

Series FLEX Power Supplies	P2
<i>Technical Information & Dimensions (Online)</i>	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



Hiccup
Mode
(default)



Manual
Restart



Continuous
Output
(C.O.)

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

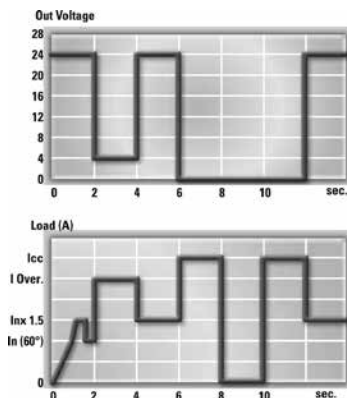


Three Modes of Protection

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

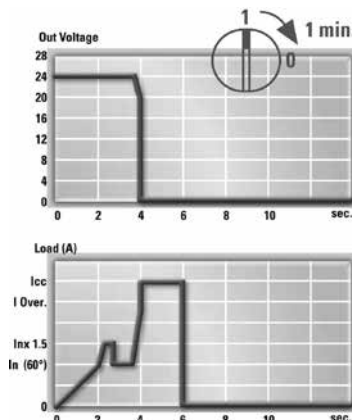
This is the default factory setting of all FLEX units. In case of short-circuit or overloading, the output current is interrupted. The device tries again to re-establish output voltage and normal condition about every 2 seconds until the problem is cleared.



Hiccup Mode

Manual Reset

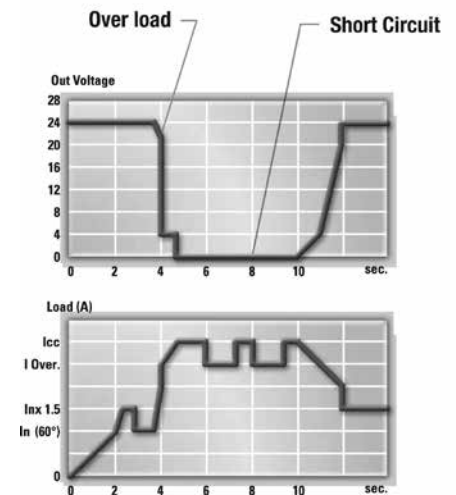
In case of short-circuit or overload, the output current is interrupted. In order to restart the output it is necessary to switch-off the input circuit for about 1 minute. This protection mode is particularly suggested in applications where safety procedures require that reset be carried out only by 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 @40°C @60°C		Power Good Contact ⑤	Catalog Number ④	Price
Single Phase								
115...230	Automatic	36...72	24	2 ①	1.5 ②	~	FLEX6024A	172.06
115/230	Selectable ③	96/120		5	4	Yes	FLEX9024A	220.78
115/230	Selectable ③	120/180		7.5	5	Yes	FLEX17024A	362.78
115/230	Selectable ③	240/336		14	10	Yes	FLEX28024A	373.14
115/230	Bridge only ⑥	480/600		25	20	Yes	FLEX50024A	857.19
Two Phase								
230/400...500	Selectable ③	96/120	24	5	4	Yes	FLEX9024B	242.55
230/400...500	Selectable ③	120/180		7.5	5	Yes	FLEX17024B	400.09
230/400...500	Selectable ③	240/336		14	10	Yes	FLEX28024B	431.19
Three Phase								
400...500	Automatic	480...600	24	25	20	Yes	FLEX50024B	604.29



