



**neptronic®**

# Evaporative Cooler

SKVF Series

Modbus Communication Module User Guide



# Introduction

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The SKVF Modbus Communication Module User Guide provides information for using Neptronic<sup>®</sup> communication feature. The controller uses Modbus communication protocol over serial line in the RTU mode and provides a Modbus network interface between client devices and Neptronic SKVF devices.

The SKVF Modbus Guide assumes that you are familiar with Modbus terminology.

The following are the requirements for Modbus:

- *Data Model.* The Evaporative Cooler Modbus server data model uses only the Modbus Registers table.
- *Register Address:*
  - As per protocol base (base 0); for PLC add 1 to protocol base.
  - As per holding register (base 400001).



*Note: Ensure that the Modbus communication software used does not have a limit on the range of the register addresses that can be viewed and supports 6-digit holding registers.*

- *Function Codes.* The Evaporative Cooler Modbus server supports a limited function codes subset comprising:
  - Read Holding Registers (0x03)
  - Write Single Register (0x06)
  - Write Multiple Registers (0x10)
- *Exception Responses.* The Evaporative Cooler Modbus server supports the following exception codes:
  - Illegal data address
  - Illegal data value
  - Slave device busy
- *Serial Line.* The Evaporative Cooler Modbus over serial line uses RTU transmission mode over a two-wire configuration RS485 (EIA/TIA-485 standard) physical layer.
  - The physical layer can use fixed baud rate selection or automatic baud rate detection (default) as per the **Modbus Auto Baud Rate** device menu item or holding register index 1.
  - The supported baud rates are 9600, 19200, 38400, and 57600.
  - The physical layer also supports variable parity control and stop bit configuration as per the **Modbus Comport Config** device menu item or holding register index 2.
  - In auto baud rate configuration, if the device detects only consecutive bad frames (2 or more) for one second with any given baud rate, it will reinitialize itself to the next baud rate.
- *Addressing.* The Evaporative Cooler device only answers at the following address:
  - The device's unique address (1 to 246) that can be set through the device menu or through holding register index 0.

# Modbus Registers

## Table Glossary

Name	Description	Name	Description
W	Writable Register	ASCII	For registers containing ASCII (8-bit) characters
RO	Read Only Register	MSB	Most Significant Byte
Unsigned	For range of values from 0 to 65,535, unless otherwise specified	LSB	Least Significant Byte
Signed	For range of values from -32,768 to 32,767, unless otherwise specified	MSW	Most Significant Word
Bit String	For registers with multiple values using bit mask (example, flags)	LSW	Least Significant Word

## Modbus Registers Table

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
0	400001	Modbus Address and Product Type	Unsigned	MSB = Product type, not writable LSB = Modbus Address (1 to 247), writable	W	
1	400002	Device Baud Rate	Unsigned <i>Scale 100</i>	0, 9600, 19200, 38400, and 57600, 0 = Auto Baud Rate <i>Detection Value/100 (e.g. 38400 baud = 384)</i>	W	19200
2	400003	Modbus Slave Communication Port Configuration	Unsigned	0 = No parity, 2 Stop bits 1 = Even parity, 1 Stop bit 2 = Odd parity, 1 Stop bit	W	No parity, 2 Stops bits
3	400004	Product Name (characters 8 & 7)	ASCII	MSB = char 6, LSB = char 7	W	
4	400005	Product Name (characters 6 & 5)	ASCII	MSB = char 4, LSB = char 5	W	
5	400006	Product Name (characters 4 & 3)	ASCII	MSB = char 2, LSB = char 3	W	
6	400007	Product Name (characters 2 & 1)	ASCII	MSB = char 0, LSB = char 1	W	

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
7	400008	Product Actual Firmware Version (in Integer x100)	Unsigned Scale 100	1 to 65535 (e.g. 100)	RO	
8	400009	Product Actual EEPROM Version (in Integer x100)	Unsigned Scale 100	1 to 65535 (e.g. 100)	RO	
2000	402001	Control Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 1000 (e.g. 2V = 2000)	RO	0V
2001	402002	Room RH Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 1000 (e.g. 2V = 2000)	RO	0V
2002	402003	Supply RH Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 1000 (e.g. 2V = 2000)	RO	0V
2003	402004	ECM Fan Feedback	Unsigned Scale 1	Units: Hz, Range: 0 to 30000Hz Value x 1 (e.g. 10Hz = 10)	RO	0Hz
2004	402005	Float Switch Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 2V = 2000)	RO	0V
2005	402006	<i>Reserved</i>				
2006	402007	Main Power Supply	Unsigned Scale 10	Unit: Volt (V), Range: 0V to 40V Value x 10 (e.g. 2V = 20)	RO	0V
2007	402008	ECM Fan Feedback 2	Unsigned Scale 1	Units: Hz, Range: 0 to 30000Hz Value x 1 (e.g. 10Hz = 10)	RO	0Hz
2008	402009	Room Temperature Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 1000 (e.g. 2V = 2000)	RO	0V
2009	402010	Supply Temperature Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 1000 (e.g. 2V = 2000)	RO	0V
2010	402011	Control Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 1000 (e.g. 2V = 2000)	RO	0V
4000	404001	Power Output Feedback Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 2V = 2000)	RO	0V

