GE
Power Conversion

T2196EN Instruction Sheet Rev 01

MV & PECe High Performance Fan

MVC3014-4001

1. DESCRIPTION

- The MV & PECe High Performance Fan system is used to cool the Air Cooled DELTA power modules.
- The High Performance Fan locates onto the upper cross rail. The inlet duct assembly provides the upper guide rail for the Air Cooled DELTA.
- The High Performance Fan housing is designed to be removed and/or replaced whilst leaving the inlet duct assembly in place.
- Easy to install.
- Whilst this High Performance Fan provides equivalent cooling to previous versions and is mechanically similar, it is not an electrically replaceable item.

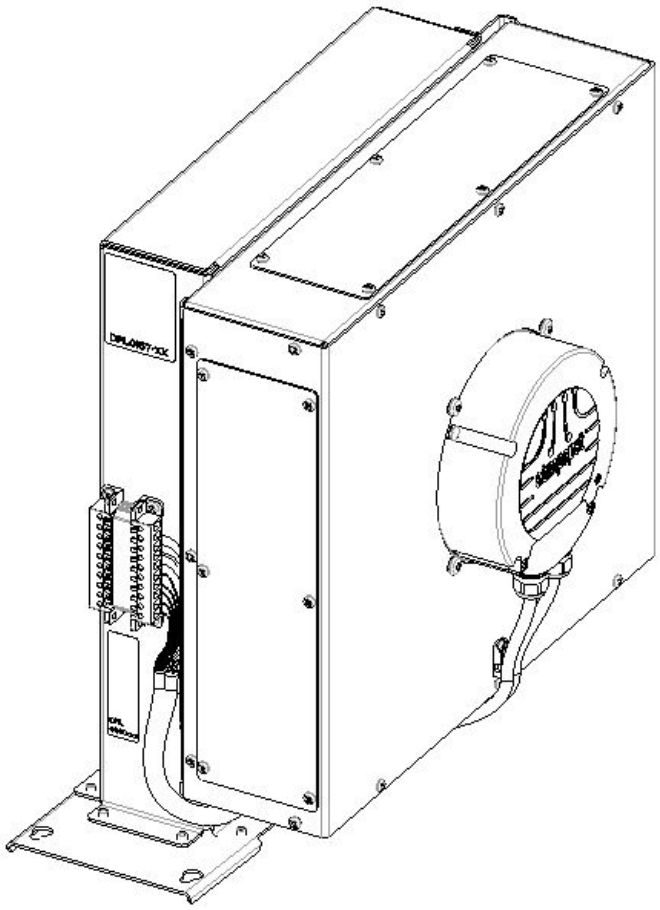

Figure 1 – MV & PECe High Performance Fan (MVC3014-4001)

2. BOX CONTENTS

Description	Quantity
MVC3014-4001 MV & PECe High Performance Fan	1
Fan Support Bracket (50Y9742/01)	1
M5 x 10 taptite screw	1
T2196EN – This Instruction Sheet.	1

3. DOCUMENT HISTORY

Revision Number	Date Of Revision	Details
Rev 0000	September 2015	Initial Release
Rev 0001	October 2015	Update of warnings & cautions

4. WARNINGS, CAUTIONS & NOTES

WARNING

- **"An instruction that draws attention to the risk of injury or death" (BS 4884-1: 1992).**

CAUTION

- **"An instruction that draws attention to the risk of damage to the product, process or surroundings" (BS 4884-1: 1992).**

NOTES: Notes separate important information from the text and give additional information.

5. SAFETY INSTRUCTIONS

Care has been taken with the design of this product to ensure that it is safe. However, in common with all products of this type, misuse can result in injury or death. Therefore, it is very important that the instructions in this publication and on the product are observed during transportation, commissioning, operation, maintenance and disposal.

This instruction sheet must be regarded as part of the product. It should be stored with the product and must be passed on to any subsequent owner or user.

Local safety laws and regulations must always be observed.

Persons working on the product must be suitably skilled and should have been trained in that work for these products.

