FAIRFORD
ELECTRONICS

HFE

Single Phase
Energy Optimizing Soft Starter

The HFE is the ideal 'retrofit' energy optimizing solution for Soft Starting single phase compressors and motors such as those used in Supermarket refrigerators and chillers etc., and can yield between 10 - 32% energy savings.

HFE

For application specific sizing go to
www.fairford.com/product_selector.html

The HFE has a rugged tin lid construction and can be mounted easily next to the machine or control panel. Installation of the unit is quick and simple due to the 'two wires in, two wires out' design. The unit is 'fit and forget' and there is no maintenance for the user.

Main Features

Retrofit, quick fit, simple wiring
Quick and simple two wire in/out implementation means low cost install in existing equipment and rapid return on investment through energy and maintenance cost reduction.

LED Indication
Two LED's showing power and energy saving.

Energy Optimizing
Reduces required energy consumption when the motor is not under load -10 - 32% saving in energy and related cost and carbon emissions.

Torque Reduction
Mechanical and electrical stress reduction or elimination means compressors and motors last longer and require less maintenance.

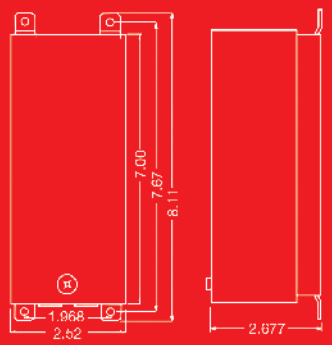
'Fit and Forget'
No maintenance time or associated cost.

Model	Current (I)	Motor kW (230V)	Motor HP (230V)
HFE 1	10A	1.1kW	1.5HP
HFE 2	30A	4kW	5.5HP
		Motor kW (110V)	**Motor HP (110V)**
HFE 1	10A	0.56kW	0.75HP
HFE 2	30A	1.5kW	2HP

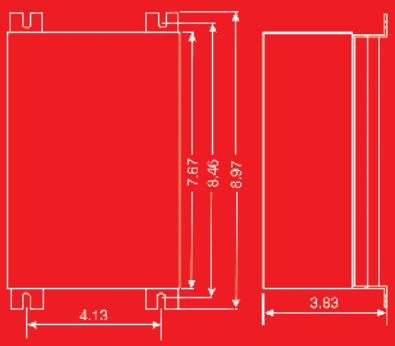
Technical Data

Operational Voltage (Ue)	110 – 230 VAC or (-15% to +10%) Single Phase
Frequency	50/60 Hz +/- 2Hz
Operational Current (Ie)	HFE 1 – 10A HFE 2 – 30A
Start Duty	Please refer to Basic Guides – FD1945 and FD2025
Ingress Protection	IP30 with standard cover
Start Time	Approx 0.5 to 5 Seconds continuously variable
Pedestal Voltage	Fixed at approx 15%
Ambient Temperature	0°C to 40°C without de rating
Design Standards	IEC 60947-4-2, EN 60947 – 4- 2 "AC Semiconductor Motor Controllers and Starters"
Ideal Applications	• Refrigeration Systems • Conveyors • Oven Fans • Chillers • Coolers • Air Conditioners

HFE 1



HFE 2



Please note: All dimensions in inches

For more information on how the HFE from Fairford Electronics can reduce your running costs and lower maintenance bills contact your local distributor.

tel: +44 (0) 1752 894554 or visit our website
www.fairford.com

FAIRFORD ELECTRONICS

info@fairford.com
www.fairford.com

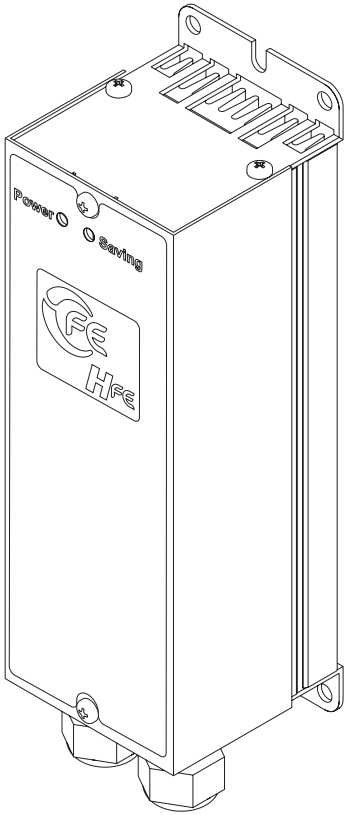
CE RoHS 2002/95/EC

HFE
Digital Soft Starters

FAIRFORD ELECTRONICS

Soft Starters and Energy Optimising Soft Starters

HFE-1 10 Amp @ 110-230 Volts



APPLICATION

HFE Energy Saving soft starters are designed to control single phase AC motors. Operation is fully automatic, a low starting voltage is applied to the motor as soon as the supply is switched on. The internal automatic ramp control immediately takes over and raises the voltage progressively, causing the motor to accelerate smoothly.

At the end of the ramp period, the motor is operated in Energy Saving mode and the HFE continuously regulates the voltage to match mechanical load.

Energy consumption at light loads is reduced, motor winding and case temperatures are lowered, motor life is extended, noise levels are reduced and power factor is improved.

Two LED's on the front of the unit indicate when the POWER supply is connected and when the unit is ENERGY SAVING. As energy consumption is reduced the ENERGY SAVING LED flashes at a slower rate.

The HFE remains in circuit until the supply is disconnected. The HFE automatically resets and is ready for the next start.

Safety at Work

ISOLATE FROM THE SUPPLY BEFORE WORKING ON THE UNIT OR MOTOR

It is the responsibility of the installer and user to ensure that this equipment is installed, operated and maintained in accordance with the Health and Safety at Work Act in the United Kingdom and all applicable legislation, regulations and codes of practice relevant to your location.

Only qualified personnel should install this equipment, after first reading and understanding this document. The installation instructions must be followed, and any questions or doubt must be referred to the supplier of the equipment.

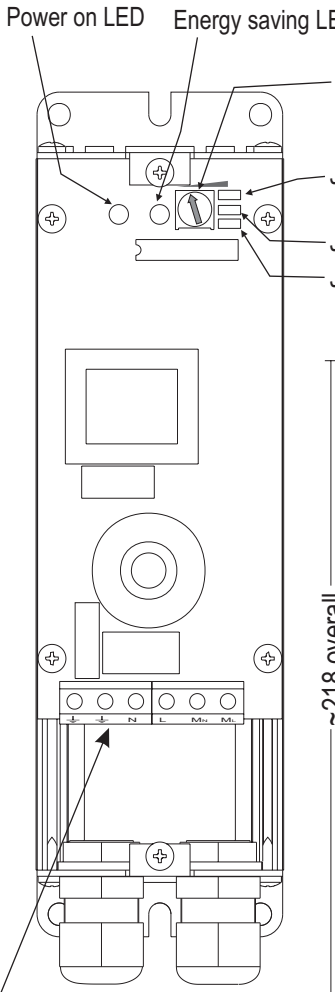
The system may be configured to allow for auto restart controlled from contacts on the motor side of the unit. Users and operators must always take all necessary precautions to prevent damage to equipment and especially to prevent the risk of injury to personnel working on or near the motor and driven equipment.

