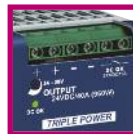


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## Power supplies - what you need to know...

A power supply has a decisive influence on the availability and operational reliability of electrical systems. Selecting the right power supply should be as critically and carefully undertaken as that of other system components.

Regardless of the technology employed, power supplies are devices with an input side and an isolated output side.

### Key criteria you will need to consider when selecting your power supply

#### Input side

- Input voltage
- Primary grounding
- Current consumption
- Inrush current
- Input fuse
- Frequency
- DC supply
- Power supply buffering
- Power factor correction (PFC)

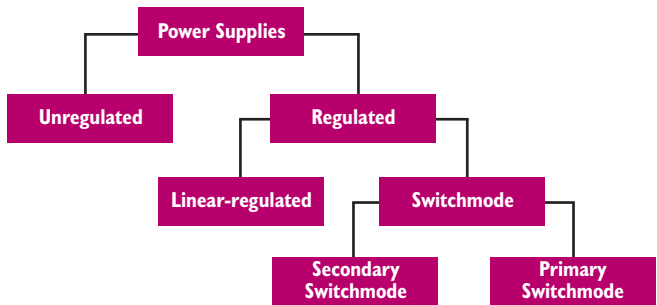
#### Output side

- Output voltage
- Secondary grounding
- Short circuit current
- Residual ripple
- Output characteristics
- Output current

Safety, galvanic isolation, insulation and secondary grounding are just a few of the different criteria that must also be taken into account.

Lutze are well known experts in all aspects of power supplies. On our website, we have a great Lutze whitepaper which is available as a free download, with all the background information you need to know before you select the correct power supply for your specific application.

In technology terms there are two different basic designs; unregulated and regulated. Regulated power supplies are subdivided further;



For more background information, download a copy of the 'Essential Guide to Using Switchmode Power Supplies' from our website; [http://www.lcautomation.com/Page/PDF\\_Downloads/Lutze.aspx](http://www.lcautomation.com/Page/PDF_Downloads/Lutze.aspx)

## Other things to consider

### The advantages of higher efficiency

Electric and electronic devices dissipate a certain amount of total absorbed power as heat. This obviously increases the temperature, within the enclosure.

Higher efficiency means less power dissipation, saving electric power, and reducing the temperature inside the enclosure.

Highly efficient power supplies can also work inside smaller enclosures without exceeding the maximum temperature and are more reliable in similar operating conditions.

Rule: the smaller the volume of the enclosure in which the power supply resides, the higher the increase in air temperature inside.

Today's technology makes it easy to get 85-90% efficiency on single phase power supplies and up to 94% on three phase versions.

### Dissipated power

A 100W output power supply with 85% efficiency, absorbs 117.6W total input power, which means 17.6W is dissipated in heat.

Manufacturers don't usually state input power, but give their efficiency.

$$\text{Input Power} = \frac{\text{Output Power}}{\text{Efficiency}}$$

Power dissipated by the power supply lost as heat is:

$$\text{Input power} - \text{Output power}$$

### Do you need power boost?

The ability of the power supply to deliver greater than its rated current for a short duration. This can be very useful in industrial applications where high current demands can occur particularly on start-up.

Another advantage is that power boost can allow circuit protection devices to detect overloads before the power supply protection operates and the device shuts down, which can assist in fault finding.

# Primary switchmode power supplies



### Features

- Efficient, robust, reliable design
- Overload and short circuit protected
- IP20 screw terminals
- LED and 'output ready' status indication (on 24V d.c. units only)
- Parallel operation possible
- DIN rail mounting
- Variable output voltage using potentiometer

### Technical specification

LED indication . . . . . Green when output OK (24V units)  
 Ambient temperature . . . . . -20 to +70°C  
 Installation . . . . . DIN rail (TS35/EN50022)

Lotze primary switchmode power supplies featuring power factor correction on the larger units.

These products offer reliable, but cost effective power in control panels and machine build applications. Units comply fully with relevant standards, including EMC, and include a range of international approvals.

They also feature standard DIN rail mounting for quick panel installation & screw terminals for secure wiring.

### Approvals

- CE
- UL

### Delta or Compact power supplies - what are the differences?



| Power                | Width mm         | Width mm |
|----------------------|------------------|----------|
| 60W                  | 40.5             | N/A      |
| 120W                 | 63.2             | 40       |
| 240W                 | 83               | 55       |
| 480W                 | 175              | 81       |
| 960W                 | 276              | 81       |
| 2000W                | N/A              | 233      |
| Efficiency (typical) | Single Phase 24V |          |
|                      | 84-86%           | >86-92%  |
| Power Boost          | 3 Phase 24V      |          |
|                      | 90-92%           | >94%     |

### Single phase input (90-265V a.c.)

| Output | Power Supply | Case Style | Dimensions (h x w x d) | Order Code | List Price |
|--------|--------------|------------|------------------------|------------|------------|
| 1.25A  | 24V d.c.     | Plastic    | 90 x 40.5 x 115mm      | 722753     | £31.64     |
| 2.5A   | 12V d.c.     | Plastic    | 90 x 40.5 x 115mm      | 722768     | £32.24     |
| 2.5A   | 24V d.c.     | Plastic    | 90 x 40.5 x 115mm      | 722754     | £33.92     |
| 3A     | 5V d.c.      | Plastic    | 90 x 22.5 x 115mm      | 722762     | £24.22     |
| 5A     | 12V d.c.     | Plastic    | 90 x 40.5 x 115mm      | 722769     | £37.78     |
| 5A     | 24V d.c.     | Metal      | 123 x 63.2 x 116mm     | 722758     | £50.26     |
| 5A     | 48V d.c.     | Metal      | 125 x 83 x 116mm       | 722778     | £88.16     |
| 6A     | 5V d.c.      | Plastic    | 90 x 40.5 x 115mm      | 722763     | £32.77     |
| 10A    | 24V d.c.     | Metal      | 125 x 83 x 116mm       | 722759     | £83.86     |
| 10A    | 48V d.c.     | Metal      | 125 x 175 x 111mm      | 722779     | £147.41    |
| 20A    | 24V d.c.     | Metal      | 125 x 175 x 111mm      | 722782     | £147.41    |