The product is a component designed for incorporation in installations, apparatus and machines.

The product must not be used as a single item safety system. In applications where maloperation of the product could cause danger, additional means must be used to prevent danger to persons.

Product approvals and certifications will be invalidated if the product is transported, used or stored outside its ratings or if the procedures in this instruction sheet are not observed.

In The European Union:

- Products within the scope of the Low Voltage Directive, 2006/95/EC are CE marked.
- The product complies with the essential protection requirements of the EMC directive 2004/108/EC, when installed and used as described in this manual.
- The requirements of the EMC Directive should be established before any installation, apparatus or machine, which incorporates the product, is taken into service.
- A machine must not be taken into service until the machine has been declared in conformity with the provisions of the Machinery (Safety) Directive, 2006/42/EC.

6. DISPOSAL

This equipment or any part of the equipment should be disposed of in accordance with the laws of the country of use.

Modern high technology materials have been used in the manufacture of the equipment to ensure optimum performance. Care has been taken with the selection of these materials to minimise risks to health and safety. However, some materials require special consideration during disposal.

7. SCOPE

This instruction sheet should be read in conjunction with the appropriate standard Product Technical Manual. This publication should be regarded as part of the product. It should be retained for the life of the product and passed on to any subsequent owner or user.

8. SPECIFICATIONS

8.1 ENVIRONMENT

The High Performance Fan is intended to be installed in an enclosure with the following characteristics:

FUNCTION	SPECIFICATION
Environmental	
Operating	
Ambient air temperature range	0 to 50°C (32°F to 122°F)
Relative humidity	5 to 95 % (non-condensing)
Altitude	Normal operating altitude up to 1000 m above sea level. From 1000 m (3280 ft) to a maximum of 2000 m (6551 ft) derate by 7.3% per 1000 m (3280 ft).
Atmosphere	Pollution Degree 2 (IEC 61800-5-1 and IEC 60664-1) i.e. clean, free from dust, condensation and conductive or corrosive gases. If conductive pollution or condensation are expected (Pollution Degree 3), the High Performance Fan must be placed in an enclosure which achieves Pollution Degree 2 by: - excluding the conductive pollution e.g. by the use of filtered air; - preventing condensation e.g. by the use of anti-condensation heaters. In extreme environments dual circuit heat exchangers are recommended.
Atmospheric chemicals (max)	15 ppm H_2S 25 ppm NO_2 25 ppm SO_2
Storage	
Temperature range	-25°C to +55°C (-13°F to 131°F)
Relative humidity	5 to 95 % (non-condensing)
Transport	
Temperature range	-25°C to +70°C (-13°F to 158°F)
Relative humidity	≤ 95 % (non-condensing)
Altitude	Will withstand air transport

8.2 ENCLOSURE: INGRESS PROTECTION

IP00 (not protected). 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.

8.3 ELECTRICAL SPECIFICATIONS

8.3.1 Nominal Input Voltage Range

Single phase, 230 V AC rms (minimum 200 V AC to maximum 277 V AC)

8.3.2 Nominal supply frequency

50 to 60 Hz

8.3.3 Input Current

The fan utilises an integrated electronic controller for optimum fan performance, as such there is no in-rush current. For this application, the fan is set to operate continually at maximum speed.

Operating current = 2.2 A

8.3.4 Start-up time

Approximately 6 seconds to impeller starting to rotate

Approximately 20 seconds to full speed

8.3.5 Typical fan speed

3740 rpm

8.3.6 Insulation Test Voltage

Refer to commissioning section 12 for limits.

8.3.7 Typical airflow characteristics

Air flow approximately 1355 m^3/hour (797 CFM) at a pressure of 733 Pa (2.9 InH_2O).

8.3.8 Connections

8.3.8.1 Input Connections

The fan assembly has a single connector TB1 which is a two-way removable plug.

Wire Size Limits: 0.5***** - 1.5 mm^2 (20***** - 16 AWG).

