

Rosemount 848L Logic Transmitter with FOUNDATIONTM Fieldbus

- *Integrates Discrete I/O on a FOUNDATION Fieldbus H1 Segment*
- *Reduces Installation and Maintenance Costs with a Single Network for Analog and Discrete devices*
- *Easily Configured with the Same DD Based Software Used for other FOUNDATION Fieldbus Devices*
- *Higher Availability Through Logic Execution Independent of a Central Controller*
- *Handles Demanding Applications with Fast Embedded Logic Execution*



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Provides an Interface Between Discrete Inputs and Outputs and a Foundation Fieldbus H1 Segment. Logic Capability Includes Boolean AND, OR, XOR, and Timer Functions.

Cost Effective H1 Discrete Input and Output:

The 848L provides a cost effective field mounted interface for discrete inputs and outputs on a Foundation Fieldbus H1 network. The 848L allows you to leverage the fieldbus network to reduce discrete input and output wiring and eliminate the need for a separate discrete I/O bus.

The 848L can communicate with other devices on the segment to provide logic interactions independent of any upper level controller.

Compact Design Mounts Virtually Anywhere:

The rugged design of the 848L allows it to be field mounted close to the process and equipment being monitored or controlled. The 848L is certified for use in Division 2 environments.

Fieldbus Function Blocks:

The device supports DI and MDI Digital Input Blocks, and DO and MDO Digital Output Blocks.

Embedded Logic Capability:

The 848L also has logic capability allowing it to independently control outputs based on the status of one or more of its inputs or discrete signals from other devices on the network. A Logic Block allows for up to 20 Boolean equations.

8 Inputs and 4 Outputs:

The 848L can accommodate 8 inputs from either dry contact, 9-32VDC, or NAMUR sensors. The 4 9-32VDC outputs can handle loads of 1.0 amps up to a total of 4 amps for the device.

Rosemount FOUNDATION Fieldbus Solutions

Rosemount 3051S Pressure and Differential Pressure Transmitter

Best-in-class performance with 0.04% accuracy available with FOUNDATION Fieldbus protocol.

Rosemount 3144P Temperature Transmitter

Two compartment housing, dual sensor design available with HART or Foundation Fieldbus protocol.

Rosemount 644 Smart Temperature Transmitter

Field mount styles available with HART or FOUNDATION Fieldbus protocol. Rail mount style available for HART protocol.

Rosemount 848T Eight Input Temperature Transmitter

Eight input transmitter available with FOUNDATION Fieldbus protocol.

Rosemount 3420 Fieldbus Interface Module

Provides an interface between FOUNDATION Fieldbus instruments and systems without fieldbus capability using standard interface protocols.

Rosemount 752 Field Indicator

Displays up to 8 variables from any device on the fieldbus segment.

Rosemount 5600 Radar Gauge

Provide a wide selection of antennas and materials for level measurement.

Refer to www.fieldbus.org for additional Emerson Process Management FOUNDATION fieldbus products.



The Rosemount 848L Transmitters power PlantWeb providing discrete I/O and logic processing on the fieldbus segment.

Specifications

FUNCTIONAL SPECIFICATIONS

Inputs

8 Discrete Inputs suitable for NAMUR specification sensors,
9-32VDC sourcing sensors or general switch inputs (dry contact)

NAMUR Sensors:

On state: > 2.1 mA

Off state: < 1.2 mA

9-32 VDC Sourcing Sensors:

On state: > 50% of I/O voltage

Off state: < 20% of I/O voltage

General Switch Inputs:

On state: < 500 Ohms

Off state: > 5k Ohms

Minimum Pulse Width: 1ms

Maximum Pulse Input Frequency: 500Hz

Outputs

4 Discrete Outputs

9-32 VDC loads

Maximum load inductance 7.0 H

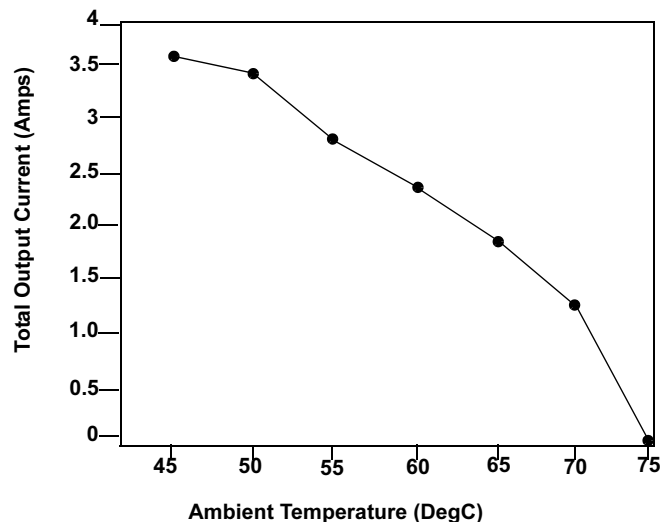
Current Ratings: 1.0 A maximum for single channel on, 4.0 A maximum per device.

Output devices must be selected as follows:

1. Designed to use the same DC voltage as supplied to the 848L I/O power terminals.
2. The DC resistance must be large enough that they consume no more than 1 amp of current steady state. The internal impedance of the 848L is negligible, therefore the Output device's current is simply calculated as: I/O power / DC resistance.
3. The inductance of the output device must be less than 7.0H.

The maximum total output current for the device will depend on the ambient temperature as shown in Figure 1.

FIGURE 1. Temperature vs. Output Current



Thermal Shutdown Protection prevents damage to the device if temperature specifications are exceeded.

Isolation

Input-Output

1200 VDC; 600 V rms 50/60 Hz for dry
and 2-wire NAMUR contact inputs
No isolation when using 3-wire sensors

Input- Foundation Fieldbus

1200 VDC; 600 V rms 50/60 Hz

Output- Foundation Fieldbus

1200 VDC; 600 V rms 50/60 Hz

Input power- Foundation Fieldbus

1200 VDC; 600 V rms 50/60 Hz

Input / Output Power Requirements

24 VDC nominal, 9 VDC minimum, 32 VDC maximum
Supply Current Rating 0.5 amps at 24 VDC plus output load

Fieldbus Segment Power

Powered over the H1 Foundation fieldbus with standard fieldbus power supplies. The logic transmitter operates between 9.0 and 32.0 VDC at 22 milliamps.

PHYSICAL SPECIFICATIONS

Environmental Ratings

Electronics (no enclosure)

-40°C to +85°C
99% non-condensing humidity
IP20

Unit (electronics and enclosure)

-40°C to +85°C
100% condensing humidity
IP66

Mounting

The Rosemount 848T can be mounted directly onto a DIN rail or it can be ordered with an optional junction box. When using the optional junction box, the transmitter can be mounted onto a panel or to a 2-in. pipe stand (with option code B6).

Entries for Optional Junction Box

No entry

- Used for custom fittings

Cable Gland

- 9 x M20 nickel-plated brass glands for 7.5–11.9 mm unarmored cable

Conduit

- 5 plugged 0.86-in. diameter holes suitable for installing 1/2-in. NPT fittings.

Materials of Construction for Optional Junction Box

Junction Box Type	Paint
Aluminum	Epoxy Resin
Plastic	NA
Stainless Steel	NA

Weight

Assembly	Weight		
	oz	lb	kg
Rosemount 848T only	9.60	0.60	0.27
Aluminum ⁽¹⁾	78.2	4.89	2.22
Plastic ⁽¹⁾	58.1	3.68	1.65
Stainless Steel ⁽¹⁾	77.0	4.81	2.18

(1) Add 35.2 oz (2.2 lb, 0.998 kg) for nickel-plated brass glands

Environmental Ratings

NEMA 4X, CSA Enclosure Type 4X, and IP66 with optional junction box.

FUNCTION BLOCKS SPECIFICATION

H1 Segment Device

Back-up LAS

Resource Block

I/O Transducer Block

All inputs can optionally be latched for the duration necessary for each input to be read during a macrocycle

Logic Transducer Block (20 Boolean Equations)

The processing cycle of the 848L logic equations from sampling the inputs to driving the outputs will vary depending upon the number and type of functions used in the 20 equations. Processing time can vary in the range of 50 to 150ms.

