



DTAM Micro Operator Interface

(Catalog Nos. 2707-M232P3xX, -M485P3X)

Installation Instructions

This document describes how to install a DTAM Micro terminal and connect power.

- Wiring and Safety Guidelines
- Enclosures
- Equipment Required
- Clearances
- Mounting Dimensions
- Installation
- Wire and Cable Length Restrictions
- Connecting Power
- Powerup Sequence
- Upload/Download DIP Switch Settings
- Upload/Download Connections
- Connecting to Devices
- Specifications
- Agency Ratings
- European Union Directive Compliance

For more information on the DTAM Micro terminal, refer to the following publications.

- DTAM Micro User Manual
2707-803
- DTAM Micro DeviceNet Operator Interface 2707-803.5

These publications are available for viewing and download from the Rockwell Automation/Allen-Bradley Website at www.ab.com.

Wiring Guidelines

Here are some recommendations on how to reduce electromagnetic noise on the communications connections:

- Careful wire routing helps reduce or minimize electrical noise. Route incoming power to the terminal by a separate path from the communications cables.
- Do not run communications wiring and power wiring in the same conduit.
- Where communications and power wiring must cross, make their intersection perpendicular.
- Proper grounding helps to reduce the effects of noise due to Electromagnetic Interference (EMI). To avoid problems caused by EMI, all cables must be shielded and grounded at one end. Grounding is also an important safety measure in electrical installations. A source for grounding recommendations is the National Electrical Code published by the National Fire protection Association of Boston Massachusetts.

Safety Guidelines

Install the DTAM Micro terminal using publication NFPA 70E, Electrical Safety Requirements for Employee Workplaces as a guide.

Be certain to follow all directions for installing and connecting DC power to the DTAM Micro.

When used in a hazardous environment, the ultimate enclosure must be in accordance with Class 1, Division 2 wiring methods as described in the National Electrical Code (ANSI/NFPA 70) and the Canadian Electrical Code.

All peripheral equipment must be suitable for the location in which it is used.

Use only a Class 2 power source as described in the National Electrical Code (ANSI/NFPA 70) and Canadian Electrical Code. The recommended AC to DC adapters (Catalog No. 1747-NP1 and Catalog No. 1747-NP2) meet this requirement.

The DTAM Micro contains no user serviceable parts.



ATTENTION:
EXPLOSION HAZARD: SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.

RISQUE D'EXPLOSION: LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE 1, DIVISION 2.

**ATTENTION**

CAUTION: USE ONLY WITH CLASS 2 POWER SOURCE LIMITED TO 30 VDC OPEN CIRCUIT AND 8A SHORT CIRCUIT.

ATTENTION: UTILISER AVEC UNE TENSION D'ALIMENTATION CLASSE 2 DE 30 VCC MAXI EN CIRCUIT OUVERT AVEC UN COURANT DE COURT-CIRCUIT DE 8A MAXI.

**DANGER**

EXPLOSION HAZARD: DO NOT CONNECT OR DISCONNECT EQUIPMENT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS

RISQUE D'EXPLOSION: NE PAS BRANCHER OU DEBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, A MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.

Enclosures

The terminal must be mounted in a panel or enclosure to protect the internal circuitry. The terminal meets NEMA Type 4, 12, 13 (indoor use only) ratings only when mounted in a panel or enclosure with the equivalent rating.

Allow enough spacing within an enclosure for adequate ventilation. For some applications, you may have to consider heat produced by other devices within a panel. The ambient temperature around the terminal must be maintained between 32° – 131° F (0° – 55° C).

Make sure that provisions are made for accessing the back panel of the terminal for wiring, routine maintenance, and troubleshooting.

Equipment Required

Other than the tools required to make the panel cutout, the tools required for installation are:

- 7mm (M4) deep well socket wrench or nut driver
- small slotted screwdriver
- torque wrench (in. / lbs).

The terminal is tightened against the panel with six self-locking nuts.