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

Position (from top)	Label details	Function
1	-	Do not use
2	-	Do not use
3	-	Do not use
4	-	Do not use
5	L	Live supply
6	N	Neutral supply
7	RL	Status relay[1]
8	RL	Status relay[1]
9	E	Earth / Ground
10	-	Do not use

Note 1: See section 8.3.8.2, Status Relay.

8.3.8.2 Status Relay

The "Status relay" indicates the condition of the fan. This relay output is "closed" when the fan is operating correctly.

Relay contact rating: 250 V AC / 2A (AC1)

8.4 MECHANICAL SPECIFICATION

8.4.1 Weight

The fan assembly comprises a fan duct that locates above the Air Cooled DELTA module and a fan housing that locates into the fan duct.

Fan duct weight: 5 kg (11 lbs)

Fan housing weight: 10 kg (22 lbs)

8.4.2 Physical Dimensions

Height (approximately): 430mm (16.9 in)

Width (approximately): 210mm (8.3 in)

Depth (approximately): 394mm (15.5 in)

9. MECHANICAL INSTALLATION

WARNING

- **Ensure that access to rotating parts of fans is prevented.**
- **Air used to cool the product is unfiltered. Air ejected from the product may contain foreign particles. Air outlets should be arranged to deflect the air away from the eyes.**
- **The combined audible noise emitted by fans in an installation can be greater than 70dB(A), dependant on the air flow path.**
  Measure the audible noise level in the installation.
  When the audible noise level exceeds 70dB(A), appropriate warning notices should be displayed.

The fan assembly is designed to locate onto the upper cross members of the DELTA mounting frame – refer to the Air Cooled DELTA manual T1689 for full installation details.

One fan assembly must be fitted above each Air Cooled DELTA module with four M6 x 15 mm ($^{9}/_{16}$ in) hexagon headed bolts with plain and spring washers. The fan mounting flange should sit flat against the underside of the two top cross members with the bolts screwing into the threaded inserts in the cross members. Partly screw in the bolts first and then slot the fan into place using the key-holes in the mounting flange as shown in Figure 2 - Installing a Fan Box. Tighten the bolts fully.