### Three phase input (340-575V a.c.)

| Output | Power Supply | Case Style | Dimensions (h x w x d) | Order Code | List Price |
|--------|--------------|------------|------------------------|------------|------------|
| 5A     | 24V d.c.     | Metal      | 124 x 74 x 118mm       | 722803     | £72.92     |
| 10A    | 24V d.c.     | Metal      | 124 x 89 x 118mm       | 722804     | £103.03    |
| 20A    | 24V d.c.     | Metal      | 124 x 150 x 118mm      | 722805     | £153.63    |
| 20A    | 48V d.c.     | Metal      | 124 x 276 x 118mm      | 722810     | £254.57    |
| 40A    | 24V d.c.     | Metal      | 124 x 276 x 118mm      | 722806     | £266.34    |

### Redundancy module



### Technical specification

Operation voltage range . . . . . 21-28V d.c.  
 Inputs . . . . . 2  
 Rated current . . . . . 20A  
 Max. output current . . . . . 30A  
 Operation temperature . . . . . -5° to +70°C  
 Housing material . . . . . Plastic  
 Protection rating . . . . . IP 20  
 Dimensions . . . . . h90 x w54 x d114mm

| Description                         | Order Code | List Price |
|-------------------------------------|------------|------------|
| 20A redundancy module with 2 inputs | 722987     | £37.11     |

See next page for our range of compact power supplies with power boost

# Compact power supplies with power boost



### Features

- Highly efficient, compact, design
- Up to 50% power boost available
- Overload and short circuit protected
- IP20 screw terminals
- LED and volt-free contact 'output ready' status indication
- Parallel operation possible
- Variable output voltage using potentiometer

### Technical specification

LED indication . . . . . Green output OK  
 Red output low  
 Ambient temperature . . . -20 to +60°C  
 Installation . . . DIN rail (TS35/EN50022)

| Approvals |
|-----------|
| • UL      |

Switchmode power supplies with power boost facility and power factor correction on all units.

When panel space is at a premium, Lutze Compact series dimensions are reduced by 50%, with high efficiency of up to 94% & minimal power loss and heating. For example the three-phase 40A version has a width of just 81 mm and weighs 1.2 kg.

### NEW Single phase input (90-264V a.c.)

| Output | Power Supply | Case Style | Dimensions (h x w x d) | Order Code | List Price |
|--------|--------------|------------|------------------------|------------|------------|
| 2.5A   | 48V d.c.     | Metal      | 115 x 40 x 128mm       | 722784     | £113.50    |
| 5A     | 24V d.c.     | Metal      | 115 x 40 x 117mm       | 723500     | £60.30     |
| 10A    | 24V d.c.     | Metal      | 117 x 63 x 140mm       | 723600     | £91.67     |
| 20A    | 24V d.c.     | Metal      | 117 x 56 x 140mm       | 723700     | £193.18    |

### Two phase input (187-550V a.c.)

| Output | Power Supply | Case Style | Dimensions (h x w x d) | Order Code | List Price |
|--------|--------------|------------|------------------------|------------|------------|
| 5A     | 24V d.c.     | Metal      | 115 x 40 x 130mm       | 722995     | £118.18    |

### Three phase input (340-550V a.c.)

| Output | Power Supply | Case Style | Dimensions (h x w x d) | Order Code | List Price |
|--------|--------------|------------|------------------------|------------|------------|
| 10A    | 48V d.c.     | Metal      | 127 x 81 x 146mm       | 722815     | £294.99    |
| 20A    | 24V d.c.     | Metal      | 127 x 81 x 146mm       | 722800     | £206.67    |
| 20A    | 48V d.c.     | Metal      | 127 x 81 x 146mm       | 722812     | £422.51    |
| 30A    | 24V d.c.     | Metal      | 127 x 81 x 146mm       | 722802     | £323.41    |
| 40A    | 24V d.c.     | Metal      | 127 x 81 x 146mm       | 722811     | £394.75    |
| 100A   | 24V d.c.     | Metal      | 158 x 233 x 102mm      | 722814     | £1,272.73  |

### Universal 1, 2 or 3-phase input (187-550V a.c.)

| Output | Power Supply | Case Style | Dimensions (h x w x d) | Order Code | List Price |
|--------|--------------|------------|------------------------|------------|------------|
| 10A    | 24V d.c.     | Metal      | 130 x 55 x 115mm       | 722996     | £139.15    |
| 20A    | 24V d.c.     | Metal      | 125 x 73 x 140mm       | 722801     | £226.29    |



## Redundancy module



The redundancy unit connects two Lutze power supplies.

In the event of a power supply failure, the redundancy unit ensures the other power supply takes over, maintaining operation of the system. The redundancy unit isolates the individual power supplies from one another, which ensures there is no interruption to the power supply.