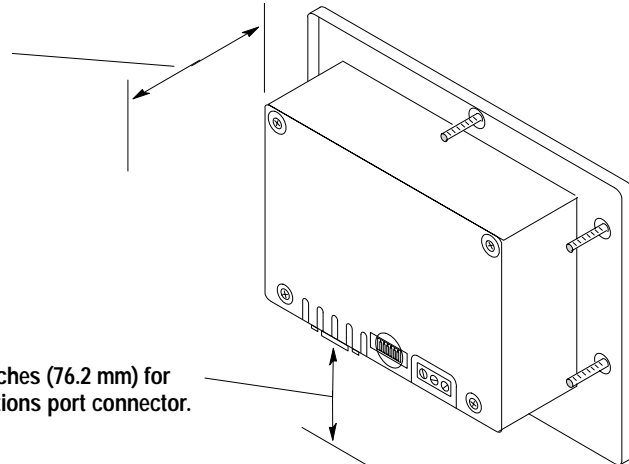
Clearances

Make sure that you leave adequate room, as shown in Figure 1, for mounting, air flow, cabling, and access to DIP switches.

Figure 1
Recommended Clearances

Leave 3 inches (76.2 mm)
for Mounting, Air Flow, and
access to DIP Switches.

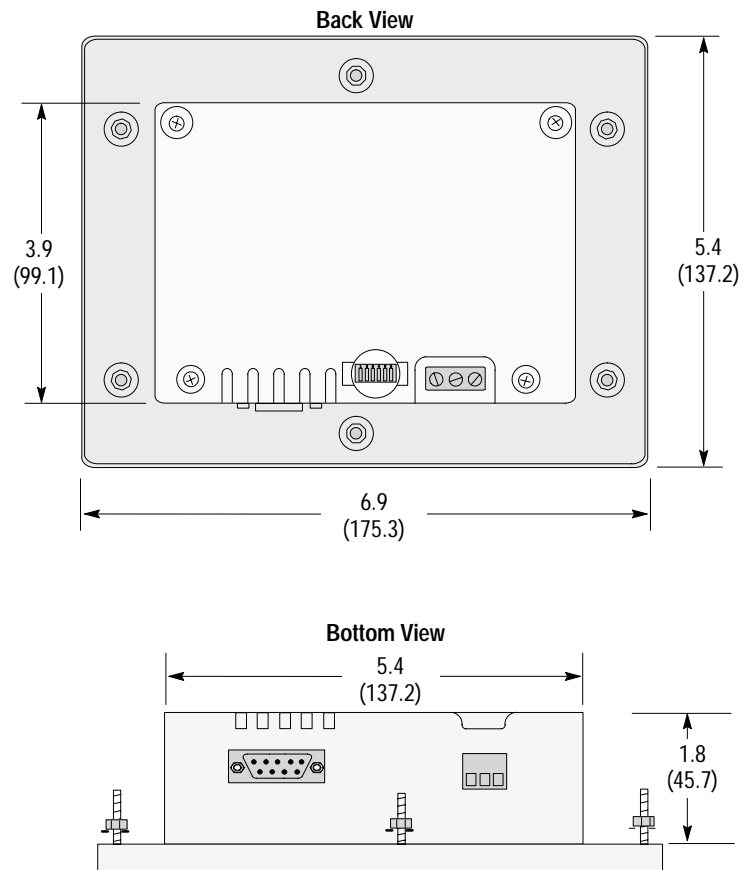
Leave 3 inches (76.2 mm) for
communications port connector.



Mounting Dimensions

Figure 2 shows the mounting dimensions of the terminal.

