REPLACING AN FPU-16 WITH AN FPU-32

The FPU-16 and the FPU-32 have the same footprint and panel-mount method, the FPU-16 plug-in terminal-blocks will connect to the FPU-32, and the FPU-32 terminals are arranged to allow replacement of the FPU-16 with minimal wiring changes.

1. Before Removing the FPU-16

Record the settings in Table 1.

MODE	FUNCTION	1ST LEVEL SETTING	2ND LEVEL SETTING	FPU-32 MENU LOCATION
0	I^2t LIMIT (s @ 600%)	_____(s) ÷ 60 = _____(m)	_____(s) ÷1st level = _____(pu)	Setup / Protection / Overload / Group 1 / Time Constant -enter the 1st level value in minutes Setup / Protection / Overload / Group 1 / I2t Alarm level - enter the 2nd level value in per unit
1	SHORT-TIME OVERCURRENT (x Phase CT)	_____(x I_p)	_____(x I_p)	Setup / Protection / Phase Inverse Select an appropriate IEEE or IEC overcurrent curve. See the FPU-32 manual.
2	INSTANTANEOUS OVERCURRENT	_____	_____	Setup / Protection / Ph Def Time / Group 1 / Trip Level -enter 1st level value Setup / Protection / Ph Def Time / Group 1 / Alarm Level -enter 2nd level value
3	CURRENT UNBALANCE (%)	_____(%)	_____(%)	Setup / Protection / Unbalance / Trip Level -enter the 1st level value Setup / Protection / Unbalance / Alarm Level -enter the 2nd level value
4	EARTH FAULT (% of EF-CT rating)	_____(%) ÷ 100 = _____(x Ie)	_____(%) ÷ 100 = _____(x Ie)	Setup / Protection / Ict Definite Time / Group 1 / Trip Level -enter the 1st level value in x Ie Setup / Protection / Ict Definite Time / Group 1 / Alarm Level -enter the 2nd level value in x Ie
5	PROGRAM		N/A	Refer to the FPU-16 manual, page 13
6	EARTH-FAULT CT RATING (Ie)	_____(A)	N/A	Setup / System Ratings / EF-CT Primary
7	PHASE-CT RATING (Ip)	_____(A)	N/A	Setup / System Ratings / CT Primary
8	RATED CURRENT	_____(A) ÷ Ip = _____(pu)	N/A	Setup / Protection / Overload / Group 1 / I2t Pickup -enter this value in per unit (pu)

Table 1: FPU-16 Settings

REPLACING AN FPU-16 WITH AN FPU-32

2. Removing the FPU-16 from Service

Unplug the connectors from the back of the FPU-16. The ICT-2 Interface Current Transformer terminates the CTs eliminating the need to short the CT secondaries. Loosen the four retaining screws of the panel-mount clamp. Lift the top and bottom latch tabs, and slide the clamp off the rear of the FPU-16. See Fig. 1. Remove the FPU-16 from the panel.

3. Preparing to Install the FPU-32

TOP TERMINAL BLOCK, TERMINALS 13 – 24

No changes are necessary on the top terminal block if:

- program-change-enable switch is not used
- the operation-counter feature of the FPU-16 is not used

PROGRAM CHANGE ENABLE FUNCTION	
FPU-16	Jumper between terminals 20 and 21
FPU-32	Password or Digital Input

The FPU-16 requires a jumper to enable program changes and emergency thermal resets. FPU-32 program changes and emergency thermal resets are enabled with the digital input or by entering a password, therefore a hard-wired program enable is often not required. To use a switch to enable program changes on the FPU-32, connect a normally open switch between terminals 31 and 26, and connect a jumper between terminals 25 and 27. Program the digital input as Program Enable.

OPERATION COUNTER	
FPU-16	Connected to terminals 17 and 19
FPU-32	Not available

The FPU-16 is able to count contact closures between terminals 17 and 19. This feature is not available on the FPU-32 and these connections should be removed.

