

DATASHEET

ADELSYSTEM

FLEX28024B

OTHER SYMBOLS:

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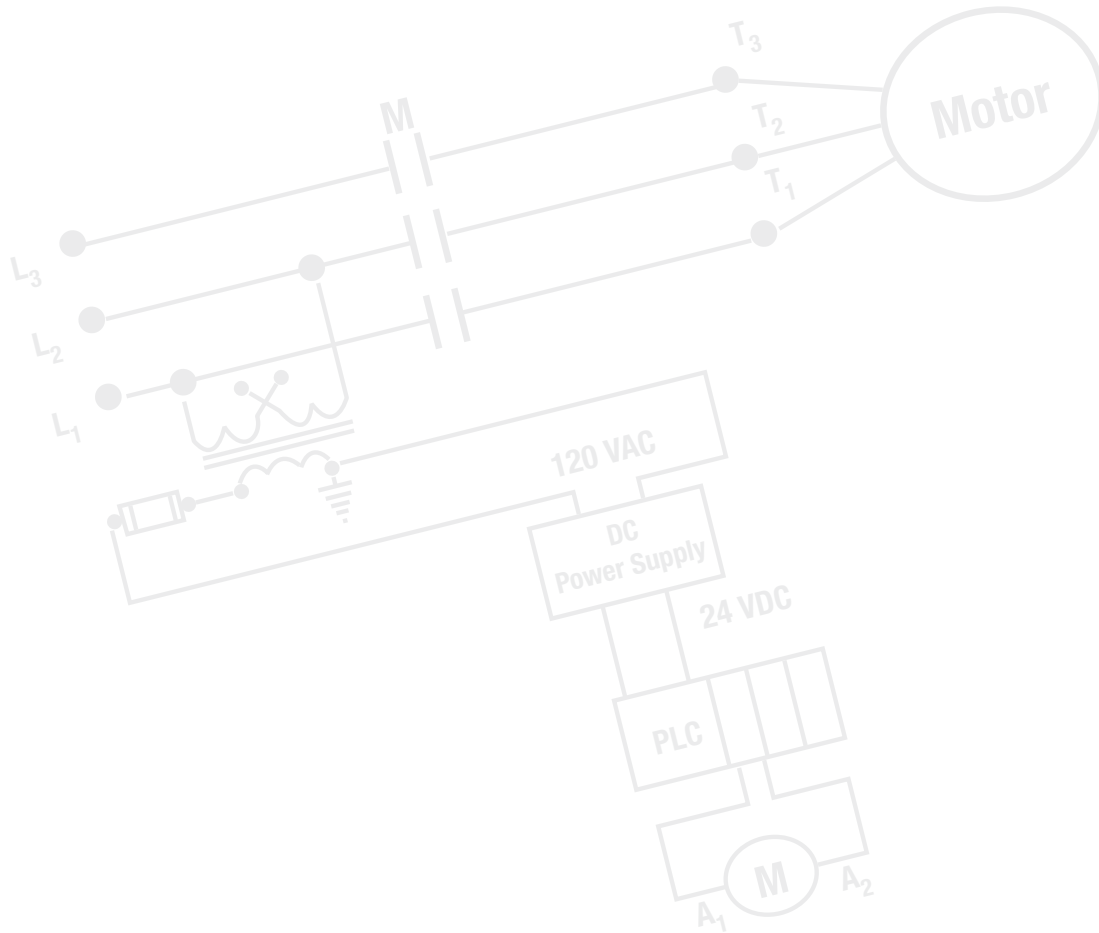
At our premises in Wrocław, we have a fully equipped servicing facility. Here we perform all the repair works and test each later sold unit. Our trained employees, equipped with a wide variety of tools and having several testing stands at their disposal, are a guarantee of the highest quality service.

