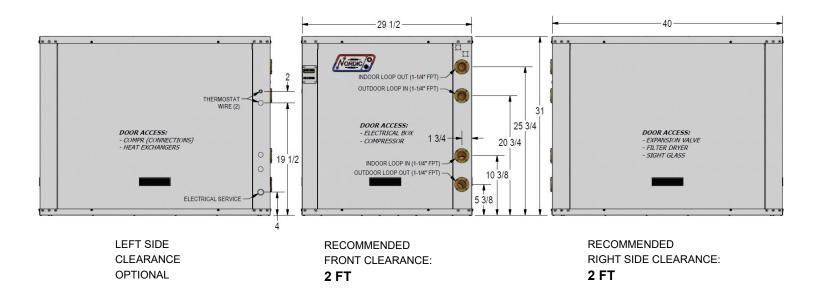
- Circulator pump module with loop / unit isolation valves (230VAC) for ground loop applications
- Barbed P/T port adapters for heat pump
- Anti-vibration pad for under unit
- 1-1/4" water valve (slow closing or solenoid) & wiring harness for open loop applications
- Compressor current sensor

Design Features





Dimensions



NO BACK CLEARANCE REQUIRED

Specifications

| Electrica | Electrical Specifications | | | | | | | | | | | | |
|-----------|---------------------------|----------|----------|-----|-------|-------|---------------------|------|------|-----------------|--------------|--|--|
| MODEL | Code | Powe | r Supply | | Compi | essor | Circulators FLA MCA | | | Max. Breaker | Min. Wire | | |
| | | V-ø-Hz | MIN | MAX | RLA | LRA | Max. A | Amps | Amps | Amps | ga | | |
| | 2 | 208-3-60 | 187 | 229 | 25.3 | 195 | 7.0 | 32.5 | 38.8 | 60 | #6-3* | | |
| WH-85 | 4 | 460-3-60 | 414 | 506 | 11.5 | 95 | N/A | 11.7 | 14.6 | 20 | #12-3 | | |
| | 5 | 575-3-60 | 518 | 632 | 10.3 | 80 | N/A | 10.5 | 13.1 | 20 | #12-3 | | |

| Shipping Information | | | | | | | | | | |
|----------------------|-----------|--------------------|---------|---------|--|--|--|--|--|--|
| MODEL | WEIGHT | DIMENSIONS in (cm) | | | | | | | | |
| WIODEL | lb. (kg) | L | W | Н | | | | | | |
| WH-85 | 466 (211) | 45 (114) | 37 (94) | 37 (94) | | | | | | |

| Refrigerant | Refrigerant Charge | | | | | | | | | | |
|---------------------------|--------------------|-----|-------|-----|--|--|--|--|--|--|--|
| MODEL Ib kg Refrigerant C | | | | | | | | | | | |
| WH-85 | 12.0 | 6.4 | R134a | POE | | | | | | | |

⁻ Oil capacity is marked on the compressor label.

⁻ Refrigerant charge is subject to revision; actual charge is indicated on the unit nameplate.

| Required Inc Outdoor Loc | loor & p Flow Rates | | | | | | | | | |
|-----------------------------|------------------------|-----|--|--|--|--|--|--|--|--|
| SIZE | gpm | L/s | | | | | | | | |
| WH-85 | WH-85 24 1.5 | | | | | | | | | |

| Loop Pro | essure Dro | ps | IND((water | | OUTDOOR (water 50°F) | | |
|----------|------------|------|----------------|-----|-------------------------|-----|--|
| | gpm | L/s | psi | kPa | psi | kPa | |
| | 22 | 1.39 | 9.8 | 68 | 5.2 | 36 | |
| WH-85 | 24 | 1.51 | 10.9 | 75 | 5.7 | 39 | |
| | 26 | 1.64 | 12.8 | 88 | 6.8 | 47 | |

| Operatir | Operating Temperature Limits | | | | | | | | | | | |
|----------|------------------------------|-------------|----------|---------|---|--|--|--|--|--|--|--|
| Loop | Mode | Parameter | (°F) | (°C) | Note | | | | | | | |
| Indoor | DHW Heating | Minimum EWT | 70 - 110 | 21 - 43 | Use formula (Outdoor ELT + 20°F) or (Outdoor ELT + 11°C). | | | | | | | |
| ilidooi | DHW Heating | Maximum LWT | 160 | 71 | | | | | | | | |
| Outdoor | DHW Heating | Minimum ELT | 45 | 7 | | | | | | | | |
| | DHW Heating | Maximum ELT | 90 | 32 | Reduce flow above this temp. to limit refrigerant suction pressure. | | | | | | | |

Values in this table are for rated liquid flow values. EWT - Entering Water Temp., LWT - Leaving Water Temp., ELT - Entering Liquid Temp., LLT - Leaving Liquid Temp.

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.

