

## ZS20-1A, ZS20-1B, ZS20-1C, ZS20-1K, ZS20-1L, ZS20-1P

### POWER SUPPLIES

- Universal AC input range 90-264 V
- Universal DC input range 124-370 V
- High efficiency up to 87%
- Boost power capability 150%
- Hiccup mode
- Build-in "Power good" relay (ZS20-1B, ZS20-1C only)
- Isolation class II
- Suitable for indoor use
- DIN rail and Wall mounting



## Power Supplies: One Solution, Many Application

### Power Supplies Selection Chart

Model	Size	Description
ZS20-1P	18x90x62 mm	I/P:- Single-Phase: 115-230 VAC, O/P:- 24VDC / 0.63A, 15W
ZS20-1K	54x90x62 mm	I/P:- Single-Phase: 115-230 VAC, O/P:- 24VDC / 1.5A, 36W
ZS20-1L	54x90x62 mm	I/P:- Single-Phase: 115-230 VAC, O/P:- 24VDC / 1.75A, 45W
ZS20-1A	54x90x62 mm	I/P:- Single-Phase: 115-230 VAC, O/P:- 24VDC / 2.50A, 60W
ZS20-1B	55x110x105 mm	I/P:- Single-Phase: 115-230 VAC, O/P:- 24VDC / 5.0A, 120W
ZS20-1C	55x110x105 mm	I/P:- Single-Phase: 115-230 VAC, O/P:- 24VDC / 7.5A, 180W

#### More Flexibility In Input Voltage Wide Range

The power supplies ZS20-1B and ZS20-1C are suitable to wide range input voltage. With a single type it is therefore possible to meet almost all application and consequently improve design and inventory management.

#### More Power: "Power Boost"

As an example, ZS20-1C is a 24V dc 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 3min. This feature allows the use of a smaller size instrument to power demanding loads such as motors, solenoid valves, lamps and other loads with transient overload behavior which would otherwise require an oversized power supply.

#### More Power At Changing Rated Temperature

As an example, ZS20-1C can be the right solution for two design cases in different temperature conditions:

- 1) 7.5A, 24V dc in continuous duty at 40°C.
- 2) 5A, 24V dc in continuous duty at 60°C + Power Boost 7.5A for at least 3 min.

### Three Modes for Output Protection ON SITE

#### Hiccup Mode Automatic Restart

This is the default factory setting of all Zs20 units. In case of short-circuiting 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.

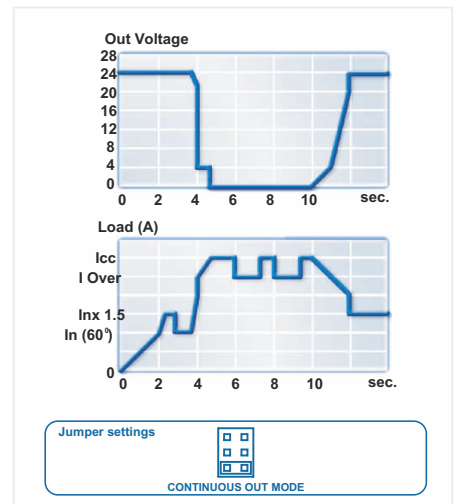
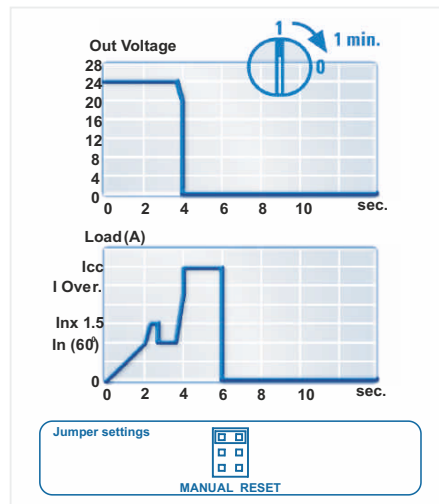
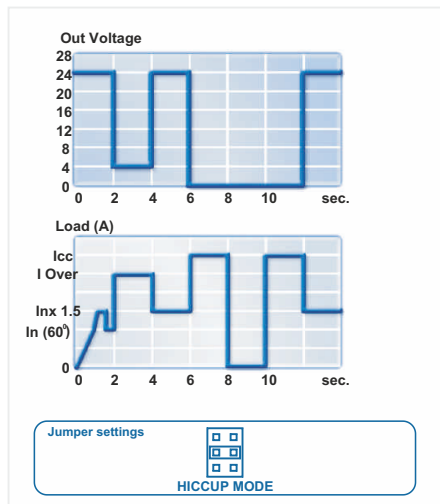
#### Manual Reset Manual Restart By Operator

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 application where safety procedures require that reset be carried out only by an authorized person.

