

FBM217 Discrete Input Module



The FBM217 Discrete Input Module provides 32 DC voltage input channels.

OVERVIEW

The FBM217 Discrete Input Module provides 32 input channels, each accepting a 2-wire input from a DC voltage source. Associated termination assemblies (TAs) provide for discrete inputs of under 60 V AC, 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 contain current limiting devices, high voltage attenuation circuits, optical isolation and external power source connections.

The module with its associated TA supports the

following discrete inputs:

FBM	Inputs
FBM217	30 V DC, 125 V DC, 120 V AC, or 240 V AC Voltage monitor or Contact sense

The module can be used as a single unit, or as a redundant pair (two FBM217s). When used as a redundant pair, the modules combine to provide redundancy at the Fieldbus Module (FBM) level, with field input signals received from one common termination assembly through a redundant adapter affixed to the FBMs' baseplate. The field input current for redundant modules is doubled. A redundant

digital input block in the Foxboro Evo™ Control Software validates each input in conjunction with information to/from the module, and selects the input with the highest quality for processing in the control strategy.

In a redundant configuration, contact sense power from each module is diode OR'd together in the redundant adapter to assure redundant power.

A redundant contact input function block, CINR, is used for each redundant pair of inputs. The CINR block handles input reads and initialization logic for the redundant channels. On each execution cycle of the CINR block, identical reads are sent to both modules, fully exercising the fieldbus and the logic circuitry of each module.

When connected to the appropriate TAs, the FBM217 module provides functionality formerly provided by the 100 Series FBM I/O subsystem. TAs are available which support the functionality of the 100 Series main FBM07A/B, FBM08, FBM20, and FBM24A/B/C (16 input main FBMs). Expansion TAs are available for use with these main FBM TAs to support the functionality of expansion FBM12, FBM13, FBM21, or FBM25A/B/C (16 input expansion FBMs).

FEATURES

Key features of the FBM217 are:

- ▶ Thirty-Two (32) discrete inputs
- ▶ Supports discrete input signals at voltages of:
 - 15 to 60 V DC
 - 120 V AC/125 V DC
 - 240 V AC
- ▶ Single or redundant modules
- ▶ Rugged design suitable for enclosure in Class G3 (harsh) environments per ISA Standard S71.04
- ▶ Executes the programs for Discrete Input, Ladder

Logic, Pulse Count, and Sequence of Events, with the configurable options: Input Filter Time and Fail-Safe Configuration

- ▶ Various Termination Assemblies (TAs) that contain:

- High voltage attenuation and optical isolation for inputs
- External power connection for device excitation.

STANDARD DESIGN

FBM217 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.

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 points.

EASY REMOVAL/REPLACEMENT

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

When redundant, either module may be replaced without upsetting field input signals to the good module. The module can be removed/replaced without removing field device termination cabling, power, or communications cabling.

SEQUENCE OF EVENTS

The Sequence of Events (SOE) software package (for use with I/A Series® v8.x software and Control Core Services v9.0 or later) is used for acquisition, storage, display, and reporting of events associated with digital input points in a control system. SOE, using

the optional GPS based time synchronization capability, supports data acquisition across control processors at intervals of up to one millisecond, depending on the signal source.

Refer to *Sequence of Events* (PSS 31S-2SOE) to learn more about this package, and to *Time Synchronization Equipment* (PSS 31H-4C2), for a description of the optional time synchronization capability.

Foxboro Evo systems with software earlier than V8.x can support SOE through ECB6 and EVENT blocks. However, these systems do not support GPS time synchronization and use a timestamp sent by the Control Processor which is accurate to the nearest second and does not provide synchronization between different Control Processors.

FIELDBUS COMMUNICATION

A Fieldbus Communications Module or a Control Processor interfaces to the 2 Mbps module Fieldbus used by the FBMs. The FBM217 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.

Redundant modules must be located in odd and even adjacent positions on the baseplate (positions 1 and 2, 3 and 4, 5 and 6, or 7 and 8). To achieve the redundancy, a redundant adapter module is placed on the two adjacent baseplate termination cable connectors to provide a single termination cable connection. A single termination cable connects from the redundant adapter to the associated TA.

