

Chapter 4

INSTALLING THE 506/507/508

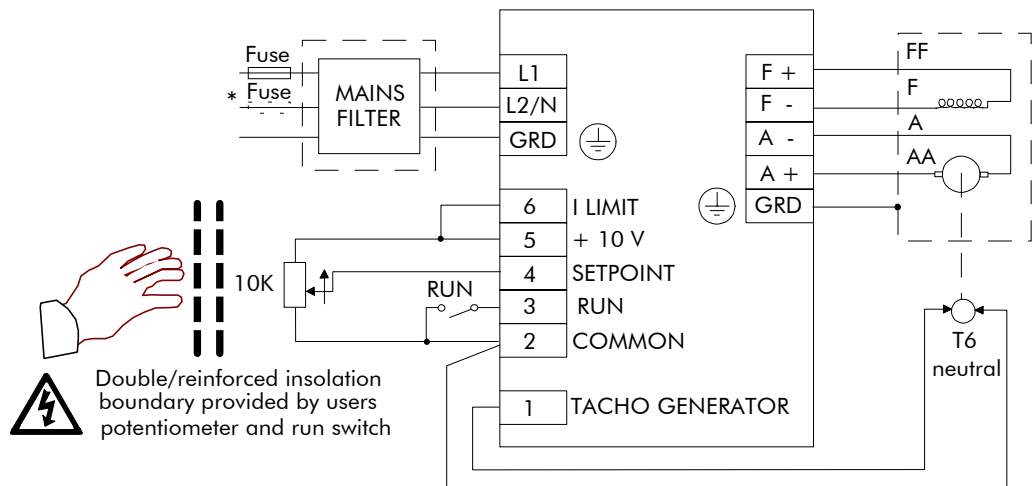
<i>Contents</i>	<i>Page</i>
Installation	4-1
Speed Control	4-1
Current Control	4-1
Wire Sizes	4-2
Requirements for UL Compliance.....	4-3
Motor Overload Protection	4-3
Short Circuit Protection Requirements	4-3
Short Circuit Rating	4-3
Operating Ambient Temperature.....	4-3
Field Wiring Temperature Rating	4-3
Field Wiring Terminal Markings	4-3
Power Wiring Terminals	4-3
Terminal Tightening Torque	4-4
Field Grounding Terminals	4-4
Fitting	4-5
Block Diagram.....	4-6
Filter	4-8
EMC Connections	4-9
Installation and Set-Up	4-9
Warning.....	4-9
• Switch Selection	4-9
• Potentiometer	4-10
• Motor.....	4-10
• Wiring.....	4-10
Applying Power	4-10
Fault Finding	4-12

INSTALLING THE 506/507/508

Installation

Speed Control

Figure 4.1 Wiring Diagram Speed Control

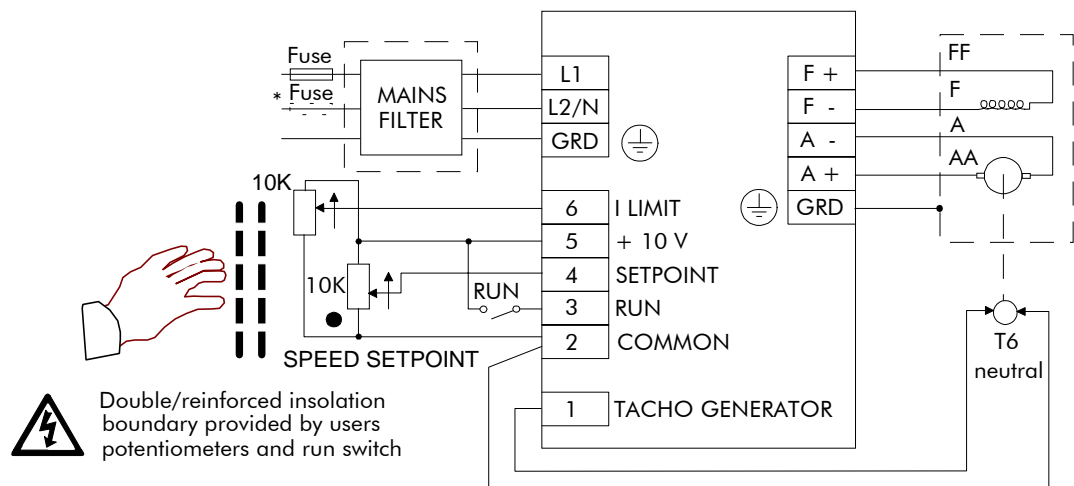


- * Additional line fuse recommended for applications where live connections are made rather than live and neutral.

