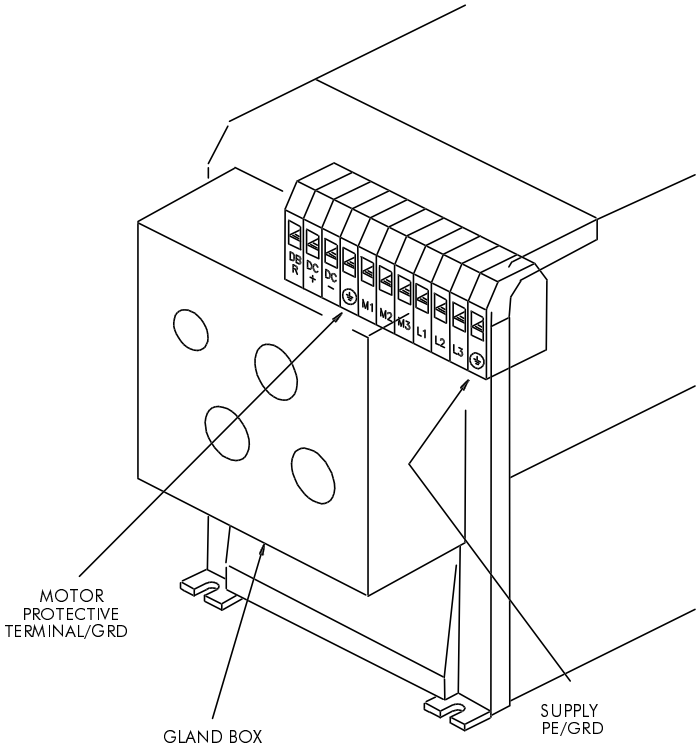
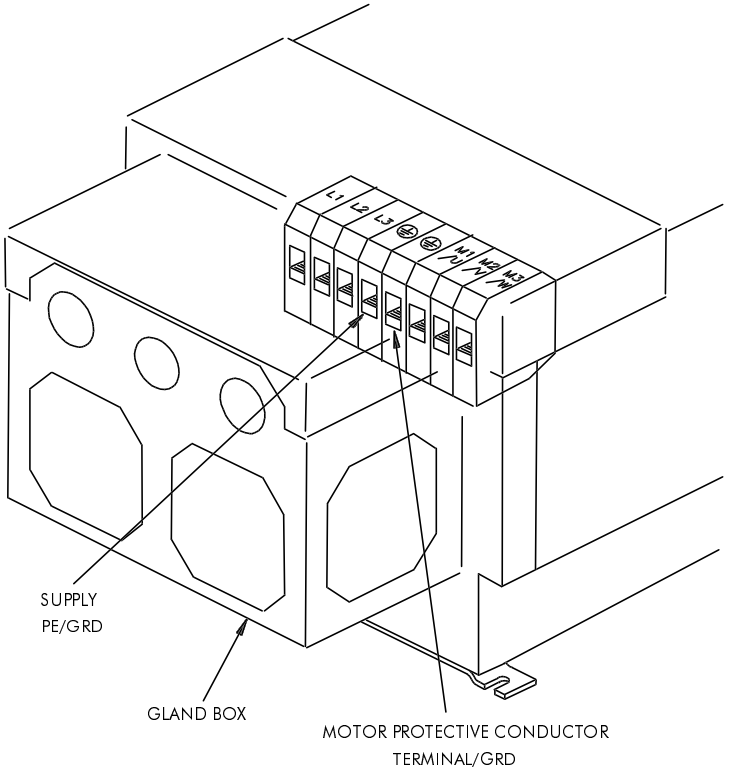
MODEL 584S TYPE 6 AND TYPE 7 SERIES

The protective earthing arrangements for these models consist of two green-yellow coloured terminal blocks located as part of the power terminal array, as shown in the accompanying drawings. The incoming protective conductor of suitable size shall be connected to the terminal marked "PE" as shown in the drawing below, whilst an adequately rated motor protective conductor shall be connected to the remaining earth terminal block. The incoming protective earth conductor will be >10mm^2 in cross section as so the drives will be permanently earthed for Europe.