To system configurator applications and monitoring through SMON, System Manager, and SMDH, redundant modules appear to be separate, nonredundant modules. The functional redundancy for these modules is provided by their associated control blocks.

TERMINATION ASSEMBLIES

Field I/O signals connect to the FBM subsystem via DIN rail mounted TAs. The TAs used with the FBM217 are described in “TERMINATION ASSEMBLIES AND CABLES” on page 7.

FUNCTIONAL SPECIFICATIONS

Input

32 group isolated channels

On-State Voltage

15 to 30 V DC

Off-State Voltage

0 to 5 V DC

Current

2.2 mA (typical) at 30 V DC Input

Source Resistance Limits

ON-STATE

1 k Ω (maximum) at 15 V DC

OFF-STATE

100 k Ω (minimum) at 30 V DC

Filter/Debounce Time⁽¹⁾

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

Maximum Pulse Count Rate

250 Hz

Isolation (Module/TA Combination)

For TAs that provide group isolation (RH916CA (supersedes P0916CA), RH916XZ (supersedes P0916XZ, P0916PW), RH916YB (supersedes P0916PY), RH916QA (supersedes P0916QA), RH924HA (supersedes P0924HA), RH924HP (supersedes P0924HP), RH924HQ (supersedes P0924HQ), RH924HS (supersedes P0924HS), and RH924HT (supersedes P0924HT)), input channels are group isolated from earth (ground). For details, refer to the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA). These module/TA combinations can withstand, without damage, a potential of 600 V AC applied for one minute between the group isolated channels and earth (ground).

Isolation (Module/TA Combination) (Cont.)

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. For high-voltage TAs RH916YB (supersedes P0916YB), RH916QA (supersedes P0916QA) and P0916QB, the inputs are group-isolated. These TAs can withstand UL required dielectric potentials. For high-voltage TAs RH916YA (supersedes P0916YA), RH916PU (supersedes P0916PU) and P0916PV, the inputs are channel isolated. These TAs can withstand UL required dielectric potentials.

Communication

Communicates with its associated FCM or FCP via the module Fieldbus

Power Requirements

INPUT VOLTAGE RANGE (REDUNDANT)

24 V DC +5%, -10%

CONSUMPTION

3 W (maximum) at 24 V DC

HEAT DISSIPATION

5 W (maximum) at 24 V DC

Calibration Requirements

Calibration of the module and termination assembly is not required.

(1) Digital filtering available for 200 Series FBM or competitive migration modules with version 1.25H or later firmware.

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

FBM217

-20 to +70°C (-4 to +158°F)

Termination Assembly

PA

-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/S² (5 to 500 Hz)

PHYSICAL SPECIFICATIONS

Mounting

MODULE

The FBM217 mounts on a modular baseplate. The baseplate can be mounted on a DIN rail (horizontally or vertically), or horizontally on a 19-inch rack using a mounting kit. Redundant modules must be located in odd and even adjacent positions on the baseplate (positions 1 and 2, 3 and 4, 5 and 6, or 7 and 8) along with the appropriate redundancy adapter. Refer to *Standard 200 Series Baseplates* (PSS 31H-2SBASPLT) for details. Alternatively, a non-redundant FBM217 mounts on a 100 Series conversion mounting structure. Refer to *100 Series Conversion Mounting Structures* (PSS 31H-2W8) 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)

Mass

MODULE

284 g (10 oz) approximate

TERMINATION ASSEMBLY - COMPRESSION

216 mm (8.51 in) – 420 g (0.93 lb, approximate)

233 mm (9.15 in) – 454 g (1.0 lb, 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 19

Part Numbers

FBM217 MODULE

RH914TR (supersedes P0914TR)

TERMINATION ASSEMBLIES

Refer to "FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES" on page 9

REDUNDANT ADAPTER

RH926ZY (supersedes P0926ZY)

PHYSICAL SPECIFICATIONS (CONTINUED)