'Run' connects to Common to 'Enable' Speed Control.

Current Control

Figure 4.2 Wiring Diagram Current Control



- Optional Speed Setpoint potentiometer to limit overspeed, connect setpoint direct to +10V if not required.

- * Additional line fuse recommended for applications where live connections are made rather than live and neutral

'Run' connected to +10V to 'Enable' Current Control and 'Override' Stall detection.

4-2 Installing the 506/507/508

Wire Sizes

* Contains semiconductor fuses as recommended below.

Model	Maximum Output Rating	Function	Cable (Wire) Size	AC Supply Fuse Rating	Eurotherm Drives Fuse Isolator Kit Part Numbers *
506	3A	DC Armature, AC Supply, Ground	1.5mm ² / 16AWG	10A	LA054664
507	6A	AC Supply, Ground DC Armature	2.5mm ² / 14AWG 1.5mm ² / 16AWG	10A	LA054664
508	12A	AC Supply DC Armature, Ground	6.0mm ² / 10AWG 4.0mm ² / 12AWG	20A	LA050062

Terminal Tightening Torques

Terminal	Torque Setting
Power	0.8 Nm 7 lbf-in
Control	0.56 Nm 5 lbf-in

Ferraz Semiconductor Fuses

Fuse Rating	Ferraz Type No.	Eurotherm Drives Part No.
10A, 250V	250VFA10A6X32	CH230014
20A, 250V	250VFA20A6X32	CH230024

Requirements for UL Compliance

For installations requiring compliance with UL Standards.

Motor Overload Protection

An external motor overload protective device must be provided by the installer. This device can comprise of a thermal sensor within the motor winding monitored by an external relay but this combination cannot be evaluated by UL. Hence, it is the responsibility of the installer/local inspector to determine whether the combination is in compliance with the National Electrical Code or local code requirements.

Short Circuit Protection Requirements

UL Recognized semiconductor fuses must be installed upstream of the controllers. Refer to the semiconductor fuses table on the previous page for recommended semiconductor fuse manufacturer and type number.

Short Circuit Rating

The 506 and 507 controllers are suitable for use on a circuit capable of delivering not more than 1000 RMS symmetrical amperes, 240V maximum; whilst the 508 controller is suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 240V maximum.

Operating Ambient Temperature

The maximum operating ambient temperature rating is 50°C.

Field Wiring Temperature Rating

Use 60°C copper conductors only.

Field Wiring Terminal Markings

For correct field wiring connections that are to be made to each terminal, refer to Chapter 5: “Terminal Description” - Power Terminals and Chapter 3 “Technical Specification” - Control Terminals.

Power Wiring Terminals


The power wiring terminals accept a maximum conductor size of No. 10 AWG (5.3mm²).

4-4 Installing the 506/507/508

Terminal Tightening Torque

Refer to the Terminal Tightening torque table shown on page 4-2 for both the Power and Control Terminals.