The manufacturer does not assume any liability, express or implied, for any consequences resulting from inappropriate, negligent or incorrect installation, application, use or adjustment of the product or circuit design, or from mismatching of a soft starter to a motor.

Mechanical Details

MOUNTING

The module must be fixed to a vertical surface. To ensure free air movement a minimum clearance of 40mm must be maintained above and below the unit.

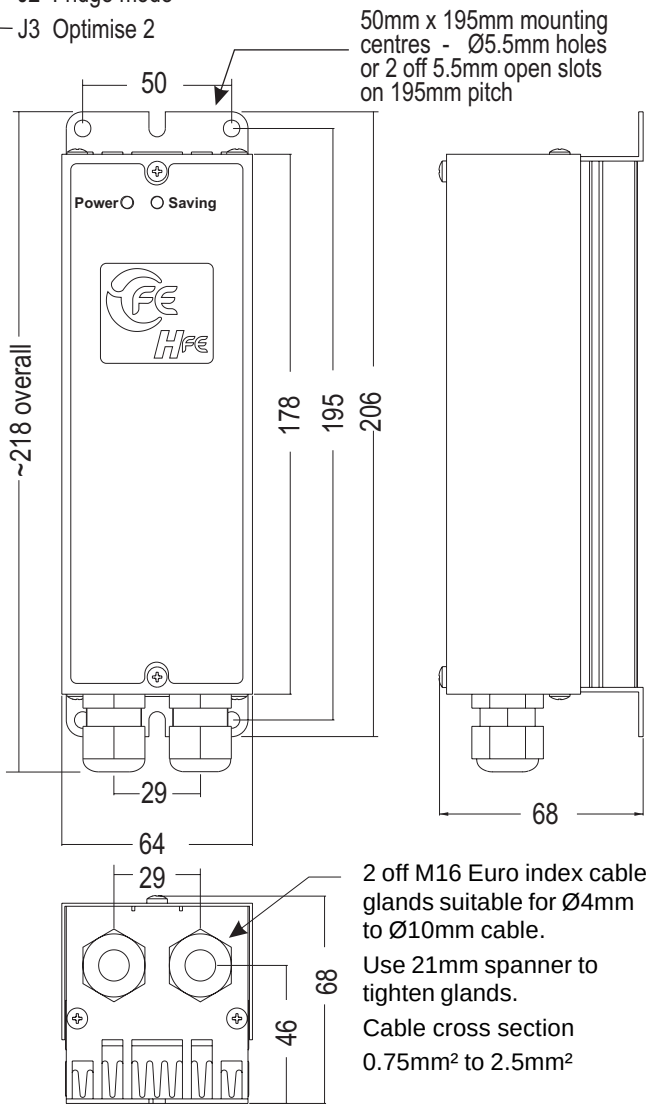


Jumper Functions

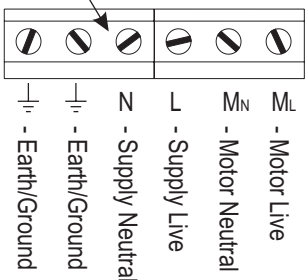
J1 - Enables Energy Saving

J2 - Fit when using with refrigeration

J3 - Remove if motor has a "Potential relay"



Electrical connections
Max. Torque 4lbs-inch
0.5 Newton Metre



2 off M16 Euro index cable glands suitable for Ø4mm to Ø10mm cable.

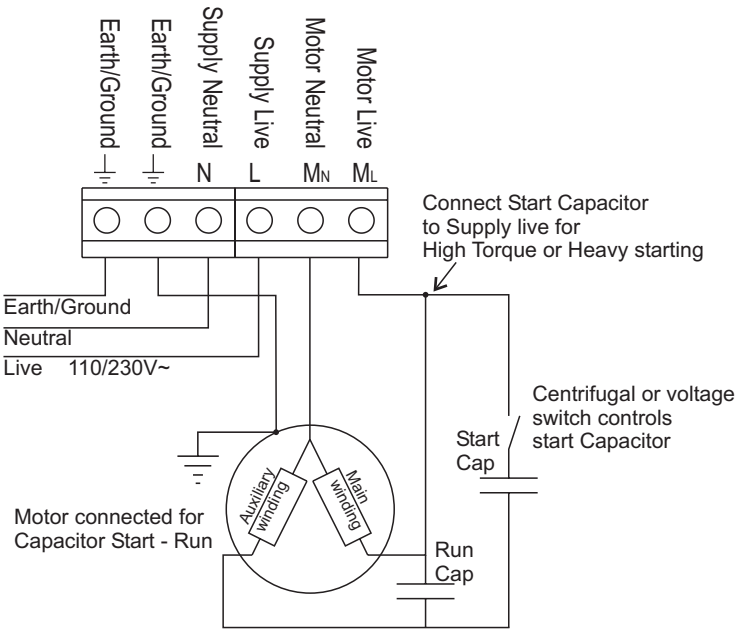
Use 21mm spanner to tighten glands.

Cable cross section 0.75mm² to 2.5mm²

WIRING

The soft starter is normally inserted into the circuit between the motor and whatever switchgear is normally used for isolation or switching. The unit can also be fitted before switchgear so that it can be installed in the supply to equipment which has it's own mechanical control.

This feature allows for easy installation on equipment such as refrigeration where the need to disturb internal wiring is avoided.



Typical connection for the HFE.

Extra starting torque may be needed for loads which have a particularly 'sticky' starting characteristic. This can be achieved by rearranging the internal connection of the starting capacitor, bringing the connection out and to the supply side of the starter as shown.

The terminations are made with industry standard cage clamp screw terminals directly onto the circuit board on all units.

The incoming power supply is connected to the terminals marked 'L' and 'N'. For EMC compliance it is important that the line circuit is connected to L and the neutral circuit to N. Outgoing connections from the HFE are taken from the terminals marked 'L_M' and 'N_M' to the motor or load input terminals (see diagram). Ensure that a good connection is made to the earth terminals provided.

Fuses or other type of short-circuit protection are required for protection against a cable or motor terminal box fault. These must be fitted externally and on the supply side of the unit. See "Specifications" section for recommended fuse type and cut-out device.

Operation

Set the ramp time potentiometer to midway to approx 2 seconds and start the system. If the motor turns instantly when the soft starter is energised and accelerates satisfactorily then no further adjustment is required. If the rate of acceleration is too great stop the unit and turn the ramp time potentiometer clockwise then restart. Adjust anti–clockwise for a shorter ramp time setting to increase the rate of acceleration. The motor should turn instantly when the soft starter is energised. If not, rearrange the connection of the starting capacitor as shown in fig 1

For running currents up to and including 10 Amps the unit is rated for continuous duty.

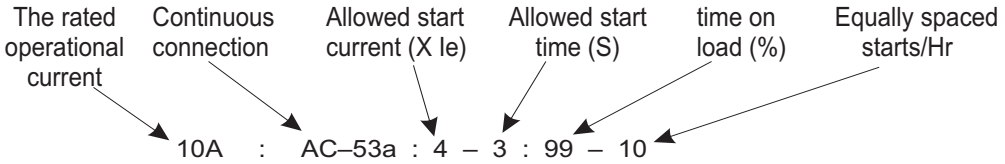
Start currents must never exceed 60A.

