Features

Range of modular DC power supplies

- High efficiency (up to 91%)
- Low (< 0.4 W) stand-by power absorption
- Thermal protection: internal, with V_{out} shutdown
- Short circuit protection: hiccup (auto-recovery) mode
- Input protection: internal fuse plus spare
- Overvoltage protection: varistor
- Flyback topology
- ZVS (Zero-voltage-switching), quasi-resonant mode technology (78.60 and 78.50)
- Compliant to EN 60950-1 and EN 61204-3
- Parallel working for automatic redundancy: with OR-IN diode
- Dual and series connection permissible
- Small dimensions: 70 mm (4-modules) wide, 60 mm deep
- 35 mm rail (EN 60715) mount

Screw terminal

For outline drawing see page 6

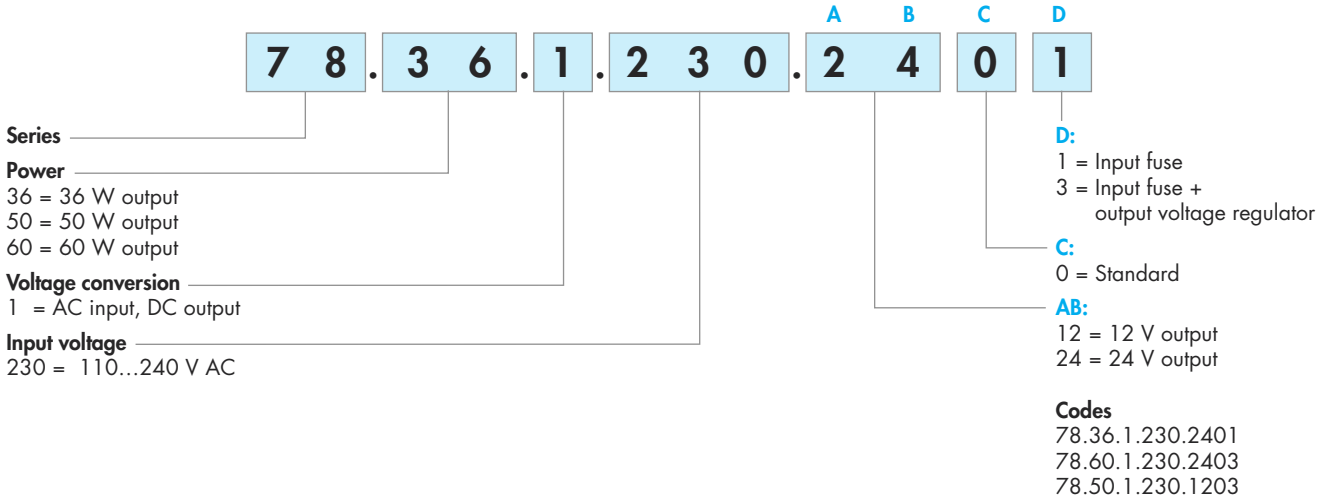
	78.36	78.60	78.50
			
	• 24 V DC, 36 W output	• 24 V DC, 60 W output • Voltage regulation 24-28V • ZVS technology	• 12 V DC, 50 W output • Voltage regulation 12-14V • ZVS technology

* (see diagrams L78-4/5/6)
** peak to peak, 100 Hz component, with 100 V AC input
*** 88...100 V AC with output current 80 % IN
**** (see derating diagrams L78-1/2/3)

