

# **584SV Series Frequency Inverter**

Addendum

HA463660 Issue 4

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Eurotherm Drives warrants the goods against defects in design, materials and workmanship for the period of 12 months from the date of delivery on the terms detailed in Eurotherm Drives Standard Conditions of Sale IA058393C.

Eurotherm Drives reserves the right to change the content and product specification without notice.

# Safety Information



## Requirements

**IMPORTANT:** Please read this information BEFORE installing the equipment.

### Intended Users

This manual is to be made available to all persons who are required to install, configure or service equipment described herein, or any other associated operation.

The information given is intended to highlight safety issues, and to enable the user to obtain maximum benefit from the equipment.

Complete the following table for future reference detailing how the unit is to be installed and used.

INSTALLATION DETAILS	
<b>Serial Number</b> <i>(see product label)</i>	
<b>Where installed</b> <i>(for your own information)</i>	
<b>Unit used as a:</b> <i>(refer to Certification for the Inverter)</i>	<input type="checkbox"/> Component <input type="checkbox"/> Relevant Apparatus
<b>Unit fitted:</b>	<input type="checkbox"/> Wall-mounted <input type="checkbox"/> Enclosure

### Application Area

The equipment described is intended for industrial motor speed control utilising AC induction or AC synchronous machines.

### Personnel

Installation, operation and maintenance of the equipment should be carried out by qualified personnel. A qualified person is someone who is technically competent and familiar with all safety information and established safety practices; with the installation process, operation and maintenance of this equipment; and with all the hazards involved.

# Safety Information



## Hazards

### WARNING!

This equipment can endanger life through rotating machinery and high voltages. Failure to observe the following will constitute an ELECTRICAL SHOCK HAZARD.

- The equipment must be **permanently earthed** due to the high earth leakage current.
- The drive motor must be connected to an appropriate safety earth.
- The equipment contains high value capacitors which take time to discharge after removal of the mains supply.
- Before working on the equipment, ensure isolation of the mains supply from terminals L1, L2 and L3. Wait for at least 3 minutes for the dc link terminals (DC+ and DC-) to discharge to safe voltage levels (<50V). Measure the DC+ and DC- terminal voltage with a meter to confirm that the voltage is less than 50V.
- Never perform high voltage resistance checks on the wiring without first disconnecting the drive from the circuit being tested.
- When replacing a drive in an application and before returning to use, it is essential that all user defined parameters for the product's operation are correctly installed.
- This equipment contains electrostatic discharge (ESD) sensitive parts. Observe static control precautions when handling, installing and servicing this product.

**IMPORTANT:** Metal parts may reach a temperature of 90 degrees centigrade in operation.

### Application Risk

The specifications, processes and circuitry described herein are for guidance only and may need to be adapted to the user's specific application.

Eurotherm Drives does not guarantee the suitability of the equipment described in this Manual for individual applications.

### Risk Assessment

Under fault conditions, power loss or other operating conditions not intended, the equipment may not operate as specified. In particular:

- The motor speed may not be controlled
- The direction of rotation of the motor may not be controlled
- The motor may be energised

### Guards

The user must provide guarding and /or additional safety systems to prevent risk of injury and electric shock.

### Protective Insulation

- All control and signal terminals are SELV, i.e. protected by double insulation. Ensure all wiring is rated for the highest system voltage.

**Note:** *Thermal sensors contained within the motor must be double insulated.*

- All exposed metalwork in the Inverter is protected by basic insulation and bonding to a safety earth.

### RCDs

These are not recommended for use with this product but, where their use is mandatory, only Type B RCDs should be used.

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# GETTING STARTED

## Introduction

The Types 8, 9 and 10 form the High Power AC (HPAC) range of the 584SV Inverters. In common with the lower power Inverters (Types 4, 5, 6 & 7), the dual mode feature (constant or quadratic torque) provides a cost effective solution to general industrial applications, as well as the control of pumps and fans.

The optional RFI filters offer enhanced EMC compliance without the need for additional external components.

Option cards can be fitted inside the Inverter to give serial communications, closed loop speed control, and the factory-fitted dynamic braking functions.

584SV Type	Nominal Power Constant Torque 380VAC	Nominal Power Constant Torque 460VAC	Nominal Power Quadratic Torque 380VAC	Nominal Power Quadratic Torque 460VAC
8	90 - 132kW	150 - 200Hp	110 - 150kW	150 - 250Hp
9	160 - 220kW	250 - 350Hp	200 - 250kW	300 - 400Hp
10	250 - 315kW	400 - 450Hp	300 - 315kW	450 - 500Hp

**Table 1-1 Summary of Ratings**

The models are identified by the product code. Refer to Chapter 2 “An Overview of the Inverter” - Understanding the Product Code.

## Standard Equipment

The following equipment is supplied as standard with each Inverter:

- Exhaust duct and top vent assembly
- Main cooling fan (Type 10 only)
- 5841 Operator Station (inverter-mounted)
- Lifting eyes (4 off)
- Product Manual and Addendum

## Optional Equipment

Item	Part Number
5841 Operator Station (for remote-mounting) <i>A unit providing control, monitoring and programming capabilities</i>	5841
Panel Mounting Kit for the 5841 Operator Station	5842
Braking Resistor <i>A resistor fitted for transient braking operations</i> 36Ω, 500W 56Ω, 200W	CZ388396 CZ463068
EMC Installation Guidelines for Modules and Systems <i>A Eurotherm Drives application manual detailing EMC requirements</i>	HA388879

# 1-2 Getting Started

Item	Part Number
5843 Technology Option <i>Plug-in field bus communications interface options:</i> <ul style="list-style-type: none"><li>• Profibus</li><li>• Profibus Technology Option Manual</li><li>• RS485</li><li>• RS485 Technology Option Manual</li><li>• Link</li><li>• Link Technology Option Manual</li></ul>	AH463470U001 HA463561 AH463469U001 HA463560 AH470016 HA470237
ConfigEd Lite <i>Eurotherm Drives' Windows-based block programming software</i>	Order by name
Dynamic Braking Module <i>A factory-fitted module</i>	Factory fitted option
External AC Supply (RFI) Filter	Refer to Chapter 11: "External AC Supply (RFI) Filters and AC Line Chokes"

## About this Manual

This manual is an Addendum to the *584SV Frequency Inverter Product Manual* (Part No. HA463617)

Every Inverter Type 8, 9 and 10 is shipped with this Addendum and the relevant Product Manual listed above. Refer to the Product Manual for details of the following:

- commissioning procedures
- safety information
- control specification
- software configuration
- diagnostics
- fault finding
- application information

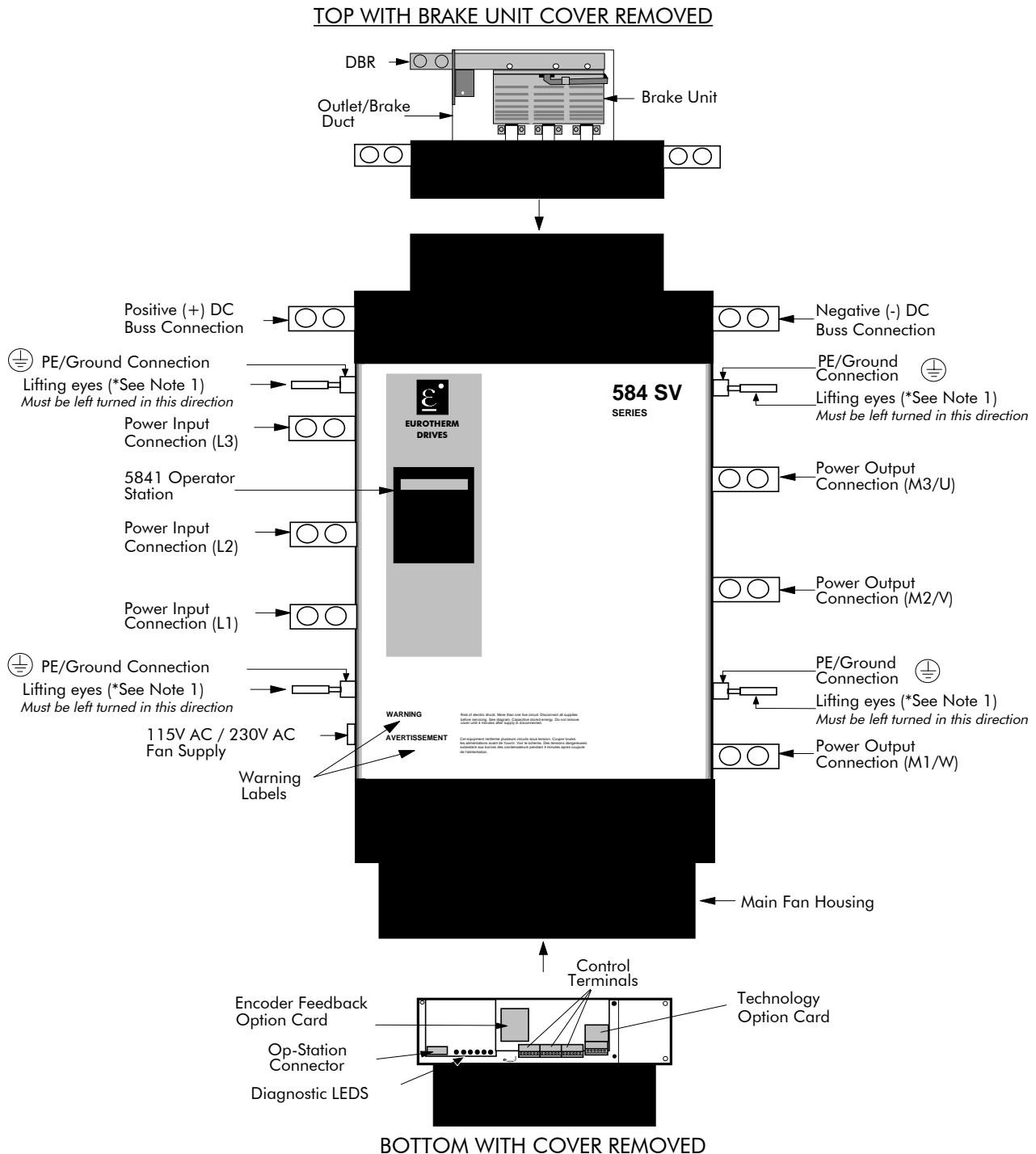
## How the Manual is Organised

Text in this Addendum is either in addition to, or is a replacement for equivalent text found in the main Product Manual.

**Note:** You will find that chapter numbers and titles are synchronised between this Addendum and the *584SV Product Manual*.

# AN OVERVIEW OF THE INVERTER

## Component Identification



**\* Note 1: PE / Grounding Connections**

Lifting eyes must be replaced with supply and motor earth (ground) connections using M10 bolts and washers supplied. Under no circumstances should lifting eyes be used to make the PE / grounding connection.



**Figure 2-1 General Features**

## 2-2 An Overview of the Inverter

### Control Features

The Inverter is fully-featured when controlled using the 5841 Operator Station (or a suitable PC programming tool).

DEFAULT

*The 'General' control features below are not available when the unit is controlled using the analogue and digital inputs and outputs.*

<b>General</b>	Output Frequency	Selectable 0-120Hz, 240Hz or 480Hz
	Switching Frequency	<i>Constant Torque:</i> 3kHz for all units <i>Quadratic Torque:</i> 3kHz for all units
	Voltage Boost	0-25% (selectable Auto or Manual)
	Flux Control	1. V/F control with linear or fan law profile 2. Sensorless vector with automatic flux control and slip compensation
	Slip Compensation	0-Limit Frequency/24
	Skip Frequencies	4 skip frequencies with adjustable skip band width
	Preset Speeds	8 presets with programmable ramp rates
	Stopping Modes	Ramp, ramp with hold, coast, dc injection, fast stop
	Ramps	Symmetric or asymmetric ramp up and down rates
	Raise/Lower	Programmable MOP function
	Jog	Programmable jog speed
	Logic Functions	10 programmable 3 input logic function blocks performing NOT, AND, NAND, OR, NOR and XOR functions
	Value Functions	10 programmable 3 input value function blocks performing IF, ABS, SWITCH, RATIO, ADD, SUB, RATIO, TRACK/HOLD, and BINARY DECODE functions
	Diagnostics	Full diagnostic and monitoring facilities
<b>Protection</b>	Trip Conditions	Output short line to line, and line to earth Overcurrent > 220% I x t overload 50-105% (adjustable) Heatsink overtemperature Motor Thermistor overtemperature Overvoltage and undervoltage
	Current Limits	Adjustable 50%-150% 180% shock load limit
	Voltage/ Frequency Profile	Constant torque Fan Law (base frequency adjustable)
<b>Inputs/ Outputs</b>	Analogue Inputs	4 user-configurable: Speed setpoint/trim $\pm 10V$ , 0-10V, 2-10V, 0-5V, 1-5V Speed setpoint 4-20, 20-4, 0-20 or 20-0mA Current loop 4-20, 20-4, 0-20 or 20-0mA Torque limit 0-10V
	Analogue Outputs	2 user-configurable: Speed 0-10V and 0-20mA Load $\pm 10V$
	Digital Inputs	8 x 24V dc inputs (user configurable)
	Digital Outputs	3 relay contacts (volt-free)

**Table 2-1 Control Features**

## Understanding the Product Code

The 584SV Inverter is fully identified using a ten block alphanumeric code which records how the Inverter was calibrated, and its various settings when despatched from the factory.

The product code appears as the "Model No.". Details of each block of the Product Code can be found in the Product Manual, however, the following blocks below are substituted for the Types 8, 9 and 10.

Block No.	Variable	Description
2	XXXX	<p>Four numbers specifying the constant torque power rating kW. For quadratic torque see Chapter 11: "Technical Specification" - Electrical Ratings - Power Circuit (quadratic torque). Horsepower ratings below as specified within NEC/NFPA-70.</p> <p>0900= 90kW @ 380V (150hp @ 460V)            1100=110kW @ 380V (150hp @ 460V)            1320=132kW @ 380V (200hp @ 460V)            1600=160kW @ 380V (250hp @ 460V)            1800=180kW @ 380V (300hp @ 460V)            2000=200kW @ 380V (300hp @ 460V)            2200 = 220kW @ 380V (350hp @ 460V)            2500=250kW @ 380V (400hp @ 460V)            2800=280kW @ 380V (450hp @ 460V)            3150 = 315kW @ 380V (450hp @ 460V)</p>
3	XXX	<p>Three numbers specifying the nominal input voltage rating:            400 380 to 460V (<math>\pm 10\%</math>) 50/60Hz</p>
4	XXXX	<p>Four digits specifying the mechanical package including livery and mechanical package style:</p> <p>First two digits Livery            00 Standard Eurotherm Drives livery            01-99 Defined customer liveries</p> <p>Third digit Mechanical packaging style            1 Standard (IP2X), protected panel mounting (terminals:: IP00)</p> <p>Fourth digit Operator Station            1 Standard product (must be 1) - 5841 Operator station fitted</p>
9	XXX	<p>Three digits specifying the cooling fan auxiliary supply:</p> <p>115 115V fan option supplied.            230 230V fan option supplied.</p>

# 2-4 An Overview of the Inverter

## Functional Overview

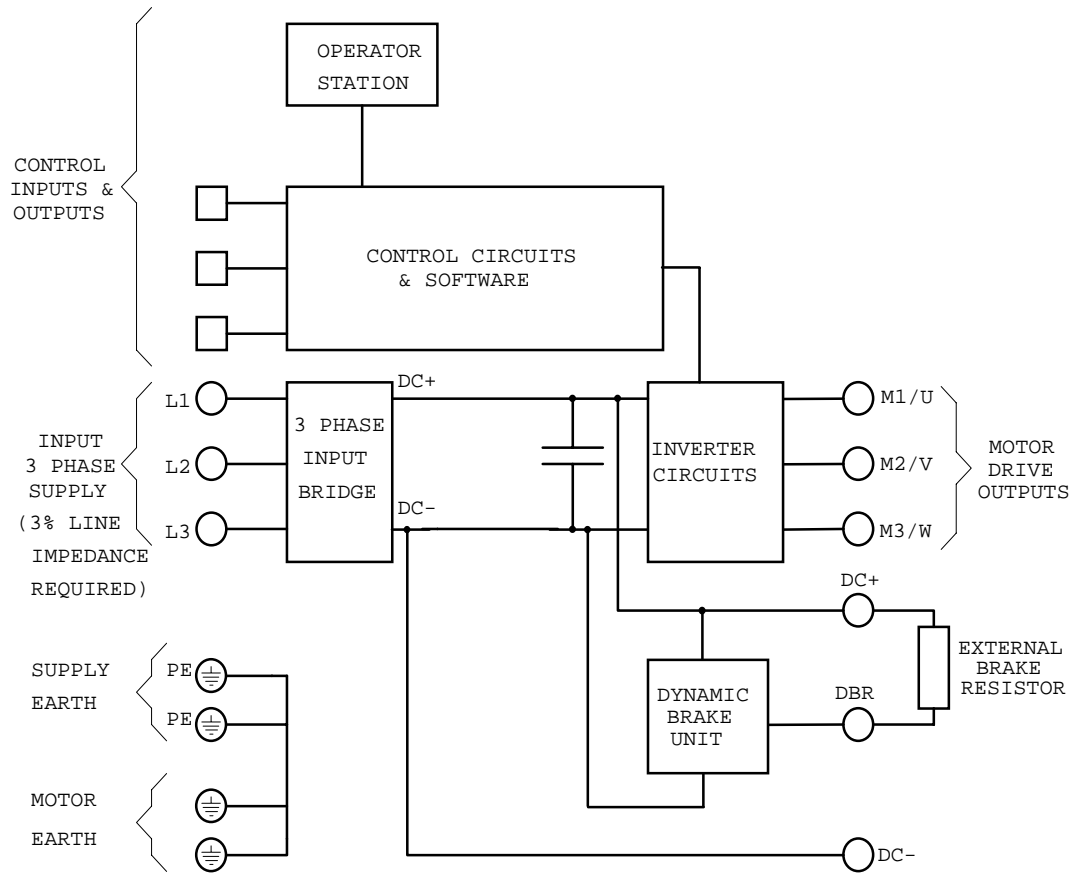


Figure 2-2 584SV High Power AC (Types 8, 9 and 10) simplified block diagram

# INSTALLING THE INVERTER

## Requirements for UL Compliance

### Solid State Motor Overload Protection

The 584SV Type 8, 9 and 10 Series provide Class 10 Motor Overload Protection. The maximum internal overload protection level (current limit) is 150% for 60 seconds for Model 584SV Series (Industrial Ratings) and 110% for 10 seconds for Model 584SV Series (HVAC Ratings).

The Motor Overload Protection provided is programmable. Refer to the 584SV Series Product Manual HA463617 Chapter 8: Programming Your Application - CURRENT LIMIT for user adjustment information describing the MOTOR I LIMIT and REGEN I LIMIT parameters.

### Motor Base Frequency

The motor Base Frequency rating is 480 Hz maximum.

### Field Grounding Terminals

The International Grounding Symbol  $\oplus$  (IEC Publication 417, Symbol 5019) is used to designate the field grounding terminals. Refer to 584SV Types 8, 9 & 10 Terminal Connections, page 3-13.

### Field Wiring Terminal Markings

For correct field wiring connections that are to be made to each terminal, refer to 584SV Types 8, 9 & 10 Terminal Connections, page 3-13.

### Field Wiring Temperature Rating

Use 75°C minimum Copper Conductors only.

### Terminal Tightening Torque

#### Power and Control Terminals

For the correct value of tightening torque, refer to Chapter 11: "Technical Specifications" - Mechanical Details.

#### Auxiliary (Fan Supply) Terminals

The tightening torque for the auxiliary terminals is 0.56 - 0.79Nm (5 -7 lbf-in) maximum.

#### Auxiliary (Fan Supply) Terminals

The auxiliary terminals accept a maximum conductor size of No. 10AWG (5.3mm<sup>2</sup>).

### Solid State Short Circuit Protection

These devices are provided with Solid-State Short-Circuit (output) Protection. Branch circuit fusing requirements must be in accordance with the latest edition of the National Electrical Code NEC/NFPA-70.

### Short Circuit Rating

Suitable for use on a circuit capable of delivering not more than 100000 RMS Symmetrical Amperes, 460V maximum.

### Fuse Replacement Information

The fuses provided on the Switch Mode Power Supply Printed Wiring Board (see page 8-2) must be replaced with those manufactured by Bussmann, Type HVR, or equivalent, rated 2A, 1000V dc. Refer to Figure 8.5 in Chapter 8.

## 3-2 Installing the Inverter

The fuses provided on Line Suppression Printed Wiring Board (AH389192) must be replaced with those manufactured by Bussman, Type KTK-10, or equivalent, rated 10A, 600V. Refer to Figure 9.3, Chapter 9.

### Mechanical Installation

#### Lifting the Inverter

The Inverter is supplied with four lifting eye bolts for hoisting. These are fitted to the four PE/grounding locations on the sides of the Inverter.

Types 8 & 9 may also be set on end for installation by forklift. Type 10 can also be placed onto forklift blades, carefully avoiding the fan mounting studs and fan power terminals on the bottom of the drive (with the fan removed - the fan is shipped separately).