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

CABLE CONNECTION

Type 4

FBM Baseplate End

37-pin D-subminiature plug

Termination Assembly End

37-pin D-subminiature receptacle

Type 6

Main TA End

25-pin D-subminiature receptacle

Expansion TA End

37-pin D-subminiature receptacle

Construction - Termination Assembly

MATERIAL

Polyamide (PA), compression

Field Termination Connections

COMPRESSION - ACCEPTED WIRING SIZES

Solid/Stranded/AWG

0.2 to 4 mm²/0.2 to 2.5 mm²/24 to 12 AWG

Stranded with Ferrules

0.2 to 2.5 mm² with or without plastic collar

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 FBM217 to provide input signal connections, signal conditioning, optical isolation from signal surges and external power connections for field devices. 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 termination assembly can be used with a single FBM217 or with a redundant pair (two FBM217s).

The DIN rail mounted termination assemblies connect to the FBM subsystem baseplate by means of removable termination cables. When used with a redundant module pair, the termination assembly is connected to the baseplate using a redundant adapter (RH926ZY (supersedes P0926ZY)).

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 "FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES" on page 9 for termination cable part numbers and specifications.

Migration Use of Termination Assemblies

When an FBM217 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 was a main FBM and may have been used in conjunction with an expansion FBM.

A single FBM217 provides the I/O communications for both the 100 Series equivalent main and expansion TAs. To provide enough terminals for the field input wiring, two termination assemblies are used with the FBM217 - one for the field input wiring for the replaced main FBM, and one for the field input wiring for the replaced expansion FBM.

The “expansion” termination assembly is daisy-chained to the “main” termination assembly via the expansion cables listed in Table 3 on page 18.

The table “FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES” on page 9 lists the termination assemblies needed to replace both the 100 Series main FBMs and the expansion FBMs.

Alternatively, the FBM217 can accept field wiring through a Termination Assembly Adapter (TAA) instead of the termination assemblies when upgrading 100 Series FBMs. This is discussed in *Termination Assembly Adapter Modules for 100 Series Upgrade* (PSS 31H-2W4).

Discrete Inputs

Various termination assemblies are available to support the interfacing of field signals to the low level FBM input circuits. Active termination assemblies support input signal conditioning for the FBM as well as channel isolation.

Be aware that for configurations which use main and expansion TAs, 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.

Low Voltage Discrete Inputs

The low voltage inputs (less than 60 V DC) use passive termination assemblies. Inputs are voltage monitor or contact sense types. Voltage monitor inputs require an external field voltage source. Contact sense inputs use the FBM auxiliary +24 V DC power supply to wet field contacts.

A load may be required for proper operation of the input channels.

High Voltage Discrete Inputs

The high voltage input circuits support 125 V DC, 120 V AC, or 240 V AC. Voltage monitor inputs require a field voltage source.

Some versions of the termination assembly have a pair of external excitation voltage terminals, which distribute customer-supplied wetting voltage to all input channels on the assembly. These terminals allow the field power to be daisy chained between terminal assemblies.

FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES

FBM Type	Input Signal	TA Part Number	Termination	BP to TA Cable	TA Certification
		PA(a)	Type(b)	Type(c)	Type(d)
FBM217	32 channel, voltage monitor 30 V DC Logic Zero – 0 to 5 V DC Logic One – 15 to 30 V DC Passive feedthrough with FBM217 group isolation	RH916CA (supersedes P0916CA)	C	4	1, 2, 4
FBM217	32 channel, contact sense 24 V DC contact wetting from FBM Passive feedthrough with FBM217 group isolation	RH916XZ (supersedes P0916XZ, P0916PW)(e)	C	4	1, 2, 4
FBM217	32 channel, voltage monitor 132 V AC or 150 V DC maximum Logic Zero - 0 to 20 V AC; 0 to 20 V DC Logic One - 80 to 132 V AC; 75 to 150 V DC Input Current for Logic One; 2.6 mA maximum Channel isolation provided by termination assembly	RH916YA (supersedes P0916YA, P0916PS)(e)	C	4	1, 4
FBM217	32 channel, contact sense inputs 132 V AC or 150 V DC maximum with external excitation Logic Zero - 0 to 20 V AC; 0 to 20 V DC Logic One - 80 to 132 V AC; 75 to 150 V DC Input Current for Logic One; 2.6 mA maximum Group isolation provided by termination assembly	RH916YB (supersedes P0916YB, P0916PY)(e)	C	4	1, 4

FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES (CONTINUED)

FBM Type	Input Signal	TA Part Number	Termination	BP to TA Cable	TA Certification
		PA(a)	Type(b)	Type(c)	Type(d)
FBM217	32 channel, voltage monitor 240 V AC Logic Zero: 0 to 40 V AC Logic One: 164 to 264 V AC Input Current for Logic One; 2.8 mA maximum Channel isolation provided by termination assembly	RH916PU (supersedes P0916PU)	C	4	1
FBM217	32 channel, contact sense inputs 240 V AC with external excitation Logic Zero: 0 to 40 V AC Logic One: 164 to 264 V AC Input Current for Logic One; 2.8 mA maximum Group isolation provided by termination assembly	RH916QA (supersedes P0916QA)	C	4	1

FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES (CONTINUED)

FBM Type	Input Signal	TA Part Number	Termination	BP to TA Cable	TA Certification
		PA(a)	Type(b)	Type(c)	Type(d)
FBM217	When replacing a main FBM07A: 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 KΩ Maximum On-state resistance 100 KΩ Minimum Off-state resistance When replacing a main FBM07B: Contact Sense, internal source 24 V DC $\pm$10% Open circuit voltage 2.5 mA maximum short circuit current 1 KΩ Maximum On-state resistance 100 KΩ Minimum Off-state resistance Pairs isolation provided by termination assembly	RH924HA (supersedes P0924HA)	C	4	1, 2, 4

FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES (CONTINUED)

FBM Type	Input Signal	TA Part Number	Termination	BP to TA Cable	TA Certification
		PA(a)	Type(b)	Type(c)	Type(d)
FBM217	When replacing a main FBM08: Voltage Monitor, external source 132 V AC or 150 V DC Maximum voltage Logic Zero: 0 to 20 V AC; 0 to 20 V DC Logic One: 79 to 132 V AC; 75 to 150 V DC 2.2 mA typical 20 to 132 V AC 1 K Ω Maximum On-state resistance 100 K Ω Minimum Off-state resistance Channel isolation provided by termination assembly	RH924HC (supersedes P0924HC)	C	4	1, 4
FBM217	When replacing a main FBM20: Voltage Monitor, external source 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 Channel isolation provided by termination assembly	RH924HL (supersedes P0924HL)	C	4	1

FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES (CONTINUED)

FBM Type	Input Signal	TA Part Number	Termination	BP to TA Cable	TA Certification
		PA(a)	Type(b)	Type(c)	Type(d)
FBM217	When replacing a main FBM24A: 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 Channel isolation provided by termination assembly	RH924HN (supersedes P0924HN)	C	4	1, 2, 4

FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES (CONTINUED)

FBM Type	Input Signal	TA Part Number	Termination	BP to TA Cable	TA Certification
		PA(a)	Type(b)	Type(c)	Type(d)
FBM217	When replacing a main FBM24B: 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 Two groups of eight isolation provided by termination assembly	RH924HP (supersedes P0924HP)	C	4	1, 2, 4
FBM217	When replacing a main FBM24C: Contact sense with 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 Group isolation provided by termination assembly	RH924HQ (supersedes P0924HQ)	C	4	1, 2, 4

(a) PA is Polyamide rated from -20 to +70°C (-4 to +158°F).

(b) C = TA with compression terminals; Knife has compression terminals.

(c) See Table 2 and Table 3 for cable part numbers and specifications.

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

(e) Polyamide RL supersedes the PVC RL, note this is not a RoHS part.