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**

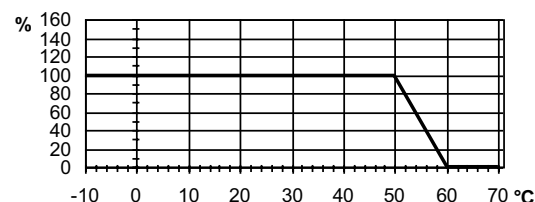
DIN Rail Mountable

Extremely small size

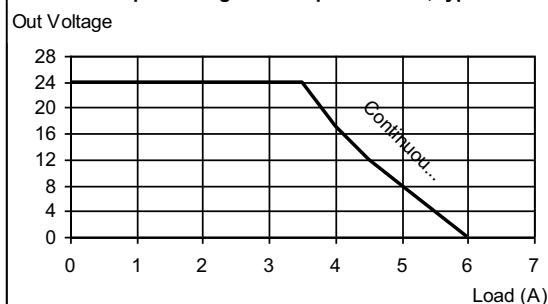
Input Data	Nominal Input Voltage (2 x Vac)	115 ... 230 Vac				
	Input Voltage range (Vac)	90 ... 264				
	Inrush Current (Vn and In Load) I ² t	≤ 19 A ≤ 5 msec.				
	Frequency	47 – 63 Hz ±6%				
	Input Current (115 – 230 Vac)	1 – 0.7 A				
	Internal Fuse	T 4 A				
	External Fuse (recommended)	6 A (MCB 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} = I _n 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	Stripped
		(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



**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 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

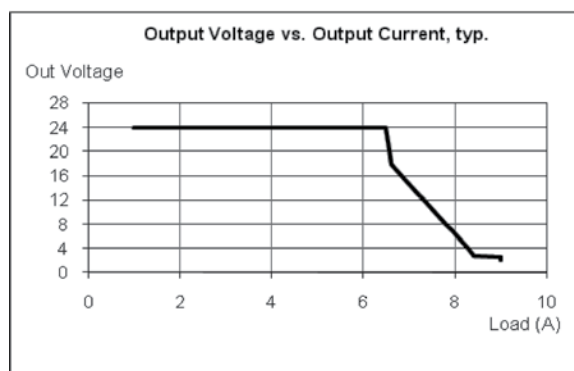
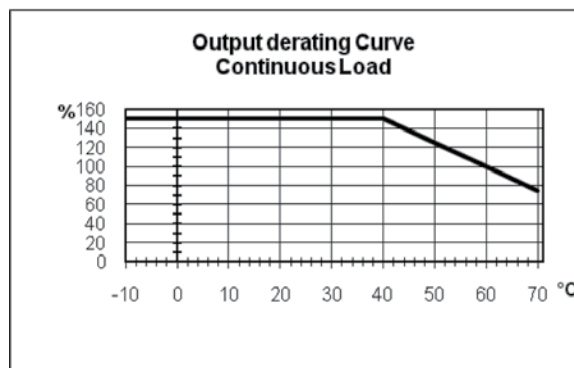


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UL File E308682



RoHS

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	$\leq 36 \text{ A} \leq 5 \text{ msec.}$				
	Frequency	47 – 63 Hz $\pm 6\%$				
	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 $\pm 3\%$	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)				
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 $\geq 3 \text{ min.}$				
Current max. Overload $\cong 4\text{Vdc}$ (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		$\leq 80 \text{ mVpp}$				
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)		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 ($>60^\circ\text{derating } 2.5\% \text{ } ^\circ\text{C}$)				
	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				
	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)	55x110x105 mm				
	Weight	0.50 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	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 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

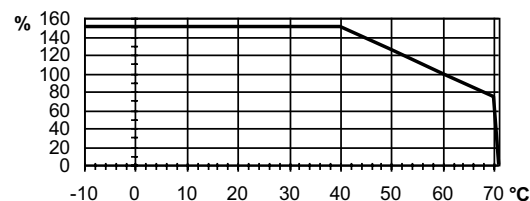
DIN Rail Mountable

Extremely small size

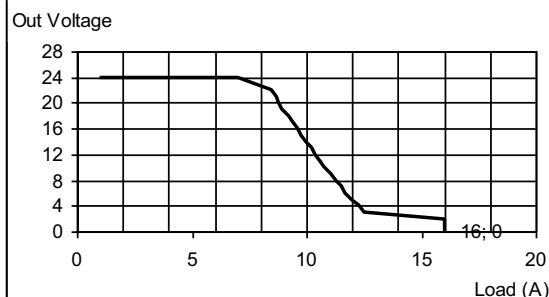
Input Data	Nominal Input Voltage (2 x Vac)			115 / 230 Vac	
	Manual select Input from 115 to 230				
	Input Voltage range (Vac)			90 – 135 (115)	170 – 264 (230)
	Inrush Current (Vn and In Load) I ² t			≤ 36 A ≤ 5 msec.	
	Frequency			47 – 63 Hz ±6%	
	Input Current (115 – 230 Vac)			2.8 – 1.3 A	
	Internal 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)			≤50.000µF	
	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. 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	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



UL File E308682

Output derating Curve
Continuous Load

Output Voltage vs. Output Current, typ.