**IMPORTANT:** Under no circumstances should the drive be lifted by its power terminals.

#### Mounting Details

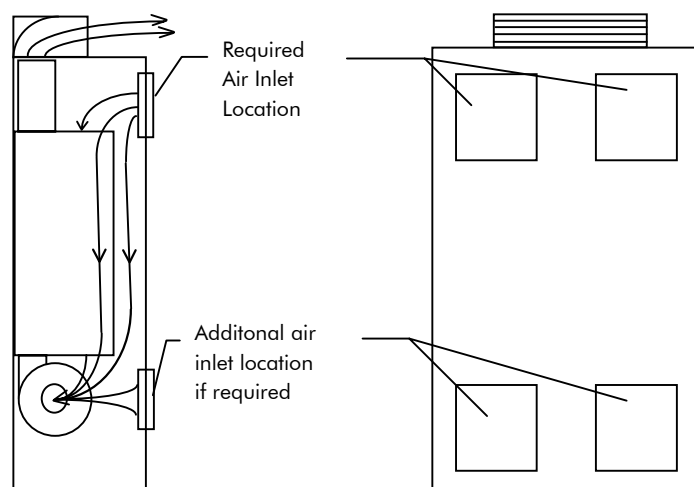
##### Ventilation

The 584SV Types 8, 9 and 10 use very large airflows. They are designed for specific airflow patterns within a cabinet.

Generally, it is intended that the bulk of the air comes into the cabinet at the top and flows down (some going through the drive to maintain internal temperatures) into the main cooling fan, through the drive, the brake/exhaust duct (supplied), and finally out the top of the cabinet through the vent assembly (supplied).

This flow pattern ensures that the top of the cabinet is effectively evacuated, and the inside of the Inverter is cooled by fresh air. The brake/exhaust duct allows for field installation of a braking module. It gives clearance for inlet air to come from the front of the cabinet into the top of the Inverter and down; it is strongly recommended that this is fitted with the Inverter, whether or not a brake is fitted. It is also important that the top vent is properly fitted to ensure that exhaust air is not recirculated (see Figure 3-1 below). Refer to the drawings at the back of this book for typical cubicle layout information.

We recommend that these Inverters are separated from other equipment in a large multifunction cabinet so that airflow is better controlled. i.e. air heated by other items will not affect the inlet temperature to the Inverter's main fan.



**Figure 3-1 Standard Product showing Recommended Air Flow**

Position the cabinet carefully to allow sufficient space in front of the cabinet to keep exhaust air and inlet air separated. If there is not sufficient space, you must redirect the exhaust air.

The drives dissipate substantial heat (see Chapter 11: "Technical Specification" - Electrical Ratings - Power Circuit for approximate heat loss) and therefore sufficient volume for exhaust

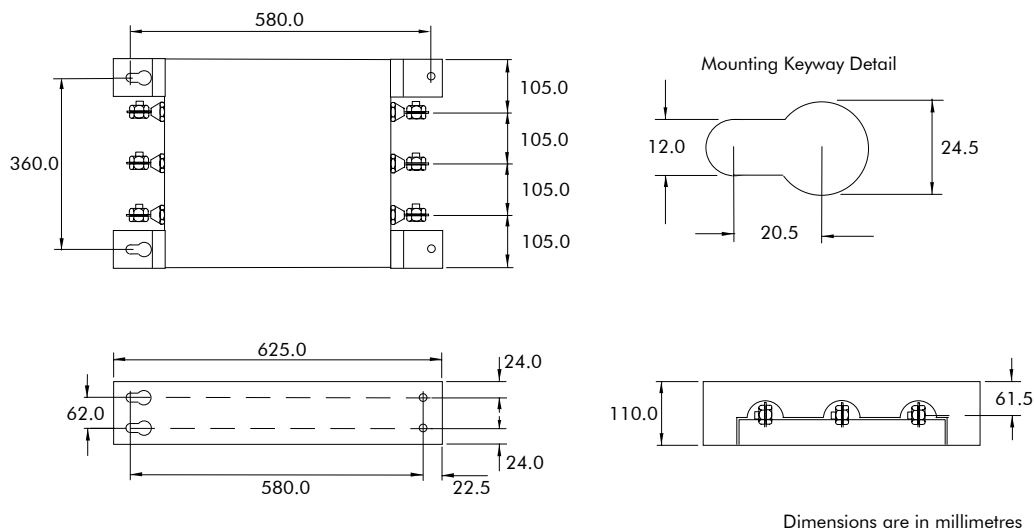


venting is required to keep the drive from raising the operating temperature beyond that specified, refer to Chapter 11: “Technical Specification” - Environmental Details.

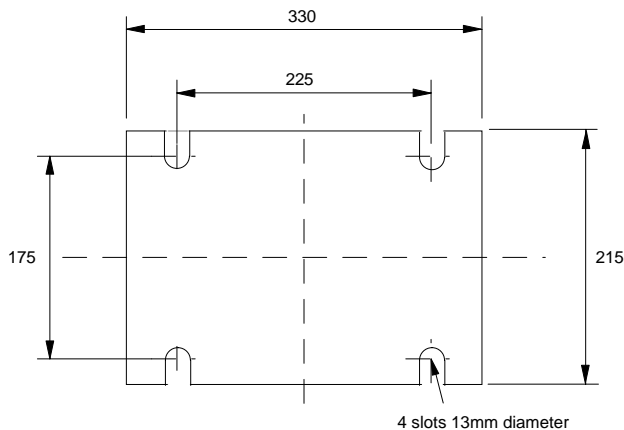
## Optional Equipment

### Fitting the AC Supply Filter and AC Line Choke

The 584SV Type 8, 9 and 10 Inverters can be supplied with filters to meet the ‘industrial’ Class A conducted emission limits of EN55011 when used with the specified 3% minimum AC line choke. Refer to Chapter 11: “Technical Specifications “ - External AC Supply (RFI) Filters and AC Line Chokes.



**Figure 3-2 AC Supply Filter CO464517**



**Figure 3-3 Fixing Details for the AC Line Choke**

Part No.	RMS Current(A)	Inductance (μH)	Rating (kW)	Use with 584SV Inverter Type	Weight (kg)
CO389936U201	308	75	132	8	70
CO389936U202	490	50	200	9	95
CO389936U203	620	35	280	10	95

**Note:** Refer to the Choke Outline Drawing at the back of this book for further information.

## 3-4 Installing the Inverter

### Cubicle-Mounting the Type 8 Inverter with Filter and AC Line Choke

The Inverter must be mounted vertically on a solid, flat, vertical surface within the cubicle. When mounting a single Inverter in a cubicle, position the EMC filter as close as possible to the incoming ac supply. The specified choke must be fitted between the Inverter and filter to ensure the reliability of both the filter and Inverter.

1. Mount the filter securely at the four fixing points.
2. Mount the Inverter next to the filter, allowing for the required airgap between the Inverter, the filter and adjacent equipment.

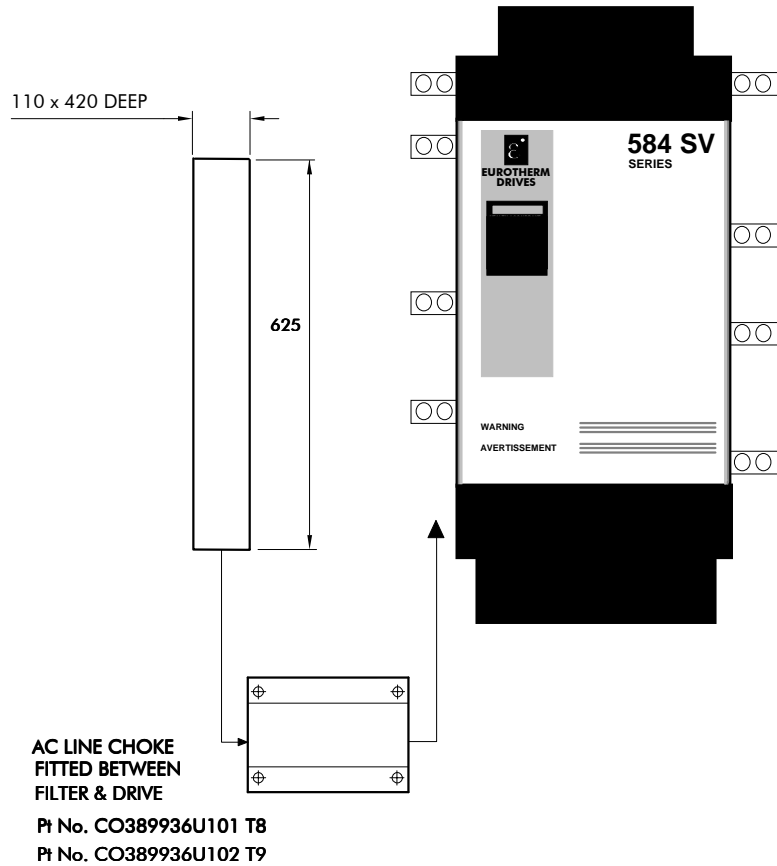


Figure 3-4 Mounting Details for Type 8, Filter Part No. CO464517

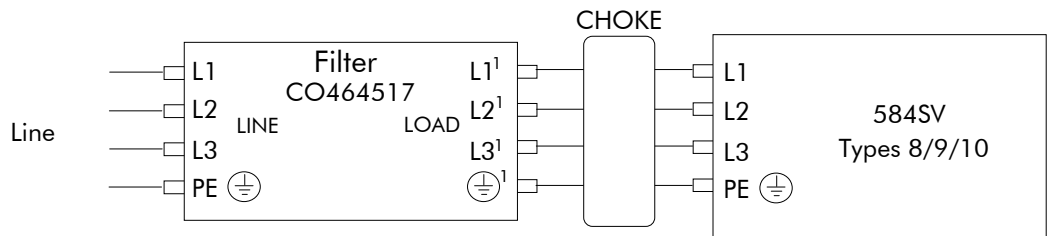


Figure 3-5 Wiring Details for Type 8, Filter Part No. CO464517

### Cubicle-Mounting the Types 9 & 10 Inverter with Filter and AC Line Choke

The Inverter must be mounted vertically on a solid, flat, vertical surface within the cubicle. When mounting a single Inverter in a cubicle, position the EMC filters as close as possible to the incoming ac supply. The specified choke must be fitted between the Inverter and filters to ensure the reliability of both the filters and Inverter.

1. Mount the filter securely at the four fixing points.
2. Mount the Inverter next to the filter, allowing for the required airgap between the Inverter, the filter and adjacent equipment.

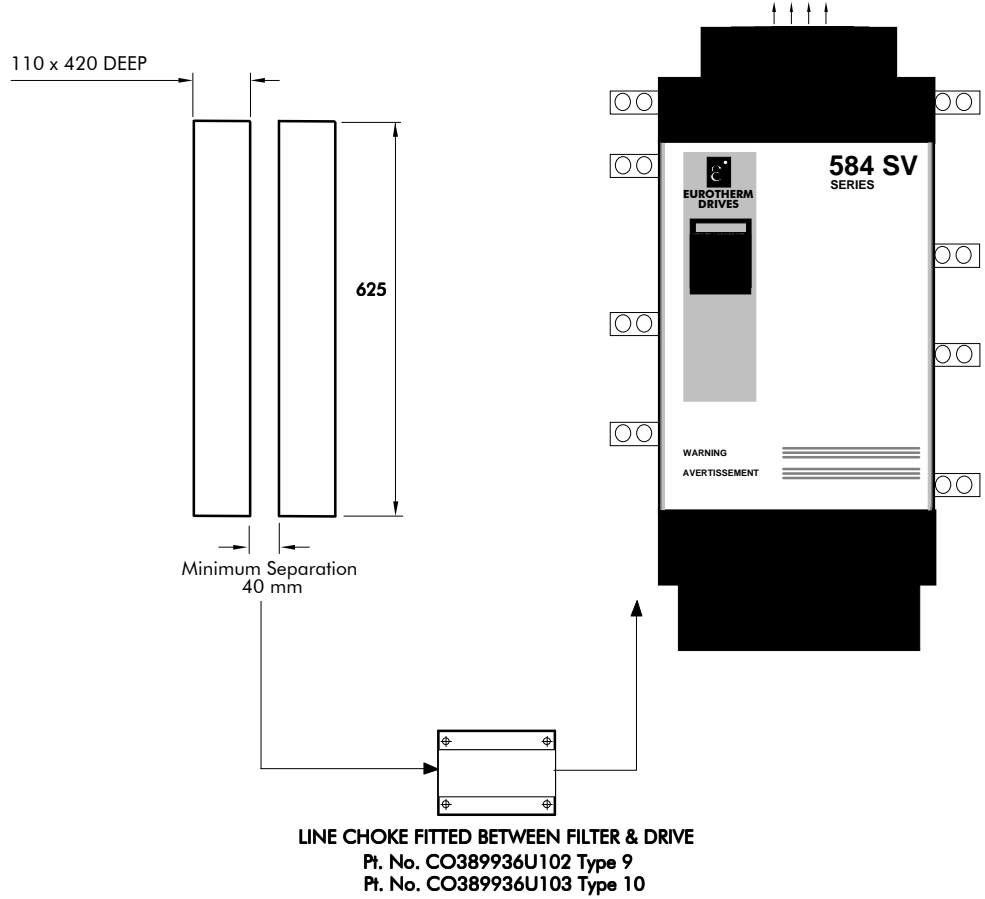


Figure 3-6 Mounting Details for Type 9 & 10, Filter Part No. CO464517

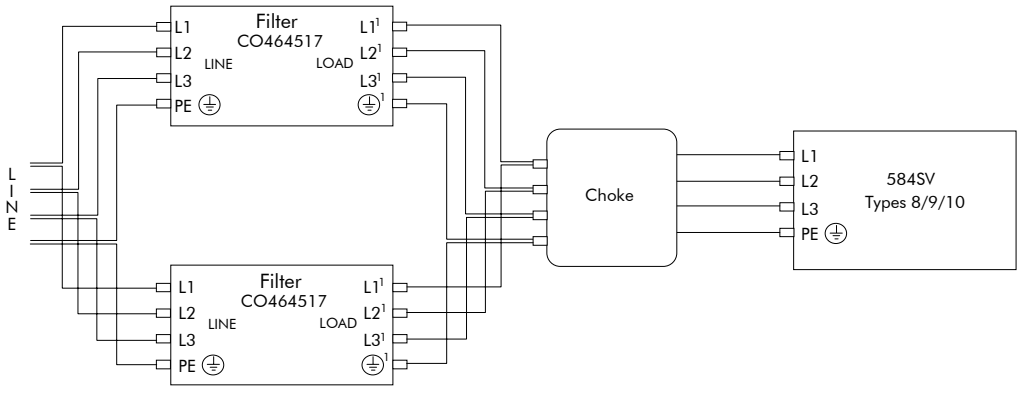


Figure 3-7 Wiring Diagram for Type 9 & 10, Filter Part No. CO464517

## 3-6 Installing the Inverter

### Fitting the Top Vent and Gasket

#### WARNING!

It is very important that the gasket for the vent is correctly fitted to the exhaust/brake outlet duct, otherwise hot exhaust air will flow back into the cabinet and overheat the drive. The brake/exhaust outlet duct should protrude from the top of the cabinet by 5-10mm to ensure engagement with the gasket.

See the drawings at the back of this book (HG463010 G 001, 002 or 003).

This assembly provides IP22 protection for the drive when fitted properly. The main function is to seal the path of return air to the enclosure as well as protect against falling contaminants. The same assembly is used for the Types 8, 9, and 10. The different sizes are accommodated by removal of the gasket inserts.

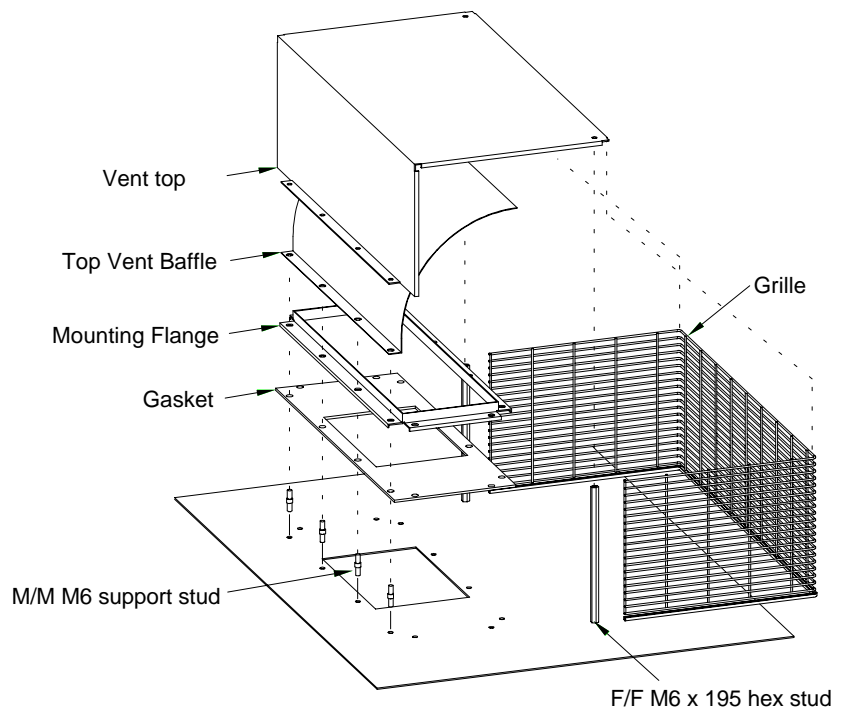


Figure 3-8 Top Vent and Gasket Assembly

Description	Qty.	Description	Qty.
Vent top	1	M6 x 195 hex studs	2
Top vent baffle	1	Grille	1
Mounting flange	1	M6 x 25 panhead slotted screws	8
Gasket	1	M6 flat washers	8
M6 support studs	4	M6 hex captive nuts	20

Table 3-1 Parts Supplied for Fitting of Top Vent

## Assembly Procedure

**Note:** Refer to Figure 3-8 Top Vent and Gasket Assembly.

### Tools Required:

10mm socket and wrench, quantity 2

No. 3 Posidrive screwdriver

10mm (3/8") flat blade screwdriver

- For cabinets with removable panels, perform the following procedure off the cabinet.
- For cabinets without removable panels, this procedure should be performed prior to mounting the drive.

**Note:** If the drive is not removed, then it must be protected from any cutting chips.

1. Cut the top of the cabinet as per drawing HG463010 G 001, 002, or 003.
2. Install (4) M/M M6 support studs in rearmost row of holes in pattern
3. Install (2) F/F M6 x 195 hex studs in forward most holes with (2) M6 x 10 posidrive screws

**Note:** The following should be done with the drive and exhaust duct fitted to ensure good fit of gasket to duct.

4. Fit the gasket over the four support studs and exhaust duct.
5. Fit the mounting flange over the gasket and attach using (8) M6 x 25 screws, (16) M6 washers, and (8) M6 nuts.
6. Fit the top vent baffle over the support studs.
7. Fit grommet strip to bottom edge of grill and position.
8. Fit vent top over the four support studs and grill.
9. Fix vent top via (2) M6 x 10 screws (using a 10mm wrench on the hex studs through the grill is helpful in aligning the stud to the hole in the top) and (4) M6 nuts and washers.

## Fitting the Remote 5841 Operator Station

The 584SV Type 8, 9 & 10 Inverters allow the use of an additional remote-mounted Operator Station. It replaces the drive-mounted Operator Station. The two cannot be operated simultaneously. The Remote Operator Station is connected to the RS232 programming port using a 3 metre, 4-way cable.

**Note:** The 5841 Operator Station requires the 5842 Panel Mounting Kit.

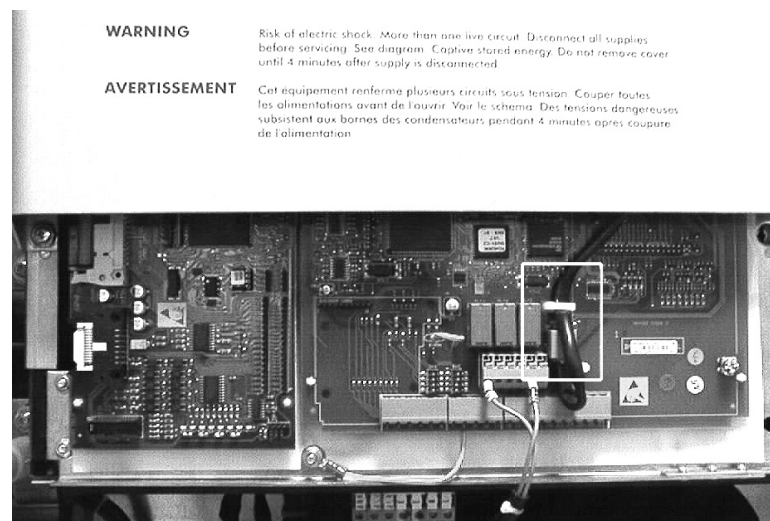


Figure 3-9 Inverter showing the RS232 programming port

## 3-8 Installing the Inverter

### 5842 Mounting Kit Parts

Qty.	Description
1	Gasket for remote Operator Station
1	4-Way cable assembly for remote Operator Station
1	Operator station retaining moulding
4	Screw No. 6 x 12mm

### Tools Required

No. 2 Posidrive screwdriver.

