



Neo Controller

Control Interface For
A/C and HVAC Systems

Operating Instructions

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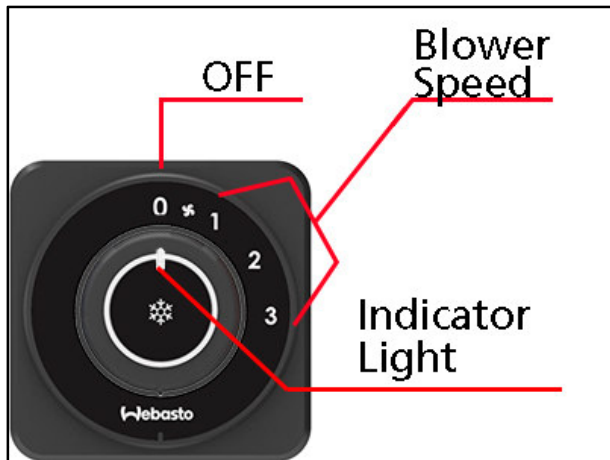
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Neo 1 – A/C Only

A/C Only

Switching the A/C system to ON (blower positions 1, 2, or 3) will turn the blower on to the desired speed, activate the refrigerant compressor, and activate the seawater pump/condenser fan. If the thermostat, low pressure, or trinary switch is open the compressor will switch OFF.

To switch the system OFF the blower knob has to be in the OFF (0) position.



*Some images of control panels are pre-production and are meant to be representative of production pieces.

Operation

Seawater pump/compressor clutch relay Input enable clutch (J2)

- 0V – Compressor and seawater pump/condenser fan OFF
- 12VDC – Compressor and seawater pump/condenser fan ON

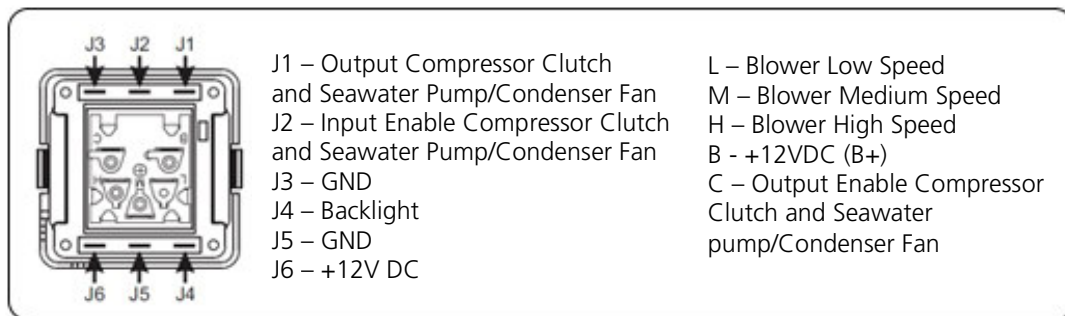
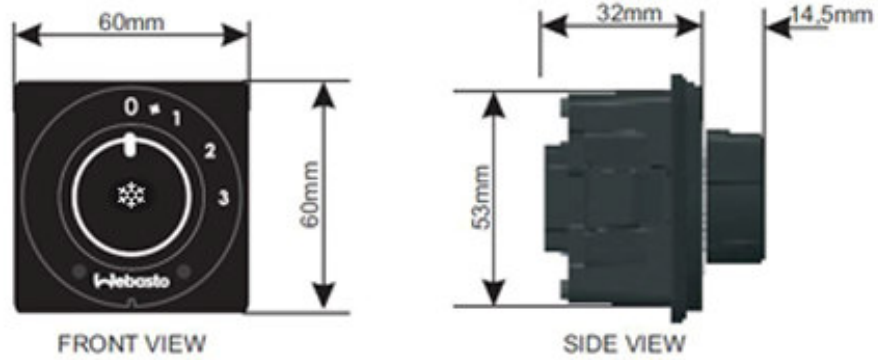
To select the desired speed, turn the knob to:

- Knob position 0 = blower OFF
- Knob position 1 = blower Low
- Knob position 2 = blower Medium
- Knob position 3 = blower High

