

## TS-R Series

### TS-R... RWF5 Load Controller Enclosures



### Description

TS-R... series RWF5 enclosures provides accurate PID loop control for specific applications such as modulating burner/boiler control application, water level, heat recovery, makeup air units, etc. The RWF55 provides a RS485 Modbus RTU communication port allowing the RWF55 control to communicate with a Building Management System (BMS) or function as an integral part of a PLC or BMS based lead/lag boiler room management system.

Each TS-R... enclosure contains a pre-mounted RWF5 in an enclosure and is prewired to field terminals. The field terminals allow for quick wiring to field devices such as a SKB/C/D actuators, pressure transmitters, differential pressure transmitters, etc.

Flexible communication interface options to the building management system (BMS) provide streamlined data collection, monitoring and control.

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## Standard Features

- RWF50 or RWF55 enclosures
- Field connection terminals
- Analog input/output connections
  - Three analog inputs per RWF55
  - One analog input per RWF50
  - One Analog output per RWF
- One dry contact for application start stop per RWF5
- One dry contact for application alarm per RWF55
- One PID loop controller per RWF5
- Various alarm function options for each RWF55
- Degree F or Degree C display for temperature applications
- Load control compatible with SCC Master Panel Lead Lag system when no LMV is present

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## Application

TS-R... RWF5 kits are used as load controller or PID controller for a system requiring external control.

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## Components

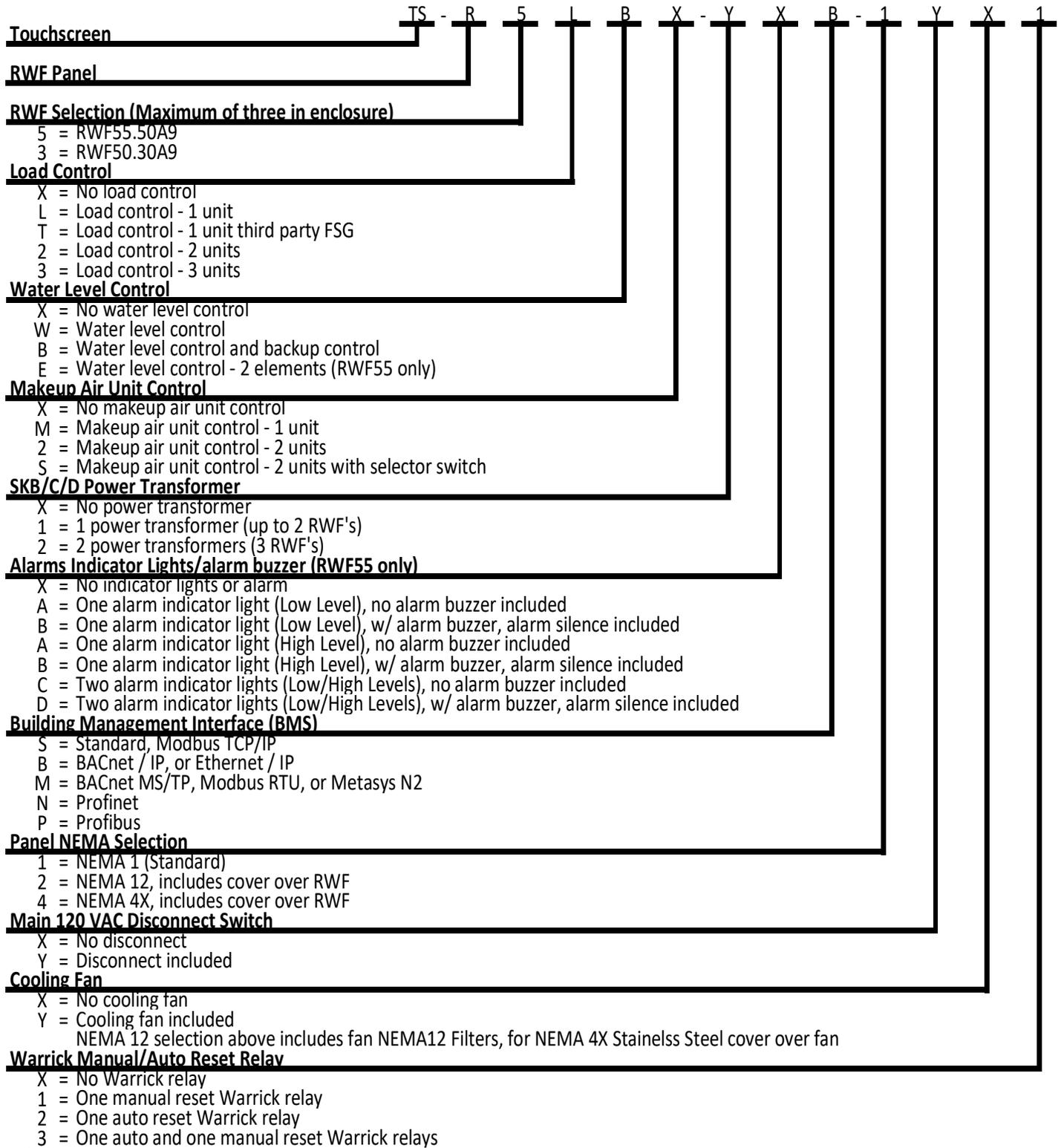
All TS-R... enclosure include the following components:

- RWF50 or RWF55 load controllers
- Branch circuit protection
- Interconnect terminals for field wiring

The following optional features are available:

- Operation and alarm indicator lights
- 24VAC transformer for SKB/C/D actuators
- Enclosure disconnect
- Cooling fan
- Manual or automatic reset Warrick relays for low water cut off
- Modbus RTU RS485 BMS communication with an RWF55
- BMS communications other than Modbus RTU RS485

## Product Part Numbers



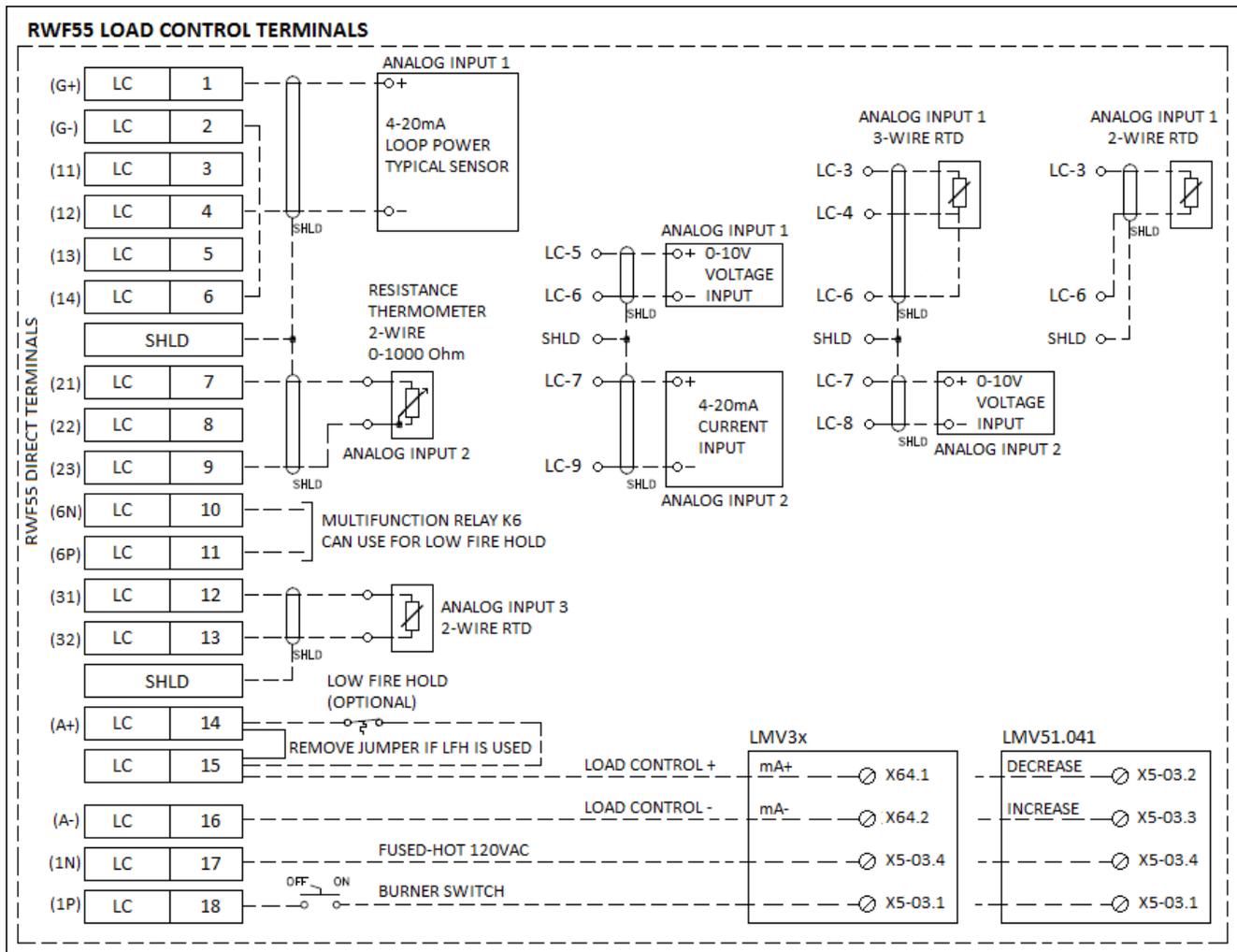
10/23/2023

## Specifications

		<b>RWF50... Enclosure</b>	<b>RWF55... Enclosure</b>
Physical Characteristics	Main power	110-240 VAC	110-240 VAC
	Frequency	60-50 Hz	60-50 Hz
	RWF Power	120VAC	120VAC
	Power Consumption RWF with 40 VA Transformer	≤ 56VA	≤ 60VA
	Power Consumption RWF without 40 VA Transformer	16VA	20VA
	Dry Contacts	1 Amps	2 Amps
Operating Environment	Operating Temperature	-4 to 122 °F [-20 to 50 °C]	-4 to 122 °F [-20 to 50 °C]
	Humidity	Max. 90%, No condensation	Max. 90%, No condensation
	NEMA Rating (Standard)	NEMA 1	NEMA 1
	NEMA Rating (Optional)	NEMA 12/4X	NEMA 12/4X

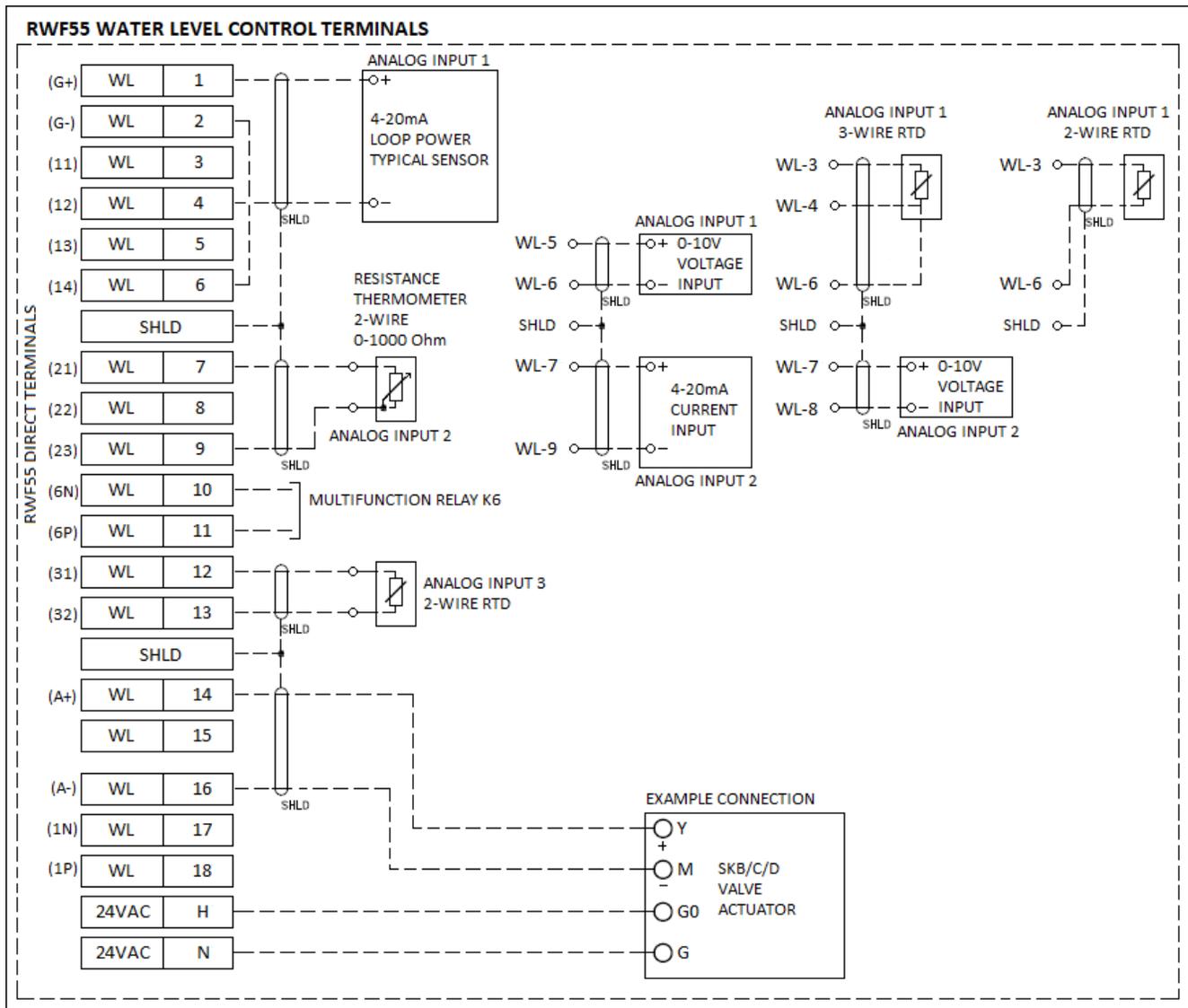
# Connections

RWF55 for load control:



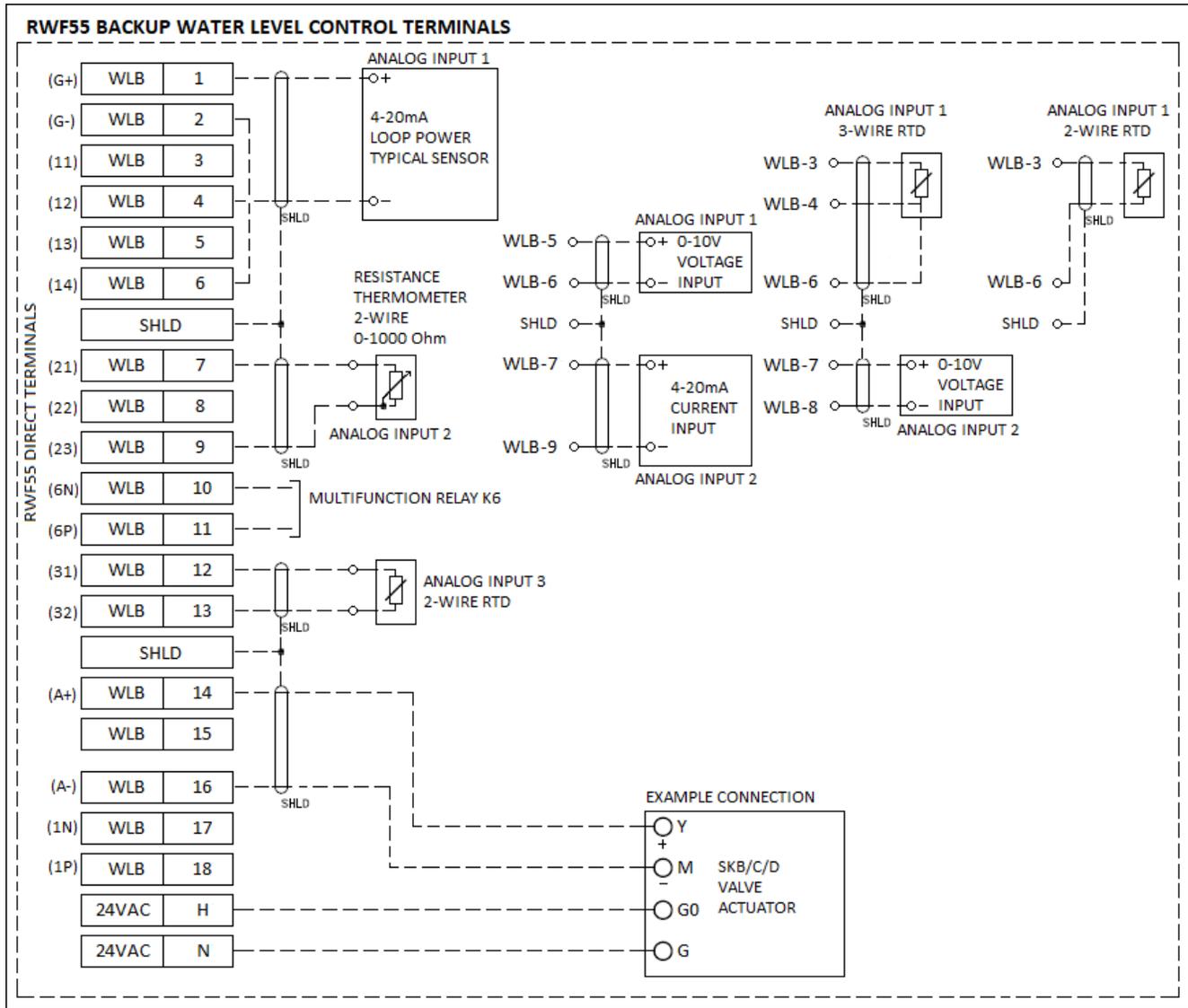
## Connections (continued)

RWF55 for water level control:



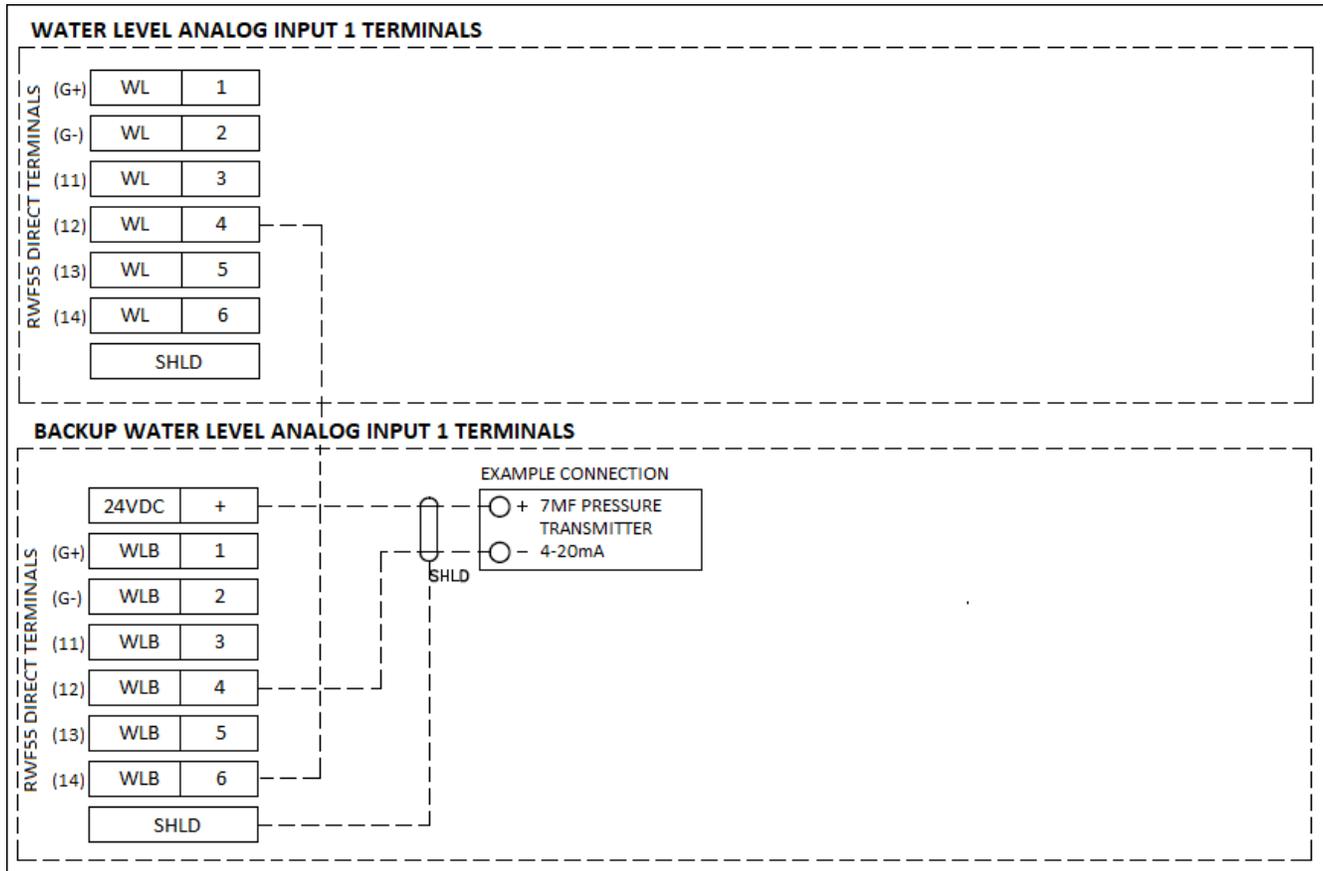
## Connections (continued)

RWF55 for backup water level control:



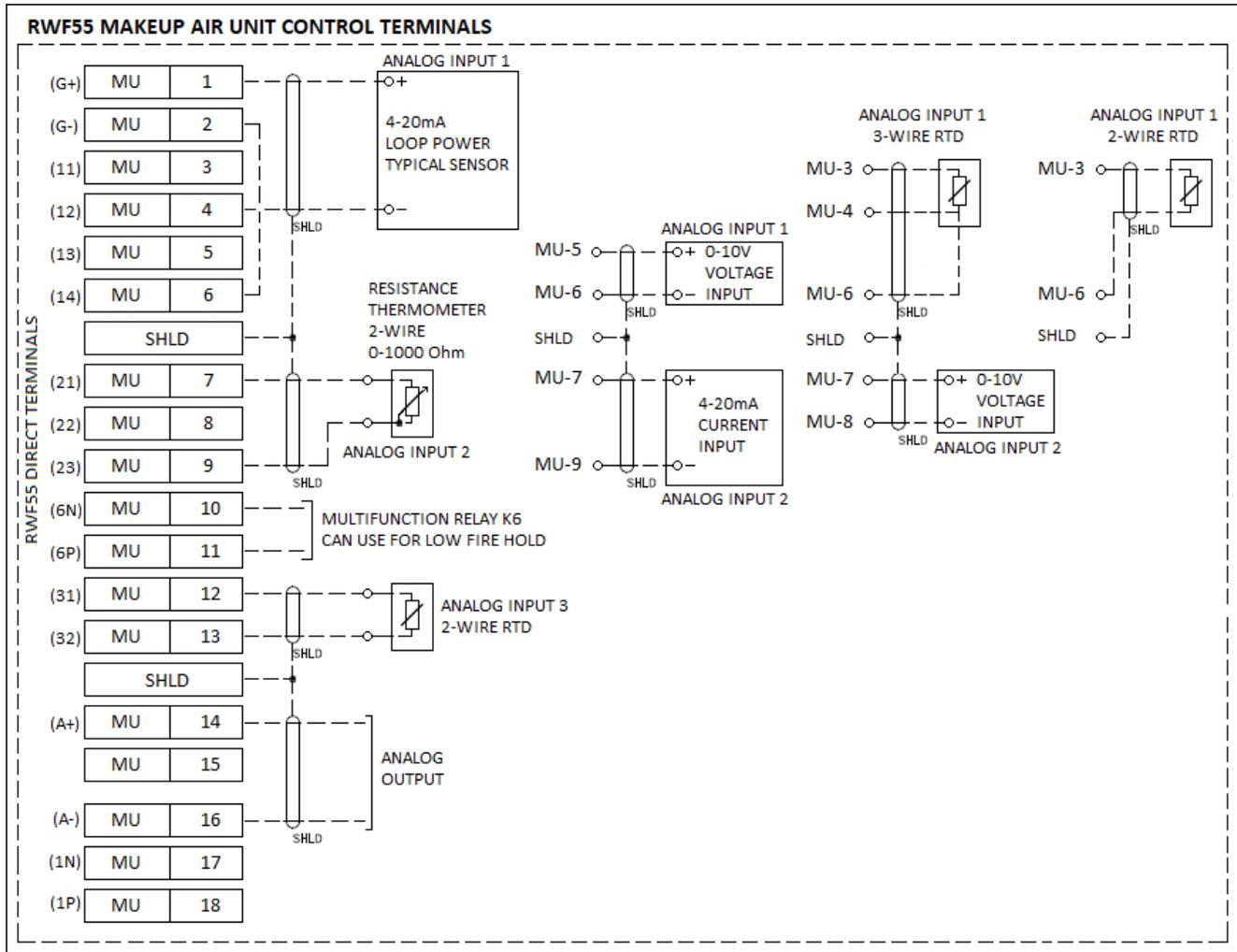
## Connections (continued)

RWF55 differential pressure transmitter connections for water level and backup water level control:



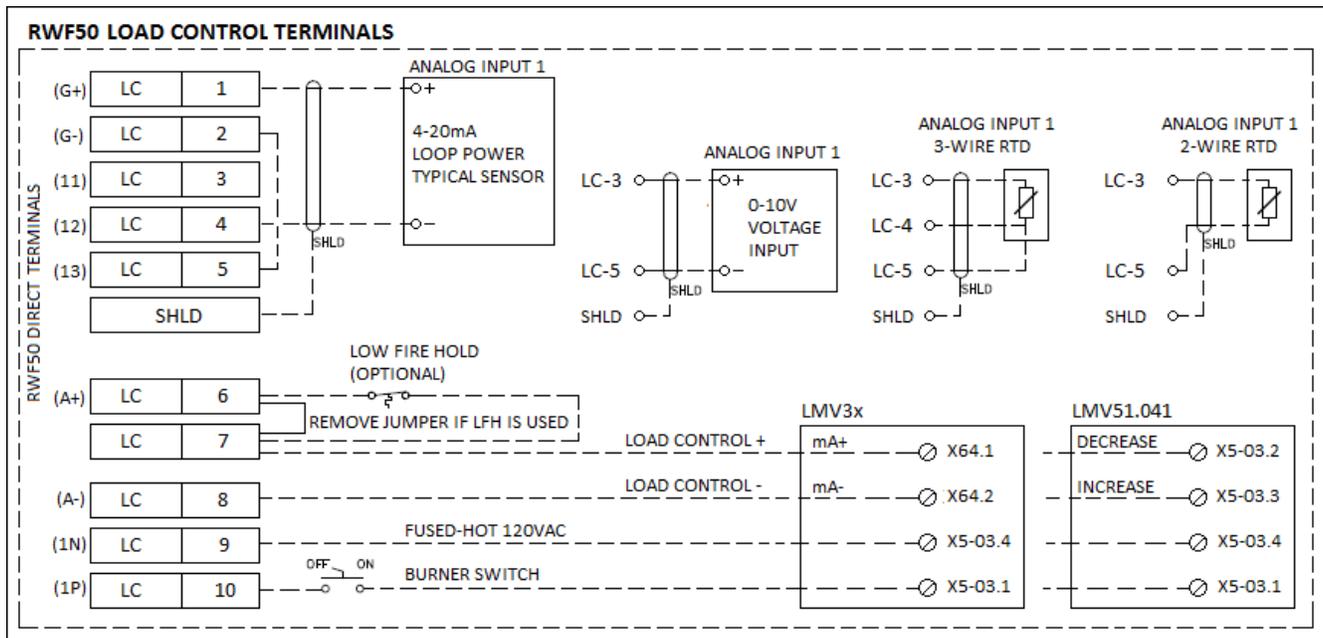
## Connections (continued)

RWF55 for a makeup air unit:

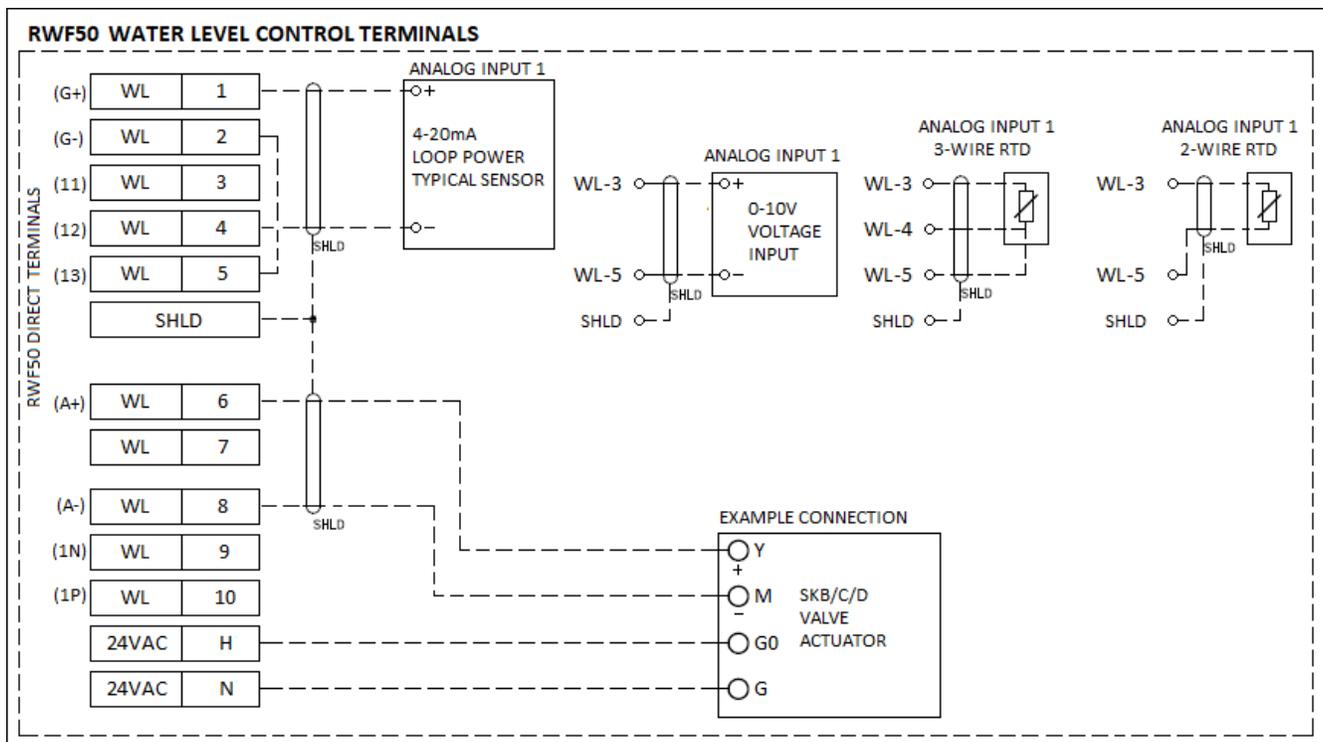


## Connections (continued)

RWF50 for load control:

