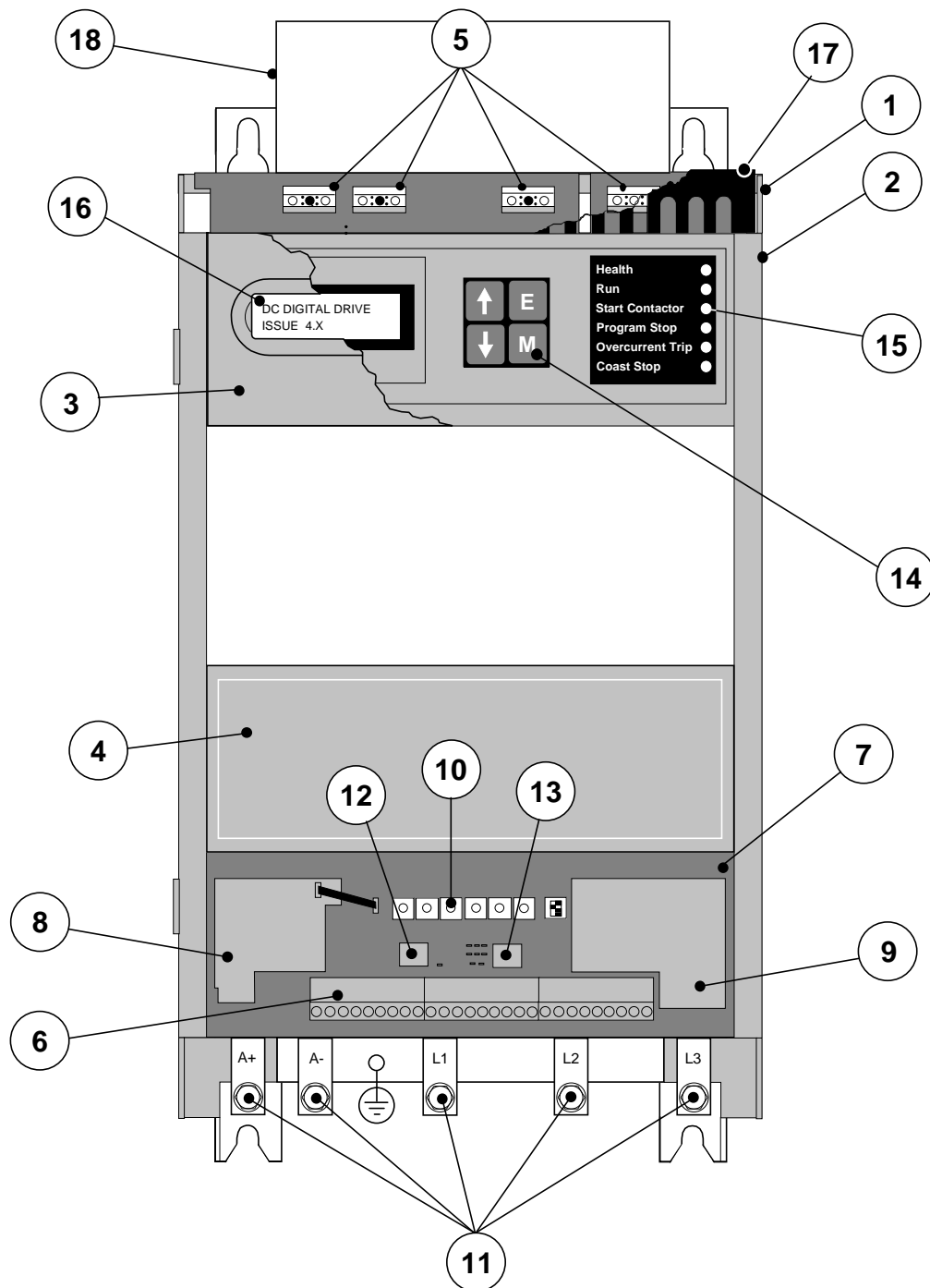


## Component Identification



**Figure 2-1 View of Component Parts (110A model illustrated)**

<b>1</b>	Main converter assembly	<b>10</b>	Calibration panel
<b>2</b>	Converter door assembly	<b>11</b>	Busbars - main power input
<b>3</b>	Hinged MMI cover	<b>12</b>	System Port (P3)
<b>4</b>	Hinged terminal cover	<b>13</b>	Auxiliary Serial Port (P2)
<b>5</b>	Field wiring terminals	<b>14</b>	Man-Machine Interface (MMI) keypad
<b>6</b>	Control terminals	<b>15</b>	Status LEDs
<b>7</b>	Control board	<b>16</b>	MMI display
<b>8</b>	Tacho/Encoder/Microtach option board	<b>17</b>	IP20 Top Cover
<b>9</b>	Main Serial Port COMMS option module (P1)	<b>18</b>	IP20 Fan Housing (where fitted)

## Control Features

Control	Control Circuits	Fully isolated from power circuit (SELV)
	Output Control	<ul style="list-style-type: none"> <li>Fully controlled 3-phase thyristor bridge</li> <li>Microprocessor implemented phase control extended firing range</li> <li>For use on 50 or 60Hz supplies with a frequency compliance range of 45 to 65Hz</li> <li>Phase control circuits are phase rotation insensitive</li> </ul>
	Control Action	<ul style="list-style-type: none"> <li>Fully digital</li> <li>Advanced PI with fully adaptive current loops for optimum dynamic performance</li> <li>Self Tuning Current Loop utilising "Autotune" algorithm</li> <li>Adjustable speed PI with integral defeat</li> </ul>
	Speed Control	<ul style="list-style-type: none"> <li>By Armature Voltage feedback with IR compensation</li> <li>By Encoder feedback or analog tachogenerator</li> </ul>