STARTING

Rating Table

Load Amps (Ie)	Utilisation Category	Start		Duty	Up to Starts/Hr	Max fuse rating *22x58mm class gR/aR	Cut-out device
		Current (Amps)	Time (Secs)				
5	AC53a	10	3	99%	60	20A	10A MCB Trip Characteristic Type "C"
		15	2	99%	60		
10	AC53a	30	4	99%	60	32A	
		40	3	99%	10		

***** 13A fused plug may be used but not for more than load amps 5A at duties as indicated in Rating Table



SPECIFICATIONS

Pedestal Voltage	Fixed at ~15%.
Start Time:	Continuously variable from ½S -5S.
Terminations:	Cage clamp terminals suitable for 0.75mm^2 (18 awg) to 2.5mm^2 (12 awg)Solid or stranded
Ambient Temperature:	0°C to 40°C without derating.
Enclosure:	IP20 with standard cover:
Rated Operational Voltage:	Ue: 110 to 230V ac (–15% +10%), 50/60Hz
Recommended cut–out device:	10A rated MCB, Trip Characteristic “C“.
Rated insulation voltage:	Ui: 250V.
Rated impulse withstand voltage:	Uimp: 4kV (1.2/50µs).
Short circuit co–ordination:	Type 1 , Iq: 5kA when protected by recommended Fuse
Fuse Type:	See rating table.

Design standards: IEC 60947–4–2: “AC Semiconductor Motor Controllers and Starters”.

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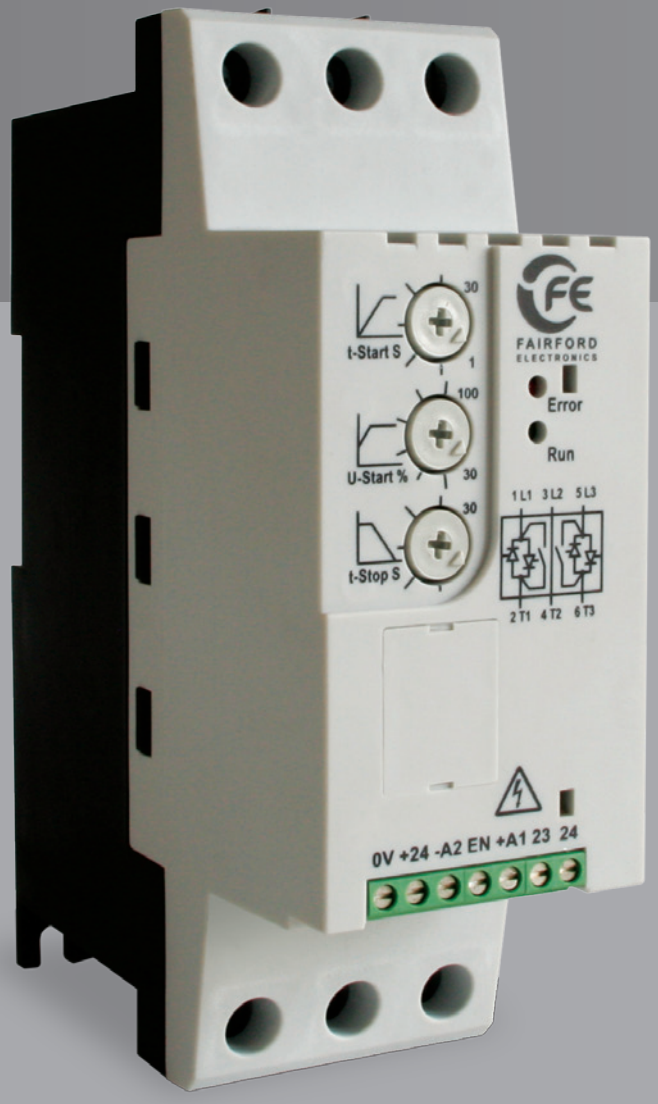
FAIRFORD
ELECTRONICS

PFE

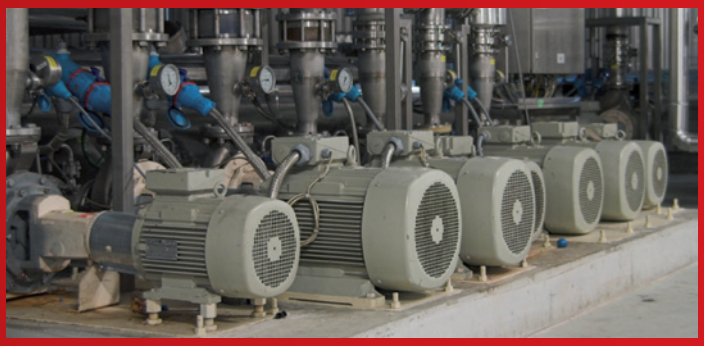


The cost effective starter for small AC induction motors

The choice for small to medium industrial applications

PFE

The PFE is an innovative development from Fairford Electronics, who have 30 years of experience producing innovative designs in the soft start market.



With ratings from 2.2kW to 22kW, the PFE is ideally placed to support any AC induction motors in use today. This makes the PFE the natural choice for distributors and customers alike.

Benefiting from Fairford's excellence in engineering, the PFE combines the quality and reliability you have come to expect. This is one product that ticks all the boxes.

Features and Benefits

Internally Bypassed
Reduces cost because the Soft Starter is out of circuit once it has done its job. This reduces cabinet size and the heat produced which again reduces cost.

Over Current Protected
Protects the Soft Starter against use above its duty rating.

45mm Wide (Size 1)
Same width as typical existing control gear for easy connectability and enables a more compact cabinet to be used.

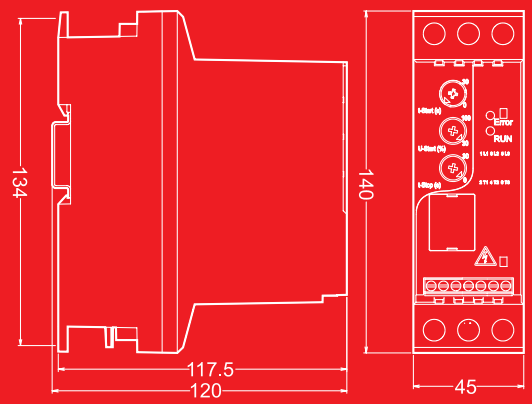
DIN Rail Mounted
For easy installation – it just clips on.