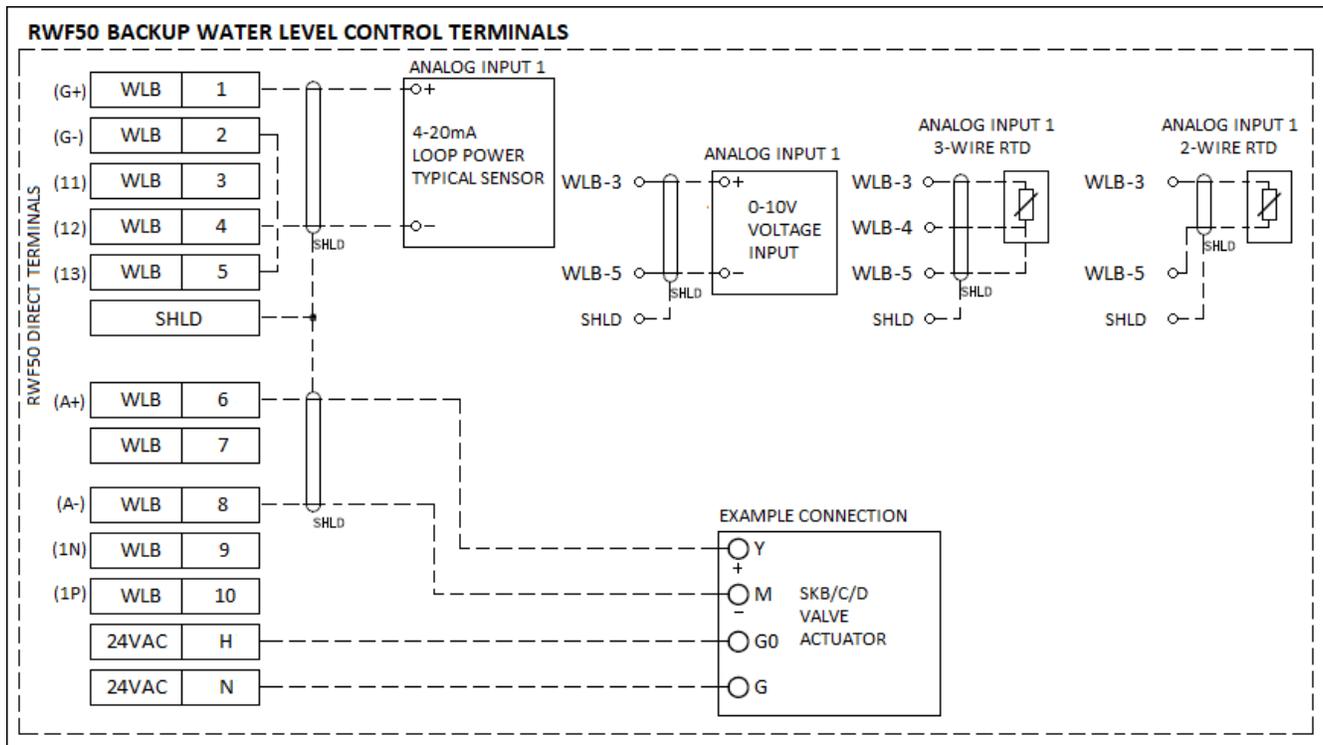


RWF50 for water level:

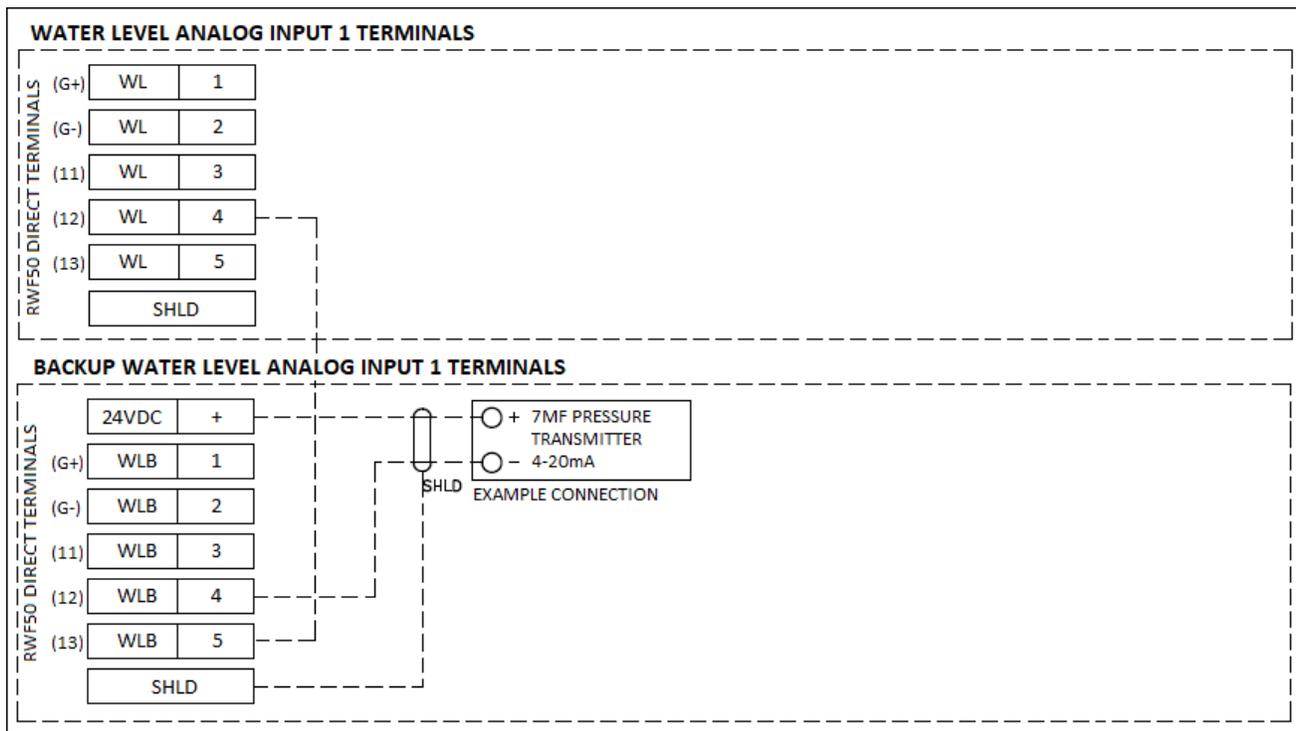


## Connections (continued)

RWF50 for backup water level:

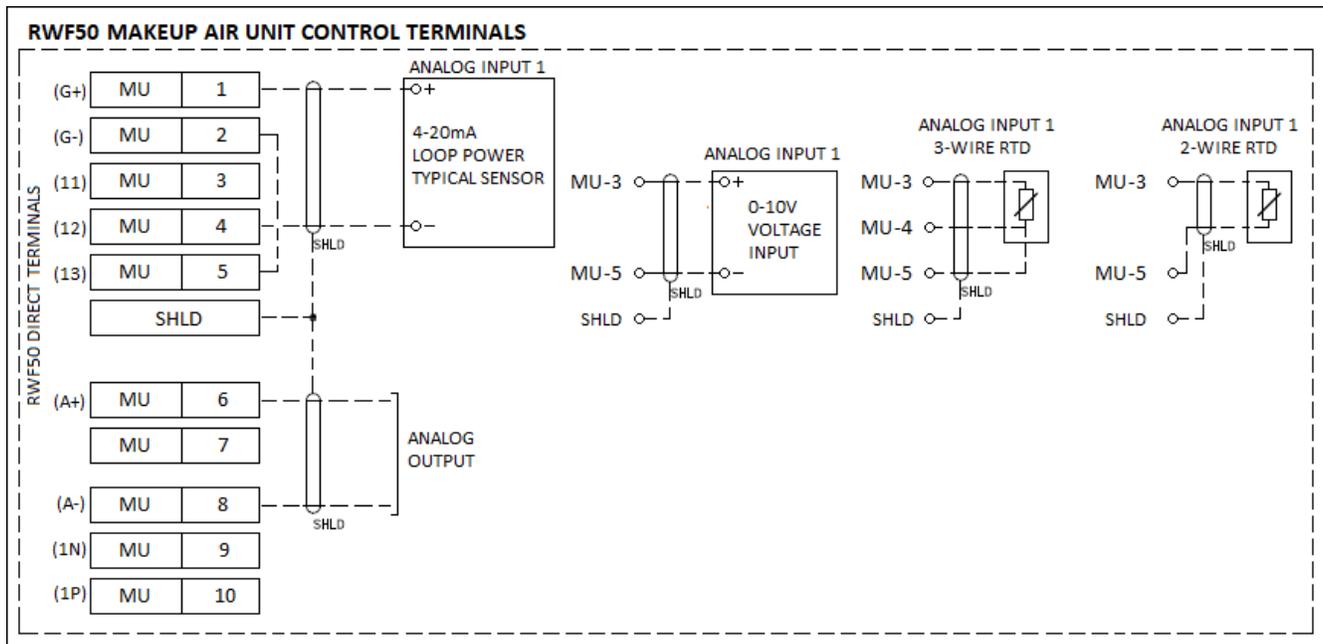


RWF50 differential pressure transmitter connections for water level and backup water level control:

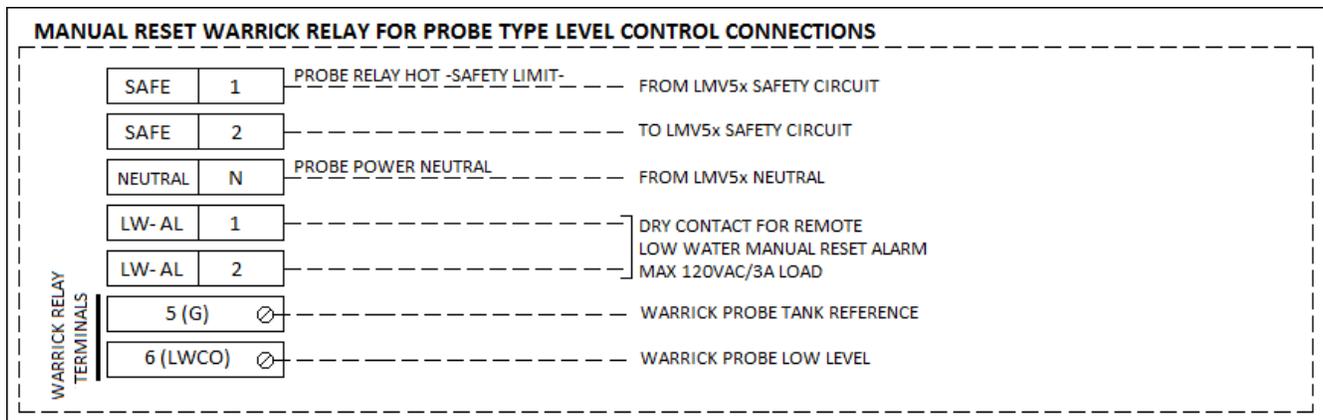


## Connections (continued)

RWF50 as a makeup air unit:

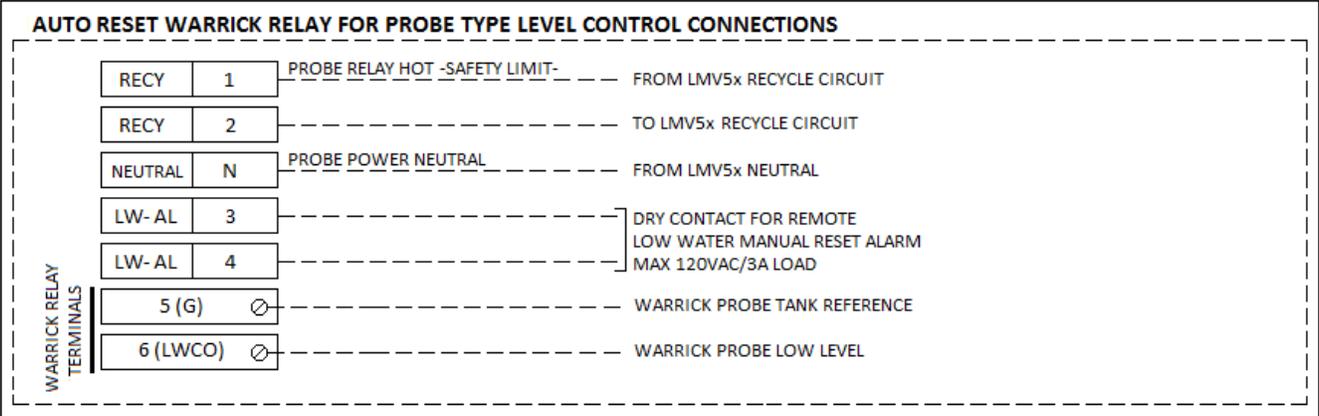


Manual reset for a Warrick relay used for low water cut off:



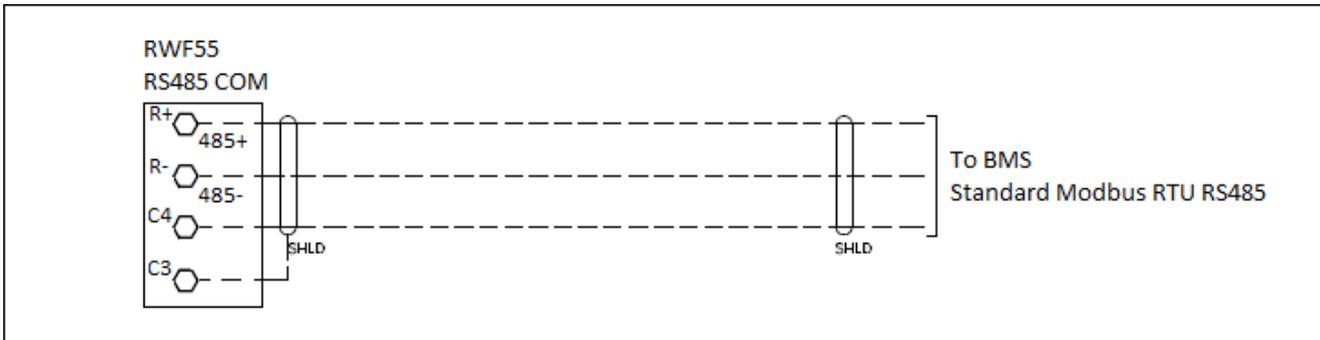
### Connections (continued)

Automatic reset for a Warrick relay used for low water cut off:

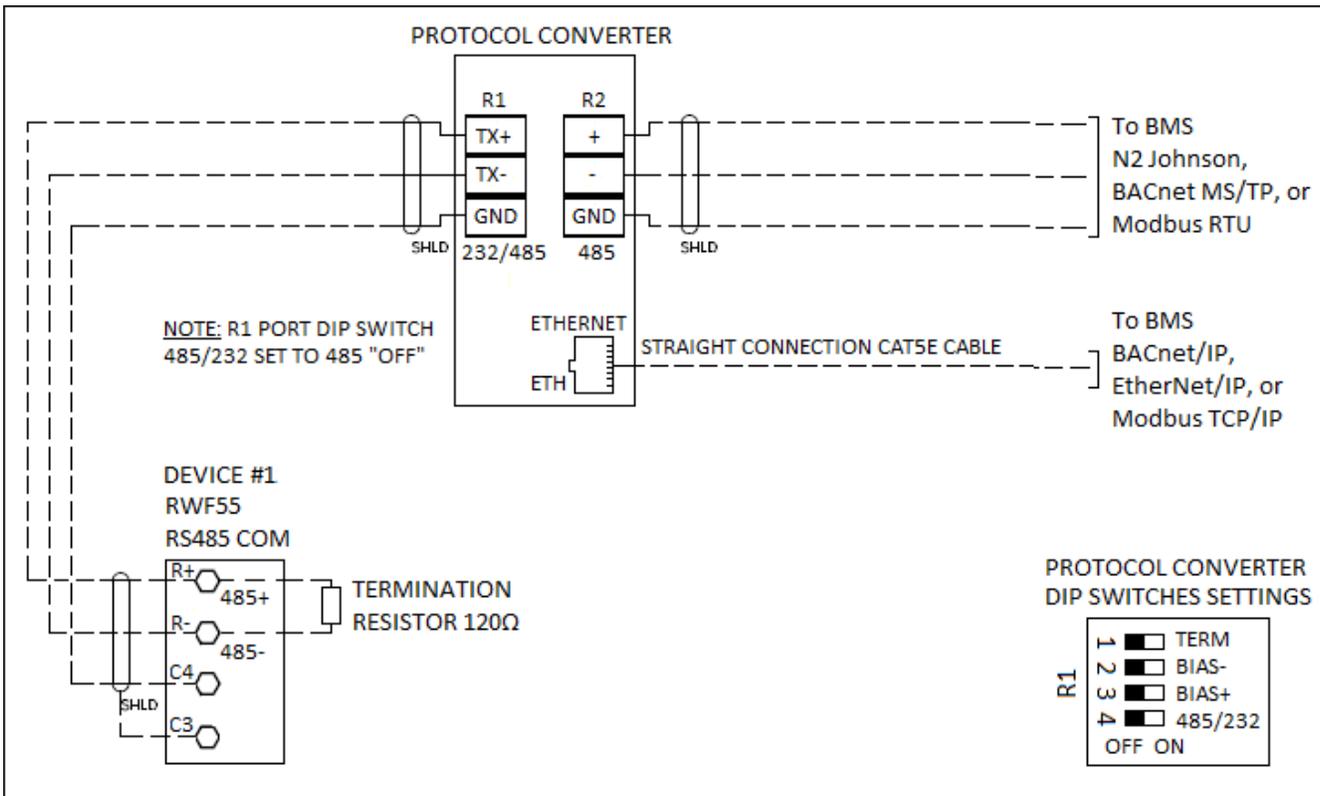


## Connections (continued)

Standard modbus RTU RS-485:

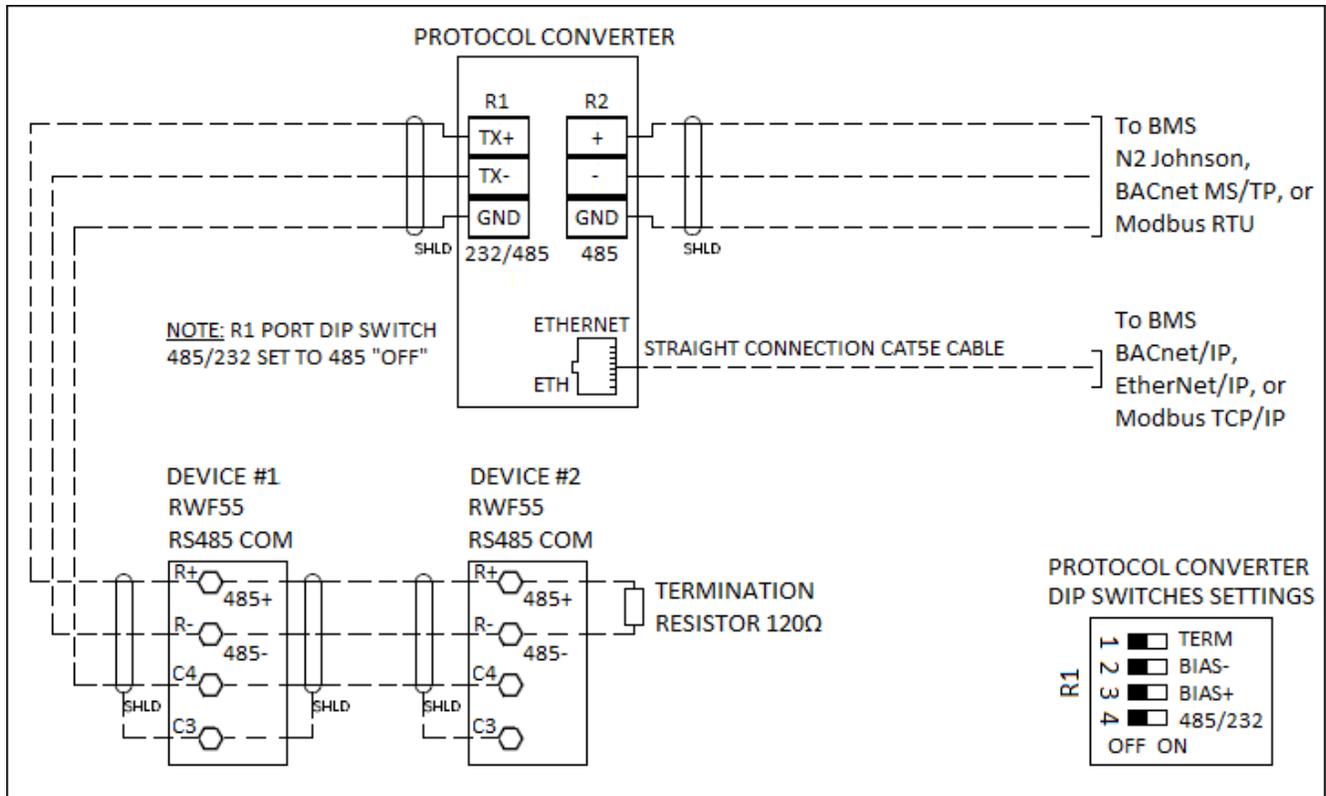


One RWF55 with ProtoAir (N2 Johnson, BACnet MS/TP, Modbus RTU, BACnet/IP, EtherNet/IP, or Modbus TCP/IP)



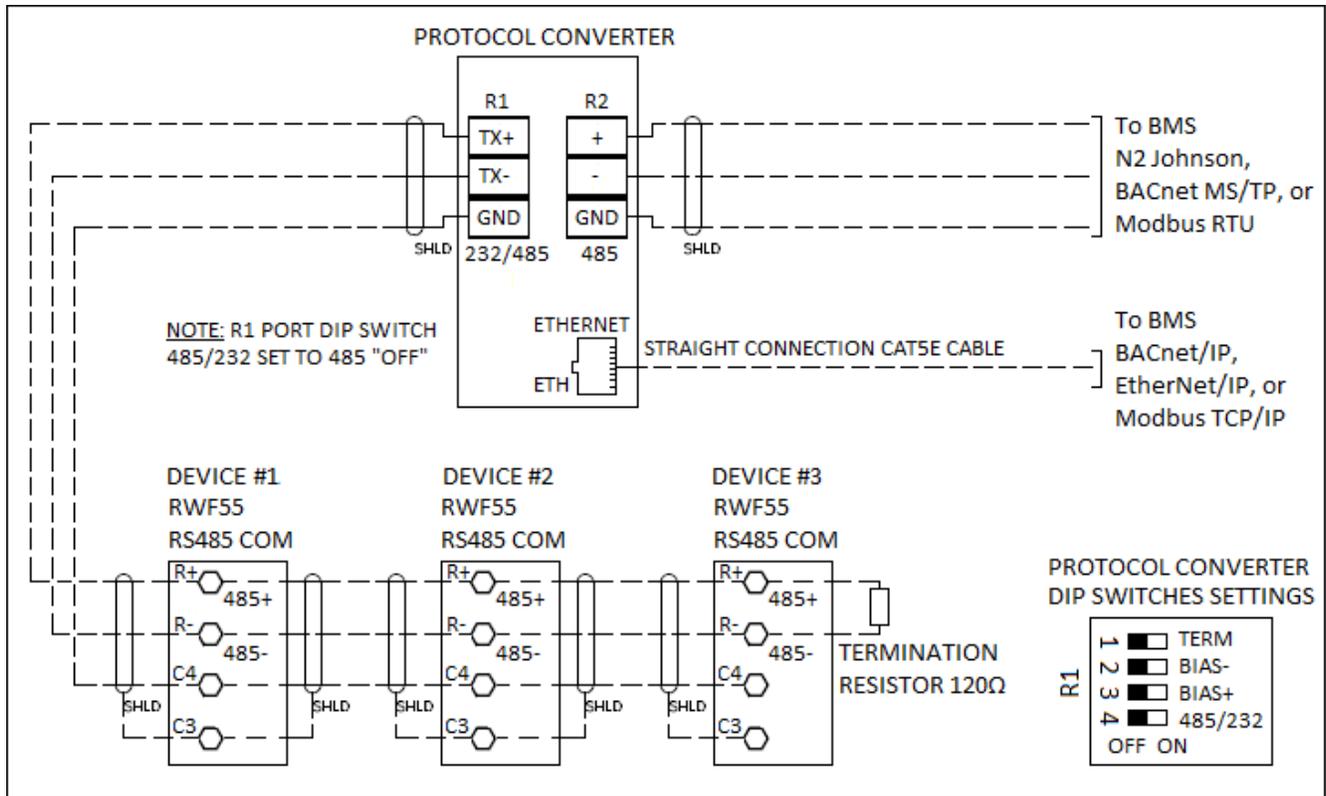
## Connections (continued)

Two RWF55s with ProtoAir (N2 Johnson, BACnet MS/TP, Modbus RTU, BACnet/IP, EtherNet/IP, or Modbus TCP/IP)

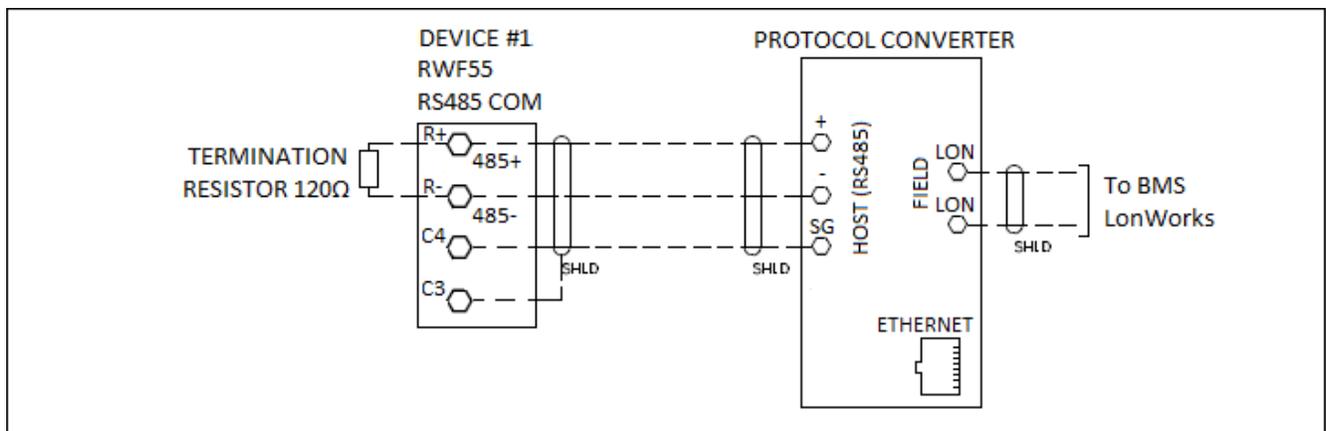


## Connections (continued)

Three RWF55s with ProtoAir (N2 Johnson, BACnet MS/TP, Modbus RTU, BACnet/IP, EtherNet/IP, or Modbus TCP/IP)

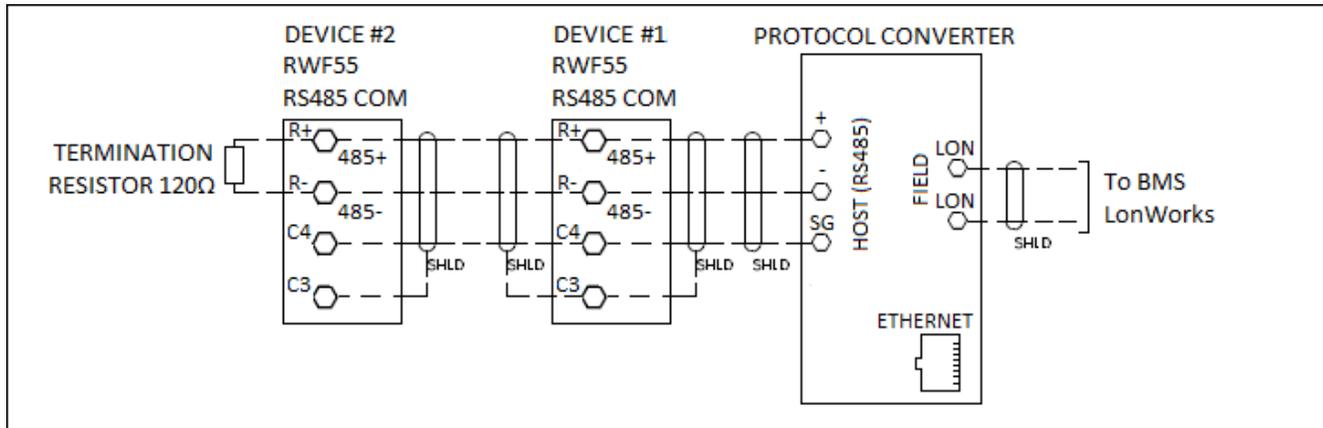


One RWF55 with ProtoNode (Lonworks)

