T1930EN INSTRUCTION SHEET REV. 10

MV3000E DELTA MAINS VOLTAGE MONITOR UNIT

MVC3006-400X

1. DESCRIPTION

- The Mains Voltage Monitor Unit (MVM Unit) is used to precisely monitor the mains voltage and mains phase angle.
- Allows MV3000e DELTA systems to operate in “Active Energy Management (AEM) mode. This permits bi-directional, low harmonic mains currents.
- Complies with protective impedance requirements of EN50178 and IEC61800-5-1.
- Easy to install. The Unit is mounted adjacent to the MV3000e DELTA Controller.
- MVC3006-4001 – MVM Unit
- MVC3006-4003 – MVM Unit
- MVC3006-4004 – MVM Unit with Anti-Alias for DSP.

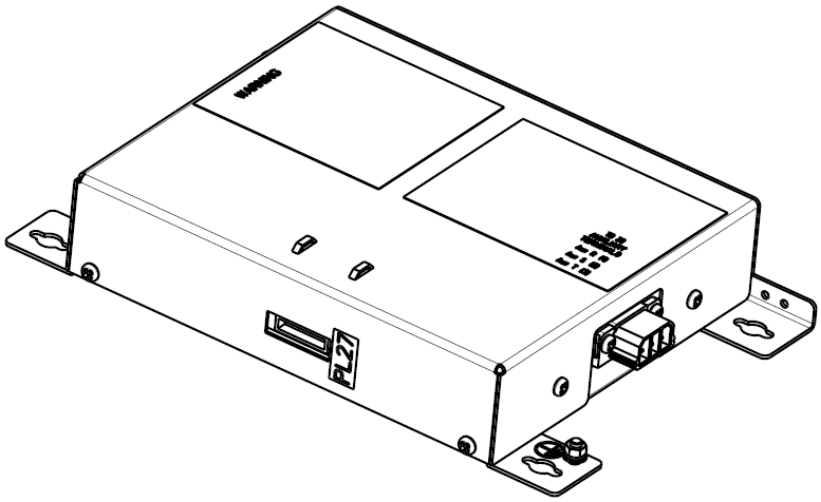

Figure 1-1. – Mains Voltage Monitor Unit

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2. BOX CONTENTS

Description	Quantity
MVC3006 – MV3000e DELTA Mains Voltage Monitor	1
3-way Plantside Connector	1
16-way Screened Ribbon Cable	1
16-way Ribbon Cable Clamp	1
16-way Ribbon Cable Clamp Base	1
Warning Label For Mains Cable	1 x English 1 x French 1 x German
Cable Ties	3
M5x8mm Taptite Screws	6
T1930 – This Instruction Sheet	1
41Y8319/01 – Drilling Pattern	1

3. RELATED DOCUMENTS

Failure to comply with any of the general requirements for installation, operation and maintenance provided in the technical manuals will significantly increase the risk of maloperation, fire or electric shock.

Instructions for removing and installing the MV3000e DELTA controller, and for commissioning the DELTA drive, are contained in the following manuals:

- T1679, MV3000 Software Manual
- T1689, Technical Manual for MV3000 DELTA.
- T1693, MV DELTA Liquid Cooled Drive System.

4. DOCUMENT HISTORY

Revision Number	Date Of Revision	Details
Issue 0008	July 2012	Company name change, etc.
Rev 0009	April 2013	Company name change, etc.
Rev 0010	May 2019	Company name change, etc.

5. SPECIFICATIONS

5.1 ENVIRONMENT

With the exception of the specific items described below, the environmental data for the MV3000e DELTA drive system and its components are contained in the specification section of the manuals T1689 (Air Cooled DELTA) and T1693 (Liquid Cooled DELTA).

5.2 ENCLOSURE: INGRESS PROTECTION

IP00 (not protected). However, the unit is protected against accidental contact **only** when installed as described in this instruction sheet. This unit must be mounted in an enclosure with restricted access.

