Foxboro Evo™ Process Automation System

Product Specifications

Foxboro_®

by Schneider Electric

PSS 31H-2S238

FBM238, 24DI/8DO Module



Many plant situations, such as Motor Control Center controls, require several inputs for each output. The FBM238 contains 24 discrete input and eight discrete output channels that are compatible with voltages and currents commonly found in industrial plants. An external power supply is used to energize the field circuits.

OVERVIEW

The FBM238 24DI/8DO Module provides twenty-four digital inputs with eight digital output channels. Associated Termination Assemblies (TAs) and Termination Assembly Adapters (TAAs) provide for discrete nominal inputs of 30 V DC, 60 V DC, 120 V AC/125 V DC or 240 V AC and nominal outputs of 60 V DC, 120 V AC/125 V DC or 240 V AC. The module performs signal conversion required to interface the electrical input signals from the field sensors to the Module Fieldbus.

Depending on the type of I/O signal required, the TAs or TAAs support current limiting devices, high voltage attenuation circuits, optical isolation and external power source connections.

FEATURES

Key features of the FBM238 are:

- Twenty-four digital input channels, used for either contact sensing, or DC voltage monitoring
- Eight digital output channels, used for either DC output switching with an external source (e.g. to

control powering of various external loads), or DC output switching with an internal source only (e.g. to power external solid state relays or other similar devices)

- Rugged design suitable for enclosure in Class G3 (harsh) environments
- > Supports discrete input signals at voltages of:
 - 30 V DC/60 V DC
 - 120 V AC/125 V DC
 - 240 V AC
- Supports output switching at voltages of:
 - 60 V DC
 - 120 V AC/125 V DC
 - 240 V AC
- Executes the programs for Digital I/O (ECB5), and Ladder Logic (ECB8)
- Various Termination Assemblies (TAs) provide for per-channel isolation and contain:
 - High voltage attenuation and optical isolation for inputs
 - External power connection for device excitation.
 - Output current limiting

STANDARD DESIGN

FBM238 has a rugged extruded aluminum exterior for physical protection of the circuits. Enclosures specially designed for mounting the FBMs provide various levels of environmental protection, up to Class G3 harsh environments, per ISA Standard S71.04.

VISUAL INDICATORS

Light-emitting diodes (LEDs) incorporated into the front of the module provide visual indication of the Fieldbus Module operational status, as well as the discrete states of the individual input/output points.

EASY REMOVAL/REPLACEMENT

The module can be removed/replaced without removing field device termination cabling, power, or communication cabling.

FIELDBUS COMMUNICATION

A Fieldbus Communications Module or a Control Processor interfaces to the 2 Mbps module Fieldbus used by the FBMs. The FBM238 accepts communication from either path (A or B) of the 2 Mbps Fieldbus — should one path fail or be switched at the system level, the module continues communication over the active path.

MODULAR BASEPLATE MOUNTING

The module mounts on a DIN rail mounted baseplate, which accommodates up to four or eight Fieldbus Modules. The Modular baseplate is either DIN rail mounted or rack mounted, and includes signal connectors for redundant Fieldbus, redundant independent DC power, and termination cables.

FIELD I/O SIGNALS

Field I/O signals connect to the FBM subsystem via DIN rail mounted TAs or Termination Assembly Adapters (TAAs) mounted on the conversion mounting structures. TAAs are discussed in *Termination Assembly Adapter Modules for 100 Series Upgrade* (PSS 31H-2W4).

The TAs used with FBM238 are described in "TERMINATION ASSEMBLIES AND CABLES" on page 6.

FUNCTIONAL SPECIFICATIONS

Input/Output Channels

24 group isolated digital input channels and eight group isolated digital output channels

Filter/Debounce Time

Configurable (No Filtering, 4, 8, 16 or 32 ms)

Voltage Monitor (FBM238 with feed through TA RH924VD (supersedes P0924VD))

INPUT

30 V DC maximum applied voltage **ON-STATE VOLTAGE**

15 to 30 V DC OFF-STATE VOLTAGE

0 to 5 V DC

CURRENT INPUT FOR ON-STATE 2.3 mA maximum at 30 V DC

2.5 TTA TTAXITTUTT AL SU V DC

SOURCE RESISTANCE LIMITS

ON-STATE 1 k Ω (maximum) at 15 V DC OFF-STATE 100 k Ω (minimum) at 30 V DC

Contact Sense (FBM238 with feed through TA RH924VG (supersedes P0924VG))