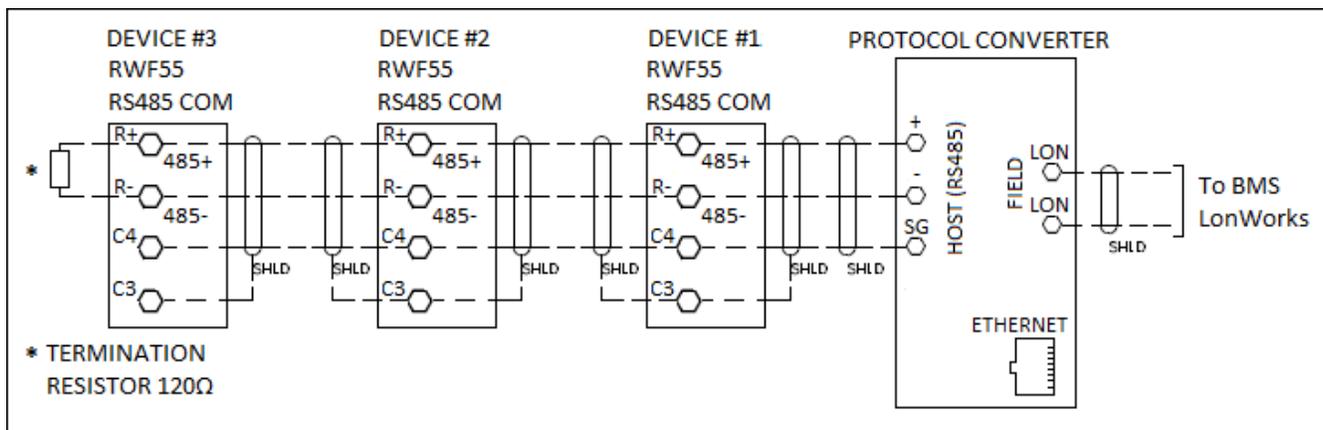


## Connections (continued)

### Two RWF55s with ProtoNode (Lonworks)



### Three RWF55s with ProtoNode (Lonworks)



## Parts Descriptions

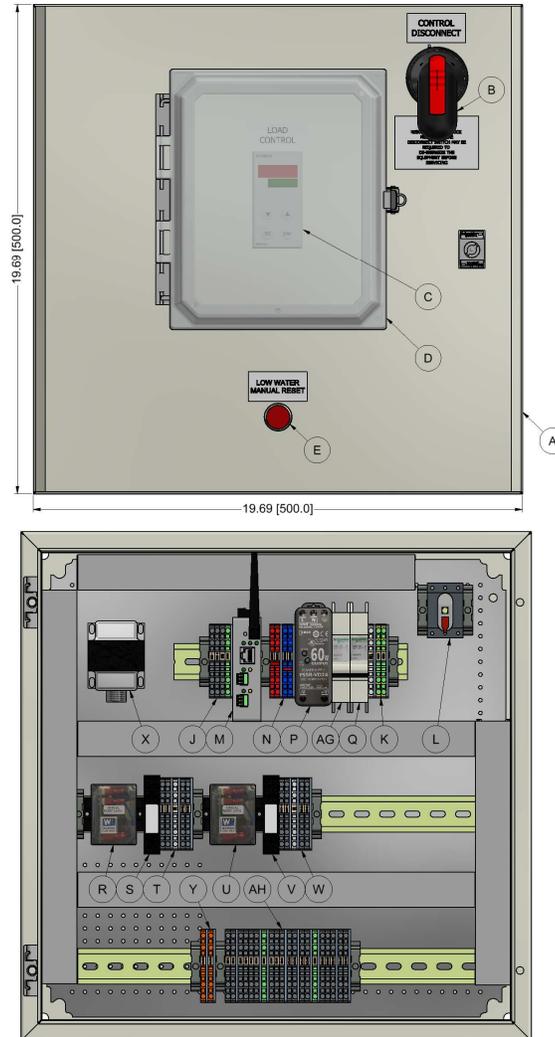
A	Enclosure	Standard Component
B	Disconnect Handle	Standard Component
C	RWF50/55	Standard Component
D	RWF50/55 Cover	NEMA 4/NEMA 12
E	Low Water Manual Reset Illuminated Push Button	Manual Reset Warrick Relay
F	Run Indicator Light	Operation and Alarm Indicator Lights
G	Alarm Indicator Light	Operation and Alarm Indicator Lights
H	Makeup Air Unit Control Selector Switch	Makeup Air Control – 2 Units with Selector Switch
J	Modbus RS232 and RS485 Terminals	Standard Component
K	Neutral and Ground Terminals	Standard Component
L	16 Amp Non-Fused Disconnect	Standard Component
M	Protocol Converter	BMS Communication Other than Modbus TCP/IP
N	24 VDC Terminals	BMS Communication Other than Modbus TCP/IP
P	24 VDC Power Supply	BMS Communication Other than Modbus TCP/IP
Q	3 Amp Power Supply Breaker	BMS Communication Other than Modbus TCP/IP
R	Manual Reset Warrick Relay	Manual Reset Warrick Relay
S	120VAC DPDT Relay	Manual Reset Warrick Relay
T	Manual Reset Warrick Relay Terminals	Manual Reset Warrick Relay
U	Automatic Reset Warrick Relay	Automatic Reset Warrick Relay
V	120VAC DPDT Relay	Automatic Reset Warrick Relay
W	Automatic Reset Warrick Relay Terminals	Automatic Reset Warrick Relay
X	24 VAC SKB/C or D Transformer	SKB/C or D Transformer

Y	24 VAC SKB/C or D Transformer Terminals	SKB/C or D Transformer
Z	24 VAC SKB/C or D Transformer	(2) SKB/C or D Transformers
AA	24 VAC SKB/C or D Transformer Terminals	(2) SKB/C or D Transformers
AB	120VAC DPDT Relays	Operation and Alarm Indicator Lights
AC	3 Amp Water Level Control Breaker	Water Level Control
AD	Water Level Control Terminals	Water Level Control
AE	3 Amp Backup Water Level Control Breaker	Backup Water Level Control
AF	Backup Water Level Control Terminals	Backup Water Level Control
AG	3 Amp Load Control Breaker	Load Control
AH	Load Control Terminals	Load Control
AJ	3 Amp Load Control Unit 2 Breaker	Load Control – 2 Units
AK	Load Control Unit 2 Terminals	Load Control – 2 Units
AL	3 Amp Load Control Unit 3 Breaker	Load Control – 3 Units
AM	Load Control Unit 3 Terminals	Load Control – 3 Units
AN	2 Amp Makeup Air Control Breaker	Makeup Air Control
AP	Makeup Air Control Terminals	Makeup Air Control
AQ	2 Amp Makeup Air Control Unit 2 Breaker	Makeup Air Control – 2 Units
AR	Makeup Air Control Unit 2 Terminals	Makeup Air Control – 2 Units
AS	Cooling Fan	Cooling Fan
AT	2A Cooling Fan Breaker	Cooling Fan
AU	Air Intake Filter	Cooling Fan
AV	Hose-Proof Hood	Cooling Fan/NEMA 12

## Dimensions and Layout

Dimensions in inches; millimeters in brackets

### One load controller



**TS-R5LXX-1XB-4YX3**

Options for Kit in Enclosure	*BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5LXX-xXB-xYXx	X			
TS-R5LXX-xXx-xYX1		X		
TS-R5LXX-xXx-xYX2			X	
TS-R5LXX-1Xx-xYXx				X

**Notes:**

12"x12" Enclosure used with NEMA1 and (0-1) options

16"x16" Enclosure used with NEMA1 and (2-3) options or NEMA4/12 and (0-3) options

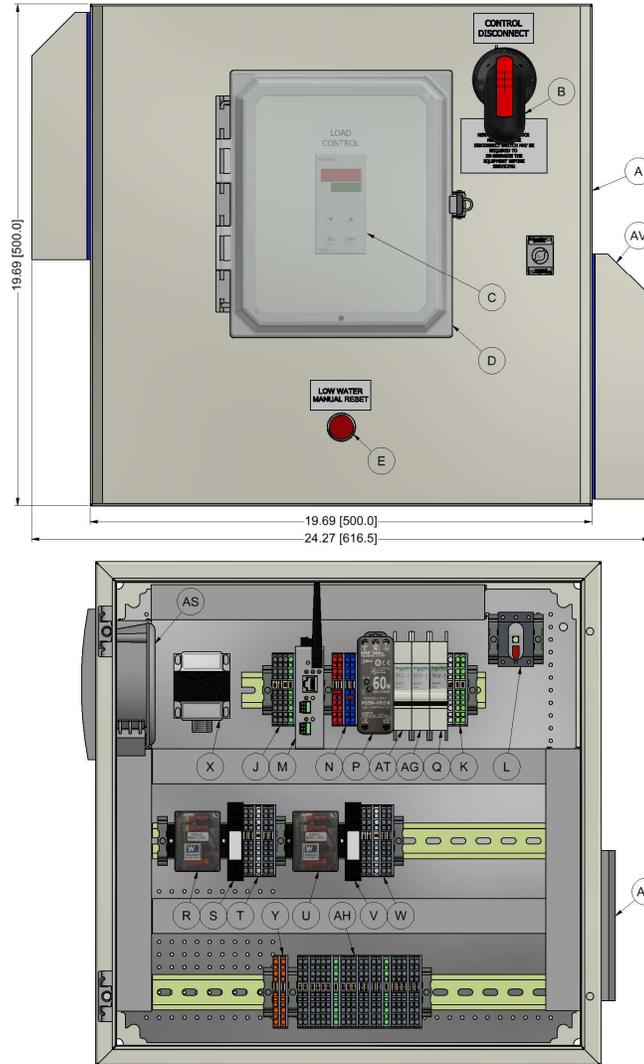
20"x20" Enclosure with (4) options

\* Option not available in 12"x12" enclosure

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### One load controller with a cooling fan



**TS-R5LXX-1XB-2YY3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5LXX-xXB-xYYx	X			
TS-R5LXX-xXx-xYY1		X		
TS-R5LXX-xXx-xYY2			X	
TS-R5LXX-1Xx-xYYx				X

**Notes:**

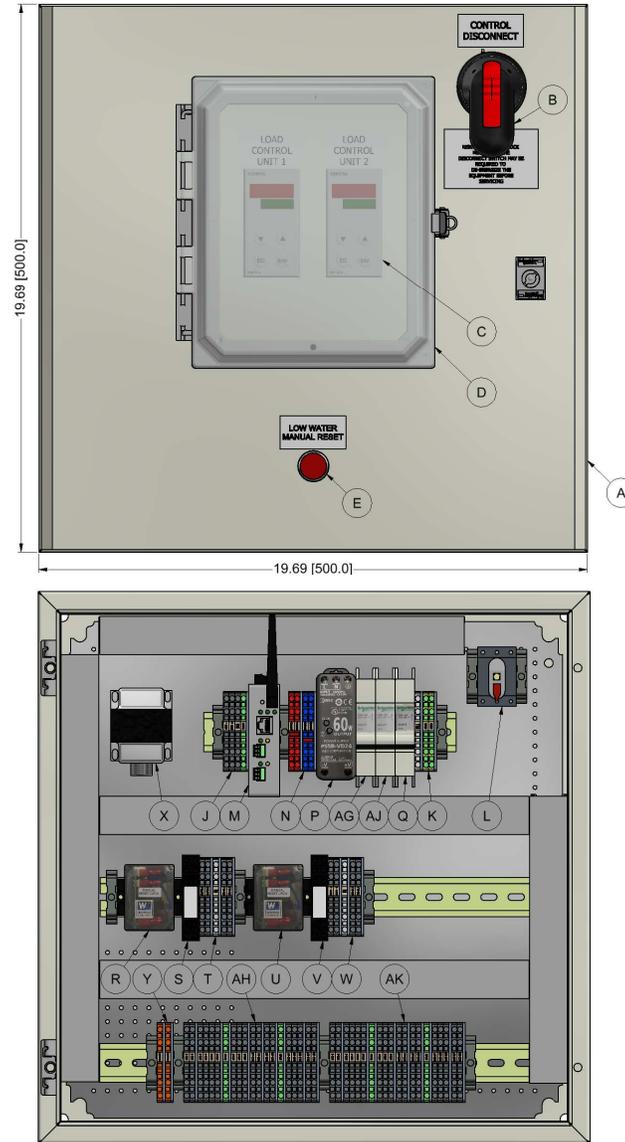
16"x16" Enclosure used with (0-2) options

20"x20" Enclosure used with (3-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Two load controllers



### TS-R52XX-1XB-4YX3

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R52XX-xXB-xYXx	X			
TS-R52XX-xXx-xYX1		X		
TS-R52XX-xXx-xYX2			X	
TS-R52XX-1Xx-xYXx				X

Notes:

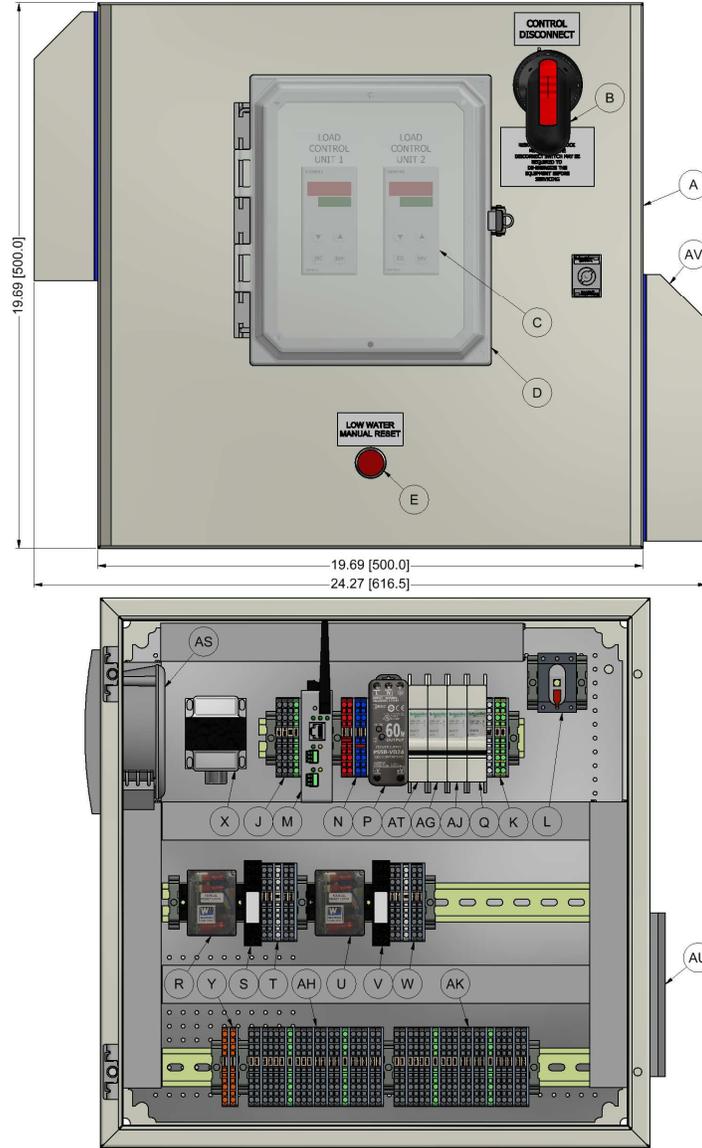
16"x16" Enclosure used with (0-1) options

20"x20" Enclosure used with (2-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Two load controllers with a cooling fan



**TS-R52XX-1XB-2YY3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R52XX-xXB-xYYx	X			
TS-R52XX-xXx-xYY1		X		
TS-R52XX-xXx-xYY2			X	
TS-R52XX-1Xx-xYYx				X

**Notes:**

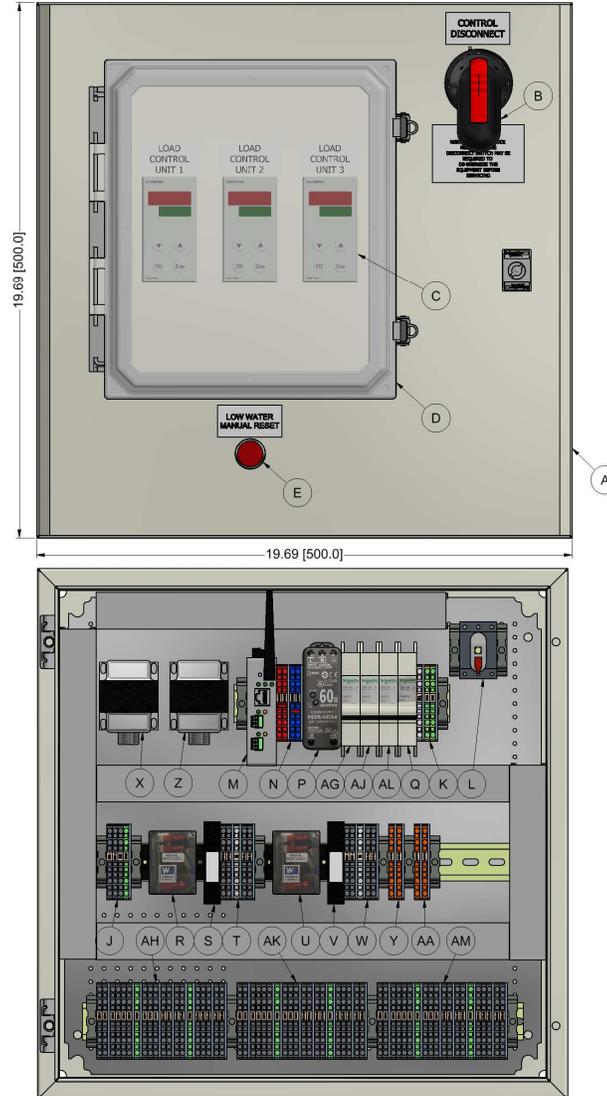
16"x16" Enclosure used with (0-1) options