Logic Functions

AND, OR, XOR, NOT
Rising Edge Trigger
Falling Edge Trigger
Turn On Delay
Turn Off Delay
Pulse Counter
Reset
Set Latch
Shift Register Right
Shift Register Left

Function Blocks

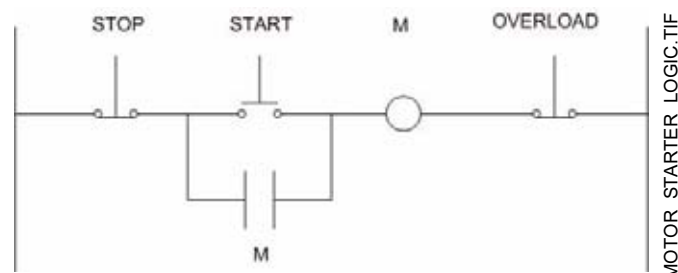
8 DI blocks, 4 DO blocks, 1 MDI block, and 1 MDO block are provided.

Foundation Fieldbus:

- Links 25
- VCR 20

EXAMPLE FOR THE LOGIC EXECUTION:

This diagram shows motor starter logic with start and stop buttons and an auxiliary contact which maintains current after the start button is pressed.



Which would translate to a Boolean equation of:
STOP = IN(1) START = IN(2) Really M = IN(3) Closed when motor is running and not overloaded.
AND(IN(1),OR(IN(2),IN(3))) which uses about 8% of the available time to maintain a 50ms execution frequency.

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA
Emerson Process Management Asia Pacific
Private Limited — Singapore
Rosemount Temperature GmbH - Karlstein, Germany

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

HAZARDOUS LOCATIONS CERTIFICATES

North American Approvals

Factory Mutual (FM) Approvals

N5 Nonincendive for Class I, Division 2, Groups A, B, C, D when installed per Rosemount drawing 00848-1035.
Temperature code: T4 ($T_{amb} = -40^{\circ}\text{C}$ to 60°C)

Canadian Standards Association (CSA) Approvals

N6 Suitable for Class I, Division 2, Groups A, B, C, D when installed per Rosemount drawing 00848-1036.
Temperature code: T4 ($T_{amb} = -40^{\circ}\text{C}$ to 60°C)


IECEX Approvals

N7 IECEX Type n Certification
Certificate: IECEX BAS 05.0007X
Ex nC IIC T4 ($-40^{\circ}\text{C} = T_a = +50^{\circ}\text{C}$)
Power Input Parameter: $U_i = 32.0\text{ V}$


Special Conditions for Safe Use:

1. The enclosure, cable gland, and blanking plug must be rated to a minimum of IP54.
2. The enclosure must be capable of withstanding a 7J impact.
3. Cable and conduit entries shall be constructed and mounted so that they do not degrade the specific characteristics of the protection of the apparatus.
4. The ambient temperature range of use shall be the most restrictive of the apparatus, enclosure, cable gland, or blanking plug.
5. The apparatus is not capable of withstanding the 500V insulation test required by Clause 8 of IEC 79-15: 1987. This must be taken into account when installing the apparatus.

European Approvals


N1 ATEX Type n
Certification Number: Baseefa04ATEX0027X
ATEX Marking  II 3 G
EEx nL IIC T4 ($T_{amb} = -40^{\circ}\text{C}$ to 50°C)
Power/Bus Input Parameter: $U_i = 32.0\text{ V}$
Special Conditions for Safe Use (x):

1. The ambient temperature range of use shall be the most restrictive of the apparatus, cable gland or blanking plug.
2. The apparatus is not capable of withstanding the 500V insulation test required by Clause 9.4 of EN 50021:1999 or Clause 8.1 of EN 60079:2003. This must be taken into account when installing the apparatus.
3. Component approved EEx e cable entries must be used so as to maintain the ingress protection of the enclosure to at least IP54.
4. Any unused cable entry holes must be filled with component approved EEx e blanking plugs.

NC ATEX Type n Component
Certification Number: Baseefa04ATEX0026U
ATEX Marking  II 3 G
EEx nA nL IIC T4 ($T_{amb} = -40^{\circ}\text{C}$ to 50°C)

Special Conditions for Safe Use (x):

1. The component must be installed in a suitable certified enclosure capable of withstanding an impact of 7.0J.
2. The apparatus is not capable of withstanding the 500V insulation test required by Clause 9.4 of EN 50021:1999 or Clause 8.1 of EN 60079:2003. This must be taken into account when installing the apparatus.