	Speed Range	100 to 1 typical with tachogenerator feedback
	Steady State Accuracy	<ul style="list-style-type: none"> <li>0.01 % Encoder Feedback with Digital setpoint (serial link or P3)</li> <li>0.1 % Analog Tach Feedback</li> <li>2 % Voltage Feedback</li> <li>Absolute (0.0% error) using QUADRALOC Mk II digital controller</li> </ul> <p><b>Note:</b> Long term analog accuracy is subject to tachogenerator temperature stability.</p>
	Adjustments	All adjustments in software can be altered by on-board pushbuttons or via serial communications. An LCD display provides monitoring of adjustment parameters and levels, in addition to diagnostic facilities.
Protection		<ul style="list-style-type: none"> <li>High energy MOVs</li> <li>Overcurrent (instantaneous)</li> <li>Overcurrent (inverse time)</li> <li>Field failure</li> <li>Speed feedback failure</li> <li>Motor overtemperature</li> <li>Thyristor Stack overtemperature (Force ventilated units)</li> <li>Thyristor "Trigger" failure</li> <li>Thyristor Snubber Network</li> <li>Zero-speed detection</li> <li>Standstill logic</li> <li>Stall protection</li> </ul>
Diagnostics		<ul style="list-style-type: none"> <li>Fully computerised with first fault latch and automatic display</li> <li>Digital LCD monitoring</li> <li>Full diagnostic information available on RS422/RS485</li> <li>LED circuit state indication</li> </ul>

Table 2-1 Control Features

## Understanding the Product Code

The unit is fully identified using an alphanumeric code which records how the Converter was calibrated, and its various settings when despatched from the factory.