20"x20" Enclosure used with (2-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Three load controllers



**TS-R53XX-2XB-4YX3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)	(2) SKB/C/D Power Transformers (Z, AA)
TS-R53XX-xXB-xYXx	X				
TS-R53XX-xXx-xYX1		X			
TS-R53XX-xXx-xYX2			X		
TS-R53XX-1Xx-xYXx				X	
TS-R53XX-2Xx-xYXx					X

**Notes:**

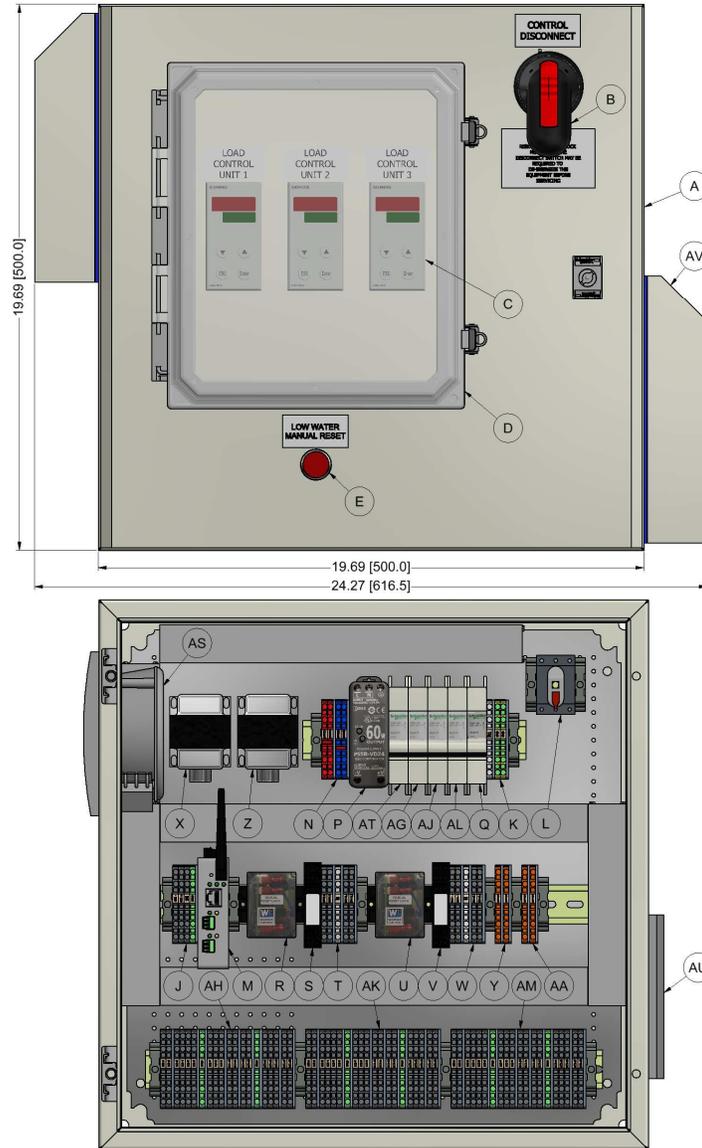
16"x16" Enclosure used with NEMA1 and (0) options

20"x20" Enclosure used with NEMA1 and (1-5) options or NEMA4/12 and (0-5) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Three load controllers with a cooling fan



**TS-R53XX-2XB-2YY3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)	(2) SKB/C/D Power Transformers (Z, AA)
TS-R53XX-xXB-xYYx	X				
TS-R53XX-xXx-xYY1		X			
TS-R53XX-xXx-xYY2			X		
TS-R53XX-1Xx-xYYx				X	
TS-R53XX-2Xx-xYYx					X

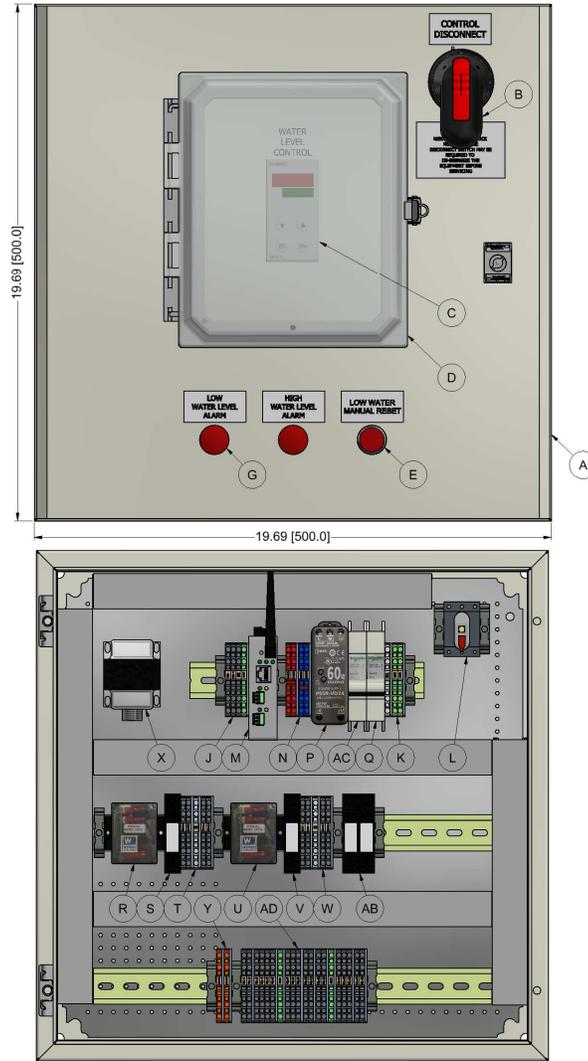
**Notes:**

20"x20" Enclosure used with (0-5) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Water Level Control



**TS-R5XWX-1YB-4YX3**

Options for Kit in Enclosure	*BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5XWX-xYB-xYXx	X			
TS-R5XWX-xYx-xYX1		X		
TS-R5XWX-xYx-xYX2			X	
TS-R5XWX-1Yx-xYXx				X

**Notes:**

12"x12" Enclosure used with NEMA1 and (0-1) options

16"x16" Enclosure used with NEMA1 and (2-3) options or NEMA4/12 and (0-3) options

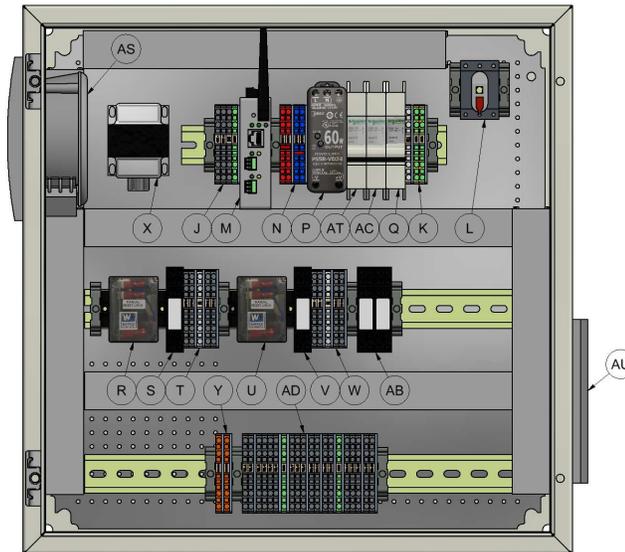
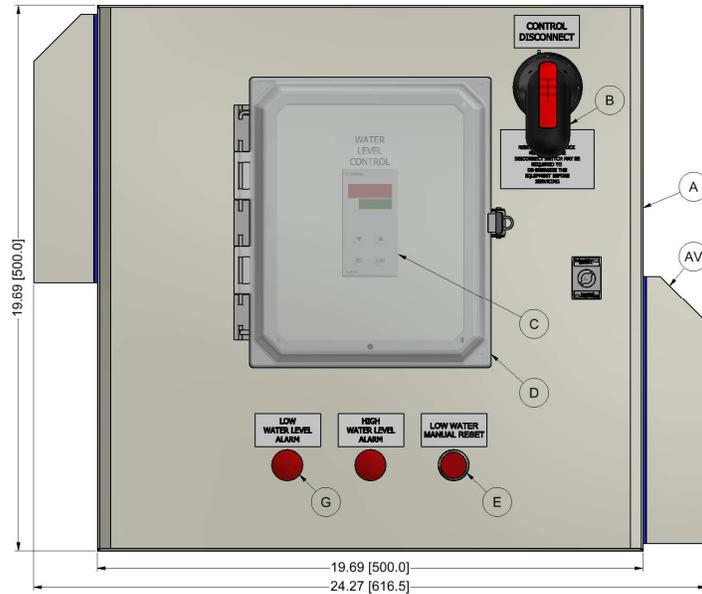
20"x20" Enclosure with (4) options

\* Option not available in 12"x12" enclosure

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Water Level Control with Cooling Fan



**TS-R5XWX-1YB-2YY3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5XWX-xYB-xYYx	X			
TS-R5XWX-xYx-xYY1		X		
TS-R5XWX-xYx-xYY2			X	
TS-R5XWX-1Yx-xYYx				X

**Notes:**

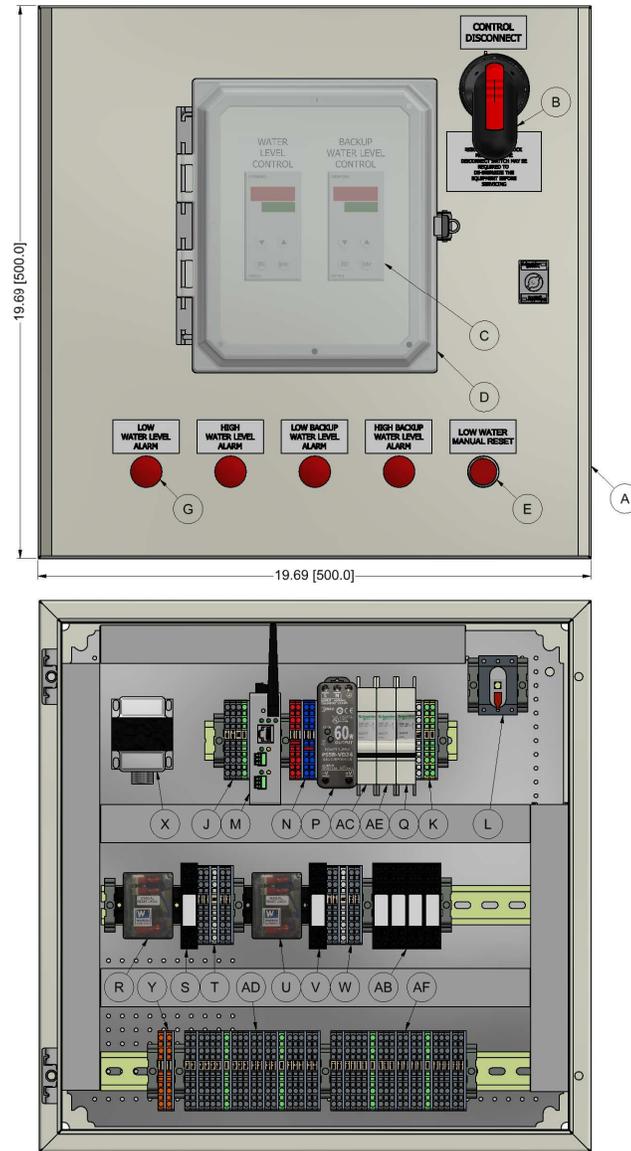
16"x16" Enclosure used with (0-2) options

20"x20" Enclosure used with (3-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Water Level Control and Backup



**TS-R5XBX-1YB-4YX3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5XBX-xYB-xYXx	X			
TS-R5XBX-xYx-xYX1		X		
TS-R5XBX-xYx-xYX2			X	
TS-R5XBX-1Yx-xYXx				X

**Notes:**

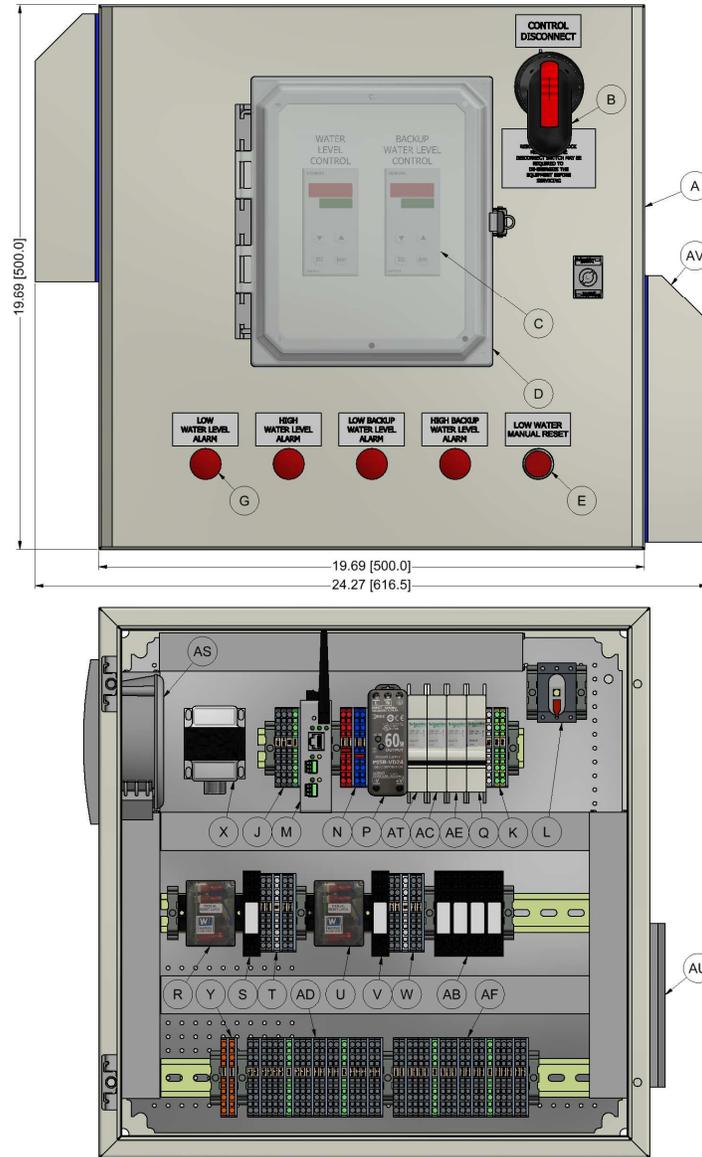
16" x 16" Enclosure used with (0-1) options

20" x 20" Enclosure used with (2-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Water Level Control and Backup with Cooling Fan



**TS-R5XBX-1YB-2YY3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5XBX-xYB-xYYx	X			
TS-R5XBX-xYx-xYY1		X		
TS-R5XBX-xYx-xYY2			X	
TS-R5XBX-1Yx-xYYx				X