Analog Output

If the FPU-16 analog output was used, ensure that the FPU-32 analog output switch is set to the ‘S’ (Self Powered) position.

REPLACING AN FPU-16 WITH AN FPU-32

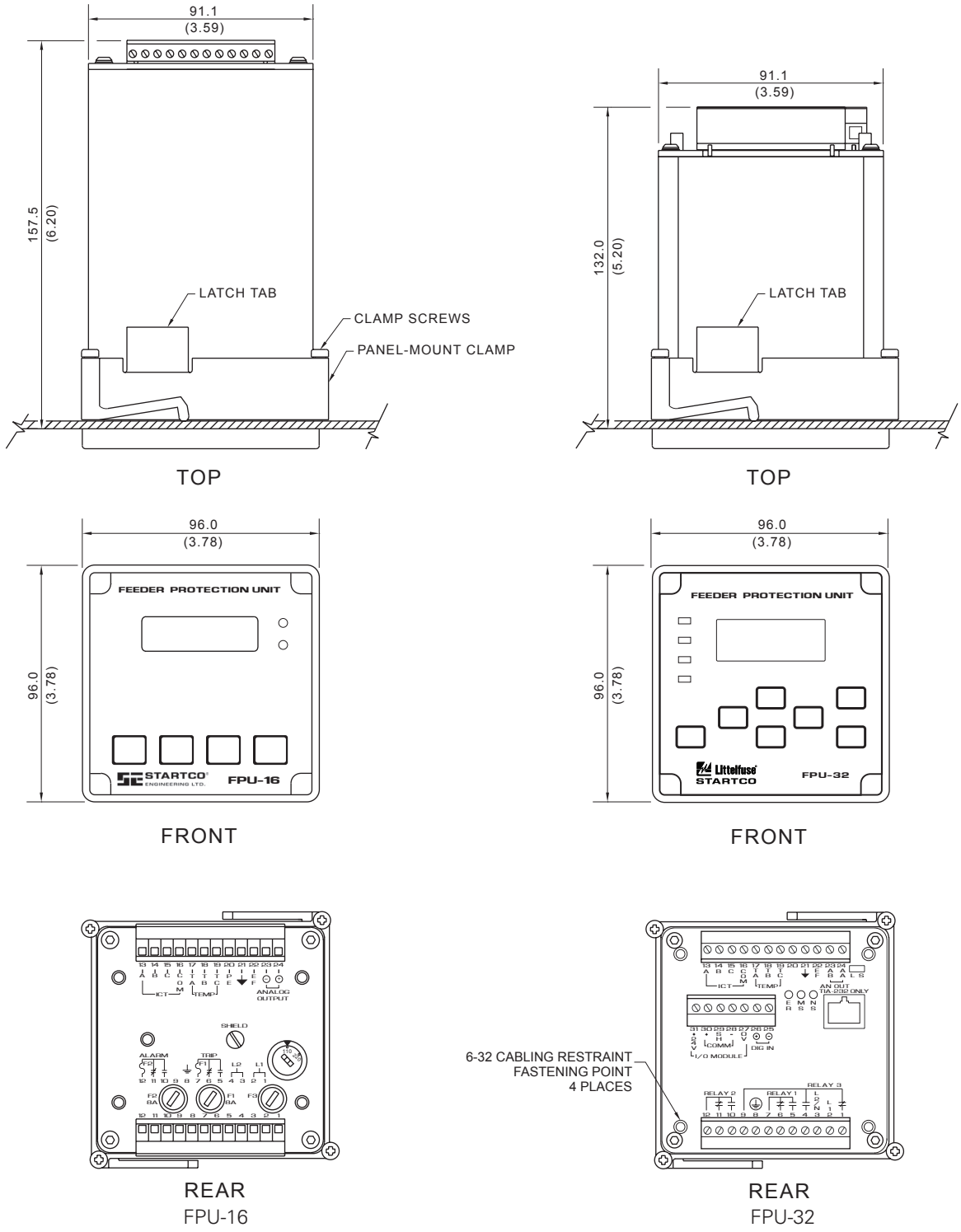

Figure 1: Physical Dimensions FPU-16 & FPU-32

REPLACING AN FPU-16 WITH AN FPU-32

FPU-32 TERMINALS 25 – 31

CABLE SHIELDING TERMINATION	
FPU-16	Center of back-plate
FPU-32	Terminal 29

Connect cable shielding to terminal 29 on the FPU-32.