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:

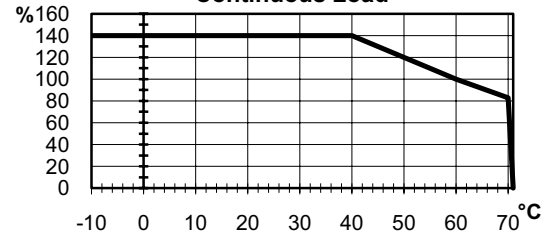
Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

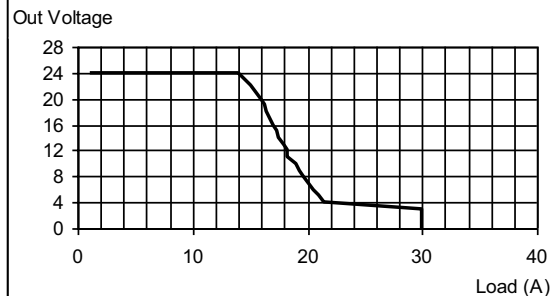
Extremely small size



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)	$I_{\text{max}} = I_{\text{In } 60^\circ\text{C}} \times (1.8 - 2.2)$				
	Current Short Circuit Icc	30A				
	Max 2 sec.: Hiccup mode					
	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. permissive 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)	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

Output derating Curve
Continuous Load

Output Voltage vs. Output Current, typ.



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) $I_{\Delta t}^2$	$\leq 80 \text{ A} \leq 5 \text{ msec.}$				
	Frequency	47 – 63 Hz $\pm 6\%$				
	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 $\pm 3\%$	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)	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 $\geq 3 \text{ min.}$				
	Current max. Overload $\cong 4\text{Vdc}$ (permanent)	$I_{\text{max}} = I_n 60^\circ\text{C} \times (1.8 - 2.2)$				
	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	$\leq 80 \text{ mVpp}$				
	Efficiency	$\geq 90 \%$				
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 ($> 60^\circ\text{C}$ 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)	85x120x140 mm				
	Weight	0.75 kg approx.				
Terminal Connections		Solid (mm ²)	Stranded (mm ²)	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

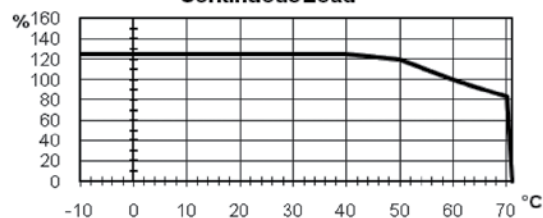
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UL File E308682

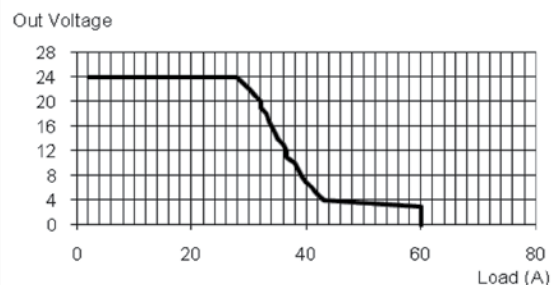


RoHS

Output derating Curve
Continuous Load



Output Voltage vs. Output Current, typ.