Technical Specification:

Power Supply	12V DC
Current Consumption	0.20 A
Maximum Output Current	Blower: 25A
	Compressor Clutch/Condenser Fan: 5A
Operating Temperature	-40° C ~ +85° C (-40° F ~ 184° F)
Protection Degree	IP 54 (FRONT)

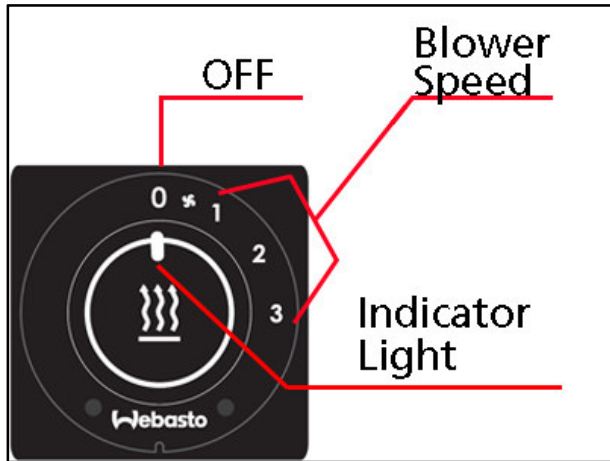
Neo 1 (continued)



Neo 1 – Heat Only

Heat Only

To start the heat mode the blower switch has to be in one of the ON (1,2 or 3) positions. The coolant valve is open when the blower switch is in ON position. The coolant pump is on when the system is on one of the ON (1, 2, or 3) positions. To switch the system OFF the blower knob has to be in the OFF (0) position.



Operation

The ignition signal enables the controller to manipulate the blower speed by varying output signals.

- Ignition input = 0V DC or open: inputs and outputs disabled.*
- Ignition input = +12V DC: inputs and outputs enabled for operation

*Backlight is independent of operating mode when connected to illumination circuit

Heating function: controls the water valve to achieve the desired temperature.

Coolant pump output: The coolant pump will be triggered when the following conditions are met:

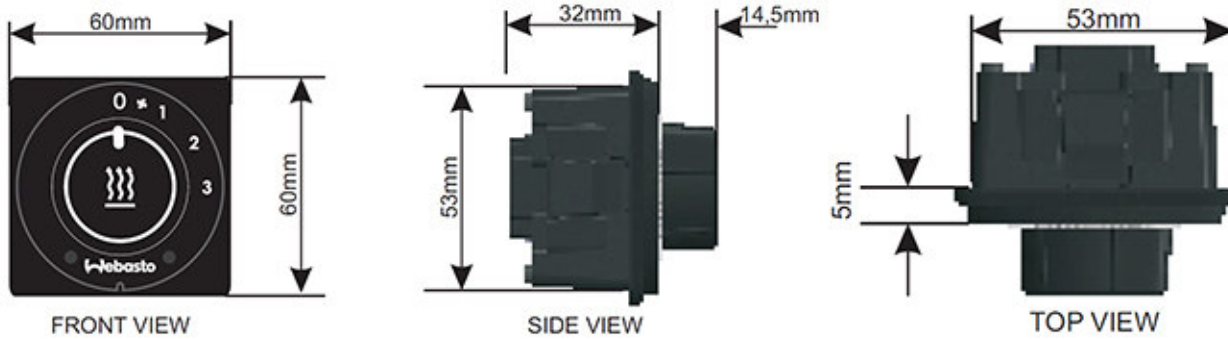
- Ventilation ON input enabled (+12V DC signal)

NOTE:

- The controller has a hysteresis of 15 seconds after 'power up' before the operating mode can be changed.