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Power Supplies

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P

Power Supplies

Flexible Switching Power Supplies

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

Power Supplies

ADEL



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

Solutions for Power Supply Continuity

The new 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
- **Five year warranty**



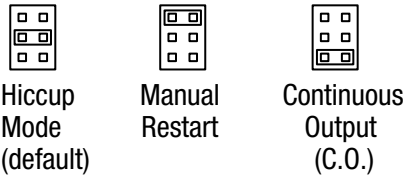
One Solution, Many Applications

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)
- Input (Input voltage)

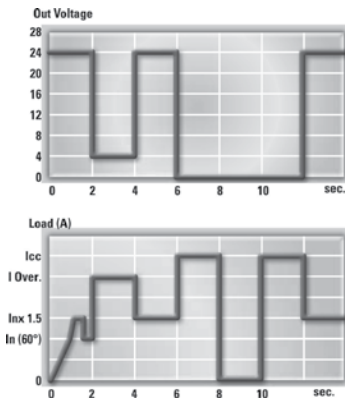


Three Modes of Protection

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

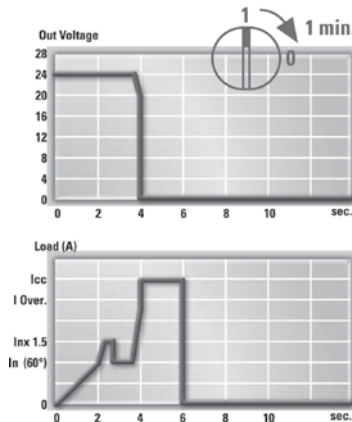
This is the default factory setting of all FLEX units. In case of short-circuit or overloading, the output current is interrupted. The device tries again to re-establish output voltage and normal condition about every 2 second till the problem is cleared.



Hiccup Mode

Manual Reset

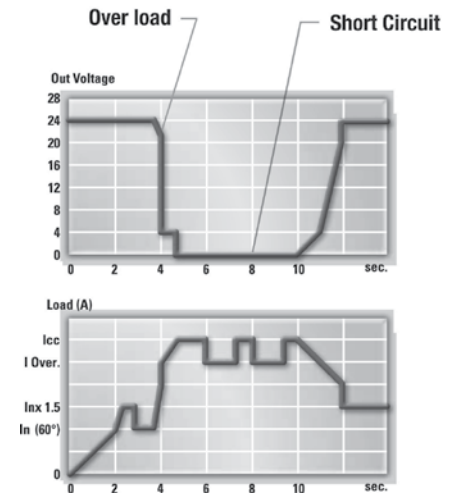
In case of short-circuit or overload, the output current is interrupted. In order to restart the output it is necessary to switch-off the input circuit for about 1 minute. This protection mode is particularly suggested in applications where safety procedures require that reset be carried out only by 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 ③	Watts	Output VDC	Output Amps @40°C	Output Amps @60°C	Power Good Contact ⑤	Catalog Number ④	Price
Single Phase								
115...230	Automatic	36...72	24	2 ①	1.5 ②	~	FLEX6024A	217
115/230	Selectable	96/120		5	4	Yes	FLEX9024A	278
115/230	Selectable	120/180		7.5	5	Yes	FLEX17024A	456
115/230	Selectable	240/336		14	10	Yes	FLEX28024A	469
115/230	Selectable	480/600		25	20	Yes	FLEX50024A	1079
Two Phase								
230/400...500	Selectable	96/120	24	5	4	Yes	FLEX9024B	305
230/400...500	Selectable	120/180		7.5	5	Yes	FLEX17024B	504
230/400...500	Selectable	240/336		14	10	Yes	FLEX28024B	542
Three Phase								
400...500	Automatic	480...600	24	25	20	Yes	FLEX50024B	760



Power Supplies
ADEL

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 contact closes any time the output voltage falls below 20 VDC.