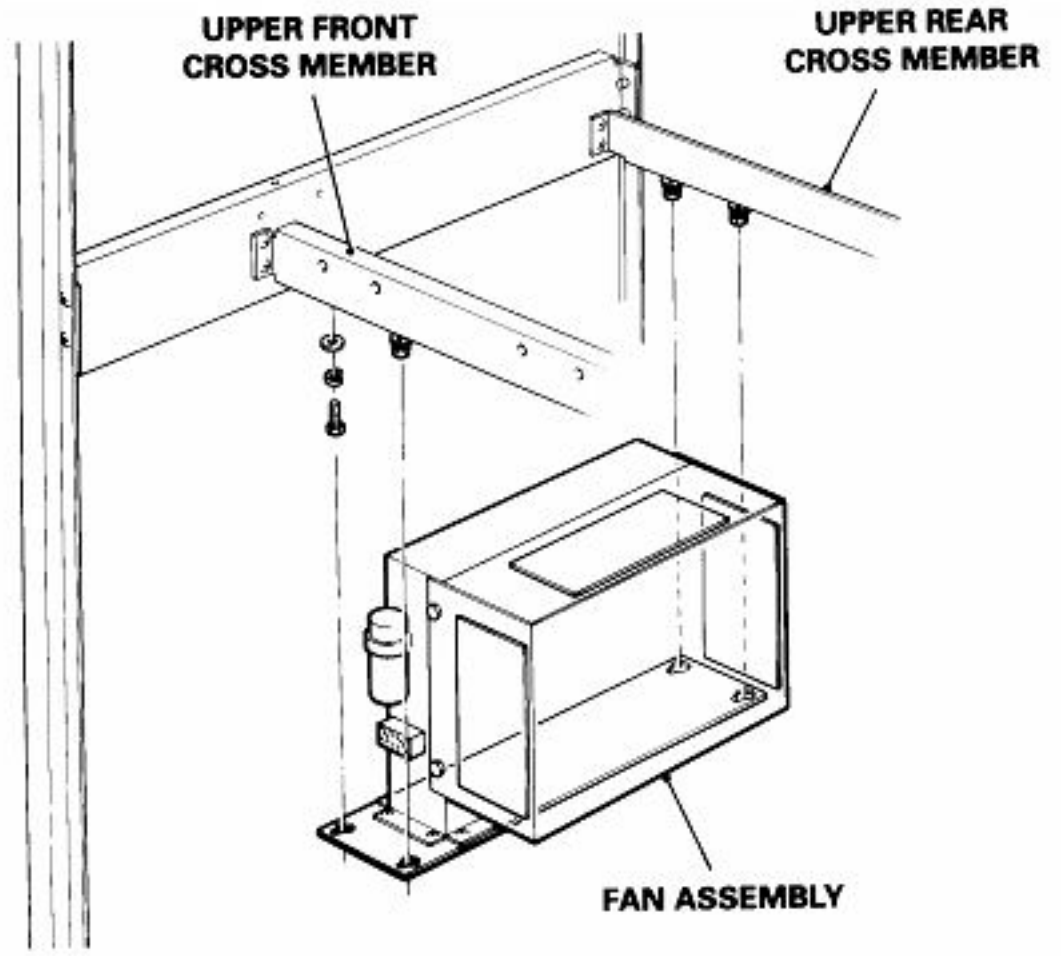

Figure 2 - Installing a Fan Box

The fans are heavy and may be awkward to lift into place, each fan may be split into two pieces. The fan duct fitted first, the main body of the fan housing then being added by pushing horizontally into the location tabs at the rear of the assembly and fixing by the two M6 bolts at the front. Care must be taken to ensure that any wiring disconnected from the terminal block is correctly re-connected and not damaged during fan installation.

Each fan has a choice of three air outlets; front, top or rear. These are selected by removing the appropriate cover and using this cover to block the unwanted outlet. To keep personnel from the main air and noise path it is recommended that the airflow outlet is through the top or rear of the drive enclosure.

These fans are normally fitted at the top of the enclosure, outside of the normal accidental finger access range. If they are installed in a position where the fan is accessible, mechanical protection must be provided.

The air outlet must not be obstructed and should preferably be ducted out of the control enclosure. Figure 3 - Fixing Centres on DELTA Cooling System for Ducting the Outlet shows the six fixing centres on each of the fan outlets for connecting a duct.