**FUNCTIONAL SPECIFICATIONS -
EXPANSION TERMINATION ASSEMBLIES**

FBM Type	Input Signal	TA Part Number	Termination	Main TA to Exp. TA Cable	TA Certification
		PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM217	When replacing an expansion FBM12A/B (16 input voltage monitor/contact sense): Input/output specifications are the same as for TA RH924HA (supersedes P0924HA) above, on page 11. Connect this TA to the main TA. Pairs isolation provided by termination assembly	RH924HB (supersedes P0924HB)	C	6	1, 2, 4
FBM217	When replacing an expansion FBM13 (16 input voltage monitor): Input/output specifications are the same as for TA RH924HC (supersedes P0924HC) above, on page 12. Connect this TA to the main TA. Channel isolation provided by termination assembly	RH924HD (supersedes P0924HD)	C	6	1, 4
FBM217	When replacing an expansion FBM21 (16 input voltage monitor): Input/output specifications are the same as for TA RH924HL (supersedes P0924HL) above, on page 12. Connect this TA to the main TA. Channel isolation provided by termination assembly	RH924HM (supersedes P0924HM)	C	6	1

**FUNCTIONAL SPECIFICATIONS -
EXPANSION TERMINATION ASSEMBLIES (CONTINUED)**

FBM Type	Input Signal	TA Part Number	Termination	Main TA to Exp. TA Cable	TA Certification
		PA ^(a)	Type ^(b)	Type ^(c)	Type ^(d)
FBM217	When replacing an expansion FBM25A (16 input voltage monitor): Input/output specifications are the same as for TA RH924HN (supersedes P0924HN) above, on page 13. Connect this TA to the main TA. Channel isolation provided by termination assembly	RH924HR (supersedes P0924HR)	C	6	1, 2, 4
FBM217	When replacing an expansion FBM25B (16 input contact sense): Input/output specifications are the same as for TA RH924HP (supersedes P0924HP) above, on page 14. Connect this TA to the main TA. Two groups of eight isolation provided by termination assembly	RH924HS supersedes P0924HS)	C	6	1, 2, 4
FBM217	When replacing an expansion FBM25C (15 input contact sense with external power supply): Input/output specifications are the same as for TA RH924HQ (supersedes P0924HQ) above, on page 14. Connect this TA to the main TA. Group isolation provided by termination assembly	RH924HT (supersedes P0924HT)	C	6	1, 2, 4

(a) PA is Polyamide rated from -20 to +70°C (-4 to +158°F).

(b) C = TA with compression terminals.

(c) See Table 2 and Table 3 for cable part numbers and specifications.

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

Table 1. Certifications for Termination Assemblies

Type	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
Type 3	Same as Type 2 above except that only input circuits are non-incendive/Class 2.
Type 4	All field circuits are Class 2 limited energy (60 V DC, 30 V AC, 100 VA or less) if customer-supplied equipment meets Class 2 limits.

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

Cable Length m (ft)	Type 4 P/PVC ^(a)	Type 4 LSZH ^(b)
0.5 (1.6)	RH916FG (supersedes P0916FG)	RH928BA (supersedes P0928BA)
1.0 (3.2)	RH916FH (supersedes P0916FH)	RH928BB (supersedes P0928BB)
2.0 (6.6)	RH931RQ (supersedes P0931RQ)	RH928BC (supersedes P0928BC)
3.0 (9.8)	RH916FJ (supersedes P0916FJ)	RH928BD (supersedes P0928BD)
5.0 (16.4)	RH916FK (supersedes P0916FK)	RH928BE (supersedes P0928BE)
10.0 (32.8)	RH916FL (supersedes P0916FL)	RH928BF (supersedes P0928BF)
15.0 (49.2)	RH916FM (supersedes P0916FM)	RH928BG (supersedes P0928BG)

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

Cable Length m (ft)	Type 4 P/PVC ^(a)	Type 4 LSZH ^(b)
20.0 (65.6)	RH916FN (supersedes P0916FN)	RH928BH (supersedes P0928BH)
25.0 (82.0)	RH916FP (supersedes P0916FP)	RH928BJ (supersedes P0928BJ)
30.0 (98.4)	RH916FQ (supersedes P0916FQ)	RH928BK (supersedes P0928BK)

- (a) P/PVC is polyurethane outer jacket and semi-rigid PVC primary conductor insulation. P/PVC cable is rated at -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).

