EUROTHERM
DRIVES

5590 Armature Voltage Feedback Unit

Product Manual

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Printed in England HA055403 Iss 3

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Chapter 1 Introduction

The Armature Voltage Feedback Unit (5590) is designed to provide a simple but effective method of achieving armature voltage control when used in conjunction with a standard 540 series controller.

The 5590 is housed in a small DIN rail mounted box with shrouded terminals at either end, control connections being at the top and armature connections at the bottom. The High Voltage Terminals are spaced to UL and CSA requirements.

The whole unit is powered from the +24V supply of the 540 controller or 590A controller, the unit itself using this power input to generate internally a balanced dc supply to the amplifiers.

The 5590 provides impedance isolation of the armature voltage signal levels, the input impedance of the unit being greater than 10M Ohm. The Armature Voltage is attenuated by a factor of 100 reducing the signal to a level compatible with the operational amplifiers used in standard analogue circuits. The overall gain of the unit is adjustable to allow use with armature voltages in the range of 100 to 550V. The scaled bi-directional output signal can be connected directly into the controller tachogenerator terminals. Armature Current compensation is also available and can be adjusted up to a maximum of 11%.

5590 Units provided off the shelf are adjusted to give the maximum output for the minimum input, thus maximum speed will not be achieved without adjustment.

Chapter 2 Technical Details

Isolation	:	Impedance isolation via high value resistors.
Operation	:	Operational amplifier attenuation circuit working common mode with variable gain output stage.
Gain Adjustment	:	50 to 1 attenuation followed by a gain adjustment of x2 to x15 giving an operating range of 90V to 550V dc.
Armature Current Compensation	:	Up to 11 %.
Output	:	+/- 10V dc @ 5mA.
Power Supply	:	+ 24V dc @ 33mA.

Chapter 3 Terminal Description

590A	540 Series 545 Series	Control Signals
T5	A2	Armature current compensation input.
T16	B1	Signal or power ground.
T17	B2	Scaled armature voltage output.
T38	C11	+ 24V dc power supply input
		Armature
	A +	Armature positive input
	A -	Armature negative input

NOTE: The terminals are numbered the same as the 540 series controllers for ease of wiring.

Chapter 4 Connection and Adjustment

Wiring

1. Armature connections are made to terminals A + and A - of the 5590. The cabling used should be fused as close as possible to the high current connections of the controller, the wiring from the controller being either capable of carrying drive full load current or as large as the fuse holder will allow. Cable size from fuse holder to the 5590 is then reduced to at most 0.75mm^2. Indicator fuses are commended, the associated microswitches being connected into the drive enable circuitry.

2. Control connections are made between the controller and the unit as dictated by the terminal numbers, 0.75mm^2 blue cable should be used.

Adjustment

1. When the drive is initially being run up under "Speed" control, check polarity of reset signal. If the drive continues to accelerate beyond the minimum speed level the unit is likely to be connected incorrectly. Reverse incoming armature connections and try again.

2. With the motor running under control, run to top speed monitoring speed reset at diagnostic 16 continually. With drive speed potentiometer P10 set to middle position adjust armature volts potentiometer unit to give nominal volts or speed. (It will be difficult to use this potentiometer to set precise speed). Trim to exact speed using P10.

3. Armature current compensation is best adjusted at stall. With all drive supplies disconnected, remove field wires from D1 to D8 and fit "field fail override plug" ① correct position. Remove B2 connection from 5590 to drive and link B2(T17) to + 10V at drive terminal block.

4. Reduce P7 potentiometer to zero. Power up drive and close contactor, monitor output of armature voltage feedback unit and gradually increase P7. As the drive output current rises the output of the transducer will increase, adjust "IR" compensation potentiometer to reduce the output toward zero. (DO NOT OVERCOMPENSATE BY REDUCING VOLTS BEYOND ZERO OR "POSITIVE" FEEDBACK WILL RESULT). If in doubt leave "IR" compensation potentiometer fully anticlockwise.

5. Remove + 10V to B2(T17) connection, replace connection from the armature voltage feedback unit to drive and restore field connections. Move field override link to normal position.

6. Run drive under "Speed" control and check performance through speed range.

NOTE ① : 590A set SW9/5 to ON position.

IMPORTANT NOTICE

All units supplied as spares are factory preset to give full output at minimum input. If the unit is used in normal operating mode, as feedback for armature voltage control systems, the motor will run at reduced speed initially. The unit must be adjusted as detailed above when installing a spare.