The Product Code appears as the “Model No.”. Each block of the Product Code is identified as below:

Block No.	Variable	Description
1	XXXX	Generic product 590C : 3 phase 4 quadrant (regenerative) converter up to 720A 591C : 3 phase 2 quadrant (non-regenerative) converter up to 720A
2	XXXX	Four identifying the maximum dc output current rating that may be calibrated for each size of product: 0350 = 35A 0700 = 70A 1100 = 110A 1500 = 150A 1800 = 180A 2700 = 270A 3600 = 360A 4500 = 450A 7200 = 720A
3	X	1 digit identifying the nominal 3 phase ac power, supply voltage; 0 = 110V 1 = 115V 2 = 208V 3 = 220V 4 = 240V 5 = 380V 6 = 415V 7 = 440V 8 = 460V 9 = 480V A = 500V
4	X	1 digit identifying the auxiliary ac control supply voltage: 0 = 110V 1 = 115V 3 = 220V 4 = 240V
5	X	One digit specifying the user interface language. 0 = English 1 = (reserved) 2 = French 3 = German (refer to Customer Services) 4 = Italian (refer to Customer Services) 5 = Spanish (refer to Customer Services)
6	X	One character specifying any feedback option installed over and above the standard features of the product: 0 = Armature Voltage 1 = DC Tacho 2 = 5701 Plastic Fibre Microtach 3 = Wire-ended Encoder 4 = 5901 Glass Fibre Microtach
7	X	One character specifying the communications protocol and its hardware implementation method: 0 = No serial link 1 = Fitted RS485 serial link 2 = PROFIBUS (Version 1) - compatible with existing products 3 = PROFIBUS (Version 2) - preferred version

Block No.	Variable	Description
8	XX	Two characters specifying special options (hardware): 00 = No special options 01 to 99 = Documented special options
9	XXX	Three characters specifying special options (software): 000 = No special options 001 to 999 = Documented special options

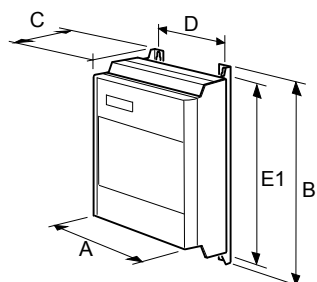


# INSTALLING THE CONVERTER

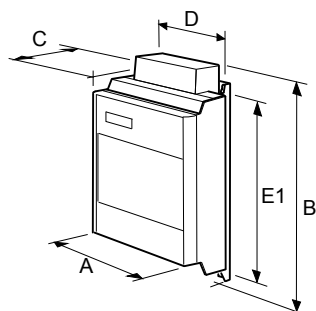
**IMPORTANT:** Read Chapter 12: "Certification for the Converter" before installing this unit.

Refer to Installation Drawings, page 3-20 for further information.