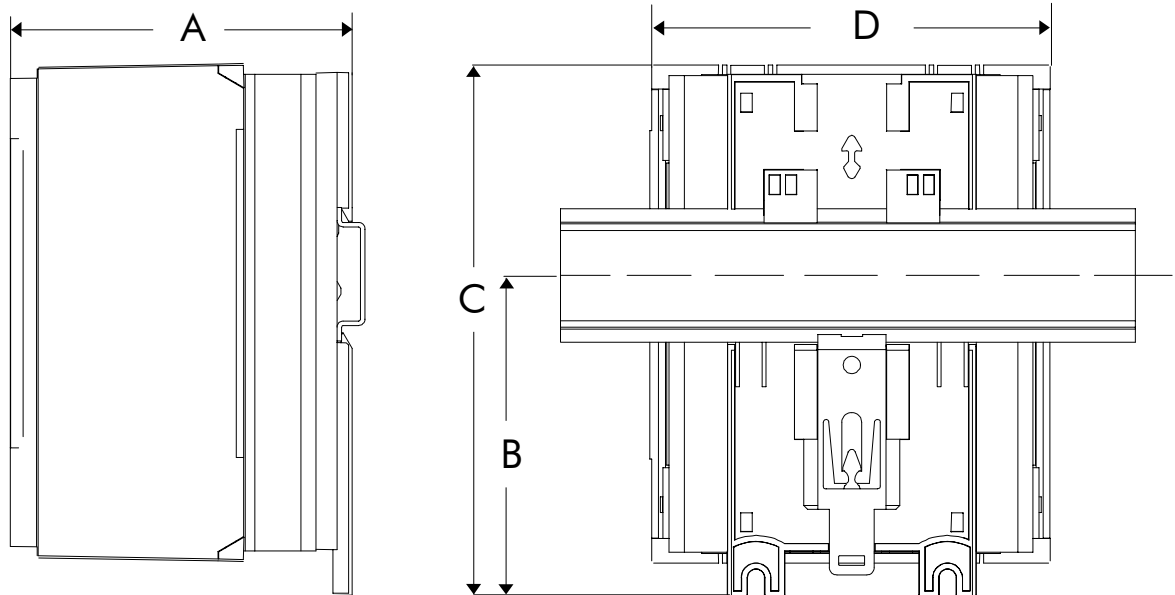
Field Grounding Terminals

The field grounding terminals are identified with the International Grounding Symbol  (IEC Publication 417, Symbol 5019).

Fitting

Figure 4.3 Product Mechanical Arrangement

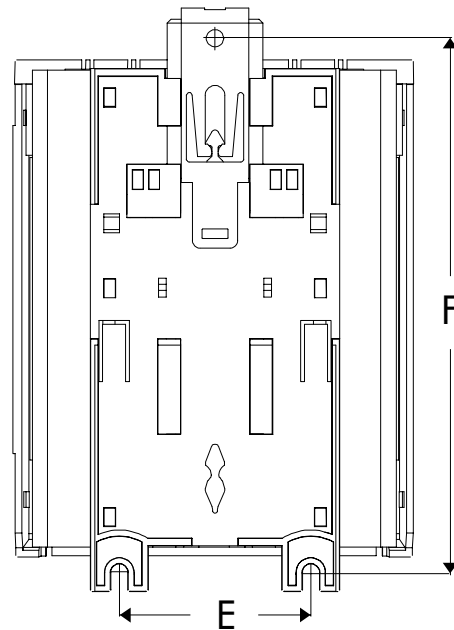
Allow 50mm above and below product for cooling.



DIN RAIL MOUNTING

PANEL MOUNTING

USE M4 FIXINGS



Mounting clip can be easily pushed to allow different mounting configurations

DIM	IP20		
	506	507	508
A	80 mm	80 mm	90 mm
B	84 mm	84 mm	84 mm
C	140 mm	140 mm	140 mm
D	105 mm	105 mm	105 mm
E	50 mm	50 mm	50 mm
F	140 mm	140 mm	140 mm