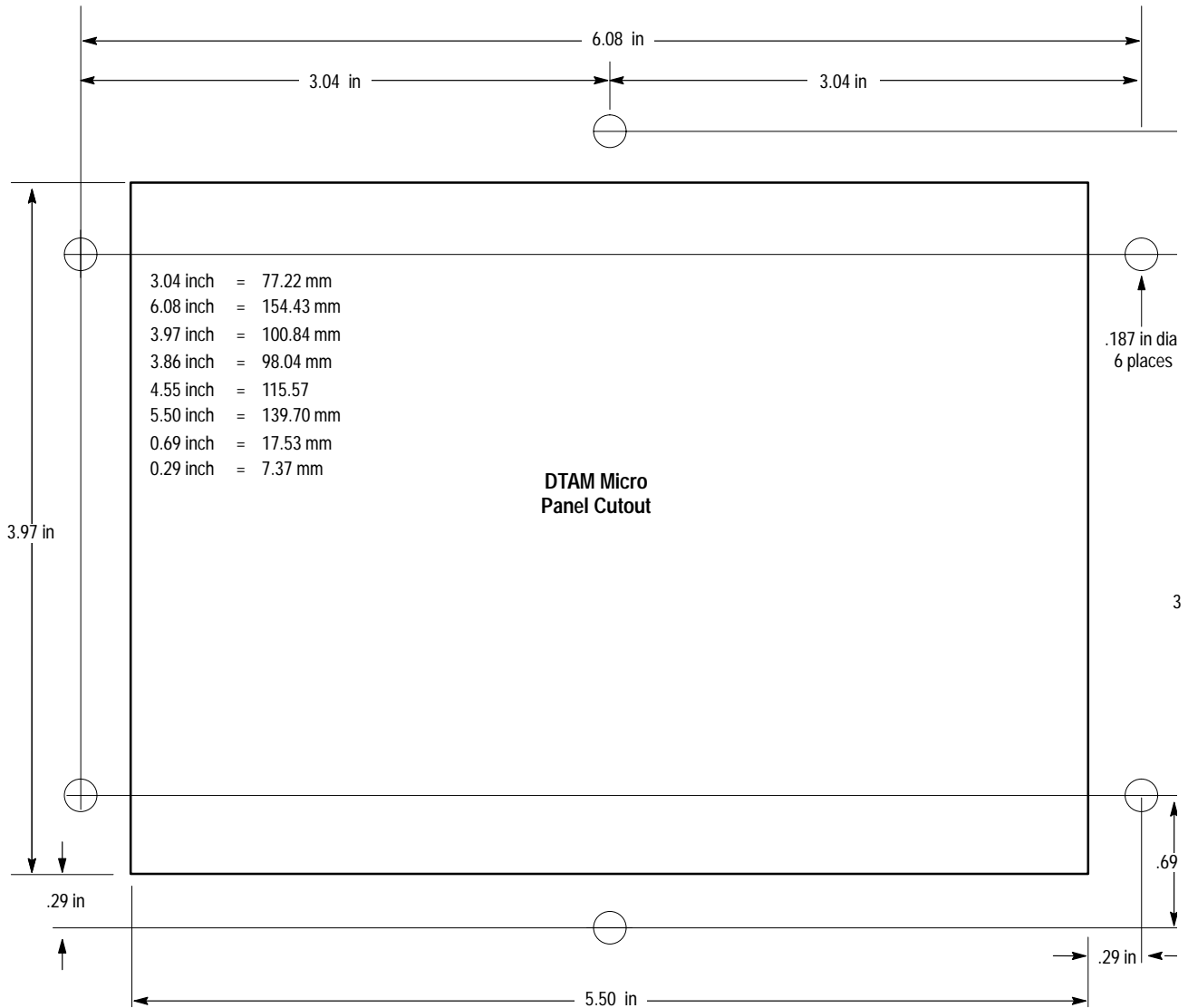
Figure 2
Mounting Dimensions in Inches (Millimeters)



Cutout Template

Figure 3 shows the panel cutout dimensions of the terminal.

Figure 3
Panel Cutout Dimensions in Inches (Millimeters)



Installation

To install the DTAM Micro Operator Module:

**ATTENTION:**

Disconnect all electrical power from the panel before making cutout.

Make sure that area around panel cutout is clear.

Take precautions so that metal filings or other debris does not fall into the DTAM Micro ventilation slots or enter any components that may already be installed in panel.

Make sure that no objects are inserted or fall into the terminal through the ventilation slots or DIP switch access hole.

Failure to follow these warnings may result in personal injury or damage to the panel components.

1. Using the cutout template shown in Figure 3, cut an opening in the panel.
 2. Make sure the sealing gasket is properly positioned on the DTAM Micro. This gasket forms a compression type seal. Do not use sealing compounds.
 3. Place the DTAM Micro in the panel cutout.
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**ATTENTION:**

Mounting nuts must be tightened to a torque of 8 to 10 inch pounds to provide a proper seal and to prevent potential damage to the terminal. Allen-Bradley assumes no responsibility for water or chemical damage to the terminal or other equipment within the enclosure because of improper installation.

4. Install the six self locking mounting nuts hand tight.
5. Alternately tighten the mounting nuts until the DTAM Micro is held firmly against the panel. Tighten mounting nuts to a torque of 8 to 10 inch-pounds. Do not over-tighten nuts.