ISS.	MODIFICATION	C.P. No.	DATE	APPROVAL
1	Initial Issue (HA055403)	2538	08.05.89	GDR
2	Change SSD to Eurotherm Drives and change address. Add warning to back page	8209	12.03.93	GDR
3	Included connection information for 590A.	9081	22.03.94	

FIRST USED ON

MODIFICATION RECORD

5590 Armature Voltage Feedback Unit Product Manual

EUROTHERM DRIVES

DRAWING NUMBER

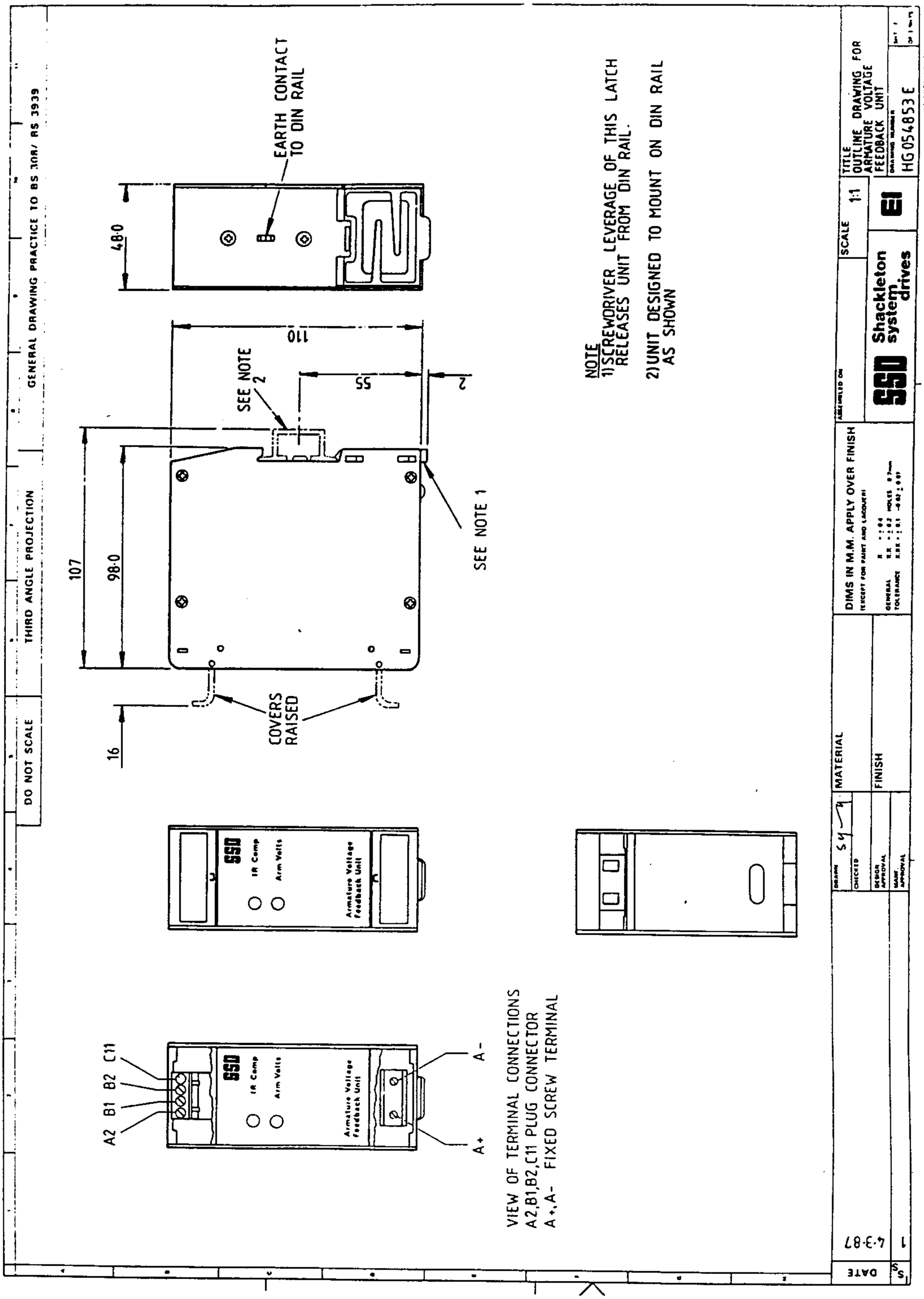
ZZ 055403 C

SHT. 1

OF 1

Issue A 08.02.1994 GA387648C016

Outline Drawing for Armature Voltage Feedback Unit



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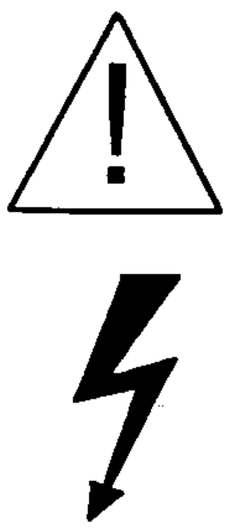

WARNING

This equipment contains hazardous voltages and hazardous rotating mechanical components (fans).
Loss of life, severe personal injury or property damage can result if instructions contained in this manual are not followed.
Only qualified personnel should work on this equipment, and only after becoming familiar with all safety instructions regarding installation, operation and maintenance procedures contained in this manual. The successful and safe operation of this equipment is dependent on proper handling, installation, operation and maintenance of the equipment.

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