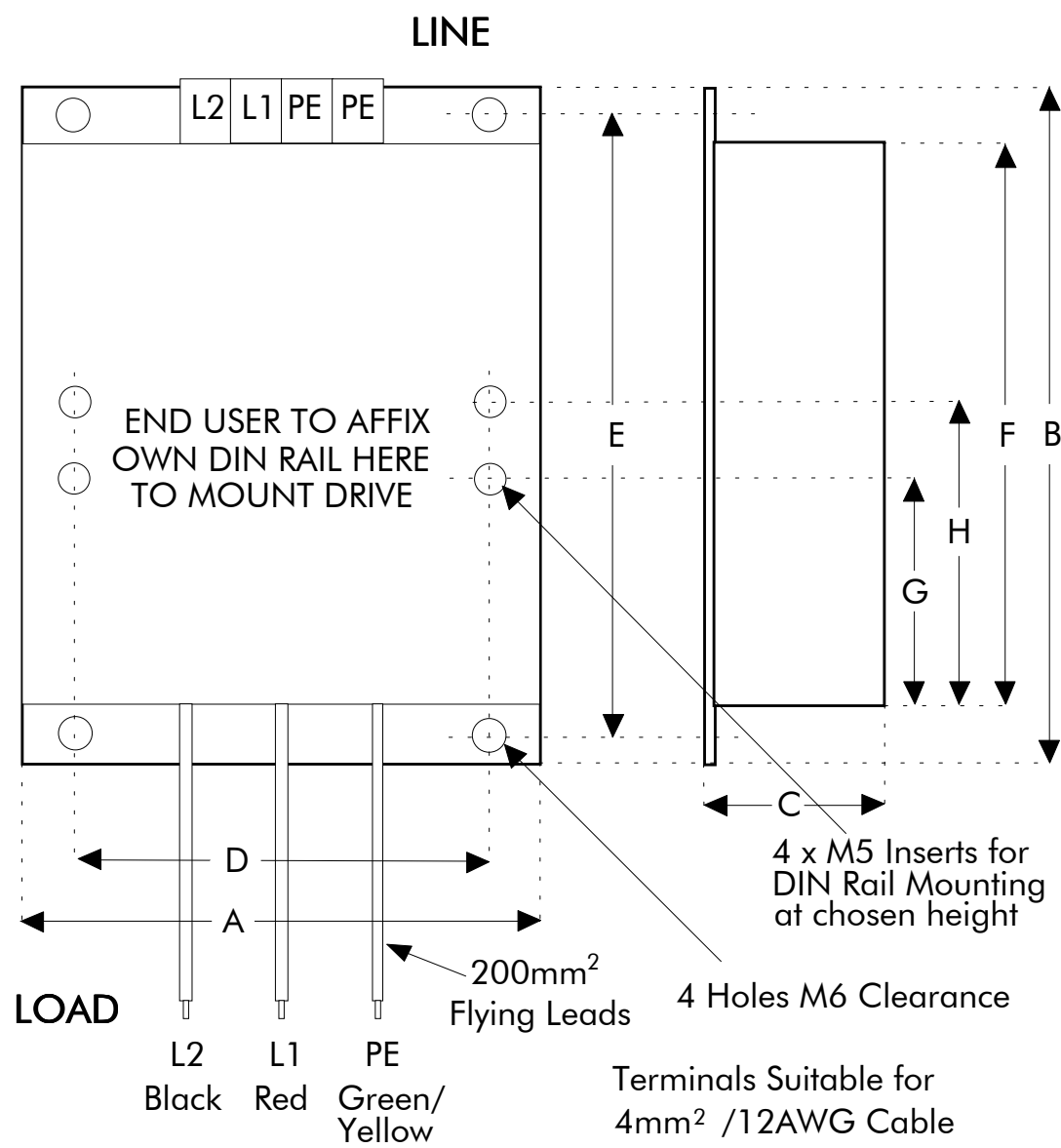
4-6 Installing the 506/507/508

Block Diagram

4-8 Installing the 506/507/508

Filter

Figure 4.4 Filter Mechanical Arrangement

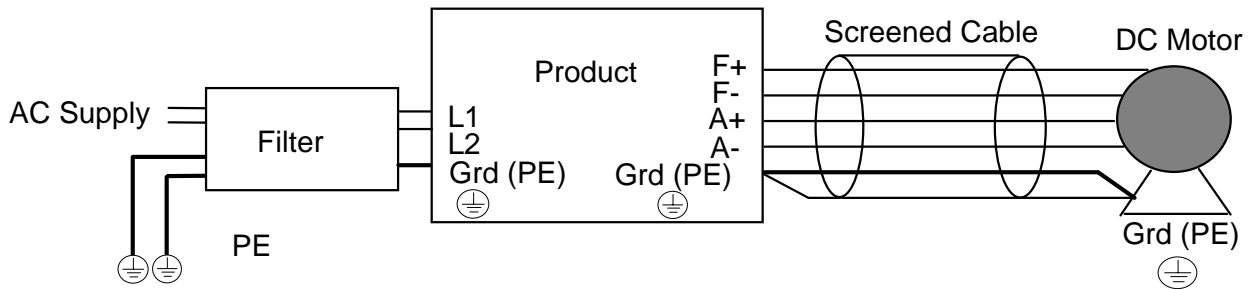


506/507/508									
Filter	Watt Loss*	Overall Dimensions			Fixing Centres				
		A	B	C	D	E	F	G	H
CO389115	9.5W	100	159	55	84	147	135	63	78

*** Note:- Watt Loss value is at a current output of 12 Amps dc.**

EMC Connections

Figure 4.5 Wiring Diagram Mains Filter



Installation and Set-Up

Warning

Before applying power check:-

Switch Selection

- (a) Mains switch set to intended supply voltage, **Left** 110/120, **Right** 220/240
- (b) Personality switches.

SW1	OFF	ON
506	0.25 to 3A	0.5 to 3A
507	0.5 to 3A	1 to 6A
508	1 to 6A	2 to 12A

Speed	Range	Maximum Feedback Voltage Range
SW2	SW3	Armature or Tacho
OFF	OFF	15 to 30
ON	OFF	30 to 60
OFF	ON	60 to 120
ON	ON	120 to 180

SW4	OFF	ON
FEEDBACK	TACH	ARMATURE

4-10 Installing the 506/507/508

Note: Even when intending to utilise tachogenerator feedback it may be wise to initially run under armature control. Set feedback voltage switches accordingly. Note that if this procedure is followed the tachogenerator must be temporarily disconnected as it will affect operation of the controller.

