

ADELSYSTEM

Power Supplies

Series FLEX Power Supplies P2
Technical Information & Dimensions (Online) P5



Flexible Switching Power Supplies

High Quality AC to DC power with power boost up to 150% of rated Output to 60°C



Sprecher + Schuh is proud to bring you a Flexible Power Supply from the best in AC to DC power supplies, Adel System.

Solutions for Power Supply Continuity

The FLEXline DC Power Supplies offer more power and flexibility for all your power needs. FLEX units are power rated from 100 to 150%, have a voltage input from 115V to 500V, and three modes of output circuit protection. The extremely compact housings offer a variety of features.

Unparalleled Benefits

ADEL system Power Supplies offer unparalleled benefits in the industry:

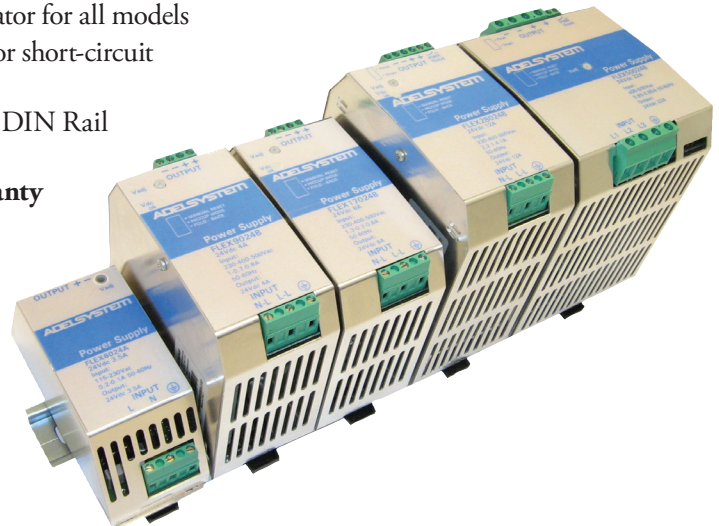
- High quality AC to DC power boost with up to 150% of rated output to 60°C
- 1- and 2-phase input from 230V to 500V AC eliminates the need for control transformers
- Hiccup, Manual Reset and Continuous Output protection modes
- Operating temperature range of -25/+70°C
- Metal Case IP 20 provides excellent heat dissipation
- Built-in overload protection
- LED status indicator for all models
- Internally fused for short-circuit protection
- Easy Installation, DIN Rail Mountable
- **Three year warranty**



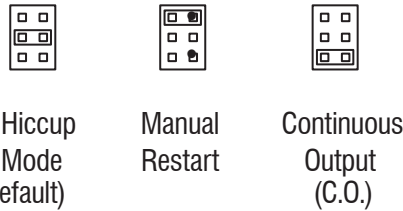
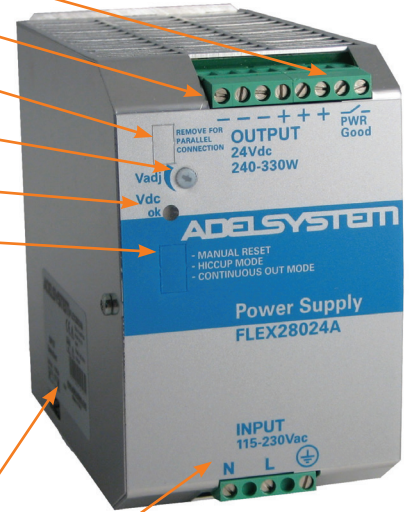
One Solution, Many Applications

ADEL system Power Supplies can apply to numerous applications and industries:

- PLC and Smart Relay power
- Proximity Switches
- Light Curtains
- Textile & Robotic Machinery
- Material Handling Equipment
- Metal & Wood Working
- Freezers & Refrigerators
- Building Automation
- Air Cleaning Systems
- Packing Equipment



- "Power Good" Contacts
- Output (Load side)
- Enable Parallel Connection
- Adjust Output 22...27 VDC
- LED Status "OK"
- Field selectable via factory supplied jumper



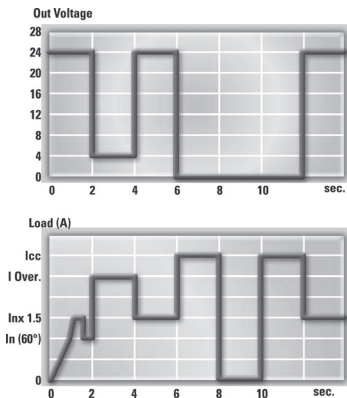
- Set Voltage Selection
 - Slide switch in casing
 - Some models are automatic or bridge only
- Input (Input voltage)

Three Modes of Protection

With the exception of FLEX6024A, all Flex Models are field selectable via a factory supplied jumper for the three protection modes as described below.

Hiccup Mode Automatic Restart

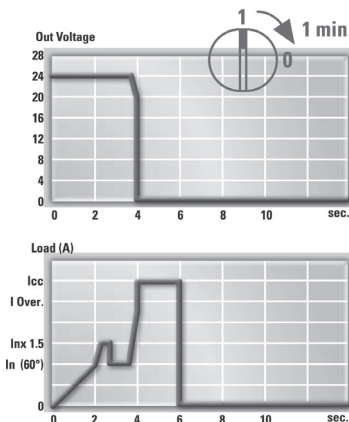
This is the default factory setting of all FLEX units. In case of short-circuit or overloading, the output current is interrupted. The device tries again to re-establish output voltage and normal condition about every 2 seconds until the problem is cleared.



Hiccup Mode

Manual Reset

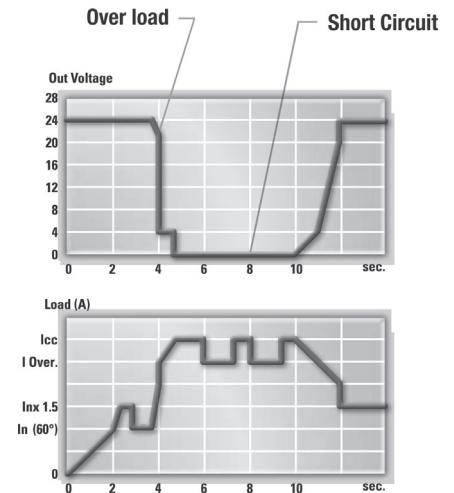
In case of short-circuit or overload, the output current is interrupted. In order to restart the output it is necessary to switch-off the input circuit for about 1 minute. This protection mode is particularly suggested in applications where safety procedures require that reset be carried out only by an authorized person.



Manual Reset

Continuous Output mode

In case of short-circuit or overload, the output current is kept at high values with near zero voltage. In case of short circuit the current can reach up to 3 times the rated current at 60°C. This protection mode is used to meet the requirements of demanding loads such as motors, solenoid valves, lamps, PLC with highly capacitive input circuits and other loads with marked transient overload behavior. FLEX6024A is factory set to continuous output (C.O.) mode only.



Continuous Output

Flexible Switching Mode Power Supplies

| Input Voltage AC | Input Voltage Selection | Watts | Output VDC | Output Amps | | Power Good Contact ⑤ | Catalog Number ④ |
|---------------------|-------------------------|-----------|------------|-------------|-------|----------------------|------------------|
| | | | | @40°C | @60°C | | |
| Single Phase | | | | | | | |
| 115...230 | Automatic | 36...72 | 24 | 2 ① | 1.5 ② | ~ | FLEX6024A |
| 115/230 | Selectable ③ | 96/120 | | 5 | 4 | Yes | FLEX9024A |
| 115/230 | Selectable ③ | 120/180 | | 7.5 | 5 | Yes | FLEX17024A |
| 115/230 | Selectable ③ | 240/336 | | 14 | 10 | Yes | FLEX28024A |
| 115/230 | Bridge only ③ | 480/600 | | 25 | 20 | Yes | FLEX50024A |
| Two Phase | | | | | | | |
| 230/400...500 | Selectable ③ | 96/120 | 24 | 5 | 4 | Yes | FLEX9024B |
| 230/400...500 | Selectable ③ | 120/180 | | 7.5 | 5 | Yes | FLEX17024B |
| 230/400...500 | Selectable ③ | 240/336 | | 14 | 10 | Yes | FLEX28024B |
| Three Phase | | | | | | | |
| 400...500 | Automatic | 480...600 | 24 | 25 | 20 | Yes | FLEX50024B |



Norms and certifications

The CE mark in According to EMC 2004/108/EC and the Low voltage directive 2006/95/EC

EMC Immunity

EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-6-2

Electrical Safety

According to UL508, UL file E308682, IEC/EN 60950 (VDE 0805) e EN 50178 (VDE 0160) for assembling device. The unit must be installed according to IEC/EN 60950. Input / Output separation: SELV EN60950-1 and PELV EN 60204-1. Double or reinforced insulation.