### Technical specification

Operation voltage range . . . 12–85V d.c.  
 Inputs . . . . . 2  
 Rated current . . . . . Max. 50A per input  
 Max. output current . . . . . 300 A  
 Operation temperature . . -20° to +50°C  
 Housing material . . . . . Aluminium  
 Protection rating . . . . . IP20  
 Dimensions . . . . . h115 x w40 x d110 mm

| Description                            | Order Code | List Price |
|--|------------|------------|
| Compact power supply redundancy module | 722999     | £212.99    |



# LCOS – Ultra compact power supplies with power boost



### Features

- Extremely compact size
- Very high efficiency
- Improved overvoltage protection
- Simple parallel operation via downslope characteristic curve
- Fault alarm
- 150% power boost
- Active power factor correction

### Technical specification

LED indication . . . . . Green on  
 Ambient temperature . . . -20 to +70°C  
 Housing  
   Material . . . . . PA6.6 (UL94 V-0, NFF12 F2)  
   Colour . . . . . Pebble grey  
 Installation . . . DIN rail (TS35/EN60715)  
 Protection . . . . . IP20

### Approvals

- UL

This new range of switchmode power supplies provide maximum functionality in an ultra compact size, which can be mounted on a standard DIN rail.

Standalone or modular using the Lutze LCOS housing system.



### Single phase input (88-264V a.c.)

|        |              |            |                        |             | DIN Rail Base |              | Modular DIN Rail Base with Power Bus |              |            |
|--------|--------------|------------|------------------------|-------------|---------------|--------------|--------------------------------------|--------------|------------|
| Output | Power Supply | Case Style | Dimensions (h x w x d) | Order Code  | List Price    | Order Code   | List Price                           | Order Code   | List Price |
| 1.25A  | 24V d.c.     | Plastic    | 100 x 22.5 x 110mm     | 779001.0213 | £82.58        | 780201.225.1 | £11.99                               | 780402.225.1 | £13.59     |
| 2.5A   | 24V d.c.     | Plastic    | 100 x 35 x 110mm       | 779001.0313 | £95.58        | 780201.350.1 | £12.99                               | 780402.350.1 | £14.19     |
| 5A     | 24V d.c.     | Plastic    | 100 x 35 x 110mm       | 779001.0413 | £135.68       | 780201.350.1 | £12.99                               | 780402.350.1 | £14.19     |

### Accessories

| Description                                       | Order Code   | List Price |
|---|--------------|------------|
| Jumper comb, single pole                          | 780961.001.2 | £1.00      |
| Marker tag, 5 x 5mm frame with 200 pieces - white | 780981.000.2 | £7.88      |



# Do you need Technical Support?

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## PROeco switch mode power supplies



### Technical specification

Supply voltage  
 Single phase ... 85-264V a.c./80-370V d.c.  
 3-Phase ... 320-575V a.c./450-800V d.c.  
 Output voltage ... 22-28V d.c. (adjustable)  
 Alarm contact ... 1 relay PSUs & capacitor module, 2 relay diode modules  
 Ambient temperature ... -25 to +70°C  
 Operating temperature ... -25 to +70°C

MTBF ... >500,000hrs  
 Efficiency ... Up to 93%  
 Protection ... IP20  
 Installation ... DIN rail mount  
 Short circuit protection ... Yes

| Approvals |         |       |
|-----------|---------|-------|
| • CE      | • cULUR | • TUV |

A comprehensive range of single and three phase switch mode power supplies with diode modules for redundancy and capacitor modules for supply brown outs.

### Features

- 3 year warranty
- Adjustable output voltage 22-28V d.c. (5, 12 and 48V d.c. output options available)
- 3-phase can operate on 2-phase supplies
- Built-in relay output
- Parallel connectivity of up to 5 units on variants up to 10A and 3 units on 20A and 40A variants
- Diode modules for system redundancy and capacitor modules for supply brown outs
- Tricolour status LED

| Output | Single Phase |            | 3 Phase    |            |
|--------|--------------|------------|------------|------------|
|        | Order Code   | List Price | Order Code | List Price |
| 3A     | 1469470000   | £54.64     | —          | —          |
| 5A     | 1469480000   | £65.56     | 1469530000 | £120.19    |
| 10A    | 1469490000   | £111.45    | 1469540000 | £136.59    |
| 20A    | 1469510000   | £196.68    | 1469550000 | £213.08    |
| 40A    | 1469520000   | £393.35    | 1469560000 | £366.04    |

| Description             | Order Code | List Price |
|-------------------------|------------|------------|
| 20A output diode module | 1222210000 | £41.23     |
| 40A output diode module | 1222220000 | £69.16     |
| 20A capacitor module    | 1222240000 | £45.26     |

## PROtop power supplies



### Features

- DCL technology for an excellent dynamic range
- High energy efficiency
- Single or parallel operation and adjustable short-circuit response (continuous current or switch-off)
- Long service life of up to 20 years
- Extremely slim design
- Built in MOSFET 'O' ring for redundancy applications
- Time-saving PUSH IN connection technology

### Technical specification

Supply voltage  
 Single phase ... 85-277V a.c./80-410V d.c.  
 Output voltage ... 24V d.c.  
 Insulation voltage  
 Input/earth ... 4kV  
 Output/earth ... 0.5kV  
 Input/output ... 4kV  
 Earth leakage current, max. ... 3.5mA  
 Series switching capability ... Yes  
 Operating temperature ... -25 to +75°C  
 Storage temperature ... -40 to +85°C  
 MTBF ... >1,000,000hrs  
 Efficiency ... Up to 94.5%  
 Protection ... IP20  
 Installation ... DIN rail mount  
 Short circuit protection ... Yes

| Approvals |
|-----------|
| • ROHS    |

PROtop power supplies have a particularly robust network input level and are not sensitive to mechanical influences, securing reliable operation, even under difficult conditions.