Output specification				
Rated current	A	1.5	2.5	4.2
Rated voltage	V	24	24	12
Rated power	W	36	60	50
Peak current capability for 3 ms *	A	8	10	10
Overcurrent @ 40 °C with 230 V AC input	A	1.7	2.8	4.6
Output voltage adjust	V	–	24...28	12...14
Voltage variation (from no-load to full-load)		< 1 %	< 1 %	< 1 %
Voltage ripple @ full load **	mV	< 200	< 200	< 200
Hold-up time@full load: with 100 V AC input	ms	< 20	< 20	< 30
with 260 V AC input	ms	< 100	< 130	< 150
Input specification				
Nominal voltage (U_N)	V AC (50/60 Hz)	110...240	110...240	110...240
	V DC (not polarized)	220	220	220
Operating range	V AC (50/60 Hz)	100...265***	100...265***	100...265***
	V DC	140...370	140...370	140...370
Max power absorption	VA	57.5	90	89
(@ 100 V AC, 50 Hz)	W	43	67.5	58.3
Stand-by power absorption	W	< 0.4	< 0.4	< 0.4
Power factor		0.74	0.75	0.65
Max current absorption (@ 88 V AC)	A	0.6	0.9	0.85
Max. inrush current (peak @ 265 V) for 3 ms	A	12	30	30
Internal protection fuse		1 A - T	1.6 A - T	1.6 A - T
Technical data				
Efficiency (@ 230 V AC)	%	86	91	90
MTTF	H	> 600.000	> 500.000	> 400.000
Start-up delay	s	< 1	< 1	< 1
Dielectric strength between input/output	V AC	3,000 (class II)	3,000 (class II)	3,000 (class II)
Dielectric strength between input/PE	V AC	–	1,500 (class I)	1,500 (class I)
Ambient temperature range @ rated current	°C	–20...+50	–20...+50	–20...+50
Ambient temperature range ****	°C	–20...+70	–20...+70	–20...+70
Protection category		IP 20	IP 20	IP 20
Approvals (according to type)		CE		

Ordering information

Example: 78 series switching power supply, 36 W 24 V DC output, supply voltage 110...240 V AC, input fuse.



Codes
78.36.1.230.2401
78.60.1.230.2403
78.50.1.230.1203

Technical data

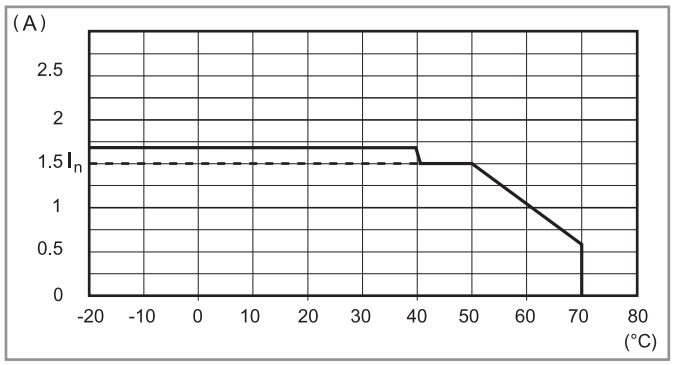
EMC specifications (according to EN 61204-3)		Reference standard	78.36	78.60, 78.50
Electrostatic discharge	contact discharge	EN 61000-4-2	4 kV	4 kV
	air discharge	EN 61000-4-2	8 kV	8 kV
Radiated electromagnetic field	80 ... 1,000 MHz	EN 61000-4-3	6 V/m	10 V/m
	1 ... 2.8 GHz	EN 61000-4-3	3 V/m	3 V/m
Fast transients (burst 5/50 ns, 5 and 100 kHz)	on supply terminals	EN 61000-4-4	2 kV	3 kV
Voltage pulses on supply terminals (surge 1.2/50 µs)	common mode	EN 61000-4-5	2 kV	2 kV
	differential mode	EN 61000-4-5	4 kV *	4 kV *
Radio-frequency common mode voltage (0.15...230 MHz)	on supply terminals	EN 61000-4-6	6 V	10 V
Short interruptions		EN 61000-4-11	5 cycles	6 cycles
Radio-frequency conducted emissions	0.15...30 MHz	EN 55022	class B	class A
Radiated emissions	30...1,000 MHz	EN 55022	class B	class A

Terminals			solid cable	stranded cable
Max. wire size		mm^2	1 x 4 / 2 x 2.5	1 x 4 / 2 x 2.5
		AWG	1 x 12 / 2 x 14	1 x 12 / 2 x 14
Screw torque		Nm	0.8	
Wire strip length		mm	9	
Other data				
Power lost to the environment	without output current	W	0.4	
	with rated output current	W	5 (78.36, 78.50), 5.4 (78.60)	