**Notes:**

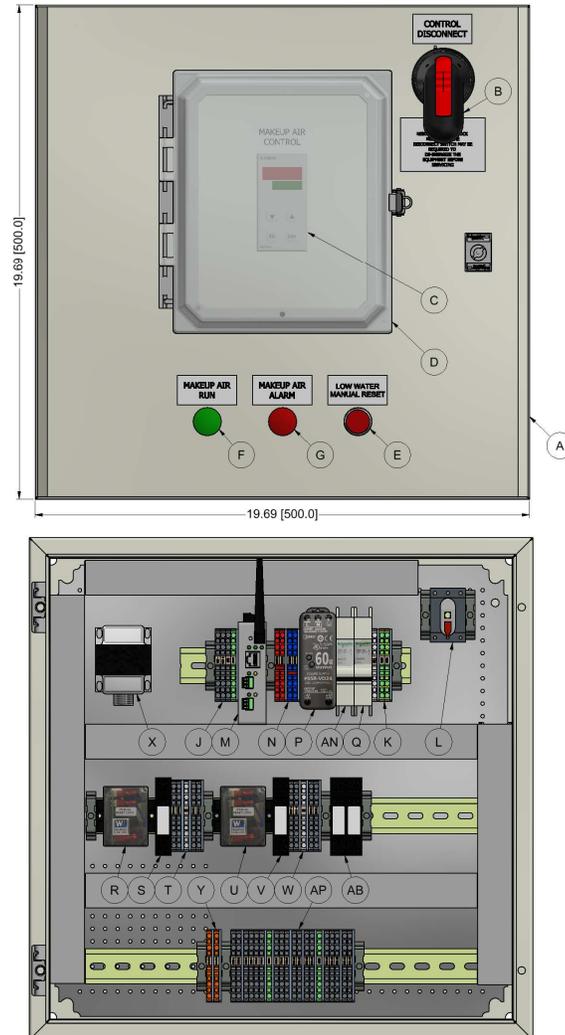
16"x16" Enclosure used with (0-1) options

20"x20" Enclosure used with (2-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Makeup Air Control



**TS-R5XXM-1YB-4YX3**

Options for Kit in Enclosure	*BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5XXM-xYB-xYXx	X			
TS-R5XXM-xYx-xYX1		X		
TS-R5XXM-xYx-xYX2			X	
TS-R5XXM-1Yx-xYXx				X

**Notes:**

12"x12" Enclosure used with NEMA1 and (0-1) options

16"x16" Enclosure used with NEMA1 and (2-3) options or NEMA4/12 and (0-3) options

20"x20" Enclosure with (4) options

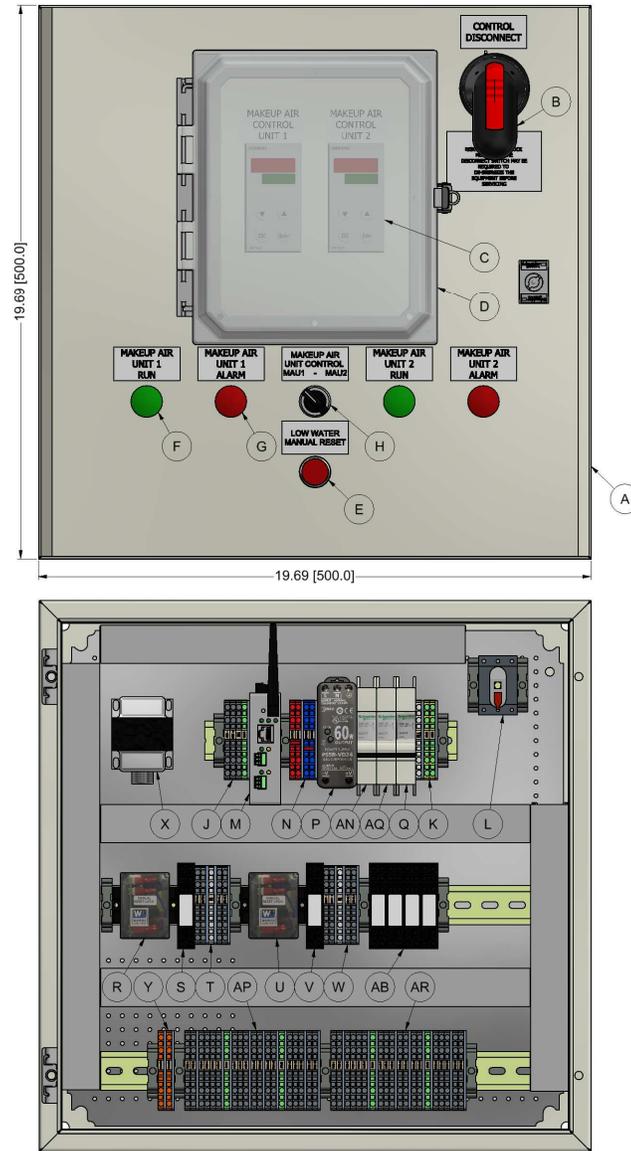
\* Option not available in 12"x12" enclosure



## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Makeup Air Control – Two Units



**TS-R5XXS-1YB-4YX3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5XXS-xYB-xYXx	X			
TS-R5XXS-xYx-xYX1		X		
TS-R5XXS-xYx-xYX2			X	
TS-R5XXS-1Yx-xYXx				X

**Notes:**

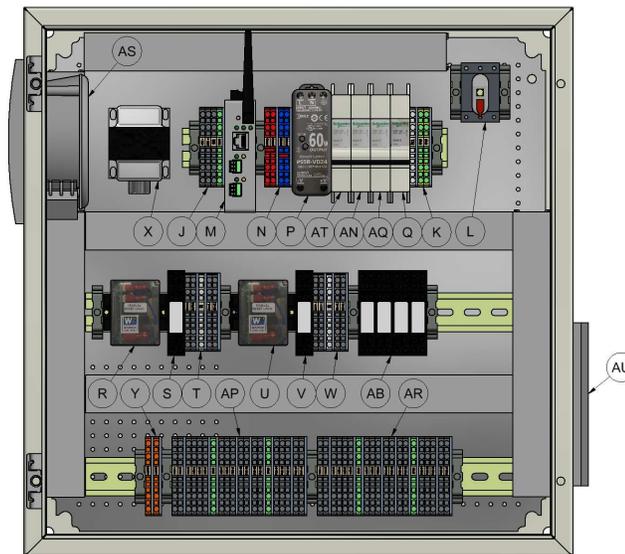
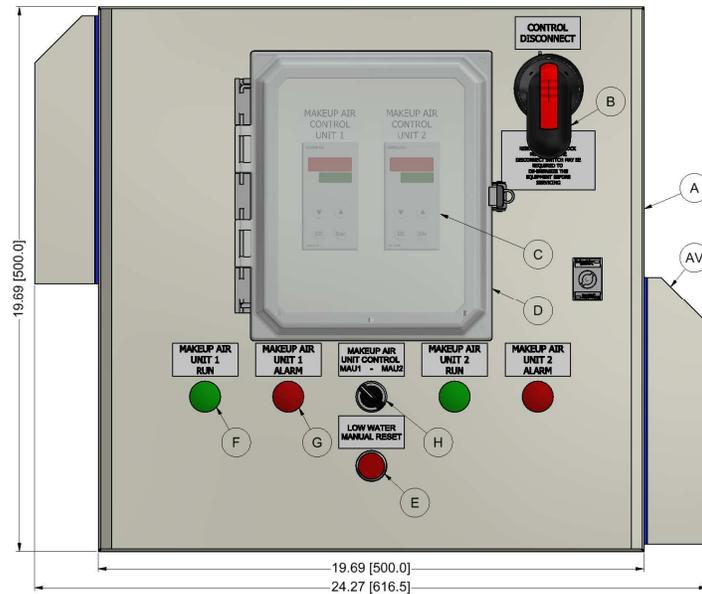
16" x 16" Enclosure used with (0-1) options

20" x 20" Enclosure used with (2-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Makeup Air Control – Two Units with Cooling Fan



#### TS-R5XXS-1YB-2YY3

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5XXS-xYB-xYYx	X			
TS-R5XXS-xYx-xYY1		X		
TS-R5XXS-xYx-xYY2			X	
TS-R5XXS-1Yx-xYYx				X

**Notes:**

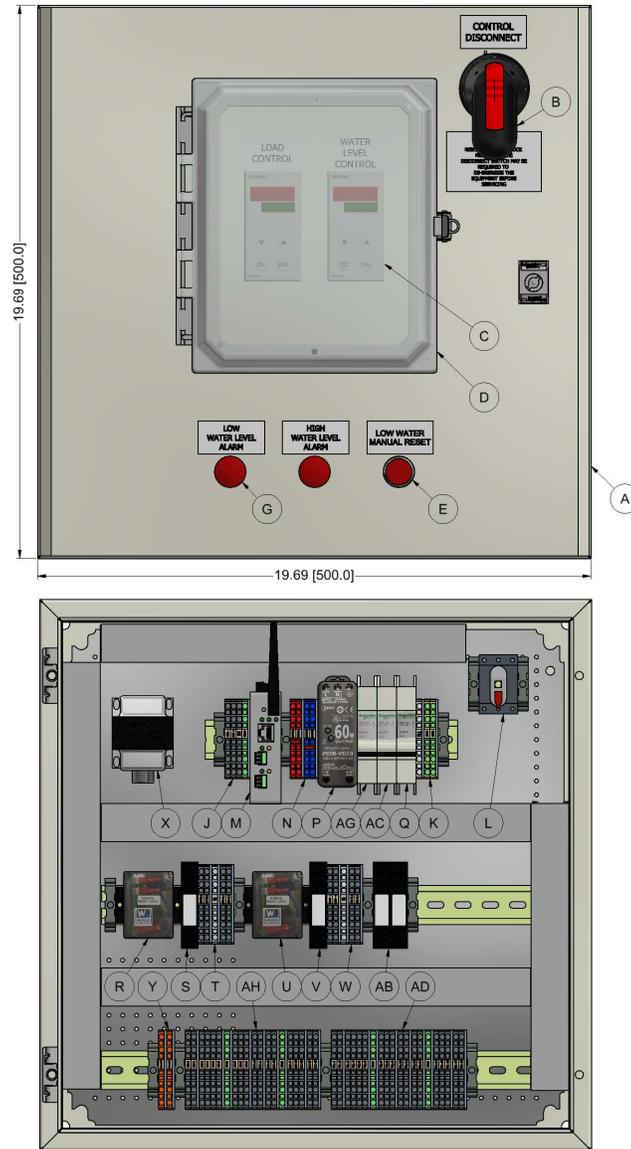
16"x16" Enclosure used with (0-1) options

20"x20" Enclosure used with (2-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Combination, Two Processes



**TS-R5LWX-1YB-4YX3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5LWX-xYB-xYXx	X			
TS-R5LWX-xYx-xYX1		X		
TS-R5LWX-xYx-xYX2			X	
TS-R5LWX-1Yx-xYXx				X

**Notes:**

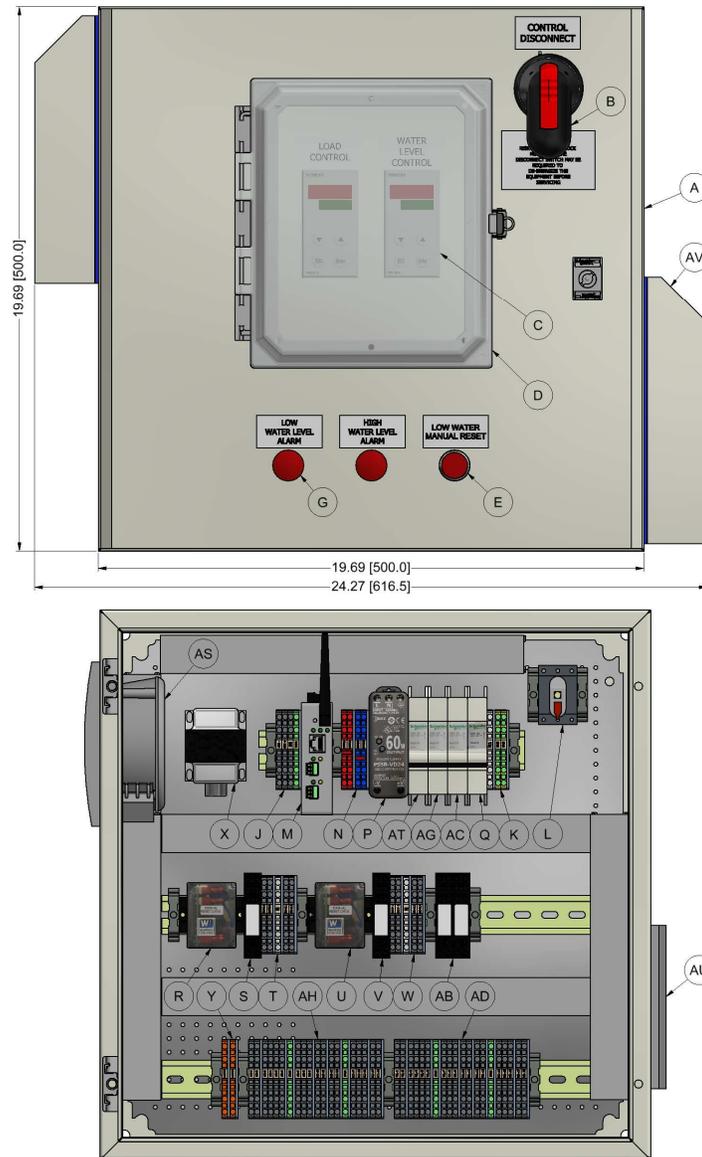
16" x 16" Enclosure used with (0-1) options

20" x 20" Enclosure used with (2-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Combination, Two Processes with Cooling Fan



#### TS-R5LWX-1YB-2YY3

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)
TS-R5LWX-xYB-xYYx	X			
TS-R5LWX-xYx-xYY1		X		
TS-R5LWX-xYx-xYY2			X	
TS-R5LWX-1Yx-xYYx				X

**Notes:**

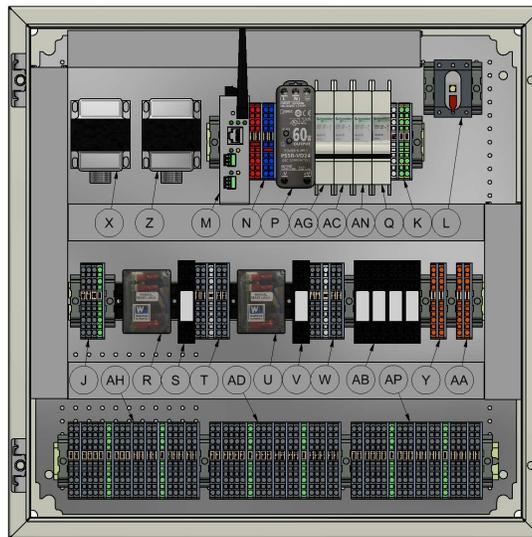
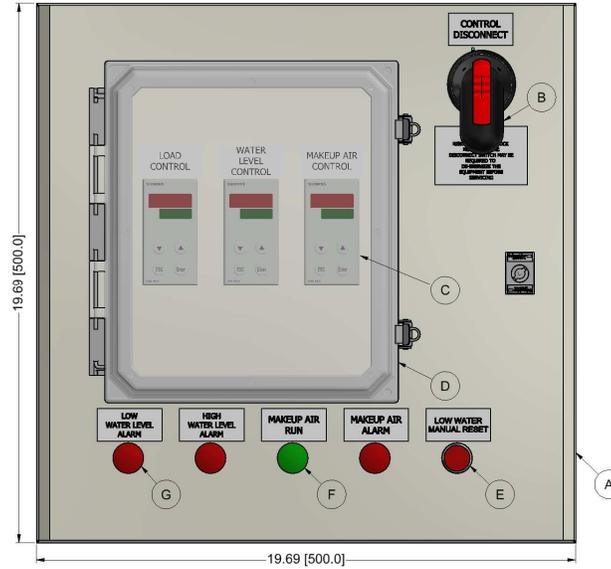
16"x16" Enclosure used with (0-1) options

20"x20" Enclosure used with (2-4) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Combination, Three Processes



**TS-R5LWM-2YB-4YX3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)	(2) SKB/C/D Power Transformers (Z, AA)
TS-R5LWM-xXB-xYXx	X				
TS-R5LWM-xXx-xYX1		X			
TS-R5LWM-xXx-xYX2			X		
TS-R5LWM-1Xx-xYXx				X	
TS-R5LWM-2Xx-xYXx					X