Communications

CABLE SHIELDING TERMINATION	
FPU-16	Optional RS-485 Communication (Modbus or AB-DF1)
FPU-32	Standard TIA-232 (RJ-45 Socket), TIA-485 (Modbus RTU or AB-DF1) optional

TIA-232 communications using the Modbus RTU protocol is a standard FPU-32 feature. A TIA-232 to TIA-485 adapter is required to use this port for network use.

The FPU-32 standard interface is non-isolated. If an isolated Modbus RTU or AB DF-1 is required, use an FPU-32 with TIA-485 communications option. FPU-32 memory registers and data are not compatible with the FPU-16 formatting.

FPU-32 TERMINALS 1 – 12

CAUTION: Remove Red Keying Plug

The FPU-16A lower terminal block has a red keying plug inserted in the terminal 9 location to prevent reversing the upper and lower terminal blocks. Failure to remove this plug will result in damage to the FPU-32.

The red keying plug can be removed using a dental pick. If the keying plug will not come out, remove the terminal block and use the terminal blocks supplied with the FPU-32.

The FPU-32 terminals are arranged to provide a third relay output at terminals 1, 4 and 9. The FPU-16 lower terminal block can be safely plugged into the FPU-32 lower terminal socket.

CAUTION: Do Not Reverse the Upper and Lower Terminal Blocks

Do not insert the FPU-16 lower terminal block into the FPU-32 upper terminal socket. Doing so will damage the FPU-32.

REPLACING AN FPU-16 WITH AN FPU-32

OUTPUT CONTACTS	
FPU-16	Trip - terminals 5, 6, 7; Alarm - terminals 10, 11, 12
FPU-32	Relay 1 - terminals 5, 6, 7; Relay 2 - terminals 10, 11, 12; Relay 3 - terminals 1, 4, 9

The FPU-16 has 2 output relays, one for the alarm function and one for the trip function. The FPU-32 has 3 programmable output relays. FPU-32 default relay assignment is the same as the FPU-16 trip- and alarm-relay configuration; relay 1 is Trip 1 and relay 2 is Alarm 1. Both are programmed for fail-safe operation.

CONTROL POWER	
FPU-16	L1-terminal 1 or 2, L2-terminal 3 or 4
FPU-32	L1-terminal 2, L2-terminal 3

If the FPU-32 does not power up, ensure that L1 is connected to terminal 2 (not terminal 1) and L2/N is connected to terminal 3 (not terminal 4). If the duplicate supply terminals on the FPU-16 were used to power another device, reconnect that device directly to the power source.

4. Installing the FPU-32

Insert the FPU-32 into the panel cutout. Slide the panel-mount clamp onto the FPU-32 body until the latch tabs lock into the latch tab holes. See Fig. 1. Gently tighten the clamp screws.

5. Programming the FPU-32

Program the FPU-32 using the settings recorded in Table 1. See Section 4 of the FPU-32 manual and Section 3 of the FPU-16 manual.

The FPU-16 has overload, short-time and instantaneous overcurrent settings. The FPU-32 has enhanced protection that offers overload, inverse-time, and definite-time phase overcurrent settings. Two set-point groups are available, with one group often programmed with lower settings for use during maintenance procedures.

Mode 5 of the FPU-16 is used to select special programming options. Tables 2 and 3 of the FPU-16 manual can be referenced to decode these values for use in the FPU-32. Manuals are available at www.startco.ca.