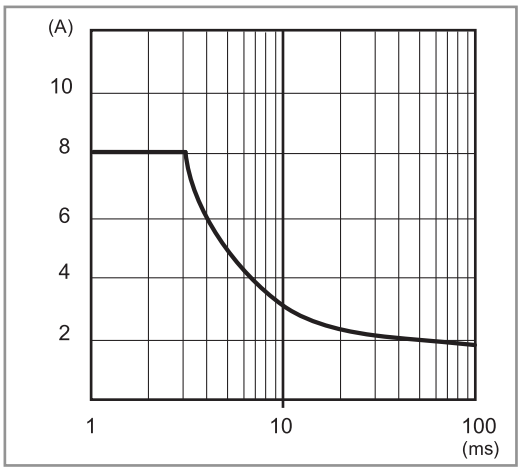
* input fuse blowing with surges higher than 1.5 kV

Output specification

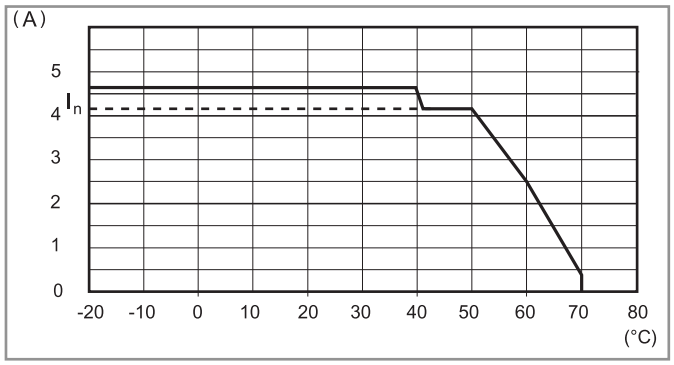
L78-1 Output current v ambient temperature (78.36)



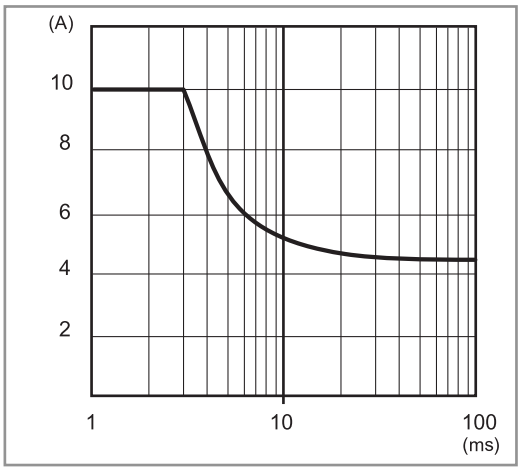
L78-4 Output peak current v time (78.36)



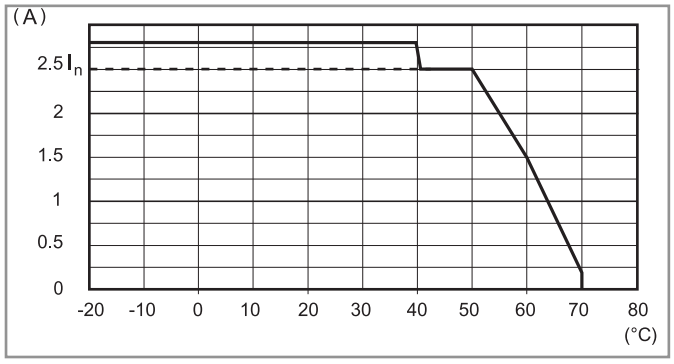
L78-3 Output current v ambient temperature (78.50)



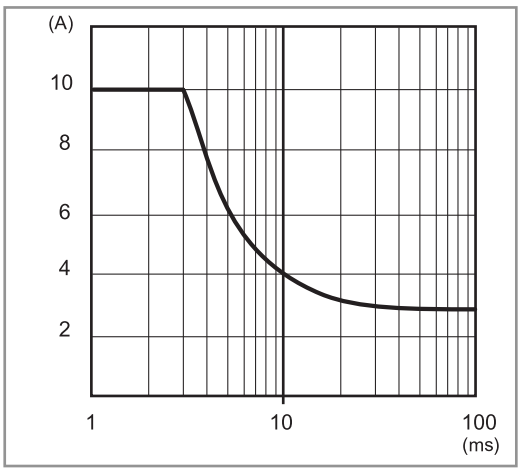
L78-6 Output peak current v time (78.50)