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

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

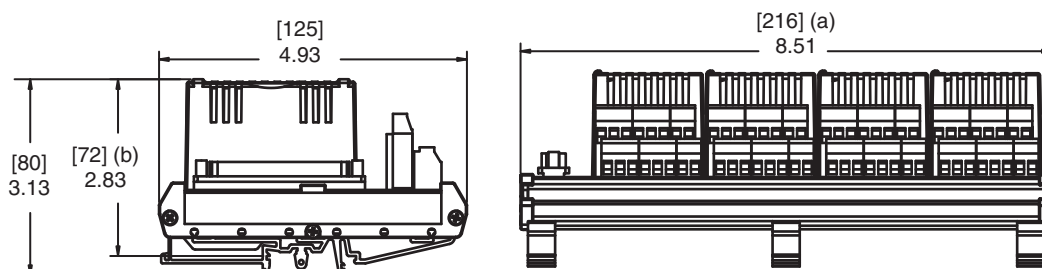
- (a) P/PVC is polyurethane outer jacket and semi-rigid PVC primary conductor insulation. P/PVC cable is rated at -20 to +80°C (-4 to 176°F).
- (b) Low smoke zero halogen or low smoke free of halogen (LSZH) is a material classification used for cable jacketing. LSZH is composed of thermoplastic or thermoset 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).

DIMENSIONS – NOMINAL

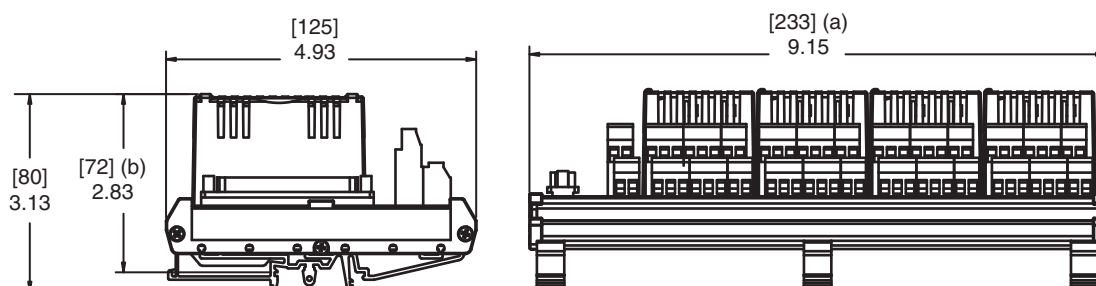
[mm]
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Compression Termination Assemblies

RH916CA (supersedes P0916CA), RH916YA (supersedes P0916YA), RH916PU (supersedes P0916PU),
RH916XZ (supersedes P0916XZ, P0916PW)



RH916QA (supersedes P0916QA), RH916YB (supersedes P0916YB, P0916PY)



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

DIMENSIONS – NOMINAL (CONTINUED)