CONTACT SUPPLY

24 V DC nominal (supplied by FBM through the TA)

CONTACT CURRENT

1.8 mA DC nominal

SOURCE RESISTANCE LIMITS

 $\begin{array}{l} \textit{ON-STATE} \\ 1 \text{ k } \Omega \text{ (maximum) at } 15 \text{ V DC} \\ \textit{OFF-STATE} \\ 100 \text{ k } \Omega \text{ (minimum) at } 30 \text{ V DC} \end{array}$

Output (FBM238 with feed through TAs RH924VD (supersedes P0924VD) or RH924VG (supersedes P0924VG))

APPLIED VOLTAGE (EXTERNAL)

60 V DC maximum

LOAD CURRENT

0.24 A DC maximum per channel 2.0 A DC maximum per TA

INDUCTIVE LOADS

Outputs may require a protective diode or MOV connected across the load

Isolation

Input and output channels are group isolated from each other and earth (ground). For details, refer to the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA). The module withstands, without damage, a potential of 600 V AC applied for one minute between the group isolated channels or between either set of group isolated channels and ground.

CAUTION

This does not imply that these channels are intended for permanent connection to voltages of these levels. Exceeding the limits for input voltages, as stated elsewhere in this specification, violates electrical safety codes and may expose users to electric shock.

Communication

Communicates with its associated FCM or FCP via the module Fieldbus

Power Requirements

INPUT VOLTAGE RANGE 24 V DC +5%. -10%

MODULE CONSUMPTION

2.65 W (maximum) at 24 V DC

MODULE HEAT DISSIPATION

5.3 W (maximum) at 2 A total load and all inputs at 30 V DC $\,$

Calibration Requirements

Calibration of the module is not required.

FUNCTIONAL SPECIFICATIONS (CONTINUED)

Regulatory Compliance

ELECTROMAGNETIC COMPATIBILITY (EMC)

European EMC Directive 2004/108/EC (Prior to April 20, 2016) and 2014/30/EU (Beginning April 20, 2016)

Meets: EN61326-1:2013 Class A Emissions and Industrial Immunity Levels

RoHS COMPLIANCE

Complies with European RoHS Directive 2011/65/EU

PRODUCT SAFETY

Underwriters Laboratories (UL) for U.S. and Canada

UL/UL-C listed as suitable for use in UL/UL-C listed Class I, Groups A-D; Division 2; temperature code T4 enclosure based systems when connected to specified Foxboro Evo processor modules as described in the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA). Communications circuits also meet the requirements for Class 2 as defined in Article 725 of the National Electrical Code (NFPA No.70) and Section 16 of the Canadian Electrical Code (CSA C22.1). Conditions for use are as specified in the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA).

European Low Voltage Directive 2006/95/EC (Prior to April 20, 2016) and 2014/35/EU (Beginning April 20, 2016) and Explosive Atmospheres (ATEX) directive 94/9/EC (Prior to April 20, 2016) and 2014/34/EU (Beginning April 20, 2016)

DEMKO certified as Ex nA IIC T4 for use in certified Zone 2 enclosure when connected to specified I/A Series processor modules as described in the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA).

MARINE CERTIFICATION

ABS Type Approved and Bureau Veritas Marine certified for Environmental Category EC31.

ENVIRONMENTAL SPECIFICATIONS

Operating

TEMPERATURE

FBM238 -20 to + 70°C (-4 to +158°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing)

ALTITUDE

-300 to +3,000 m (-1,000 to +10,000 ft)

Storage

TEMPERATURE

-40 to +70°C (-40 to +158°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing) **ALTITUDE**

-300 to +12,000 m (-1,000 to +40,000 ft)

Contamination

Suitable for use in Class G3 (Harsh) environments as defined in ISA Standard S71.04, based on exposure testing according to EIA Standard 364-65, Class III.

Vibration

 0.75 m/S^2 (0.75g) from 5 to 500 Hz

PHYSICAL SPECIFICATIONS

Mounting

MODULE

FBM238 mounts on a baseplate. The baseplate can be mounted on a DIN rail (horizontally or vertically), or horizontally on a 19-inch rack using a mounting kit. Alternatively, FBM238 mounts on a 100 Series conversion mounting structure. Refer to *Standard 200 Series Baseplates* (PSS 31H-2SBASPLT) for details.