ND ATEX Dust Ignition Proof
Certification Number: Baseefa04ATEX0028X
ATEX Marking  II 1 D
T90C ($T_{amb} = -20^{\circ}\text{C}$ to 65°C)

Special Conditions for Safe Use (x):

1. Component approved EEx e cable entries must be used so as to maintain the ingress protection of the enclosure to at least IP66.
2. Any unused cable entry hole must be filled with component approved EEx e blanking plugs.
3. The ambient temperature range of use shall be the most restrictive of the apparatus, cable gland or blanking plug.

Dimensional Drawings

FIGURE 2. Rosemount 848L Dimensional Drawings

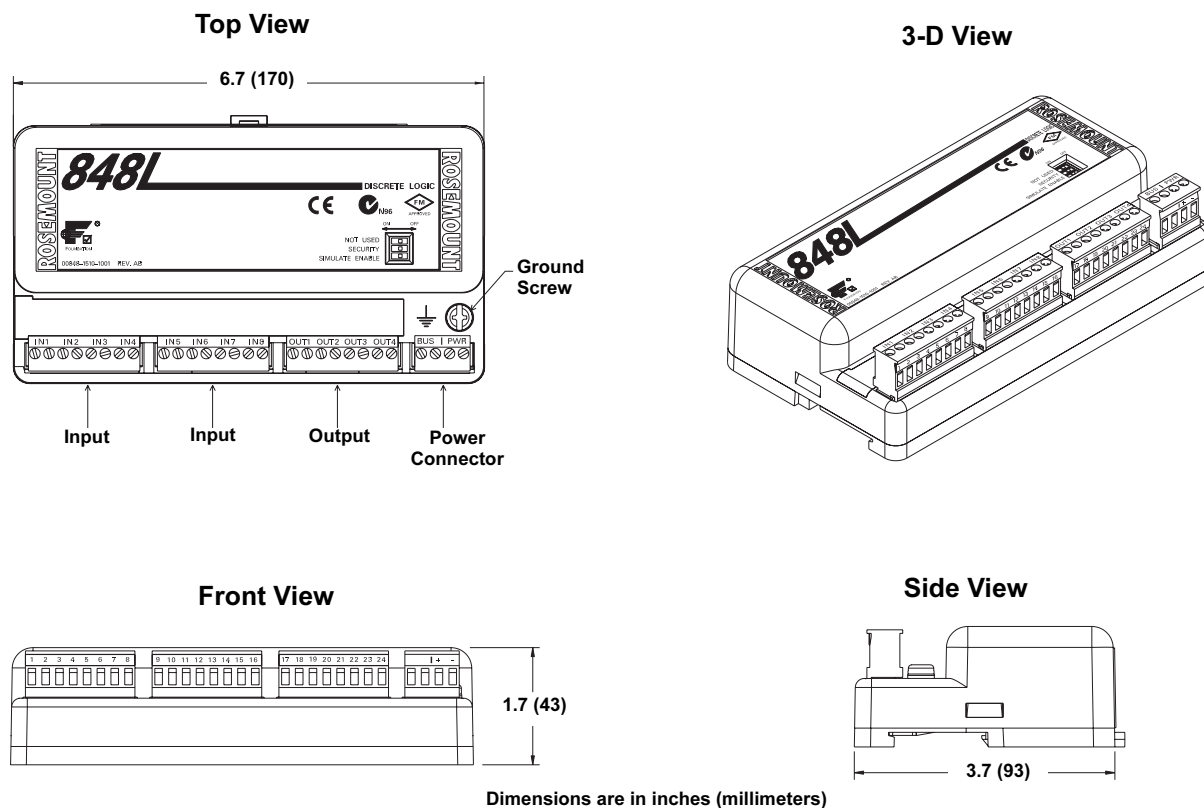
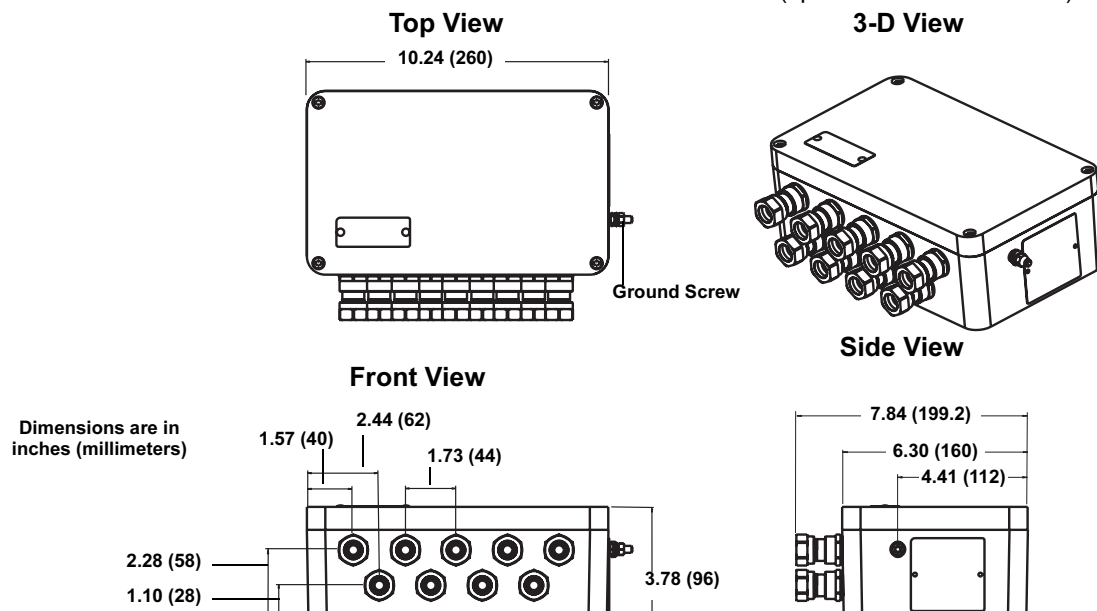


