

Flex

ENG / 05.2013

One solution, many applications



A new way to make and use Power Supplies

The FLEX technology is the result of these corner stones of our corporate identity.

Designed taking into account the pressure to optimal use of space, FLEX units are very compact in size.

The wide input voltage range allows to have just one article for many applications and minimize stock.

FLEX is based on semi-resonant switching circuit which allows efficiency up to 93% and a very dynamic and robust power supply to a wide range of loads such as PLC, sensors, motors, resistive/ inductive loads, etc.

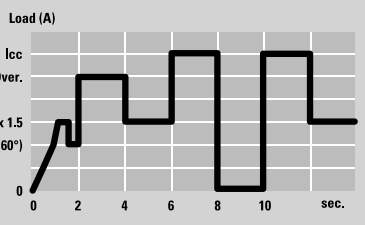
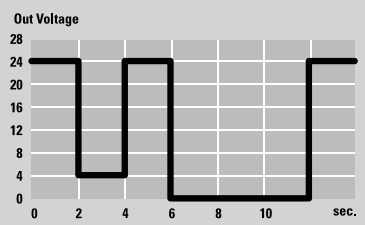
The FLEX range conforms with the highest quality standards and guarantees a reliable and durable operation with a MTBF up to 500.000 hours and 3 year warrantee.

three
modes for output
protection

Three modes for output protection.

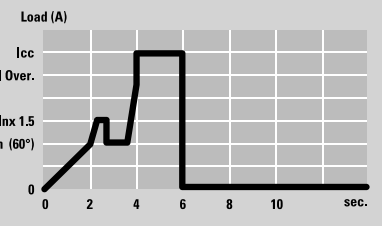
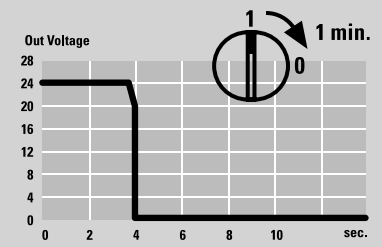
Hiccup Mode Automatic Restart

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.



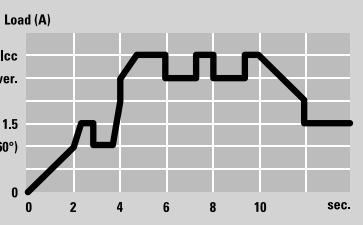
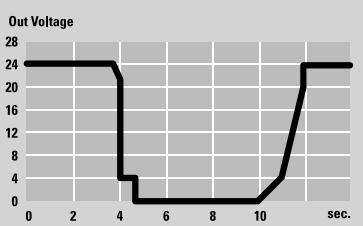
Manual reset manual Restart by Operator

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.



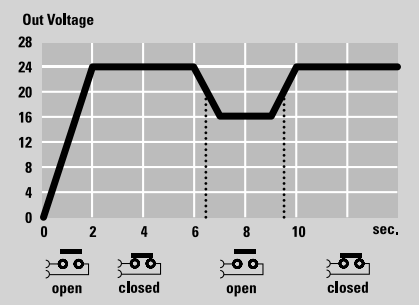
“Continuous Output mode”

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.



“Power Good” relay for monitoring the output voltage level

Output voltage is continuously monitored. The units 24 Vdc output FLEX170, FLEX280 and FLEX500 are equipped with Power Good relay. The NO contact triggers any time the output voltage level goes below 20Vdc (24 Vdc output). This feature is particularly useful in redundant applications.



Applications in compliance with the norm EN 60204-1

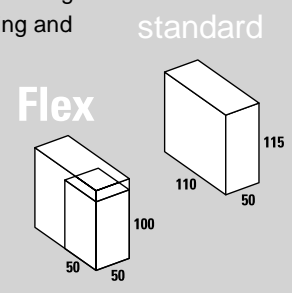
FLEX units comply with the norm requirement that an overload of 50% over the nominal current be withstand by the power supply for at least 1 hour to allow the tripping of magneto-thermic switches on the output. These features allows the implementation of “Control of commands and Emergency stops” by means of industrial PCs, PLC, remote I/O, etc. required by the norm. Adelsystem supplies a table for the sizing and length of connecting cables and the choice of proper magneto-thermic switches.