CUBICLE AND WALL MOUNTING PE/GRD CONNECTIONS
584S TYPE 7



CUBICLE AND WALL MOUNTING PE/GRD CONNECTIONS
584S TYPE 7

Control Wiring

General wiring diagrams for the 584S are provided in Chapter 2 Figures 2.3 to 2.6.

For normal speed control operation, the speed demand signals are connected to the speed inputs provided (control board terminals 1, 2 and 3) as required. Terminal 4 or 10 may be used for the 0V connection associated with the SPEED SETPOINT, +CURRENT LOOP and TRIM signals. The maximum speed, and other associated parameters, are set from the MMI.

The RUN signal to the 584S is provided by connecting a single holding contact between control board terminal 20 (RUN) and terminal 18 (+24V) - open contact to stop, close contact to run.

A relay contact indicating drive healthy is provided on control board terminals 12 and 13 of the 584S drive. Any alarm which causes the drive healthy relay to de-activate is internally latched by the drive - the cause of the alarm is displayed by the MMI. Once latched, such an alarm can be cleared only by removing and re-applying the main supply to the drive, or removing and re-applying the RUN signal (terminal 20).

Control cables should be 0.75mm^2 (18AWG) minimum. It is recommended that screened cable be used, with the screen connected at the drive end only. Control wiring should be kept separate from power and motor wiring.

DYNAMIC BRAKING

Introduction

During deceleration, or with an overhauling load, the motor acts as a generator. Energy flows back from the motor into the DC link capacitors within the drive. This causes the DC link voltage to rise. If the DC link voltage exceeds 810V for the 400V build (or 420V for the 230V build) then the drive will trip to protect the capacitors and the inverter power devices. The amount of energy that can be absorbed in the capacitors is relatively small; typically more than 20% braking torque will cause the drive to trip on overvoltage. Dynamic braking increases the braking capability of the drive by dissipating the excess energy in a high power resistor connected across the DC link (refer to Figure 3.2).

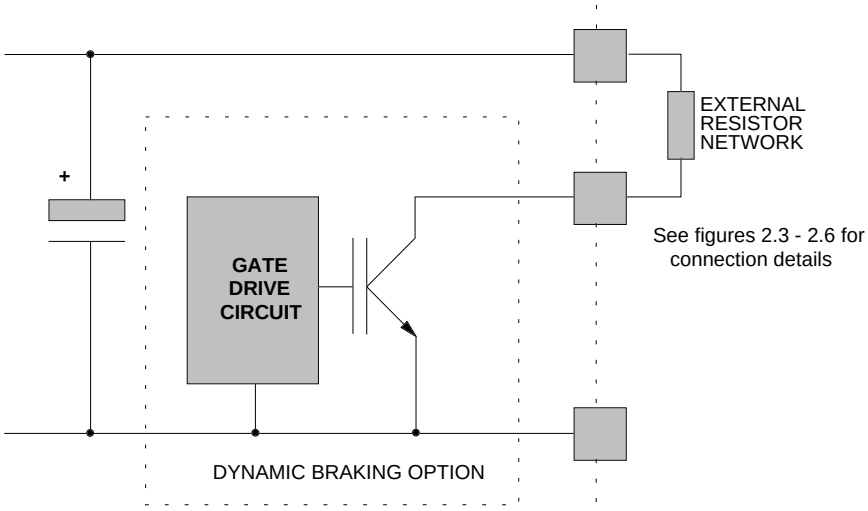


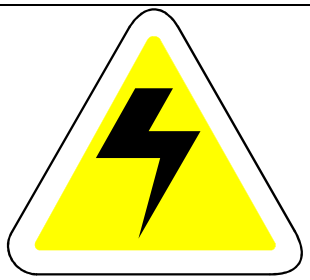
Figure 3.2 - The Dynamic Braking Option

The dynamic braking option is a PCB with an extra IGBT power device fitted. This is fitted inside the drive package and is connected to the negative side of the DC link as shown in Figure 3.7.

When the DC link voltage rises above 750V for the 400V build (385V for the 230V build), the brake unit switches the external resistor network across the DC link. The brake unit switches off again when the DC link voltage falls below the threshold level. The amount of energy produced by the motor during regeneration depends upon the RAMP DOWN TIME parameter and the inertia of the load.