#### Continuous Output Mode

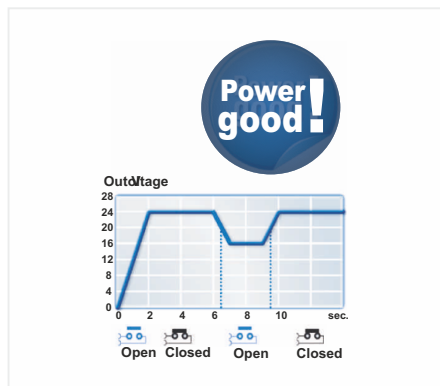
In case of short-circuit or overload, the output current is kept at high values with near zero voltage. In case of short circuit the current can reach up to 3 times the rated current at 60°C. This protection mode is used to meet the requirements of demanding loads such as motors, solenoid valves, lamps,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

## Power Supplies: One Solution, Many Application



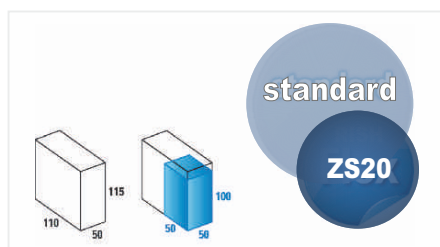
### “Power Good” Relay For Monitoring The Output Voltage Level

Output voltage is continuously monitored. The units ZS20-1C and ZSC20-1B are equipped with Power Good relay. The NO contact triggers any time the output voltage level goes below 20VDC. This feature is particularly useful in redundant applications.



### Reduced Dimensions & Snap-on DIN Rail Bracket

The higher performances obtained with the ZS20 Line, allow almost half dimensions as conventional technology and higher performances. An example is ZS20-1A 60W with maximum current till 6A. In permanent duty at 40°C it can deliver 3A at 24V DC. All ZS20 units feature the new DIN rail mounting bracket, easy to use and safe against heavy loading and vibrations.

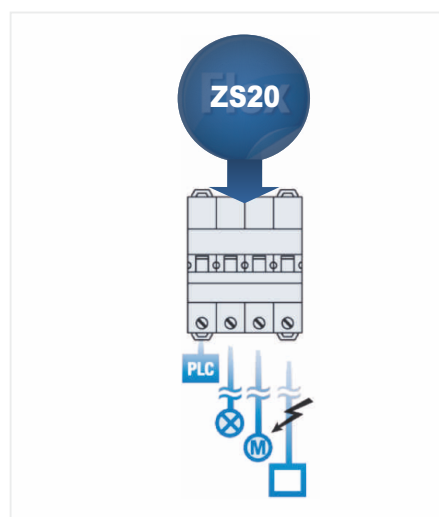


### Output Circuits Protected By Magneto-thermic Circuit Breakers

Standard output circuit breakers can be triggered quickly and reliably with ZS20 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.

### Applications In Compliance With The Standard EN 60204-

ZS20 units comply with the standard 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 PC’s, PLC, remote I/O, etc. required by the standard. LUMEL supplies a table for the sizing and length of connecting cable and the choice of proper magneto thermic switches.



### A New Way To Make And Use Power Supplies

Yet another strong proposition by LUMEL for power supplies and power continuity specialists. LUMEL aim is to provide designers and users with a complete range of solutions in power supplies and power continuity products, focusing on both standard special application. Our target is to deliver problem free solutions so that you can safely dedicate your attention to the reset of the automation project. The ZS20 technology is the result of these corner stones of our corporate identity. Designed taking into account the pressure to optimal use of space, ZS20 units are very compact in size. The wide input voltage range allows to have just one article for many applications and minimize stock.

ZS20 is based on semi-resonant switching circuit which allows efficiency up to 87% and a very dynamic and robust power supply to a wide range of loads such as PLC, sensors, motors, resistive/inductive loads etc. The ZS20 range conforms with the highest quality standards and guarantees a reliable and durable operation with a MTBF upto 5,00,000 hours and a 3 year warranty.