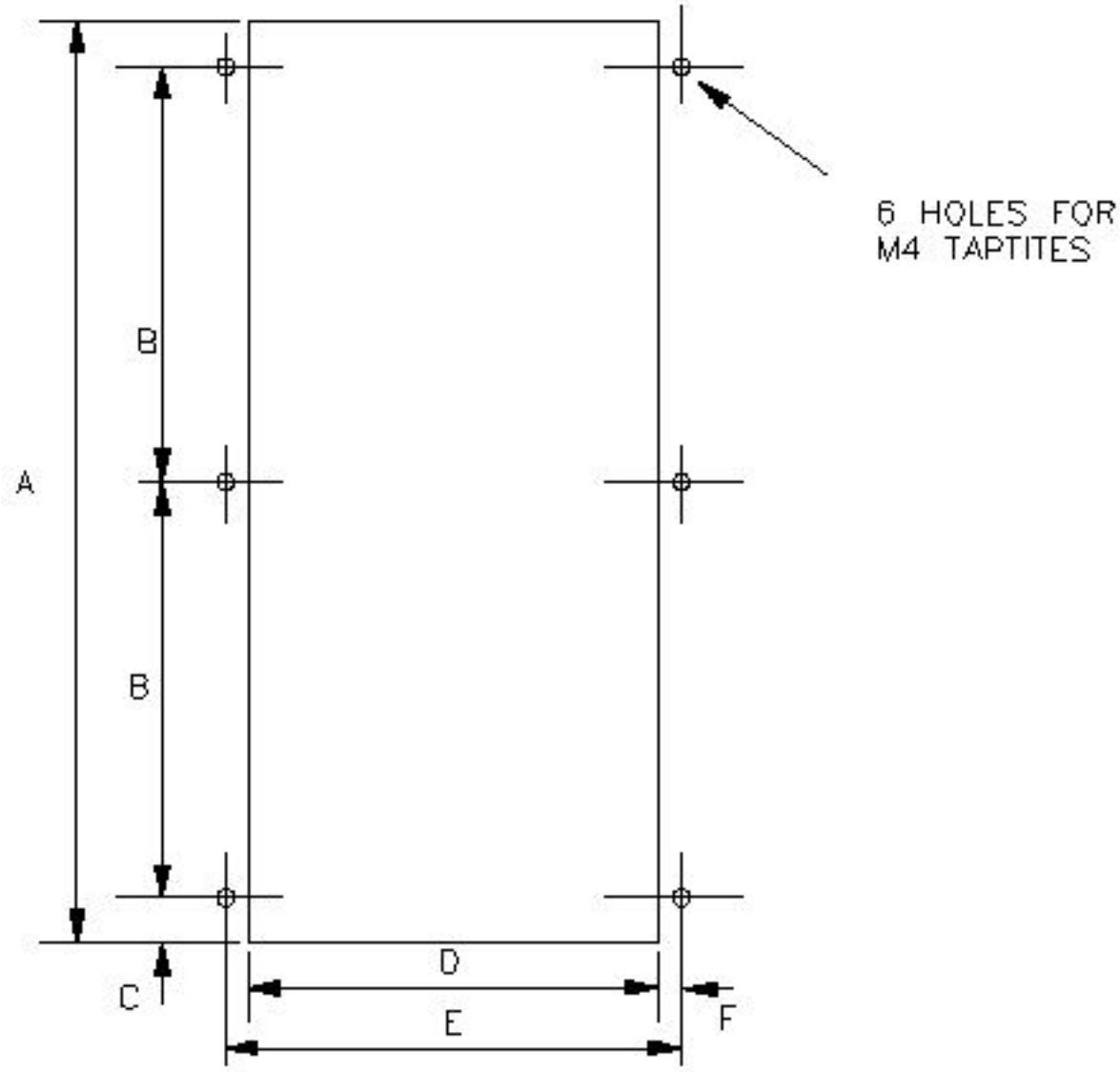

Figure 3 - Fixing Centres on DELTA Cooling System for Ducting the Outlet

Description	Order No.	Units	A	B	C	D	E	F
High Performance Cooling System	MVC3014-4001	mm in	298 11.73	144 5.66	5 0.2	68 2.68	78 3.07	5 0.20

Table 9-1. –Dimensions for Figure 3

NOTE: Standard pitch of 250 mm between duct outlets.

10. FAN SUPPORT BRACKET

NOTE: The bracket (50Y9743/01) must be fitted to the cubicle to provide support for the high performance fan. Failure to fit this bracket may cause mechanical damage.

Each bracket should be secured to the Upper Rear Cross Member with an M5 x 10 mm pozi-headed Taptite screw.

Shown in Figure 4 - Fitting of fan support bracket (50Y9743/01) is the recommended fitting for the support bracket.