### Assembly Procedure

1. Select the location for the remotely-mounted Operator Station and drill the four mounting holes.
2. Cut out the cable aperture.
3. Peel backing from gasket and attach to the panel.
4. Place the Operator Station into the retaining moulding and screw to the panel.
5. Remove the drive-mounted Operator Station cable from the RS232 programming port (P3) on the Control Board PCB. The removed cable and connector are insulated and can be safely left in-situ. Connect the supplied cable (either end) to the P3 port on the Control Board PCB.
6. Route the cable from the Inverter to the remotely-mounted Operator Station and secure, ensuring that adequate protection from live parts and abrasion is achieved.
7. Finally, connect the free end to the remotely-mounted Operator Station.

### Cutout Dimensions

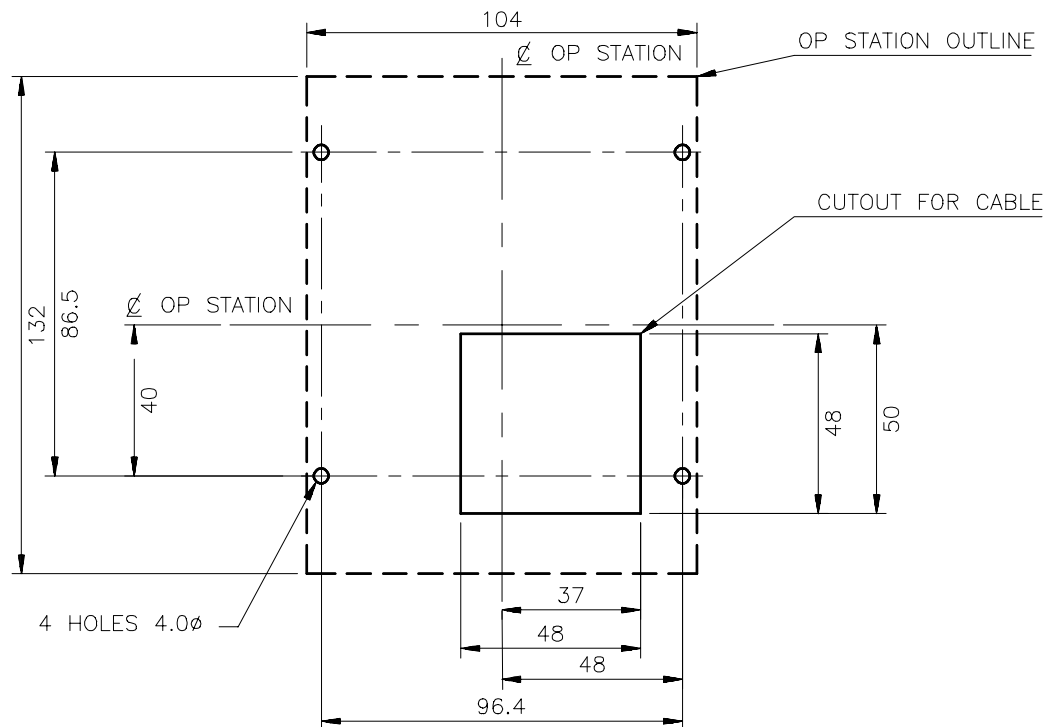


Figure 3-10 Mounting Dimensions for the Remote-Mounted Operator Station 5841

## Inverter Brake Unit Installation Guidelines

The Type 8, 9 and 10 brake units are optional. However, it is possible to retro-fit a brake unit should the need arise.

There are three brake units, one for each drive frame size. The brake unit is shipped with an exhaust brake duct. The original exhaust duct supplied with the Inverter or the exhaust duct supplied with the brake unit may be used in the final installation.

The brake unit consists of the following parts (see Figure 3-11):

- Exhaust duct
- Heatsink & IGBT assembly
- Control cable
- Brake connection plates - 1 set for Type 8 & 9 and 2 sets for Type 10
- Snubber capacitors and screws
- Heatsink fixings
- Brake unit cover and retaining nuts
- Earth bonding bracket

The brake unit is shipped in a pre-assembled state (except for the connection plate(s)). We recommend that this assembly is carefully studied prior to installation within the cubicle. It is also recommended that the brake unit heatsink/IGBT assembly is removed from the exhaust duct before installing the unit within the cubicle.

### Required Tools

- 10mm spanner
- No. 3 Posidrive torque screwdriver
- No. 2 Posidrive torque screwdriver

### Installation Procedure

#### **WARNING!**

Follow this procedure carefully.

Disconnect all electrical supplies before working on the Inverter. Allow 15 minutes for the Inverter's dc link capacitors to discharge fully.

Be careful not to drop any screws, nuts etc. into the the Inverter.

**Note:** See Figure 3-12 and Figure 3-13 for a typical brake unit installation.

1. Remove the brake unit cover.
2. Remove the snubber capacitors from the brake unit IGBT module.
3. Remove the earth bonding bracket from the heatsink.
4. Loosen heatsink clamps and rotate out of the way. Remove the heatsink/IGBT assembly from the shipping brake duct and carefully place on a clear flat surface - take care not to damage the heatsink fins.
5. *If retro-fitting the brake unit to an existing exhaust duct, remove the existing exhaust duct aperture cover and screws. Transfer the heatsink clamps, washer, bolts and springs from the shipping brake duct to your existing drive duct.*
6. Undo the two, quarter-turn fasteners on the top of the Inverter casing and remove the front top cover (plastic).

## 3-10 Installing the Inverter

7. Undo the six M5 screws (four on the side, two on the top) holding the Inverter top cover. Remove the cover carefully to prevent it from falling into the drive and damaging internal components.
8. *If retro-fitting the brake unit to an existing exhaust duct, install the brake unit IGBT/heatsink assembly within the exhaust duct and tighten the heatsink clamps.*
9. Offer the exhaust duct/brake unit to the Inverter. Connect the brake unit control cable to the 14-way bulkhead connector in the top of the Inverter.
10. Fit the brake connection plate(s) to the phase joining tabs of the Inverter top phase (M3/U) using the M6 screws provided (finger tight only). Do this by placing the end of the connection plate(s) with the threaded tabs under (behind) the phase joining tabs.
11. Fit the snubber capacitors (fit 2 on Type 8, 3 on Type 9, 4 on Type 10) over the brake connection plate(s) to the IGBT using M6 screws (finger tight only).
12. Tighten all M6 screws on the brake connection plate(s) to 5Nm (3.7 ft-lb).
13. Screw the earth bonding bracket to the heatsink, and fit the two M5 duct connection screws to the exhaust duct, of which one is earth bonding. Tighten to 4Nm (3 ft-lb). **NOTE - This connection MUST NOT be omitted as it is required for safety reasons.**
14. Replace the Inverter's top cover. **Take care not to damage the brake connection plates with the top cover as this will compromise the electrical insulation.** Tighten the four M5 screws on the side of the Inverter and the two M5 screws on the top of cover to 2.5Nm (1.84 ft-lb).
15. Replace the front top cover (plastic) and tighten the two, quarter-turn fasteners to hold it in place.
16. Fit the brake unit cover using the M6 captive washer nuts.

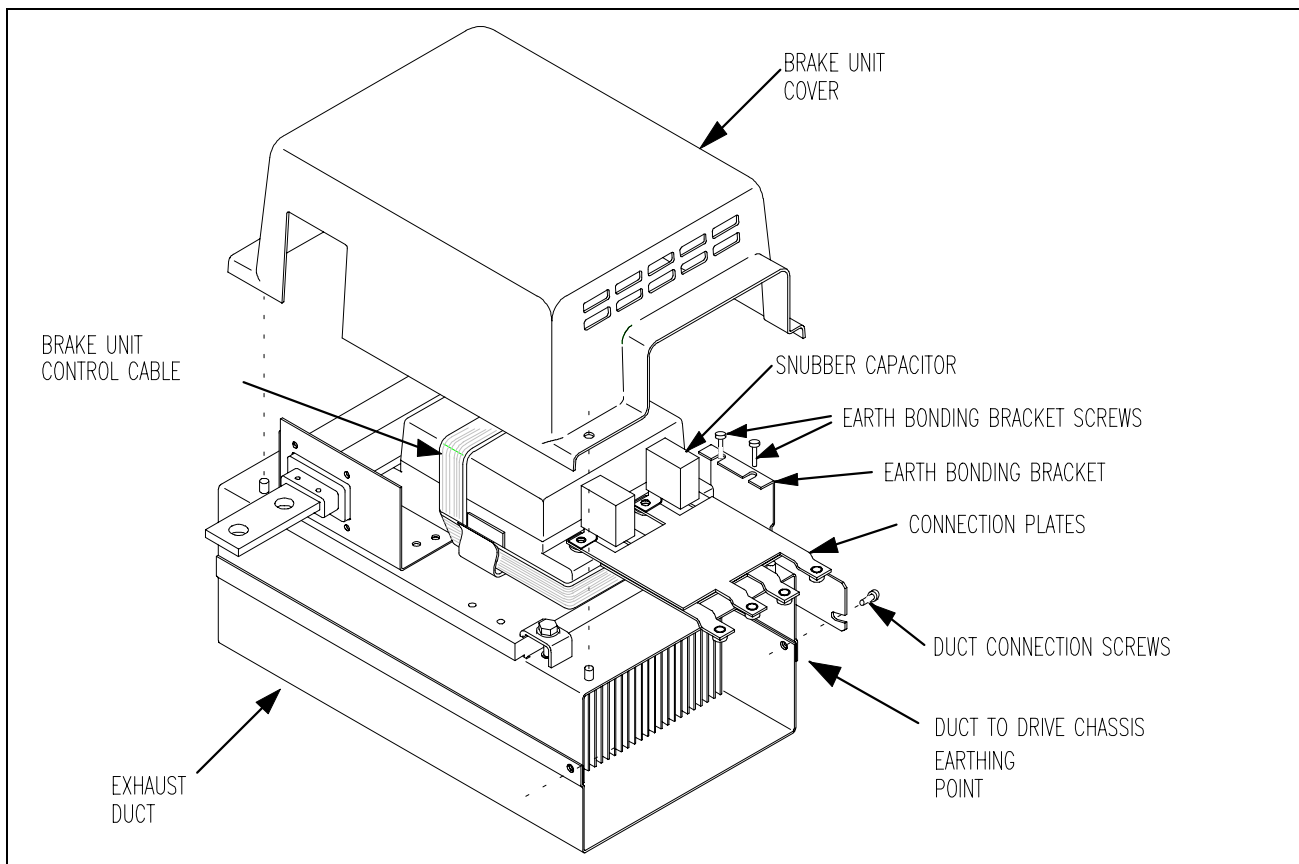
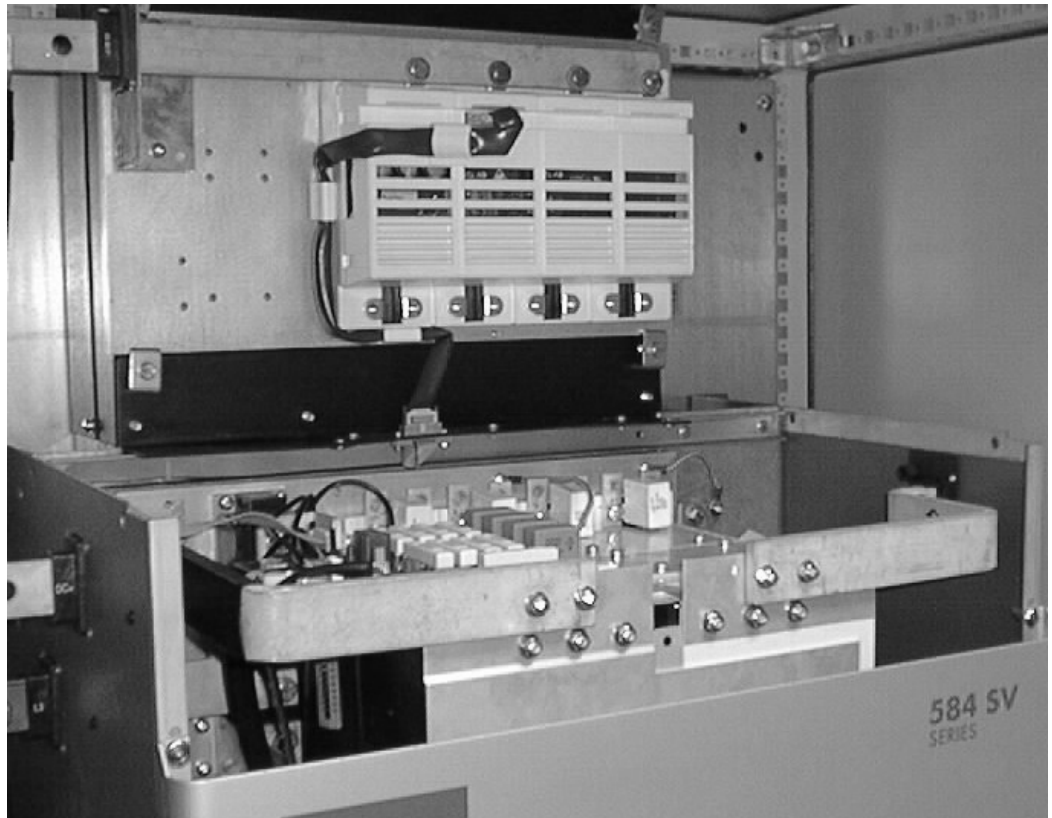


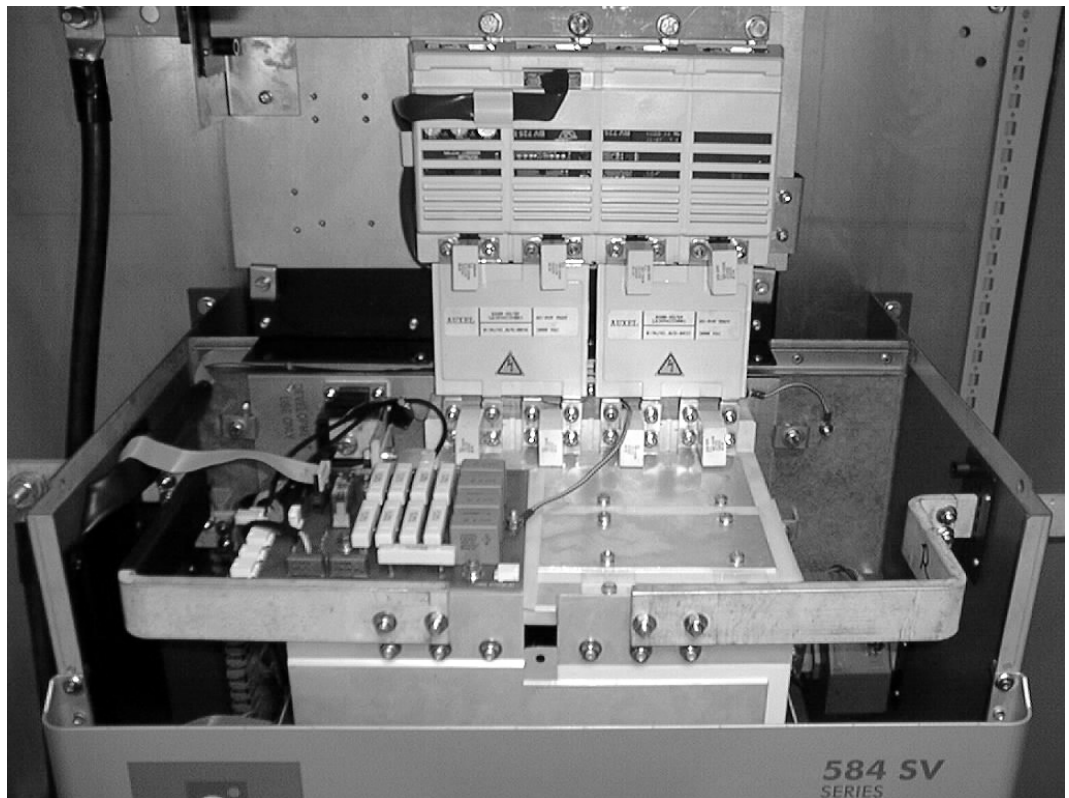
Figure 3-11 Exploded diagram of Brake Unit (Type 8 illustrated)



**Figure 3-12 View without Brake Connecting Plate(s) showing the Control Cable connection between the Brake Unit and the Inverter**



**Figure 3-13 Top View of Exhaust Duct/Brake Unit/Inverter Assembly showing the Brake Connecting Plate(s) and Snubber Capacitors fitted**



## Electrical Installation

### Wiring the Inverter

#### Power Wiring Connections

#### **WARNING!**

Ensure that all wiring is electrically isolated and cannot be made "live" unintentionally by other personnel.

**Note:** Refer to Chapter 11: "Technical Specifications" for additional Cabling Requirements and Terminal Block Wire Sizes.

**IMPORTANT:** Make supply/motor PE ground connections using the M10 bolts and washers provided (under no circumstances should lifting eyes be used to make connection). Position the ground lug between the washer and M10 bolt head.

#### Power Wiring Terminations

UL Compression Lug Kits are available for the following Inverter ratings. These lugs must be applied with the correct tooling as described in the Installation Instructions provided with each Lug Kit.

Constant Torque	Quadratic Torque	Kit No.	Lug Size	AMP Part No.
150 Hp	-	LA463403	# 1/0 AWG (53.5mm <sup>2</sup> )	36919
200 Hp	-	LA463404	# 2/0 AWG (67.4mm <sup>2</sup> )	321873
250 Hp	-	LA463405	# 3/0 AWG (85.0mm <sup>2</sup> )	321877
300 Hp	-	LA463406	# 250MCM (127.0mm <sup>2</sup> )	322254
350Hp	-	LA463407	# 300MCM (152.0mm <sup>2</sup> )	322259
400 Hp	-	LA463408	# 350MCM (177.0mm <sup>2</sup> )	322259
450 Hp	-	LA463409	# 500MCM (253.0mm <sup>2</sup> )	322269
			# 400MCM (203.0mm <sup>2</sup> )	322264
-	150 Hp	LA463403	# 1/0 AWG (53.5mm <sup>2</sup> )	36919
-	200 Hp	LA463404	# 2/0 AWG (67.4mm <sup>2</sup> )	321873
-	250 Hp	LA463405	# 3/0 AWG (85.0mm <sup>2</sup> )	321877
-	300 Hp	LA463406	# 250MCM (127.0mm <sup>2</sup> )	322254
-	350 Hp	LA463407	# 300MCM (152.0mm <sup>2</sup> )	322259
-	400 Hp	LA463408	# 350MCM (177.0mm <sup>2</sup> )	322259
-	450 Hp	LA463410	# 500MCM (253.0mm <sup>2</sup> )	322269
-	500 Hp	LA463411	# 600MCM (304.0mm <sup>2</sup> )	322269
			# 500MCM (253.0mm <sup>2</sup> )	322269

## 584SV Types 8, 9 & 10 Terminal Connections

Terminals are provided for both the power connections and the control connections to allow reliable interface connections with external devices. The function of these terminals is described in the Product Manual.

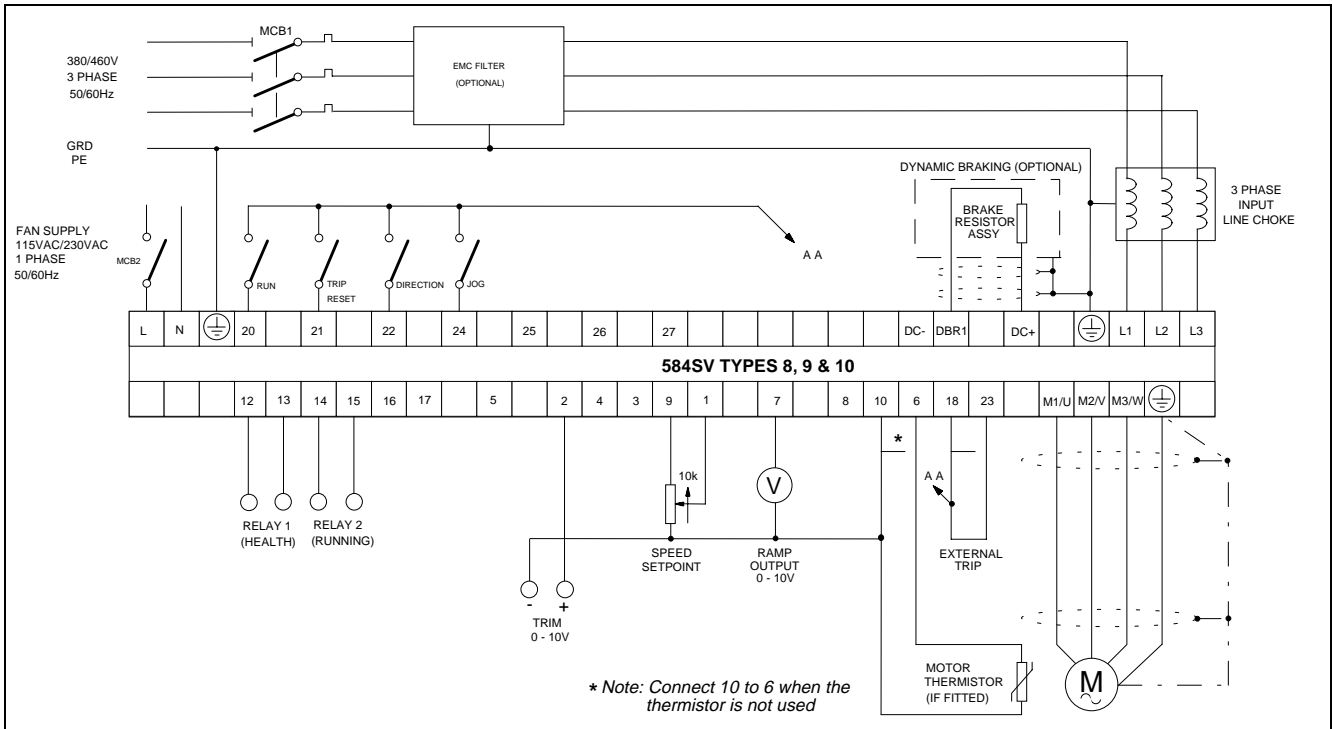


Figure 3-14 General Wiring Diagram for Macro 1 - 584SV Types 8, 9 & 10

## Optional Equipment Installation Details

### AC Supply Filter and AC Line Choke

#### WARNING!

The Filter must only be used with a **permanent earth connection**.