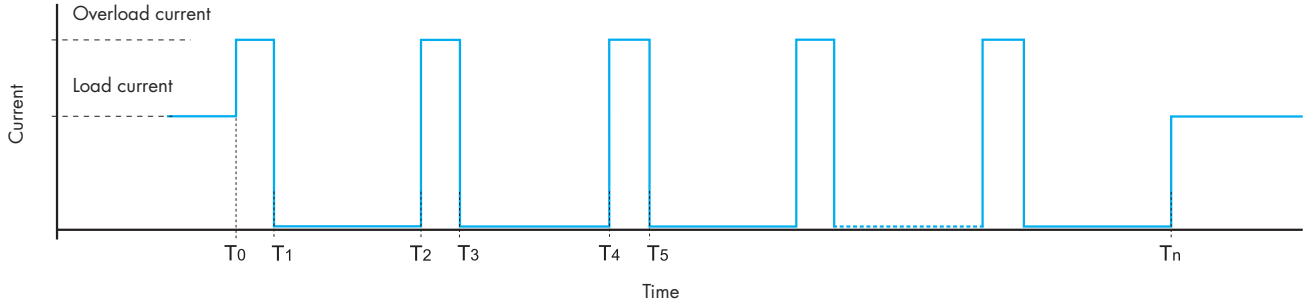
L78-2 Output current v ambient temperature (78.60)



L78-5 Output peak current v time (78.60)

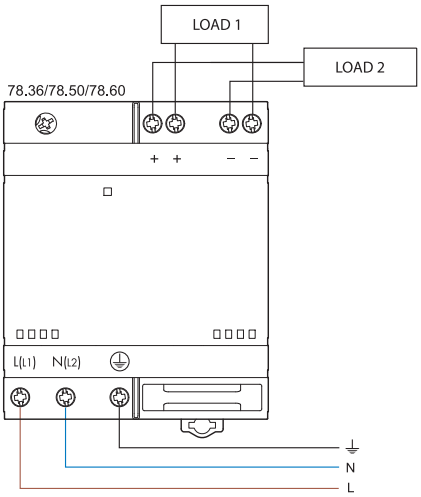


Hiccup mode

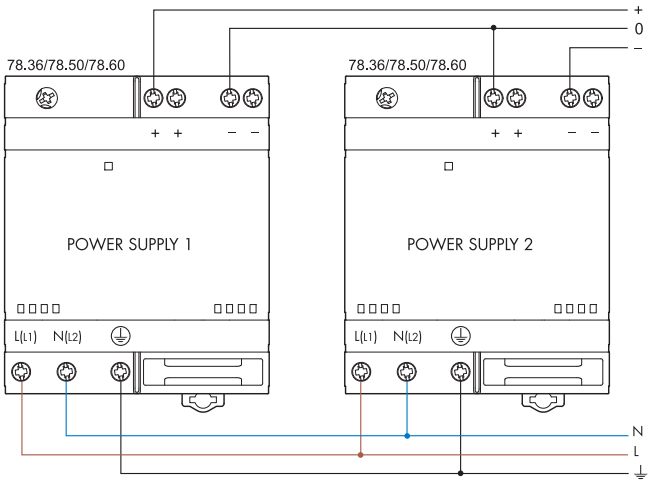


Under normal conditions, the 78 Series Power Supply supplies the current required by the load.
However, under abnormal conditions such as a short circuit or heavy overload (T_0) the output voltage will be rapidly reduced to zero - followed by the current (T_1). After approximately 2 seconds (T_1 to T_2), the power supply checks for the persistence of the anomaly over the time period T_2 to T_3 (30 to 100ms - dependent on the type of anomaly). If the anomaly persists, as shown above, the current is again reset to 0 A for a further 2 s (T_3 to T_4). This "hiccup" process is repeated until the anomaly is removed (T_n), whereon the power supply then returns to normal working.