EMC Emission:

EN 61000-6-4, EN61000-3-2

Standards Conformity

EN 60204-1 Safety of Electrical Equipment Machines

① 115V Amp Rating shown; 3A @ 230V (72 W)
 ② 115V Amp Rating shown; 2.5@ 230V @ 50°C (60 W)
 ③ Input voltage selectable via slide switch located below input terminals inside metal casing.

④ With the exception of Flex6024A, all models are capable of being set to hiccup mode, manual reset or Continuous mode via factory supplied jumper.
 ⑤ The NO Power Good signal contact Closes when the output power is OK and Opens when the output voltage falls below 20V DC.
 ⑥ For 115V input voltage jumper is required between "bridge only" terminals.

FLEX6024A

Input: single-phase **115 ... 230 V AC**

Output: One output **24 V DC 50°C**

Efficiency up to **85%**

Strong overload without switch-off up

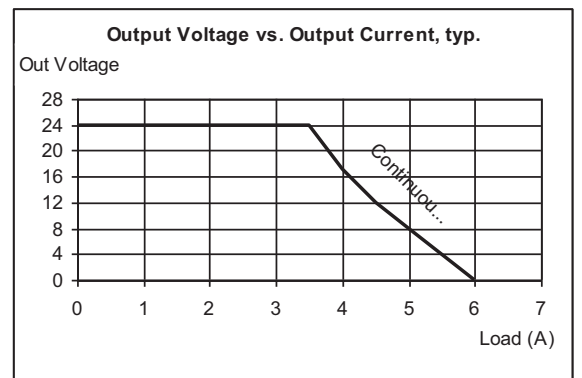
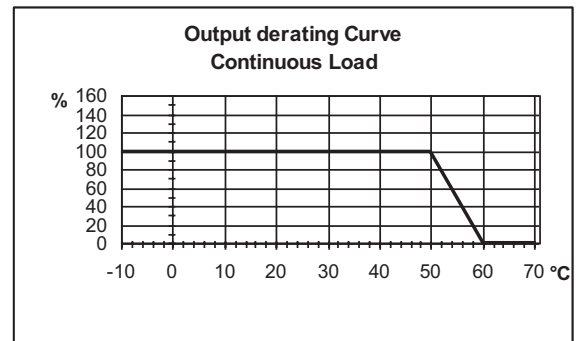
Flexible power continuity: **36 to 72 W**

DIN Rail Mountable

Extremely small size



| | | | | | |
|----------------------------------------------|--------------------------------------------------|----------------------------------------------|--------------------|----------|---------|
| Input Data | Nominal Input Voltage (2 x Vac) | 115 ... 230 Vac | | | |
| | Input Voltage range (Vac) | 90 ... 264 | | | |
| | Inrush Current (Vn and In Load) I ² t | ≤ 19 A ≤ 5 msec. | | | |
| | Frequency | 47 – 63 Hz ±6% | | | |
| | Input Current (115 – 230 Vac) | 1 – 0.7 A | | | |
| | Internal Fuse | T 4 A | | | |
| | External Fuse (recommended) | 6 A (MCB curve B) | | | |
| | Output Data | Output Voltage (Vn) Factory Setting 3% | 24 Vdc | | |
| | | Adjustment range (Vadj) | 22 – 27 Vdc | | |
| | | Start up with Strong Load (capacitive load) | ≤ 50.000 μF | | |
| Turn-On delay after applying mains voltage | | 1.5 sec. (max) | | | |
| Continuous Current at 24 V < 40°C (In) | | 2 A (115) 3 A (230) | | | |
| Continuous Current at 24 V < 50°C (In) | | 1.5 A (115) 2.5 A (230) | | | |
| Power Boost Current at 24 Vdc 50°C(In) | | 3.5A ≥ 3 min. | | | |
| Current max. Overload 4Vdc (permanent) | | I _{max} = In 50°C x (1.8 - 2.2) | | | |
| Max current Short Circuit (I _{cc}) | | 7 A | | | |
| Hold-up Time (min. Vac) 24Vdc 5A | | Typ. 20 msec | | | |
| Residual Ripple | | ≤ 80 mV _{pp} | | | |
| Efficiency | | ≥ 85 % | | | |
| Over temperature Protection | | Yes. Shut-down output and automatic restart. | | | |
| Short-circuit protection | | Yes, Continuous Mode | | | |
| Dissipation power load max (W) | | 13 | | | |
| Over Load protection | | Yes, Continuous Mode | | | |
| Over Voltage Output protection | Yes (typ. 35 Vdc) | | | | |
| Parallel connection | Yes | | | | |
| Climatic Data | Ambient Temperature operation | -25 up to +70 °C | | | |
| | | (>50°derating 2.5% °C) | | | |
| | Ambient Temperature Storage | -40 up to +85 °C | | | |
| | Humidity at 25 °C, no condensation | 95 % to 25 °C | | | |
| General Data | Isolation Voltage (In / Out) | 3000 Vac | | | |
| | Isolation Voltage (In / PE) | 1605 Vac | | | |
| | Isolation Voltage (Out / PE) | 500 Vac | | | |
| | Protection Class (EN/IEC 60529) | IP 20 | | | |
| | Reliability: MTBF IEC 61709 | > 500.000 h | | | |
| | Pollution Degree Environment | 2 | | | |
| | Protection class | I with PE connected | | | |
| | Dimension (w-h-d) | 50x120x50 mm | | | |
| | Weight | 0.3 kg approx. | | | |
| | Terminal Connections | | Solid | Stranded | Torque |
| | | (mm ²) | (mm ²) | (NM) | Length: |
| Input: | | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 |
| Output: | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |



FLEX9024A

Input: single-phase **115 / 230 V AC**

Output: One output **24 V DC 60°C**

Efficiency up to **89%**

Strong overload without switch-off, up to **50%**

Flexible power continuity: **96 to 120 W**

"Power Good" Contact

Selectable Protection Mode:

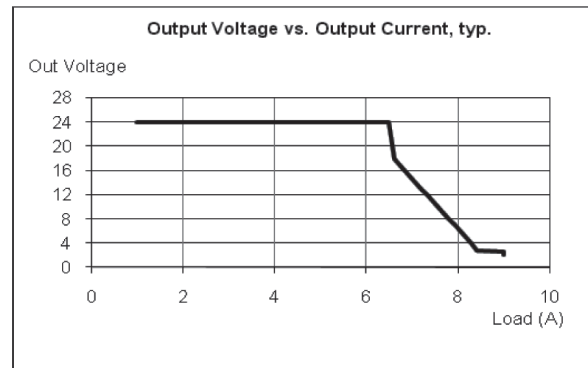
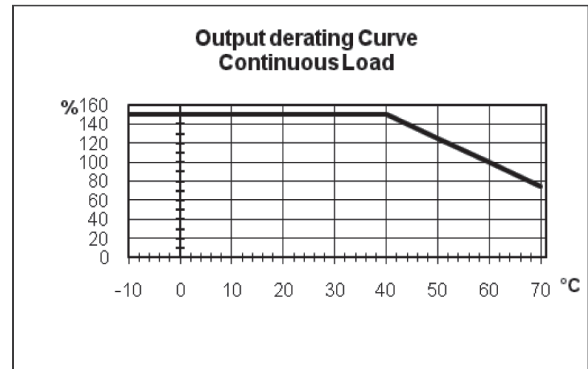
Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