The recommended filters are only for use with earth referenced supplies (TN). On sites where the supply is non-earth referenced, contact Eurotherm Drives for information.

The filters contain large capacitors phase-to-phase and phase-to-earth. Do not touch filters, terminals or wiring for a period of 5 minutes after removing the ac supply. **Not adhering to this warning can result in electric shock.**

#### Connection Details

The connection between the Inverter, filter and choke must always be as short as possible and **be segregated from all other cables**. Take care not to obstruct any ventilation spacing.

If this cable/busbar exceeds 1.0m in length it must be replaced with a screened/armoured cable. The screen/armour must be earthed at the filter, choke and Inverter ends with large-area contact surfaces, preferably with metal cable glands.

The connections between the Inverter and motor **must be segregated from all other cables or wires**. Ideally, mount the filter and choke onto the same metallic panel as the Inverter.

Refer to the main Product Manual for "Earthing Details" and "Operating Conditions".

## 3-14 Installing the Inverter

# TRIPS AND FAULT FINDING

## Trips

### What Happens when a Trip Occurs

#### Inverter Indications

In addition to the diagnostics provided by the Operator Station, eight fault LEDs are situated on the Power Control Board to provide an indication for the cause of fault trips. The fault LEDs are visible when the bottom terminal cover is removed - refer to Figure 2-1.

Fault	Illuminated LED's							
M1 phase overcurrent	8							1
M2 phase overcurrent	8						2	
M3 phase overcurrent	8					3		
M1 phase IGBT fault alarm				5				1
M2 phase IGBT fault alarm				5			2	
M3 phase IGBT fault alarm				5		3		
DB unit IGBT fault alarm				5	4			
M1 phase IGBT over-temperature			6					1
M2 phase IGBT over-temperature			6				2	
M3 phase IGBT over-temperature			6			3		
DB unit IGBT over-temperature			6		4			
L1 thermostat over-temperature		7						1
L2 thermostat over-temperature		7					2	
L3 thermostat over-temperature		7				3		
AC supply fail	8							
Output current imbalance			6	5				
CAL board not fitted	8	7	6	5				
Internal supply fail	8	7						
FPGA not programmed	8	7	6	5	4	3	2	1

Figure 7-1 LED Fault Indications

## Fault Finding

Fault	Remedy
M1 phase overcurrent	Output current greater than trip level. Check output wiring and motor for insulation breakdown or short-circuits either between phases or between phase and earth.
M2 phase overcurrent	
M3 phase overcurrent	
M1 phase IGBT fault alarm	Excessive output current.
M2 phase IGBT fault alarm	
M3 phase IGBT fault alarm	
DB unit IGBT fault alarm	Check wiring and verify value of brake resistor.
M1 phase IGBT over-temperature	Maximum IGBT junction temperature exceeded.
M2 phase IGBT over-temperature	
M3 phase IGBT over-temperature	

## 7-2 Trips and Fault Finding

Fault	Remedy
DB unit IGBT over-temperature	Clean or replace cubicle inlet air filters.
L1 thermostat over-temperature	Maximum input bridge temperature exceeded. Check that motor load is within drive rating. Check value of AC line choke. Maximum internal temperature exceeded. Check that all fans are operational.
L2 thermostat over-temperature	
L3 thermostat over-temperature	
AC supply fail	One or more supply phases missing - check supply wiring.
Output current imbalance	Check wiring to motor and motor itself for earth faults.
CAL board not fitted	Internal fault - consult supplier
Internal supply fail	Internal fault - consult supplier
FPGA not programmed	Internal fault - consult supplier

**Figure 7-2 Fault Finding**

# ROUTINE MAINTENANCE AND REPAIR

## Routine Maintenance

Periodically inspect the Inverter for build-up of dust or obstructions that may affect ventilation of the unit. Remove this using dry air.

## Spares Information

Eurotherm Drives are able to provide guidance regarding the necessary component part to be replaced.

## Electro-Mechanical Parts

The following items are product/kW rating dependant.

Inverter	Main Cooling Fan		Motor Start Capacitor for Main Cooling Fan		Internal Extractor Fan (2 required - Type 10 only)	
	Fan Voltage		Fan Voltage		Fan Voltage	
	115V	230V	115V	230V	115V	230V
Type 8	DL389775	DL464085	CY389841	CY464087	-	-
Type 9	DL389776	DL464086	CY389842	CY464088	-	-
Type 10	DL389776	DL464086	CY389842	CY464088	DL049612	DL049612*

\* 2 fans wired in series for 230V rating

Product Code (Block 2)	Phase Assembly (Drive build standard <200)	Brake Unit Assy (Drive build standard >200)	Phase Assembly (Drive build standard >200)	Brake Unit Assy (Drive build standard >200)
Type 8 - 90kW 110kW/132kW	LA464082U001	LA464083U001	LA464082U100	LA464083U101
	LA464082U001	LA464083U001	LA464082U101	LA464083U101
Type 9	LA464082U002	LA464083U002	LA464082U102	LA464083U102
Type 10	LA464082U003	LA464083U003	LA464082U103	LA464083U103

## Printed Circuit Boards

The printed circuit boards listed below are common to the 584SV Type 8, 9 and 10 series of Inverters.

PCB Description	Part Number (Drive build standard <200)	Part Number (Drive build standard >200)
Power Control PCB	AH389167U001	AH464471U001
Switch Mode Power Supply PCB	AH389166U101	AH464472U101
Line Suppression PCB	AH389192U001	AH464192U001

## 8-2 Routine Maintenance and Repair

### Repair Procedures

The 584SV Types 8, 9 and 10 series of Inverters have been designed to be serviceable units. In the unlikely event of component failure, it is possible to replace the faulty item without having to replace the complete drive unit.

Replacement of components should only be carried out by electrically competent personnel with the knowledge/expertise required to perform the relevant operation, i.e. in order to replace component parts, drive disassembly, rebuild and re-testing is required.

Having identified the faulty component, follow the replacement procedure carefully.

#### **WARNING!**

FAILURE TO FOLLOW PROCEDURE MAY RESULT IN DAMAGE TO THE INVERTER AND POSSIBLE ELECTRICAL SHOCK HAZARD! PERSONNEL PERFORMING COMPONENT REPLACEMENT PROCEDURES MUST BE ELECTRICALLY COMPETENT AND POSSESS THE KNOWLEDGE /EXPERTISE REQUIRED TO PERFORM THE RELEVANT OPERATION.



#### **WARNING!**

BEFORE PERFORMING MAINTENANCE ON THIS UNIT, ENSURE ISOLATION OF THE MAIN SUPPLY TO TERMINALS L1, L2 AND L3.

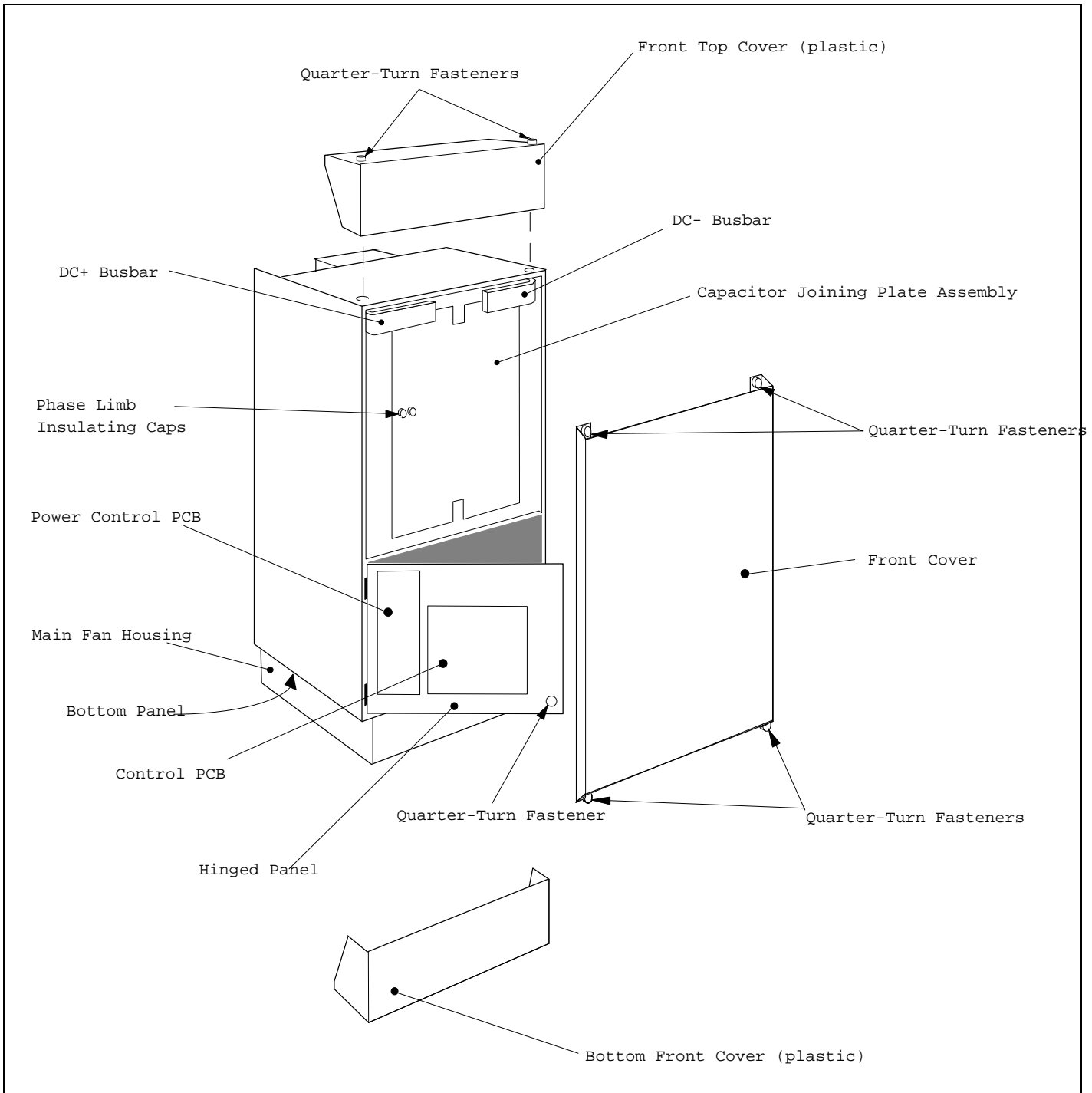
WAIT FOR AT LEAST 5 MINUTES FOR THE DC LINK TERMINALS (DC+ AND DC-) TO DISCHARGE TO SAFE VOLTAGE LEVELS (<50V), FAILURE TO DO SO CONSTITUTES AN ELECTRICAL SHOCK HAZARD.



**Static Sensitive**

This equipment contains electrostatic discharge (ESD) sensitive parts. Observe static control precautions when handling, installing and servicing this product.





**Figure 8-1 Simplified View showing Panels Removed**

## 8-4 Routine Maintenance and Repair

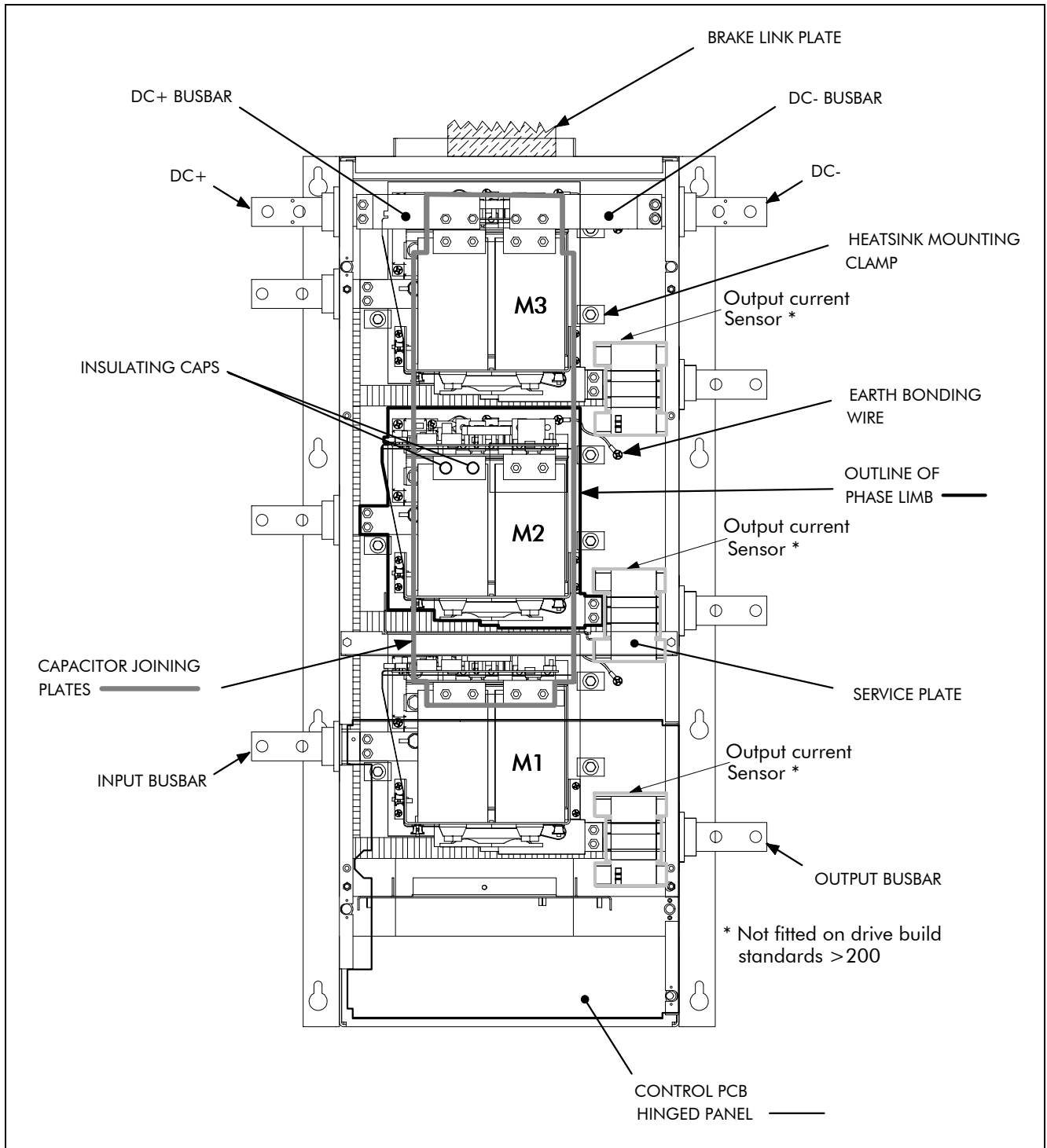


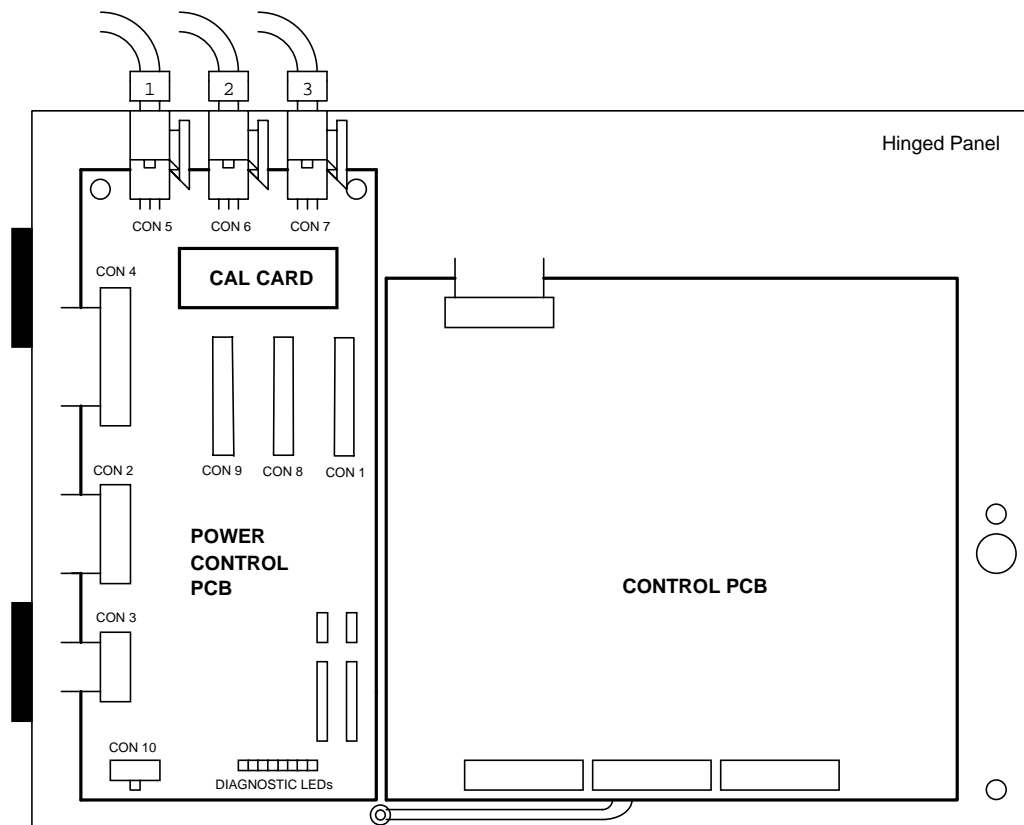
Figure 8-2 Internal Detail Drawing of the Inverter (typical)

## Printed Circuit Board (PCB) Replacement

**IMPORTANT:** Observe all electrical warnings and static handling precautions.

### Power Control PCB and Control PCB (AH464162) Replacement

1. Undo the two, quarter-turn fasteners on the top of the Inverter casing and remove the front top cover (plastic). Repeat the operation on the bottom terminal cover.
2. Disconnect the Operator Station 4-way cable from the P3 port on the Control PCB.
3. Undo the four, quarter-turn fasteners to remove the Inverter's front cover (metal). Take care not to damage PCBs beneath the cover when removing it.
4. You will now see the Power Control PCB, Control PCB and Calibration Card mounted on the front of the hinged panel as shown below.



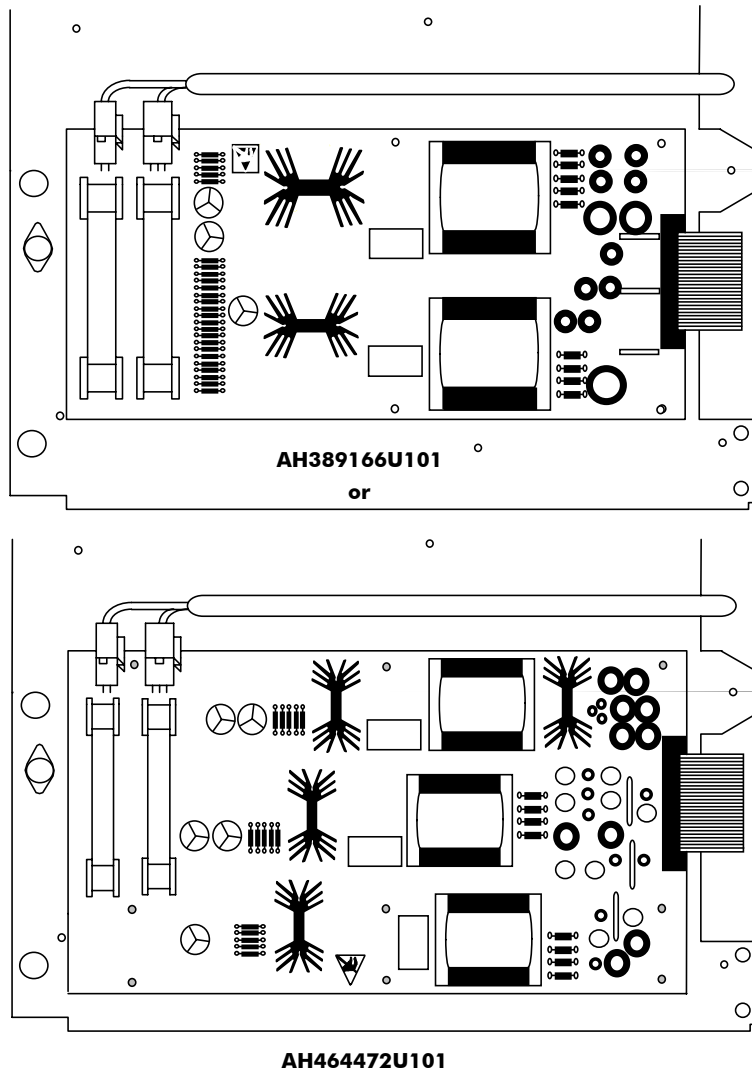
**Figure 8-3 View of Power Control PCB, Control PCB and Calibration Card**

5. Before replacing the PCB take note of how it is connected, ensuring that the new PCB is re-connected correctly.
6. Replace the Inverter's front cover (metal) which is attached using the four, quarter-turn fasteners (take care not to damage PCBs beneath the cover).
7. Re-connect the Operator Station 4-way cable to the P3 port on the Control PCB.
8. Re-fit the Inverter's top cover (plastic) using the two quarter-turn fasteners.
9. Re-fit the Inverter's bottom terminal cover (plastic) using the two quarter-turn fasteners.