Output circuits protected by magneto-thermic circuit breakers

Standard output circuit breakers can be triggered quickly and reliably with FLEX technology, which allows three times the nominal current at 60°C. Defective current paths are selectively disconnected, the defect is limited and the important parts of the system remain in operation. This together with the 50% overload capacity in compliance with EN60204-1 allows to safely manage any overload and short circuit condition.

Reduced dimensions and snap-on DIN rail bracket

The higher performances obtained with the FLEX! line, allow almost half dimensions as conventional technology and higher performances. An example is Flex6024A 60W with maximum current till 6A. In permanent duty at 40°C it can deliver 3A at 24Vdc. All FLEX units feature the new DIN rail mounting bracket, easy to use and safe against heavy loading and vibrations.



More exibility in input voltage

The power supplies FLEX90, FLEX170 and FLEX280 B are suitable to a wide range of input voltage. With a single type it is therefore possible to meet the requirements of more applications and consequently improve design activity and stock management.

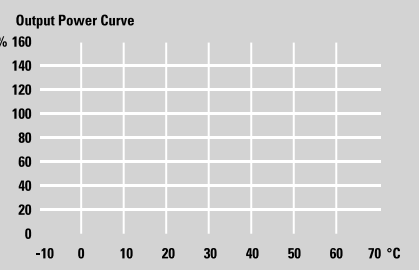


More power: “Power Boost”

As an example, Flex17024A is a 24Vdc power supply that features a continuous duty current of 5A at 60°C and a Power Boost of 150%, equivalent to 7,5A, for at least 3 min. This features allows the use of a smaller size unit to power demanding loads such as motors, solenoid valves, lamps and other loads with transient overload behavior which would otherwise require an oversize power supply.

As an example, Flex17024A can be the right solution for two design cases in very different temperature conditions:
1) 7.5A, 24Vdc in continuous duty at 40°C.
2) 5A, 24Vdc in continuous duty at 60°C +Power Boost 7,5A for at least 3 min.

7.5A
at 40°C
5A
at 60°C
+ PowerBoost
7.5A for 3 min.