FIGURE 3. Aluminum/Plastic Junction Box - Cable Gland (option codes JA2 and JP2)



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Rosemount 848L

FIGURE 4. Stainless Steel Junction Box - Cable Glands (option code JS2)

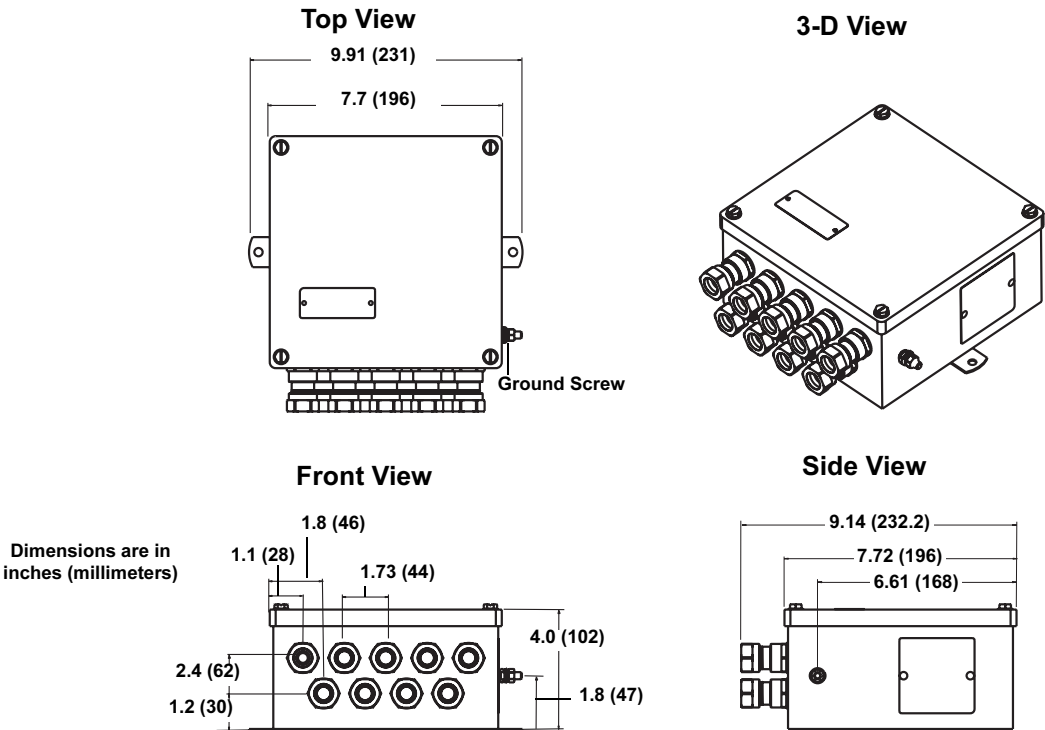
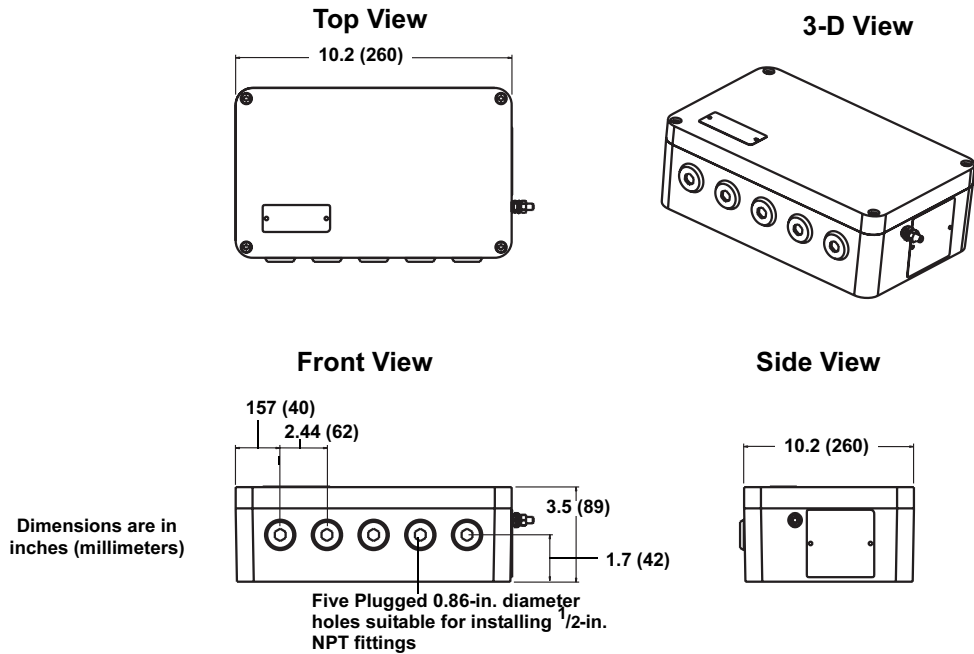


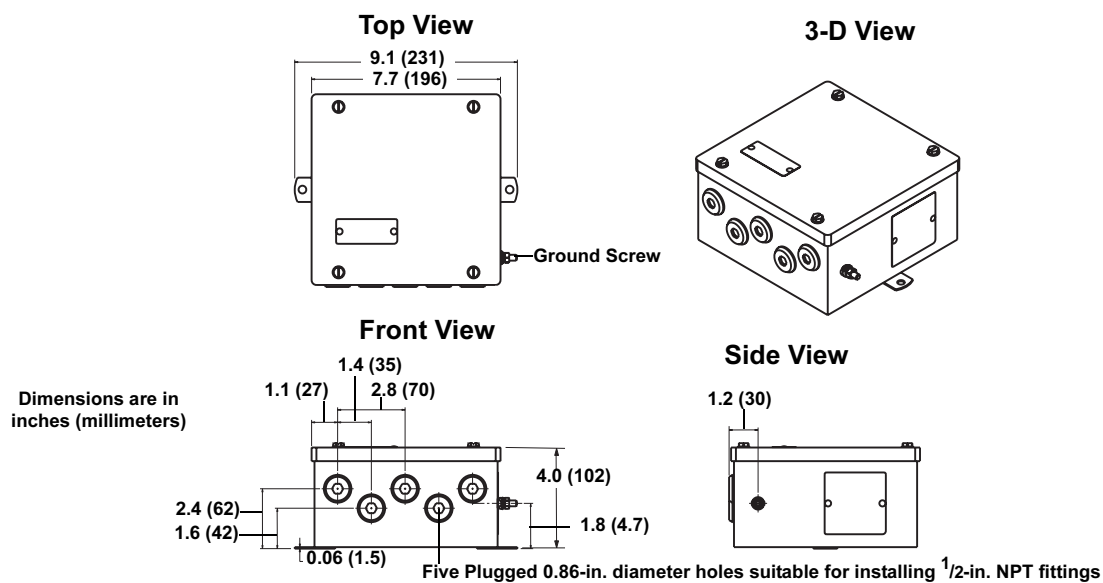
FIGURE 5. Aluminum/Plastic Junction Box - Conduit Entry (option codes JA3 and JP3)