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
4001	404002	ECM Fan Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 2V = 2000)	RO	0V
6000	406001	SKVF Demand	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6001	406002	Power Output	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6002	406003	Control Input	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%
6003	406004	Control Min	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%
6004	406005	Control Max	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%
6005	406006	Control Bias	Signed Scale 100	Unit: %, Range: -10% to 10% Value x 100 (e.g. 10% = 1000)	W	0%
6006	406007	Room RH	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6007	406008	Room RH Min	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	0% RH
6008	406009	Room RH Max	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	0% RH
6009	406010	Room RH Bias	Unsigned Scale 100	Unit: % RH, Range: -10% RH to 10% RH Value x 100 (e.g. 10% RH = 1000)	W	0% RH
6010	406011	Supply High Limit RH	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6011	406012	Supply High Limit RH Min	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	0% RH

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6012	406013	Supply High Limit RH Max	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	0% RH
6013	406014	Supply High Limit RH Bias	Signed Scale 100	Unit: %, Range: -10% RH to 10% RH Value x 100 (e.g. 10% RH = 1000)	W	0% RH
6014	406015	Run Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 2147483647 h Value x 100 (e.g. 10 h = 1000)	RO	0h
6015	406016	Run Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6016	406017	Run Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		
6017	406018	Run Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		
6018	406019	On Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 2147483647 h Value x 100 (e.g. 10 h = 1000)	RO	0h
6019	406020	On Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6020	406021	On Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		
6021	406022	On Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		
6022	406023	Water Treated Volume (0)	Unsigned Scale 100	Units: Litres (l), Range: 0 to 9999999 l Value x 100 (e.g. 10 h = 1000)	RO	0l
6023	406024	Water Treated Volume (1)		Units: Litres (l), Range: 0 to 9999999 l		
6024	406025	Water Treated Volume (2)		Units: Litres (l), Range: 0 to 9999999 l		
6025	406026	Water Treated Volume (3)		Units: Litres (l), Range: 0 to 9999999 l		
6026	406027	Service On Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 2147483647 h Value x 100 (e.g. 10 h = 1000)	RO	0h
6027	406028	Service On Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6028	406029	Service On Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		
6029	406030	Service On Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6030	406031	Dead Band	Unsigned Scale 1	Unit: %, Range: 1% to 100% Value x 1 (e.g. 10% = 10)	W	5%
6031	406032	Minimum Production Output	Unsigned Scale 1	Unit: %, Range: 0% to 100% Value x 1 (e.g. 10% = 10)	W	10%
6032	406033	Maximum Production Output	Unsigned Scale 1	Unit: %, Range: 0% to 100% Value x 1 (e.g. 10% = 10)	W	100%
6033	406034	Idle Fan Speed	Unsigned Scale 1	Unit: %, Range: 0% to 100% Value x 1 (e.g. 10% = 10)	W	0%
6034	406035	Service Interval	Unsigned Scale 1	Units: Hours (h), Range: 1000 to 3000 h Value x 1 (e.g. 10 h = 10)	W	1000h
6035	406036	<i>Reserved</i>				
6036	406037	Power Output Feedback Bias	Unsigned Scale 1000	Unit: V, Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	W	0V
6037	406038	Power Output Feedback Min	Unsigned Scale 1000	Unit: V, Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	W	0V
6038	406039	Power Output Feedback Max	Unsigned Scale 1000	Unit: V, Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	W	10V
6039	406040	Power Output Feedback	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6040	406041	Dilution Ratio	Unsigned Scale 1	Unit: %, Range: 0% to 300% Value x 1 (e.g. 10% = 10)	W	100%
6041	406042	Drain Interval	Unsigned Scale 1	Unit: Hours (h), Range: 0 to 24 h Value x 1 (e.g. 10h = 10)	W	4h
6042	406043	Fixed Drain Time	Unsigned Scale 1	Unit: Hours (h), Range: 4 to 72 h Value x 1 (e.g. 10h = 10)	W	6h



Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6043	406044	Line Rinse Time	Unsigned Scale 1	Unit: Seconds (sec), Range: 0sec to 400sec Value x 1 (e.g. 10sec = 10)	W	180 sec
6044	406045	Water Treatment Service Volume	Unsigned Scale 1	Unit: Litres (l), Range: 0 to 30000 l Value x 1 (e.g. 10h = 10)	W	0 l
6045	406046	Water Supply Duty Cycle	Unsigned Scale 1	Unit: %, Range: 8% to 70% Value x 1 (e.g. 10% = 10)	W	10%
6046	406047	Water Supply Period	Unsigned Scale 1	Unit: Seconds (sec), Range: 0sec to 180sec Value x 1 (e.g. 10sec = 10)	W	60 sec
6047	406048	Room RH Network Reading	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	0% RH
6048	406049	Room RH Setpoint	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	40% RH
6049	406050	Room RH Unoccupied Setpoint	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	30% RH
6050	406051	Room RH Vacant Setpoint	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	20% RH
6051	406052	Room RH Demand Proportional Gain	Unsigned Scale 10	No Unit, Range: 1 to 200 Value x 10 (e.g. 10 = 100)	W	28.5
6052	406053	Room RH Demand Integral Time	Unsigned Scale 10	Unit: Seconds (sec), Range: 0 to 900 sec Value x 10 (e.g. 10 sec = 100)	W	0 sec
6053	406054	Room RH Demand Derivative Time	Unsigned Scale 10	Unit: Seconds (sec), Range: 0 to 60 sec Value x 10 (e.g. 10 sec = 100)	W	0 sec
6054	406055	Room RH Demand	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6055	406056	RH Supply High Limit Network Reading	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	0% RH



Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6056	406057	RH Supply High Limit Setpoint	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	80% RH
6057	406058	RH Supply High Limit Unoccupied Setpoint	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	80% RH
6058	406059	RH Supply High Limit Vacant Setpoint	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	80% RH
6059	406060	RH Supply High Limit Proportional Gain	Unsigned Scale 10	No Unit, Range: 1 to 200 Value x 10 (e.g. 10 = 100)	W	28.5
6060	406061	RH Supply High Limit Integral Time	Unsigned Scale 10	Unit: Seconds (sec), Range: 0 to 900 sec Value x 10 (e.g. 10 sec = 100)	W	0 sec
6061	406062	RH Supply High Limit Derivative Time	Unsigned Scale 10	Unit: Seconds (sec), Range: 0 to 60 sec Value x 10 (e.g. 10 sec = 100)	W	0 sec
6062	406063	RH Supply High Limit Demand	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6063	406064	Control Network Demand	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%
6064	406065	Control Network High Limit	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%
6065	406066	Demand	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6066	406067	<i>Reserved</i>				
6067	406068	Room Temperature	Signed Scale 100	Unit: C or F, Range: -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C Value x 100 (e.g. 10°C = 1000)	W	20.0°C or 68.0°F
6068	406069	Room Temperature Min	Signed Scale 100	Unit: C or F, Range: -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C Value x 100 (e.g. 10°C = 1000)	W	0.0°C or 32.0°F