The innovative DCL technology, PROtop has excellent dynamic properties and provides consistent peak load reserves for anything from a few milliseconds to a few seconds. This means circuit breakers can be reliably triggered and difficult loads supplied with high start-up currents. Additional static power reserves enable a continuous current of 130%, even at ambient temperatures of 40°C.

| Output Current | Output Power | Order Code | List Price |
|----------------|--------------|------------|------------|
| 3A             | 72W          | 2466850000 | £99.11     |
| 5A             | 120W         | 2466870000 | £126.43    |
| 10A            | 240W         | 2466880000 | £188.58    |
| 20A            | 480W         | 2466890000 | £258.27    |
| 40A            | 960W         | 2466900000 | £473.65    |

## DC UPS uninterruptible power supply



NEW

### Features

- Compact design
- Status indication
- Configurable via keys/LCD
- Suitable for 12 or 24V d.c. batteries

### Approvals

- UL

### Technical specification

|                       |                                     |
|-----------------------|-------------------------------------|
| Supply voltage        | 24V d.c.                            |
| Operation temperature | 723110 ..... -20 to +50°C           |
|                       | 723100 ..... -20 to +60°C           |
| Monitoring            | 723110 ..... 1 changeover contact   |
|                       | 723100 ..... 2 N/O contacts         |
| Housing material      | Aluminium                           |
| Protection rating     | IP20                                |
| Installation          | DIN rail mountable TS35, (EN 60715) |

An intelligent battery monitoring system for NIMH, NICAD, LiON, LifePo4 batteries.



Battery pack

Capacitive buffer

### Controllers

| Description                                 | Dimensions (h x w x d) | Order Code | List Price |
|---|------------------------|------------|------------|
| 10A control unit for 24V d.c. systems       | 115 x 54 x 110mm       | 723110     | £89.98     |
| 20A control unit for 12 or 24V d.c. systems | 117 x 63 x 140mm       | 723100     | £354.98    |

### Battery pack/capacitive buffer

| Description   | Order Code | List Price |
|---|------------|------------|
| Battery pack with 2 x 12V d.c., 1.2A per hour lead acid batteries | 723115B    | £98.93     |
| Capacitive buffer UPS, 20A max output 12-85V d.c. operation       | 723120     | £294.37    |

## DC UPS uninterruptible power supply



### Features

- 3 relay and 3 transistor alarm outputs (buffer, alarm, charging)
- Parallel connectivity of 2 batteries for increased hold up times
- Temperature compensated charge characteristic ensures longer battery life
- Lifetime service up to 10 years and maintenance free batteries
- Error analysis LED indicators on UPS controller
- Pluggable terminals on batteries

### Technical specification

|                     |  |
|---------------------|--|
| Supply voltage      | 24V d.c.   |
| Alarm contact       | 3 relay/3 transistor (logic switchable)                |
| Ambient temperature | Controllers ..... -25 to +70°C                         |
|                     | Batteries ..... 0 to +40°C                             |
| Protection rating   | IP20   |
| Installation        | DIN rail mount, Chassis mount on batteries above 3.4Ah |

### Approvals

- CE
- cUL/UR
- TÜV

Suitable for bridge power failures of up to 40A for 30 minutes or 1A for 30 hours.

### Controllers

| Description          | Order Code | List Price |
|----------------------|------------|------------|
| 20A/10A control unit | 1370050010 | £185.13    |
| 40A control unit     | 1370040010 | £313.96    |

### Batteries

| Description   | Order Code | List Price |
|---------------|------------|------------|
| 3.4Ah battery | 1251070000 | £119.05    |
| 7.2Ah battery | 1251080000 | £140.19    |
| 12Ah battery  | 1251090000 | £171.02    |
| 17Ah battery  | 1251110000 | £217.96    |



3.4Ah battery



7.2Ah battery

## Euro range transformers



| Dimensions |        |       |        |
|------------|--------|-------|--------|
| VA Rating  | Length | Depth | Height |
| 50VA       | 66mm   | 80mm  | 75mm   |
| 100VA      | 78mm   | 81mm  | 90mm   |
| 150VA      | 96mm   | 105mm | 101mm  |
| 200VA      | 96mm   | 105mm | 101mm  |
| 250VA      | 120mm  | 88mm  | 118mm  |
| 300VA      | 120mm  | 88mm  | 118mm  |
| 500VA      | 135mm  | 115mm | 130mm  |

The new economy, standard range of multi voltage panel transformers are continuous rated.

The units are manufactured using metric laminations and frames. They are smaller than the imperial types and would be ideal for panel applications. All the transformers are manufactured to EN60742 standards.

## Input voltage 220V a.c., 230V a.c. and 240V a.c.

| 24V a.c. |            |            | 110V a.c.  |            |
|----------|------------|------------|------------|------------|
| Type     | Order Code | List Price | Order Code | List Price |
| 50V      | MV50P1S3   | £16.50     | MV50P1S1   | £16.50     |
| 100VA    | MV100P1S3  | £20.80     | MV100P1S1  | £20.80     |
| 150VA    | MV150P1S3  | £28.00     | MV150P1S1  | £28.00     |
| 200VA    | MV200P1S3  | £30.50     | MV200P1S1  | £30.50     |
| 250VA    | MV250P1S3  | £38.50     | MV250P1S1  | £38.50     |
| 300VA    | MV300P1S3  | £43.50     | MV300P1S1  | £43.50     |
| 500VA    | MV500P1S3  | £60.00     | MV500P1S1  | £60.00     |

## Input voltage 380V a.c., 400V a.c., 415V a.c. and 440V a.c.

| 24V a.c. |            |            | 110V a.c.  |            |
|----------|------------|------------|------------|------------|
| Type     | Order Code | List Price | Order Code | List Price |
| 50V      | MV50P2S3   | £16.50     | MV50P2S1   | £16.50     |
| 100VA    | MV100P2S3  | £20.80     | MV100P2S1  | £20.80     |
| 150VA    | MV150P2S3  | £28.00     | MV150P2S1  | £28.00     |
| 200VA    | MV200P2S3  | £30.50     | MV200P2S1  | £30.50     |
| 250VA    | MV250P2S3  | £38.50     | MV250P2S1  | £38.50     |
| 300VA    | MV300P2S3  | £43.50     | MV300P2S1  | £43.50     |
| 500VA    | MV500P2S3  | £60.00     | MV500P2S1  | £60.00     |



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# Does your building have external lightning protection?