## 8-6 Routine Maintenance and Repair

### Switch Mode Power Supply PCB Replacement

1. Undo the two, quarter-turn fasteners on the top of the Inverter casing and remove the front top cover (plastic). Repeat the operation on the bottom terminal cover.
2. Disconnect the Operator Station 4-way cable from the P3 port on the Control PCB.
3. Undo the four, quarter-turn fasteners to remove the Inverter's front cover (metal). Take care not to damage PCBs beneath the cover when removing it.
4. Release the hinged panel using the quarter-turn fastener.
5. The SMPS PCB will be seen on the back of the hinged panel as shown below.

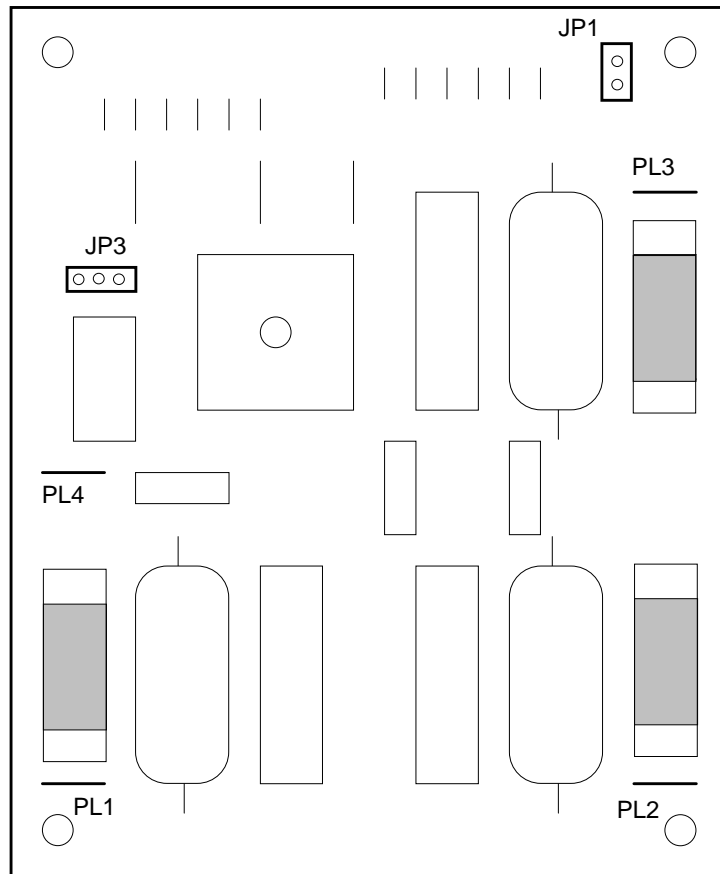


**Figure 8-4 SMPS PCB mounted on the back of the hinged panel**

6. Before replacing the PCB take note of how it is connected, ensuring that PCB is re-connected correctly.
7. Refit the hinged panel, securing in place with the quarter-turn fastener.
8. Replace the Inverter's front cover (metal) which is attached using the four, quarter-turn fasteners (take care not to damage PCBs beneath the cover).
9. Re-connect the Operator Station 4-way cable to the P3 port on the Control PCB.
10. Re-fit the Inverter's top cover (plastic) using the two quarter-turn fasteners.
11. Re-fit the Inverter's bottom terminal cover (plastic) using the two quarter-turn fasteners.

## Line Suppression PCB (AH389192) Replacement

1. Undo the two, quarter-turn fasteners on the top of the Inverter casing and remove the front top cover (plastic). Repeat the operation on the bottom terminal cover.
2. Disconnect the Operator Station 4-way cable from the P3 port on the Control PCB.
3. Undo the four, quarter-turn fasteners to remove the Inverter's front cover (metal). Take care not to damage PCBs beneath the cover when removing it.
4. Release the hinged panel using the quarter-turn fastener.
5. You will now see the Line Suppression PCB inside the Inverter as shown below.



**Figure 8-5 Line Suppression PCB**

6. Before replacing the PCB take note of how it is connected, ensuring that PCB is re-connected correctly.
7. Refit the hinged panel, securing in place with the quarter-turn fastener.
8. Replace the Inverter's front cover (metal) which is attached using the four, quarter-turn fasteners (take care not to damage PCBs beneath the cover).
9. Re-connect the Operator Station 4-way cable to the P3 port on the Control PCB.
10. Re-fit the Inverter's top cover (plastic) using the two quarter-turn fasteners.
11. Re-fit the Inverter's bottom terminal cover (plastic) using the two quarter-turn fasteners.

## 8-8 Routine Maintenance and Repair

### Fan Replacement

**IMPORTANT:** Observe all electrical warnings and static handling precautions.

#### **WARNING!**

When the fan is replaced, ensure that the original wiring loom routing/fixing is preserved. *This is an electrical safety requirement.*

### Inverter Main Cooling Fan and Fan Start Capacitor Replacement (Type 8 & 9)

1. Undo the two, quarter-turn fasteners on the top of the Inverter casing and remove the front top cover (plastic). Repeat the operation on the bottom terminal cover.
2. Disconnect the Operator Station 4-way cable from the P3 port on the Control PCB.
3. Undo the four, quarter-turn fasteners to remove the Inverter's front cover (metal). Take care not to damage PCBs beneath the cover when removing it.
4. Remove the main fan housing.
5. Release the hinged panel using the quarter-turn fastener.
6. Take note of the fan and fan start capacitor wiring. Disconnect the fan and fan start capacitor wiring.
7. Remove the fan mounting and fan start capacitor mounting nuts (it may be easier to remove the capacitor mounted on its bracket, where fitted). Remove the fan and fan start capacitor, taking care not to damage other components within the Inverter.
8. Replace the fan and fan start capacitor taking care not to damage other components within the Inverter. Tighten the mounting nuts.
9. Re-connect fan wiring loom and ensure that electrical safety isolation is preserved, refer to wiring diagram HJ 463151 D 001, Figure 8-6, page 8-10.
10. Re-fit the fan housing.
11. Refit the hinged panel, securing in place with the quarter-turn fastener.
12. Replace the Inverter's front cover (metal) which is attached using the four, quarter-turn fasteners (take care not to damage PCBs beneath the cover).
13. Re-connect the Operator Station 4-way cable to the P3 port on the Control PCB.
14. Re-fit the Inverter's top cover (plastic) using the two quarter-turn fasteners.
15. Re-fit the Inverter's bottom terminal cover (plastic) using the two quarter-turn fasteners.

## Inverter Main Cooling Fan, Internal Extractor Fan and Main Fan Start Capacitor Replacement (Type 10)

In addition to the main cooling fan, the Type 10 Inverter also has two internal 120mm square fans. The main cooling fan, internal extractor fans and main fan start capacitor are mounted on the bottom panel of the drive, refer to drawing HG 463009 G 001 at the back of this book.

### **WARNING!**

When the fan is replaced, ensure that the original wiring loom routing/fixing is preserved. *This is an electrical safety requirement.*

### Replacing the Fan Start Capacitor

1. Disconnect the capacitor wiring (two Faston connectors on the top of the capacitor).
2. Remove the capacitor mounting nuts and replace with the new capacitor. Retighten the mounting nuts.
3. Reconnect the capacitor wiring, taking care not to damage other components within the Inverter.

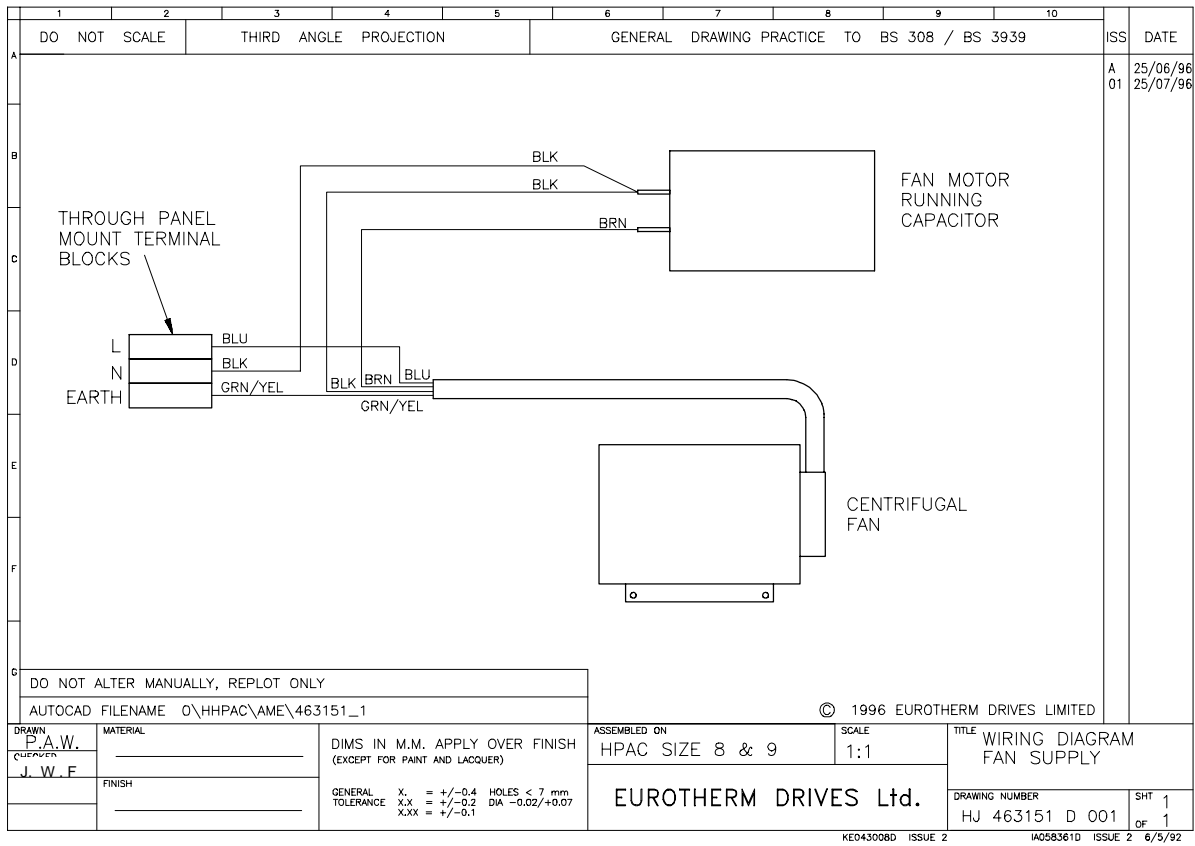
### Replacing the Main Cooling Fan Only

1. Remove the main fan housing.
2. Disconnect the main cooling fan's supply wiring loom at the terminal block on the bottom panel of the Inverter. Note the colour coding of the connections to the terminal block.
3. Undo the fan mounting nuts. Remove the main cooling fan and fan start capacitor, taking care not to damage other components within drive. Replace with the new fan and fan start capacitor. Retighten the mounting nuts.
4. Re-connect the fan wiring loom at the terminal block, ensuring that electrical safety isolation is preserved, refer to wiring diagram HJ 463151 D 001, Figure 8-7, page 8-10.
5. Refit the lower panel assembly to the Inverter.

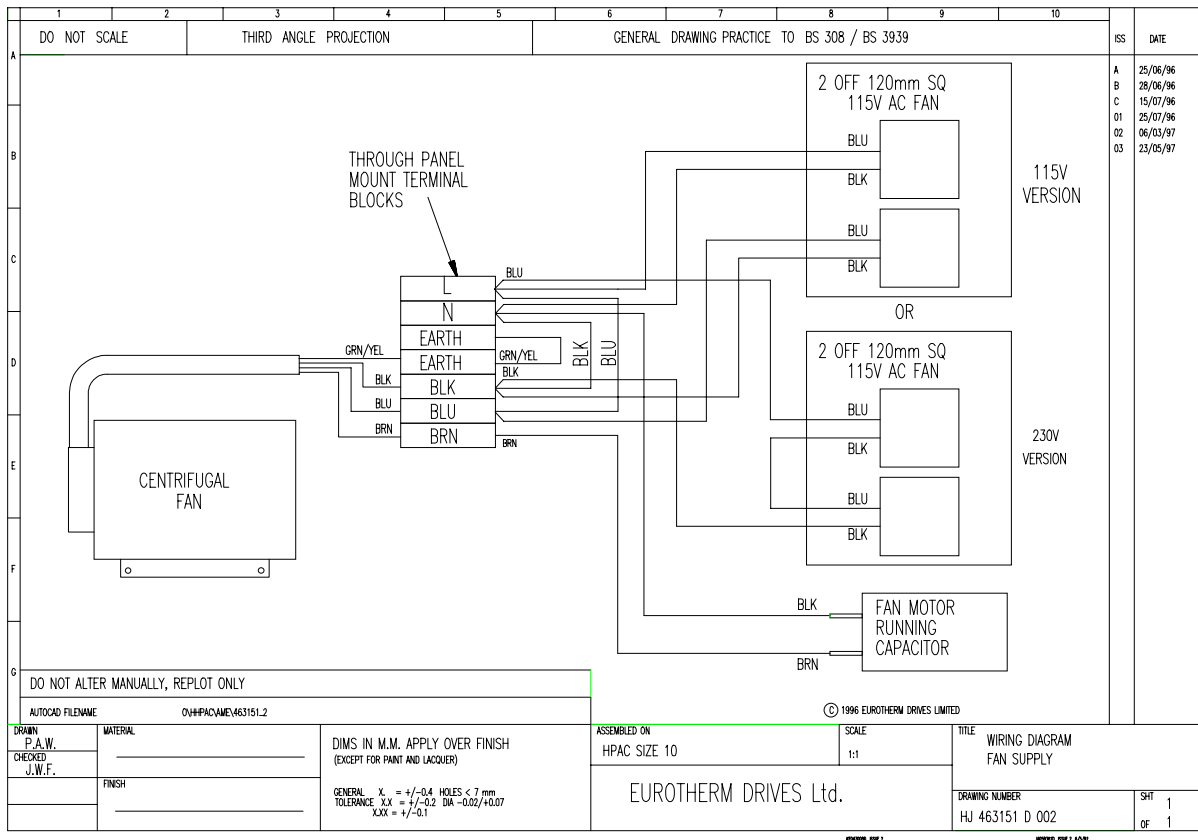
### Replacing the Internal Extractor Fans

1. Remove the main fan housing.
2. Disconnect the main cooling fan's supply wiring loom at the terminal block on the bottom panel of the Inverter. Note the colour coding of the connections to the terminal block.
3. Undo the fan mounting nuts and remove the main cooling fan.
4. While supporting the weight of the bottom panel assembly, remove the six M6 screws that secure it.
5. Lower the bottom panel assembly out of the Inverter.
6. Disconnect the supply cable to the faulty extractor fan.
7. Replace the faulty fan and reconnect the supply to it.
8. Re-fit the bottom panel assembly and tighten screws
9. Re-fit the main cooling fan and secure in position.
10. Reconnect the main cooling fan's supply wiring loom at the terminal block on the bottom of the Inverter, refer to wiring diagram HJ 463151 D 001, Figure 8-7, page 8-10.
11. Replace the main fan housing.

# 8-10 Routine Maintenance and Repair



**Figure 8-6 Wiring Diagram Fan Supply (Types 8 & 9)**



**Figure 8-7 Wiring Diagram Fan Supply (Type 10)**



## Phase Assembly Replacement

The Inverter power stage consists of 3 identical phase assemblies. Each phase assembly consists of a heatsink, IGBT module, 1/3 of the input bridge, DC link capacitors and PCB 'AH389193'.

We recommend that the whole phase assembly is carried as a spare part and replaced as a unit. Spare phase assemblies are available for Inverter Types 8, 9 & 10.

The spare phase assembly is supplied with a 'service tray' which is designed to assist in phase assembly replacement. It also protects the other delicate components within the Inverter during the replacement procedure.

**IMPORTANT:** Observe all electrical warnings and static handling precautions.

### Supplied Parts

- Service tray
- M5 x 10 hex head screws (2 off)
- Heatsink clamps (4 off). These are to be used in the replacement assembly if the original clamps are excessively distorted.
- Insulating caps (3 off)

### Required Tools

- Square Drive ratchet wrench, 300mm extension, 8mm & 10mm socket
- No.3 Posidrive screwdriver

## Phase Assembly Removal Procedure

1. Undo the two, quarter-turn fasteners on the top of the Inverter casing and remove the front top cover (plastic). Repeat the operation on the bottom terminal cover.
2. Disconnect the Operator Station 4-way cable from the P3 port on the Control PCB.
3. Undo the four, quarter-turn fasteners to remove the Inverter's front cover (metal). Take care not to damage PCBs beneath the cover when removing it.
4. Remove the DC+ and DC- busbars at the top of the Inverter by undoing the two M6 captive nuts at the capacitor joining plate assembly, and the two M6 captive nuts at the external connection busbars. (Use the 300mm long extension for this step).
5. Remove the capacitor joining plate assembly by undoing the M6 captive washer nuts. *Note that the nuts on the left hand side of the M2 phase limb are covered with plastic insulating caps, (2 caps on Type 8, 3 caps on Types 9 & 10). These caps are a safety requirement and must be re-fitted.*

**Note:** If you are removing the M3 phase limb from an Inverter which has a Brake unit fitted, you will have to remove the brake connecting plate. Refer to Chapter 3: "Installing the Inverter" - Inverter Brake Unit Installation Guidelines.

6. Remove the two M6 captive nuts from the input busbar on the phase limb to be replaced. (Use the 300mm long extension for this step).
7. Remove the two M6 hex bolts and washers from the output busbar on the phase limb to be replaced. (Use the 300mm long extension for this step).
8. Disconnect the cable(s) from the printed circuit board on the phase limb to be replaced. Take note of PCB connectivity.
9. Disconnect the earth bonding wire to the right of the phase limb to be replaced by removing the M4 captive nut at the chassis.
10. Insert the 'service tray' underneath the phase limb to be removed and secure to the side panels of the Inverter using two M5 x 12 screws.
11. Loosen the heatsink clamps (3 per phase assembly on Type 8, 4 per phase assembly on Types 9 & 10) and rotate through 90°.
12. Carefully remove the phase limb assembly.

## 8-12 Routine Maintenance and Repair

### Phase Assembly Installation Procedure

1. Replace any badly distorted heatsink clamps with the spare clamps provided.
2. Carefully slide the replacement phase limb assembly into position, making sure that the studs on the input busbars (left-hand side) are located in the holes provided on the phase limb busbar. Re-fit nuts and washers, but do not tighten.
3. Re-fit the output busbar bolts and washers and tighten to 6.8Nm torque.
4. Secure the phase limb assembly to the chassis using the heatsink clamps.
5. Remove the `service tray`.
6. Tighten the input busbar nuts to 6.8Nm torque.
7. Secure the earth bonding wire to the chassis and tighten to 4Nm torque.
8. Reconnect the cable(s) to the phase limb assembly printed circuit board.
9. Refit the capacitor joining plate, tightening the M6 captive nuts to 6.8Nm torque.
10. Refit the plastic insulating caps to the (middle) M2 phase limb. They fit onto the left-hand side capacitor joining plate nuts, (2 caps on Type 8, 3 caps on Types 9 & 10). ***These caps are a safety requirement and must be re-fitted.***
11. Refit the DC+ and DC- busbars, tightening the two M6 captive nuts on the capacitor joining plate and the two M6 captive nuts at the external connection busbars to 6.8Nm torque.

**Note:** Refit the brake connection plate and top cover if you have a Brake Unit fitted. Refer to Chapter 3: "Installing the Inverter" - Inverter Brake Unit Installation Guidelines.

12. Replace the Inverter's front cover (metal) which is attached using the four, quarter-turn fasteners (take care not to damage PCBs beneath the cover).
13. Re-connect the Operator Station 4-way cable to the P3 port on the Control PCB.
14. Re-fit the Inverter's top cover (plastic) using the two quarter- turn fasteners.
15. Re-fit the Inverter's bottom terminal cover (plastic) using the two quarter- turn fasteners.