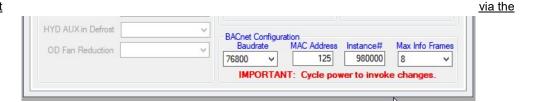
Vendor: Maritime Geothermal Ltd.

Vendor ID: 260

Model Name: MGT GEN2 Control Board

The following parameters can be set 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.

For tables listing BACnet objects, refer to Application, Installation, and Service Manual.

Performance Tables

WH-85-H-B-2S *R134a, 60 Hz, ZR94KCE-TF5*

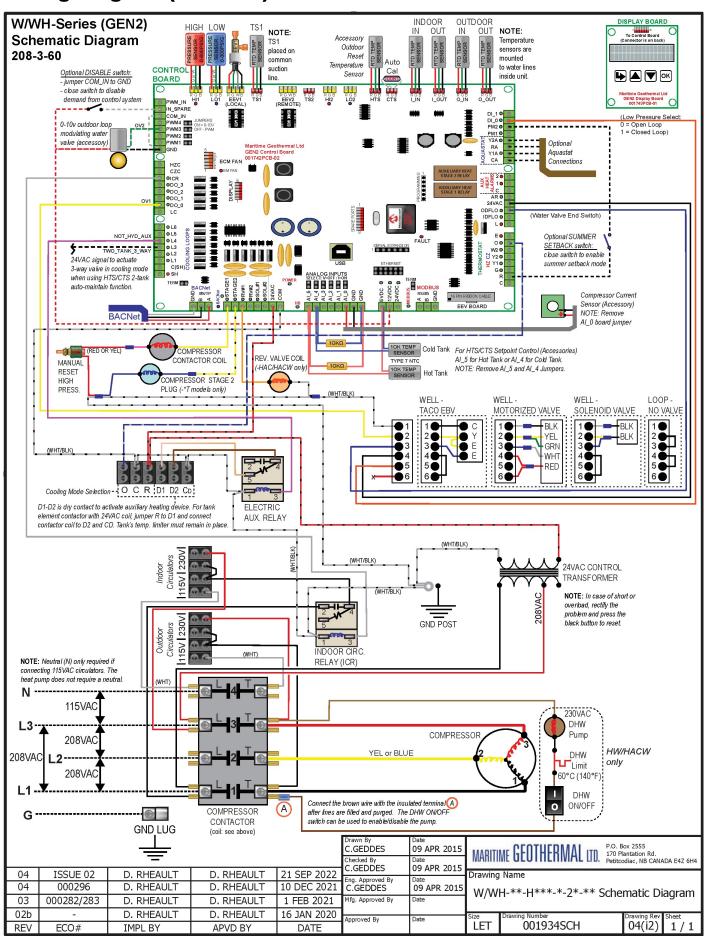
| | | OU. | TDOOR I | OOP (W | /ater) | | ELECTI | RICAL | | | INDOO | R LOOP | (Water) | | |
|----------|-------------|----------------|---------------|-------------|-----------------|-----------------------|----------------------------|--------------------|-------------|----------------|---------------|-------------|-----------------|---------------------|------|
| | ELT (°F) | Evap. Temp. | Flow (gpm) | LLT (°F) | Delta T (°F) | Heat Abs. (Btu/hr) | Compressor Current (A)* | Input Power (W) | EWT (°F) | Cond. Temp. | Flow (gpm) | LWT (°F) | Delta T (°F) | Heating (Btu/hr) | СОРн |
| | 50 | 44 | 24 | 46 | 4 | 45,950 | 21.4 | 5,160 | 115 | 121 | 24 | | 5 | 63,143 | 3.59 |
| | 60 | 53 | 24 | 55 | 5 | 56,089 | 21.7 | 5,281 | 114 | 122 | 24 | 120 | 6 | 73,696 | 4.09 |
| | 70 | 62 | 24 | 64 | 6 | 68,094 | 21.8 | 5,395 | 113 | 122 | 24 | | 7 | 86,090 | 4.68 |
| 6 | 80 | 70 | 24 | 73 | 7 | 81,997 | 21.8 | 5,488 | 112 | 124 | 24 | | 8 | 100,309 | 5.36 |
| Ž | 90 | 79 | 24 | 82 | 8 | 97,806 | 21.6 | 5,561 | 110 | 125 | 24 | | 10 | 116,358 | 6.13 |
| | 50 | 44 | 24 | 47 | 3 | 40,019 | 24.8 | 6,251 | 135 | 142 | 24 | | 5 | 60,934 | 2.86 |
| m | 60 | 53 | 24 | 56 | 4 | 47,938 | 25.0 | 6,371 | 134 | 142 | 24 | | 6 | 69,265 | 3.19 |
| = | 70 | 62 | 24 | 65 | 5 | 57,225 | 25.0 | 6,439 | 133 | 142 | 24 | 140 | 7 | 78,785 | 3.58 |
| 3 | 80 | 71 | 24 | 74 | 6 | 67,680 | 24.8 | 6,514 | 133 | 143 | 24 | | 8 | 89,494 | 4.03 |
| H | 90 | 80 | 24 | 83 | 7 | 79,473 | 24.2 | 6,540 | 132 | 143 | 24 | | 9 | 101,368 | 4.54 |
| _ | 50 | 45 | 24 | 47 | 3 | 32,878 | 29.0 | 7,533 | 155 | 161 | 24 | | 5 | 58,169 | 2.26 |
| | 60 | 54 | 24 | 57 | 3 | 39,512 | 29.2 | 7,717 | 155 | 162 | 24 | | 6 | 65,433 | 2.48 |
| | 70 | 63 | 24 | 66 | 4 | 46,879 | 29.3 | 7,809 | 154 | 162 | 24 | 160 | 6 | 73,113 | 2.74 |
| | 80 | 73 | 24 | 75 | 5 | 54,940 | 28.9 | 7,818 | 153 | 163 | 24 | | 7 | 81,204 | 3.04 |
| | 90 | 82 | 24 | 85 | 5 | 63,567 | 28.3 | 7,789 | 153 | 163 | 24 | | 8 | 89,725 | 3.38 |