For buildings which have external lightning protection, Class I and Class II surge protection devices must be installed in accordance with BS7671 and BS62305.

In July 2011, the Institution of Engineering and Technology and the British Standards Institution (BSI) jointly published important changes to The IET Wiring Regulations, 17th Edition, BS 7671:2008 incorporating Amendment No. 1, 2011. This set out the national standard to which all new electrical installations must comply and they came into effect on 1st January 2012.

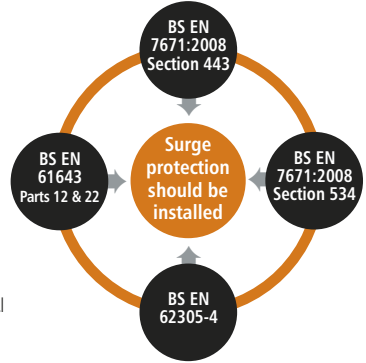
This means new considerations for those of you involved in protecting businesses against the potential effects of transient overvoltages, along with the maintenance, installation and/or design of electrical installations or wiring in buildings.

Any switching operation, fault initiation or interruption is followed by a transient phenomenon in which an overvoltage can occur. Common causes can include power grid quality issues, downed lines or faulty wiring. Surges can also occur through natural causes such as lightning strikes.

**NEW Section 534: Devices for protection against overvoltages: this section is a collation of information contained in**

- BS EN 7671:2008 Section 443
- BS EN 60664-1 Insulation Co-ordination
- BS EN 62305-4 Protection of Electronic Systems within Structures
- BS EN 61643 Parts 12 & 22: Power, Data, Telecoms and Signal Surge Protection

The standard has been designed to ensure that all competent parties adhere to, and implement, lightning and surge protection strategies, within electrical systems. It also lays out selection and erection guidelines for installations.



## Classes of surge protection devices

|   |  |   |
|---|--|---|
| <p><b>Class I</b></p> <p>Use on buildings in applications where there is an external lightning protection system installed, usually installed at the service entrance or main distribution board.</p> | <p><b>Class II</b></p> <p>Installed after the Class I device if installed or suitable for all other applications at the sub distribution board, or machine control panels.</p> | <p><b>Class III</b></p> <p>Installed after Class II devices where a specific piece of electronic equipment or mission critical application requires the highest levels of protection.</p> |
|---|--|---|

## Class I, VPU I LCF arrester



### Features

- Tested according to IEC 61643-11 for type I and II surge protection
- Pluggable arrester
- LCF - Leak Current Free for installation before the meter
- Suitable for lightning protection zones I, II, III & IV
- Green/red status indication

### Technical specification

High discharge current  $I_{imp}$  . . . . . 25kA (10/350µs)  
 Insulation coordination . . . . . Designed for 6kV in a 230/400V Net  
 Max Continuous (V) . . . . . 280V a.c.  
 Protection level (up) . . . . . ≤1.6kV  
 Tested in compliance with IEC61643-11

| Description             | Signalling Relay | Network                      | Order Code | List Price |
|-------------------------|------------------|------------------------------|------------|------------|
| VPU I 4 R LCF 280V/25kA | ●                | Three phase, network & earth | 1351720000 | £635.10    |
| VPU I 4 LCF 280V/25kA   |                  | Three phase, network & earth | 1351730000 | £607.47    |

## Class I, VPU I arrester

Weidmüller **Features**

- Tested according to IEC 61643-11 for type I and II surge protection
- Pluggable arresters
- Suitable for lightning protection zones III & IV
- External monitoring contact option
- Green/red status indication

**Technical specification**

High discharge current  $I_{imp}$  . . . . . 12.5kA  
(10/350 $\mu$ s)

Insulation coordination . . . . . Designed for  
6kV in a 230/400V Net

Max Continuous (V) . . . . . 280V a.c.

Protection level (up) . . . . .  $\leq 1.4kV$

Tested in compliance with IEC61643-11

| Description           | Signalling Relay | Network                      | Order Code | List Price |
|-----------------------|------------------|------------------------------|------------|------------|
| VPU I 4 R 280V/12.5kA | ●                | Three phase, network & earth | 1352190000 | £398.41    |
| VPU I 4 280V/12.5kA   |                  | Three phase, network & earth | 1352180000 | £325.42    |

## Class II, VPU II arrester

Weidmüller **Features**

- Pluggable arrester
- Coded voltage level
- High energy absorption with short time to sparkover
- Arrester can be rotated through 180°
- No follow-on current
- Installation in distribution board
- Thermal protection function
- Co-ordination with VPU Type I

**Technical specification**

High discharge current  $I_{max}$  . . . . . 40kA  
(8/20 $\mu$ s)

Insulation coordination . . . . . Designed for  
4kV in a 230/400V Net

Max Continuous (V) . . . . . 280V a.c.

Protection level (up) . . . . .  $\leq 1.55kV$

Tested in compliance with IEC61643-11

| Description          | Signalling Relay | Network                      | Order Code | List Price |
|----------------------|------------------|------------------------------|------------|------------|
| VPU II 4 R 280V/40kA | ●                | Three phase, network & earth | 1352690000 | £169.82    |
| VPU II 4 280V/40kA   |                  | Three phase, network & earth | 1352680000 | £135.86    |
| VPU II 2 R 280V/40kA | ●                | Single phase                 | 1352620000 | £84.91     |
| VPU II 2 280V/40kA   |                  | Single phase                 | 1352600000 | £67.92     |

## Class III, VPU III arrester

Weidmüller **Features**

- Pluggable terminals
- Suitable for protecting terminals
- Installed after VPUII and before the end device
- Installed in the vicinity of the equipment to be protected
- Arrester with remote signalling contact