PFE – Technical data

For application specific sizing go to **www.fairford.com** and click product selector

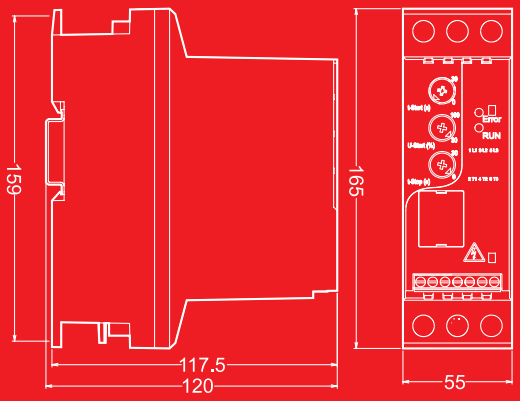
Operational Voltage (Ue)	230-460 VAC rms 3-Phase (-15% +10%)
Rated Frequency	50 - 60Hz +/- 2Hz
Index Rating	Standard AC53b: 3-5: 355 Class 10 AC53b: 3-23: 697
Control Supply	24V DC approx 4VA supplied externally to terminals 0 - 24.
Enable and Start/ Soft Stop	24V DC galvanically isolated terminals -A2, EN, +A1
Indication	Multi function LEDs on front panel
Start Time	1 to 30 seconds.
Stop Time	0 to 30 seconds
Start Duty	3 x FLC for 5 seconds at standard rating
Starts / Hour	10 starts per hour or 5 starts + 5 soft stops per hour.
Optimum Starts / Hour	Up to 60 Starts/Hr with Optional Fan
Internally bypassed	
Power Terminals	Input 1/L1, 3/L2 & 5/L3 output 2/T1, 4/T2 6/T3. IP20 Rated wire clamping terminals (unit is IP20)
Ambient Temperature	0°C to 40°C. Above 40°C de-rate linearly by 2% of unit FLC per °C to a derate of 40% at 60°C
Transport and Storage	-25°C to +60°C
Altitude	1000m. Above 1000m de-rate linearly by 1% of unit FLC per 100m to a max altitude of 2000m.
Humidity	Max. 85% non-condensing, not exceeding 50% at 40°C
Protection/IP Rating	IP20, NEMA 1
Design Standards	IEC 60947-4-2; EN60947-4-2 “AC Semiconductor Motor Controllers and Starters”, UL, C-Tick & CE

Size 1 PFE-02 to PFE-10



Please note: All dimensions in mm

Size 2 PFE-12 to PFE-18



Please note: All dimensions in mm

Model	Current (I) Amps	Motor kW (400V)	Motor HP (460V)
PFE-02	5	2.2	3
PFE-04	7	3	5
PFE-06	9	4	6
PFE-08	12	5.5	7.5
PFE-10	16	7.5	10
PFE-12	22	11	15
PFE-14	30	15	20
PFE-16	36	18.5	25
PFE-18	40	22	30

PFE – Case Study

The PFE range has been successfully used in many applications. A good example of its versatility is in the following case study of an unloading winch and davit in a large commercial port.

The winch is used for unloading 500Kg fish/scallop boxes from vessel to shore and a smoother start/stop was required to alleviate 'jarring' which was becoming a problem. A PFE-08 5.5Kw soft start with fan was chosen to increase the number of start/stops per hour as the trawler can be 5/8 meters below dock level and jogging is used to position the lifting gear under the skippers instructions. Due to the success of the installation another four systems have been installed.

Dockside Davit designed and built by Spencer Carter Ltd, Falmouth, Cornwall. www.spencercarter.com

For more information on how the PFE from Fairford Electronics can reduce your running costs and lower maintenance bills contact your local distributor.

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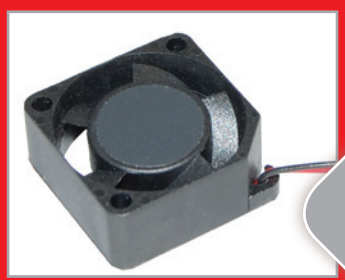
www.fairford.com

PFE – Options



Auxiliary Fan

Increases performance to **60** starts per hour

Power supply

Can run up to **3** PFE's

FAIRFORD ELECTRONICS

info@fairford.com
www.fairford.com

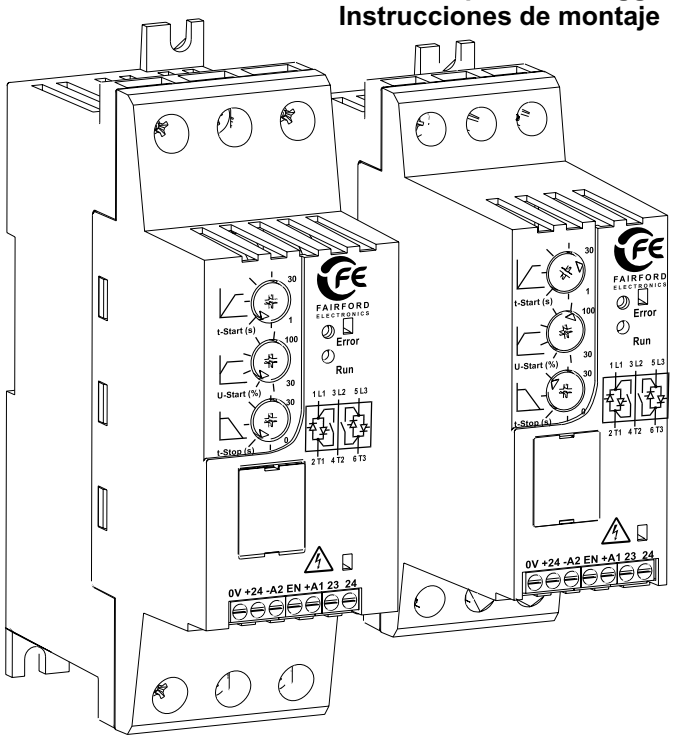
investing in **your** future
European Regional Development Fund
European Union

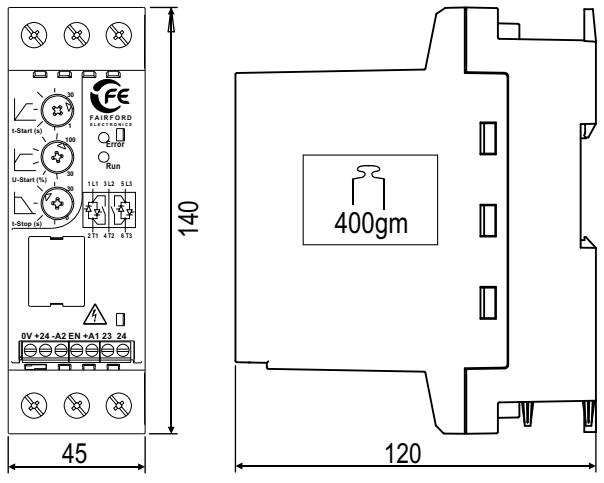
CE | RoHS 2002/95/EC | UL | C

PFE Digital Soft Starters

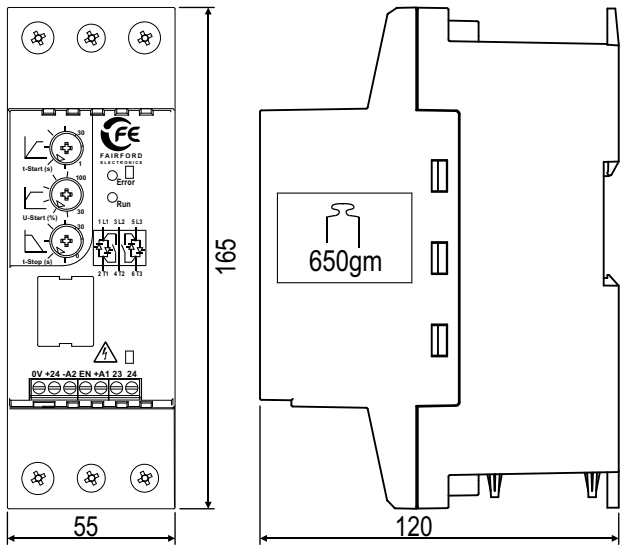
M-7G44-F
090930

Installation Instructions
Montageanweisung
Notice d'installation
Istruzioni per il montaggio
Instrucciones de montaje