WETRIC

| | | OU | TDOOR I | LOOP (N | /ater) | | ELECTI | RICAL | INDOOR LOOP (Water) | | | | | | |
|----------|-------------|----------------|---------------|-------------|-----------------|------------------|----------------------------|--------------------|---------------------|----------------|---------------|-------------|-----------------|----------------|------|
| | ELT (°C) | Evap. Temp. | Flow (L/s) | LLT (°C) | Delta T (°C) | Heat Abs. (W) | Compressor Current (A)* | Input Power (W) | EWT (°C) | Cond. Temp. | Flow (L/s) | LWT (°C) | Delta T (°C) | Heating (W) | СОРн |
| | 10.0 | 6.4 | 1.5 | 7.9 | 2.1 | 13,463 | 21.4 | 5,160 | 45.9 | 49.4 | 1.5 | | 2.9 | 18,501 | 3.59 |
| RIC) | 15.6 | 11.4 | 1.5 | 13.0 | 2.6 | 16,434 | 21.7 | 5,281 | 45.5 | 49.7 | 1.5 | | 3.4 | 21,593 | 4.09 |
| | 21.1 | 16.4 | 1.5 | 18.0 | 3.2 | 19,951 | 21.8 | 5,395 | 44.9 | 50.0 | 1.5 | 49 4. | 4.0 | 25,224 | 4.68 |
| | 26.7 | 21.2 | 1.5 | 22.9 | 3.8 | 24,025 | 21.8 | 5,488 | 44.2 | 50.8 | 1.5 | | 4.6 | 29,390 | 5.36 |
| ĮΣ | 32.2 | 26.1 | 1.5 | 27.7 | 4.5 | 28,657 | 21.6 | 5,561 | 43.5 | 51.7 | 1.5 | | 5.4 | 34,093 | 6.13 |
| | 10.0 | 6.4 | 1.5 | 8.1 | 1.9 | 11,726 | 24.8 | 6,251 | 57.2 | 60.8 | 1.5 | | 2.8 | 17,854 | 2.86 |
| 2 | 15.6 | 11.4 | 1.5 | 13.3 | 2.2 | 14,046 | 25.0 | 6,371 | 56.8 | 60.9 | 1.5 | | 3.2 | 20,295 | 3.19 |
| IF | 21.1 | 16.4 | 1.5 | 18.5 | 2.7 | 16,767 | 25.0 | 6,439 | 56.3 | 61.1 | 1.5 | 60 | 3.7 | 23,084 | 3.58 |
| ■ 4 | 26.7 | 21.4 | 1.5 | 23.5 | 3.1 | 19,830 | 24.8 | 6,514 | 55.8 | 61.4 | 1.5 | | 4.1 | 26,222 | 4.03 |
| | 32.2 | 26.4 | 1.5 | 28.5 | 3.7 | 23,285 | 24.2 | 6,540 | 55.3 | 61.7 | 1.5 | | 4.7 | 29,700 | 4.54 |
| | 10.0 | 7.2 | 1.5 | 8.5 | 1.5 | 9,633 | 29.0 | 7,533 | 68.4 | 71.7 | 1.5 | | 2.7 | 17,043 | 2.26 |
| 1 | 15.6 | 12.2 | 1.5 | 13.7 | 1.8 | 11,577 | 29.2 | 7,717 | 68.1 | 71.9 | 1.5 | | 3.0 | 19,172 | 2.48 |
| | 21.1 | 17.2 | 1.5 | 18.9 | 2.2 | 13,735 | 29.3 | 7,809 | 67.7 | 72.2 | 1.5 | 71 | 3.4 | 21,422 | 2.74 |
| | 26.7 | 22.5 | 1.5 | 24.1 | 2.5 | 16,097 | 28.9 | 7,818 | 67.3 | 72.5 | 1.5 | | 3.8 | 23,793 | 3.04 |
| | 32.2 | 27.5 | 1.5 | 29.3 | 2.9 | 18,625 | 28.3 | 7,789 | 66.9 | 72.8 | 1.5 | | 4.2 | 26,289 | 3.38 |