Extremely small size



| | | | | | |
|---------------------------------------------|------------------------------------------------------|--------------------------------------------|--------------------|---------|------------------|
| Input Data | Nominal Input Voltage (2 x Vac) | 115 / 230 Vac | | | |
| | Manual select Input from 115 to 230 | | | | |
| | Input Voltage range (Vac) | 90 – 135 (115) 170 – 264 (230) | | | |
| | Inrush Current (Vn and In Load) I ² t | ≤ 36 A ≤ 5 msec. | | | |
| | Frequency | 47 – 63 Hz ±6% | | | |
| | Input Current (115 – 230 Vac) | 1.91 – 0.96 A | | | |
| | Internal Fuse | T 4 A | | | |
| | External Fuse (recommended) | 10 A (MCB curve B) | | | |
| | Output Data | Output Voltage (Vn) Factory Setting ±3% | 24 Vdc | | |
| | | Adjustment range (Vadj) | 22 – 27 Vdc | | |
| Start up with Strong Load (capacitive load) | | ≤ 50.000 µF | | | |
| Turn-On delay after applying mains voltage | | 1 sec. (max) | | | |
| Continuous Current at 24 V < 40°C (In) | | 5 A (permanent) | | | |
| Continuous Current at 24 V < 50°C (In) | | 4.5 A (permanent) | | | |
| Continuous Current at 24 V < 60°C (In) | | 4 A (permanent) | | | |
| Power Boost Current at 24 Vdc 60°C(In) | | In (60°C) x 1.5 ≥ 3 min. | | | |
| Current max. Overload ≥ 4Vdc (permanent) | | I _{max} = In 60°C x (1.8 - 2.2) | | | |
| Current Short Circuit I _{cc} | | | | | |
| Max 2 sec.: Hiccup mode | | 12 A | | | |
| Permanent : Continuous Mode Mode | | | | | |
| Hold-up Time (min. Vac) 24Vdc 5A | | Typ. 20 msec | | | |
| Residual Ripple | | ≤ 80 mVpp | | | |
| Efficiency | | ≥ 89 % | | | |
| Over temperature Protection | Yes. Shut-down output and automatic restart. | | | | |
| Short-circuit protection modes | Hiccup Mode Continuous Mode Restart After Main | | | | |
| Dissipation power load max (W) | 15 | | | | |
| Over Load protection | Yes | | | | |
| Over Voltage Output protection | Yes (typ. 35 Vdc) | | | | |
| Parallel connection | Yes | | | | |
| Power Good contact rating (EN60947.4.1): | | | | | |
| Max. DC1: 30VDC 1S; AC1: 60 VAC 1A | Resistive load | | | | |
| Min. 1mA at 5 VDC | Min. permissive load | | | | |
| Climatic Data | Ambient Temperature operation | -25 up to +70 °C (>60°derating 2.5% °C) | | | |
| | Ambient Temperature Storage | -40 up to +85 °C | | | |
| | Humidity at 25 °C, no condensation | 95 % to 25 °C | | | |
| General Data | Isolation Voltage (In / Out) | 3000 Vac | | | |
| | Isolation Voltage (In / PE) | 1605 Vac | | | |
| | Isolation Voltage (Out / PE) | 500 Vac | | | |
| | Protection Class (EN/IEC 60529) | IP 20 | | | |
| | Reliability: MTBF IEC 61709 | > 500.000 h | | | |
| | Pollution Degree Environment | 2 | | | |
| | Protection class | I with PE connected | | | |
| | Dimension (w-h-d) | 55x110x105 mm | | | |
| | Weight | 0.50 kg approx. | | | |
| Terminal Connections | | Solid | Stranded | Torque | Stripped Length: |
| | | (mm ²) | (mm ²) | (NM) | |
| | Input: | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 |
| Output: | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |



FLEX17024A

Input: single-phase **115 / 230 V AC**

Output: **24 V DC 60°C**

Efficiency up to **89%**

Strong overload without switch-off, up to **50%**

Flexible power continuity: **120 to 180 W**

"Power Good" Contact

Selectable Protection Mode:

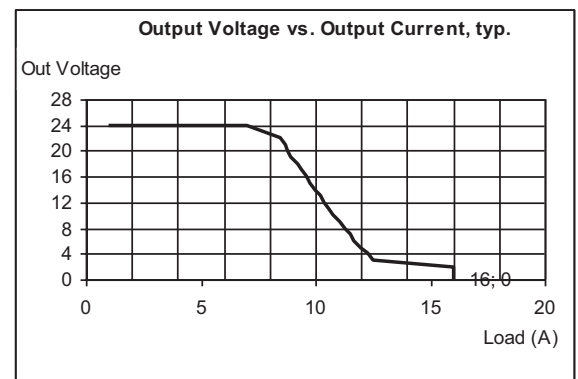
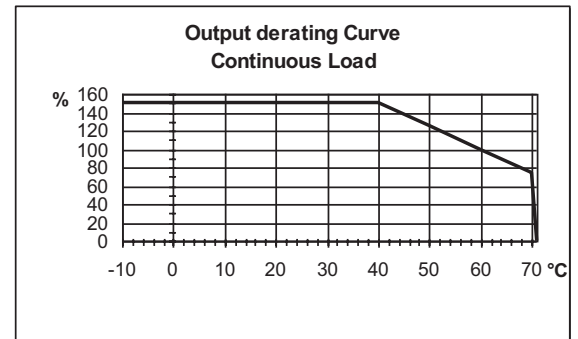
Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

Extremely small size



| Input Data | Nominal Input Voltage (2 x Vac) | | | |
|----------------------|--------------------------------------------------|------------------------------------------------------|--------|----------|
| | 115 / 230 Vac | | | |
| | Manual select Input from 115 to 230 | | | |
| | Input Voltage range (Vac) | 90 – 135 (115) 170 – 264 (230) | | |
| | Inrush Current (Vn and In Load) I ² t | ≤ 36 A ≤ 5 msec. | | |
| | Frequency | 47 – 63 Hz ±6% | | |
| | Input Current (115 – 230 Vac) | 2.8 – 1.3 A | | |
| | Internal Fuse | T 4 A | | |
| | External Fuse (recommended) | 10 A (MCB curve B) | | |
| Output Data | Output Voltage (Vn) Factory Setting ±3% | | | |
| | 24 Vdc | | | |
| | Adjustment range (Vadj) | 22 – 27 Vdc | | |
| | Start up with Strong Load (capacitive load) | ≤ 50.000 μF | | |
| | Turn-On delay after applying mains voltage | 1 sec. (max) | | |
| | Rated Current at 24 V < 40°C (In) | 7.5 A (permanent) | | |
| | Rated Current at 24 V < 50°C (In) | 6 A (permanent) | | |
| | Rated Current at 24 V < 60°C (In) | 5 A (permanent) | | |
| | Power Boost Current at 24 V 60°C(In) | In (60°C) x 1.5 ≥ 3 min. | | |
| | Current max. Overload ≅ 4Vdc (permanent) | I _{max} = In 60°C x (1.8 - 2.2) | | |
| | Current Short Circuit I _{cc} | | | |
| | Max 2 sec.: Hiccup mode | 16A | | |
| | Permanent: Continuous Mode mode | | | |
| | Hold-up Time (min. Vac) 24Vdc 5A | Typ. 20 msec | | |
| | Residual Ripple | ≤ 80 mV _{pp} | | |
| | Efficiency | ≥ 89 % | | |
| | Over temperature Protection | Yes. Shut-down output and automatic restart. | | |
| | Short-circuit protection modes | Hiccup Mode Continuous Mode Restart After Main | | |
| | Dissipation power load max (W) | 22 | | |
| | Over Load protection | Yes | | |
| | Over Voltage Output protection | Yes (typ. 35 Vdc) | | |
| | Parallel connection | Yes | | |
| | Power Good contact rating (EN60947.4.1): | | | |
| | Max. DC1: 30VDC 1S; AC1: 60 VAC 1A | Resistive load | | |
| | Min. 1mA at 5 VDC | Min. permissible load | | |
| Climatic Data | Ambient Temperature operation | | | |
| | -25 up to +70 °C (>60°derating 2.5% °C) | | | |
| | Ambient Temperature Storage | | | |
| | -40 up to +85 °C | | | |
| | Humidity at 25 °C, no condensation | | | |
| | 95 % to 25 °C | | | |
| General Data | Isolation Voltage (In / Out) | | | |
| | 3000 Vac | | | |
| | Isolation Voltage (In / PE) | | | |
| | 1605 Vac | | | |
| | Isolation Voltage (Out / PE) | | | |
| | 500 Vac | | | |
| | Protection Class (EN/IEC 60529) | | | |
| | IP 20 | | | |
| | Reliability: MTBF IEC 61709 | | | |
| | > 500.000 h | | | |
| | Pollution Degree Environment | | | |
| | 2 | | | |
| | Protection class | | | |
| | I with PE connected | | | |
| | Dimension (w-h-d) | | | |
| | 55x110x105 mm | | | |
| | Weight | | | |
| | 0.60 kg approx. | | | |
| Terminal Connections | Solid | Stranded | Torque | Stripped |
| | (mm ²) | (mm ²) | (NM) | Length: |
| | Input: 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 |
| | Output: 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 |
| | | | | 7 mm |