P

FLEX Power Supplies

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

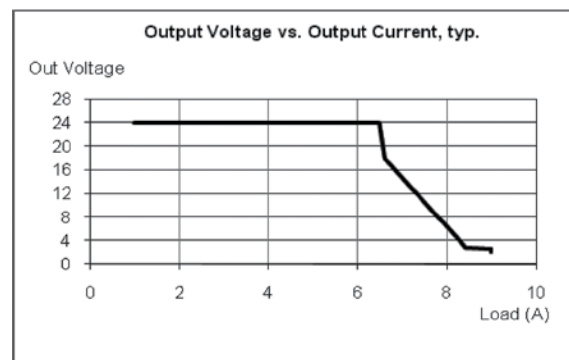
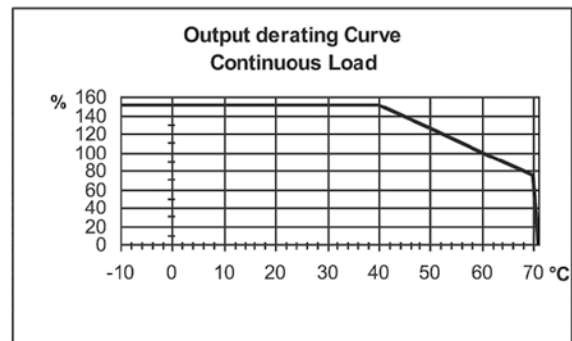


UL US LISTED
UL File E308682



RoHS

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^2t	$\leq 17 \text{ A} \leq 5 \text{ msec.}$
	Frequency	47 – 63 Hz $\pm 6\%$
	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 $\pm 3\%$	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)	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 $\geq 3 \text{ min.}$
	Current max. Overload $\cong 4 \text{ Vdc}$ (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	$\leq 80 \text{ mVpp}$
	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)	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 Min. 1mA at 5 VDC	Resistive load Min. permissive 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
	Isolation Voltage (In / Out)	3000 Vac
General Data	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)	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
	Output: 0.2-2.5	0.2-2.5



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:

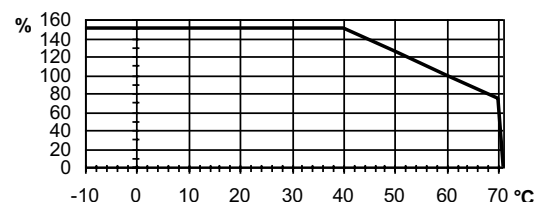
Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

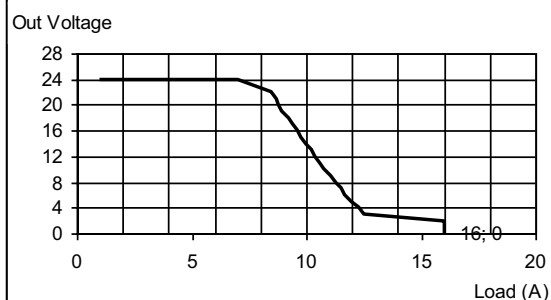
Extremely small size



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) I²t	≤ 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 (mm²)	Stranded (mm²)	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

Output derating Curve
Continuous Load

Output Voltage vs. Output Current, typ.



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:

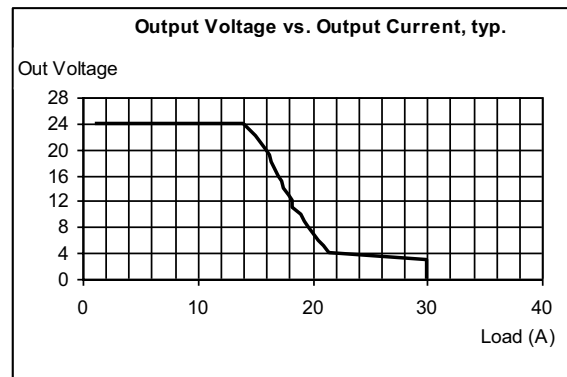
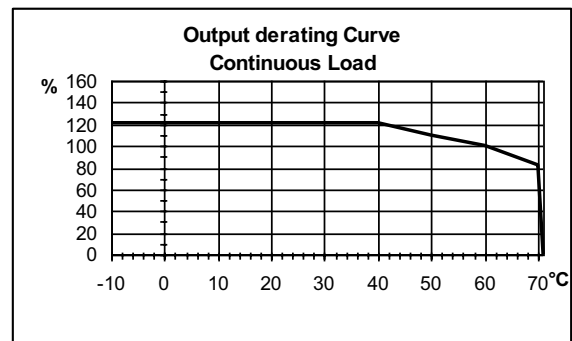
Hiccup, Continuous Mode & Restart after Main

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) I²t			≤ 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 Icc				
	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. 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	Stranded	Torque	Stripped
		(mm²)	(mm²)	(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
	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