# TECHNICAL SPECIFICATIONS

The main Product Manual details the technical specification of the control circuits, protection circuits, diagnostics and I/O.

Environmental Details	
Humidity (max.)	85% relative humidity at 40°C non-condensing
Altitude	Above 1000m derate 1% per 100m,
Atmosphere	Non flammable, non corrosive and dust free
Operating temperature range	0°C to 40°C (Constant torque mode) 0°C to 40°C (Quadratic torque mode)
Storage temperature	Minimum -25°C to maximum +55°C
Transport temperature	Minimum -25°C to maximum +70°C
Climatic Conditions	Class 3k3 as defined by EN50178 (1998)
Pollution Degree	2
Installation / Overvoltage Category	3

Mechanical Details		
584SV Type	Detail	Description
8, 9 & 10	Mounting Orientation	Vertical
8, 9 & 10	Power Terminations	3-phase supply and output terminals: Bus-bars with 2 off M12 holes, 25mm separation. 2 off M12 bolt, nut and washer supplied. Tightening torque 97Nm (71.5 lb-ft)  Protective Earth terminals: 4 off M10 bolts with conical washers - supplied loose Tightening torque 55Nm (40.5 lb-ft)  DC link terminals: Bus-bars with 2 off M12 holes, 35mm separation. Designed to accept semiconductor fuses directly mounted on terminals (eg. Gould Sawmut A100P) 2 off M12 bolt, nut and washer supplied. Tightening torque 97Nm (71.5 lb-ft)  Dynamic Brake terminal: Bus-bars with 2 off M12 holes, 44mm separation. 2 off M12 bolt, nut and washer supplied. Tightening torque 97Nm (71.5 lb-ft)
8, 9 & 10	Control Terminations	Removable screw connectors for 0.75mm <sup>2</sup> wire (18 AWG). Terminals will accept up to 1.5mm <sup>2</sup> wire (16 AWG). Tightening torque 0.6Nm (0.4lb-ft)
8	Weight	100kg (108kg including DB unit)
	Dimensions	Refer to drawing HG463009G003 at the back of this book
9	Weight	125kg (138kg including DB unit)
	Dimensions	Refer to drawing HG463009G002 at the back of this book
10	Weight	160kg (176kg including DB unit)
	Dimensions	Refer to drawing HG463009G001 at the back of this book

# 11-2 Technical Specifications

## Electrical Ratings - Power Circuit (constant torque)

See the following Notes 1 and 2.

584SV Type	Type 8				Type 9				Type 10		
Input Voltage	380V to 460V *4 ±10%, 50/60Hz										
Product Code Block 2	0900	1100	1320	1600	1800	2000	2200	2500	2800	3150	
Nominal Motor Power (kW) @ 380V	90	110	132	160	180	200	220	250	280	315	
Nominal Motor Power (kW) @ 415/440V	90	110	150	185	200	220	250	280	315	315	
Motor Power (Hp) @ 460V (as specified within NEC/NFPA-70)	150	150	200	250	300	300	350	400	450	450	
Output Current (A)	180	216	250	316	361	375	420	480	520	550	
Input Current (A) * 1 & 2	185	220	260	320	365	400	435	490	550	575	
Fundamental Input Power Factor	0.95										
Input Bridge I <sup>2</sup> t	245 000 A <sup>2</sup> s				813 000 A <sup>2</sup> s						
Fuse Rating/Circuit Breaker *3 (A)	200	250	300	350	400	450	450	550	600	600	
Approx. loss @ 3kHz (kW)	2.4	2.9	3.5	4.3	4.8	5.2	5.4	6.7	7.1	7.5	
Switching Frequency	3kHz										
Output Voltage (max)	Input Voltage										
Output Overload	150% for 60 seconds										
Output Frequency	0 to 120Hz										
Fan Inlet temperature Range	0 to 40°C										
IP Rating	IP20 Enclosure, IP00 Power Terminals										
Earth Leakage Current	>>100mA. Product must be permanently earthed										

## Electrical Ratings - Power Circuit (quadratic torque)

See the following Notes 1 and 2.

584SV Type	Type 8				Type 9				Type 10		
Input Voltage	380V to 460V *4 ±10%, 50/60Hz										
Product Code Block 2	0900	1100	1320	1600	1800	2000	2200	2500	2800	3150	
Nominal Motor Power (kW) @ 380V	110	132	150	200	220	250	250	300	315	315	
Nominal Motor Power (kW) @ 415/440V	110	150	150	225	250	280	280	315	355	355	
Motor Power (Hp) @ 460V (as specified within NEC/NFPA-70)	150	200	250	300	350	400	400	450	500	500	
Output Current (A)	216	260	302	377	420	480	480	545	595	595	
Input Current (A) *1 & 2	220	265	310	400	430	490	490	590	620	620	
Fundamental Input Power Factor	0.95										
Input Bridge I <sup>2</sup> t	245 000 A <sup>2</sup> s				813 000 A <sup>2</sup> s						
Fuse Rating/Circuit Breaker *3 (A)	250	300	350	450	450	550	550	650	650	650	
Approx. loss @ 3kHz (kW)	2.9	3.5	4.2	5.1	5.6	6.9	6.9	7.6	8.6	8.6	
Switching Frequency	3kHz										
Output Voltage (max)	Input Voltage										
Output Overload	110% for 10 seconds										
Output Frequency	0 to 120Hz										
Fan Inlet temperature Range	0 to 40°C										
IP Rating	IP20 Enclosure, IP00 Power Terminals.										
Earth Leakage Current	>>100mA. Product must be permanently earthed										

**Note: 1: 3% line impedance MUST be provided for each module, and is assumed in the quoted input current values. Failure to do so will severely curtail DC link capacitor lifetime and could result in damage to the input bridge**

**2: Input current quoted is for 380V supply at the maximum output motor power. Motor efficiency of 93% is assumed.**

**3: Short circuit protection Semiconductor Fuses should be installed in the 3-phase supply to the drive module to protect the input bridge. Circuit breakers or HRC fuses will not protect the input bridge.**

**4: Suitable for earth referenced (TN) and non earth referenced (IT) supplies.**

## EMC Compliance

Type 8, 9 and 10 Inverters with the option to be 'CE' marked meet the following EMC emission limits provided they are installed in accordance with the EMC installation instructions, with the specified EMC filters and line chokes as shown in the "External AC Supply (RFI) Filters and AC Line Chokes" table.

\* 3kHz switching frequency, 300 metres screened motor cable.

Port	Phenomenon	Basic Standard	Level	Generic Standard
Enclosure Port	Radiated	EN55011 (1991)	Class A (cubicle mount)	EN50081-2 (1994)
AC Power Port	Conducted (with specified filter)	EN55011 (1991)	Class A (upto 300m screened motor cable)	EN50081-2 (1994)
AC Power Port	Conducted (no filter)	EN55011 (1991)	130dB $\mu$ V @ 150kHz* (common mode) 130dB $\mu$ V @ 150kHz* (differential mode) Reducing with frequency by 20dB/decade	

## External AC Supply (RFI) Filters and AC Line Chokes

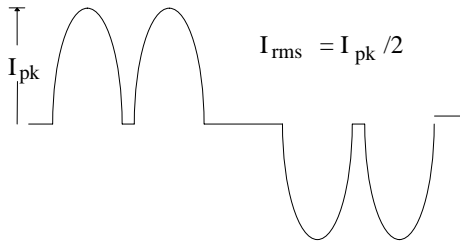
Filters conform to EN55011 Class A conducted emission limits when used with 300m of screened motor cable and the specified 3% minimum AC Line Choke. For use on earth referenced (TN) and non-earth referenced (IT) supplies.

*CT = Constant Torque, HVAC = Quadratic Torque*

584SV Type	Rating	No. of CO464517 Filters Required in Parallel *	Total Filter Watt Loss	AC Line Choke
Type 8 (90kW)	CT + HVAC	One	50W	CO389936U201
Type 8 (110kW)	CT + HVAC	One	50W	CO389936U201
Type 8 (132kW)	CT + HVAC	One	50W	CO389936U201
Type 9 (160kW)	CT + HVAC	Two	100W	CO389936U202
Type 9 (180kW)	CT + HVAC	Two	100W	CO389936U202
Type 9 (200kW)	CT + HVAC	Two	100W	CO389936U202
Type 9 (220kW)	CT + HVAC	Two	100W	CO389936U202
Type 10 (250kW)	CT + HVAC	Two	100W	CO389936U203
Type 10 (280kW)	CT + HVAC	Two	100W	CO389936U203
Type 10 (315kW)	CT + HVAC	Two	100W	CO389936U203

## AC Line Choke Specification


- Connections required suitable for busbars.
- Foot mounting.
- The typical current waveform is shown below:



- Harmonic current content. Total rms current comprises:
 

Fundamental	95.0%
5th Harmonic	33.0%
7th Harmonic	10.0%
9th Harmonic	0.5%
11th Harmonic	5.0%
- 3 phase line choke for use with an inverter.
- Rated RMS value of current,  $I_{rms}$ , will be quoted.
- Overload capability 150% of  $I_{rms}$  for 60 seconds.
- Choke should not saturate at  $I_{pk}$  corresponding to 2 times rated RMS current - the inductance shall be maintained within -25% under this condition.
- To be suitable for 50°C ambient and connection to terminals at 70 °C.
- To be suitable for vertical or horizontal mounting.
- To be suitable for continuous connection to 480V  $\pm 10\%$  3 phase supply [earth (TN) or non-earth(IT) references].
- To be suitable for 50 or 60Hz operation.
- Packaging: suitable for delivery to Eurotherm Drives' Goods In Department without any damage.
- Unit to display rating label which will include Eurotherm Drives part number to be approved by Eurotherm Drives Ltd.
- Design should be rated to IP00 (optional IP20)
- Input and output connections to be labelled L1, L2, L3.
- Suitable earth connection to be provided.
- Earth terminal to be identified by international ground symbol (IEC417 Symbol 5019).
- Weight to be advised (kg).
- Heat output to be minimised and advised to Eurotherm Drives (Watts).
- Any plastic used to be flame retardant (V0 minimum).
- Winding-to-winding and winding-to-earth must withstand 3kV AC test voltage for 1 minute, to be applied to each choke.
- Insulation resistance between winding and core at no less than 500V DC to be greater than 100M  $\Omega$ .
- Design must be CE marked to conform to the Low Voltage Directive by using BS EN 60289 (1995). The supplier should maintain design evidence for a period of 5 years from the last shipment. Design parameters: Pollution Degree 2, Overvoltage Category III.
- Design also to be in accordance with UL 506, to allow future UL and C-UL marking by supplier.
- This specification to be read in conjunction with the mechanical drawing:  
CO 389936 D 201/202/203.

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File Name: G:\MSDOCS2\463---\463115.WRD				
ISS:	DATE	DRN:	RB	DRAWING NUMBER: HL463115C
A	050696	CHKD:	MP	TITLE: Rating Specification for HPAC AC line choke
1	190696			
2	081096			
3	190398			
				SHT 1 OF 1 SHTS

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## AC Line Choke Specification

Type 8, 9 and 10 Inverters require the use of an AC Line Choke, however, where an Inverter is individually supplied from a dedicated transformer with the required impedance, the AC Line Choke is not required.

Where a system comprises a number of Type 8, 9 and 10 Inverters connected to a common supply, a separate AC Line Choke is required in the supply to each Inverter.

When an EMC external ac supply filter is used, the AC Line Choke must be fitted between the filter and Inverter.

### Caution

Failure to provide the correct line impedance will severely reduce the Inverters lifetime and could result in catastrophic failure of the Inverter.

The required AC Line Choke line impedance is nominally 3% of the Inverter rating for the highest power build of each frame size. Eurotherm Drives can supply the following line chokes:

584SV Type	Inductance/Phase	RMS Current	Peak Instantaneous Current	Part No.
Type 8	75µH	308A	±1000A	CO389936U201
Type 9	50µH	490A	±1600A	CO389936U202
Type 10	35µH	620A	±2200A	CO389936U203

## External AC Supply (RFI) Filter Specification

Filter Part No.	CO464517	Voltage	500 VAC
Humidity	90% RH (non-condensing)	Frequency	50/60Hz
Vibration	10-200Hz 1.8g	Current	340A @ 50°C
Weight	13kg approximately	Leakage Current	2A @ 440V 50Hz
Terminals	35 x3mm bus bar (M12 fixings)	Surge	3kV 1.2/50µs
Filter Mounting	4 x M10	Electric Strength	2700VDC/1 minute

## Brake Unit Rating

Type 8, 9 and 10 brake units have the following specification:

Maximum braking power: 150%  
 Operating voltage: 750 - 820V dc  
 Maximum duty cycle: 30%  
 Maximum on time: 20 Seconds

584SV Type	Maximum Brake Current @750V dc	Minimum Brake Resistance
Type 8 (90kW)	220A	3.40 ohms
Type 8 (110kW)	264A	2.84 ohms
Type 8 (132kW)	300A	2.50 ohms
Type 9 (160kW)	360A	2.00 ohms
Type 9 (180kW)	440A	1.70 ohms
Type 9 (200kW/220kW)	450A	1.60 ohms
Type 10 (250kW)	525A	1.43 ohms
Type 10 (280kW/315kW)	675A	1.11 ohms

## Main Cooling Fan and Supply Requirements

Type 8 & 9 Inverters have an integral main cooling fan, but the Type 10 Inverter has a separate main cooling fan.

Refer to drawing HG463009G001 at the back of this book.

All the Inverter types require an external single phase supply and fuse protection (motor start type) for the main cooling fan.

584SV Type	Type 8	Type 9	Type 10
Supply Voltage	110 to 130V ac, 50/60 Hz		
Fuse Rating	3A	6A	10A
Supply Voltage	220 to 240V ac, 50/60Hz		
Fuse Rating	2A	4A	6A
Airflow Requirement	750m <sup>3</sup> /h (425CFM)	1200m <sup>3</sup> /h (700CFM)	1700m <sup>3</sup> /h (1000CFM)



### Supply Harmonic Analysis

Assumptions: 90 - 280kW: 18,000A short circuit supply capability, constant torque load and stated nominal motor output power. \* 315kW: 30,000A short circuit supply capability.

$$THD(V) \times 100 = \sqrt{\frac{\sum_{h=2}^{h=40} O_h^2}{O_{1n}}} \%$$

where  $O_{1n}$  is the rated rms value of the fundamental voltage of the supply transformer.

The results conform to stage 3 of the Engineering Recommendation G.5/3 September 1976, Classification 'C': Limits for Harmonics in the UK Electricity Industry.

Drive Type	584SV									
Type	8	8	8	9	9	9	9	10	10	10
Motor Power (kW)	90	110	132	160	180	200	220	250	280	315 *
Fundamental Voltage (V)	400	400	400	400	400	400	400	400	400	400
Typical Motor Efficiency	93%	93%	93%	94%	94%	94%	94%	95%	95%	95%
Harmonic No.	RMS Current (A)									
1	141.3	172.1	209.2	246.8	274.2	325.1	350.6	360.9	416.9	442.2
5	67.2	74.9	80.0	99.5	102.9	114.8	112.7	130.0	141.8	151.9
7	32.3	32.4	29.3	39.1	36.9	37.8	26.3	44.1	44.5	34.2
11	10.4	12.3	14.8	17.5	19.3	22.0	20.1	24.9	27.4	26.9
13	6.5	6.8	7.2	8.9	9.3	10.8	10.1	12.1	13.7	11.5
17	4.7	5.5	6.2	7.6	8.1	8.9	7.4	10.2	10.7	10.4
19	2.8	3.2	3.9	4.6	5.2	6.1	5.9	6.9	7.8	7.2
23	2.6	2.9	3.1	3.9	4.0	4.2	3.2	4.9	4.9	4.5
25	1.7	2.1	2.5	2.9	3.3	3.8	3.2	4.3	4.6	4.4
29	1.6	1.7	1.7	2.2	2.2	2.3	2.0	2.7	2.8	2.5
31	1.1	1.4	1.6	2.0	2.1	2.3	1.7	2.7	2.7	2.5
35	1.0	1.1	1.0	1.3	1.4	1.6	1.5	1.8	2.0	1.8
37	0.8	1.0	1.0	1.3	1.3	1.4	1.2	1.7	1.7	1.5
Total RMS Current (A)*	160.5	191.5	227.0	271.0	297.0	348.0	370.1	387.5	444.0	469.9
THD (V) %	2.6	2.9	3.1	3.9	3.9	4.3	4.44	4.7	4.9	3.23

\*These figures are different to those stated in the Electrical Ratings -Power Circuit (constant torque) table due to the difference in assumed operating conditions.

# 11-8 Technical Specifications

# CERTIFICATION FOR THE INVERTER

## EC Declaration of Conformity (EMC Directive)

Issued for compliance with the EMC Directive when the unit is used as *relevant apparatus*.



### EC DECLARATION OF CONFORMITY

In accordance with the EEC Directive 89/336/EEC,  
Article 10 and Annex 1, (EMC DIRECTIVE)

We Eurotherm Drives Limited, address as below, declare under our sole responsibility that the following Electronic Products

**584SV (Type 8, 9 & 10)**

When installed, used and CE marked in accordance with the instructions in the Product Manual (provided with each piece of equipment) using the specified EMC filters to which this declaration refers is in Conformity with the following standards:-

BSEN50081-2 (1994)

BSEN50082-1# (1992) & draft prEN50082-2#\* (1992)

Following provisions of EEC- Directive  
89/336/EEC with amendments 92/31/EEC and 93/68/EEC

8th April 1999

.....  
Dr Martin Payn,  
Conformance Officer  
Eurotherm Drives Ltd

.....  
Dr Dan Slattery,  
Technical Director  
Eurotherm Drives Ltd

.....  
Date

# Compliant with these immunity standards without specified EMC filters.

\* For information only

**EUROTHERM DRIVES LIMITED**

NEW COURTWICK LANE, LITTLEHAMPTON, WEST SUSSEX BN17 7RZ  
TELEPHONE: 01903 737000 FAX: 01903 737100

Registered Number: 1159876 England. Registered Office: Southdownview Way, Worthing, West Sussex BN14 8NN

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File Name: P:\PRODUCTS\CE\EMC\PRODUCTS\584SV\TYPE8\PRODFILE\A\_389937.912

ISS:	DATE	DRN: FEP	DRAWING NUMBER:	HK389937C912
C	08.04.99	CHKD: MP	TITLE:	SHT 1
			584SV (Type 8, 9 & 10) EC Declaration of Conformity for EMC	OF
				1 SHTS

Issue D 20.02.1995 GA387648C017

# 12-2 Certification for the Inverter

## Manufacturer's EMC Declaration

This is provided to aid your justification for EMC compliance when the unit is used as a component.



**EUROTHERM  
DRIVES**

### MANUFACTURERS EMC DECLARATION

In accordance with the EEC Directive 89/336/EEC,  
Article 10 and Annex 1, (EMC DIRECTIVE)

We Eurotherm Drives Ltd., address as below, declare under our sole responsibility  
that the following electronic products

**584SV (Type 8, 9 & 10)**

When installed and used in accordance with the instructions in the product manual  
(provided with each piece of equipment) and using the specified EMC filters  
to which this declaration refers is in conformity with the following standards:-

BSEN50081-2 (1994)

BSEN50082-1<sup>#</sup> (1992) & draft prEN50082-2<sup>#\*</sup> (1992)

Following provisions of EEC- Directive  
89/336/EEC with amendments 92/31/EEC and 93/68/EEC

.....  
Dr Martin Payn,  
Conformance Officer  
Eurotherm Drives Ltd

.....  
Dr Dan Slattery,  
Technical Director  
Eurotherm Drives Ltd

8th April 1999

.....  
Date

<sup>#</sup> Compliant with these immunity standards without specified EMC filters.

\* For information only

#### EUROTHERM DRIVES LIMITED

NEW COURTWICK LANE, LITTLEHAMPTON, WEST SUSSEX BN17 7RZ

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File Name: P:\PRODUCTS\CE\EMC\PRODUCTS\584SV\TYPE8\PRODFILE\A\_389937.914

ISS:	DATE	DRN: FEP	DRAWING NUMBER:	HK389937C914
C	08.04.99	CHKD: MP	TITLE:	SHT 1 OF 1 SHTS
			584SV (Type 8, 9 & 10) Manufacturers EMC Declaration	

Issue D 20.02.1995 GA387648C017

**EC Declaration of Conformity (Low Voltage Directive)**

The 585SV Inverter is CE marked in accordance with the low voltage directive for electrical equipment and appliances in the voltage range 50-1000V ac and 75-1500V dc when installed correctly.