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6069	406070	Room Temperature Max	Signed Scale 100	Unit: C or F, Range: -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C Value x 100 (e.g. 10°C = 1000)	W	40.0°C or 104.0°F
6070	406071	Room Temperature Bias	Signed Scale 100	Unit: C or F, Range: -18.0°F, max: 18.0°F or -10.0°C, max: 10.0°C Value x 100 (e.g. 10°C = 1000)	W	0.0°C or 0.0°F
6071	406072	Room Temperature Network Reading	Unsigned Scale 100	Unit: °C/°F, Range: -40°C to 260°C or -40°F to 500°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	W	0°C or 32°F
6072	406073	Room Temperature Setpoint	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 40°C or 32°F to 104°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	W	22°C or 71.6°F
6073	406074	Room Temperature Unoccupied Setpoint	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 40°C or 32°F to 104°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	W	24°C or 75.2°F
6074	406075	Room Temperature Vacant Setpoint	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 40°C or 32°F to 104°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	W	26°C or 78.8°F
6075	406076	Room Temperature Demand Proportional Gain	Unsigned Scale 10	No Unit, Range: 1 to 200 Value x 10 (e.g. 10 = 100)	W	28.5
6076	406077	Room Temperature Demand Integral Time	Unsigned Scale 10	Unit: Seconds (sec), Range: 0 to 900 sec Value x 10 (e.g. 10 sec = 100)	W	0 sec
6077	406078	Room Temperature Demand Derivative Time	Unsigned Scale 10	Unit: Seconds (sec), Range: 0 to 60 sec Value x 10 (e.g. 10 sec = 100)	W	0 sec
6078	406079	Room Temperature Demand	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6079	406080	HRL Temperature	Signed Scale 100	Unit: °C/°F, Range: -40°C to 260°C or -40°F to 500°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	0°C or 32°F
6080	406081	HRL Humidity	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6081	406082	Room Temp Demand Proportional Band	Unsigned Scale 10	Unit: %, Range: 1% to 100% Value x 10 (e.g. 10% = 100)	W	5%
6082	4061083	Temp Supply High Limit Network Reading	Signed Scale 100	Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	W	0°C or 32°F
6083	406084	Temp Supply High Limit Setpoint	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 40°C or 32°F to 104°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	W	15°C or 59°F
6084	406085	Temp Supply High Limit Unoccupied Setpoint	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 40°C or 32°F to 104°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	W	17°C or 62.6°F
6085	406086	Temp Supply High Limit Vacant Setpoint	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 40°C or 32°F to 104°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	W	16°C or 60.8°F
6086	406087	Temp Supply High Limit Proportional Gain	Unsigned Scale 10	No Unit, Range: 1 to 200 Value x 10 (e.g. 10 = 100)	W	28.0
6087	406088	Temp Supply High Limit Integral Time	Unsigned Scale 10	Unit: Seconds (sec), Range: 0 to 900 sec Value x 10 (e.g. 10 sec = 100)	W	0 sec
6088	406089	Modbus TCP IP Keep Alive Time Out	Unsigned Scale 1	Unit: Minutes (min), Range: 1 to 1440 mins Value x 1 (e.g. 5 mins = 5)	W	5 min
6089	406090	Temp Supply High Limit Derivative Time	Unsigned Scale 10	Unit: Seconds (sec), Range: 0 to 60 sec Value x 10 (e.g. 10 sec = 100)	W	0 sec
6090	406091	Temp Supply High Limit Demand	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6091	406092	Temp Supply High Limit Proportional Band	Unsigned Scale 10	Unit: %, Range: 1% to 100% Value x 100 (e.g. 10% = 100)	RO	10%
6092	406093	Supply High Limit Temperature	Signed Scale 100	Unit: C or F, Range: -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C Value x 100 (e.g. 10°C = 1000)	W	20.0°C or 68.0°F

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6093	406094	Supply High Limit Temperature Min	Signed Scale 100	Unit: C or F, Range: -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C Value x 100 (e.g. 10°C = 1000)	W	0.0°C or 32.0°F
6094	406095	Supply High Limit Temperature Max	Signed Scale 100	Unit: C or F, Range: -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C Value x 100 (e.g. 10°C = 1000)	W	40.0°C or 104.0°F
6095	406096	Supply High Limit Temperature Bias	Signed Scale 100	Unit: C or F, Range: -18.0°F, max: 18.0°F or -10.0°C, max: 10.0°C Value x 100 (e.g. 10°C = 1000)	W	20.0°C or 68.0°F
6096	406097	Control Input	Signed Scale 100	Unit: C or F, Range: -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C Value x 100 (e.g. 10% = 1000)	W	20.0°C or 68.0°F
6097	406098	Control Min	Signed Scale 100	Unit: C or F, Range: -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C Value x 100 (e.g. 10% = 1000)	W	0.0°C or 32.0°F
6098	406099	Control Max	Signed Scale 100	Unit: C or F, Range: -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C Value x 100 (e.g. 10% = 1000)	W	40.0°C or 104.0°F
6099	406100	Control Bias	Signed Scale 100	Unit: C or F, Range: -18.0°F, max: 18.0°F or -10.0°C, max: 10.0°C Value x 100 (e.g. 10% = 1000)	W	20.0°C or 68.0°F
6100	406101	Demand Low Dead Band	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	1%
6101	406102	Network Timeout	Unsigned Scale 1	Unit: Seconds (sec), Range: 1 to 900 sec Value x 1 (e.g. 10sec = 10)	W	900 sec
6102	406103	Room RH Demand Proportional Band	Unsigned Scale 10	Unit: %, Range: 1% to 100% Value x 10 (e.g. 10% = 100)	W	5%