**Technical specification**

Rated discharge current . . . . . Up to 3kA  
(8/20 $\mu$ s)

Insulation coordination . . . . . Designed for  
2.5/1.5kV in a 230/400V Net

Protection level (up)  
230V . . . . .  $\leq 1.8kV$   
24V . . . . .  $\leq 890V$

Suitable for electrical circuits up to . . 16A

Tested in compliance with IEC61643-11

| Description                 | Signalling Relay | Rating | Network      | List Order Code | Price  |
|-----------------------------|------------------|--------|--------------|-----------------|--------|
| VPU III R 230V/6kV a.c.     | ●                | 3kA    | Single phase | 1351650000      | £55.24 |
| VPU III R 24V/4kV a.c./d.c. | ●                | 2kA    | Single phase | 1351580000      | £53.03 |

## Power control selector chart

Eurotherm.  
by Schneider Electric

| Power Control                 | Single Phase  | Single Phase  | Single Phase  | Three Phase  | Three Phase  |
|-------------------------------|---|---|---|--|--|
|                               |  |  |  | (Two phase control)<br> |  |
| Features                      | ESwitch™  | EFit™   | EPack™  | EPack™   | EPack™   |
| Page                          | 296   | 297   | 298   | 298  | 298  |
| Heater Type Resistance        | ●   | ●   | ●   | ●  | ●  |
| SWIR (Short Wave Infrared)    | —   | ●   | ●   | —  | ●  |
| Variable Resistance           | —   | ●   | ●   | —  | ●  |
| Inductive Transformer Coupled | —   | ●   | ●   | ●  | ●  |
| True Power Control            | —   | —   | ●   | ●  | ●  |
| Maximum Voltage (Volts)       | 500V  | 500V  | 500V  | 500V   | 500V   |
| Maximum Current (Amps)        | 50A   | 50A   | 125A  | 125A   | 125A   |
| Controlled Phases             | 1   | 1   | 1   | 2  | 3  |
| Input (Analogue)              | —   | ●   | ●   | ●  | ●  |
| Logic                         | ●   | —   | ●   | ●  | ●  |
| Firing Mode (Phase Angle)     | —   | ●   | ●   | —  | ●  |
| Burst Firing                  | —   | ●   | ●   | ●  | ●  |
| PLF and/or PLU                | ●   | —   | ●   | ●  | ●  |
| Current Limit                 | —   | ●   | ●   | —  | ●  |
| Diagnostics                   | —   | —   | ●   | ●  | ●  |
| Alarms                        | ●   | —   | ●   | ●  | ●  |
| Digital Communications        | —   | —   | EtherNet/IP Modbus<br>TCP Profinet  | EtherNet/IP Modbus<br>TCP Profinet   | EtherNet/IP Modbus<br>TCP Profinet   |
| Compliance                    | CE UL CSA EAC   | CE UL CSA EAC   | CE UL CSA EAC   | CE UL CSA<br>EAC (pending)   | CE UL CSA<br>EAC (pending)   |
| Compliance to: EN60947-4-3    | ●   | ●   | ●   | ●  | ●  |

# ESwitch power switch - thyristor controller

**Eurotherm.**  
by Schneider Electric

**NEW**



Mechanical contactors controlling heating elements can operate up to three million times per year. The lifetime of these contactors is between one and three years; so they need to be replaced regularly during the typical life of an industrial machine.

ESwitch is an interesting solution to solve this problem. Because the contact is electronic, the lifetime is significantly extended. Its wiring is as simple as for a mechanical contactor and the mounting is very easy; just clip it on a DIN rail! It features a broad range of a.c. and d.c. command signals with a front face LED to display the input status to help commissioning and diagnostics.

By combining robustness and security of operations with simplicity of integration and use, ESwitch offers the best ratio of 'performance versus price' for the power switches market.

### Features

- No configuration
- Simplified installation
- Global standardisation
- Reduces maintenance costs
- Reduces downtime because of its reliable operation
- Partial load failure alarm
- Prevents heating circuit dysfunction
- Red light PLF detection

### Technical specification

Current (max) ..... 50A  
 Voltage (max) ..... 500V  
 Controlled phases ..... 1  
 Operating temperature ... 0 to +45°C

| Approvals |      |
|-----------|------|
| • CE      | • UL |

| Model | Height | Width       |          | Depth  | Weight | Mounting |
|-------|--------|-------------|----------|--------|--------|----------|
|       |        | without PLF | with PLF |        |        |          |
|       |        | 16A         | 115mm    |        |        |          |
| 25A   | 115mm  | 54.3mm      | 70mm     | 92.5mm | 0.7kg  | DIN rail |
| 40A   | 115mm  | 89.3mm      | 105mm    | 92.5mm | 0.9kg  | DIN rail |
| 50A   | 115mm  | 106.8mm     | 122.5mm  | 92.5mm | 1.2kg  | DIN rail |

## Order code generator

### Basic Product

**ESWITCH** Solid state contactor

### 1 Current

|            |         |         |
|------------|---------|---------|
| <b>16A</b> | 16 amps | £104.00 |
| <b>25A</b> | 25 amps | £116.00 |
| <b>40A</b> | 40 amps | £138.00 |
| <b>50A</b> | 50 amps | £162.00 |

### 2 Voltage

|             |           |        |
|-------------|-----------|--------|
| <b>120V</b> | 120 volts | —      |
| <b>240V</b> | 240 volts | —      |
| <b>500V</b> | 500 volts | £56.00 |

### 3 Input Type

|            |                                   |        |
|------------|-----------------------------------|--------|
| <b>LGC</b> | Logic d.c. input (5-32V d.c.)     | —      |
| <b>LAC</b> | Low voltage a.c. (30-55V a.c.)    | £29.00 |
| <b>HAC</b> | High voltage a.c. (100-240V a.c.) | £29.00 |