Mounting Centres 30mm x 130mm



Mounting Centres 40mm x 155mm

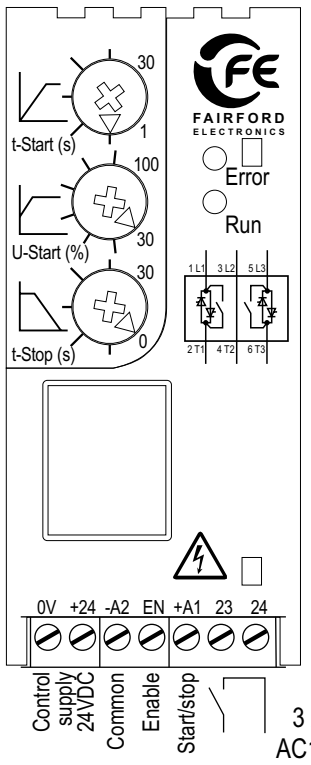
This device is suitable for use in industrial environments. EN 55011/22 Class A
Das Gerät ist für den industriellen Einsatz geeignet EN 55011/22 Klasse A.
L'appareil a été conçu pour l'emploi en milieu industriel EN 55011/22 classe A.
L'apparecchio è adatto per uso in ambienti industriali EN 55011/22 Classe A.
El aparato es adecuado para uso en ambiente industrial EN 55011/22 clase A.

Size1 5Amp to 16Amp

PFE-02	**2.2kW**	**@ 400V**	**5Amp**
PFE-04	**3kW**	**@ 400V**	**7Amp**
PFE-06	**4kW**	**@ 400V**	**9Amp**
PFE-08	**5.5kW**	**@ 400V**	**12Amp**
PFE-10	**7.5kW**	**@ 400V**	**16Amp**

Size2 22Amp to 41Amp

PFE-12	**11kW**	**@ 400V**	**22Amp**
PFE-14	**15kW**	**@ 400V**	**30Amp**
PFE-16	**18.5kW**	**@ 400V**	**36Amp**
PFE-18	**22kW**	**@ 400V**	**41 Amp (Non UL)**
PFE-18	**30HP**	**@460V**	**FLA 40A (UL)**

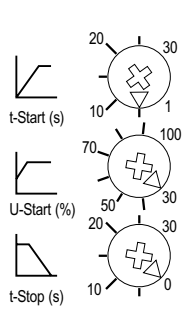


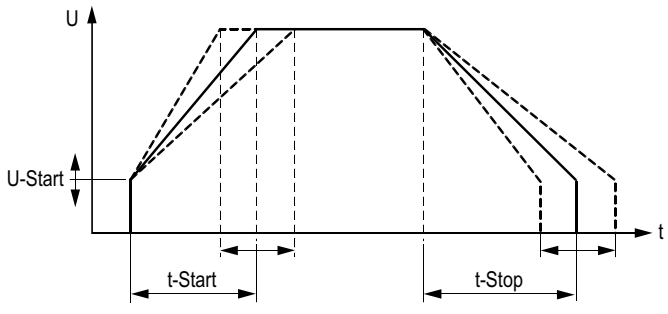
3 Amp NO
AC11 230VAC

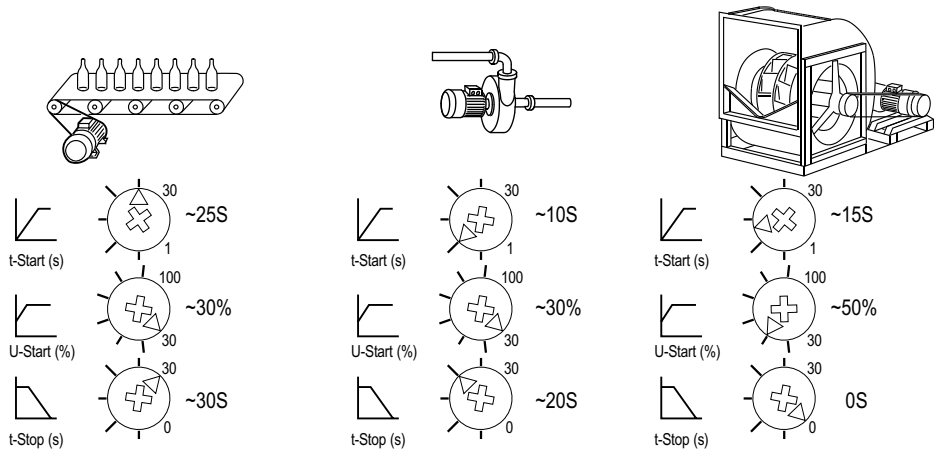
Not Enabled	**LED green+red - LED grün+rot – DEL vert+rouge – LED verde+rosso - LED verde+rojo**		
Slow Flash	Initialisation – Initialisierung – Initialisation – Inizializzazione – Inicialización		
Run	**LED green - LED grün – DEL vert – LED verde - LED verde**		
Slow Flash	Ready for operation – Betriebsbereit – Prêt à fonctionner - Pronto al funzionamento – En condiciones para funcionamiento		
Quick Flash	Starting – in Rampe – en rampe – in rampa – en rampa		
Full On	Full volts – vollen Spannung – pleine tension – piena tensione – plena tensión		
Quick Flash	Soft-Stop – Soft stop – Arrêt progressif – Soft-Stop – Paro suave		

Very quick green flash:- Starting to trip on over current

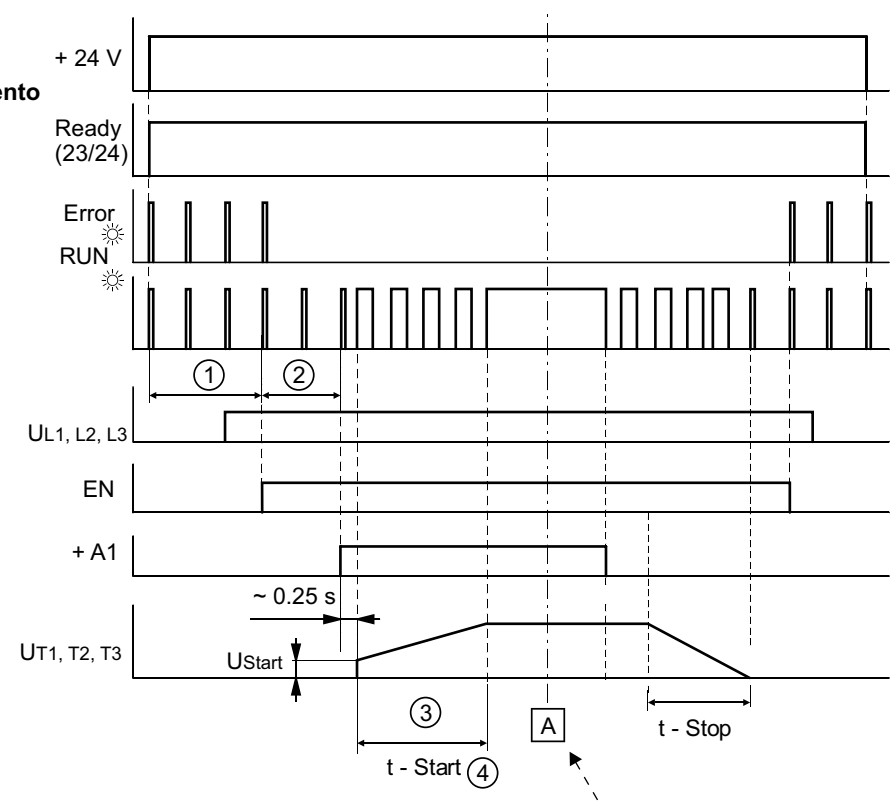
Error	**Fault LED red – Fehler LED rot – DEL erreur rouge – LED errore rosso –LED error rojo**		
1	SCR or supply	2	Too hot
3	Control supply low volts	4	Bypass relay failure
5	Shearpin (4.4 x Ie)	6	Overcurrent