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848_848A50A

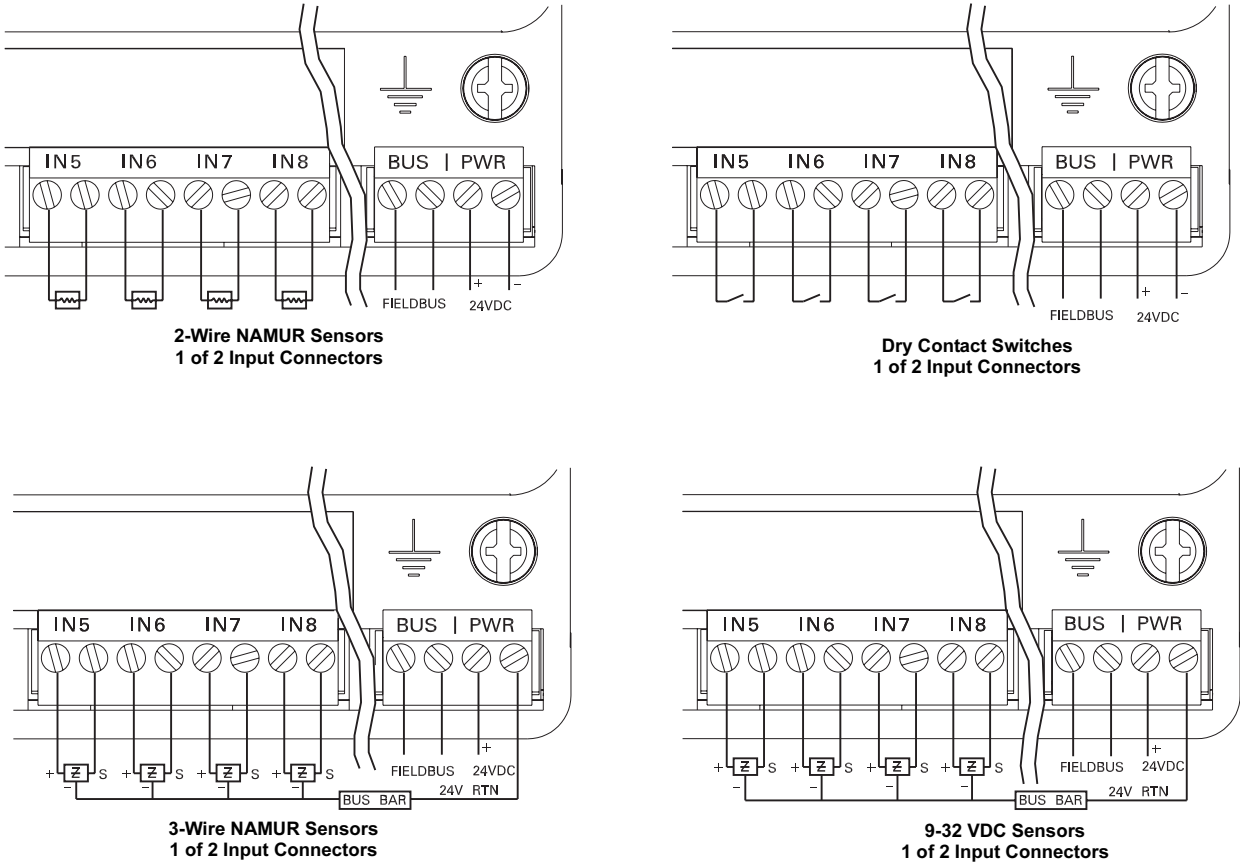
FIGURE 6. Stainless Steel Junction Box - Conduit Entry (option code JS3)