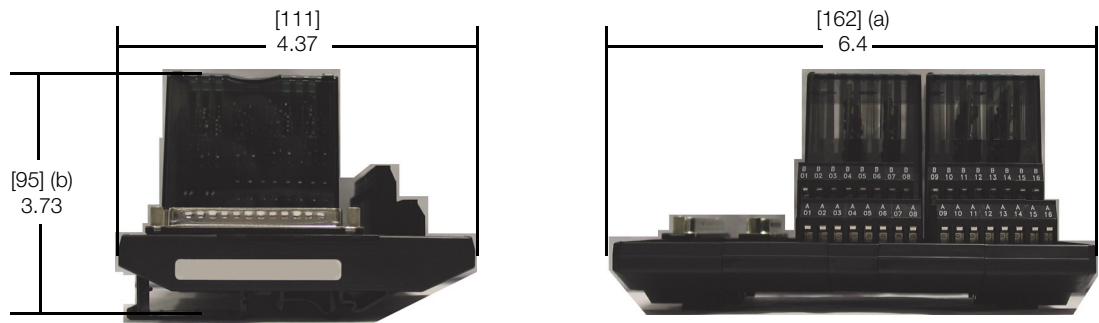
[mm]
in

Compression Termination Assemblies

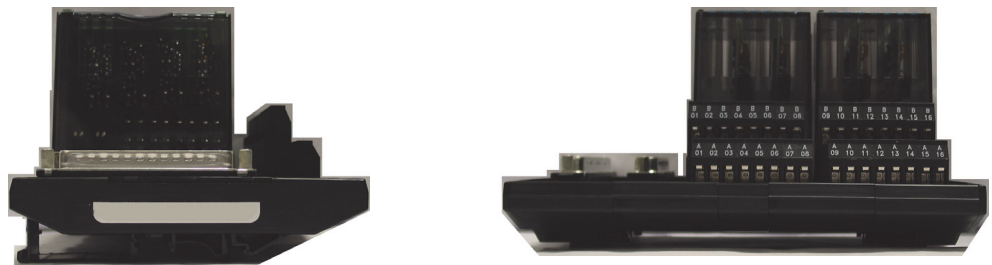
RH924HA (supersedes P0924HA), RH924HB (supersedes P0924HB)



RH924HC (supersedes P0924HC), RH924HD (supersedes P0924HD)



RH924HL (supersedes P0924HL), RH924HM (supersedes P0924HM)



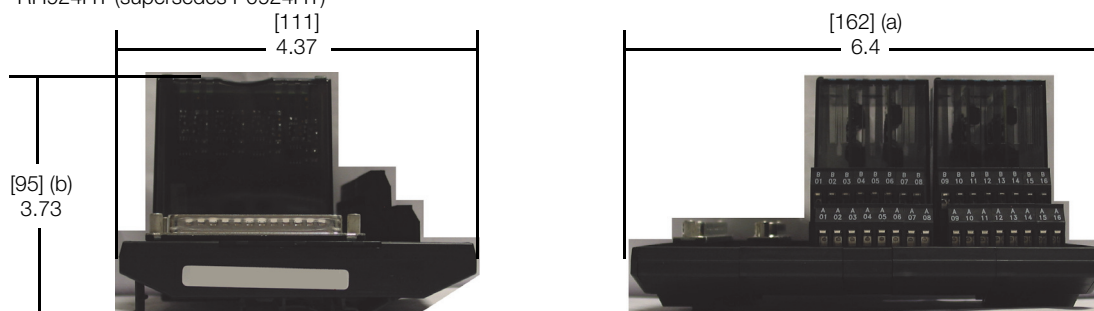
(a) Overall width — for determining DIN rail loading.
(b) Height above DIN rail (add to DIN rail height for total).

DIMENSIONS – NOMINAL (CONTINUED)

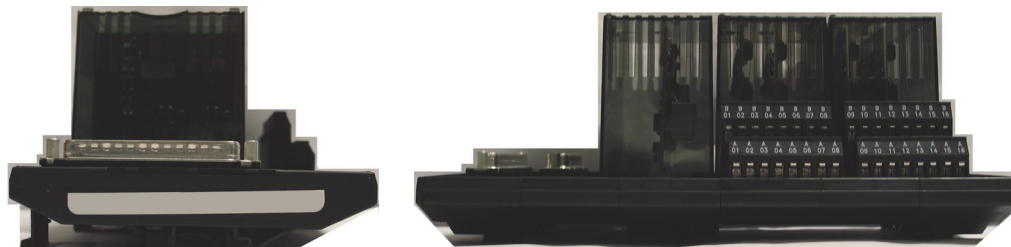
[mm]
in

Compression Termination Assemblies

RH924HN (supersedes P0924HN), RH924HR (supersedes P0924HR), RH924HQ (supersedes P0924HQ),
RH924HT (supersedes P0924HT)



RH924HP (supersedes P0924HP), RH924HS (supersedes P0924HS)



- (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-2CERTS	Standard and Compact 200 Series I/O - Agency Certifications
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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