## Power Supplies



Data		ZS20-1P	ZS20-1K	ZS20-1L	
Input Data	Model	ZS20-1P	ZS20-1K	ZS20-1L	
	Input Type	1-Phase	1-Phase	1-Phase	
	Rating	24V / 0.63A	24V / 1.5A	24V / 1.75A	
	Input Voltage	115 / 230 V AC	115 / 230 V AC	115 / 230 V AC	
	Input Voltage Range AC	85 ... 264 VAC	85 ... 264 VAC	85 ... 264 VAC	
	Input Voltage Range DC	120 ... 370 VDC	120 ... 370 VDC	120 ... 370 VDC	
	Turn on delay after applying mains Voltage	1 second	1 second	1 second	
	Frequency	45 ... 65 Hz	45 ... 65 Hz	45 ... 65 Hz	
	Line Regulation	< ± 0.5 %	< ± 0.5 %	< ± 0.5 %	
	Load Regulation	< ± 0.5 % (change in load, static 10 % ... 90 %)	< ± 0.5 % (change in load, static 10 % ... 90 %)	< ± 0.5 % (change in load, static 10 % ... 90 %)	
Output Data	Input Current	0.3 A (230 VAC), 0.4 A (115 VAC)	0.48 A (230 VAC), 0.88 A (115 VAC)	0.55 A (230 VAC), 0.95 A (115 VAC)	
	Inrush Current	≤ 36 A Typically	≤ 36 A Typically	≤ 36 A Typically	
	Internal Fuse	T2 A	T4 A	T4 A	
	External Fuse	10 A (curve B)	10 A (curve B)	10 A (curve B)	
	Output Voltage Range	24 VDC +/-3%	24 VDC +/-3%	24 VDC +/-3%	
	Adjustment Range (Vadj)	—	22 - 27 Vdc	22-27 VDC	
	Start up with Capacitive Load	—	—	—	
	Output Current (@ 40°C)	0.63A @ 40°C	1.5A @ 40°C	1.75A @ 40°C	
	Output Current (@ 50°C)	0.63A @ 50°C, 0.48A @ 60°C	1.5A @ 50°C, 1.125A @ 60°C	1.75A @ 50°C, 1.41A @ 60°C	
	Power Boost (@ 60°C) for 3 minutes	0.63 A	1.5 A	1.75 A	
General Data	Power	15W	36W	45W	
	Hold Up Time	≥ 50 msec (230 VAC)	≥ 50 msec (230 VAC)	≥ 30 msec (230 VAC)	
	Parallel Connection	No	No	No	
	Derating	from 50°C 2.5% /°C	from 50°C 2.5% /°C	from 50°C 2.5% /°C	
	Efficiency	> 87 % (for 230 VAC and nominal values)	> 87 % (for 230 VAC and nominal values)	> 87 % (for 230 VAC and nominal values)	
	Dissipation Power Load Max (W)	2.24 W	4.4 W	2.24 W	
	Output Over Voltage Protection	35 VDC	35 VDC	35 VDC	
	Protection	short circuit, overload, over voltage, over temperature	short circuit, overload, over voltage, over temperature	short circuit, overload, over voltage, over temperature	
	Protection Modes	Hiccup	Hiccup	Hiccup	
	Ripple and Noise	≤ 150 mVpp (with nominal values)	≤ 150 mVpp (with nominal values)	≤ 150 mVpp (with nominal values)	
Mounting	Short Circuit Current (Permanent)	Not Available	Not Available	Not Available	
	Resistance to reverse feed	max 35 VDC	max 35 VDC	max 35 VDC	
	Relay Power Good	Not Available	Not Available	Not Available	
	RoHS Compliant	Yes	Yes	Yes	