FLEX6024A

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

Output: One output **24 V DC 50°C**

Efficiency up to **88%**

Strong overload without switch-off up

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

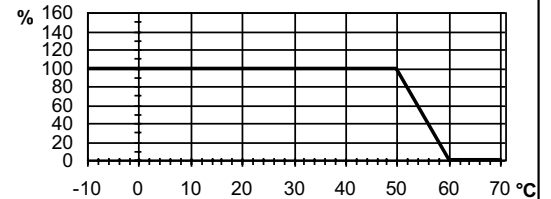
DIN Rail Mountable

Extremely small size

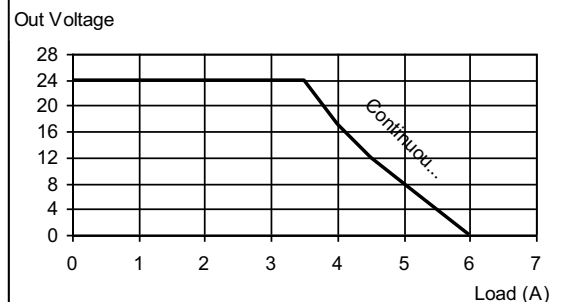


Input Data	Nominal Input Voltage (2 x Vac)	115 ... 230 Vac				
	Input Voltage range (Vac)	90 ... 264				
	Inrush Current (Vn and In Load) I ² t	≤ 7 A ≤ 5 msec.				
	Frequency	47 – 63 Hz ±6%				
	Input Current (115 – 230 Vac)	1 – 0.7 A				
	Internal Fuse	T 4 A				
	External Fuse (recommended)	6 A (MCB 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		≥ 88 %				
Over temperature Protection		Yes. Shut-down output and automatic restart.				
Short-circuit protection		Yes, Continuous Mode				
Dissipation power load max (W)		6				
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 (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

Output derating Curve
Continuous Load



Output Voltage vs. Output Current, typ.



FLEX9024A

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

Output: One output **24 V DC 60°C**

Efficiency up to **91%**

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

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

"Power Good" Contact

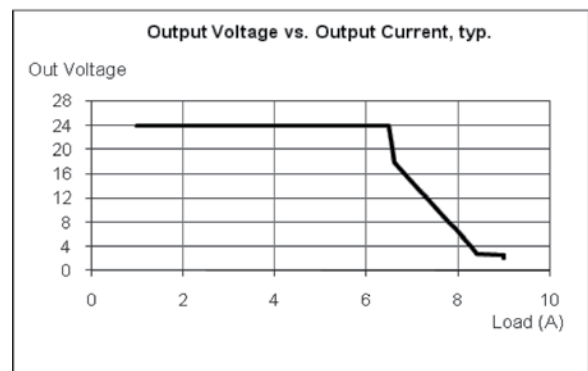
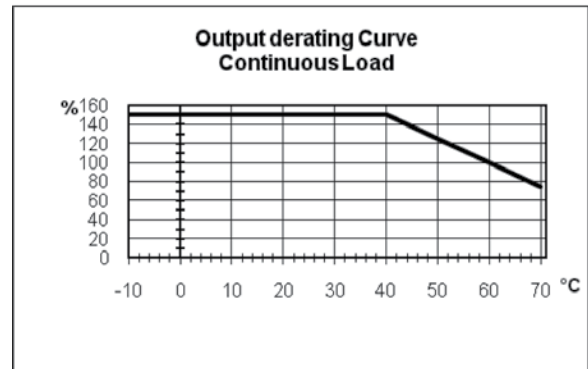
Selectable Protection Mode:

Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

Extremely small size

Input Data	Parameter	Value				
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) 180 – 264 (230)				
	Inrush Current (Vn and In Load) I ² t	≤ 11 A ≤ 5 msec.				
	Frequency	47 – 63 Hz ±6%				
	Input Current (115 – 230 Vac)	1.8 – 0.9 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 (Vadi)	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)		Imax = In 60°C x (1.8 - 2.2)				
Current Short Circuit Icc						
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		≥ 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)		11				
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
		(mm ²)	(mm ²)	AWG	(NM)	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