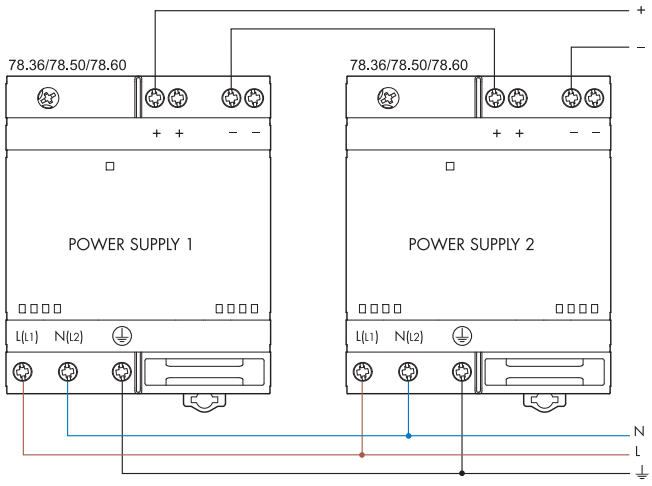
Wiring diagrams



Dual connection

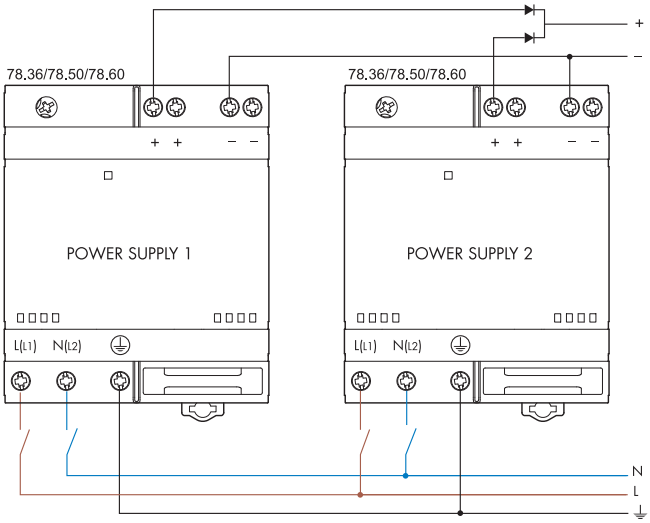


Series connection

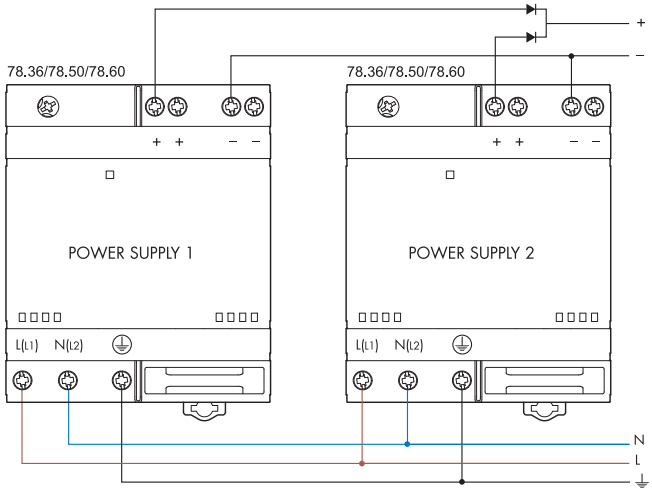


Application example: redundancy connection

Manual

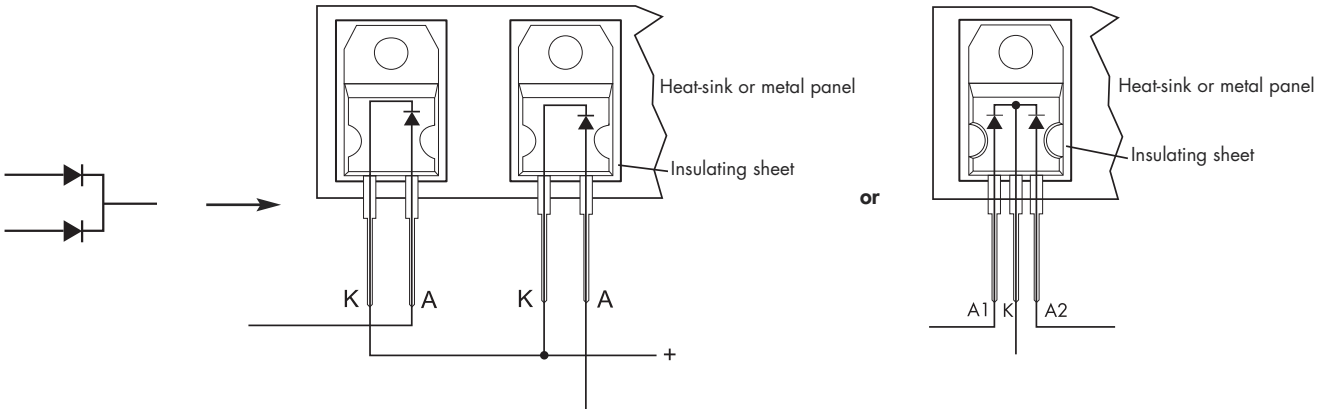


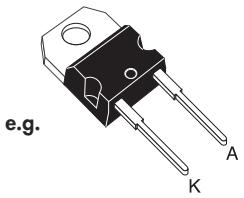
Automatic (with parallel connection)



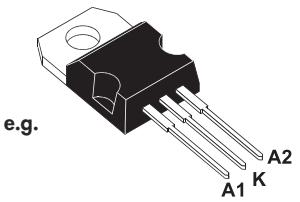