TERMINATION ASSEMBLY

The TA mounts on a DIN rail and accommodates multiple DIN rail styles including 32 mm (1.26 in) and 35 mm (1.38 in)

Weight

MODULE

284 g (10 oz) approximate

Dimensions - Module

HEIGHT

102 mm (4 in),114 mm (4.5 in) including mounting lugs

WIDTH

45 mm (1.75 in)

DEPTH

104 mm (4.11 in)

Dimensions - Termination Assembly

Compression Screw - Refer to page 20

Part Numbers

FBM238 MODULE RH927AF (supersedes P0927AF)

TERMINATION ASSEMBLIES

Refer to "FUNCTIONAL SPECIFICATIONS -STANDARD TERMINATION ASSEMBLIES" on page 7, "FUNCTIONAL SPECIFICATIONS - MAIN TERMINATION ASSEMBLIES" on page 8 and "FUNCTIONAL SPECIFICATIONS - EXPANSION TERMINATION ASSEMBLIES" on page 15.

Termination Cables

CABLE LENGTHS

Up to 30 m (98 ft)

CABLE MATERIALS

Polyurethane or Low Smoke Zero Halogen (LSZH)

TERMINATION CABLE TYPE

Baseplate to Main TA Type 4 - Refer to Table 2 Main TA to Expansion TA Type 6 - Refer to Table 3

BASEPLATE TO MAIN TA CABLE CONNECTION

FBM Baseplate End 37-pin D-subminiature *Termination Assembly End* 37-pin D-subminiature

PHYSICAL SPECIFICATIONS (CONTINUED)

MAIN TA TO EXPANSION TA CABLE CONNECTION

Main TA End 25-pin D-subminiature Expansion TA End 37-pin D-subminiature Construction - Termination Assembly MATERIAL Polyamide (PA), compression Field Termination Connections COMPRESSION - ACCEPTED WIRING SIZES

TERMINATION ASSEMBLIES AND CABLES

General Description

Field I/O signals connect to the FBM subsystem via DIN rail mounted termination assemblies (TAs). Multiple types of TAs are available with FBM238 to provide I/O signal connections, signal conditioning, optical isolation from signal surges and external power connections for field devices as required by the particular FBM. Since these features are built into the termination assemblies (where required), in most applications there is no need for additional termination equipment for field circuit functions such as circuit protection or signal conditioning (including fusing and power distribution).

The DIN rail mounted termination assemblies connect to the FBM subsystem baseplate by means of removable termination cables. The cables are available in a variety of lengths, up to 30 meters (98 feet), allowing the termination assemblies to be mounted in either the enclosure or in an adjacent enclosure. Refer to "Cable Types (Baseplate to Main TA Cables) and Part Numbers" on page 18 and "Cable Types (Main TA to Expansion TA Cables) and Part Numbers" on page 19 for termination cable part numbers and specifications.

Use of Termination Assemblies in 100 Series Upgrade

When an FBM238 is used to replace 100 Series FBMs, its associated termination assembly is

determined based on which 100 Series FBM is being replaced. Typically, the 100 Series FBM being replaced is a main FBM and may be used in conjunction with an expansion FBM.

A single FBM238 provides the I/O communications for both the 100 Series equivalent main and expansion TAs. To provide enough terminals for the field I/O wiring, two termination assemblies are used with the FBM238 - one for the field I/O wiring for the replaced main FBM, and one for the field I/O wiring for the replaced expansion FBM.

The "expansion" termination assembly is daisychained to the "main" termination assembly via the expansion cables listed in Table 3 on page 19.

The table "FUNCTIONAL SPECIFICATIONS - MAIN TERMINATION ASSEMBLIES" on page 8 lists the termination assemblies needed to replace the 100 Series main FBMs. "FUNCTIONAL SPECIFICATIONS - EXPANSION TERMINATION ASSEMBLIES" on page 15 lists the termination assemblies needed to replace the 100 Series expansion FBMs.

Alternatively, the FBM238 can accept field wiring through Termination Assembly Adapters (TAAs) instead of the termination assemblies when replacing 100 Series FBMs. This is discussed in *Termination Assembly Adapter Modules for 100 Series Upgrade* (PSS 31H-2W4).