Operation – Betrieb – Service – Funzionamento



Fault – Störung – Défaut – Guasto – Avería

RUN-LED green – RUN LED grün – DEL RUN vert – LED RUN verde – LED RUN verde – RUN-LED –

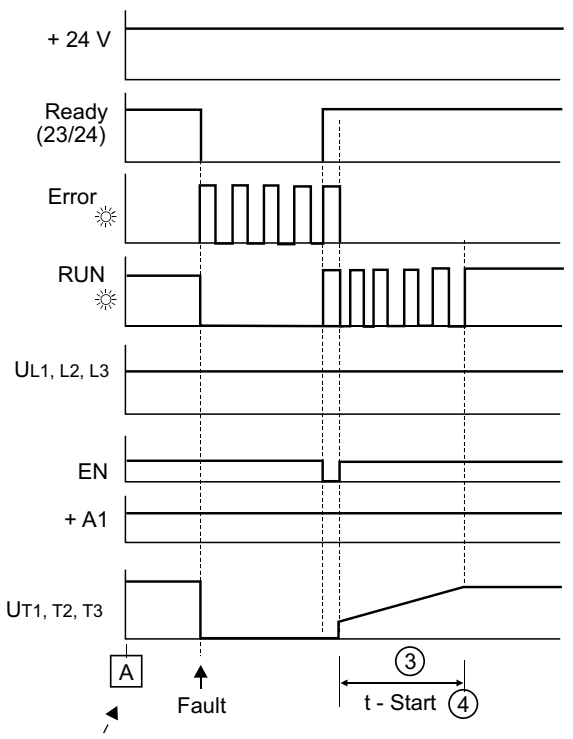
Error-LED red – Error LED rot – DEL erreur rouge – LED errore rosso – LED error rojo

1 Initialisation – Initialisierung – Initialisation – Inizializzazione – Inicialización

2 Ready for operation – Betriebsbereit – Prêt à fonctionner – Pronto al funzionamento – En condiciones para funcionamiento

3 in ramp – in Rampe – en rampe – in rampa – en rampa

4 Top of ramp – Rampenende erreicht – Fin de rampe atteinte – Fine rampa – Fin de rampa



0V, +24 + A1, E, -A2 23, 24	mm² / AWG	mm / inch	Nm / Lb.in	mm
1 x	0.5 – 2.5 / 20 – 14	6 / ¼"	0.4 / 3.5	0.6 x 3.5
2 x	0.5 - 1.5 / 20 – 16			

Melderelais – Signalling relay – Relais à voyant – Relè di segnalazione – Relé de señalización

U	(L)	(R) AC11	I_{min}	U_{min}
250V AC	0.2A	2.5A	10mA	100V AC
30V DC	0.7A	3A	100mA	5V DC

DANGER! Hazardous Voltage. Will cause death or serious injury. Hazardous voltage is also present in the OFF/STOP status of the soft starter when the supply voltage is switched on (Ue).

GEFAHR! Gefährliche Spannung. Lebensgefahr oder schwere Verletzungsgefahr.Bei eingeschalteter Versorgungsspannung (Ue) steht auch im AUS-/STOP-Zustand des Softstarters am Ausgang gefährliche Spannung an.

DANGER ! Tension dangereuse. Danger de mort ou risque de blessures graves. En cas de tension d'alimentation (Ue) enclenchée, la tension dangereuse existe aussi en position d'Arrêt à la sortie du démarreur progressif.

PERICOLO! Tensione pericolosa. Può provocare morte o lesioni gravi. Con la tensione di alimentazione (Ue) inserita, anche nello stato OFF/STOP del softstarter è presente tensione pericolosa in uscita.

¡PELIGRO! Tensión peligrosa. Puede causar la muerte o lesiones graves. Si la tensión de alimentación está conectada (Ue), existe también en la salida tensión peligrosa con el arrancador suave en estado OFF/ON.

PFE-02 to PFE-10 1 L1, 3 L2, 5 L3 2 T1, 4 T2, 6 T3	75°C wire CU only mm² / AWG	mm / inch	M4 Nm / Lb.in	mm	
1 or 2 x	1 – 4 / 18 – 12	9 / 3/8"	1.3 / 12	1 x 6	PZ2

PFE-12 to PFE-18 1 L1, 3 L2, 5 L3 2 T1, 4 T2, 6 T3	75°C wire CU only mm² / AWG	mm / inch	M5 Nm / Lb.in	mm	
1 or 2 x	2.5 – 10 / 12 – 8	12 / ½"	2.5 / 22	1 x 6	PZ2

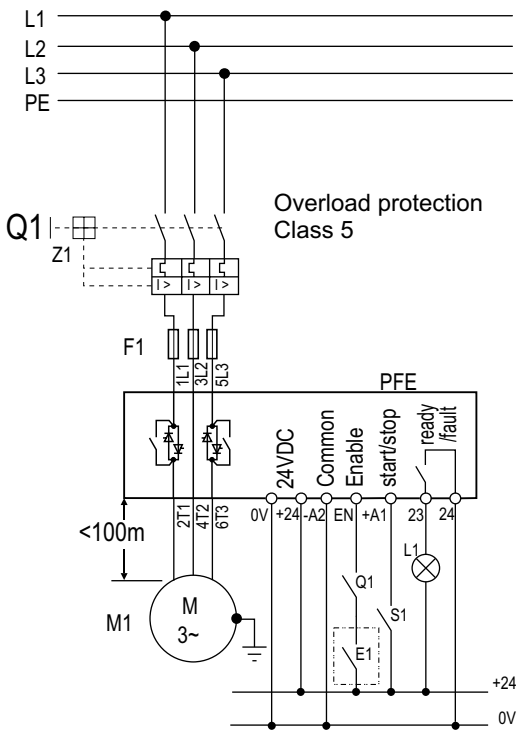
Where several conductors are to be connected, the difference between the wires/cables used must not exceed one DIN Standard size level.

Bei Mehrleiteranschluss darf maximal ein DIN-Normgrößen-Sprung zwischen den verwendeten Leitern liegen.

En cas de raccordement de plusieurs conducteurs, il faut 1 écartement normalisé max. entre les conducteurs.

In caso di collegamento a più conduttori, è ammesso al massimo un salto di grandezze DIN standard fra i conduttori utilizzati.