Note: Since parallel working is intended to provide automatic redundancy, rate the output current at no more than In.

Diode(s)





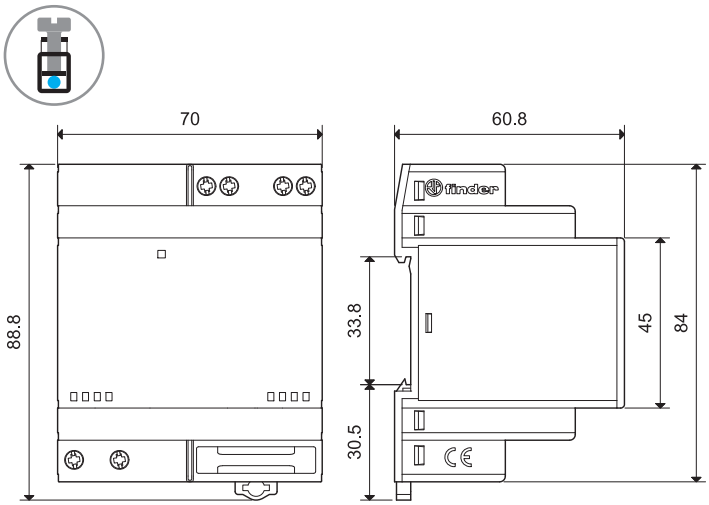
TO-220AC
STPS1545D



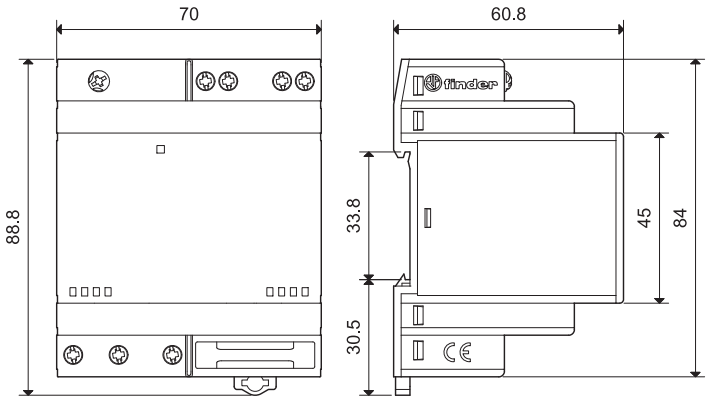
TO-220AB
STPS30L40CT

Outline drawings

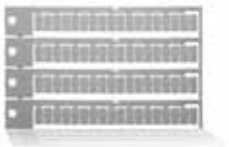
78.36
Screw terminal



78.50 / 78.60
Screw terminal



Accessories



060.72

Sheet of marker tags, plastic, 72 tags, 6x12 mm	060.72

019.01

Identification tag, plastic, 1 tag, 17x25.5 mm	019.01