Discrete Inputs/Outputs

Various termination assemblies are available to support the interfacing of field signals to the low level FBM I/O circuits. Active termination assemblies support input/output signal conditioning for the FBM as well as channel isolation. The I/O signal conditioning circuits are designed to emulate the 100 Series FBM I/O subsystem. This provides for functional I/O equivalence during upgrades from 100 Series to 200 Series hardware. The signal conditioning circuits are located on daughter boards that are mounted under the component covers of the termination assemblies. To condition signals, these termination assemblies provide optical isolation, current limiting, voltage attenuation and optional terminal blocks to connect externally supplied excitation voltage.

FBM Type	Input Signal	Output Signal	TA Part No. ^(a) PA	Term. Type (b)	BP to TA Cable (c)	TA Cert. Type (d)
FBM238	24 channel, Voltage Monitor, external source 30 V DC maximum applied voltage Logic Zero – 0 to 5 V DC Logic One – 15 to 30 V DC 2.2 mA typical at 30 V DC 1 K Ω Maximum On-state resistance 100 K Ω Minimum Off-state resistance	8 channel output switch, external source 60 V DC maximum voltage 0.25 A DC maximum current 2.0 A DC maximum current per FBM 0.25 mA DC maximum off-state leakage current 0.4 A over-current fuse	RH924VD (supersedes P0924VD)	С	4	1, 2, 4
FBM238	 24 channel, Contact Sense, internal source 24 V DC nominal open circuit voltage 7 mA nominal maximum current 2.2 mA typical at 30 V DC 1 KΩ Maximum On-state resistance 100 KΩ Minimum Off-state resistance 	8 channel output switch, external source 60 V DC maximum voltage 0.25 A DC maximum current 2.0 A DC maximum current per FBM 0.25 mA DC maximum off-state leakage current 0.4 A over-current fuse	RH924VG (supersedes P0924VG)	С	4	1, 2, 4

FUNCTIONAL SPECIFICATIONS - STANDARD TERMINATION ASSEMBLIES

(a) PA is Polyamide rated from -20 to $+70^{\circ}$ C (-4 to $+158^{\circ}$ F).

(b) C = TA with compression terminals.

(c) Refer to Table 2 for cable part numbers and specifications.

(d) Refer to Table 1 Termination Assembly certification definitions.

FBM			TA Part Number	Termination	BP to Main TA Cable	TA Certification
Туре	Input Signal	Output Signal	PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM238	When replacing a main FBM09A/B: Voltage Monitor external source 130 V DC Maximum voltage Logic Zero: 0 to 5 V DC Logic One: 15 to 130 V DC 2.2 mA typical 5 to 130 V DC 1 K Ω Maximum On- state resistance 100 K Ω Minimum Off-state resistance When replacing a main FBM09C/D: Contact sense internal source 24 V DC ±10% Open circuit voltage 2.5 mA maximum short circuit current 1 K Ω Maximum On- state resistance 100 K Ω Minimum Off-state resistance	When replacing a main FBM09A/C: Output Switch external source 60 V DC Maximum voltage 0.5 V maximum voltage drop @ 0.5 A 0.5 A maximum current 0.75 A current limit Shorted load duration: indefinite (duty-cycle limited) 1.0 mA maximum off-state leakage When replacing a main FBM09B/D: output switch internal source $11 V DC \pm 2 V$ Open circuit voltage Source resistance 680Ω nominal Shorted load duration: indefinite 0.5 mA maximum off-state leakage	RH924HE (supersedes P0924HE)	C	4	1, 2, 4

FBM			TA Part Number	Termination	BP to Main TA Cable	TA Certification
Туре	Input Signal	Output Signal	PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM238	When replacing a main FBM10: Voltage Monitor, external source 132 V AC Maximum voltage Logic Zero: 0 to 20 V AC Logic One: 79 to 132 V AC 2.2 mA typical 20 to 132 V AC 1 K Ω Maximum On- state resistance 100 K Ω Minimum Off-state resistance	When replacing a main FBM10: Output Switch external source 132 V AC Maximum voltage 0.4 V maximum voltage drop @ 1 A 2 A maximum current per channel 12 A maximum current per TA 3 A current limit 24 A surge current limit for 10 msec Shorted load duration: indefinite (duty-cycle limited) 3 mA maximum off- state leakage	RH924HG (supersedes P0924HG)	C	4	1, 4