	Isolation Voltage (IN/OUT)	3000 VAC	3000 VAC	3000 VAC	
	Isolation Voltage (IN/PE)	—	—	—	
	Isolation Voltage (OUT/PE)	—	—	—	
	MTBF	> 1 100 000 hrs according to IEC 61709	> 450 000 hrs according to IEC 61709	> 1 100 000 hrs according to IEC 61709	
	Safety Approvals	CE	CE	CE	
	Type	DIN Rail	DIN Rail	DIN Rail	
Compliance	Position (Recommended)	Vertical	Vertical	Vertical	
	Location	Indoor	Indoor	Indoor	
	Environment (Preferred)	Dust Protected Panels	Dust Protected Panels	Dust Protected Panels	
	Norms and Certifications	According to EMC and Low voltage	According to EMC and Low voltage	According to EMC and Low voltage	
	Electrical Safety	- According to IEC/EN 60950 (VDE 0805) & EN 50178 (VDE 0160) for assembling device. - Input / Output separation: SELV EN60950-1 and PELV EN 60204-1. Double or reinforced insulation. - IEC/ EN 60950 for Installation according	- According to IEC/EN 60950 (VDE 0805) & EN 50178 (VDE 0160) for assembling device. - Input / Output separation: SELV EN60950-1 and PELV EN 60204-1. Double or reinforced insulation. - IEC/ EN 60950 for Installation according	- According to IEC/EN 60950 (VDE 0805) & EN 50178 (VDE 0160) for assembling device. - Input / Output separation: SELV EN60950-1 and PELV EN 60204-1. Double or reinforced insulation. - IEC/ EN 60950 for Installation according	
	EMC Immunity	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5,	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5,	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5,	
	EMC Emission	EN61000-6-4, EN61000-3-2	EN61000-6-4, EN61000-3-2	EN61000-6-4, EN61000-3-2	
	Standards Conformity	EN 60204-1 Safety of Electrical Equipment Machines	EN 60204-1 Safety of Electrical Equipment Machines	EN 60204-1 Safety of Electrical Equipment Machines	
	External Data	Operating Temperature	-30 to +70°C	-30 to +70°C	-30 to +70°C
		Storage Temperature	-40 ... 85 °C	-40 ... 85 °C	-40 ... 85 °C
Operating Humidity		95% at +25°C,	95% at +25°C,	95% at +25°C,	
Pollution Degree Environment		2	2	2	
Degree of Protection		IP 20	IP 20	IP 20	
Class of Protection		II	II	II	
Cooling		Free Air Convection	Free Air Convection	Free Air Convection	
Connection Terminal Blocks		Screw Type 2.5 mm	Screw Type 2.5 mm	Screw Type 2.5 mm	
Dimensions	Climatic Class	3K3	3K3	3K3	
	Dimensions	18 x 90 x 62 mm	54 x 90 x 62 mm	54 x 90 x 62 mm	
	Weight	0.2 kg approx.	0.25 kg approx.	0.25 kg approx.	