Technical Specification:

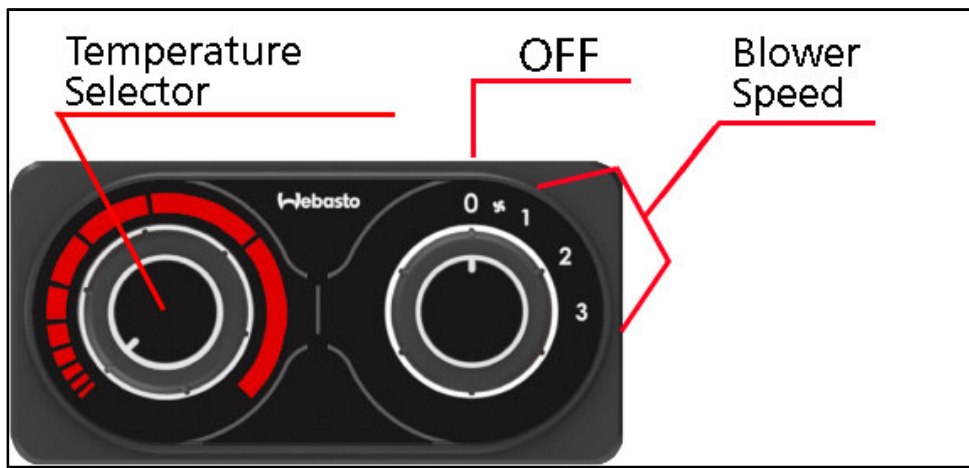
Power Supply	12V DC
Current Consumption	0.20 A
Maximum Output Current	Blower: 25A
	Coolant Pump / Coolant Valve: 5A
Operating Temperature	-40° C ~ +85° C (-40° F ~ 184° F)
Protection Degree	IP 54 (FRONT)



<p>Internal wiring diagram of the control unit showing terminals J1 through J6 and L, M, H, B, C. The diagram shows the internal components and their connections to the terminals.</p>	J1 – Heating
	J2 – Input Enable Coolant Pump / Valve
	J3 – GND
	J4 –Backlight
	J5 – GND
	J6 - +12VDC
	L – Blower Low Speed
	M – Blower Medium Speed
	H – Blower High Speed
	B - +12VDC (B+)
C – Output Enable Coolant Pump / Valve	

Neo 2 – Heat Only

To start the heat mode the blower switch has to be in one of the ON (1,2 or 3) positions. The coolant valve is operational when the blower switch is in ON position. The coolant valve is controlled by the temperature knob; it's position will depend on temperature dial position. The valve will be fully open when the temperature knob is turned to full hot (full clockwise), and fully closed when the temperature knob is turned to full cool (full counter-clockwise). The coolant pump is on when the system is on one of the ON (1, 2, or 3) positions, but off when the temperature dial is at the lowest 10% of the range. To switch the system OFF the blower knob has to be in the OFF (0) position.



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Operation

The ignition signal enables the controller to manipulate the system (blower speed, temperature) by varying output signals.

- Ignition input = 0V DC or open: inputs and outputs disabled.*
 - Ignition input = +12V DC: inputs and outputs enabled for operation
- *Backlight is independent of operating mode when connected to illumination circuit

Heating function: controls the water valve to achieve the desired temperature. The position of the temperature selector knob determines the open position of the water valve.

Coolant pump output (if equipped): The coolant pump will be triggered when the following conditions are met:

- Ventilation ON input enabled (+12V DC signal)

NOTE:

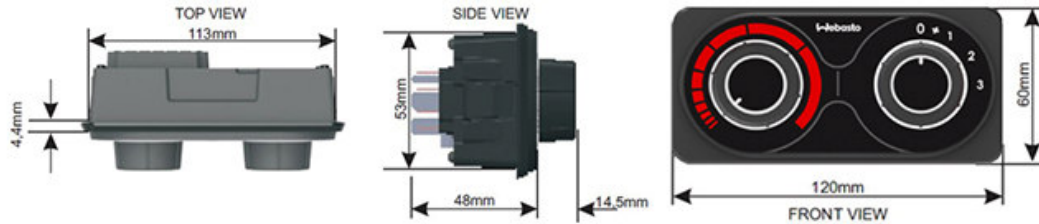
- The controller has a hysteresis of 15 seconds after 'power up' before the operating mode can be changed.