^{*} Divide by 2.2 for 460VAC, by 2.8 for 575VAC

Wiring Diagram (208-3-60)



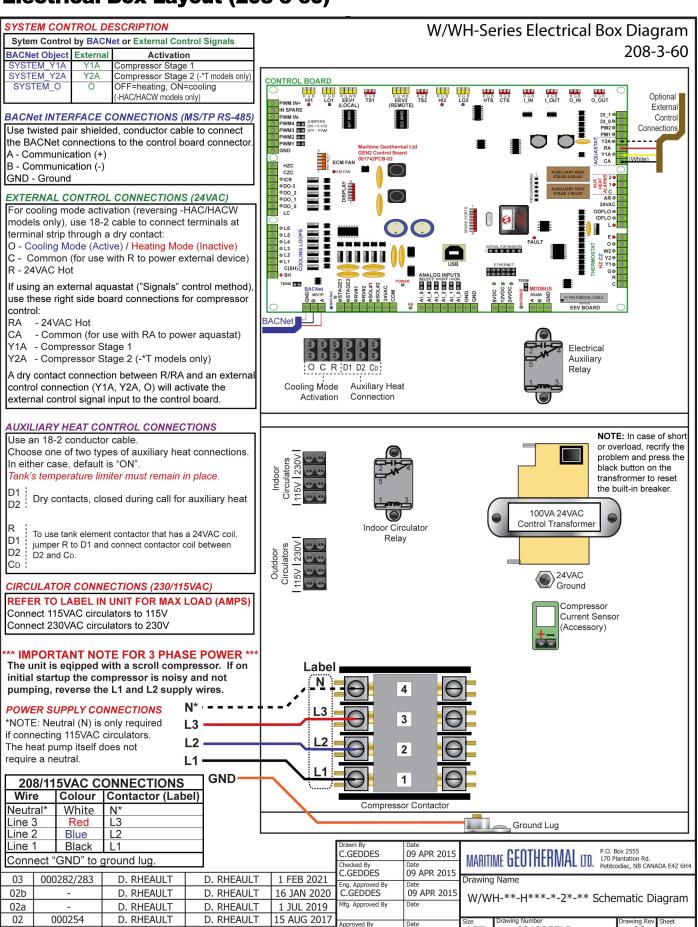
Electrical Box Layout (208-3-60)