Potentiometer

(a)	Product	Default
	P1 Ramp Up	Anti-clockwise
	P2 Ramp Down	Anti-clockwise
	P3 Stability	Mid
	P4 I Limit	Anti-clockwise
	P5 IR Comp	Anti-clockwise
	P6 Min Speed	Anti-clockwise
	P7 Max Speed	Mid.
(b)	External	
	Speed setpoint to minimum.	

Motor

- (a) Check motor is compatible with controller and settings.
- (b) Check motor and load are free to rotate.

Wiring

- (a) Check there is no loose wire ends on the PCB.
- (b) Check that there are no free wire ends on external controls liable to contact grounded metal or earth (ground) referenced parts.

Applying Power

1. Power on LED 1 should illuminate.
2. Close “RUN” contact and apply a small speed setpoint (5%). Armature current should now flow, the motor should turn and run at a fixed speed.

If the motor runs above 5% up to top speed Open Run Contact.

If the controller is in “Armature” Control then excess speed is due to incorrect setting of SW2 and 3, the speed scaling.

If the controller is in “Tacho” control then excess speed is due to incorrect polarity of feedback. Alter wiring as follows:-

Problem

Action

Direction correct but overspeeding.

Reverse Tachogenerator polarity only.

Direction incorrect and overspeeding.

Reverse field polarity only.