Technical Specification:

Power Supply	12V DC
Current Consumption	0.15 A
Maximum Output Current	Blower: 25A
	Coolant Pump: 5A
Operating Temperature	-40° C ~ +85° C (-40° F ~ 184° F)
Protection Degree	IP 54 (FRONT)

Neo 2 – Heat Only (continued)

Dimensions:

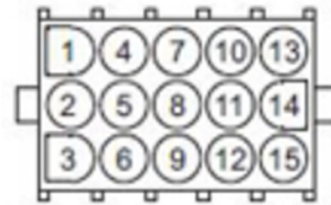


Connections:

CN1



CN2



CN1	CN2
L – Blower Low Speed	1 - +12VDC
M – Blower Medium Speed	2 – Water Valve
H – Blower High Speed	3 – Water Valve
B - +12VDC	4 – Not Used
C – Blower ON	5 – Coolant Pump (+)
	6 – Not Used
	7 – Not Used
	8 – GND
	9 – Ignition (+)
	10 – Water Valve Feedback
	11 – Water Valve GND
	12 – Backlight Control
	13 – Not Used
	14 – Not Used
	15 – Blower ON (+)

Neo 2 – HVAC

A/C Mode

Switch the blower speed selector to one of the ON positions (1, 2, or 3) and press the A/C button to activate A/C mode. The snowflake will illuminate to indicate the system is in A/C mode. The A/C button will only function if the blower switch is on an ON position.

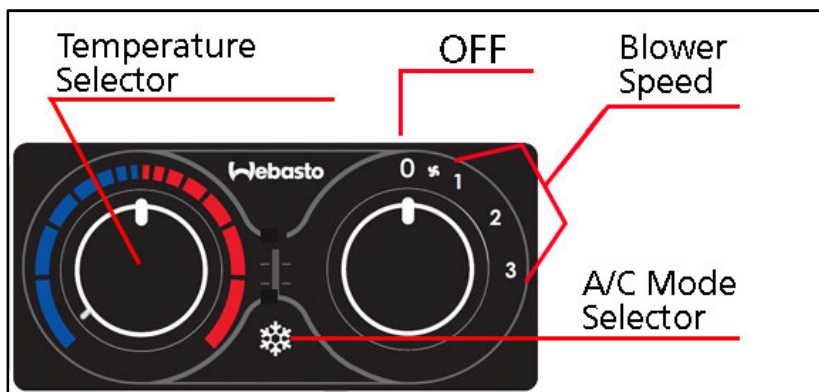
The seawater pump/condenser fan and A/C compressor will start when the A/C button is pressed. If the thermostat, low pressure, or trinary switch is open the compressor will switch OFF. The seawater pump/condenser fan will continue to run as long as the system switch is set to any of the three ON positions and the A/C mode is selected.

Heat Mode

To start the heat mode the blower switch has to be in one of the ON (1,2 or 3) positions.

The coolant valve is operational when the blower switch is in ON position. The coolant valve is controlled by the temperature knob; it's position will depend on temperature dial position. The valve will be fully open when the temperature knob is turned to full hot (full clockwise), and fully closed when the temperature knob is turned to full cool (full counter-clockwise). The coolant pump is on when the system is on one of the ON (1, 2, or 3) positions, but off when the temperature dial is at the lowest 10% of the range.

To switch the system OFF the blower knob has to be in the OFF (0) position.



*Some images of control panels are pre-production and are meant to be representative of production pieces.

Operation:

The ignition signal enables the controller to manipulate the system by varying output signals.

- Ignition input = 0V DC or open: inputs and outputs disabled.*
 - Ignition input = +12V DC: inputs and outputs enabled for operation
- *Backlight is independent of operating mode when connected to illumination circuit

Air conditioning function: controls the clutch / condenser output via the snowflake button.

NOTE: After pressing the snowflake button:

- Ventilation ON A/C input = 0V DC or open: compressor OFF
- Ventilation ON A/C input = +12V DC: compressor ON, clutch ON

NOTE: The control panel has a 30 second hysteresis between clutch / condenser output changes, i.e. the unit will remain OFF for at least 30 seconds after being switched OFF.