Jumper settings



Flex Flex

LOAD

		5 Vdc		12 Vdc		48 Vdc		24 Vdc		24 Vdc		24 Vdc		24 Vdc		24 Vdc		
	Input (Volt)	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac	230 - 400 - 500 Vac	230 - 400 - 500 Vac	230 - 400 - 500 Vac	400 - 500 Vac	
	Output (Vdc - W)	5 Vdc 35 W	12 Vdc 36 - 72 W	12 Vdc 120 - 180 W	12 Vdc 280 - 336 W	48 Vdc 120 - 180 W	48 Vdc 240 - 345 W	48 Vdc 480 - 600 W	24 Vdc 40 - 70 W	24 Vdc 95 - 120 W	24 Vdc 120 - 180 W	24 Vdc 240 - 330 W	24 Vdc 480 - 600 W	24 Vdc 95 - 120 W	24 Vdc 120 - 180 W	24 Vdc 240 - 330 W	24 Vdc 480 - 600 W	
	Model	FLEX6005A	FLEX6012A	FLEX17012A	FLEX28012A	FLEX17048A	FLEX28048A	FLEX50048A	FLEX6024A	FLEX9024A	FLEX17024A	FLEX28024A	FLEX50024A	FLEX9024B	FLEX17024B	FLEX28024B	FLEX50024B	
INPUT DATA	Nominal Input Voltage	115 - 230 Vac	115 - 230 Vac	115 - 230 Vac Input*	115 - 230 Vac Input*	115 - 230 Vac Input*	115 - 230 Vac Input*	115 - 230 Vac Input*	115 - 230 Vac	115 - 230 Vac*	115 - 230 Vac*	115 - 230 Vac*	115 - 230 Vac*	230 - 400 - 500 Vac*	230 - 400 - 500 Vac*	230 - 400 - 500 Vac*	400 - 500Vac	
	Input Voltage Range	90 - 264	90 - 264 Vac	90 - 135 Vac 180 - 264 Vac	90 - 135 Vac 180 - 264 Vac	90 - 135 Vac 180 - 264 Vac	90 - 135 Vac 180 - 264 Vac	90 - 135 Vac 180 - 264 Vac	90 - 264 Vac	90 - 135 Vac 180 - 264 Vac	90 - 135 Vac 180 - 264 Vac	90 - 135 Vac 180 - 264 Vac	90 - 135 Vac 180 - 264 Vac	187 - 264 Vac 330 - 550 Vac	187 - 264 Vac 330 - 550 Vac	187 - 264 Vac 330 - 550 Vac	330 - 550Vac	
	Inrush Current (Vn and In Load) I2t	7 A 5 msec.	11 A 5msec	16 A 5msec	16 A 5msec	11 A 5msec	16 A 5msec	16 A 5msec	7 A 5msec	11 A 5msec	11 A 5msec	16 A 5msec	16 A 5msec	17 A 5msec	17 A 5msec	17 A 5msec	17 A 5msec	
	Frequency	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	
	Input Current	0.5 - 0.25 A	1 - 0.7 A	2.8 - 1.3 A	3.3 - 2.2 A	2.8 - 1.3 A	3.3 - 2.2 A	8.5 - 4.2 A	1.0 - 0.7A	1.8 - 0.9A	2.8 - 1.3A	3.3 - 2.2A	8.5 - 4.2 A	1.0 - 0.5 - 0.4A	1.5 - 0.8 - 0.7 A	2.2 - 1.4 - 1.0A	1.7A	
	Internal Fuse	4.0 A	4.0 A	4.0 A	6.3 A	4.0 A	6.3 A	10.0 A	4A	4A	4A	6.3A	10A	4A	4A	4A	6.3A	
	External Fuse (recommended)	6 A (MCB curve B)	6.0 A	10.0 A	16.0 A	10.0 A	16.0 A	16.0 A	6A	10A	10A	16A	16A	10A	10A	16 A	16A	
	OUTPUTS DATA	Output Voltage Factory Setting ±3%	5 Vdc	12 Vdc	12 Vdc	12 Vdc	48 Vdc	48 Vdc	48 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Adjustment range (Vadj)		4.75 - 5.25 Vdc	10 - 15.5Vdc	10 - 14 Vdc	10 - 14 Vdc	41 - 55 Vdc	41 - 55 Vdc	41 - 55 Vdc	22 - 27 Vdc	22 - 27 Vdc	22 - 27 Vdc	22 - 27 Vdc	22 - 27 Vdc	22 - 27 Vdc	22 - 27 Vdc	22 - 27 Vdc	22 - 27 Vdc	
Start up with capacitive load		50.000 mF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	50.000 µF	
Turn-On delay after applying mains voltage		1 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	1.5 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	1 sec. (max)	
Continuous Current at 24 V < 40°C (In)		5.0 A	4 A (115) 6A (230)	14 A	16 A	3.75 A	7.0 A	12.0 A	2.0A (115) 3.0 A (230)	5.0A	7.5A	14A	25 A	5.0 A	7.5 A	14 A	25 A	
Continuous Current at 24 V < 50°C (In)		5.0 A	3 A (115) 5A (230)	12 A	15 A	3.0 A	6.0 A	11.0 A	1.5A (115) 2.5A (230)	4.5A	6.0A	12A	22 A	4.5 A	6.0 A	12 A	22 A	
Continuous Current at 24 V < 60°C (In)		5.0 A	2 A (115) 3A (230)	10 A	14 A	2.5 A	5.0 A	10.0 A	-	4.0A	5.0A	10A	20 A	4.0 A	5.0 A	10 A	20 A	