REV

ECO#

IMPL BY

APVD BY



DATE

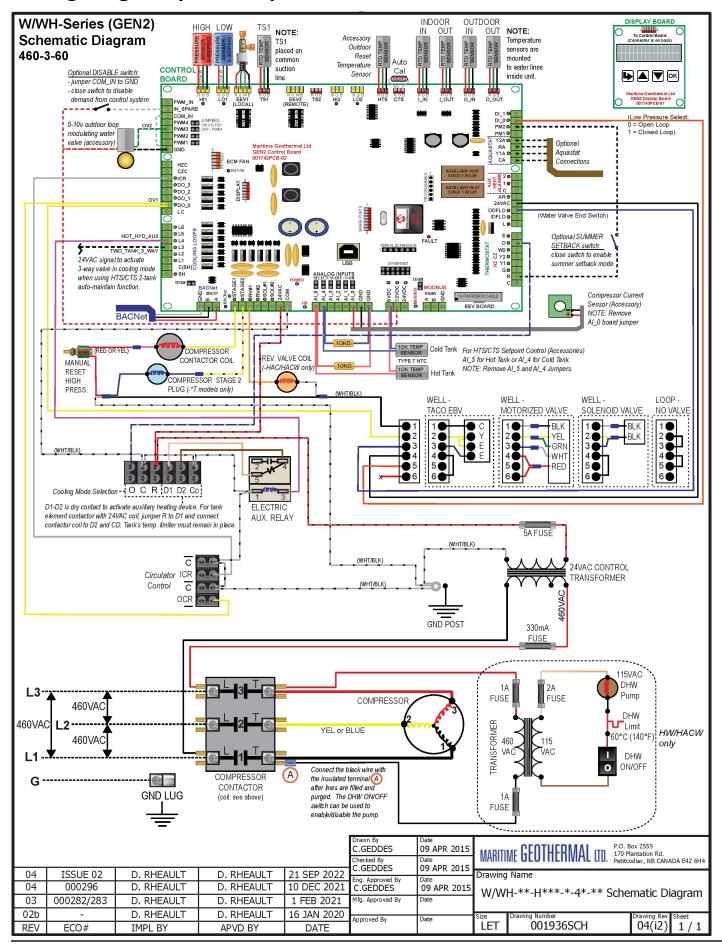
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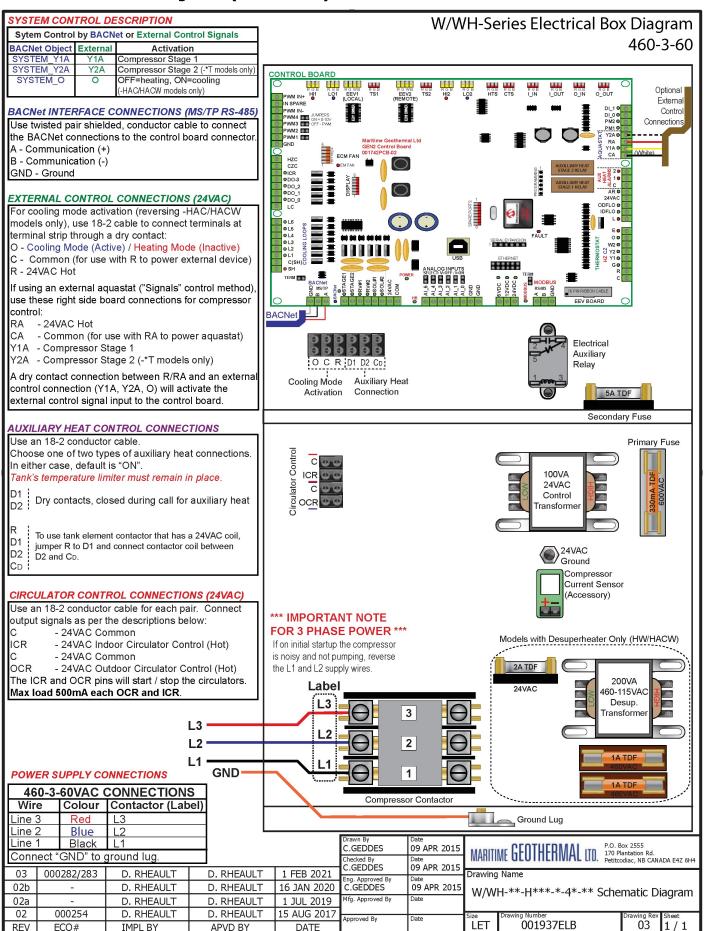
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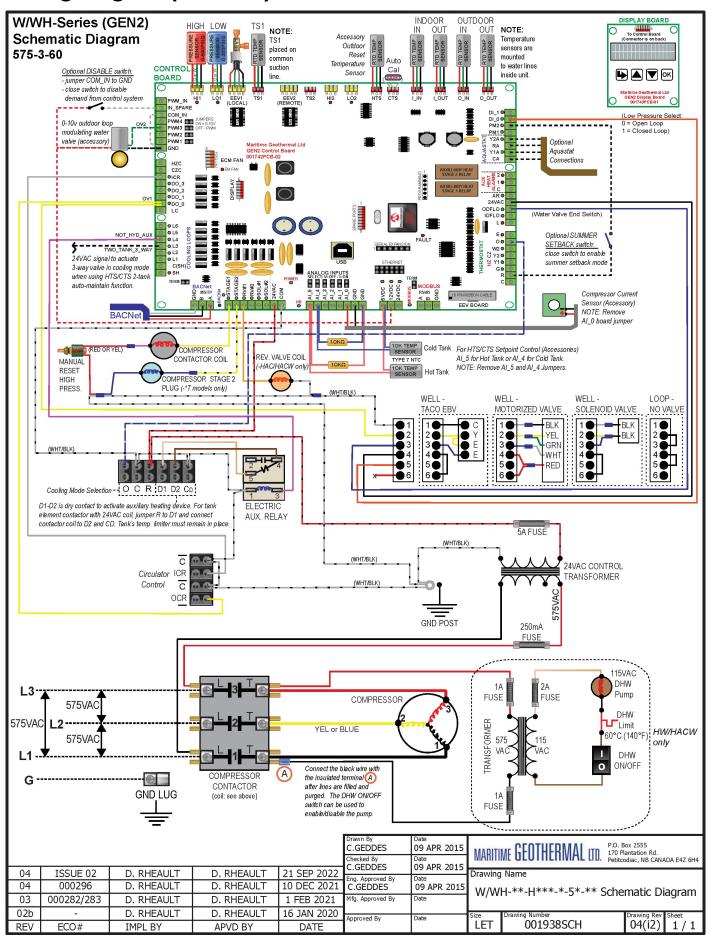
Wiring Diagram (460-3-60)