FLEX28024A

Input: single-phase **115 / 230 V AC**

Output: **24 V DC 60°C**

Efficiency up to **89%**

Strong overload without switch-off, up to **50%**

Flexible power continuity: **240 to 336 W**

"Power Good" Contact

Selectable Protection Mode:

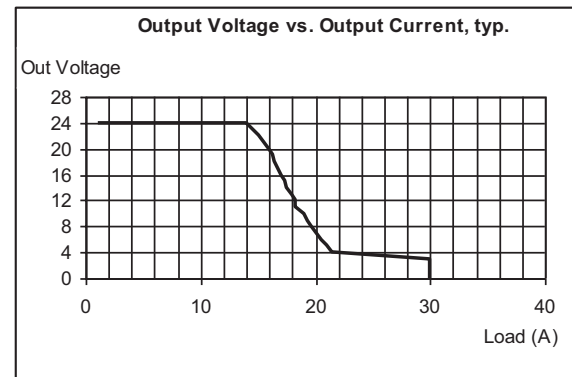
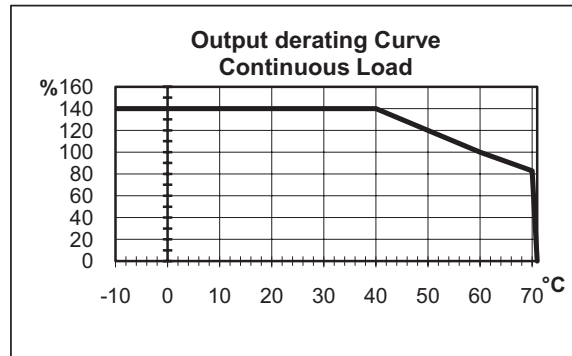
Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

Extremely small size



| | | | | | | |
|-------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------|--------------------------|-----------------------------|---------|-------------|
| Input Data | Nominal Input Voltage (2 x Vac) | 115 / 230 Vac | | | | |
| | Manual select Input from 115 to 230 | | | | | |
| | Input Voltage range (Vac) | 90 – 135 (115) 170 – 264 (230) | | | | |
| | Inrush Current (Vn and In Load) I^2t | $\leq 42 \text{ A} \leq 5 \text{ msec.}$ | | | | |
| | Frequency | 47 – 63 Hz $\pm 6\%$ | | | | |
| | Input Current (115 – 230 Vac) | 3.3 – 2.2 A | | | | |
| | Internal Fuse | T 6.3 A | | | | |
| | External Fuse (recommended) | 16 A (MCB curve B) | | | | |
| | Output Data | Output Voltage (Vn) Factory Setting $\pm 3\%$ | 24 Vdc | | | |
| | | Adjustment range (Vadj) | 22 – 27 Vdc | | | |
| Start up with Strong Load (capacitive load) | | $\leq 50.000 \mu\text{F}$ | | | | |
| Turn-On delay after applying mains voltage | | 1 sec. (max) | | | | |
| Rated Current at 24 V < 40°C (In) | | 14 A (permanent) | | | | |
| Rated Current at 24 V < 50°C (In) | | 12 A (permanent) | | | | |
| Rated Current at 24 V < 60°C (In) | | 10 A (permanent) | | | | |
| Power Boost Current at 24 V 60°C(In) | | In (60°C) x 1.5 $\geq 3 \text{ min.}$ | | | | |
| Current max. Overload $\cong 4\text{Vdc}$ (permanent) | | $I_{\text{max}} = I_{\text{n } 60^\circ\text{C}} \times (1.8 - 2.2)$ | | | | |
| Current Short Circuit Icc | | | | | | |
| Max 2 sec.: Hiccup mode | | 30A | | | | |
| Permanent: Continuous Mode mode | | | | | | |
| Hold-up Time (min. Vac) 24Vdc 5A | | Typ. 20 msec | | | | |
| Residual Ripple | | $\leq 80 \text{ mVpp}$ | | | | |
| Efficiency | | $\geq 89 \%$ | | | | |
| Over temperature Protection | | Yes. Shut-down output and automatic restart. | | | | |
| Short-circuit protection modes | | Hiccup Mode | | | | |
| | | Continuous Mode | | | | |
| | Restart After Main | | | | | |
| Dissipation power load max (W) | 42 | | | | | |
| Over Load protection | Yes | | | | | |
| Over Voltage Output protection | Yes (typ. 35 Vdc) | | | | | |
| Parallel connection | Yes, "Easy Parallel" | | | | | |
| Power Good contact rating (EN60947.4.1): | | | | | | |
| Max. DC1: 30VDC 1S; AC1: 60 VAC 1A | Resistive load | | | | | |
| Min. 1mA at 5 VDC | Min. permissible load | | | | | |
| Climatic Data | Ambient Temperature operation | -25 up to +70 °C ($> 60^\circ\text{C}$ derating 2.5% °C) | | | | |
| | Ambient Temperature Storage | -40 up to +85 °C | | | | |
| | Humidity at 25 °C, no condensation | 95 % to 25 °C | | | | |
| General Data | Isolation Voltage (In / Out) | 3000 Vac | | | | |
| | Isolation Voltage (In / PE) | 1605 Vac | | | | |
| | Isolation Voltage (Out / PE) | 500 Vac | | | | |
| | Protection Class (EN/IEC 60529) | IP 20 | | | | |
| | Reliability: MTBF IEC 61709 | $> 500.000 \text{ h}$ | | | | |
| | Pollution Degree Environment | 2 | | | | |
| | Protection class | I with PE connected | | | | |
| | Dimension (w-h-d) | 72x115x135 mm | | | | |
| | Weight | 0.65 kg approx. | | | | |
| | Terminal Connections | | Solid (mm ²) | Stranded (mm ²) | AWG | Torque (NM) |
| Input: | | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |
| Output: | | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |
| Signal: | | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |



FLEX Power Supplies

FLEX50024A

Input: single-phase **115 / 230 V AC**
 Output: **24 V DC 60°C**
 Efficiency up to **90%**
 Strong overload without switch-off, up to **50%**
 Flexible power continuity: **480 to 600 W**
 "Power Good" Contact
 Selectable Protection Mode:

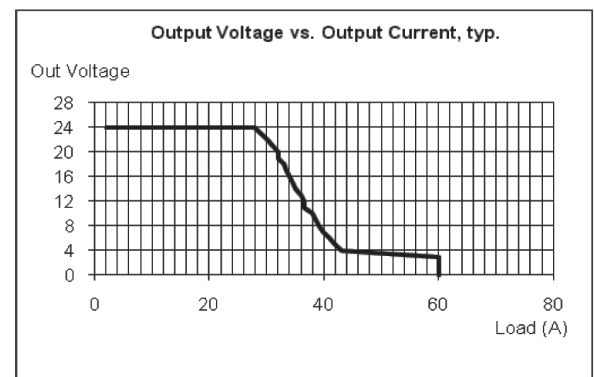
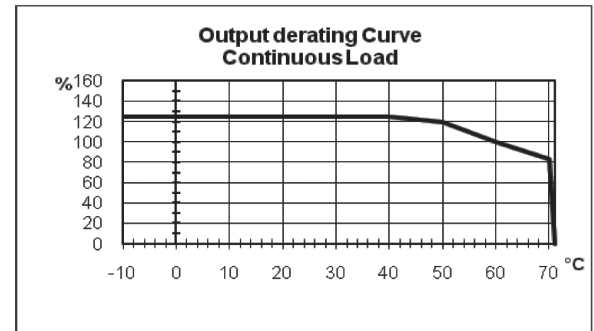
Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

Extremely small size



| | | | | | | |
|------------------------------------------|------------------------------------------------------|---------------------------------------------|--------------------|----------|---------|----------|
| Input Data | Nominal Input Voltage (2 x Vac) | 115 / 230 Vac | | | | |
| | Bridge for 115V | | | | | |
| | Input Voltage range (Vac) | 90 – 135 (115) 170 – 264 (230) | | | | |
| | Inrush Current (Vn and In Load) I ² t | ≤ 80 A ≤ 5 msec. | | | | |
| | Frequency | 47 – 63 Hz ±6% | | | | |
| | Input Current (115 – 230 Vac) | 8 – 4.2 A | | | | |
| | Internal Fuse | T 10 A | | | | |
| | External Fuse (recommended) | 16 A (MCB curve B) | | | | |
| | Output Data | Output Voltage (Vn) Factory Setting ±3% | 24 Vdc | | | |
| | | Adjustment range (Vadj) | 22 – 27 Vdc | | | |
| | | Start up with Strong Load (capacitive load) | <50.000µF | | | |
| | | Turn-On delay after applying mains voltage | 1 sec. (max) | | | |
| Rated Current at 24 V < 40°C (In) | | 25 A (permanent) | | | | |
| Rated Current at 24 V < 50°C (In) | | 22 A (permanent) | | | | |
| Rated Current at 24 V < 60°C (In) | | 20 A (permanent) | | | | |
| Power Boost Current at 24 V 60°C(In) | | In (60°C) x 1.5 ≥ 3 min. | | | | |
| Current max. Overload ≅ 4Vdc (permanent) | | I _{max} = In 60°C x (1.8 - 2.2) | | | | |
| Current Short Circuit I _{cc} | | | | | | |
| Max 2 sec.: Hiccup mode | | 60A | | | | |
| Permanent: Continuous Mode mode | | | | | | |
| Hold-up Time (min. Vac) 24Vdc 5A | | Typ. 20 msec | | | | |
| Residual Ripple | | ≤ 80 mVpp | | | | |
| Efficiency | | ≥ 90 % | | | | |
| Over temperature Protection | Yes. Shut-down output and automatic restart. | | | | | |
| Short-circuit protection modes | Hiccup Mode Continuous Mode Restart After Main | | | | | |
| Dissipation power load max (W) | 62 | | | | | |
| Over Load protection | Yes | | | | | |
| Over Voltage Output protection | Yes (typ. 35 Vdc) | | | | | |
| Parallel connection | Yes, "Easy Parallel" | | | | | |
| Power Good contact rating (EN60947.4.1): | | | | | | |
| Max. DC1: 30VDC 1S; AC1: 60 VAC 1A | Resistive load | | | | | |
| Min. 1mA at 5 VDC | Min. permissive load | | | | | |
| Climatic Data | Ambient Temperature operation | -25 up to +70 °C | | | | |
| | Ambient Temperature Storage | -40 up to +85 °C | | | | |
| | Humidity at 25 °C, no condensation | 95 % to 25 °C | | | | |
| General Data | Isolation Voltage (In / Out) | 3000 Vac | | | | |
| | Isolation Voltage (In / PE) | 1605 Vac | | | | |
| | Isolation Voltage (Out / PE) | 500 Vac | | | | |
| | Protection Class (EN/IEC 60529) | IP 20 | | | | |
| | Reliability: MTBF IEC 61709 | > 500.000 h | | | | |
| | Pollution Degree Environment | 2 | | | | |
| | Protection class | I with PE connected | | | | |
| | Dimension (w-h-d) | 85x120x140 mm | | | | |
| | Weight | 0.75 kg approx. | | | | |
| | Terminal Connections | | Solid | Stranded | Torque | Stripped |
| | | (mm ²) | (mm ²) | (NM) | Length: | |
| Input: | | 4.0 | 6.0 | 30-10 | 0.8-1.0 | 7 mm |
| Output: | | 4.0 | 6.0 | 30-10 | 0.8-1.0 | 7 mm |
| Signal: | | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |



FLEX9024B

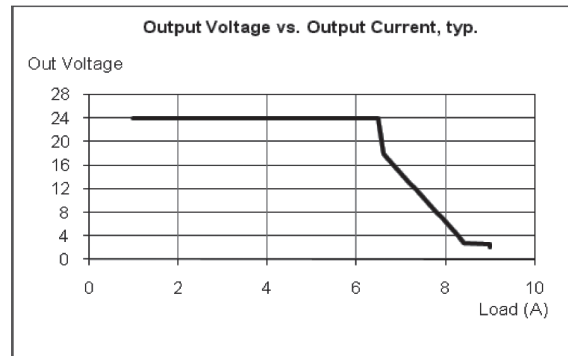
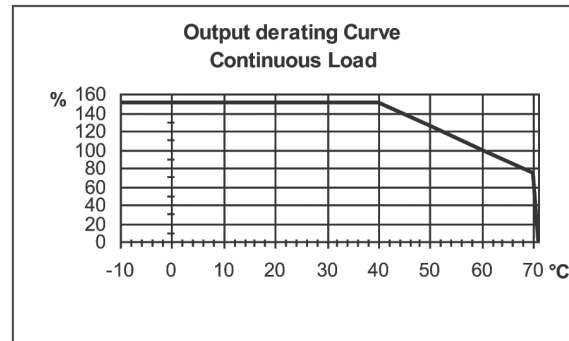
Input: two-phase **230 / 400 ... 500 V AC**
 Output: **24 V DC 60°C**
 Efficiency up to **89%**
 Strong overload without switch-off, up to **50%**
 Flexible power continuity: **96 to 120 W**
 "Power Good" Contact
 Selectable Protection Mode:

Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable
 Extremely small size



| Input Data | | | | | |
|--------------------------------------------------|------------------------------------------------------|-----------------------------|-------|-------------|------------------|
| Nominal Input Voltage (2 x Vac) | 230 / 400 ... 500 Vac | | | | |
| Manual select Input from 230 to 400-500 | | | | | |
| Input Voltage range (Vac) | 187 – 264 (230) | 330 – 550 (400-500) | | | |
| Inrush Current (Vn and In Load) I ² t | ≤ 17 A ≤ 5 msec. | | | | |
| Frequency | 47 – 63 Hz ±6% | | | | |
| Input Current (230/400...500 V AC) | 1.0 – 0.58 – 0.46 A | | | | |
| Internal Fuse | T 4 A | | | | |
| External Fuse (recommended) | 10 A (MCB curve B) | | | | |
| Output Data | | | | | |
| Output Voltage (Vn) Factory Setting ±3% | 24 Vdc | | | | |
| Adjustment range (Vadj) | 22 – 27 Vdc | | | | |
| Start up with Strong Load (capacitive load) | ≤50.000µF | | | | |
| Turn-On delay after applying mains voltage | 1 sec. (max) | | | | |
| Rated Current at 24 V < 40°C (In) | 5 A (permanent) | | | | |
| Rated Current at 24 V < 50°C (In) | 4.5 A (permanent) | | | | |
| Rated Current at 24 V < 60°C (In) | 4 A (permanent) | | | | |
| Power Boost Current at 24 V 60°C(In) | In (60°C) x 1.5 ≥ 3 min. | | | | |
| Current max. Overload ≥ 4Vdc (permanent) | Imax = In 60°C x (1.8 - 2.2) | | | | |
| Current Short Circuit Icc | | | | | |
| Max 2 sec.: Hiccup mode | 12A | | | | |
| Permanent: Continuous Mode mode | | | | | |
| Hold-up Time (min. Vac) 24Vdc 5A | Typ. 20 msec | | | | |
| Residual Ripple | ≤ 80 mVpp | | | | |
| Efficiency | ≥ 89 % | | | | |
| Over temperature Protection | Yes. Shut-down output and automatic restart. | | | | |
| Short-circuit protection modes | Hiccup Mode Continuous Mode Restart After Main | | | | |
| Dissipation power load max (W) | 12 | | | | |
| Over Load protection | Yes | | | | |
| Over Voltage Output protection | Yes (typ. 35 Vdc) | | | | |
| Parallel connection | Yes, "Easy Parallel" | | | | |
| Power Good contact rating (EN60947.4.1): | | | | | |
| Max. DC1: 30VDC 1S; AC1: 60 VAC 1A | Resistive load | | | | |
| Min. 1mA at 5 VDC | Min. permissive load | | | | |
| Climatic Data | | | | | |
| Ambient Temperature operation | -25 up to +70 °C | | | | |
| Ambient Temperature Storage | -40 up to +85 °C | | | | |
| Humidity at 25 °C, no condensation | 95 % to 25 °C | | | | |
| General Data | | | | | |
| Isolation Voltage (In / Out) | 3000 Vac | | | | |
| Isolation Voltage (In / PE) | 1605 Vac | | | | |
| Isolation Voltage (Out / PE) | 500 Vac | | | | |
| Protection Class (EN/IEC 60529) | IP 20 | | | | |
| Reliability: MTBF IEC 61709 | > 500.000 h | | | | |
| Pollution Degree Environment | 2 | | | | |
| Protection class | I with PE connected | | | | |
| Dimension (w-h-d) | 55x110x105 mm | | | | |
| Weight | 0.50 kg approx. | | | | |
| Terminal Connections | | | | | |
| | Solid (mm ²) | Stranded (mm ²) | AWG | Torque (NM) | Stripped Length: |
| Input: | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |
| Output: | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |



FLEX17024B

Input: two-phase **230 / 400 ... 500 V AC**

Output: **24 V DC 60°C**

Efficiency up to **89%**

Strong overload without switch-off, up to **50%**

Flexible power continuity: **120 to 180 W**

"Power Good" Contact

Selectable Protection Mode:

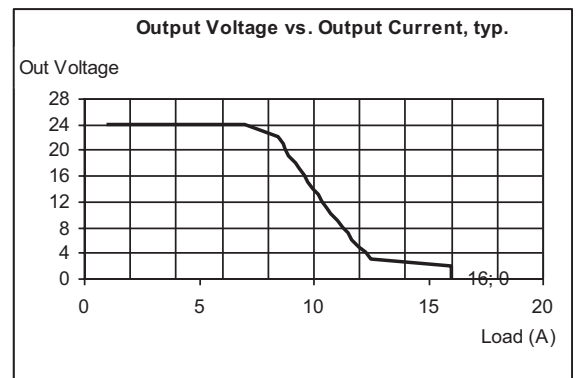
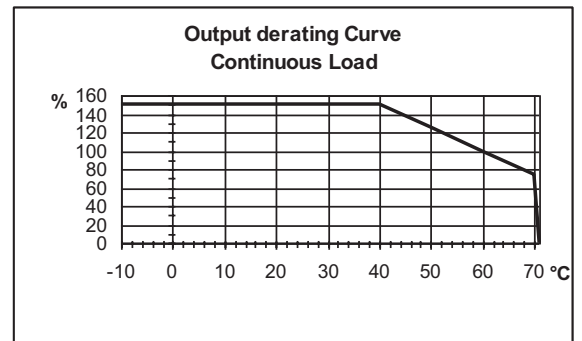
Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

Extremely small size



| | | | | |
|------------------------------------------|--------------------------------------------------|------------------------------------------------------|--------------|---------|
| Input Data | Nominal Input Voltage (2 x Vac) | 230 / 400 ... 500 Vac | | |
| | Manual select Input from 230 to 400-500 | | | |
| | Input Voltage range (Vac) | 187 – 264 (230) 330 – 550 (400-500) | | |
| | Inrush Current (Vn and In Load) I ² t | ≤ 28 A ≤ 5 msec. | | |
| | Frequency | 47 – 63 Hz ±6% | | |
| | Input Current (230/400...500 V AC) | 1.45 - 0.83 - 0.68 A | | |
| | Internal Fuse | T 4 A | | |
| | External Fuse (recommended) | 10 A (MCB curve B) | | |
| | Output Data | Output Voltage (Vn) Factory Setting ±3% | 24 Vdc | |
| | | Adjustment range (Vadj) | 22 – 27 Vdc | |
| | | Start up with Strong Load (capacitive load) | ≤50.000µF | |
| | | Turn-On delay after applying mains voltage | 1 sec. (max) | |
| Rated Current at 24 V < 40°C (In) | | 7.5 A (permanent) | | |
| Rated Current at 24 V < 50°C (In) | | 6 A (permanent) | | |
| Rated Current at 24 V < 60°C (In) | | 5 A (permanent) | | |
| Power Boost Current at 24 V 60°C(In) | | In (60°C) x 1.5 ≥ 3 min. | | |
| Current max. Overload ≈ 4Vdc (permanent) | | I _{max} = In 60°C x (1.8 - 2.2) | | |
| Current Short Circuit I _{cc} | | | | |
| Max 2 sec.: Hiccup mode | | 16A | | |
| Permanent: Continuous Mode mode | | | | |
| Hold-up Time (min. Vac) 24Vdc 5A | | Typ. 20 msec | | |
| Residual Ripple | | ≤ 80 mV _{pp} | | |
| Efficiency | | ≥ 89 % | | |
| Over temperature Protection | | Yes. Shut-down output and automatic restart. | | |
| Short-circuit protection modes | | Hiccup Mode Continuous Mode Restart After Main | | |
| Dissipation power load max (W) | | 22 | | |
| Over Load protection | Yes | | | |
| Over Voltage Output protection | Yes (typ. 35 Vdc) | | | |
| Parallel connection | Yes | | | |
| Power Good contact rating (EN60947.4.1): | | | | |
| Max. DC1: 30VDC 1S; AC1: 60 VAC 1A | Resistive load | | | |
| Min. 1mA at 5 VDC | Min. permissible load | | | |
| Climatic Data | Ambient Temperature operation | -25 up to +70 °C (>60°derating 2.5% °C) | | |
| | Ambient Temperature Storage | -40 up to +85 °C | | |
| | Humidity at 25 °C, no condensation | 95 % to 25 °C | | |
| General Data | Isolation Voltage (In / Out) | 3000 Vac | | |
| | Isolation Voltage (In / PE) | 1605 Vac | | |
| | Isolation Voltage (Out / PE) | 500 Vac | | |
| | Protection Class (EN/IEC 60529) | IP 20 | | |
| | Reliability: MTBF IEC 61709 | > 500.000 h | | |
| | Pollution Degree Environment | 2 | | |
| | Protection class | I with PE connected | | |
| | Dimension (w-h-d) | 55x110x105 mm | | |
| | Weight | 0.60 kg approx. | | |
| | Terminal Connections | Solid | Stranded | Torque |
| (mm ²) | | (mm ²) | (NM) | Length: |
| Input: 0.2-2.5 | | 0.2-2.5 | 24-14 | 0.5-0.6 |
| Output: 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |



FLEX28024B

Input: two-phase **230 / 400 ... 500 V AC**

Output: **24 V DC 60°C**

Efficiency up to **89%**

Strong overload without switch-off, up to **50%**

Flexible power continuity: **240 to 336 W**

"Power Good" Contact

Selectable Protection Mode:

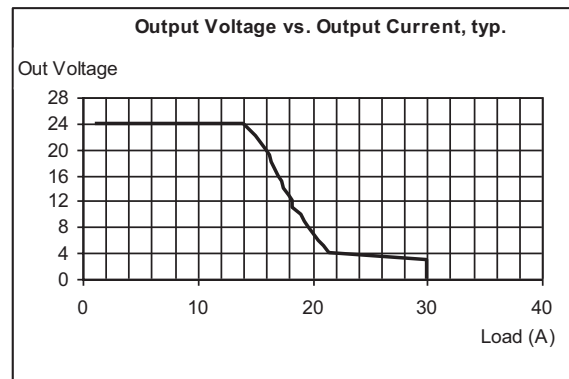
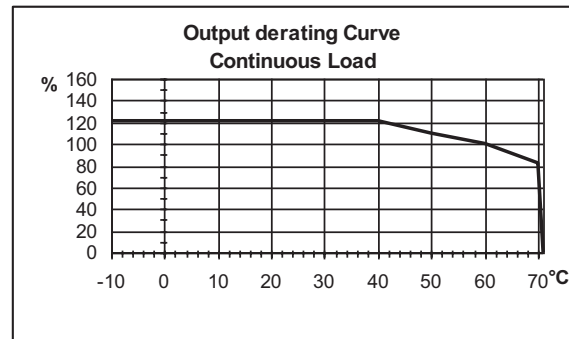
Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

Extremely small size



| Input Data | Nominal Input Voltage (2 x Vac) | 230 / 400 ... 500 Vac | | | |
|----------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|-------------|------------------|
| | Manual select Input from 230 to 400-500 | | | | |
| | Input Voltage range (Vac) | 187 – 264 (230) 330 – 550 (400-500) | | | |
| | Inrush Current (Vn and In Load) I ² t | ≤ 34 A ≤ 5 msec. | | | |
| | Frequency | 47 – 63 Hz ±6% | | | |
| | Input Current (230/400...500 V AC) | 2.49 - 1.44 - 1.15 A | | | |
| | Internal Fuse | T 4 A | | | |
| | External Fuse (recommended) | 16 A (MCB curve B) | | | |
| Output Data | Output Voltage (Vn) Factory Setting ±3% | 24 Vdc | | | |
| | Adjustment range (Vadj) | 22 – 27 Vdc | | | |
| | Start up with Strong Load (capacitive load) | ≤50.000µF | | | |
| | Turn-On delay after applying mains voltage | 1 sec. (max) | | | |
| | Rated Current at 24 V < 40°C (In) | 14 A (permanent) | | | |
| | Rated Current at 24 V < 50°C (In) | 12 A (permanent) | | | |
| | Rated Current at 24 V < 60°C (In) | 10 A (permanent) | | | |
| | Power Boost Current at 24 V 60°C(In) | In (60°C) x 1.5 ≥ 3 min. | | | |
| | Current max. Overload ≥ 4Vdc (permanent) | I _{max} = In 60°C x (1.8 - 2.2) | | | |
| | Current Short Circuit I _{cc} | | | | |
| | Max 2 sec.: Hiccup mode | 30A | | | |
| | Permanent: Continuous Mode mode | | | | |
| | Hold-up Time (min. Vac) 24Vdc 5A | Typ. 20 msec | | | |
| | Residual Ripple | ≤ 80 mV _{pp} | | | |
| | Efficiency | ≥ 89 % | | | |
| | Over temperature Protection | Yes. Shut-down output and automatic restart. | | | |
| | Short-circuit protection modes | Hiccup Mode Continuous Mode Restart After Main | | | |
| | Dissipation power load max (W) | 40 | | | |
| | Over Load protection | Yes | | | |
| | Over Voltage Output protection | Yes (typ. 35 Vdc) | | | |
| | Parallel connection | Yes | | | |
| | Power Good contact rating (EN60947.4.1): Max. DC1: 30VDC 1S; AC1: 60 VAC 1A Min. 1mA at 5 VDC | Resistive load Min. permissive load | | | |
| Climatic Data | Ambient Temperature operation | -25 up to +70 °C (>60°derating 2.5% °C) | | | |
| | Ambient Temperature Storage | -40 up to +85 °C | | | |
| | Humidity at 25 °C, no condensation | 95 % to 25 °C | | | |
| General Data | Isolation Voltage (In / Out) | 3000 Vac | | | |
| | Isolation Voltage (In / PE) | 1605 Vac | | | |
| | Isolation Voltage (Out / PE) | 500 Vac | | | |
| | Protection Class (EN/IEC 60529) | IP 20 | | | |
| | Reliability: MTBF IEC 61709 | > 500.000 h | | | |
| | Pollution Degree Environment | 2 | | | |
| | Protection class | I with PE connected | | | |
| | Dimension (w-h-d) | 72x115x135 mm | | | |
| | Weight | 0.65 kg approx. | | | |
| Terminal Connections | Solid (mm ²) | Stranded (mm ²) | AWG | Torque (NM) | Stripped Length: |
| | Input: 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |
| | Output: 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |
| | Signal: 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |



FLEX50024B

Input: three-phase **400 ... 500 V AC**
 Output: **24 V DC 60°C**
 Efficiency up to **91%**
 Strong overload without switch-off, up to **50%**
 Flexible power continuity: **480 to 600 W**
 "Power Good" Contact
 Selectable Protection Mode:

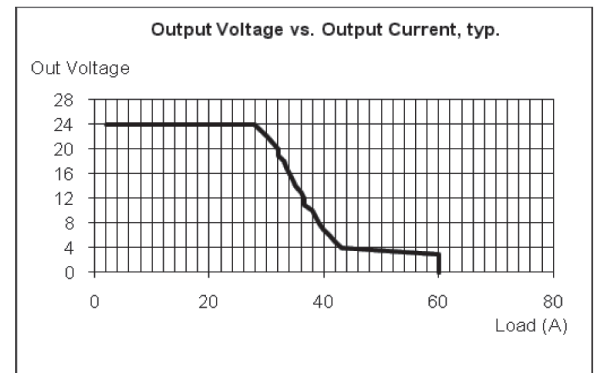
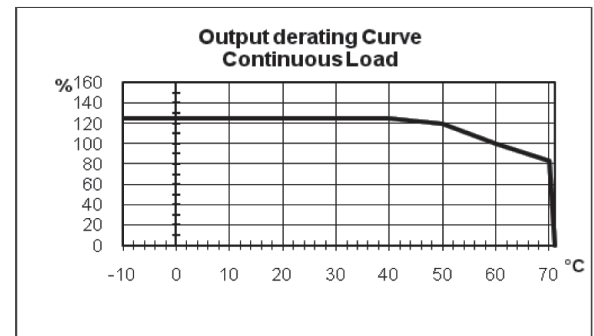
Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