5.3 ELECTRICAL SPECIFICATIONS

Nominal Input Measurement Voltage Range

380 – 690V ac rms (nominal)

(380 – 600 V UL/CSA)

45 – 63Hz

Input Impedance To Earth (Ground)

	MVC3006-4001	**MVC3006-4003 MVC3006-4004**
R Phase (PL28/1)	1.5 MΩ	1.1 MΩ
S Phase (PL28/2)	0.75 MΩ	0.73 MΩ
T Phase (PL28/3)	1.5 MΩ	1.1 MΩ

Input Measurement Current

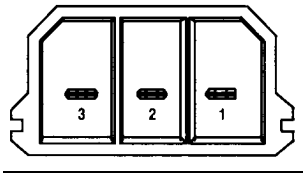
<1mA

Mains Input Phase Sequence

The drive system will only operate correctly if the phasing of the mains supply to PL28, on the MVM Unit is the same as the phasing of the mains supply to the DELTA Transistor Bridges.

PL28 Input Mains Connector

Pin 1	R
Pin 2	S
Pin 3	T



Insulation Test Voltage

Refer to Commissioning Section for limits.

5.4 MECHANICAL SPECIFICATION

Weight : 1.75 kg (3.85 lb) net

Physical Dimensions

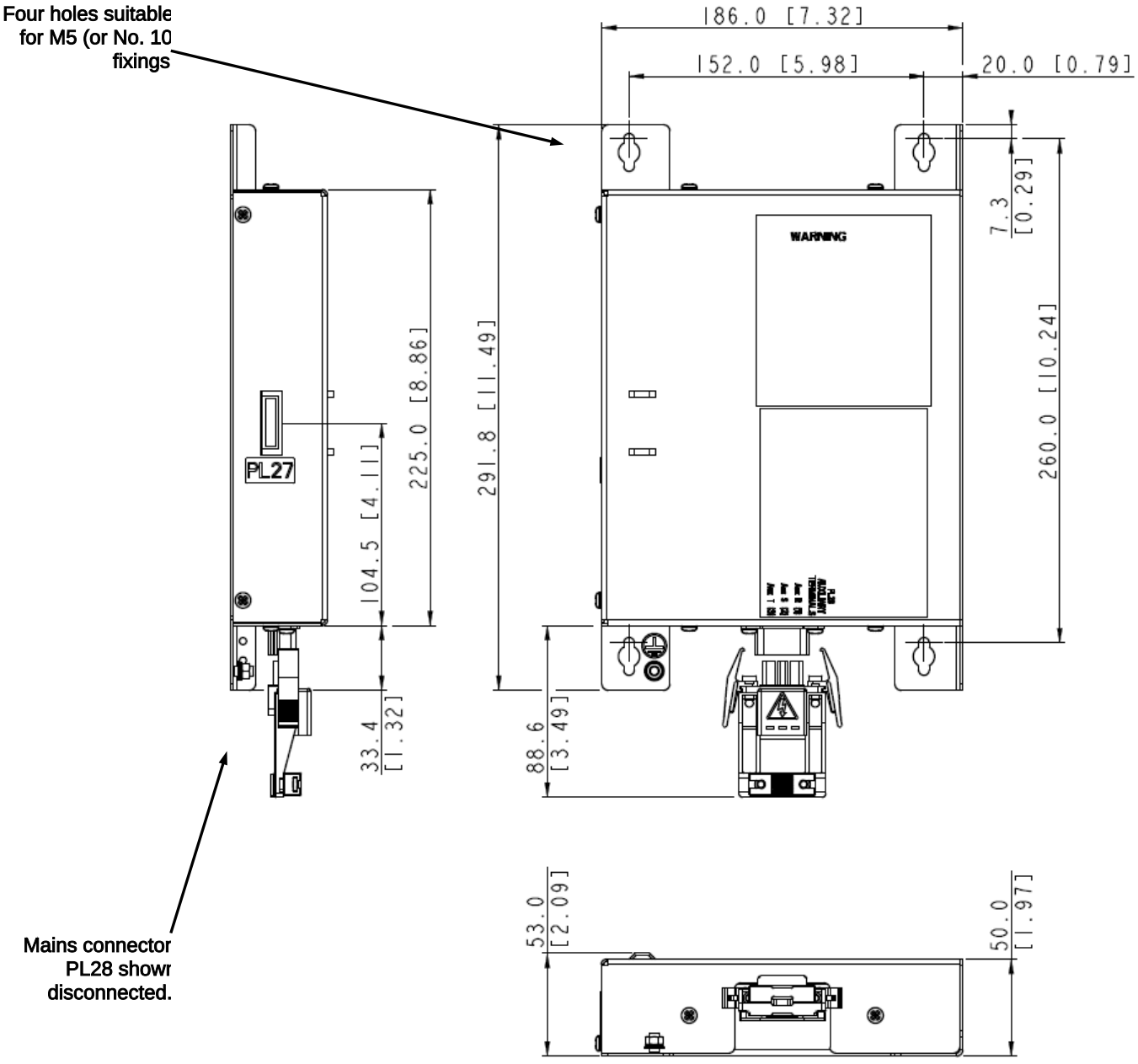


Figure 5-1. – Unit Dimensions

NOTE: Dimensions in mm (inches).