Wire and Cable Length Restrictions

The following wire and cable length restrictions apply to DTAM products that are CE marked when used in installations that require compliance to European EMC Directive 89/336:

DC Power Wiring	10 meters
Ground Terminal Wire	3 meters
Communication Cables	30 meters

These restrictions apply to catalog numbers 2707–M232P3 Series E and 2707–M485P3 Series E.

Connecting Power

The DTAM Micro accepts power supply voltages from 18 to 30 VDC (use isolated DC power supply capable of providing at least 200 mA). Connect the DTAM Micro directly to the power source or use either of two AC to DC Adapters depending upon the source voltage.

- 120 VAC Input, use AC to DC Adapter (Catalog No. 1747-NP1)
- 240 VAC Input, use AC to DC Adapter (Catalog No. 1747-NP2)

To connect the DTAM Micro to a power source:



ATTENTION: Verify that the power is disconnected from the power source before wiring. Failure to disconnect power may result in electrical shock.

Make sure that the supply voltage to the DTAM Micro is 18 to 30 volts DC. The incorrect voltage may damage the DTAM Micro.

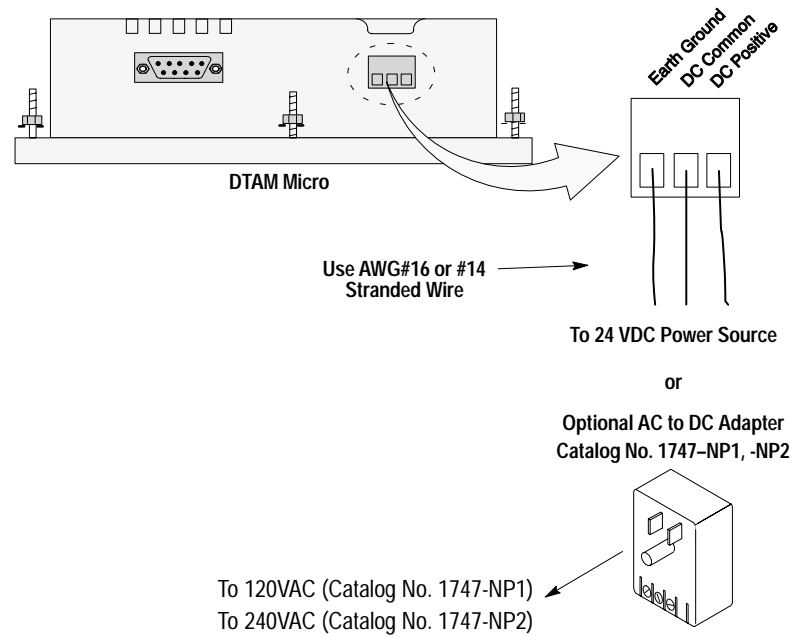
Do not overtighten the power connector screw terminals.

Overtightening the terminals may damage the DTAM Micro.

1. Make sure that the voltage source is not turned on.
2. Use AWG#16 or #14 stranded wire to connect the DTAM Micro screw terminals to the DC power source (see below).

Note: The terminal block on the DTAM Micro is not removeable.

Figure 4
DC Power Connections



3. Connect communications cabling, refer to Connecting to Devices section on page 11.
4. Apply voltage and verify the DTAM Micro powerup sequence.

Powerup Sequence

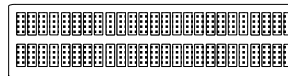
The powerup sequence is automatic, you do not have to respond to the screens. The sequence depends upon DIP switch position #1 (upload / download enable). The DTAM Micro is shipped with this switch On.

Powerup Sequence (DIP Switch #1 On)

1. The DTAM Micro verifies the system memory checksum, program checksum, and system RAM. After the test is completed, the result is displayed with the current DIP switch settings.

Memory Check: pass
DIP Switch: 101000

2. The display is tested, every pixel of the display is turned on.



If all of the pixels do not turn on, the display may be defective.

3. DTAM Micro information appears indicating the microprocessor core firmware version and communication port (RS-232 or RS-485).