Extremely small size

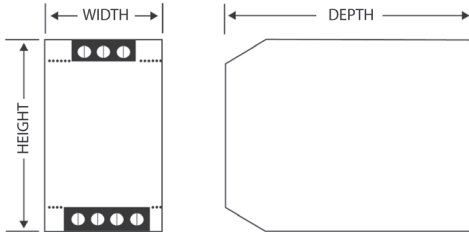


| | | | | | | |
|------------------------------------------|--------------------------------------------------|------------------------------------------------------|--------------------|----------|---------|----------|
| Input Data | Nominal Input Voltage (3 x Vac) | 400...500 Vac | | | | |
| | Input Voltage range (Vac) | 330 – 550 | | | | |
| | Inrush Current (Vn and In Load) I ² t | ≤ 35 A ≤ 5 msec. | | | | |
| | Frequency | 47 – 63 Hz ±6% | | | | |
| | Input Current (400...500 V AC) | 1.27 - 1.01 A | | | | |
| | Internal Fuse | T 6.3 A | | | | |
| | External Fuse (recommended) | 16 A (MCB curve B) | | | | |
| | Output Data | Output Voltage (Vn) Factory Setting ±3% | 24 Vdc | | | |
| | | Adjustment range (Vadj) | 22 – 27 Vdc | | | |
| | | Start up with Strong Load (capacitive load) | ≤50.000µF | | | |
| | | Turn-On delay after applying mains voltage | 1 sec. (max) | | | |
| | | Rated Current at 24 V < 40°C (In) | 25 A (permanent) | | | |
| | | Rated Current at 24 V < 50°C (In) | 22 A (permanent) | | | |
| | | Rated Current at 24 V < 60°C (In) | 20 A (permanent) | | | |
| Power Boost Current at 24 V 60°C(In) | | In (60°C) x 1.5 ≥ 3 min. | | | | |
| Current max. Overload ≥ 4Vdc (permanent) | | I _{max} = In 60°C x (1.8 - 2.2) | | | | |
| Current Short Circuit I _{cc} | | | | | | |
| | Max 2 sec.: Hiccup mode | 60A | | | | |
| | Permanent: Continuous Mode mode | | | | | |
| | Hold-up Time (min. Vac) 24Vdc 5A | Typ. 20 msec | | | | |
| | Residual Ripple | ≤ 80 mV _{pp} | | | | |
| | Efficiency | ≥ 91 % | | | | |
| | Over temperature Protection | Yes. Shut-down output and automatic restart. | | | | |
| | Short-circuit protection modes | Hiccup Mode Continuous Mode Restart After Main | | | | |
| | Dissipation power load max (W) | 54 | | | | |
| | Over Load protection | Yes | | | | |
| | Over Voltage Output protection | Yes (typ. 35 Vdc) | | | | |
| | Parallel connection | Yes | | | | |
| | Power Good contact rating (EN60947.4.1): | | | | | |
| | Max. DC1: 30VDC 1S; AC1: 60 VAC 1A | Resistive load | | | | |
| | Min. 1mA at 5 VDC | Min. permissible load | | | | |
| Climatic Data | Ambient Temperature operation | -25 up to +70 °C (>60°derating 2.5% °C) | | | | |
| | Ambient Temperature Storage | -40 up to +85 °C | | | | |
| | Humidity at 25 °C, no condensation | 95 % to 25 °C | | | | |
| General Data | Isolation Voltage (In / Out) | 3000 Vac | | | | |
| | Isolation Voltage (In / PE) | 1605 Vac | | | | |
| | Isolation Voltage (Out / PE) | 500 Vac | | | | |
| | Protection Class (EN/IEC 60529) | IP 20 | | | | |
| | Reliability: MTBF IEC 61709 | > 500.000 h | | | | |
| | Pollution Degree Environment | 2 | | | | |
| | Protection class | I with PE connected | | | | |
| | Dimension (w-h-d) | 85x120x140 mm | | | | |
| | Weight | 0.75 kg approx. | | | | |
| | Terminal Connections | | Solid | Stranded | Torque | Stripped |
| | | (mm ²) | (mm ²) | (NM) | Length: | |
| Input: | | 4.0 | 6.0 | 30-10 | 0.8-1.0 | 7 mm |
| Output: | | 4.0 | 6.0 | 30-10 | 0.8-1.0 | 7 mm |
| Signal: | | 0.2-2.5 | 0.2-2.5 | 24-14 | 0.5-0.6 | 7 mm |



Dimensions

- Dimensions are in millimeters (inches).
- Dimensions not intended for manufacturing purposes.



| FLEX | WIDTH | HEIGHT | DEPTH |
|----------------------------------------|-----------|------------|------------|
| FLEX6024A | 50 (1.97) | 120 (4.72) | 50 (1.97) |
| FLEX9024A, 17024A FLEX9024B, 17024B | 55 (2.17) | 110 (4.33) | 105 (4.13) |
| FLEX28024A & B | 72 (2.83) | 115 (4.53) | 135 (5.31) |
| FLEX50024A & B | 85 (3.35) | 120 (4.72) | 140 (5.51) |

Electrical Connection

Input - Output power connection:

| Input: | | |
|-------------------|----------------------------------|------------------|
| FLEXxxxxxA series | 1 Phase Switching Power Supplies | L, N, PE Ⓢ |
| FLEXxxxxxB series | 1Phase Switching Power Supplies | L, N, PE Ⓢ |
| FLEXxxxxxB series | 2 Phase Switching Power Supplies | L1, L2, PE Ⓢ |
| FLEX500xxB series | 3 Phase Switching Power Supplies | L1, L2, L3, PE Ⓢ |
| Output: | 24 Vdc is made via the | (+), (-). |

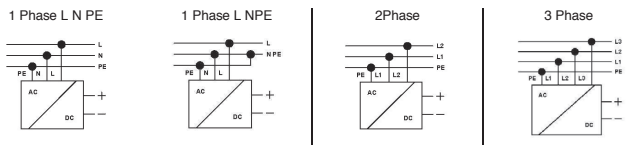
Signaling:

Red LED (DC OK) Status:

Output voltage OK: Lights up permanently
 Switch OFF, in Overload and Short Circuit conditions
 Blink, in Overload and Short Circuit conditions

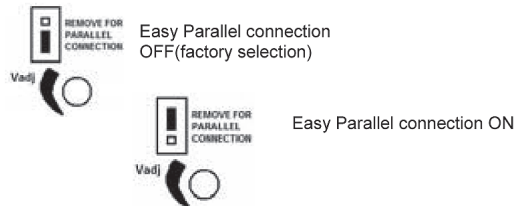
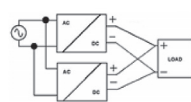
Jumper Setting

| | Hiccup Mode | Manual Reset | Continuous Mode |
|------------------------------------------------------|-------------|--------------|-----------------|
| Output voltage OK: Lights up permanently | ■ | ■ | ■ |
| Switch OFF, in Overload and Short Circuit conditions | | ■ | ■ |
| Blink, in Overload and Short Circuit conditions | ■ | | |



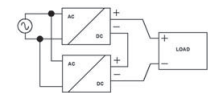
Parallel Connection, to increase Output Power:

- Made parallel connection with same model of power supply to increase the output power.
- Adjust the output approximately to the same value ($\pm 20mV$) applying 1-2 A load to all devices output before connecting them in parallel.
- Easy parallel connections Jumper. In FLEX280xxX and FLEX500xxX for more power, you must change position of the jumper to enable parallel connection. In this mode you can out in parallel up to 4 power supply

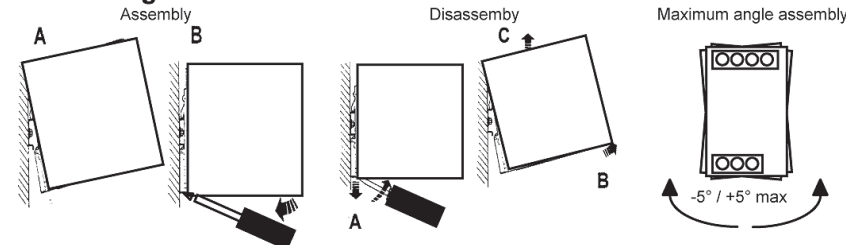


Serial Connection:

- It is possible to connect as many units in series as needed, providing the sum of the output voltage does not exceed 150Vdc.
- Voltages with a potential above 60Vdc are not SELV any more and can be dangerous. Such voltages must be installed with a protection against touching.
- For serial operation use power supplies of the same type.
- Grounding of the output is required when the sum of the output voltage is above 60Vdc.
- Keep an installation clearance of 15mm (left/right) between two power supplies and avoid installing the power supplies on top of each other. Note: Avoid return voltage (e.g. from a decelerating motor or battery) which is applied to the output terminals.



Rail Mounting:



Other models / modules must have a minimum vertical and horizontal distance of 10 cm to this power supply in order to guarantee sufficient auto convection. Depending on the ambient temperature and load of the device, the temperature of the housing can become very high!

Notes

*For Technical Information and Dimensions
please see the online catalog*

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