Heating function: controls the water valve to achieve the desired temperature. The position of the temperature selector knob determines the open position of the water valve.

Coolant pump output: The coolant pump will be triggered when the following conditions are met:

- Ventilation ON A/C input enabled (+12V DC signal)

NOTE:

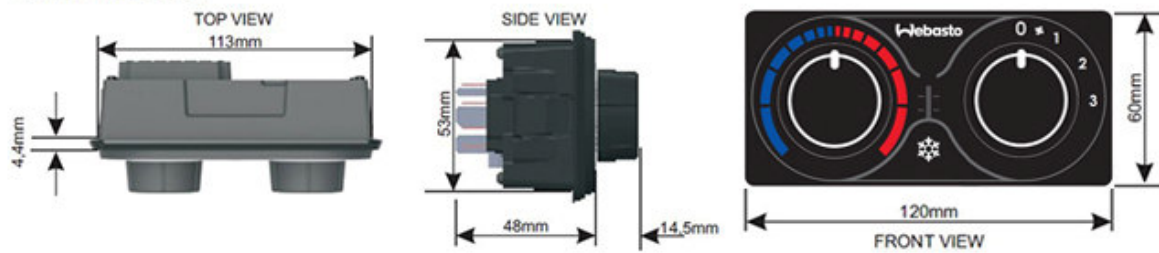
- The panel has a hysteresis of 15 seconds after 'power up' before the operating mode can be changed.

Neo 2 – HVAC (continued)


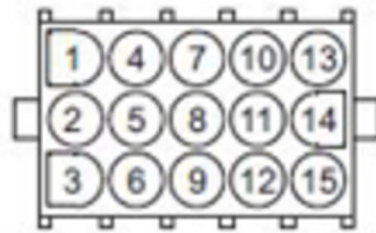
Technical Specification:

Power Supply	12V DC
Current Consumption	0.15 A
Maximum Output Current	Blower: 25A
	Coolant Pump: 5A
	Compressor Clutch and Seawater Pump/Condenser Fan: 5A
Operating Temperature	-40° C ~ +85° C (-40° F ~ 184° F)
Protection Degree	IP 54 (FRONT)

Dimensions:



Connections:

CN1	CN2
	
L – Blower Low Speed	1 - +12VDC
M – Blower Medium Speed	2 – Water Valve
H – Blower High Speed	3 – Water Valve
B - +12VDC	4 – Not Used
C – Blower ON	5 – Coolant Pump (+)
	6 – A/C Clutch (+)
	7 – Not Used
	8 – GND
	9 – Ignition (+)
	10 – Water Valve Feedback
	11 – Water Valve GND
	12 – Backlight Control
	13 – Not Used
	14 – Not Used
	15 – Blower ON (+)

Neo 3 – Heat and A/C – Seperate Systems

The Neo 3 controller is used in split systems, where there is an A/C system as well as a heat system that are independent of each other.

A/C Mode

Switch the A/C blower speed selector to one of the ON positions (1, 2, or 3) and press the A/C button to activate A/C mode. The snowflake will illuminate to indicate the system is in A/C mode. The A/C button will only function if the A/C blower speed selector is on an ON position.

The seawater pump/condenser fan and A/C compressor will start when the A/C button is pressed. If the thermostat, low pressure, or trinary switch is open the compressor will switch OFF. The seawater pump/condenser fan will continue to run as long as the A/C blower speed selector is set to any of the three ON positions and the A/C mode is selected.

When A/C mode is active, the coolant pump is OFF and the coolant valve is closed. The heated air blower motor is used to circulate ambient air inside the vehicle.