FBM			TA Part Number	Termination	BP to Main TA Cable	TA Certification
Туре	Input Signal	Output Signal	PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM238	When replacing a main FBM11: Voltage Monitor 264 V AC Maximum voltage Logic Zero: 0 to 40 V AC Logic One: 164 to 264 V AC 2.2 mA typical 40 to 264 V AC 1 K Ω Maximum On- state resistance 100 K Ω Minimum Off-state resistance	When replacing a main FBM11: Output Switch external source 264 V AC Maximum voltage 0.6 V maximum voltage drop @ 0.5 A 1 A maximum current per channel 7 A maximum current per TA 1.5 A current limit 12 A surge current limit for 10 msec Shorted load duration: indefinite (duty-cycle limited) 2.5 mA maximum off-state leakage	RH924HJ (supersedes P0924HJ)	C	4	1

FBM			TA Part Number	Termination	BP to Main TA Cable	TA Certification
Туре	Input Signal	Output Signal	PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM238	When replacing a main FBM26A: Voltage Monitor, external source 150 V DC Maximum voltage Logic Zero: 0 to 10 V DC Logic One: 33 to 150 V DC 2.5 mA typical 10 to 150 V DC 1 K Ω Maximum On- state resistance 100 K Ω Minimum Off-state resistance	When replacing a main FBM26A: Output Switch external source 150 V DC Maximum voltage 0.4 V maximum voltage drop @ 1 A 2 A maximum current per channel 12 A maximum current per TA 2.3 A current limit 20 A surge current limit, 20 ms Shorted load duration: indefinite (duty-cycle limited) 2 mA maximum off- state leakage	RH924HU (supersedes P0924HU)	C	4	1, 2, 4

FBM			TA Part Number	Termination	BP to Main TA Cable	TA Certification
Туре	Input Signal	Output Signal	PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM238	When replacing a main FBM26B: Contact Sense internal source 48 V DC nominal open circuit voltage 2.5 mA $\pm 20\%$ short circuit current 1 K Ω Maximum On- state resistance 100 K Ω Minimum Off-state resistance	When replacing a main FBM26B: Output Switch external source 150 V DC Maximum voltage 0.4 V maximum voltage drop @ 1 A 2 A maximum current per channel 12 A maximum current per TA 2.3 A current limit 20 A surge current limit, 20 ms Shorted load duration: indefinite (duty-cycle limited) 2 mA maximum off- state leakage	RH924HV (supersedes P0924HV)	C	4	1, 2, 4

FBM			TA Part Number	Termination	BP to Main TA Cable	TA Certification
Туре	Input Signal	Output Signal	PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM238	When replacing a main FBM26C: Contact Sense external source on channel 1 150 V DC Maximum voltage Logic Zero: 0 to 10 V DC Logic One: 33 to 150 V DC 2.5 mA typical 10 to 150 V DC 1 K Ω Maximum On- state resistance 100 K Ω Minimum Off-state resistance	When replacing a main FBM26C: Output Switch external source 150 V DC Maximum voltage 0.4 V maximum voltage drop @ 1 A 2 A maximum current per channel 12 A maximum current per TA 2.3 A current limit 20 A surge current limit, 20 ms Shorted load duration: indefinite (duty-cycle limited) 2 mA maximum off- state leakage	RH924HW (supersedes P0924HW)	C	4	1, 2, 4

FBM			TA Part Number	Termination	BP to Main TA Cable	TA Certification
Туре	Input Signal	Output Signal	PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM238	When replacing a main FBM41A: Voltage Monitor external source $60 \vee DC$ Maximum voltage Logic Zero: 0 to 5 V DC Logic One: 15 to 60 V DC 6 mA maximum input current 1 K Ω Maximum On- state resistance 100 K Ω Minimum Off-state resistance When replacing a main FBM41C: Contact sense internal source 24 V DC ±20% Open circuit voltage 5 mA maximum short circuit current 1 K Ω Maximum On- state resistance 100 K Ω Minimum Off-state resistance	When replacing a main FBM41A/C: Output Switch external source 60 V DC Maximum voltage 0.4 V maximum voltage drop @ 1 A 2.25 A maximum current 12 A maximum current per TA 10 A surge current limit for 20 msec maximum Shorted load duration: indefinite (duty-cycle limited) 0.5 mA maximum off-state leakage	RH924JA (supersedes P0924JA)	C	4	1, 2, 4

(a) PA is Polyamide rated from -20 to $+70^{\circ}$ C (-4 to $+158^{\circ}$ F).