### 4 Manual Language

|            |         |          |
|------------|---------|----------|
| <b>ENG</b> | English | Included |
| <b>FRA</b> | French  | —        |
| <b>GER</b> | German  | —        |
| <b>SPA</b> | Spanish | —        |
| <b>ITA</b> | Italian | —        |

### 5 Partial Load Failure\*

|            |                               |        |
|------------|-------------------------------|--------|
| —          | Without                       | —      |
| <b>PLF</b> | Relay contact open on alarm   | £87.00 |
| <b>IPF</b> | Relay contact closed on alarm | £87.00 |

\* Partial load failure only available with LGC input

### 6 Fuse\*

|                  |                     |        |
|------------------|---------------------|--------|
| <b>NOFUSE</b>    | Without fuse        | —      |
| <b>FUSE/16A</b>  | Without microswitch | £17.00 |
| <b>FUSE/25A</b>  | Without microswitch | £19.00 |
| <b>FUSE/40A</b>  | Without microswitch | £29.00 |
| <b>FUSE/50A</b>  | Without microswitch | £39.00 |
| <b>MSFUSE16A</b> | With microswitch    | £43.00 |
| <b>MSFUSE25A</b> | With microswitch    | £44.00 |
| <b>MSFUSE40A</b> | With microswitch    | £47.00 |
| <b>MSFUSE50A</b> | With microswitch    | £57.00 |

\* According to the CE regulation it is mandatory to place a high-speed fuse in order to protect the thyristors. Do not use to protect the installation.

### EXAMPLE ORDER CODE – ESwitch thyristor controller

|         |       |        |       |       |     |          |
|---------|-------|--------|-------|-------|-----|----------|
| ESWITCH | 1 16A | 2 120V | 3 LGC | 4 ENG | 5 — | 6 NOFUSE |
|---------|-------|--------|-------|-------|-----|----------|

List Price = £104.00

## Power Control Selector Guide

See page 295

www.lcautomation.com

## EFit – Single phase

Eurotherm.  
by Schneider Electric

The EFit power controller provides no compromise control for resistive and infrared heating elements. Ideal for all heating applications and fully compliant to international quality, immunity, and emissions standards, EFit achieves outstanding stable, precise control in the most demanding industrial environments, even when cabinet space is at a premium.

Some industrial processes such as heat treatment require precise temperatures in order to comply with regulations and it is imperative that the workpiece temperature is kept within specific limits. This can be difficult to achieve in industrial plants where the operation of large machinery can cause fluctuations in the voltage supply. In the case of resistive heaters a variation of 10% in the supply voltage will generate a 20% variation in the power to the load, resulting in undesirable temperature fluctuations. EFit contains built in compensation that continues to apply stable power with better than  $\pm 2\%$  linearity at the boundaries of the load, even during fluctuations in the supply.

### Features

- Connects easily with no configuration
- Compact installation
- Global standardisation
- Eliminates voltage fluctuations
- Achieves tight tolerances
- Optimises energy use
- Minimises downtime and maximises throughput

| Dimensions |        |         |        |        |          |
|------------|--------|---------|--------|--------|----------|
| Model      | Height | Width   | Depth  | Weight | Mounting |
| 16A        | 115mm  | 52.5mm  | 92.5mm | 0.55kg | DIN rail |
| 25A        | 115mm  | 70mm    | 92.5mm | 0.7kg  | DIN rail |
| 40A        | 115mm  | 105mm   | 92.5mm | 0.9kg  | DIN rail |
| 50A        | 115mm  | 122.5mm | 92.5mm | 1.2kg  | DIN rail |

## Order code generator

### Basic Product

**EFIT** Basic SCR power controller

### 1 Current

|            |         |         |
|------------|---------|---------|
| <b>16A</b> | 16 amps | £213.00 |
| <b>25A</b> | 25 amps | £236.00 |
| <b>40A</b> | 40 amps | £318.00 |
| <b>50A</b> | 50 amps | £330.00 |

### 2 Voltage

|             |           |        |
|-------------|-----------|--------|
| <b>100V</b> | 100 volts | —      |
| <b>115V</b> | 115 volts | —      |
| <b>200V</b> | 200 volts | —      |
| <b>230V</b> | 230 volts | —      |
| <b>240V</b> | 240 volts | —      |
| <b>277V</b> | 277 volts | £40.00 |
| <b>380V</b> | 380 volts | £40.00 |
| <b>400V</b> | 400 volts | £40.00 |
| <b>415V</b> | 415 volts | £40.00 |
| <b>440V</b> | 440 volts | £40.00 |
| <b>480V</b> | 480 volts | £40.00 |
| <b>500V</b> | 500 volts | £40.00 |

### 3 Input

|              |           |   |
|--------------|-----------|---|
| <b>0V5</b>   | 0-5V d.c. | — |
| <b>4mA20</b> | 4-20mA    | — |
| <b>0V10</b>  | 0-10V     | — |

### 4 Firing Mode

|            |                       |   |
|------------|-----------------------|---|
| <b>FC</b>  | Fast cycle            | — |
| <b>FCI</b> | Single cycle          | — |
| <b>SCA</b> | Advanced single cycle | — |
| <b>PA</b>  | Phase angle           | — |

### 5 Language

|            |         |   |
|------------|---------|---|
| <b>ENG</b> | English | — |
| <b>FRA</b> | French  | — |
| <b>GER</b> | German  | — |

### 6 Supply

|             |                |        |
|-------------|----------------|--------|
| <b>SELF</b> | Self-powered   | —      |
| <b>115V</b> | Auxiliary 115V | £11.00 |
| <b>230V</b> | Auxiliary 230V | £11.00 |