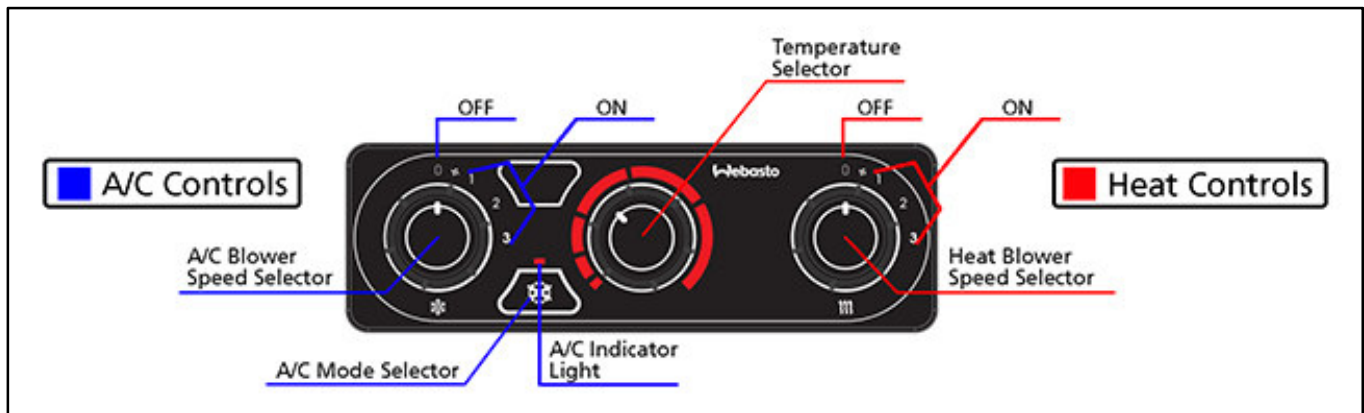
Heat Mode

To start the heat mode the heat blower speed selector has to be in one of the ON (1, 2 or 3) positions and A/C button in the OFF position. The seawater pump/condenser fan and A/C compressor will be OFF. The A/C blower speed selector can be in any position.

The coolant valve is operational when the blower switch is in any of the ON positions (1, 2, or 3). The coolant valve is controlled by temperature knob; it's position will depend on temperature dial position. The valve will be fully open when the temperature knob is turned to full hot (full clockwise), and fully closed when the temperature knob is turned to full cool (full counter-clockwise). The coolant pump is on when the system is on one of the ON (1, 2, or 3) positions, but off when the temperature dial is at the lowest 10% of the range.

To switch the system OFF the blower knob has to be in the OFF (0) position.

The A/C blower motor is used to circulate ambient air inside the vehicle.



Technical Specification:

Power Supply	12V DC
Current Consumption	0.15 A
Maximum Output Current	Blower: 25A
	Coolant Pump: 5A
	Compressor Clutch and Seawater Pump/Condenser Fan: 5A
Operating Temperature	-40° C ~ +85° C (-40° F ~ 184° F)
Protection Degree	IP 54 (FRONT)

Neo 3 – Heat and A/C – Separate Systems (continued)

Operation:

The ignition signal enables the controller to manipulate the system by varying output signals.

- Ignition input = 0V DC or open: inputs and outputs disabled.*
 - Ignition input = +12V DC: inputs and outputs enabled for operation
- *Backlight is independent of operating mode when connected to illumination circuit

Air conditioning function: controls the compressor clutch and seawater pump/condenser fan via the snowflake button.

NOTE: After pressing the snowflake button:

- Blower ON A/C input = 0V DC or open: compressor OFF
- Blower ON A/C input = +12V DC: compressor ON, clutch ON

NOTE: The controller has a 30 second hysteresis between compressor clutch and seawater pump/condenser fan output changes, i.e. the unit will remain OFF for at least 30 seconds after being switched OFF.