FLEX17024A

Input: single-phase 115 / 230 V AC

Output: 24 V DC 60°C

Efficiency up to 91%

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

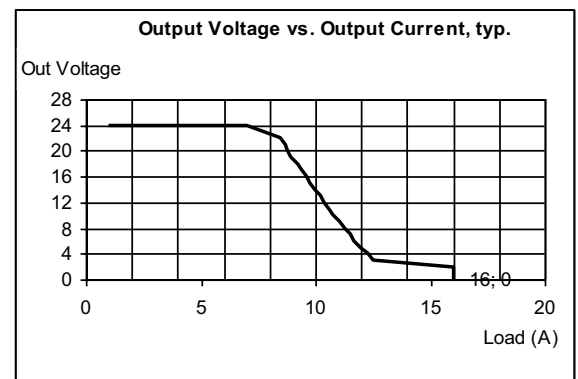
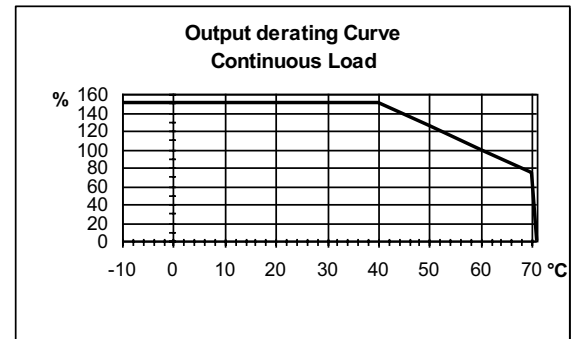


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Power Supplies

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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) 180 – 264 (230)			
	Inrush Current (Vn and In Load) I ² t	≤ 11 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)		≤50.000µF			
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		≥ 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)	17				
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		0.60 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	



FLEX28024A

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

Output: **24 V DC 60°C**

Efficiency up to **91%**

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

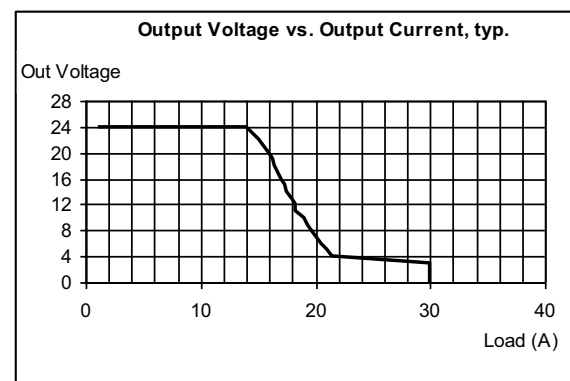
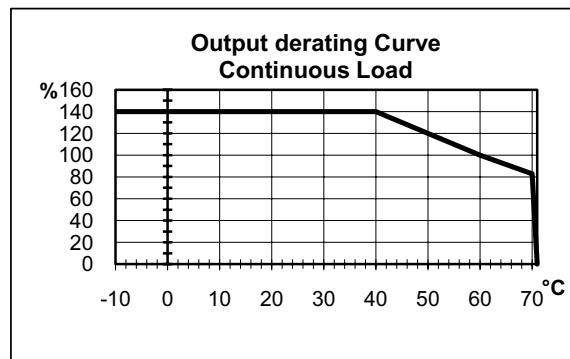


UL File E308682

Power Supplies

ADEL

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) 180 – 264 (230)			
	Inrush Current (Vn and In Load) I ² t	≤ 16 A ≤ 5 msec.			
	Frequency	47 – 63 Hz ±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 ±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	≥ 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)	28			
	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 (>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



FLEX50024A

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

Output: **24 V DC 60°C**

Efficiency up to **92%**

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

**1-PH
600W
max**

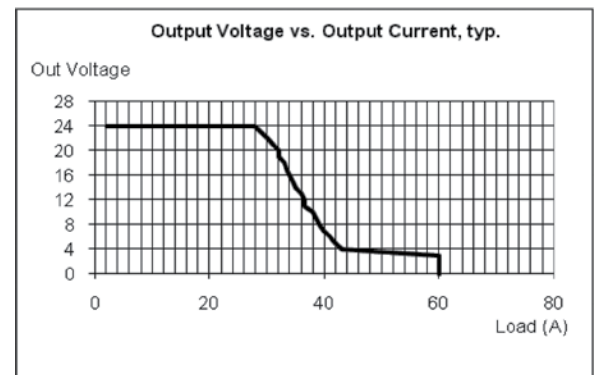
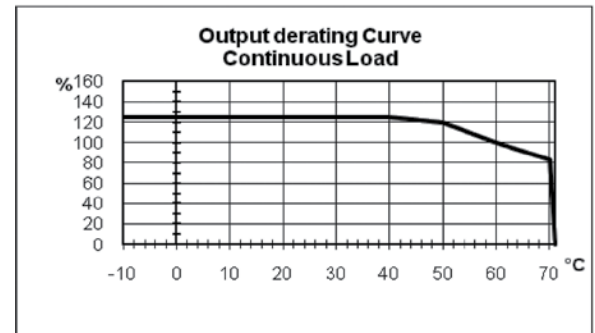