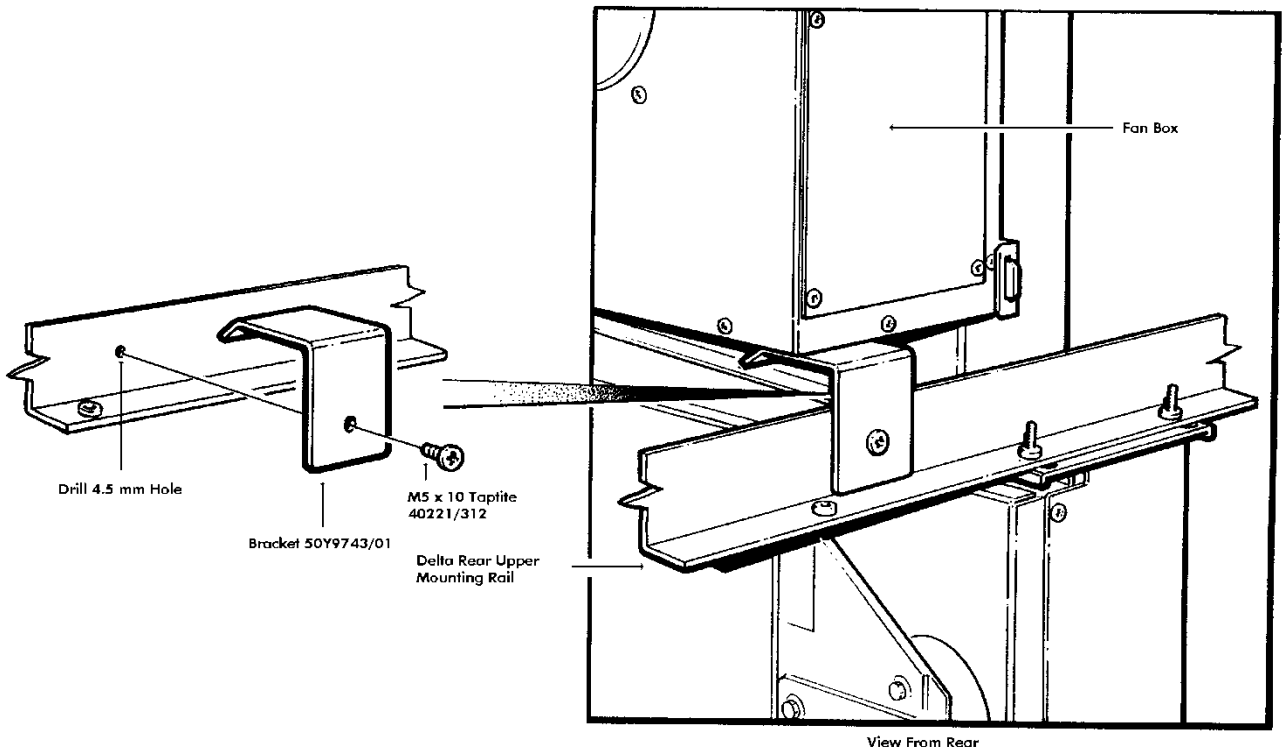

Figure 4 - Fitting of fan support bracket (50Y9743/01)

11. WIRING FOR THE FAN

WARNING

- **High Voltages**
  Replace all shrouds and close all doors before energising the equipment.
- **Connect this equipment to earth (ground) using the earth terminal provided.**
  The minimum size of the protective conductor must be in accordance with local safety regulations.

CAUTION

- **Ensure all conductors connected to this product are mechanically restrained.**

The single phase supply input to the fan is through the terminal block (TB1) located on the front of the module - see Figure 1 – MV & PECe High Performance Fan (MVC3014-4001).

The fan motor is protected from overtemperature by an internal thermal cut-out. This will switch off the internal motor controller and stop the fan. This may lead to the module being cooled by the fan, to trip on overtemperature. Fan re-start is automatic when the fan motor temperature falls below the reset temperature.

For wiring protection the fan supply should be fused – see Sections 8.3.3.

12. INSTALLATION & COMMISSIONING

If it is necessary to perform insulation tests on the converter cubicle, the fan assembly must only be tested at a maximum of 1000 Vac.

12.1 COMISSIONING

If the local safety regulations do not permit reliance on direct metal to metal contact to earth this unit, then the earthing connection TB1/9 must be used.

When the system is being commissioned measure the level of audible noise emitted by the equipment and compare with the legal limits. If the levels are greater than 70dB(A) check all ducting to see if any improvements can be made to reduce the audible noise. If no improvements can be made ensure that the area in which the equipment is located is identified as a restricted area for which appropriate ear protection should be worn.

12.2 CABLING

Ensure all cables connected to this unit are adequately restrained.

13. CONTACT DETAILS FOR SALES, SERVICE AND SUPPORT

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

Technical Support Centre

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