## Power Supplies



Data	ZS20-1A	ZS20-1B	ZS20-1C
Model	ZS20-1A	ZS20-1B	ZS20-1C
Input Type	1-Phase	1-Phase	1-Phase
Rating	24V / 2.5A	24V / 5A	24V / 7.5A
Input Voltage	115 / 230 V AC	115 ... 230 V AC	115 ... 230 V AC
Input Voltage Range AC	85 ... 264 VAC	85 ... 264 VAC	85 ... 264 VAC
Input Voltage Range DC	120 ... 370 VDC	125 ... 350 VDC	125 ... 350 VDC
Turn on delay after applying mains Voltage	1 second	2 seconds	1.5 seconds
Frequency	45 ... 65 Hz	45 ... 65 Hz	45 ... 65 Hz
Line Regulation	< ± 1 %	< ± 1 %	< 0.1 % (change in input voltage ± 10 %)
Load Regulation	< ± 1 % (change in load, static 10 % ... 90 %)	< 0.1 % (change in input voltage ± 10 %)	< 1 % (change in load, static 10 % ... 90 %)
Input Current	0.8 A (230 VAC), 1.4 A (115 VAC)	1.1 A (230 VAC), 2.8 A (115 VAC)	1.5 A (230 VAC), 2.8 A (115 VAC)
Inrush Current	≤ 36 A Typically	≤ 36 A Typically	≤ 36 A Typically
Internal Fuse	T4 A	T4 A	T4 A
External Fuse	10 A (curve B)	10 A (curve B)	10 A (curve B)
Output Voltage Range	24 VDC +/-3%	24 VDC +/-3%	24 VDC +/-3%
Adjustment Range (Vadj)	22 - 27 Vdc	22 - 27 Vdc	22 - 27 VDC
Start up with Capacitive Load	—	≤ 50.000µF	≤ 50.000µF
Output Current (@ 40°C)	2.5A @ 40°C	5A @ 40°C	7.5A @ 40°C
Output Current (@ 50°C)	2.0A @ 50 C, 1.875A @ 60°C	4A @ 50°C, 3A @ 60°C	6.5A @ 50 °C, 5A @ 60°C
Power Boost (@ 60°C) for 3 minutes	2.5 A	4.5 A	7.5 A
Power	60W	95 ... 120 W	120 ... 180 W
Hold Up Time	≥ 20 msec (230 VAC)	≥ 20 msec (230 VAC)	≥ 20 msec (230 VAC)
Parallel Connection	No	No	No
Derating	from 50 °C 2.5% / °C	from 60 °C 2.5% / °C	from 60°C 2.5% /°C
Efficiency	> 87 % (for 230 VAC and nominal values)	> 87 % (for 230 VAC and nominal values)	> 87 % (for 230 VAC and nominal values)
Dissipation Power Load Max (W)	8.9 W	17 W	25 W
Output Over Voltage Protection	—	—	35 VDC
Protection	short circuit, overload, over voltage, over temperature	short circuit, overload (EN 60204-1), over voltage, over temperature	short circuit, overload (EN 60204-1), over voltage, over temperature
Protection Modes	Hiccup	Hiccup	Hiccup
Ripple and Noise	≤ 150 mVpp (with nominal values)	≤ 120 mVpp (with nominal values)	≤ 120 mVpp (with nominal values)
Resistance to reverse feed	—	—	max 35 VDC
Short Circuit Current (Permanent)	Not Available	Not Available	Not Available
Relay Power Good	Not Available	Trigger 30VDC	Trigger 30 VDC
RoHS Compliant	Yes	Yes	Yes
Isolation Voltage (IN/OUT)	3000 VAC	3000 VAC	3000 VAC
Isolation Voltage (IN/PE)	—	1605 VAC	1605 VAC
Isolation Voltage (OUT/PE)	—	500 VAC	500 VAC
MTBF	> 300 000 hrs according to IEC 61709	> 500 000 hrs according to IEC 61709	> 500 000 hrs according to IEC 61709
Safety Approvals	CE	CE	CE
Type	DIN Rail	DIN Rail	DIN Rail
Position (Recommended)	Vertical	Vertical	Vertical
Location	Indoor	Indoor	Indoor
Environment (Preferred)	Dust Protected Panels	Dust Protected Panels	Dust Protected Panels
Norms and Certifications	According to EMC and Low voltage	According to EMC 89/336/EEC and Low voltage 93/68/EEC	According to EMC 89/336/EEC and Low voltage 93/68/EEC
Electrical Safety	- According to IEC/EN 60950 (VDE 0805) & EN 50178 (VDE 0160) for assembling device. - Input / Output separation: SELV EN60950-1 and PELV EN 60204-1. Double or reinforced insulation. - IEC/ EN 60950 for Installation according	- According to IEC/EN 60950 (VDE 0805) & EN 50178 (VDE 0160) for assembling device. - Input / Output separation: SELV EN60950-1 and PELV EN 60204-1. Double or reinforced insulation. - IEC/ EN 60950 for Installation according	- According to IEC/EN 60950 (VDE 0805) & EN 50178 (VDE 0160) for assembling device. - Input / Output separation: SELV EN60950-1 and PELV EN 60204-1. Double or reinforced insulation. - IEC/ EN 60950 for Installation according
EMC Immunity	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5,	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5,	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5,
EMC Emission	EN61000-6-4, EN61000-3-2	EN61000-6-4, EN61000-3-2	EN61000-6-4, EN61000-3-2
Standards Conformity	EN 60204-1 Safety of Electrical Equipment Machines	EN 60204-1 Safety of Electrical Equipment Machines	EN 60204-1 Safety of Electrical Equipment Machines
Operating Temperature	-30 to +70°C	-25 to +70°C	-25 to +70°C
Storage Temperature	-40 ... 85 °C	-40 ... 85 °C	-40 ... 85 °C
Operating Humidity	95% at +25°C,	95% at +25°C,	95% at +25°C,
Pollution Degree Environment	2	2	2
Degree of Protection	IP 20	IP 20	IP 20
Class of Protection	II	I, with PE connected	I, with PE connected
Cooling	Free Air Convection	Through Grid on housing & Metal caing	Through Grid on housing & Metal caing
Connection Terminal Blocks	Screw Type 2.5 mm	Screw Type 2.5 mm	Screw Type 2.5 mm
Climatic Class	3K3	3K3	3K3
Dimensions	54 x 90 x 62 mm	55 x 110 x 105 mm	55 x 110 x 105 mm
Weight	0.25 kg approx.	0.5 kg approx.	0.50 kg approx.



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