Operator Interface
Core: 3.00 RS-232

4. The DTAM Micro waits for an application download.

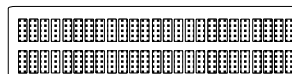
Programming Mode
Waiting Up/Download

Powerup Sequence (DIP Switch #1 Off)

1. The DTAM Micro verifies the system memory checksum, program checksum, and system RAM. After the test is completed, the result is displayed with the current DIP switch settings.

Memory Check: pass
DIP Switch: 101000

2. The display is tested, every pixel of the display is turned on.



If all of the pixels do not turn on, the display may be defective.

3. Operating system information appears indicating the firmware release number and protocol being used (PLC5-DF1 or AB DH-485).

DTAM Micro (c) 1994
FRN 2.20 PLC5-DF1

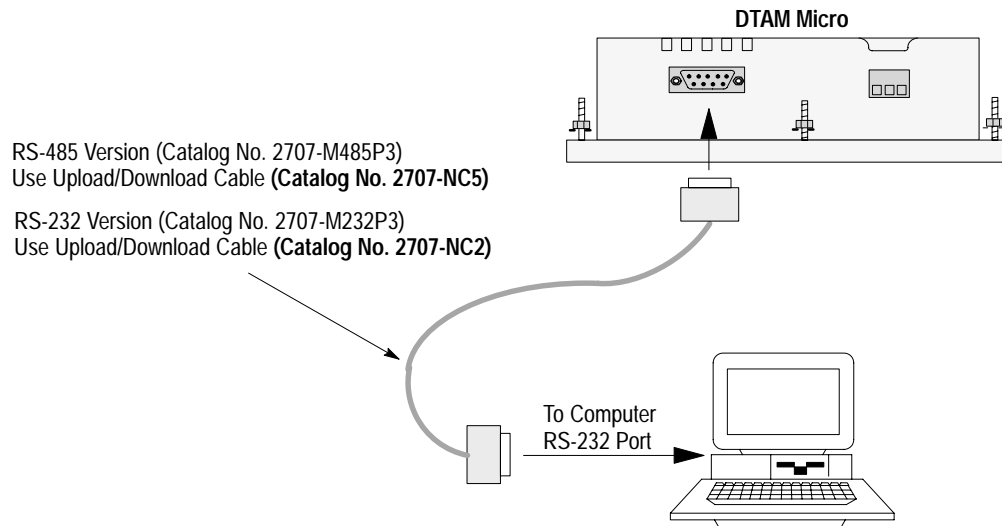
4. The first application screen displays. If the DTAM Micro is being powered up the first time you will see:

Bul. 2707 DTAM Micro
No Program Loaded

Upload / Download Connections

To download an application to the DTAM Plus, you must:

- connect a power supply (see Connecting DC Power on page 8)
- connect the (Catalog No. 2707-NC2) upload/download cable if you have the RS-232 version
- connect the (Catalog No. 2707-NC5) upload/download cable if you have the RS-485 version. This cable converts the computer's RS-232 output to RS-422 which is compatible with the DTAM Micro RS-485 port.



Connecting to Devices

To connect the DTAM Micro to an RS-232 device:

1. Make sure that the DTAM Micro is not connected to a voltage source.
2. Use the proper cabling to connect the DTAM Micro communications port to the port of the controller (PLC-5 channel 0 or SLC 5/03, 5/04 or 5/05 RS-232 port).
 - Use cable, Catalog No 2707-NC3 for PLC-5 channel 0 connection.
 - Use cable, Catalog No. 1747-CP3 for SLC 5/03, 5/04 or 5/05 port connection. This cable requires a 9-pin female to male gender adapter.

If you need to make your own cable, refer to the cable diagrams in Appendix B of the DTAM Micro User Manual (2707-803). The maximum recommended cable length is 50 feet (15.2 meters).

3. Make sure that the communication parameters of the DTAM Micro terminal match the host device.
4. Apply power and verify that communications are established.

To connect the DTAM Micro terminal to an RS-485 device:

1. Make sure that the power to the DTAM Micro is off.
2. Use the proper cabling to connect the DTAM Micro communications port to the port of the controller (PLC-5 channel 0 or SLC 5/03, 5/04 or 5/05 RS-232 port).
 - Use cable, Catalog No 2707-NC4 for PLC-5 channel 0 RS-422 connection
 - Use cable, Catalog No. 2707-NC5 for PLC 5 channel 0 RS-232 connection. The 2707-NC5 cable converts the signals from the RS-485 port to RS-232 levels.
 - Use cable, Catalog No. 2707-NC1 for SLC 5/03, 5/04 or 5/05 port and DH-485 network connections

If you need to make your own cable, refer to the connection diagrams in Appendix B of the DTAM Micro User Manual (2707-803). The maximum recommended cable length is 200 feet (60.8 meters).