En caso de conexión de múltiples conductores puede haber como máximo un salto de magnitud normalizada DIN entre los conductores utilizados.



F1 = Coordination Type1
Recommended Semiconductor Fuses
PFE-02 to PFE-08 SIBA 2018920-35
PFE-10 SIBA 2018920-40
PFE-12 to PFE-18 SIBA 2018920-125

UL Requirement - Short Circuit rating 5000A, 480Vac when protected by fuses or circuit breakers, rated as indicated in table below

MODEL #	Class J or T Fuse Rated 600VAC	Circuit Breaker Rated 600VAC
PFE-02	15A	-
PFE-04	15A	-
PFE-06	30A	-
PFE-08	40A	-
PFE-10	50A	-
PFE-12	80A	80A
PFE-14	100A	100A
PFE-16	125A	125A
PFE-18	150A	150A

Control Circuit Elements
E1 = Optional switch to allow trip reset without opening main breaker **Q1**
Q1= Auxiliary contact of main breaker **Q1**
S1 = Start/Stop control switch
L1 = Indicator:-
On: Ready
Off: Fault

Q1 = Cable protection - Leitungsschutz - Protezione di linea - Protección de cable - Protection de câbles
Z1 = Overload relay - Überlastrelais - Relè termico - Relé de sobrecarga - Relais thermique
F1 = Semiconductor fuse for type 1 coordination, in addition to Q1
Halbleitersicherung für Zuordnungsart 1, zusätzlich zu Q1
Per avere la protezione del semiconduttore in coordinamento di tipo 1, è necessario un fusibile in aggiunta a Q1
Fusible semiconductor para tipo de coordinación 1, adicionalmente a Q1
Fusible pour semi-conducteurs pour coordination de type 1, additionnel à Q1
PFE = Soft Starter - Halbleiterschütz - Contactor semiconductor - Contattore a semiconduttori - Contacteur à semi-conducteurs
A1-A2 = Start/Stop - Start/Stopp - Start/Stop - Arranque/Parada - Démarrage/Arrêt

Electric shock risk. Danger
Only skilled or instructed persons may carry out the following operations.
Lebensgefahr durch elektrischen Strom!
Nur Elektrofachkräfte und elektrotechnisch unterwiesene Personen dürfen die im Folgenden beschriebenen Arbeiten ausführen.
Tension électrique dangereuse !
Seules les personnes qualifées et averties doivent exécuter les travaux ci-après.
Tensione elettrica: Pericolo di morte!
Solo persone abilitate e qualificate possono eseguire le operazioni di seguito riportate.
¡Corriente eléctrica! ¡Peligro de muerte!
El trabajo a continuación descrito debe ser realizado por personas cualificadas y advertidas.

Rated Impulse withstand Voltage (Uimp) 2.5kV
Rated Insulation Voltage (Ui) 500V
Pollution Degree 2
Rated Short Circuit Current (Iq)* **5**kA
Short Circuit Co-ordination* Type 1
Surrounding Air Temperature 0°C to 40°C.
Above 40°C de-rate linearly by 2% of unit FLC per °C to a derate of 40% at 60°C (not UL)
Transport and Storage -25°C to +60°C
Altitude 1000m. 1000-2000m de-rate 1% of unit FLC per 100m to 2000m.
Humidity max. 85% non-condensing, not exceeding 50% at 40°C
IP Rating IP20
Design Standards IEC 60947-4-2; EN60947-4-2
"AC Semiconductor Motor Controllers and Starters"
United States Standard UL508
* When protected by recommended semiconductor fuse.

EMC EMISSION AND IMMUNITY LEVELS		
ESD immunity	IEC 61000-4-2	4kV contact. 8kV air discharge
R F immunity	IEC 61000-4-6	140dBuV over 0.15-80MHz
R F immunity	EC 61000-4-3	10V/m over 80 -1000MHz
Fast Transient immunity	IEC 61000-4-4	2kV/5kHz
Surge immunity	IEC 61000-4-5	2kV line to ground 1kV line to line
Conducted RF emissions	EN 55011	Class A
Radiated RF emissions	EN 55011	Class A

Operational Voltage (Ue)		230-460 VAC rms 3-Phase (-15% +10%)
Rated Frequency		50 - 60Hz +/- 2Hz **Form Designation** Form 1
Index Rating		Standard (Class5) AC53b: 3-5: 355 Overcurrent = > 3 x Ie for 5 Seconds
Control Supply Us		24V DC approx 4VA supplied to terminals 0V - +24V
Enable Control		24V DC galvanically isolated terminals -A2 - EN
Start/Stop Control		24V DC galvanically isolated terminals -A2 - +A1
Auxiliary Circuits relay		Ready/Fault - 23/24. 250VAC 2.5A, AC11.
Indication		Red = Error - Green = Run LEDs
t-Start		1 to 30 seconds.
U-Start		30% - 100%
t-Stop		0 to 30 seconds
Start Duty		3 x FLC for 5 seconds at standard rating
Starts / Hour	standard	10 starts per hour or 5 starts + 5 soft stops per hour
	with optional fan	60 starts per hour or 30 starts + 30 soft stops per hour Internally bypassed
Power Terminals		IP20 Rated wire clamping terminals

Listed Soft starter can be used when fitted with fan part numbers as detailed in document M-7G71-F

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M-7G44-F

FAIRFORD ELECTRONICS

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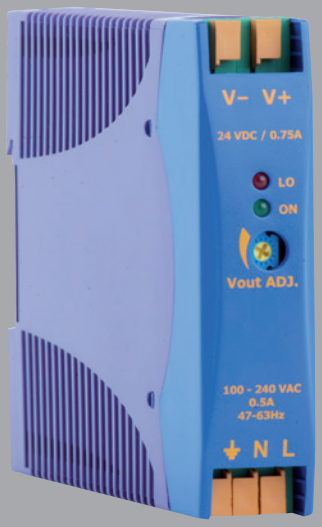
PSU5R SERIES
PSU6R SERIES

AC-DC DIN rail mountable power supply industrial control equipment

- Universal input 85~264VAC
- Short circuit protection
- Internal input filter
- 2 years warranty

PSU 5R SERIES

c UL us LISTED IND. CONT. EQ. UL 508 | c UL us Class I, Div 2 | c UL us UL 1310 | c UL us UL 60950-1 | EN 60950-1 | CE



The PSU 5R is the ideal choice for your control supply needs for both the DFE (up to 97A) and PFE Soft Starters. It is a compact 24VDC power supply that is DIN Rail mounted which cuts down on cabinet space and minimises installation time.

One PSU 5R can control up to 3 PFE or DFE (up to 97A) Soft Starters reducing the need for multiple power supply systems.