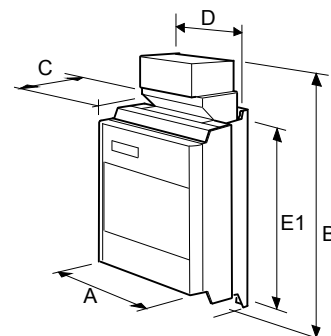
## Mechanical Installation



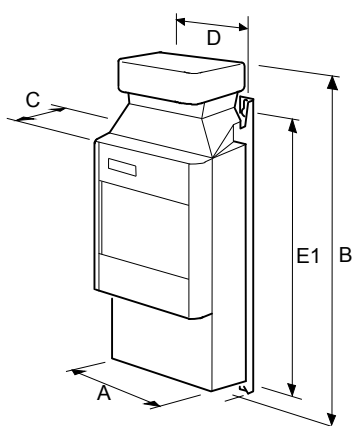
35A - 70A



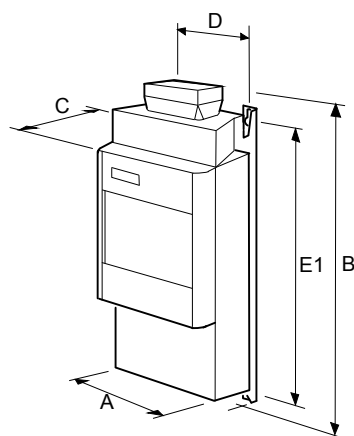
110A - 150A



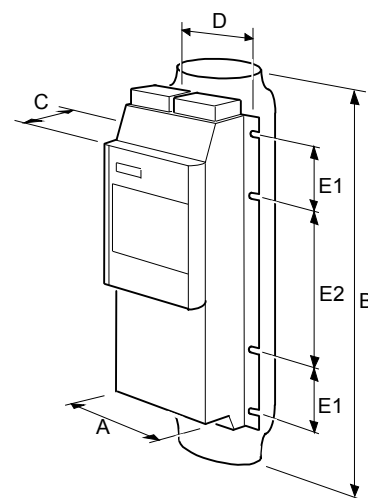
180A - 270A



360A



450A \*



720A - 800A \*

\* Cooling fan assemblies not shown

Current Rating (A)	Model	Overall Dimensions			Fixing Centres		
		A	B	C	D	E1	E2
35 - 70	590D/591D	250	415	180	200	400	-
110 - 150	590D/591D	250	445	180	200	400	-
180	590D/591D	250	555	180	200	400	-
270	590D/591D	300	500	210	200	400	-
360 & 450	590D/591D	322	705	252	200	600	-
720 & 800	590D/591D	370	930	330	300	133	400

*Dimensions are in millimetres*

## 3-2 Installing the Converter

### **Mounting the Converter**

General installation details are given below for mounting the Converter, however, if you are installing the unit with an EMC filter refer to “External AC Supply EMC Filter Installation”, page 3-17.

Mount the unit vertically on a solid, flat, vertical surface. It is mounted using bolts or screws into four fixing points (keyhole slots). The design allows the use of 100mm grid fixing.

It must be mounted inside a suitable cubicle. To comply with the European safety standards VDE 0160 (1994)/EN50178 (1998), the cubicle must require a tool for opening.

### **Ventilation and Cooling Requirements**

Refer to Chapter 11: “Technical Specifications” - Cooling.

The Converter gives off heat in normal operation and must therefore be mounted to allow the free flow of air through the air entries and exits. Maintain the minimum air clearances given on the drawings to ensure that heat generated by other adjacent equipment is not transmitted to the Converter, be aware that other equipment may have its own clearance requirements. When mounting two or more 590's together, these clearances are cumulative.

Ensure that the mounting surface is normally cool.

Refer to Chapter 13: “Standard and Optional Equipment” - Heatsink Cooling Fan Connections for fan connection details.

### **AC Line Choke**

**We recommend that you always use the specified ac line choke with the Converter** to provide a known supply impedance for effective operation of the thyristor transient suppression circuits.

Refer to Chapter 11: “Technical Specifications” - External AC Supply (RFI) Filters and Line Choke for selection details.

## Electrical Installation

**IMPORTANT:** Please read the Safety Information on page Cont. 3 & 4 before proceeding.

### 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.

Cables are considered to be electrically *sensitive*, *clean* or *noisy*. You should already have planned your cable routes with respect to segregating these cables for EMC compliance. If not, refer to Chapter 12: "Certification for the Converter".

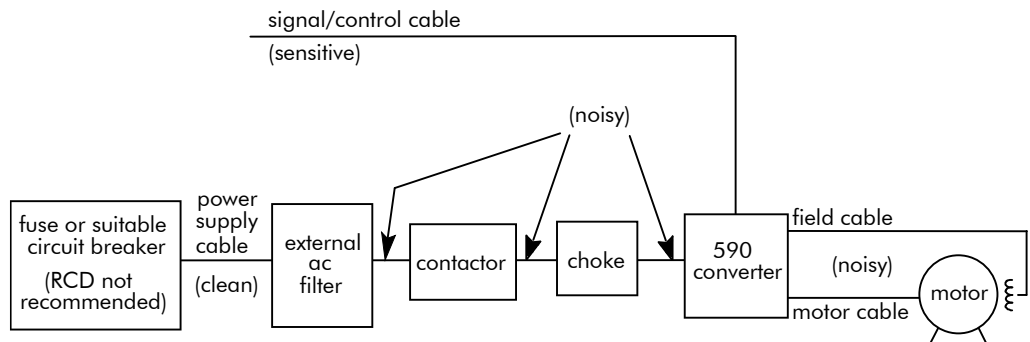


Figure 3-1 Cabling Requirements

If the controller is to be operating in a regenerating mode for extended periods acting as a load generator for another machine, it is advisable to fit additional protection in the armature circuit. A dc fuse or high speed circuit breaker will provide this protection. If in doubt, contact Parker SSD Drives.