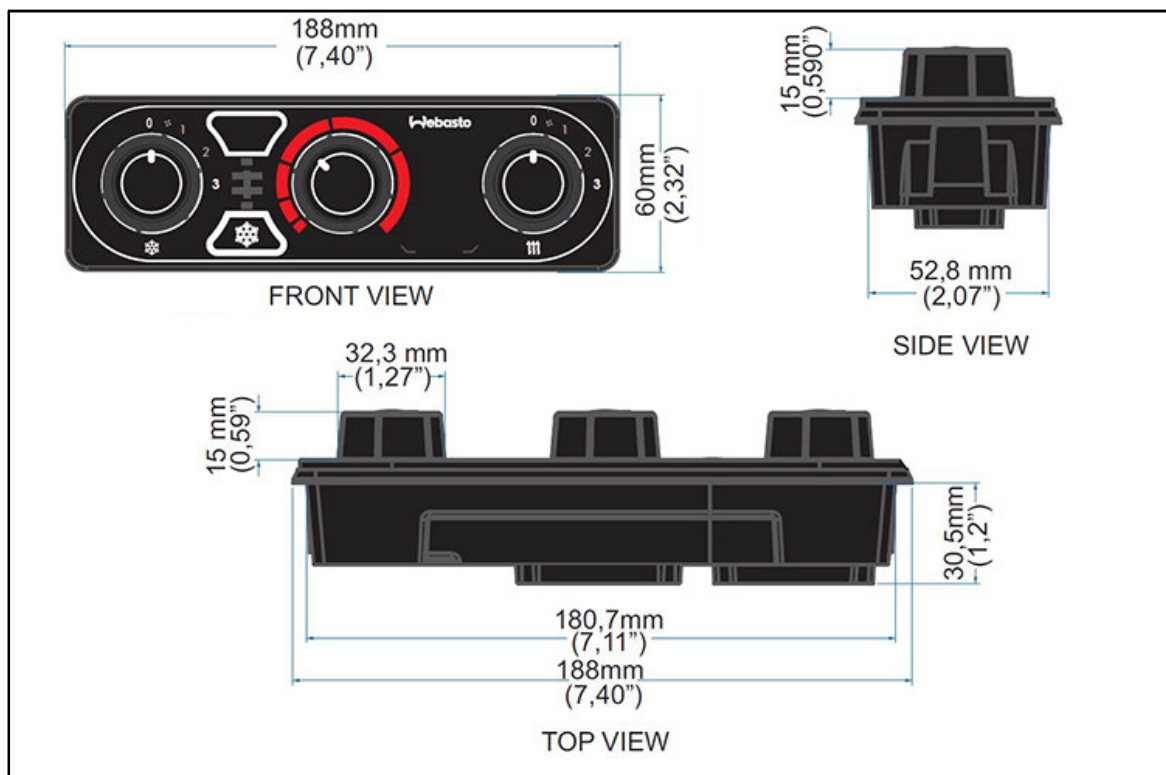
Heating function: controls the water valve to achieve the desired temperature. The position of the temperature selector knob determines the open position of the water valve.

Coolant pump output: The coolant pump will be triggered when the following conditions are met:

- Blower ON heat input enabled (+12V DC signal) and the temperature selector is not in the full-counter clockwise position.

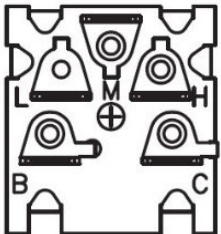
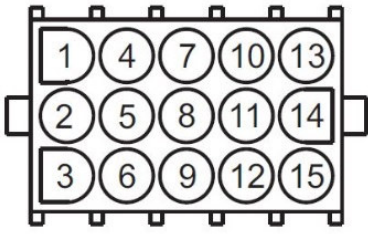
NOTE:

- The controller has a 30 second hysteresis between compressor clutch and seawater pump/condenser fan output changes, i.e. the unit will remain OFF for at least 30 seconds after being switched OFF.



Neo 3 – Heat and A/C – Separate Systems (continued)



CN1 and CN3		CN2	
			
L – Blower Low Speed	1 – +12V DC	6 – Compressor Clutch and Seawater Pump/Condenser Fan	11 – Water Valve GND
M – Blower Medium Speed	2 – Water Valve	7 – Not used	12 – Backlight Control
H – Blower High Speed	3 – Water Valve	8 – GND	13 – Not used
B – +12V DC	4 – Not used	9 – Ignition +	14 – Heater Blower ON (+)
C – Heat Blower ON (CN1) C – A/C Blower ON (CN3)	5 – Coolant Pump +	10 - Gnd	15 – A/C Blower ON (+)





Feel the Drive

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