UL US LISTED
UL File E308682

CE

RoHS

Input Data	Nominal Input Voltage (2 x Vac)				
Manual select Input from 115 to 230	115 / 230 Vac				
Input Voltage range (Vac)	90 – 135 (115)	180 – 264 (230)			
Inrush Current (Vn and In Load) I ² t	≤ 16 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%				
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)	Imax = In 60°C x (1.8 - 2.2)				
Current Short Circuit Icc	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	≥ 92 %				
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, "Easy Parallel"				
Power Good contact rating (EN60947.4.1):	Max. DC1: 30VDC 1S; AC1: 60 VAC 1A Min. 1mA at 5 VDC				
	Resistive load 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 (mm ²)	Stranded (mm ²)	AWG	Torque (NM)	Stripped 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



P

Power Supplies

ADEL

FLEX9024B

Input: two-phase **230 / 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: **96 to 120 W**
 "Power Good" Contact
 Selectable Protection Mode:

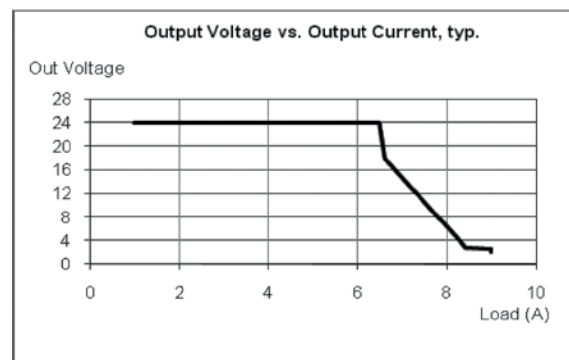
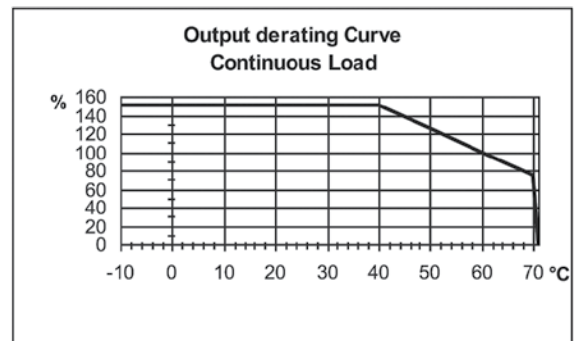
Hiccup, Continuous Mode & Restart after Main

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 – 0.5 – 0.4 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)	I _{max} = In 60°C x (1.8 - 2.2)			
	Current Short Circuit I _{cc}				
	Max 2 sec.: Hiccup mode	12A			
	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)	11			
	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 (>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 (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



UL File E308682



FLEX17024B

Input: two-phase **230 / 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: **120 to 180 W**
 "Power Good" Contact
 Selectable Protection Mode:

Hiccup, Continuous Mode & Restart after Main

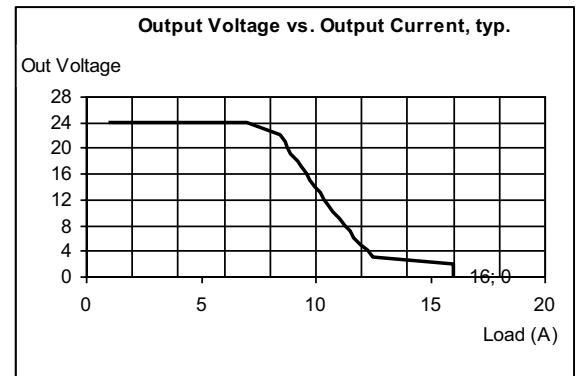
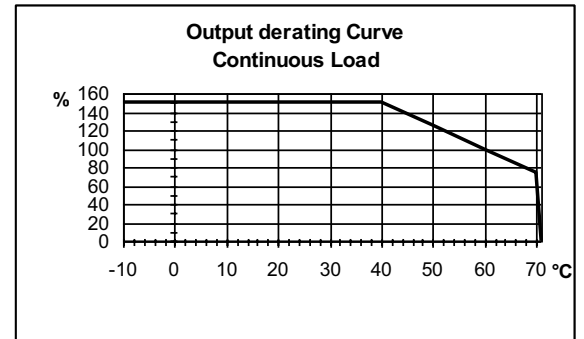
DIN Rail Mountable

Extremely small size



P
Power Supplies
ADEL

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)	1.5 – 0.8 – 0.7 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	≥ 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)	17					
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				
General Data	Humidity at 25 °C, no condensation	95 % to 25 °C				
	Isolation Voltage (In / Out)	3000 Vac				
Terminal Connections	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.				
		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	



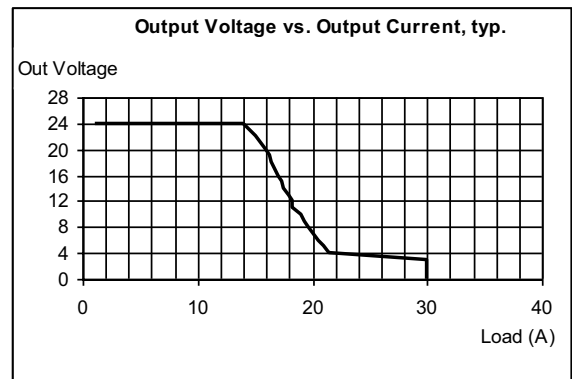
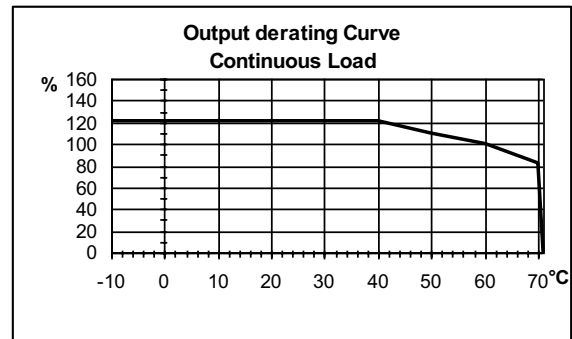
FLEX28024B

Input: two-phase **230 / 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: **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	≤ 17 A ≤ 5 msec.			
	Frequency	47 – 63 Hz ±6%			
	Input Current (230/400...500 V AC)	2.2 – 1.4 – 1.0 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 _{op}			
	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)	28			
	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)	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 **92%**

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

**3-PH
600W
max**

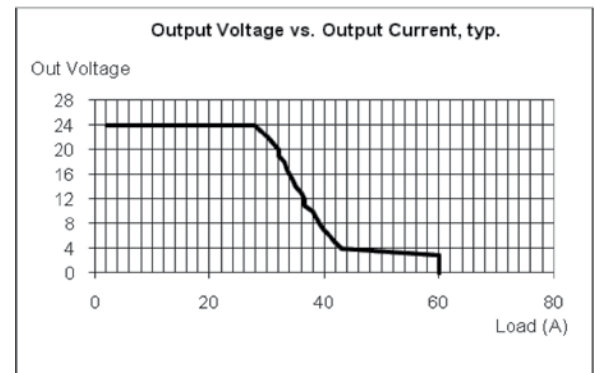
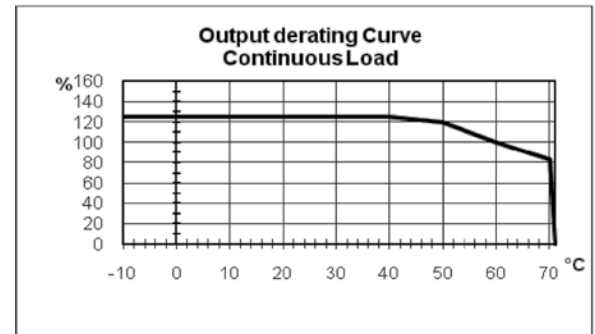