### Cable Gland Requirements

Use a metal gland to connect to the cubicle backplate, near the VSD (variable speed drive). It must be capable of securing a 360 degree screened connection to give EMC compliance. A 360 degree screened connection can be achieved as shown.

We suggest a rubber grommet should be fitted on holes where a cable gland is not used.

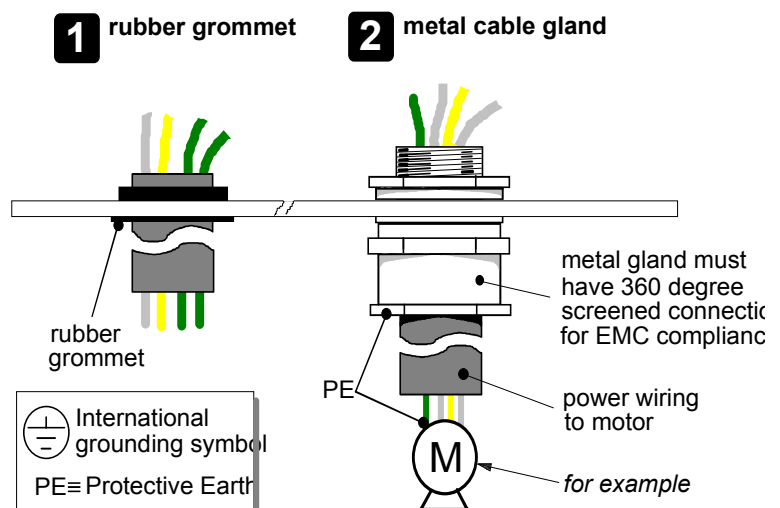


Figure 3-2 Cable and Screen Fixings

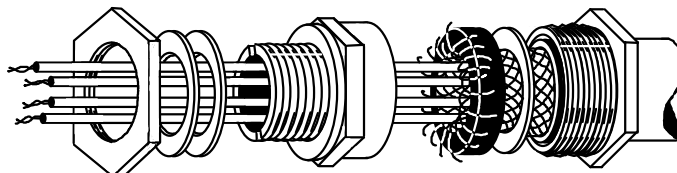


Figure 3-3 360 Degree Screened Connection



## 3-4 Installing the Converter

### Minimum Connection Requirements

**Note:** *Because of the complexity of showing all possible configurations, this Chapter deals only with a 'general purpose' operation as a basic speed controller. Special wiring options usually form part of a customer-specific system and connection details will be provided separately.*

The circuit diagram over the page uses bold lines to show the minimum connection requirements for operating the Converter. These connection details are highlighted 1 to 9 in the following text with the symbol opposite. The remaining connection details are not necessary for a "quick start-up".