MODEL

Model No.	Input Voltage	Output Wattage	Output Voltage	Output Current	EEF. (min)	EEF. (typ.)
DRA18-24A	90~264 VAC	18 WATTS	+ 24 VDC	750 mA	75%	77%

SPECIFICATIONS

All Specifications Typical At Nominal Line, Full Load, 25 C Unless Otherwise Noticed

INPUT SPECIFICATION

Characteristics	Condition	min.	typ.	max.	unit
Rated input voltage	Io nom	100		240	VAC
Input current	Vi: 115/230 VAC, Io nom		335/210		mA
Rated input current	Vi: 90 VAC, Io nom			500	mA
Line frequency	Vi: nom, Io nom	47		63	Hz
Inrush current	Vi: 115/230 VAC, Io nom			10/18	A
Power dissipation	Vi: 230 VAC, Io nom 24V model		4.45		W
Leakage current	Input - Output			0.25	mA
	Input - FG			3.5	mA

OUTPUT SPECIFICATION

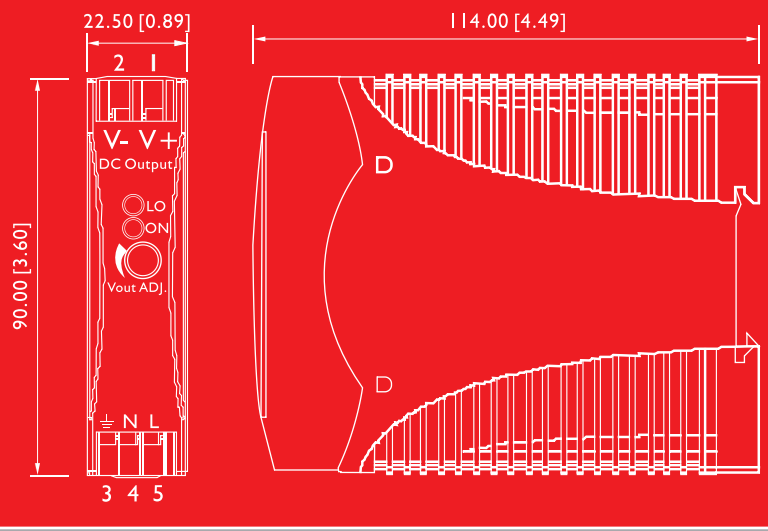
Characteristics	Condition	min.	typ.	max.	unit
Output voltage accuracy (Adjusted before shipment)	Vi: nom, Io max	0		+1	%
Rated continuous loading	Vi nom, 24V model	0.75 A @ 24Vdc / 0.6 A @ 28.8 Vdc			

CONTROL AND PROTECTION

Characteristics	Condition	min.	typ.	max.	unit
Rated over load protection	Vi nom (see typ current limited curve)	110		140	%

MECHANISM & PIN CONFIGURATION

Sizes mm (inches)



CONSTRUCTION

Easy snap-on mounting onto the DIN-Rail (TS35/7.5 or TS35/15), unit sits safely and firmly on the rail.

INSTALLATION

Ventilation / Cooling
- Normal convection
- All sides 25mm free space
- For cooling recommended

Connector size range
- Spring terminal:
- AWG24-14 (0.2~2mm^2) flexible / solid cable, 10 m/m stripping at cable end recommends

Use copper conductors only, 60 / 75°C

GENERAL TOLERANCE	
0.00[0.00] - 30.00[1.18]	±0.30[0.01]
30.00[1.18] - 120.00[4.72]	±0.50[0.02]

PSU6R SERIES

LISTED IND. CONT. EQ. UL 508 | Class I, Div 2 | UL 1310 | UL 60950-1 | EN 60950-1 | EN 61558-1 EN 61558-2-17

The PSU 6R is the ideal choice for your control supply needs for the DFE (above 97A) Soft Starters. It is a compact 24VDC power supply that is DIN Rail mounted which cuts down on cabinet space and minimises installation time.

One PSU 6R controls one DFE (above 97A) Soft Starters.

MODEL

Model No.	Input Voltage	Output Wattage	Output Voltage	Output Current	EEF. (min)	EEF. (typ.)
DRA60-24A	85~264 VAC	60 WATTS	+ 24 VDC	2500 mA	86%	89%

SPECIFICATIONS

All Specifications Typical At Nominal Line, Full Load, 25 C Unless Otherwise Noticed

INPUT SPECIFICATION

Characteristics	Condition	min.	typ.	max.	unit
Rated input voltage	Io nom	100		240	VAC
Input current	Vi: 115/230 VAC, Io nom		1060/590		mA
Rated input current	Vi: 85 VAC, Io nom			1500	mA
Line frequency	Vi: nom, Io nom	47		63	Hz
Inrush current	Vi: 115/230 VAC, Io nom			20/40	A
Power dissipation	Vi: 230 VAC, Io nom 24V model		8.8		W
Leakage current	Input - Output			0.25	mA
	Input - FG			3.5	mA

OUTPUT SPECIFICATION

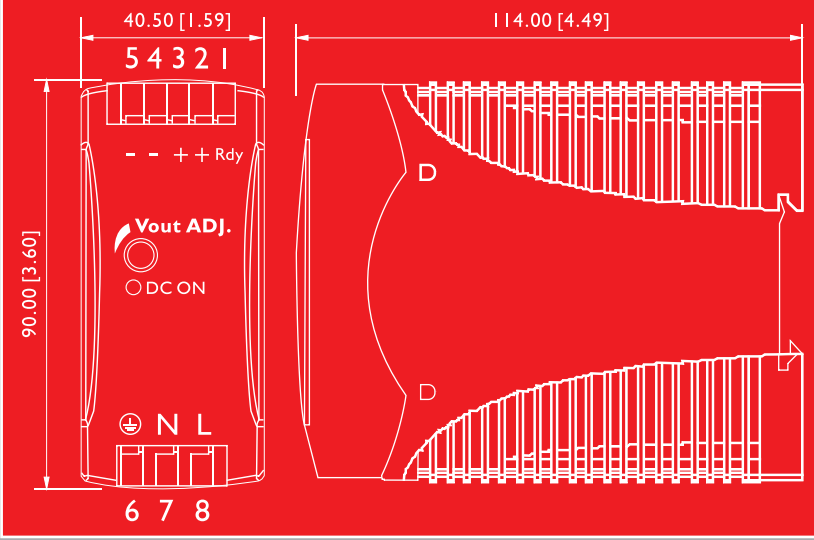
Characteristics	Condition	min.	typ.	max.	unit
Output voltage accuracy (Adjusted before shipment)	Vi: nom, Io max	0		+1	%
Rated continuous loading	Vi nom, 24V model	2.5 A @ 24Vdc / 2.1 A @ 28 Vdc			

CONTROL AND PROTECTION

Characteristics	Condition	min.	typ.	max.	unit
Rated over load protection	Vi nom (see typ current limited curve)	110		150	%

MECHANISM & PIN CONFIGURATION

Sizes mm (inches)



CONSTRUCTION

Easy snap-on mounting onto the DIN-Rail (TS35/7.5 or TS35/15), unit sits safely and firmly on the rail.

INSTALLATION

Ventilation / Cooling
- Normal convection
- All sides 25mm free space
- For cooling recommended

Connector size range
- Spring terminal:
- AWG24-14 (0.2~2mm^2) flexible / solid cable,
- 10 m/m stripping at cable end recommends

Use copper conductors only, 60 / 75˚C

GENERAL TOLERANCE	
0.00[0.00] - 30.00[1.18]	±0.30[0.01]
30.00[1.18] - 120.00[4.72]	±0.50[0.02]

For more information on how the PSU 5 & 6 from Fairford Electronics can reduce your running costs and lower maintenance bills contact your local distributor.

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FAIRFORD ELECTRONICS

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