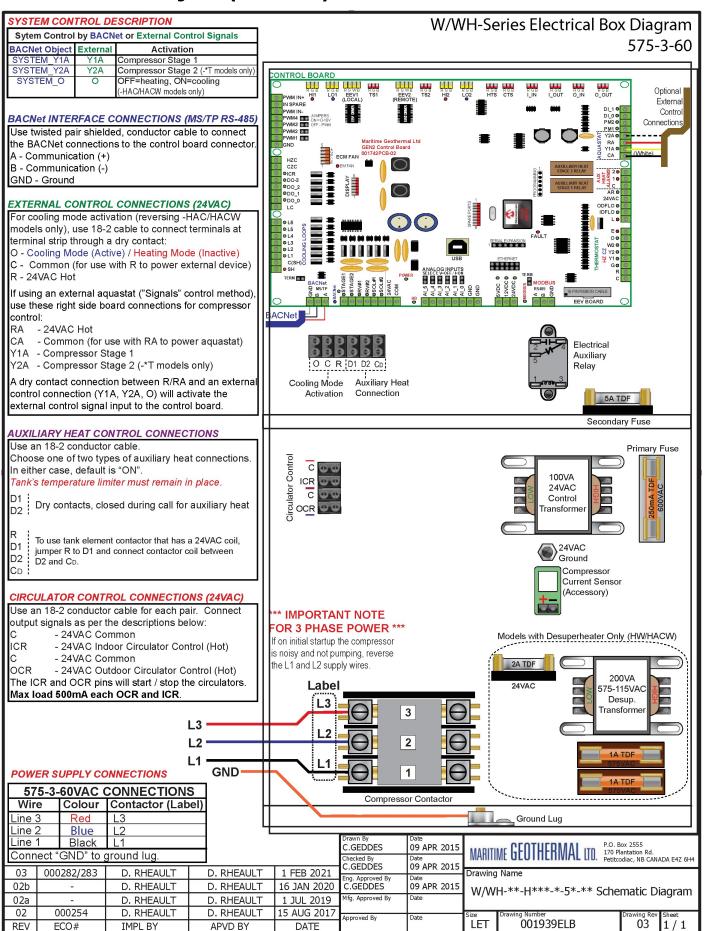
Electrical Box Layout (460-3-60)

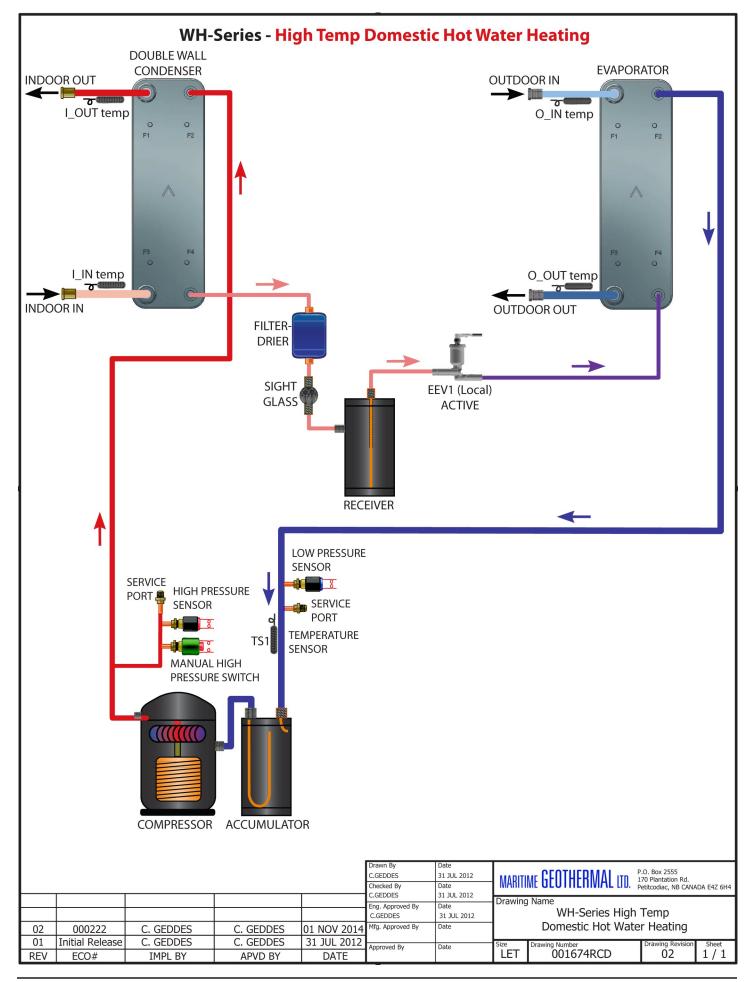


Wiring Diagram (575-3-60)



Electrical Box Layout (575-3-60)





Engineering Guide Specifications

General

The liquid source water-to-water heat pump shall be a single packaged high temperature heating unit. The unit shall be listed by a nationally recognized safety-testing lab (NRTL), such as ETL, TUV, UL or CSA. The unit shall be rated in accordance with applicable standards of the Air Conditioning, Heating, and Refrigeration Institute / International Standards Organization (AHRI/ISO) and/or Canadian Standards Association (CSA). The liquid source water to water heat pump unit, as manufactured by Maritime Geothermal, Petitcodiac, New Brunswick, shall be designed to operate correctly within liquid temperature ranges specified on the "Minimum and Maximum Operating Temperatures" page of this engineering specification document.