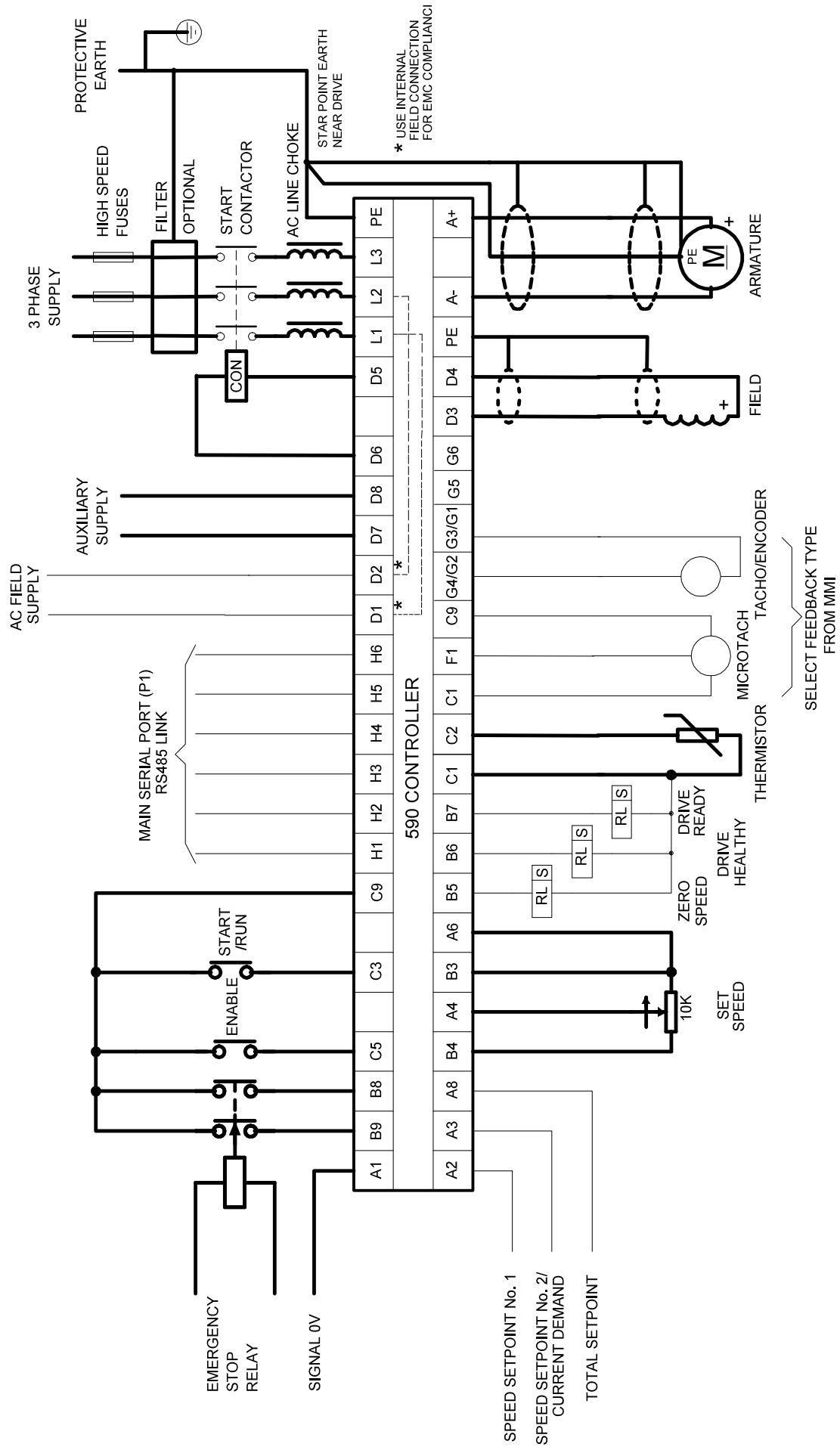
MINIMUM  
CONNECTION  
REQUIREMENT

The Converter is using the default Armature Voltage feedback when following the 'minimum connection' instructions.

**IMPORTANT:** Indicator lamps, annunciators, etc., for "Drive On" condition should be switched by an auxiliary contactor of the main contactor, not by the controller auxiliary relay.

To avoid damaging the drive NEVER carry out high voltage resistance or dielectric strength tests without first completely disconnecting the drive from the circuit being tested.

- Power cables must have a minimum rating of 1.1 x full load current. (1.25 x FLC when required to comply with UL requirements).
- All incoming main AC power supply connections must be protected with high speed semiconductor fuses. Refer to Chapter 11: "Technical Specifications" for fuse information.
- The External AC Supply EMC Filter must only be fitted on the mains side of the contactor.



**Figure 3-4 Minimum Connection Requirements ('general purpose' configuration)**