> Note: The dynamic braking option is designed to cope with short term stopping or braking only. It is not rated for a continuously overhauling load.

All 584S units are supplied without braking resistors. The following paragraphs should be used as a guide to calculate the braking requirements of the system.



WARNING!

Connecting a brake resistor to a drive not fitted with brake option (see product code) will result in damage to this unit. In the case when an internal brake option is not present the DBR1 terminal may be used to connect an external braking unit

Brake Resistor Selection

Brake resistor assemblies must be rated to absorb both peak braking power during deceleration and the average power over the complete cycle.

$$\text{Peak braking power} = \frac{0.0055J \times (n_1^2 - n_2^2)}{t_b} \quad \text{(W)}$$

$$\text{Average braking power } P_{av} = \frac{P_{pk}}{t_c} \times t_b$$

J - total inertia (kgm^2)

n_1 - initial speed (rpm)

n_2 - final speed (rpm)

t_b - braking time (s)

t_c - cycle time (s)

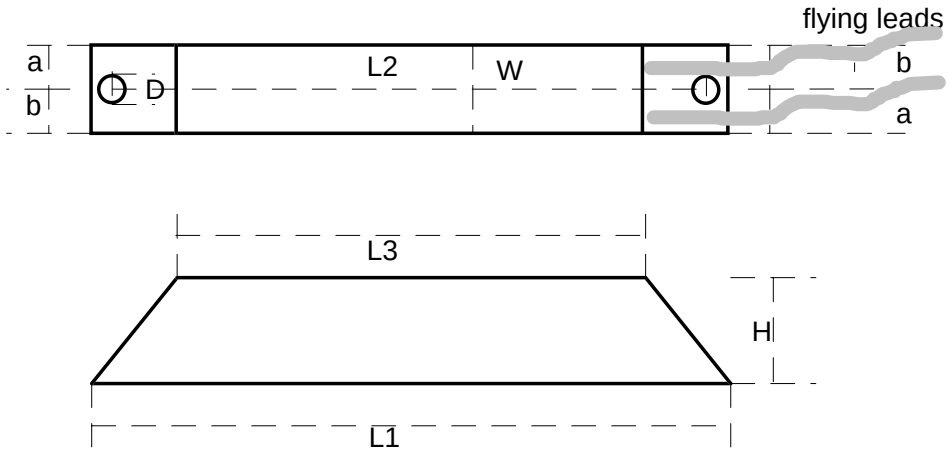
Information on the peak power rating and the average power rating of the resistors must be obtained from the resistor manufacturer. Alternatively if this information is not available then a large safety margin must be incorporated to ensure that the resistors are not overloaded. Eurotherm Drives can supply suitable brake resistor assemblies as detailed over.

By connecting these resistors in series and in parallel the braking capacity can be selected for the application.

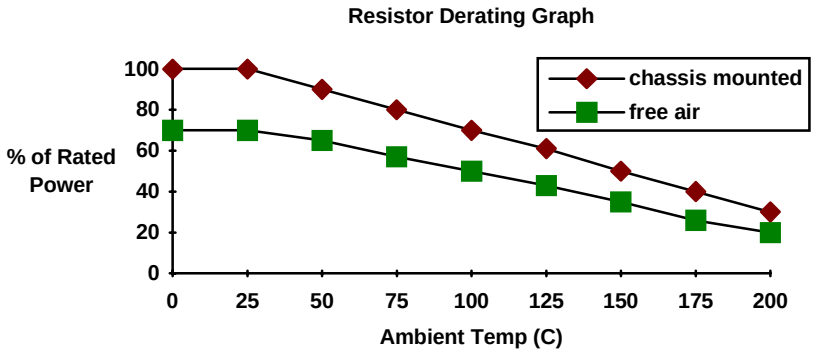
The minimum resistance of the combination should not be less than that specified in table 3.3.

The resistor(s) must be specified to the maximum DC link voltage (810V for the 400V build, 420V for the 230V build).