**EC DECLARATION OF CONFORMITY**

In accordance with the EEC Directive 73/23/EEC and amended by 93/68/EEC,  
Article 13 and Annex III, (LOW VOLTAGE DIRECTIVE)

We Eurotherm Drives Limited, address as below, declare under our sole responsibility that the following Electronic Products

**584SV (Type 8, 9 & 10)**

When installed and operated with reference to the instructions in the Product Manual (provided with each piece of equipment), is in accordance with the following standard:-

VDE0160(1994)/EN50178 (1998)

Following provisions of EEC-Directive  
73/23/EEC with amendment 93/68/EEC

.....  
Dr Martin Payn,  
Conformance Officer  
Eurotherm Drives Ltd

.....  
Dr Dan Slattery,  
Technical Director  
Eurotherm Drives Ltd

8th April 1999

.....  
Date

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File Name: P:\PRODUCTS\CE\SAFETY\PRODUCTS\584S8\_10\LVD\PRODFILE\C\_389955.955

ISS:	DATE	DRN: MP	DRAWING NUMBER:	HK389955C955
C	08.04.99	CHKD: DS	TITLE: 584SV (Type 8, 9 & 10) EC Declaration of Conformity for Electrical Safety	SHT 1 OF 1 SHTS

Issue D 20.02.1995 GA387648C017

# 12-4 Certification for the Inverter

## Manufacturer's Declaration

Since the potential hazards are mainly electrical rather than mechanical, the 584SV Inverter does not fall under the machinery directive. However, we do supply a manufacturer's declaration for when the 585SV Inverter is used (as a *component*) in machinery.



**EUROTHERM  
DRIVES**

### MANUFACTURER'S DECLARATION

The following Electronic Products  
**584SV (Type 8, 9 & 10)**  
are components to be incorporated into machinery and may not be operated alone.

The complete machinery or installation using this equipment may only be put into service when the safety considerations of the Directive 89/392/EEC are fully adhered to.

Particular reference should be made to  
EN60204-1 ( Safety of Machinery - Electrical Equipment of Machines).

All instructions, warnings and safety information of the Product Manual and Addendum must be adhered to.

8th April 1999

.....  
Dr Martin Payn,  
Conformance Officer  
Eurotherm Drives Ltd

.....  
Dr Dan Slattery,  
Technical Director  
Eurotherm Drives Ltd

.....  
Date

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File Name: P:\PRODUCTS\CE\SAFETY\PRODUCTS\584S8_10\LVD\PRODFILE\B_389955.918				
ISS:	DATE	DRN: MPC	DRAWING NUMBER:	HK389955C918
C	08.04.99	CHKD: MP	TITLE: 584SV Type 8/9/10 Machinery Directive	SHT 1 OF 1 SHTS

Issue D 20.02.1995 GA387648C017

# APPLICATION MACROS

## Macro Descriptions

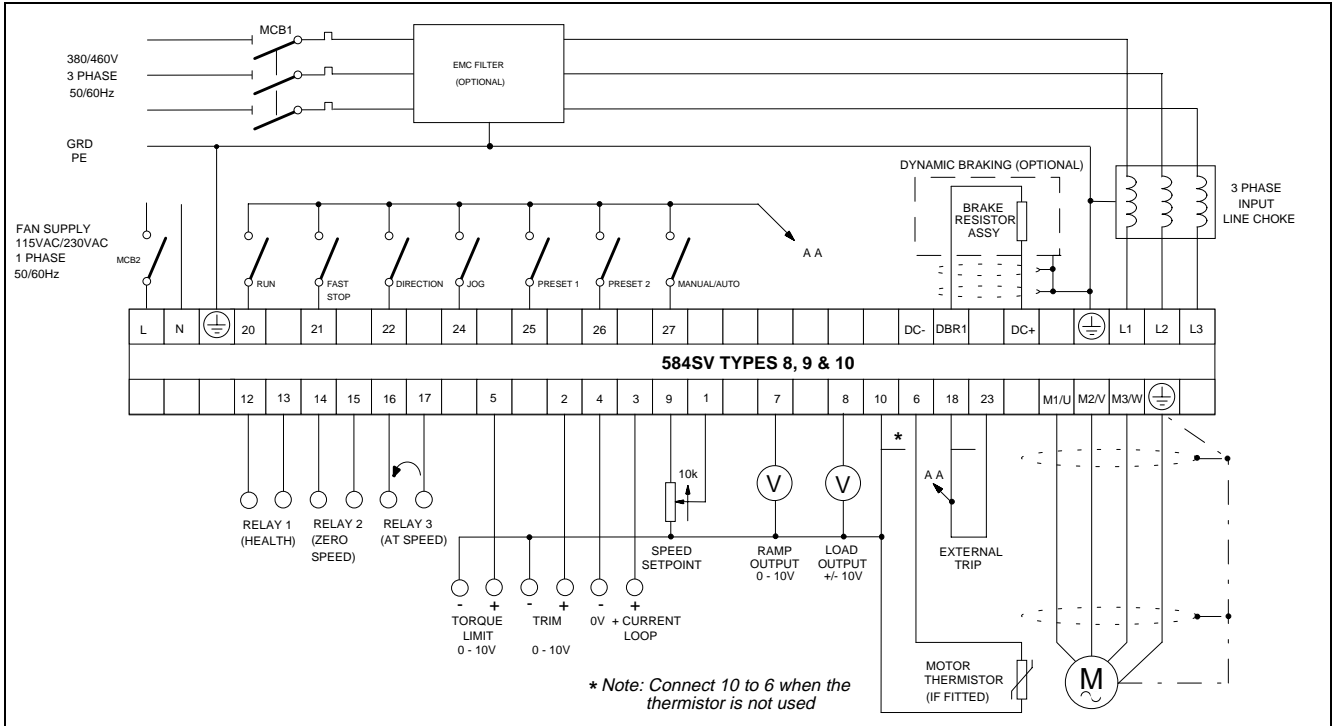
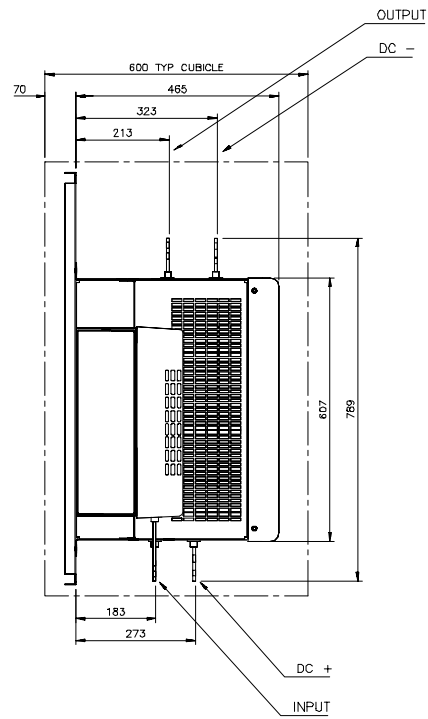


Figure 15-1 General Wiring Diagram for Macro 99 - 584SV Types 8, 9 & 10

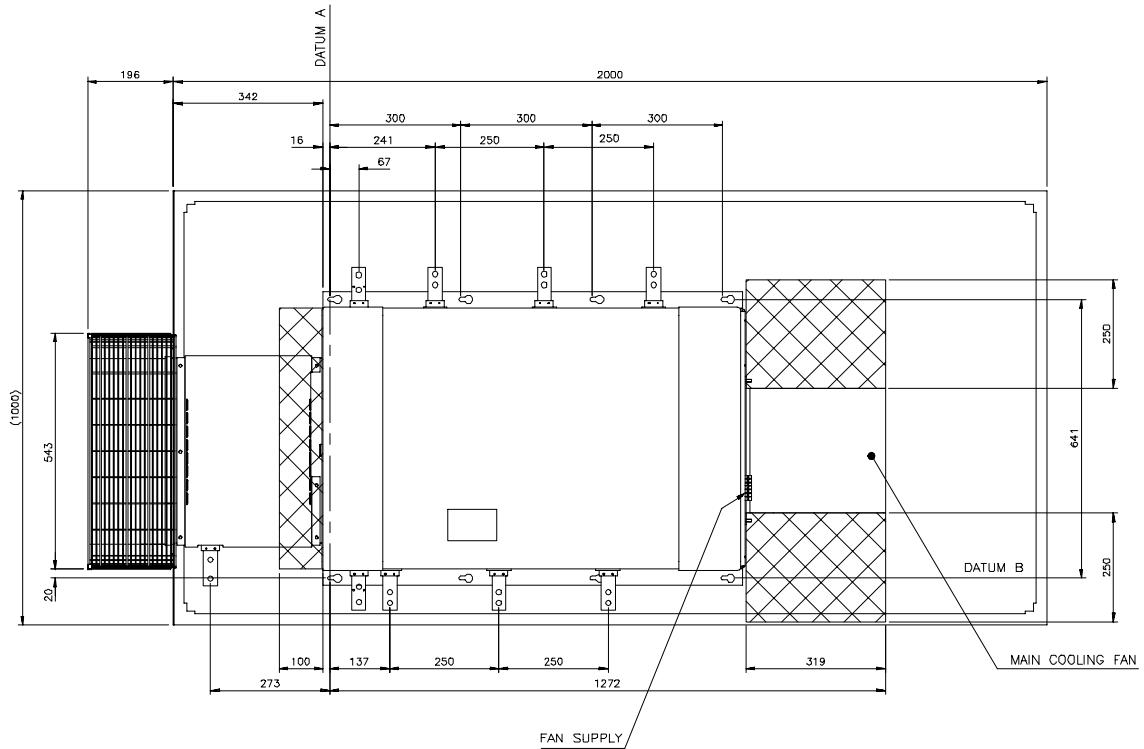
For Further information refer to the main product manual.

# 15-2 Application Macros



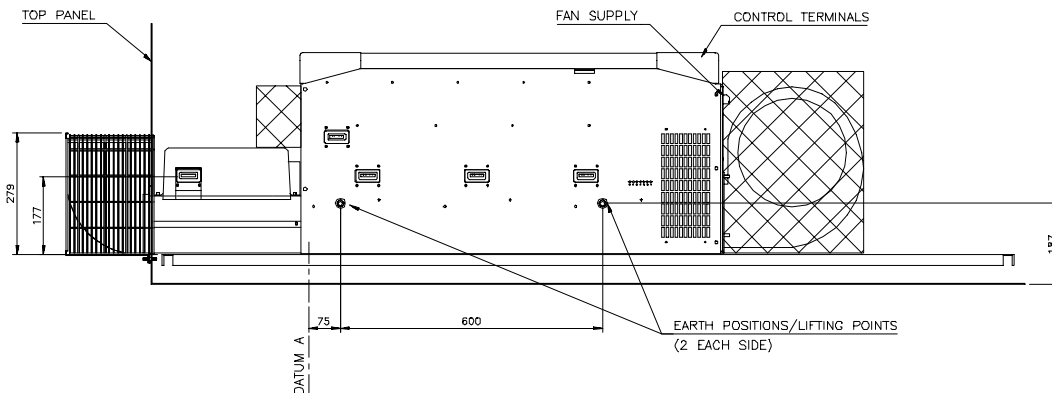


VIEW ON TOP OF UNIT WITH FAN VENT ASSEMBLY REMOVED.

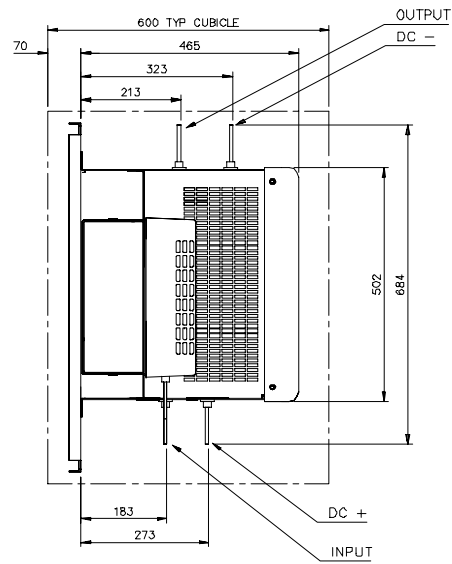


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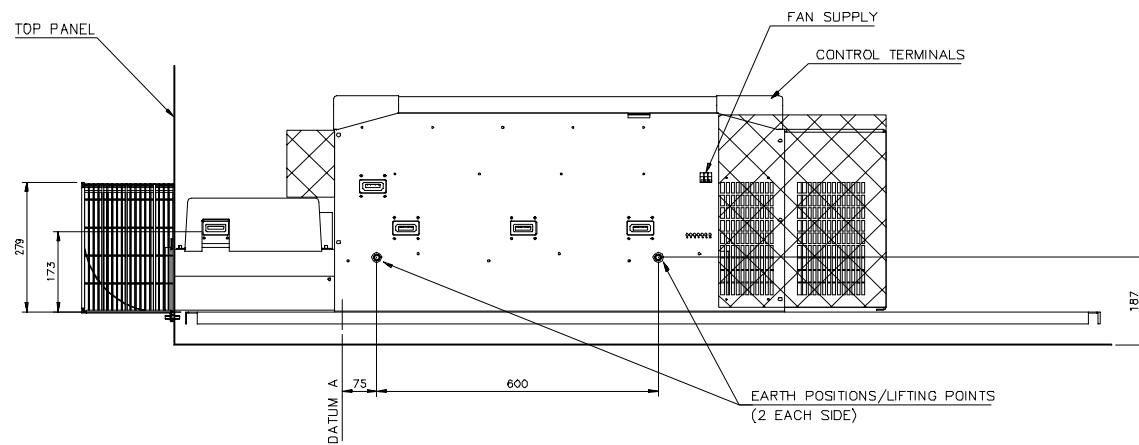
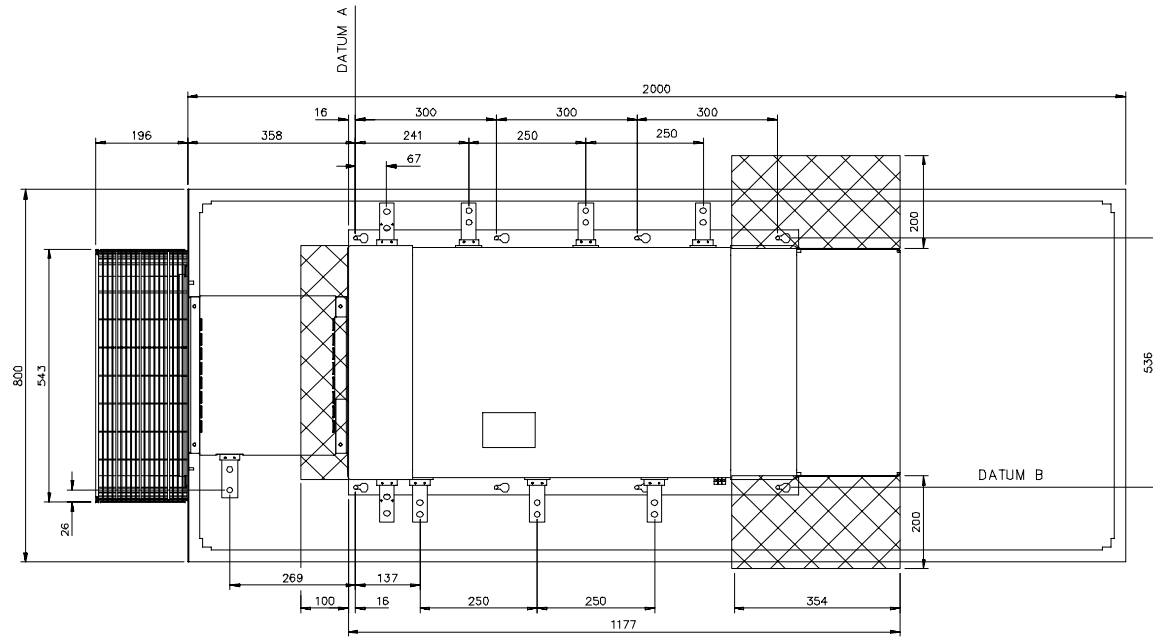
1. REFER TO HG 389313 G 001 & HG 463010 G 001 FOR FURTHER DETAILS.
2. AREAS INDICATED TO BE FREE FROM ANY OBSTRUCTION TO ALLOW AIRFLOW THROUGH PRODUCT.



584SV Size 10 Typical Cubicle Installation Outline Drawing (HG 463009 G 001)



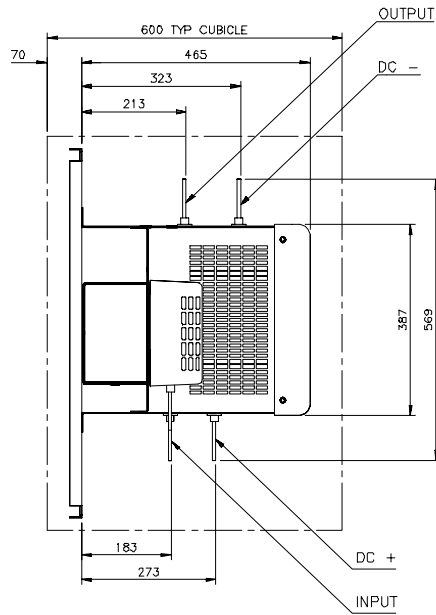
VIEW ON TOP OF UNIT WITH FAN VENT ASSEMBLY REMOVED.



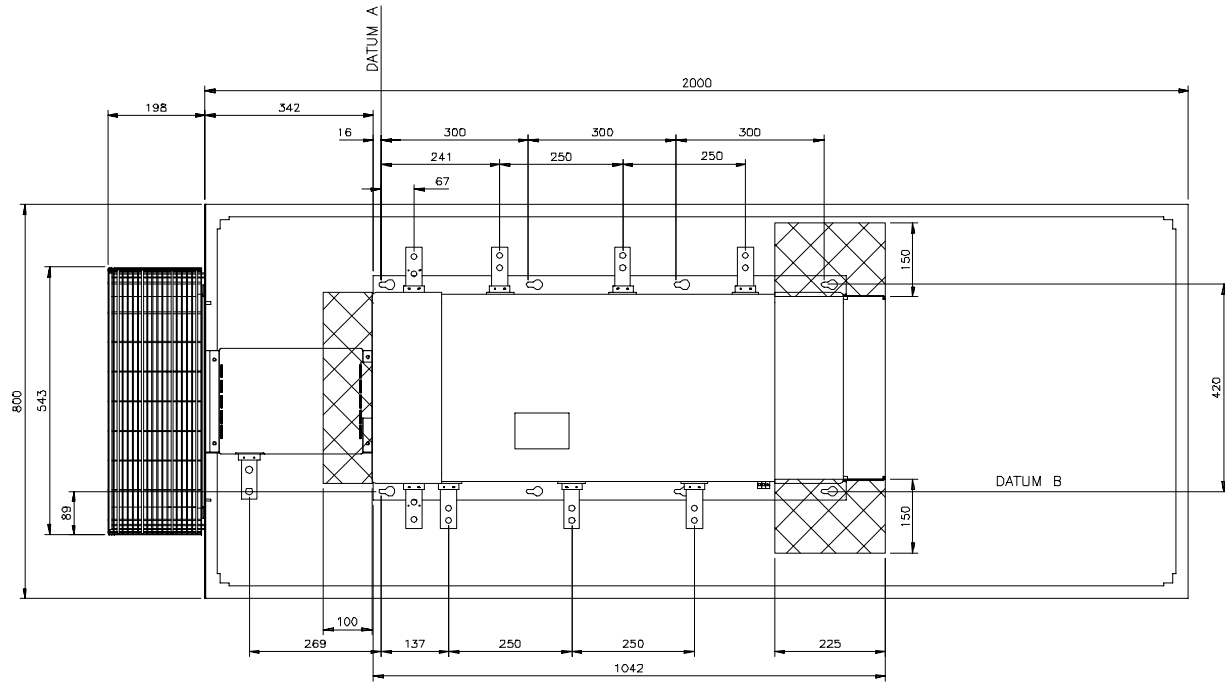
NOTES:

1. REFER TO HG 389313 G 002 & HG 463010 G 002 FOR FURTHER DETAILS.
2. AREAS INDICATED TO BE FREE FROM ANY OBSTRUCTION TO ALLOW AIRFLOW THROUGH PRODUCT.

584SV Size 9 Typical Cubicle Installation Outline Drawing (HG 463009 G 002)

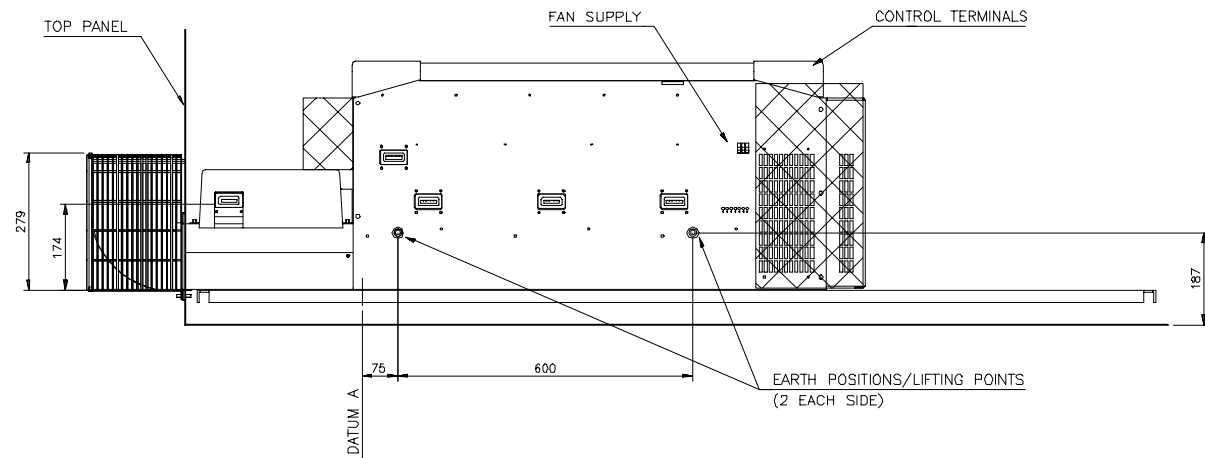


VIEW ON TOP OF UNIT WITH FAN VENT ASSEMBLY REMOVED.