Factory Quality

Each unit shall be run tested at the factory with water circulating in both indoor and outdoor loops. Quality control system checks shall include: computerized nitrogen pressurized leak test, evacuation of refrigeration circuit to sustained vacuum, accurate system charge, detailed heating and cooling mode tests, and quality cross check all operational and test conditions to pass/fail criteria. Units tested without water flow are not acceptable. 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). 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, Electronic Expansion Valve (EEV), brazed plate heat exchanger on the evaporator side and a double walled brazed plate heat exchanger on the condenser side, factory installed high and low pressure sensors, manual reset high pressure switch, service ports, liquid line filter-dryer, liquid line receiver, sight glass, and suction accumulator.

Compressors shall be specified for heat pump duty with internal isolation consisting of rubber vibration isolators and mounting plate with rubber vibration isolators. Compressor motors shall have internal high temperature overload protection.

The water to refrigerant heat exchangers shall be of stainless steel brazed plate construction, certified for minimum 600 psig [4136 kPa] working pressure on the refrigerant side and 450 psig [3108 kPa] on the water side. Heat exchangers shall be insulated over all of their outside surface with minimum 3/8" thick closed cell insulation. Insulation consisting of 1/8" closed-cell insulating tape shall not be acceptable.

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'.

Piping and Connections

The unit shall have one set of primary water in and water out connections. The primary connection type shall be 1-1/4" nominal female National Pipe Thread (NPT). All water connectors shall be rigidly mounted to cabinet with corrosion resistant fasteners to prevent relative movement. All water connectors shall be constructed of copper or brass material for corrosion resistance.

All internal water and refrigerant piping shall be insulated with minimum 3/8" thick closed cell insulation. Insulation consisting of 1/8" closed-cell insulating tape shall not be acceptable.

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 power up to facilitate starting multiple units after a power failure.
- 3. Flow switch on outdoor loop, and also on indoor loop for reversing units.
- 4. Compressor shutdown for high or low refrigerant pressures, low flow conditions and for phase protection faults.
- 5. Automatic intelligent reset: unit shall automatically restart 5 minutes after trip if the fault has cleared. Should a fault reoccur 3 times sequentially then permanent lockout shall occur, requiring cycling of the power to the unit in order to reset.
- 6. Manual reset high pressure in case of electronic board failure.
- 7. The low pressure shall not be monitored for the first 90 seconds after a compressor start to prevent nuisance safety trips.
- 8. 2 x 16 backlit Liquid Crystal Display (LCD) and four buttons for limited data access. Unit may be configured for stand alone operation with optional temperature sensor(s)
- 9. Universal Serial Bus (USB) port for full data access and diagnostic information, including real-time charting and data-logging

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 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.

Warranty: W/WH-Commercial Series

COMMERCIAL LIMITED EXPRESS WARRANTY

Unless a statement is specifically identified as a warranty, statements made by Maritime Geothermal Ltd. ("MG") or its representatives relating to MG's products, whether oral, written or contained in any sales literature, catalogue or agreement, are not express warranties and do not form a part of the basis of the bargain, but

are merely MG's opinion or commendation of MG's products.
SET FORTH HERE IS THE ONLY EXPRESS WARRANTY THAT APPLIES TO MG'S PRODUCTS. MG MAKES NO WARRANTY AGAINST LATENT DEFECTS.
MG MAKES NO WARRANTY OF MERCHANTABILITY OF THE GOODS OR OF THE FITNESS OF THE GOODS FOR ANY PARTICULAR PURPOSE.

LIMITED EXPRESS COMMERCIAL WARRANTY - PARTS

MG warrants its Commercial Class products, purchased and retained in the United States of America and Canada, to be free from defects in material and workmanship under normal use and maintenance as follows:

- (1) Air conditioning, heating and/or heat pump units built or sold by MG ("MG Units") for one (1) year from the Warranty Inception Date (as defined below).
 (2) Thermostats, auxiliary electric heaters and geothermal pumping modules built or sold by MG, when installed with MG Units, for five (5) years from the Warranty Inception Date (as defined below).
- (3) Sealed refrigerant circuit components of MG Units (which components only include the compressor, refrigerant to air/water heat exchangers, reversing valve body and refrigerant metering device) for one (1) year from the Warranty Inception Date (as defined below).
- (4) Other accessories, when purchased separately, for (1) year from the date of shipment from MG.

The "Warranty Inception Date" shall be the date of original unit installation, as per the date on the installation Startup Record; or sixty (60) days from date of unit shipment from MG, whichever comes first.