Brake Resistor Specification



Part number	CZ463068	CZ388396
Resistance	56ohms	36ohms
Max Wattage	200W	500W
5 second rating	500%	500%
3 second rating	833%	833%
1 second rating	2500%	2500%
Dimensions L1 (mm)	165	335
L2 (mm)	146	316
L3 (mm)	125	295
W (mm)	30	30
H (mm)	60	60
D (mm)	5.3	5.3
a (mm)	13	13
b (mm)	17	17
Flying lead length (mm)	500	500
Electrical Connection	M5 spade	M5 ring



These resistors should be mounted on a heatsink (back panel) and covered to prevent injury from burning.

Specification of the Dynamic Braking Switch

Chassis type 4		
Typical motor rating	(380 - 460 Volts)	0.75kW to 7.5kW
Typical motor rating	(208 - 240 Volts)	0.75kW to 4.0kW
Current rating	(20s max)	15A
Max duty cycle		30%
Min resistor value	(380 - 460 Volts)	50Ω
Min resistor value	(208 - 240 Volts)	25Ω

Chassis type 5		
Typical motor rating	(380 - 460 Volts)	11kW to 15kW
Typical motor rating	(208 - 240 Volts)	5.5kW to 7.5kW
Current rating	(20s max)	30A
Max duty cycle		30%
Min resistor value	(380 - 460 Volts)	25Ω
Min resistor value	(208 - 240 Volts)	12.5Ω

Chassis type 6					
Typical motor rating	(380 - 460 Volts)	18kW	22kW	30kW	37kW
Typical motor rating	(208 - 240 Volts)	-	11kW	15Kw	18kW
Current rating	(20s max)	45A	45A	65A	75A
Max duty cycle		30%	30%	30%	30%
Min resistor value	(380 - 460 Volts)	17Ω	17Ω	11.5Ω	10Ω
Min resistor value	(208 - 240 Volts)	-	8.5Ω	6Ω	5Ω

Chassis type 7				
Typical motor rating	(380 - 460 Volts)	45kW	55kW	75kW
Typical motor rating	(208 - 240 Volts)	22kW	30kW	37kW
Current rating	(20s max)	90A	110A	150A
Max duty cycle		30%	30%	30%
Min resistor value	(380 - 460 Volts)	8.3Ω	6.9Ω	5.0Ω
Min resistor value	(208 - 240 Volts)	4.2Ω	3.5Ω	2.6Ω

Table 3.3 Dynamic Braking Switch Ratings

EMC INSTALLATION GUIDELINES

Introduction

This section provides installation guidelines for drive modules and systems to maximise their '**E**lectro Magnetic **C**ompatibility' (EMC) in their intended operating environment. All installers must read this section and apply the advice which is relevant to their application. **Pass on this information to others as is appropriate.**

All power drive systems have the potential to produce electrical emissions, both radiated and conducted back into the AC supply. This is due to the inherent operation of all drives by switching large voltages and currents rapidly in order to control the motor. Because the drives internal control electronics operates continuously in very close proximity to the electrically noisy power switching elements, drives are inherently immune to any additional external electrical noise.

Great care has been taken in the design and selection of suitable EMC filters to provide the correct level of interface suppression, ease of installation and to ensure that electrical safety is not compromised. The EMC performance can only be guaranteed to be within the limits specified when the 584S/620 drive modules are installed together with the recommended EMC filters in accordance with the following instructions.

The subject of EMC is explored in more detail in a separate Eurotherm Application Manual entitled "EMC Installation Guidelines for modules and systems', part number HA388879, available from your local Eurotherm office.