5.5 SYSTEM DESIGN

This section advises on the selection of components that are not supplied with this unit, but are required for its installation into a standard AEM DELTA system.

Wiring Mains Monitoring Point To Connector PL28

The current through this cable is less than 1mA. The cable should be selected for its mechanical strength and voltage insulation. Ensure that it has a suitably large cross-sectional area to be protected by the mains monitoring point fuses.

PL28 Wire Size Limits: 0.5***** - 2.5mm^2 (20***** - 14 AWG).

***** Use consolidating crimp for smaller wires.

Mains Monitoring Point to Connector PL28 Fuses

Protect the wiring to connector PL28 by suitable fuses (rated no higher than 6A). These should be positioned as close to the supply end of the cable as practical.

IEC Fuses	-	Use general purpose fuses class gG or GL	Examples	• Ferraz Shawmut FR10GG50Vx for drives rated 400V, 480V • Ferraz Shawmut FR10GG69Vx for drives rated 690V
UL Fuses	-	Use class CC	Examples	• Ferraz ATQR range • Bussmann FNQ-R range

Fuse holders are available from the fuse suppliers.

Isolation Of Mains Input

This unit is not galvanically isolated. This results in current flowing to earth, limited by high value resistors to ensure compliance with the relevant safety standards. See Section 5.3 – Electrical Specifications for the value of the input impedance.

Where multiple Mains Voltage Monitor Units are connected on the same supply, and there is concern for the level of current to earth, use potential transformers of sufficient accuracy to isolate the mains input.

6. FITTING INSTRUCTIONS

For reasons of Electromagnetic Compatibility, the MVM unit must be fitted to the same metal mounting panel as the DELTA Controller and DELTA I/O panel. The panel should be unpainted to permit a good electrical contact to be made to the units.

However if the panel is painted, it is essential that the paint is scraped away from the mounting points and the bare surface adequately protected against corrosion after fitting the MVM unit.

The general arrangement of the Controller, I/O panel and MVM units can be seen in Figure 6-1. – Mounting Schematic.

The unit must be mounted in an enclosure to which personnel access is restricted.

Full dimensions and drilling information are shown on drawing 41Y8319/01, supplied with this MVM unit.