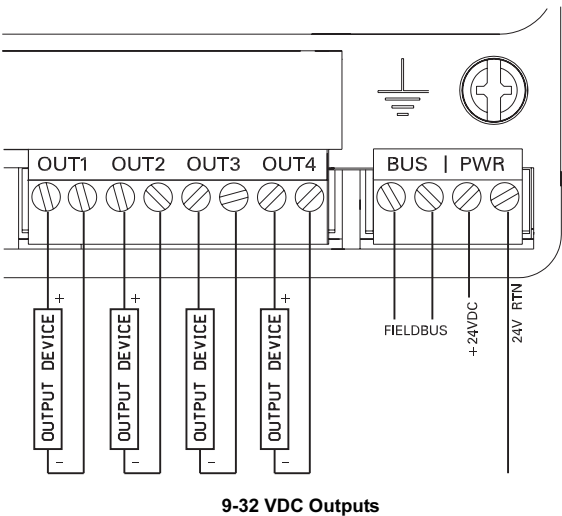
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FIGURE 7. Rosemount 848L Wiring Diagram

DISCRETE INPUT WIRING CONFIGURATION



DISCRETE OUTPUT WIRING CONFIGURATION



Ordering Information

Model	Product Description (Includes One Fieldbus H1 Segment)	
848L	Fieldbus Logic Transmitter	
Code	Communications Protocol	
F	FOUNDATION™ fieldbus digital signal (includes 8 DI, 4 DO, 1 MDI, and 1 MDO function blocks, and Backup Link Active Scheduler)	
Code	Power Input	
A	Bus and I/O Power (4-wire)	
Code	Product Certifications	Rosemount Junction Box required?
NA	No Approval	No
N1	ATEX Type n (enclosure required)	Yes
NC	ATEX Type n Component	No ⁽¹⁾
ND	ATEX Dust Ignition Proof	Yes
N5	FM Non-Incendive for Class 1, Division 2, Groups A, B, C, D	Yes
N6	CSA Non-Incendive for Class 1, Division 2, Groups A, B, C, D	Yes
N7	IECEx Type n Approval (consult factory for availability) (enclosure required)	No ⁽²⁾
Code	Discrete Inputs and Outputs Types	
S001	8 - Dry Contact Inputs / 4 - 9 to 32 VDC Outputs	
S002	8 - 2-wire NAMUR Sensor Inputs / 4 - 9 to 32 VDC Outputs	
S003	8 - 3-wire NAMUR Sensor Inputs / 4 - 9 to 32 VDC Outputs	
S004	8 - 9 to 32 VDC Inputs / 4 - 9 to 32 VDC Outputs	
Code	Options	
	Mounting Kit Options	
B6	Mounting Kit to a 2 in. pipe	
	Non Explosion-Proof Junction Box Options	
JP1	Plastic Junction Box; No Entries	
JP2	Plastic Junction Box; Cable Glands (9 X M20 nickel-plated brass glands for 7.5-11.9 mm unarmored cable)	
JP3	Plastic Junction Box; Conduit Entries (5 Plugged Holes, suitable for installing 1/2-in. NPT fittings)	
JA1	Aluminum Junction Box; No Entries	
JA2	Aluminum Cable Glands (9 X M20 nickel-plated brass glands for 7.5-11.9 mm unarmored cable)	
JA3	Aluminum Conduit Entries (5 Plugged Holes, suitable for installing 1/2-in. NPT fittings)	
JS1	Stainless Steel Junction Box; No Entries	
JS2	SST Box; Cable Glands (9 X M20 nickel-plated brass glands for 7.5-11.9 mm unarmored cable)	
JS3	Stainless Steel Box, Conduit Entries (5 Plugged Holes, suitable for installing 1/2-in. NPT fittings)	
	Software Options	
CT	Disable Local Logic Function	
	Conduit Electrical Connector	
GE ⁽³⁾	M12, 4-pin, Male Connector (<i>euromast</i> ®)	
GM ⁽²⁾	A size Mini, 4-pin, Male Connector (<i>minimast</i> ®)	
Typical Model Number: 848L F A NA S001 T1 JP1		

(1) The Rosemount 848L ordered with option code NC is not approved as a stand-alone unit. Additional system certification is required.

(2) The Rosemount 848L must be installed so it is protected to at least the requirements of IP54; All listed Junction Boxes fulfill this requirement.

(3) Available with Intrinsically Safe approvals only. For FM Intrinsically Safe or non-incendive approval (option code I5), install in accordance with Rosemount drawing 03151-1009 to maintain NEMA 4X rating.

Product Data Sheet

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Rosemount 848L

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