EMC Filters to Reduce Line Conducted Noise

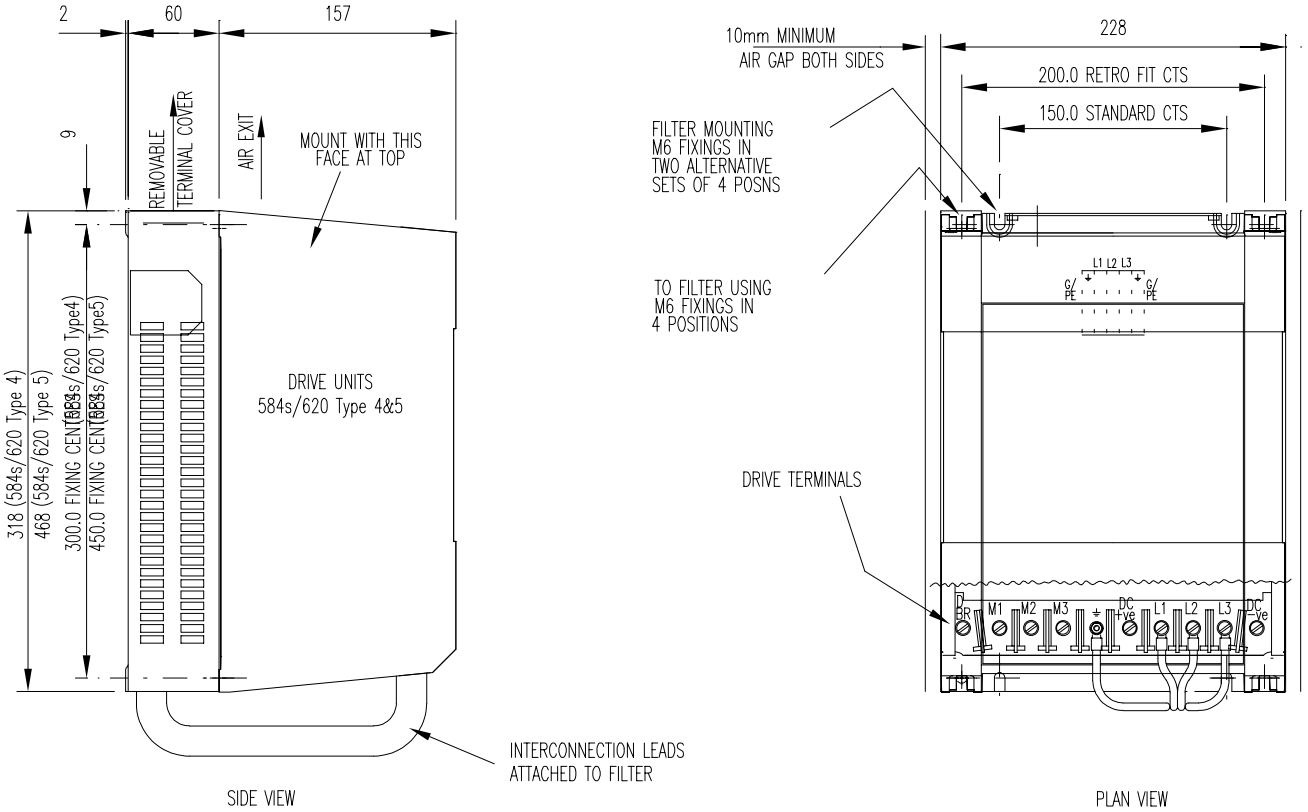
An EMC supply filter may be used with each 584S/620 drive module to reduce the line conducted noise. The recommended filters are listed in table 3.4 below.

Table 3.4 AC Supply Filter Part Numbers for Conformance with EN55011 Class B (suitable for both generic environments)

Eurotherm Product	Rating	Watt Loss	Eurotherm Filter Part Number
584S Type 4	0.75kW - 5.5kW (380V to 460V) & 0.75kW - 2.2kW (208V to 240V) constant torque	20W	CO388966U021
584S Type 4	7.5kW (380V to 460V) & 4kW (208V to 240V) constant torque	35W	CO388966U035
584S Type 5	All	25W	CO388966U045
584S Type 6	All	75W	CO464053U095
584S Type 7	All	158W	CO464053U200

The recommended EMC filters for the type 4 and 5 584S/620 are to be mounted behind the drive module (underfloor mounting) and share the same footprint. They are suitable as standard for cubicle mount applications, as shown in figure 3-2. For wall mounting a purpose designed pressed steel conduit (Part No. BA388844) is supplied with the gland box, for mounting between the filter body and gland box is shown in the mechanical mounting drawing figures 3-3.

Figure 3-2. Filter Cubicle Mounting Details (584S/620 types 4 & 5)



FILTER (CUBICLE) MOUNTING DETAIL

FILTERS:– CO388966U021 (18amp FOR 584s/620 Type 4)
CO388966U035 (24amp FOR 584s/620 Type 4)
CO388966U045 (38amp FOR 584s/620 Type 5)