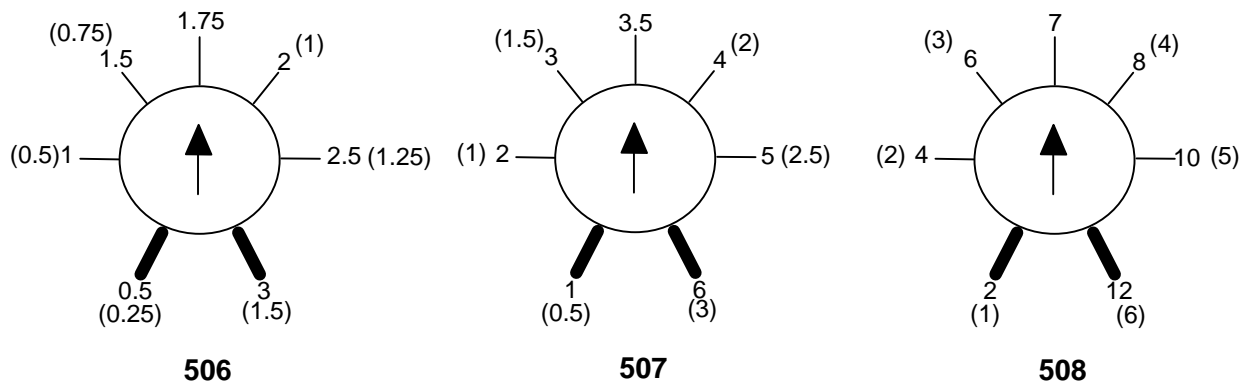
If motor does not run, increase I limit potentiometer P4 as current may be insufficient for rotation. The Health light LED2 may light in this condition after 15 seconds indicating a Stall, remove and reapply power to reset condition.

If the motor is in control but runs in the wrong direction either:-

(a) Armature Control - Reverse Field Polarity.

(b) Tacho Control - Reverse Field AND Tacho Polarity.

3. Increase speed setpoint to maximum and check armature voltage does not exceed rated value, adjust maximum speed using P7. If a minimum speed setting is required reduce speed setpoint potentiometer to zero adjust minimum speed potentiometer P6 to give required value. With speed setpoint at maximum, re-adjust maximum speed with P7.
4. Adjust I Limit potentiometer to suit Motor Current Rating.



More accurate adjustment may be achieved by inserting a meter in the armature circuit.

5. Adjust Ramp Up P1 and Ramp Down P2 potentiometers as required.
6. In Armature Voltage Feedback, speed droop will occur as load is applied. Adjust IR compensation P5 to reduce this effect. Excessive adjustment may cause instability.
7. It may be necessary to adjust the Speed Stability Potentiometer P3 to improve speed response. Excessive adjustment may cause instability.

Fault Finding

Problem	Possible Cause	Remedy
Controller will not power up - no 'on' indication.	Wrong supply voltage. Line fuses blown (if fitted).	Check setting on mains switch. It is likely that if too high a voltage has been used the Controller will be permanently damaged. Power off, check circuits and replace fuses.
Motor will not turn.	No run circuit. No setpoint.	Check run contact and wiring. Check connections to and operation of setpoint potentiometer.
Motor accelerates out of control with tacho-generator feedback and small setpoint.	Tacho polarity. Tacho linkage. Tacho faulty.	Power off and reverse tacho connections. Check tacho coupling to motor. Remove and replace tacho.
Motor rotates in the wrong direction. Speed is controlled though.	Motor connections are wrong for required direction with: 1. Armature voltage feedback. 2. Tacho-generator	Power off and reverse armature connections. Power off and reverse <u>both</u> armature and tacho connections.
Motor will not turn and the stall light comes on after 15 seconds in speed control mode.	Motor shaft locked or jammed. No field current (not applicable for permanent magnet motors). No armature current. Low current limit.	Power off and check motor and load for stiffness or jamming. Check that DC voltage across motor field terminals is present. If not power off and check field circuit for continuity. Power off and check armature circuit for continuity. Check current limit with +10V link on Controller.
Motor will only run at full speed.	Maximum speed setpoint.	Check connections to and operation of setpoint potentiometer.

Problem	Possible Cause	Remedy
Motor will not run at correct maximum speed.	Wrong speed range selection on preset switches.	Refer to Installation and Set-up chapter.
Stall light comes on after 15 seconds in current control mode.	Incorrect wiring of run contact.	Run contact should be wired between the two terminals marked 'run' and '+10V'.
Stall light comes on immediately after the 'run' contact is closed.	Faulty or incorrect load across the 'A+' and 'A-' terminals.	Check motor armature thoroughly. The Controller should not be used on motors with a low inductance.

4-14 Installing the 506/507/508