Power Boost Current (at 24Vdc 60°C ≥ 3min.)		5.0 A	4 A (115) 6A (230)	14 A	16 A	3.75 A	7.0 A	12.0 A	3.5A	5.0A	7.5A	14A	25 A	5.0 A	7.5 A	14 A	25 A	
Short circuit current (Icc)									7.0A	12A	16A	30A	60 A	12 A	16 A	30 A	60 A	
Hold-up Time (min. Vac) 24Vdc		Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	Typ. 20 msec	
Residual Ripple		80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	80 mV _{pp}	
Efficiency (50% of In)		82 %	88 %	91 %	92 %	91 %	91 %	92 %	88%	91%	91%	91%	92%	91%	91%	91%	92%	
Over temperature Protection		Shut-down output and automatic restart																
Short-circuit protection		Continuous Mode				1° Hiccup Mode ; 2° Continuous Mode ; 3° Manual Reset				Continuous Mode				1° Hiccup Mode; 2° Continuous Mode; 3° Restart After Main				
Dissipation power load max (W)	7	7	7	7	7	28	54	6	11	17	17	17	17	17	17	17	17	
Over Load protection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Over voltage output protection (Internal)	Yes (typ. 15 V)	Yes (typ. 35 V)	Yes (typ. 35 V)	Yes (typ. 35 V)	Yes (typ. 72 Vdc)	Yes (typ. 72 Vdc)	Yes (typ. 72 Vdc)	Yes (typ. 35 Vdc)	Yes (typ. 35 Vdc)	Yes (typ. 35 Vdc)	Yes (typ. 35 Vdc)	Yes (typ. 35 Vdc)	Yes (typ. 35 Vdc)	Yes (typ. 35 Vdc)	Yes (typ. 35 Vdc)	Yes (typ. 35 Vdc)		
Parallel connection	✓	✓	✓	Easy parallel	✓	Easy parallel	Easy parallel	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Relay power good	✗	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓		
CLIMATIC DATA	Ambient Temperature operation	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	-25 - +70 °C	
	De rating T* > (In)	>60° 2.5% °C	>60° 2.5% °C	>60° 2.5% °C	>60° 2.5% °C	>60° 2.5% °C	>60° 2.5% °C	>60° 2.5% °C	> 50° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	
	Ambient Temperature Storage	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C	-40 - +85 °C
	Humidity at 25 °C	95 % to 25 °C	95 % to 25 °C	95 % to 25 °C	95 % to 25 °C	95 % to 25 °C	95 % to 25 °C	95 % to 25 °C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	
GENERAL DATA	Isolation Voltage (IN / OUT)	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000 Vac	3000 Vac	3000 Vac	3000 Vac	3000 Vac	3000 Vac	3000 Vac	3000 Vac	3000 Vac	
	Isolation Voltage(IN / PE)	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	1605 Vac	
	Isolation Voltage(OUT / PE)	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	500 Vac	
	Reliability (MTBF IEC 61709)	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h
	Pollution Degree Environment	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
	Connection Terminal Blocks Screw Type	2,5 mm	2,5 mm	2,5 mm	2,5 mm	2,5 mm	2,5 mm	4 mm	2,5 mm	2,5 mm	2,5 mm	2,5 mm	4 mm	2,5 mm	2,5 mm	2,5 mm	4 mm	
	Dimension (w-h-d) mm	50x120x50	50x120x50	55x110x105	72x115x135	55x110x105	72x115x135	85x120x140	50x120x50	55x110x105	55x110x105	72x115x135	85x120x140	55x110x105	55x110x105	72x115x135	85x120x140	
	Weight	0.30 kg approx	0.30 kg approx	0.6 kg approx	0.77 kg approx	0.60 kg approx	0.77 kg approx	1.1 kg approx	0.30 kg approx	0.50 kg approx	0.60 kg approx	0.72 kg approx	1.1 kg approx	0.50 kg approx	0.60 kg approx	0.72 kg approx	1.0 kg approx	
	Safety Standard Approval	CE	CE	CE	CE	CE	CE	CE	CE, UL listed	CE, UL listed	CE, UL listed	CE, UL listed	CE, UL listed	CE, UL listed	CE, UL listed	CE, UL listed	CE, UL listed	

* selectable