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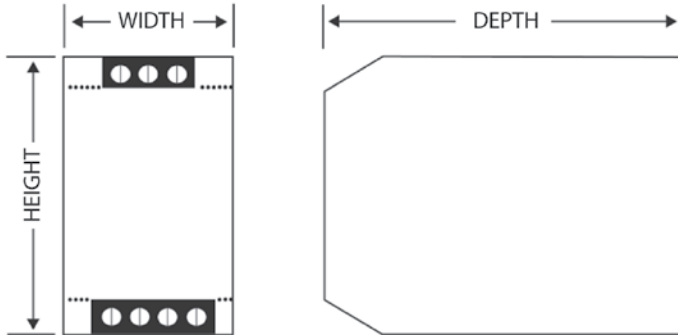
RoHS

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	≤ 17 A ≤ 5 msec.				
	Frequency	47 – 63 Hz ±6%				
	Input Current (400... 500 V AC)	0.95 – 0.85 A				
	Internal Fuse	T 6.3 A				
	External Fuse (recommended)	16 A (MCB curve B)				
	Output Voltage (Vn) Factory Setting ±3%	24 Vdc				
	Adjustment range (Vadj)	22 – 27 Vdc				
	Start up with Strong Load (capacitive load)	≤50.000µF				
Output Data	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	≥ 92 %					
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)	28					
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. 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 (mm ²)	Stranded (mm ²)	AWG	Torque (NM)
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.

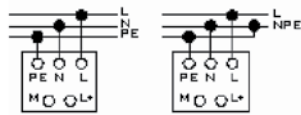


FLEX	WIDTH	HEIGHT	DEPTH
FLEX6024A	50 (1.97)	120 (4.72)	50 (1.97)
FLEX9024A, 17024A FLEX9024B, 17024B	55 (2.17)	110 (4.33)	105 (4.13)
FLEX28024A & B	72 (2.83)	115 (4.53)	135 (5.31)
FLEX50024A & B	85 (3.35)	120 (4.72)	140 (5.51)

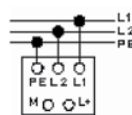
Electrical Connection

Connection:

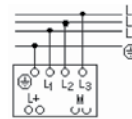
1 Phase Models



2 Phase Models

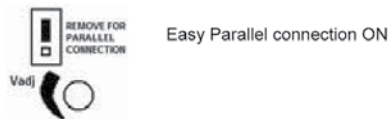
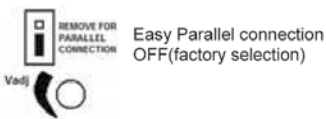
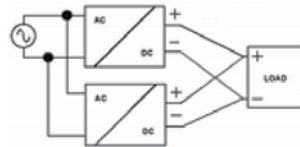


3 Phase Models



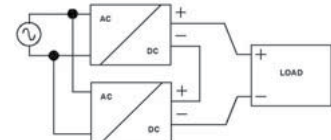
Parallel Connection, to Increase Output Power:

- 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 put in parallel up to 4 power supply

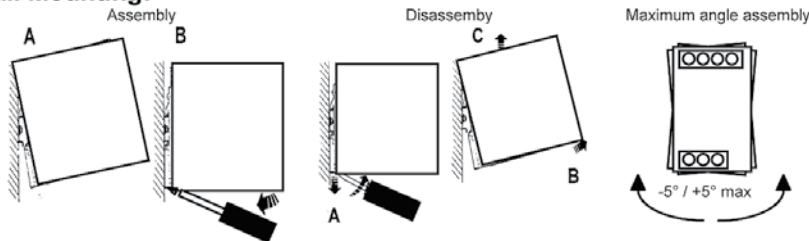


Serial Connection:

- 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!