Important: The DH-485 network cable requires proper shielding, grounding, and termination. Refer to Data Highway / Data Highway Plus / Data Highway-485 Cable Installation Manual (1770-6.2.2).

3. The DH-485 connectors are not electrically isolated. If electrical isolation is required, use Link Couplers (Catalog No. 1747-AIC).



ATTENTION: Electrical isolation using Link Couplers (Catalog No. 1747-AIC) is required in applications where the distance between the DTAM Micro terminal and the SLC is greater than 6.5 feet (2 meters).

4. Make sure that the communication parameters of the DTAM Micro terminal match the host device.
5. Apply power and verify that communications are established.

DTAM Micro Specifications

LCD Display

Character Size (H x W)	0.19 x 0.12 in (4.75 x 2.95 mm)
Character Format	5 mm x 8 mm dot matrix
Column and Character	2 lines x 20 characters
Backlight	Yellow-green LED, fixed intensity
Contrast	Fixed
Display Viewing Area (H x W)	1.0 x 3.0 in (15 mm x 76 mm)
Viewing Angle	Horizontal $\pm 30^\circ$, Vertical -20° to $+30^\circ$

Keypad

Keypad Type	Tactile embossed, domed keys, sealed membrane
Operation Force	16 oz (453 grams)
Operational Life	1 million operations

Electrical

Communications Port	
Catalog No. 2707-M232P3	RS-232
Catalog No. 2707-M485P3	RS-485 (Allen-Bradley DH-485 protocol)
Communication Distances	
RS-232	50 ft (15 meters) maximum
RS-485	4,000 ft (1219 meters) maximum with the
Link	
Coupler (Catalog No. 1747-AIC)	
RS-422	200 feet (61 meters) maximum with PLC-5
Input Voltage Range	18-30V DC
Input Current	200mA maximum

Environmental

Operating Temperature	0 to 55°C (32 to 131°F) Series C or later
Storage Temperature	-20 to 70°C (-4 to 158°F)
Relative Humidity	5 to 95%, noncondensing
Shock	30G operating
Vibration	50G non-operating

Mechanical

Dimensions (Approximate)	
Height:	3.9 inch (99.1 mm)
Width:	5.4 inch (137.2 mm)
Depth:	1.8 inch (45.7 mm)
Front Panel Size	
Height:	5.4 inch (137.2 mm)
Width:	6.9 inch (175.3 mm)
Weight	1.0 lbs (0.45 kg) max
LED Indicator	RUN LED (Green)

Agency Ratings

NEMA Type 4, 12, 13 (indoor use only)



Class 1 Division 2 Groups A, B, C, D, hazardous locations (Series B or higher)



Class 1 Division 2 Groups A, B, C, D, hazardous locations (Series D or higher)



Series C or higher (2707–M232P3, –M485P3)
Series A or higher (2707–M232P3D)

European Union Directive Compliance

If this product is installed within the European Union or EFTA regions, the following regulations apply:



ATTENTION: To maintain compliance with European Union Directives there must exist at least 2.5 cm (1 in.) free air space around the sides and back of this unit when installed in an enclosure.

This apparatus is tested to meet Council Directive 89/336 Electromagnetic Compatibility (EMC) standards:

- EN50081–2 Class A (Industrial) Emissions
- EN50082–2 Class A (Industrial) Immunity
- EN61000–6–2 Class A (Industrial) Immunity – (Series E Only)

According to these Standards, the factor which determines, for EMC purposes, whether an apparatus is deemed to be “Industrial” or “Residential, commercial and light industrial”, is given in Clause 1 of EN50081–2 as follows:

Apparatus covered by this standard is not intended for connection to a public mains network, but is intended to be connected to a power network supplied from a high– or medium–voltage transformer dedicated for the supply of an installation feeding a manufacturing or similar plant.

The product described in this document is intended solely for use in an industrial environment as defined above. When installed in Europe, any other application is in contravention of the European Union Directives, and a breach of those laws.

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