**Notes:**

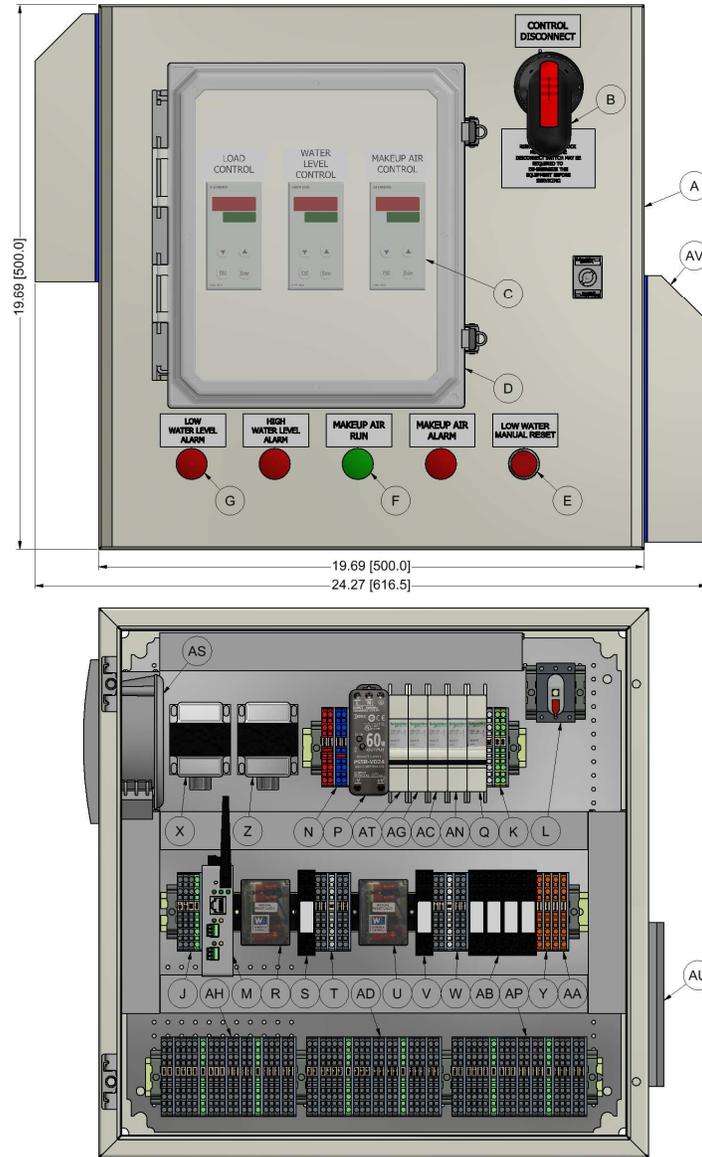
16" x 16" Enclosure used with NEMA1 and (0) options

20" x 20" Enclosure used with NEMA1 and (1-5) options or NEMA4/12 and (0-5) options

## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### Combination, Three Processes with Cooling Fan



**TS-R5LWM-2YB-2YY3**

Options for Kit in Enclosure	BMS Comm Other than Modbus RS485 (M, N, P, Q)	Manual Reset Warrick Relay (E, R, S, T)	Automatic Reset Warrick Relay (U, V, W)	SKB/C/D Power Transformer (X, Y)	(2) SKB/C/D Power Transformers (Z, AA)
TS-R5LWM-xYB-xYYx	X				
TS-R5LWM-xYx-xYY1		X			
TS-R5LWM-xYx-xYY2			X		
TS-R5LWM-1Yx-xYYx				X	
TS-R5LWM-2Yx-xYYx					X

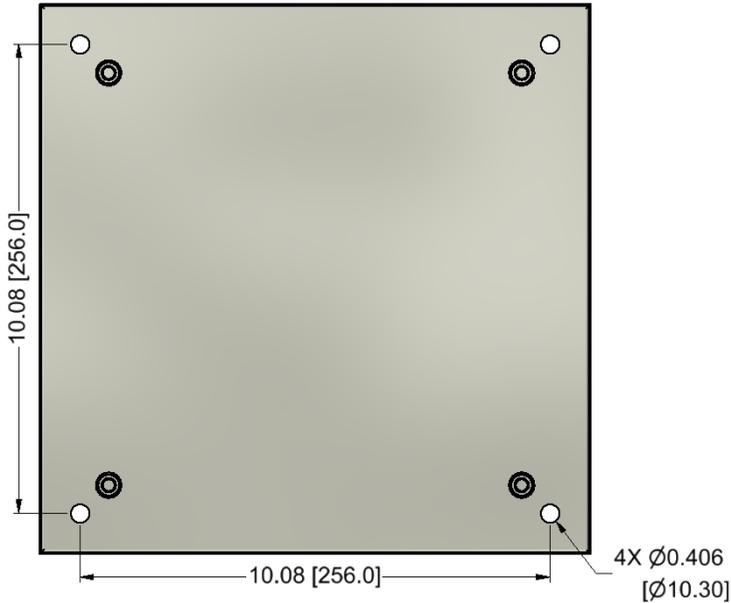
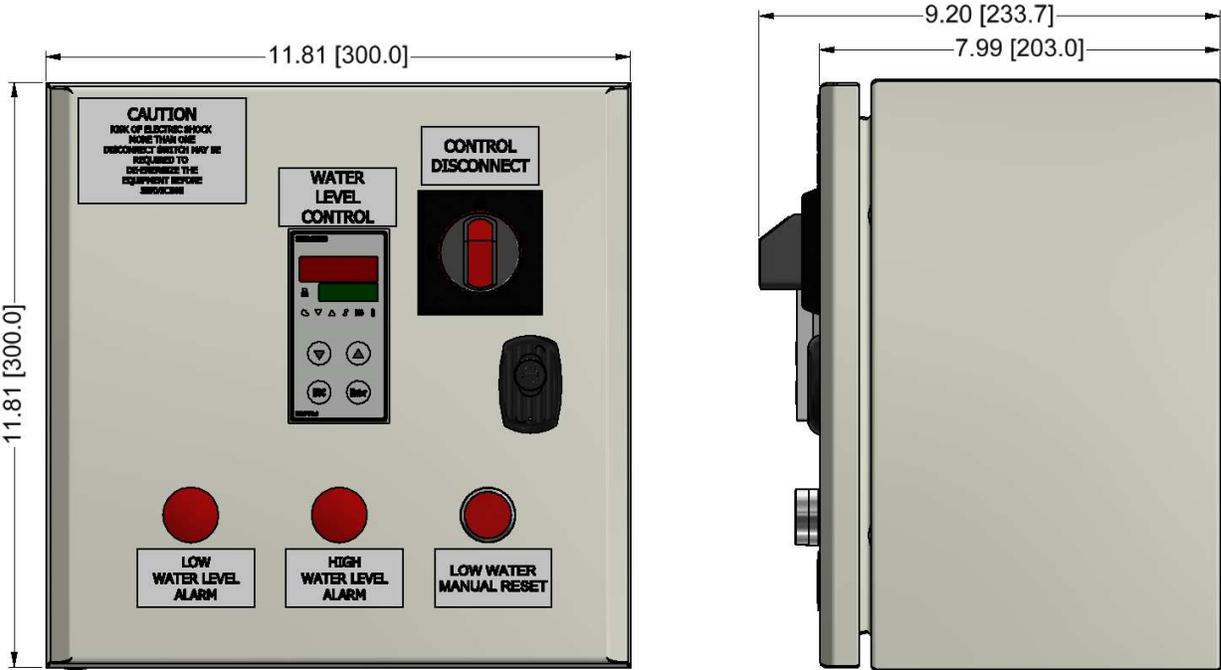
Notes:

20"x20" Enclosure used with (0-5) options

# Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

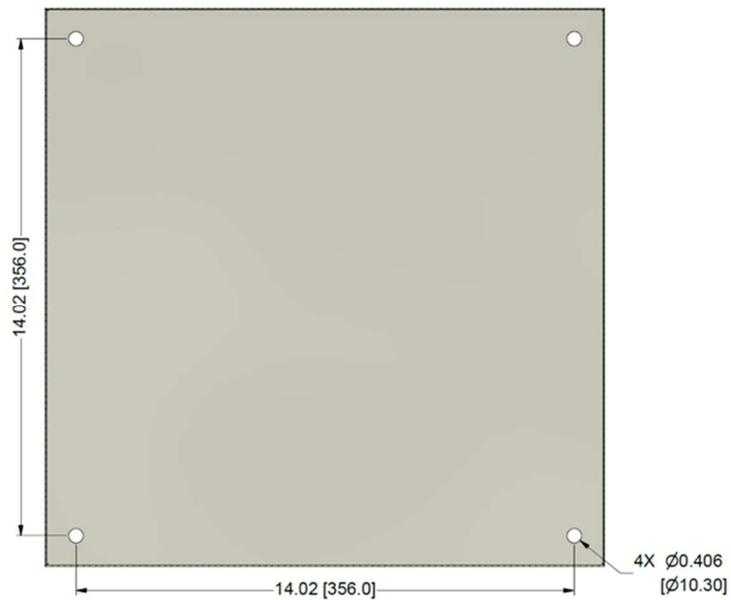
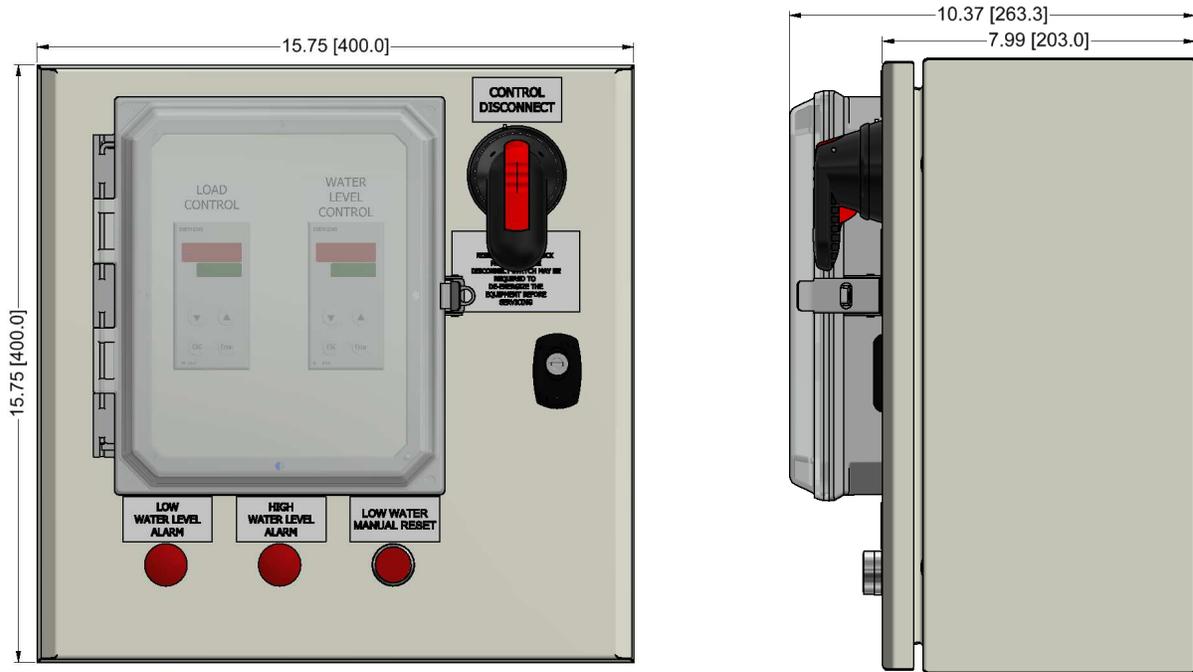
## 12" X 12" X 8" Enclosure Dimensions



## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

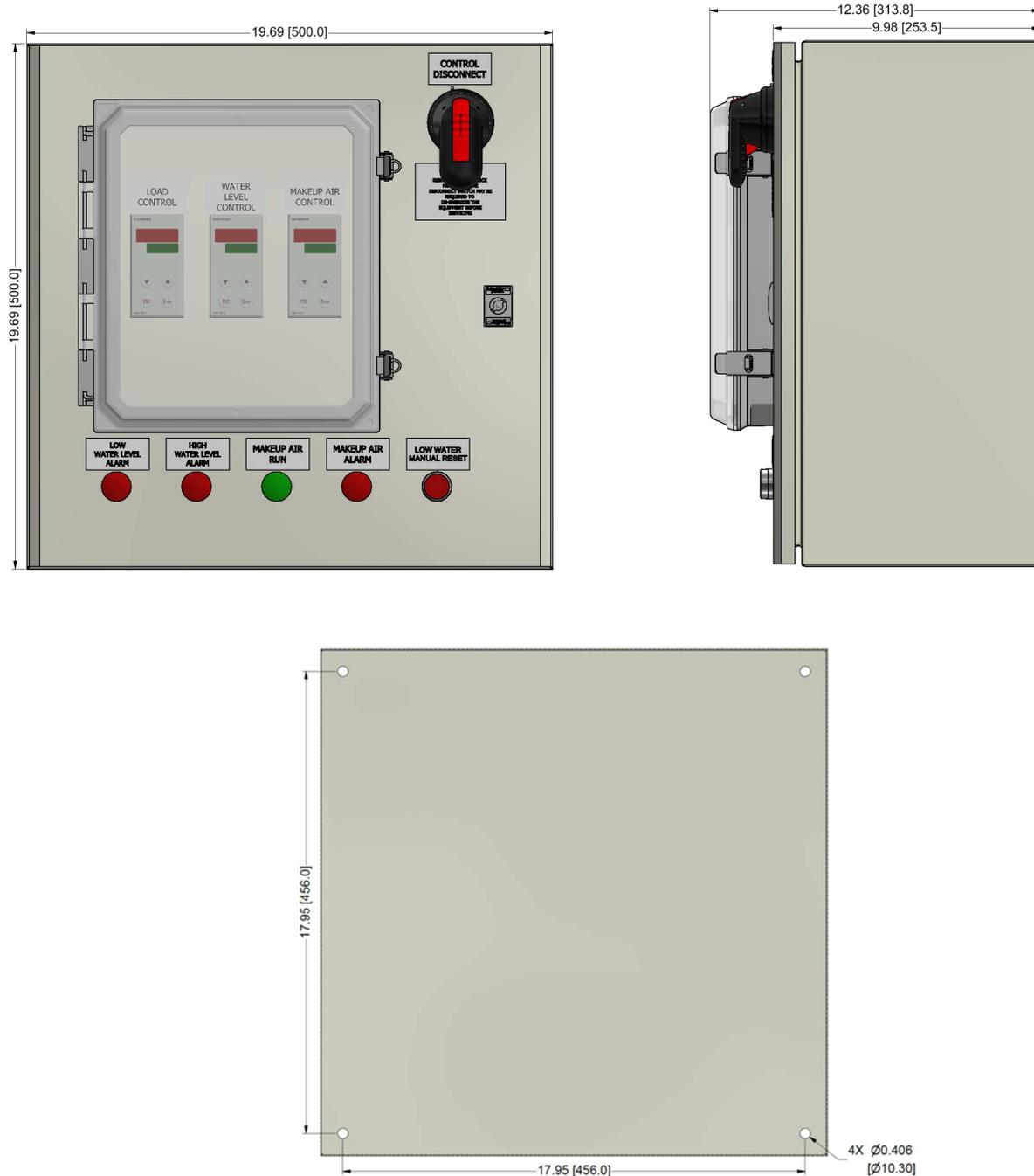
### 16" X 16" X 8" Enclosure Dimensions



## Dimensions and Layout (continued)

Dimensions in inches; millimeters in brackets

### 20" X 20" X 10" Enclosure Dimensions



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