(b) C = TA with compression terminals.

(c) See Table 2 for cable part numbers and specifications.

(d) See Table 1 for Termination Assembly certification definitions.

FUNCTIONAL SPECIFICATIONS - EXPANSION TERMINATION ASSEMBLIES

FBM		TA Part Number	Termination	Main TA to Exp. TA Cable	TA Certification
Туре	I/O Signal	PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM238	When replacing an expansion FBM12A/B (16 input voltage monitor/contact sense), connect this TA to the main TA. Input specifications are the same as for TA RH924HE (supersedes P0924HE) above, on page 8.	RH924HB (supersedes P0924HB)	С	6	1, 2, 4
FBM238	When replacing an expansion FBM13 (16 input 120 V ac voltage monitor), connect this TA to the main TA. Input specifications are the same as for TA RH924HG (supersedes P0924HG) above, on page 9.	RH924HD (supersedes P0924HD)	С	6	1, 4
FBM238	When replacing an expansion FBM21 (16 input 240 V ac voltage monitor), connect this TA to the main TA. Input specifications are the same as for TA RH924HJ (supersedes P0924HJ) above, on page 10.	RH924HM (supersedes P0924HM)	С	6	1
FBM238	When replacing an expansion FBM25A (16 input 125 V DC voltage monitor), connect this TA to the main TA. Input specifications are the same as for TA RH924HU (supersedes P0924HU) above, on page 11.	RH924HR (supersedes P0924HR)	С	6	1, 2, 4

FBM		TA Part Number	Termination	Main TA to Exp. TA Cable	TA Certification
Туре	I/O Signal	PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM238	When replacing an expansion FBM25B (16 input contact sense (internal source)), connect this TA to the main TA. Input specifications are the same as for TA RH924HV (supersedes P0924HV) above, on page 12.	RH924HS (supersedes P0924HS)	С	6	1, 2, 4
FBM238	When replacing an expansion FBM25C (16 input contact sense (external source)), connect this TA to the main TA. Input specifications are the same as for TA RH924HW (supersedes P0924HW) above, on page 13.	RH924HT (supersedes P0924HT)	С	6	1, 2, 4

FUNCTIONAL SPECIFICATIONS - EXPANSION TERMINATION ASSEMBLIES

(a) PA is Polyamide rated from -20 to $+70^{\circ}$ C (-4 to $+158^{\circ}$ F).

(b) C = TA with compression terminals.

(c) See Table 2 for cable part numbers and specifications.

(d) See Table 1 for Termination Assembly certification definitions.

Туре	Certification
Type 1	TAs are UL/UL-C listed as suitable for use in Class I; Groups A-D; Division 2 temperature code T4 hazardous locations. They are DEMKO certified EEx nA IIC T4 for use in Zone 2 potentially explosive atmospheres.
Type 2	TAs are UL/UL-C listed as associated apparatus for supplying non-incendive field circuits Class I; Groups A-D; Division 2 hazardous locations when connected to specified 200 Series FBMs and field circuits meeting entity parameter constraints specified in <i>Standard and Compact 200 Series Subsystem User's Guide</i> (B0400FA). They are also DEMKO certified as associated apparatus for supplying field circuits for Group IIC, Zone 2 potentially explosive atmospheres. Field circuits are also Class 2 limited energy (60 V DC, 30 V AC, 100 VA or less) if customer-supplied equipment meets Class 2.
Туре З	Same as Type 2 above except that only input circuits are non-incendive/Class 2.
Type 4	All field circuits are NEC/CEC Class 2 limited energy if customer-supplied equipment meets Class 2 limits.