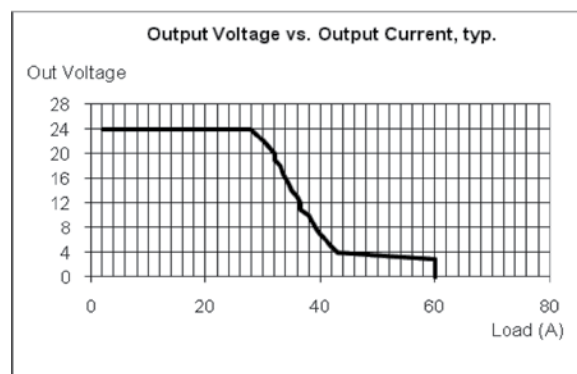
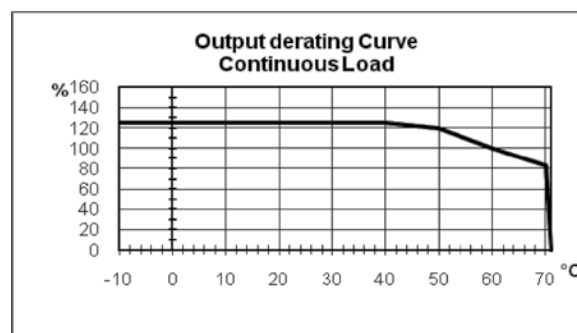
Selectable Protection Mode:

Hiccup, Continuous Mode & Restart after Main

DIN Rail Mountable

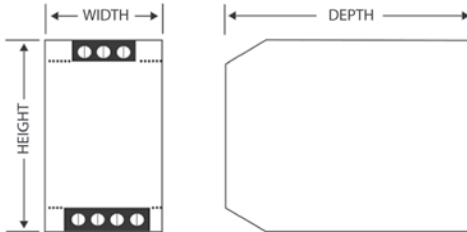
Extremely small size

Input Data	Nominal Input Voltage (3 x Vac)	400...500 Vac			
	Input Voltage range (Vac)	330 – 550			
	Inrush Current (Vn and In Load) I _{ti}	≤ 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. permissive load			
	Min. 1mA at 5 VDC				
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			
	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			
Terminal Connections	Weight	0.75 kg approx.			
		Solid	Stranded	Torque	Stripped
		(mm ²)	(mm ²)	AWG	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.



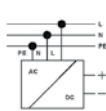
FLEX	WIDTH	HEIGHT	DEPTH
FLEX6024A	50 (1.97)	120 (4.72)	50 (1.97)
FLEX9024A, 17024A FLEX9024B, 17024B	55 (2.17)	110 (4.33)	105 (4.13)
FLEX28024A & B	72 (2.83)	115 (4.53)	135 (5.31)
FLEX50024A & B	85 (3.35)	120 (4.72)	140 (5.51)

Electrical Connection

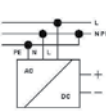
Input - Output power connection:

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	(+), (-).

1 Phase L N PE



1 Phase L N PE



2Phase



3 Phase



Signaling:

Red LED (DC OK) Status:

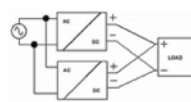
Output voltage OK: Lights up permanently
Switch OFF, in Overload and Short Circuit conditions
Blink, in Overload and Short Circuit conditions

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 ($\pm 20\text{mV}$) 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



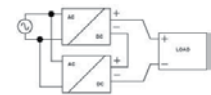
Easy Parallel connection
OFF(factory selection)



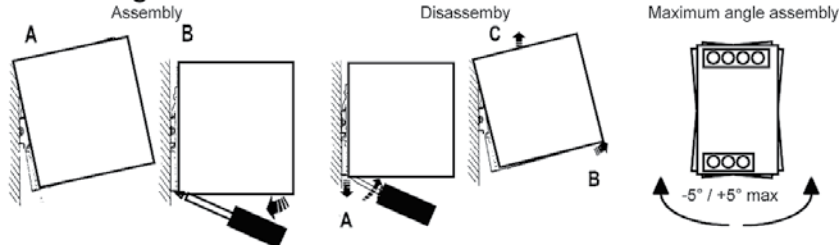
Easy Parallel connection ON

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!