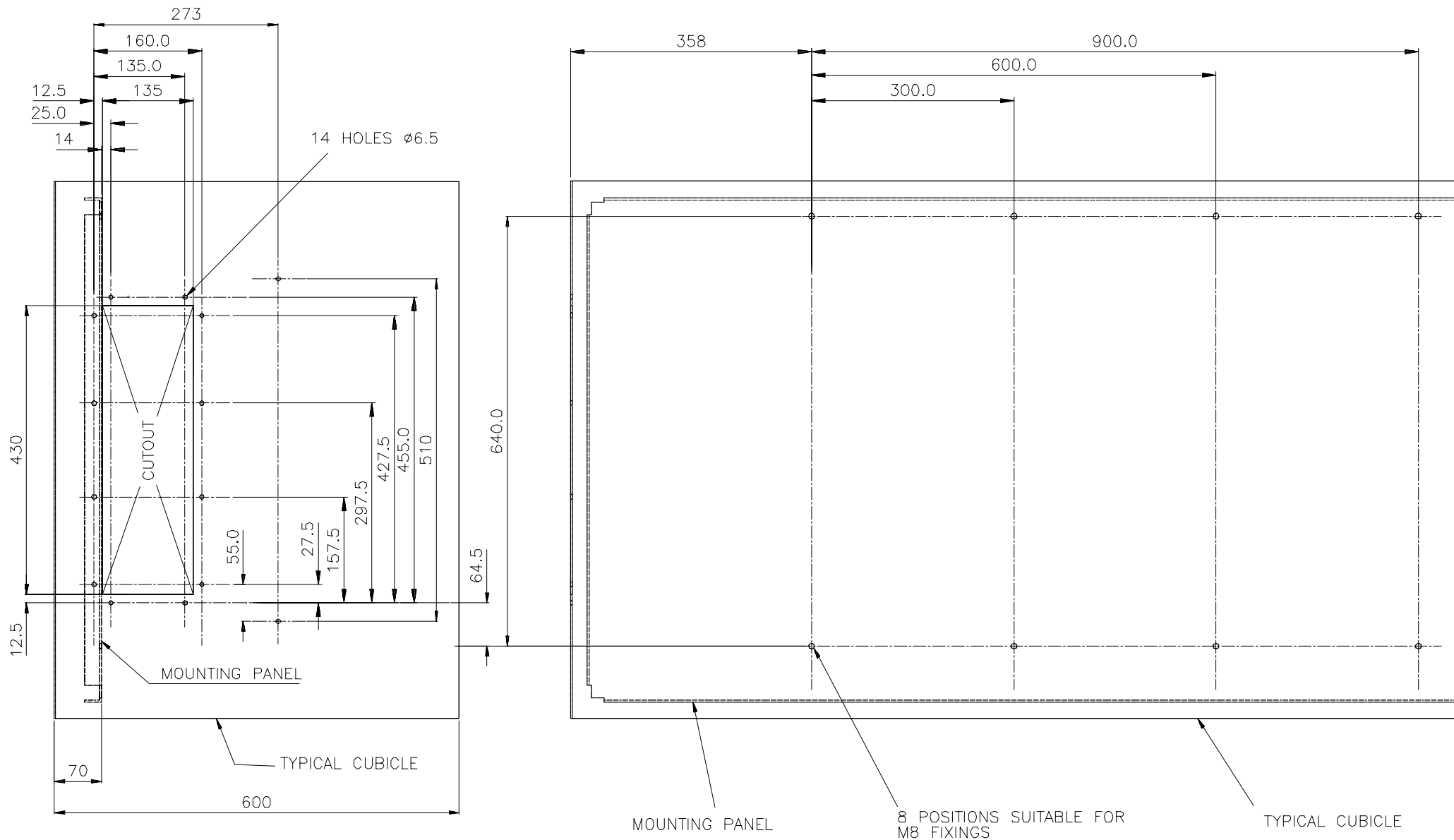


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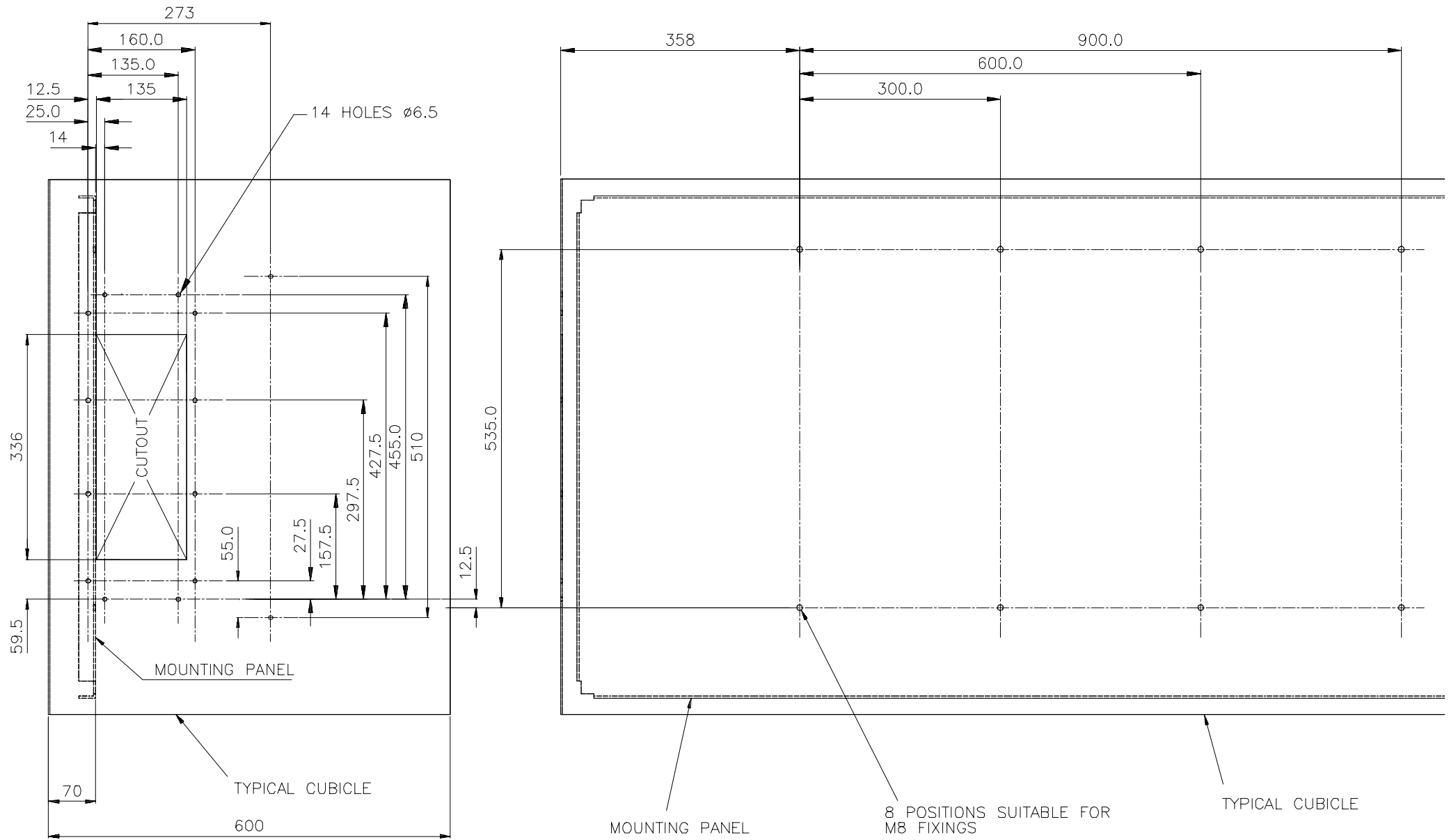
1. REFER TO HG 389313 G 003 & HG 463010 G 003 FOR FURTHER DETAILS.
2. AREAS INDICATED TO BE FREE FROM ANY OBSTRUCTION TO ALLOW AIRFLOW THROUGH PRODUCT.



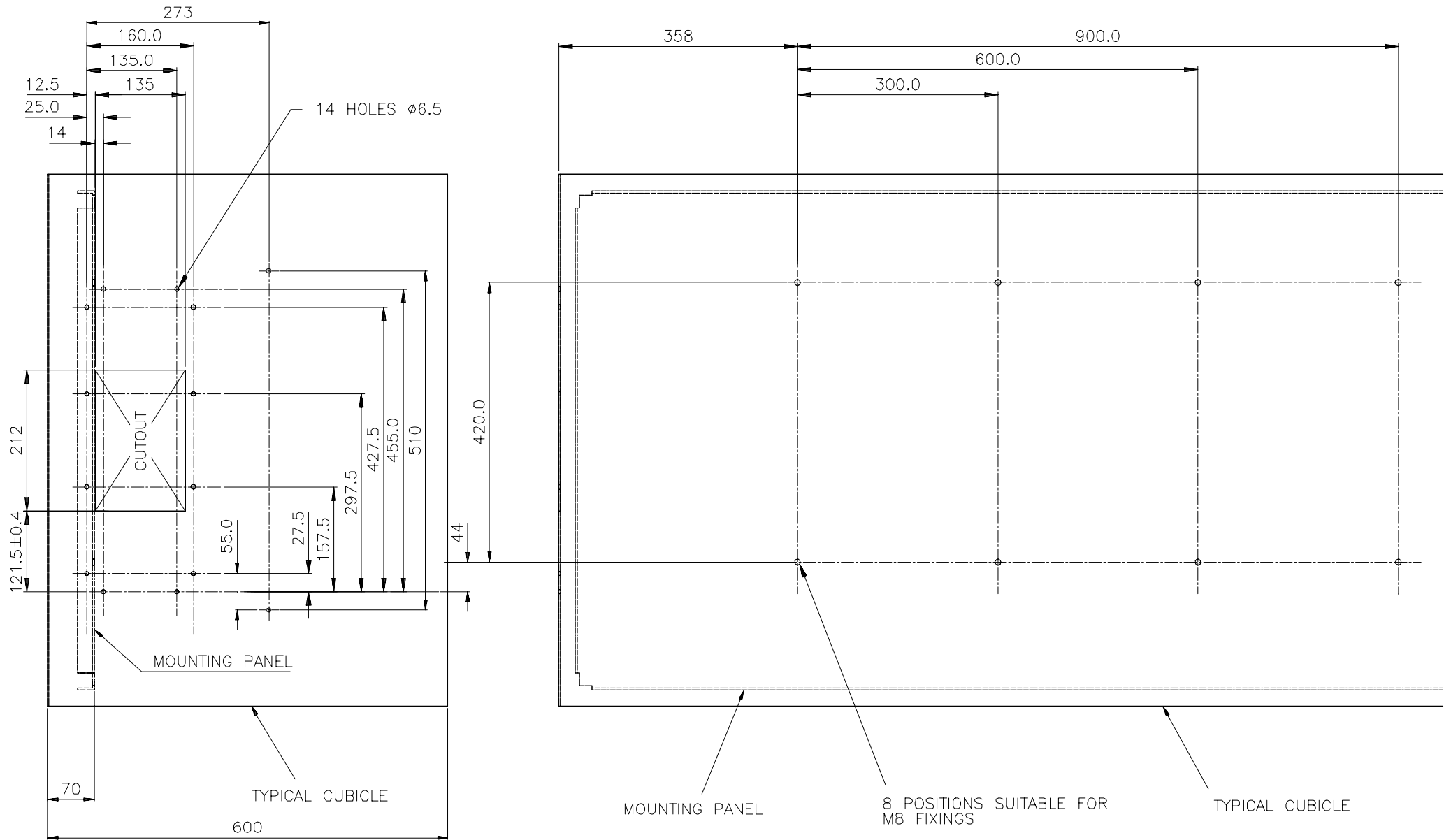
584SV Size 8 Typical Cubicle Installation Outline Drawing (HG 463009 G 003)



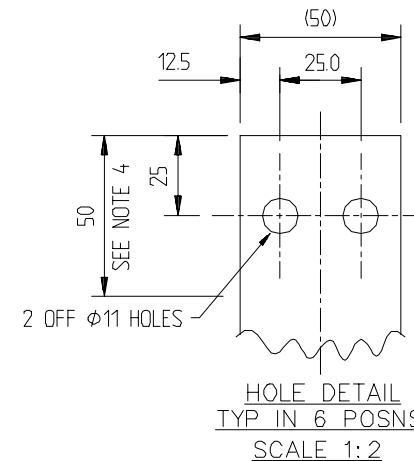
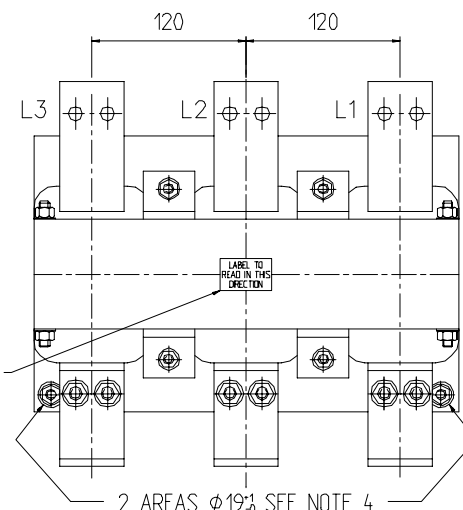
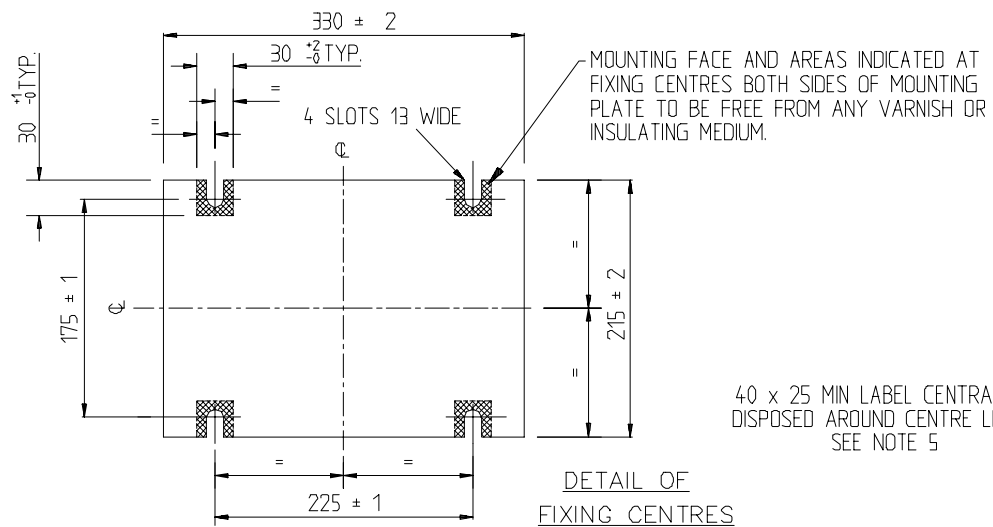
584SV Size 10 Typical Cubicle Machining (HG 463010 G 001)



584SV Size 9 Typical Cubicle Machining (HG 463010 G 002)



584SV Size 8 Typical Cubicle Machining (HG 463010 G 003)



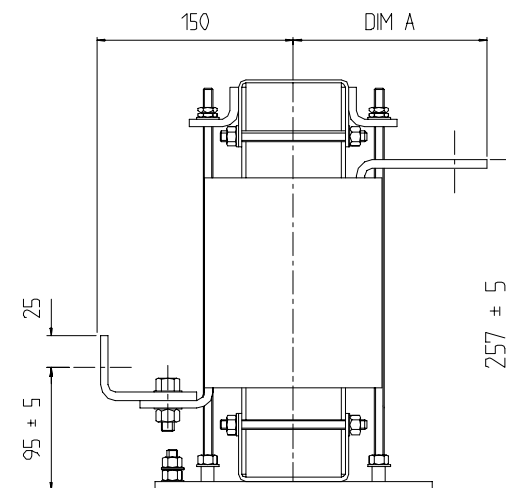
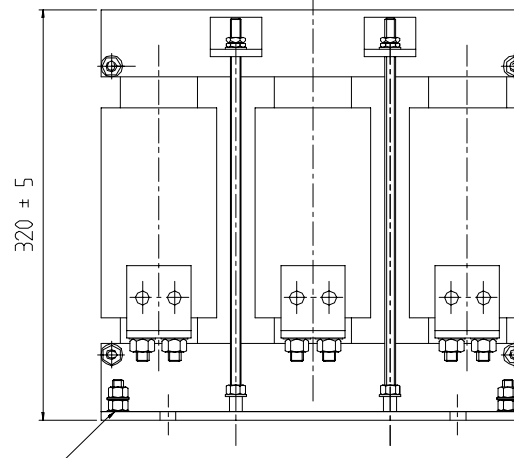
NOTES:

- CONSTRUCTION OF THIS CHOKE MUST COMPLY WITH EUROTHERM DRIVES SPECIFICATION HL463115 ISS.3 OR LATER.
- "kW" RATING INDICATED REFERS TO AC DRIVE WITH WHICH IT WILL BE USED.
- ALL FERROUS SURFACES OTHER THAN MOUNTING FACES AND EARTH POINTS MUST BE PROTECTED FROM CORROSION.
- (a) 6 OFF CONNECTING LUGS 50 x 50, 2 OFF M8 EARTH STUDS & 2 OFF AREAS  $\phi 19 \pm 0.1$  MIN TO BE FREE FROM ANY VARNISH OR INSULATING MATERIAL.  
(b) WHERE SPECIFIED ON PURCHASE ORDER USE 6 OFF CONNECTING LUGS TO BE SOLDER DIPPED ( $5\mu\text{m}$  MIN THICKNESS), ALL FLUX RESIDUE TO BE REMOVED.
- FINISHED COMPONENT TO BE LEGIBLY AND DURABLY LABELLED.

LABEL TO INCLUDE:

RATING \*\*\* AMPS  
DATE CODE  
INDUCTANCE \*\*\*\*  $\mu\text{H}$   
EUROTHERM DRIVES PART NUMBER  
MANUFACTURERS PART NUMBER  
UL MARKING (WHERE SPECIFIED)

- WHERE SPECIFIED ON PURCHASE ORDER, PRODUCT TO BE OR RECOGNIZED.
- A MINIMUM CLEARANCE OF 15mm MUST BE MAINTAINED BETWEEN ANY UN-INSULATED CONDUCTOR AND ANY GROUNDED METAL PARTS.




PART NO.	RMS CURRENT	INDUCTANCE	DIM 'A' ±2	RATING kW	USE WITH E/DRIVES PRODUCT 584S, 584SV OR 620 SERIES	WEIGHT kg
CO389936U201	308	75 $\mu\text{H}$	132	132	SIZE 8	70
CO389936U202	490	50 $\mu\text{H}$	150	200	SIZE 9	95
CO389936U203	620	35 $\mu\text{H}$	150	280	SIZE 10	95

584SV 8, 9 & 10 Choke Outline Drawing (CO 389936 D 201/202/203)





ISS.	MODIFICATION	ECN No.	DATE	DRAWN	CHK'D
A	First Issue of HA463617, replacing HA389756. Updated to Version 3.x software. Manual style updated.	-	9/2/98	CM	KJ
1	New manual. Version 4.x software.	11205C	23/3/98	CM	KJ
2	Issue 1 errors amended Remote Operator Station information amended	12759 12787	24/6/98	CM	KJ
3	Removed from page 3-10 torque setting 11.5Nm (8.5 ft-lb). Page 11-1 corrected torque setting 6.6 lb-ft to 71.5 lb-ft and 3.8 lb-ft to 40.5 lb-ft. Page 12-3 replaced 'prEN50178(1995)' with 'EN 50178 (1997)' and re-worded sentence 'When installed and operated ... standard:-'	12923 13106 13114	12.10.98	FEP	SG
4	Manual reduced from A4 to A5. Removed blank chapters 4, 5, 6, 9, 10, 13, 14. Page 1-1 changed 200kW to 220kW, 300Hp to 350Hp 280kW to 315kW. Page 2-3 added to Block 2 options 2200 and 3150. Page 3-1 replaced AH389166 with see page 8-2. Replaced Figures 3-9, 3-12 and 3-13 with correct diagrams. Page 3-12 added 350Hp option. Page 8-1, 8-2 New ratings added to tables. Page 8-4 added '*Output current sensors not fitted on drive build standards >200'. Page 8-5 removed AH part numbers. Page 8-6 added new diagram. Chapter 12 - Certificates updated to reflect change of registered office, telephone and fax numbers. Pages 11-2, 11-3, 11-5, 11-7 added new ratings.	12033	06.04.99	FEP	NB
FIRST USED ON		MODIFICATION RECORD			
		584SV Series Frequency Inverter Addendum			
 <b>EUROTHERM DRIVES</b>		DRAWING NUMBER			SHT. 1
		ZZ463660			OF 1

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[www.acpd.co.uk](http://www.acpd.co.uk)