Table 1. Certifications for Termination Assemblies

Cable Length m (ft)	Type 4 P/PVC ^(a)	Type 4 LSZH ^(b)
0.5 (1.6)	RH916FG	RH928BA
	(supersedes PU916FG)	(supersedes P0928BA)
1.0 (3.2)	RH916FH	RH928BB
	(supersedes P0916FH)	(supersedes P0928BB)
2.0 (6.6)	RH931RQ	RH928BC
	(supersedes P0931RQ)	(supersedes P0928BC)
3.0 (9.8)	RH916FJ	RH928BD
	(supersedes P0916FJ)	(supersedes P0928BD)
5.0 (16.4)	RH916FK	RH928BE
	(supersedes P0916FK)	(supersedes P0928BE)
10.0 (32.8)	RH916FL	RH928BF
	(supersedes P0916FL)	(supersedes P0928BF)
15.0 (49.2)	RH916FM	RH928BG
	(supersedes P0916FM)	(supersedes P0928BG)
20.0 (65.6)	RH916FN	RH928BH
	(supersedes P0916FN)	(supersedes P0928BH)
25.0 (82.0)	RH916FP	RH928BJ
	(supersedes P0916FP)	(supersedes P0928BJ)
30.0 (98.4)	RH916FQ	RH928BK
	(supersedes P0916FQ)	(supersedes P0928BK)

Table 2. Cable Types (Baseplate to Main TA Cables) and Part Numbers

(a) P/PVC is polyurethane outer jacket and semi-rigid PVC primary conductor insulation. PVC is rated from -20 to +80°C (-4 to 176°F).

(b) Low smoke zero halogen or low smoke free of halogen (LSZH) is a material classification used for cable jacketing. LSZH is composed of thermoplastic or thermoset compounds that emit limited smoke and no halogen when exposed to high sources of heat. Temperature range: -40 to +105°C (-40 to +221°F).

Cable Length	Type 6	Type 6
m (ft)	P/PVC ^(a)	LSZH ^(b)
0.75 (2.5)	RH924CK (supersedes P0924CK)	RH928CQ (supersedes P0928CQ)

Table 3. Cable Types (Main TA to Expansion TA Cables) and Part Numbers

 (a) P/PVC is polyurethane outer jacket and semi-rigid PVC primary conductor insulation. PVC is rated from -20 to +80°C (-4 to +176°F)

(b) Low smoke zero halogen or low smoke free of halogen (LSZH) is a material classification used for cable jacketing. LSZH is composed of thermoplastic or thermoset compounds that emit limited smoke and no halogen when exposed to high sources of heat. Temperature range: -40 to +105°C (-40 to +221°F)

Use of Termination Assemblies in 100 Series Upgrade

When an FBM238 is used to replace the 100 Series FBMs, it may use any of the appropriate termination assemblies listed above for the FBM238's field I/O wiring. Alternatively, the FBM238 can accept this field wiring through main and expansion Termination Assembly Adapters (TAA) instead of termination assemblies. This is discussed in *Termination Assembly Adapter Modules for 100 Series Upgrade* (PSS 31H-2W4).

DIMENSIONS - NOMINAL

[mm] in

Compression Termination Assemblies

RH924HB (supersedes P0924HB), RH924HE (supersedes P0924HE)



RH924HD (supersedes P0924HD), RH924HM (supersedes P0924HM), RH924HR (supersedes P0924HR), RH924HT (supersedes P0924HT)





RH924HG (supersedes P0924HG), RH924HJ (supersedes P0924HJ), RH924JA (supersedes P0924JA)



(a) Overall width - for determining DIN rail loading.

(b) Height above DIN rail (add to DIN rail height for total).

DIMENSIONS – NOMINAL (CONTINUED)

[mm] in

Compression Termination Assemblies



RH924HU (supersedes P0924HU), RH924HV (supersedes P0924HV), RH924HW (supersedes P0924HW)



RH924VD (supersedes P0924VD), RH924VG (supersedes P0924VG)



(a) Overall width – for determining DIN rail loading.(b) Height above DIN rail (add to DIN rail height for total).

RELATED PRODUCT SPECIFICATION SHEETS (PSS)

PSS Number	Description	
PSS 31H-2SOV	Standard 200 Series Subsystem Overview	
PSS 31H-2W100	100 Series Fieldbus Module Upgrade Subsystem Overview	
PSS 31H-2WCERTS	Standard and Compact 200 Series I/O - Agency Certification	
PSS 31H-2W4	Termination Assembly Adapter Modules for 100 Series Upgrade	
PSS 31H-2SBASPLT	Standard 200 Series Baseplates	
PSS 31H-2W8	100 Series Conversion Mounting Structures	
PSS 21S-3CP270IC	Control Processor 270 (CP270) Integrated Control Software	
PSS 31S-3FCPICS	Field Control Processor 280 (CP280) Integrated Control Software	

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