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6103	406104	RH Supply High Limit Proportional Band	Unsigned Scale 10	Unit: %, Range: 1% to 100% Value x 100 (e.g. 10% = 100)	RO	10%
6104	406105	Completely Dry Delay	Unsigned Scale 1	Unit: Hours (h), Range: 0 to 24 h Value x 1 (e.g. 10h = 10)	W	2h
6105	406106	Hour of Day Drying Cycle	Unsigned Scale 1	Unit: Hours (h), Range: 0 to 24 h Value x 1 (e.g. 10h = 10)	W	0h
6106	406107	Drying Fan Speed	Unsigned Scale 1	Unit: %, Range: 0% to 100% Value x 1 (e.g. 10% = 10)	W	100%
6107	406108	HRL Temperature Bias	Signed Scale 100	Unit: C or F, Range: -18.0°F, max: 18.0°F or -10.0°C, max: 10.0°C Value x 100 (e.g. 10°C = 1000)	W	0.0°C or 0.0°F
6108	406109	HRL Humidity Bias	Unsigned Scale 100	Unit: % RH, Range: -10% RH to 10% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
10000	410001	Air Flow	Unsigned Scale 1	0 = Closed 1 = Open	RO	Closed
10001	410002	Supply High Limit	Unsigned Scale 1	0 = Closed 1 = Open	RO	Closed
10002	410003	Interlock	Unsigned Scale 1	0 = Closed 1 = Open	RO	Closed
10003	410004	Binary External Demand	Unsigned Scale 1	0 = 0% 1 = 100%	RO	0%
10004	410005	Water Leak Detection	Unsigned Scale 1	0 = Ok 1 = Leak	RO	Ok
10005	410006	RS485 Interface	Unsigned Scale 1	0 = No 1 = Yes	RO	No
10006	410007	Ethernet Interface	Unsigned Scale 1	0 = No 1 = Yes	RO	No

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
10007	410008	Relay Fuse	Unsigned Scale 1	0 = Normal 1 = Blown Fuse	RO	Normal
10008	410009	Control PCB Fuse	Unsigned Scale 1	0 = Normal 1 = Open Fuse	RO	Normal
11000	411001	Alarm Warning Relay	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11001	411002	Service Warning Relay	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11002	411003	Water Supply Valve	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11003	411004	Drain Valve	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11004	411005	Circulation Pump	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11005	411004	Alarm LED	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11006	411005	Power LED	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11007	411008	Buzzer	Unsigned Scale 1	0 = Off 1 = On	RO	Off
12000	412001	Float Switch	Unsigned Scale 1	0 = Inactive 1 = Active	RO	Inactive
12001	412002	Water Treatment Service Due	Unsigned Scale 1	0 = No 1 = Yes	RO	No
12002	412003	Service Due	Unsigned Scale 1	0 = Not Allowed 1 = Allowed	W	Not Allowed

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
12003	412004	Run While Water Service Alarm	Unsigned Scale 1	0 = Not Allowed 1 = Allowed	W	Not Allowed
12004	412005	Startup Line Rinse	Unsigned Scale 1	0 = Off 1 = On	W	Off
12005	412006	Run While Service Alarm	Unsigned Scale 1	0 = Not Allowed 1 = Allowed	W	Allowed
12006	412007	HRL Lock Setpoint	Unsigned Scale 1	0 = Unlock 1 = Lock	W	Unlock
12007	412008	Network Control State	Unsigned Scale 1	0 = Normal 1 = Fault	W	Normal
12008	412009	Notify Alarm	Unsigned Scale 1	0 = Off 1 = On	W	Off
12009	412010	Notify Warning	Unsigned Scale 1	0 = Off 1 = On	W	Off
12010	412011	Notify App Msg	Unsigned Scale 1	0 = Off 1 = On	W	Off
12011	412012	Memory Status	Unsigned Scale 1	0 = Ok 1 = Fail	W	Ok
12012	412013	Float Switch Type	Unsigned Scale 1	0 = Legacy 1 = Digital	W	Legacy
15000	415001	Modbus Server Units	Unsigned Scale 1	0 = Metric 1 = Imperial	W	Metric
15001	415002	Control Signal Type	Unsigned Scale 1	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15002	415003	Room RH Signal Type	Unsigned Scale 1	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc



Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
15003	415004	Supply RH Signal Type	Unsigned Scale 1	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15004	415005	Control Profile	Unsigned Scale 1	0 = ExternAnalog 1 = ExternNetwork 2 = InternHumAnalog 3 = InternHumNetwork 4 = InternCoolAnalog 5 = InternCoolNetwork 6 = HRLHum 7 = HRLCool 8 = Custom	W	ExternAnalog
15005	415006	Modulating High Limit Profile	Unsigned Scale 1	0 = Disabled 1 = ExternAnalog 2 = ExternNetwork 3 = InternHumAnalog 4 = InternHumNetwork 5 = InternCoolAnalog 6 = InternCoolNetwork 7 = Custom	W	Disabled
15006	415007	Occupancy State	Unsigned Scale 1	0 = Occupied 1 = Unoccupied 2 = Vacant 3 = Off	RO	Occupied
15007	415008	Room RH Source	Unsigned Scale 1	0 = None 1 = RoomRH 2 = Network 3 = HRL	W	None
15008	415009	Room RH Setpoint Source	Unsigned Scale 1	0 = None 1 = Internal 2 = ControllInput	W	None
15009	415010	RH Supply High Limit Reading Source	Unsigned Scale 1	0 = None 1 = SupplyHLRH 2 = Network	W	None
15010	415011	RH Supply High Limit Setpoint Source	Unsigned Scale 1	0 = None 1 = Internal 2 = ControllInput	W	None
15011	415012	Control Demand Source	Unsigned Scale 1	0 = None 1 = ControllInput 2 = RoomDemand 3 = Network	W	ControllInput
15012	415013	Control High Limit Source	Unsigned Scale 1	0 = None 1 = ControllInput 2 = RHSupplyHLDemand 3 = Network 4=TempSupplyHLDemand	W	None
15013	415014	Control Binary Demand Source	Unsigned Scale 1	0 = None 1 = BinaryExtDemand	W	None

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
15014	415015	Control Cutout State	Unsigned Scale 1	0 = Off 1 = Normal 2 = LowLimit 3 = HighLimit 4 = NoAirFlow 5 = Interlock	RO	Off
15015	415016	State	Unsigned Scale 1	0 = Off 1 = Idle 2 = LineRinse 3 = Filling 4 = Draining 5 = Running 6 = Alarm 7 = Drying	RO	Off
15016	415017	System Alarm	Unsigned Scale 1	0 = Normal 1 = DrainTimeout 2 = FillTimeout 3 = WaterLeak 4 = FanDefect	RO	Normal
15017	415018	Fan Request	Unsigned Scale 1	0 = Off 1 = Default 2 = On	W	Default
15018	415019	Pump Request	Unsigned Scale 1	0 = Off 1 = Default 2 = On	W	Default
15019	415020	Water Supply Request	Unsigned Scale 1	0 = Off 1 = Default 2 = On	W	Default
15020	415021	Room Temperature Setpoint Source	Unsigned Scale 1	0 = None 1 = Internal 2 = ControllInput	W	None
15021	415022	Temp Supply High Limit Reading Source	Unsigned Scale 1	0 = None 1 = SupplyHLTemp 2 = Network	W	None
15022	415023	Temp Supply High Limit Setpoint Source	Unsigned Scale 1	0 = None 1 = Internal 2 = ControllInput	W	None
15023	415024	Room Temperature Source	Unsigned Scale 1	0 = None 1 = RoomTemp 2 = Network 3 = HRL	W	None
15024	415025	Room Temperature Signal Type	Unsigned Scale 1	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
15025	415026	Supply Temperature Signal Type	Unsigned Scale 1	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15026	415027	Control Signal Type	Unsigned Scale 1	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15027	415028	System Power State	Unsigned Scale 1	0 = Off 1 = On	W	Off
15028	415029	Recirculation Request	Unsigned Scale 1	0 = None 1 = ResetAlarms 2 = Drain 3 = ResetServCnt 4 = ResetWtrServCnt 5 = Filling	W	None
15029	415030	DirectFeed Request	Unsigned Scale 1	0 = None 1 = ResetAlarms 3 = ResetServCnt 4 = ResetWtrServCnt	W	None
15030	415031	DirectFeed Water Supply Adapt	Unsigned Scale 1	0 = Disable 1 = Enable	W	Enable
15031	415032	Update Process Status	Unsigned Scale 1	0 = Ok 1 = CRC 2 = Device 3 = Failed	W	Ok





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