### 7 Current Limit

|           |   |        |
|-----------|---|--------|
| <b>XX</b> | Without current limit                         | —      |
| <b>CL</b> | With current limit<br>(only with phase angle) | £54.00 |

### 8 Fuse

|                  |                     |        |
|------------------|---------------------|--------|
| <b>NOFUSE</b>    | Without fuse        | —      |
| <b>FUSE/16A</b>  | Without microswitch | £16.00 |
| <b>FUSE/25A</b>  | Without microswitch | £16.00 |
| <b>FUSE/40A</b>  | Without microswitch | £34.00 |
| <b>FUSE/50A</b>  | Without microswitch | £41.00 |
| <b>MSFUSE16A</b> | With microswitch    | £39.00 |
| <b>MSFUSE25A</b> | With microswitch    | £39.00 |
| <b>MSFUSE40A</b> | With microswitch    | £44.00 |
| <b>MSFUSE50A</b> | With microswitch    | £64.00 |

### EXAMPLE ORDER CODE – EFit

|      |          |           |          |         |          |           |         |             |
|------|----------|-----------|----------|---------|----------|-----------|---------|-------------|
| EFIT | 1<br>16A | 2<br>100V | 3<br>05V | 4<br>FC | 5<br>ENG | 6<br>SELF | 7<br>XX | 8<br>NOFUSE |
|------|----------|-----------|----------|---------|----------|-----------|---------|-------------|

List Price = £213.00

## Power Control Selector Guide

See page 295

www.lcautomation.com

# E-Pack – Power controllers for 1 and 3-phase supply

**Eurotherm.**  
by Schneider Electric



The E-Pack series consists of a range of compact, fully featured power controllers, combining a high level of functionality and configurability with simplicity of setup and operation.

A variety of firing modes including burst firing avoids generation of harmonics and reduces the consumption of reactive power. A wide range of alarms can quickly identify a controller detected fault which reduces downtime.

## Features

- Nominal load current from 1-125A
- Voltage up to 500V
- Compact DIN rail and bulkhead mounting format
- Configurable via Eurotherm iTools or front panel
- Plug and play Ethernet communications with zero configuration networking
- V2, I2 or true power control
- Controls comprehensive range of loads: Resistive, infrared, transformer primary, molybdenum disilicide, silicon carbide etc
- Energy usage measurement
- Advanced load diagnostics
- Integrated dual port Ethernet switch for “daisy chained” communications
- Modbus® TCP, Ethernet IP or Profinet protocols

## Order code generator

### Product coding

| Basic Products   |                                 |
|------------------|---------------------------------|
| <b>EPACK-1PH</b> | Single phase power controller   |
| <b>EPACK-2PH</b> | 3-phase, 2 leg power controller |
| <b>EPACK-3PH</b> | 3-phase, 3 leg power controller |

| 1 Current   |          |
|-------------|----------|
| <b>16A</b>  | 16 amps  |
| <b>25A</b>  | 25 amps  |
| <b>32A</b>  | 32 amps  |
| <b>40A</b>  | 40 amps  |
| <b>50A</b>  | 50 amps  |
| <b>63A</b>  | 63 amps  |
| <b>80A</b>  | 80 amps  |
| <b>100A</b> | 100 amps |
| <b>125A</b> | 125 amps |

| 2 Auxiliary Power Supply |               |
|--------------------------|---------------|
| <b>500V</b>              | 500V max      |
| <b>24V</b>               | 24V a.c./d.c. |

| 3 Reserved |          |
|------------|----------|
| <b>XXX</b> | Reserved |

| 4 Control Option |   |
|------------------|---|
| <b>V2</b>        | V <sup>2</sup> control (standard)                   |
| <b>I2</b>        | I <sup>2</sup> control                              |
| <b>V2CL</b>      | V <sup>2</sup> with current limitation by threshold |
| <b>PWRCL</b>     | Power control with current limit                    |

| 5 Transfer Option |                         |
|-------------------|-------------------------|
| <b>XXX</b>        | —                       |
| <b>TFR</b>        | I <sup>2</sup> Transfer |

| 6 Energy Option |                    |
|-----------------|--------------------|
| <b>XXX</b>      | —                  |
| <b>EMS</b>      | Energy measurement |

| 7 Comms Options |                       |
|-----------------|-----------------------|
| <b>TCP</b>      | Modbus TCP (standard) |
| <b>IP</b>       | Ethernet/IP           |
| <b>PN</b>       | Profinet              |

| 8 OEM Security |              |
|----------------|--------------|
| <b>XXX</b>     | —            |
| <b>OEM</b>     | OEM security |

| 9 Warranty   |                   |
|--------------|-------------------|
| <b>XXX</b>   | Standard warranty |
| <b>WL005</b> | 5 year warranty   |

| 10 Custom Labelling |                      |
|---------------------|----------------------|
| <b>XXX</b>          | Standard (Eurotherm) |
| <b>FXXXX</b>        | Special label        |

| 11 Graphical Wiring |                         |
|---------------------|-------------------------|
| <b>XXX</b>          | Standard configuration  |
| <b>GWE</b>          | Graphical wiring editor |

| 12 Fuse    |                                 |
|------------|---------------------------------|
| <b>XXX</b> | Without fuse                    |
| <b>HSP</b> | Highspeed fuse - no microswitch |
| <b>HSM</b> | Highspeed fuse + microswitch    |

### EXAMPLE ORDER CODE – EPACK-1PH

|           |     |      |     |    |     |     |     |     |     |     |     |     |
|-----------|-----|------|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| EPACK-1PH | 1   | 2    | 3   | 4  | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  |
|           | 16A | 500V | XXX | V2 | XXX | XXX | TCP | XXX | XXX | XXX | XXX | XXX |

List Price = £372.00

Additional configuration and software options are available for the E-Pack series, please contact sales for further information

## Power Control Selector Guide

See page 295

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