To make a claim under this warranty, parts must be returned to MG in Petitcodiac, New Brunswick, freight prepaid, no later than ninety (90) days after the date of the failure of the part. If MG determines the part to be defective and within MG's Limited Express Commercial Warranty, MG shall, when such part has been either replaced or repaired, return such to a factory recognized distributor, dealer or service organization, freight prepaid. The warranty on any part repaired or replaced under warranty expires at the end of the original warranty period.

LIMITED EXPRESS COMMERCIAL WARRANTY - LABOUR

MARITIME GEOTHERMAL LTD. will not be responsible for any consequential damages or labour costs incurred.

This warranty does not cover and does not apply to:

- (1) (2) (3)
- Air filters, fuses, refrigerant, fluids, oil.

 Products relocated after initial installation.
- Any portion or component of any system that is not supplied by MG, regardless of the cause of the failure of such portion or component.
- Products on which the unit identification tags or labels have been removed or defaced. (4)
- Products on which payment to MG, or to the owner's seller or installing contractor, is in default.
- Products subjected to improper or inadequate installation, including but not limited to:
 - Indoor or outdoor loop flow lower than listed in engineering specification or as expressly approved by MARITIME GEOTHERMAL LTD.
 - Operating the heat pump either manually or with automated controls so that the unit is forced to function outside its normal operating range
 - Disabling of safety controls
 - Insufficient loop antifreeze concentration for loop temperature, or antifreeze concentration incorrectly set in control board
 - Fouled heat exchangers due to poor water quality
 - Failure to use strainers or 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)
 - Unit not mounted with supplied anti-vibration grommets when specified for use
 - 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
- Mold, fungus or bacteria damage Corrosion or abrasion of the product.
- Products supplied by others.
- (10) Electricity or fuel, or any increases or unrealized savings in same, for any reason whatsoever.

- The costs of fluids, refrigerant or system components supplied by others, or associated labour to repair or replace the same, which is incurred as a result of a defective part covered by MG's Limited Commercial Warranty.
 The costs of labour, refrigerant, materials, or service incurred in diagnosis and removal of defective part, or in obtaining and replacing the new or repaired part.
- Transportation costs of the defective part from the installation site to MG, or of the return of that part if warranty coverage declined.
- The costs of normal maintenance.

MG'S LIABILITY UNDER THE TERMS OF THIS LIMITED WARRANTY SHALL APPLY ONLY TO THE MG UNITS REGISTERED WITH MG THAT BEAR THE MODEL AND SERIAL NUMBERS STATED ON THE INSTALLATION START UP RECORD, AND MG SHALL NOT, IN ANY EVENT, BE LIABLE UNDER THE TERMS OF THIS LIMITED WARRANTY UNLESS THIS INSTALLATION START UP RECORD HAS BEEN ENDORSED BY OWNER & DEALER/INSTALLER AND RECIEVED BY MG LIMITED WITHIN 90 DAYS OF START UP.

Limitation: This Limited Express Commercial Warranty is given in lieu of all other warranties. If, notwithstanding the disclaimers contained herein, it is determined that other warranties exist, any such express warranty, including without imitation any express warranties or any implied warranties of fitness for particular purpose and merchantability, shall be limited to the duration of the Limited Express Commercial Warranty.

LIMITATION OF REMEDIES

In the event of a breach of the Limited Express Commercial Warranty, MG will only be obligated at MG's option to repair the failed part or unit, or to furnish a new or rebuilt part or unit in exchange for the part or unit which has failed. If after written notice to MG's factory in Petitcodiac, New Brunswick of each defect, malfunction or other failure, and a reasonable number of attempts by MG to correct the defect, malfunction or other failure, and the remedy fails of its essential purpose, MG shall refund the purchase price paid to MG in exchange for the return of the sold good(s). Said refund shall be the maximum liability of MG. THIS REMEDY IS THE SOLE AND EXCLUSIVE REMEDY OF THE BUYER OR PURCHASER AGAINST MG FOR BREACH OF CONTRACT, FOR THE BREACH OF ANY WARRANTY OR FOR MG'S NEGLIGENCE OR IN STRICT LIABILITY.

MG shall have no liability for any damages if MG's performance is delayed for any reason or is prevented to any extent by any event such as, but not limited to: any war, civil unrest, government restrictions or restraints, strikes, or work stoppages, fire, flood, accident, shortages of transportation, fuel, material, or labour, acts of God or any other reason beyond the sole control of MG. MG EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGE IN CONTRACT, FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, OR IN TORT, WHETHER FOR MG'S NEGLIGENCE OR AS STRICT LIABILITY.

OBTAINING WARRANTY PERFORMANCE

Normally, the dealer or service organization who installed the products will provide warranty performance for the owner. Should the installer be unavailable, contact any MG recognized distributor, dealer or service organization. If assistance is required in obtaining warranty performance, write or call Maritime Geothermal Ltd.

NOTE: Some states or Canadian provinces do not allow limitations on how long an implied warranty lasts, or the limitation or exclusions of consequential or incidental damages, so the foregoing exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state and from Canadian province to Canadian province.