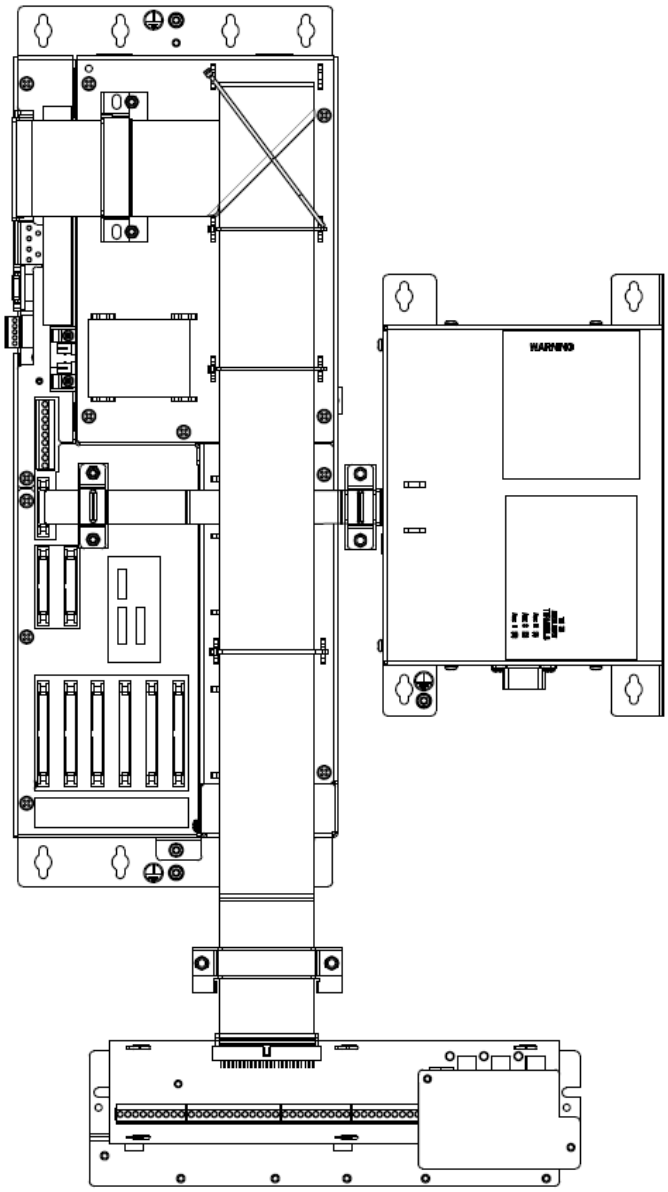


Figure 6-1. – Mounting Schematic

6.1 TOOL REQUIREMENTS

- Drill with 4.5mm (11/64") bit
- Terminal Screwdriver
- Posidrive Screwdriver (PZ2)

6.2 FITTING TO THE CABINET

a) Mark out the panel for the MVM fixings (including ribbon cable clamp fixings), using the dimensions shown on 41Y8319/01.

b) The M5 Taptite screws supplied are suitable for Aluminium or Steel 1.5 to 3.5mm (0.059 to 0.137 in) thick. If these screws are to be used, drill six holes 4.5mm diameter. Alternatively, the installer may use locally supplied M5 or No. 10 screws and drill six holes to suit.

c) Mount the MVM unit on the panel and secure with four M5 Taptite or No. 10 screws.

d) Connect the supplied ribbon cable between PL27 on the MVM unit and PL10 on the Controller.

NOTE: The connectors are polarised to prevent incorrect connection.

e) Route the cable as shown in 41Y8319/01.

f) Clamp the MVM end of the 16-way ribbon to the mounting sheet using the supplied two-part clamp assembly.

g) Clamp the Controller end of the 16-way ribbon to the Controller chassis using the clamp supplied with the Controller.

NOTE: Ensure that only the exposed screen of the ribbon cable is clamped, and that the ribbon is placed centrally to prevent cores being trapped by the clamp edges.

h) Fit a suitable cable to the 3-pin connector supplied and connect it to PL28 on the MVM Unit. Restrain the mains cable using the strain relief provided with the 3 pin connector.

i) Connect the free end of the cable via suitably rated fuses (see Section 5.3 – Electrical Specification) to the mains, on the mains side of the line reactor and pre-charge contactor, ensuring that the phase rotation is R-S-T.

NOTE: The connector must not be unplugged when the electricity supply is on.

j) Fit the supplied warning label, in the appropriate language, to the end of the cable nearest to connector PL28.

k) This unit must be connected to safety earth (ground). If local safety regulations do not permit reliance upon the bonding, as detailed adjacent to Figure 6-1, an additional connection may be made using a wire connected to the MVM unit earth stud. When using the earth stud, wire of a similar size to the mains wiring connected to PL28 should be used unless a larger size is required by local regulations.

7. COMMISSIONING

CAUTION

- **High voltage insulation tests can damage this equipment.**
  Cables/external components, to be insulation tested must be disconnected from this equipment.

NOTE: **Commissioning of the MVM Unit is carried out when the drive is commissioned as described in Manual T1689 for air-cooled systems, or in T1693 for liquid cooled systems.**
If it is necessary to perform high voltage insulation tests on the mains wires to this unit, disconnect mains monitoring connector PL28, to prevent permanent damage to the unit.
Ensure that the free end of the connector is kept away from earthed metalwork and that nobody can touch it during the test.

8. FIRMWARE VERSION

MV3000e Firmware should be V12.03 or later for systems incorporating MVC3006-4003 or MVC3006-4004 units.

9. CONTACT DETAILS FOR SALES, SERVICE AND SUPPORT

www.avidcontrolsinc.com

Please refer to your local technical support centre if you have any queries about this product.

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