

## 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.

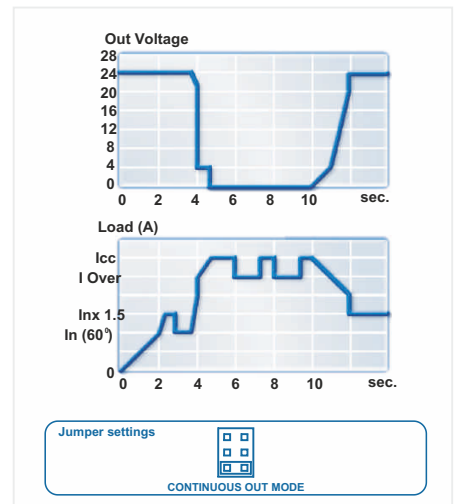
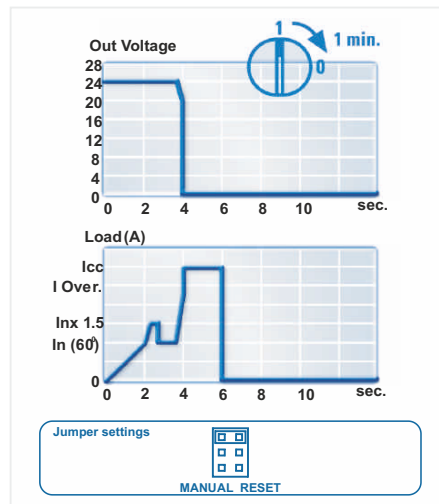
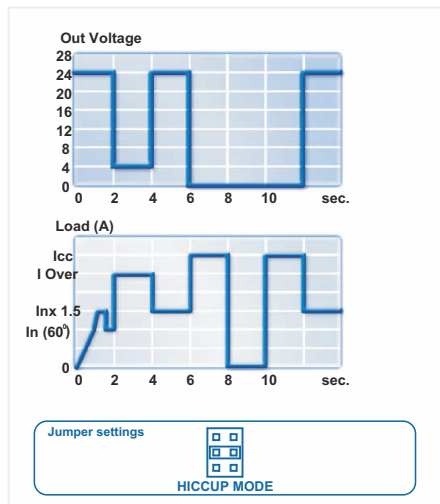
#### Manual Reset Manual Restart By Operator

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

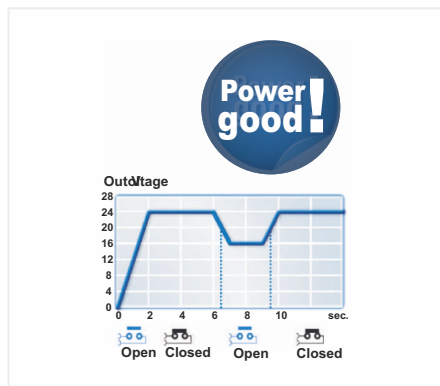
In case of short-circuit or overload, the output current is kept at high values with near zero voltage. In case of short circuit the current can reach up to 3 times the rated current at 60°C. This protection mode is used to meet the requirements of demanding loads such as motors, solenoid valves, lamps,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

## Power Supplies: One Solution, Many Application



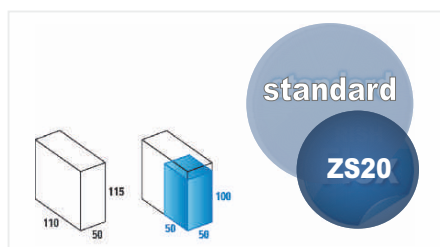
### “Power Good” Relay For Monitoring The Output Voltage Level

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.

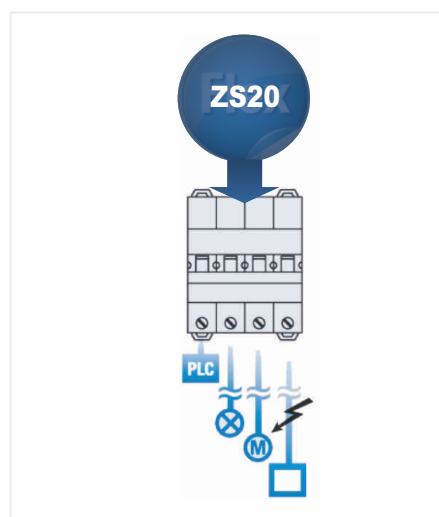


### Output Circuits Protected By Magneto-thermic Circuit Breakers

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



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

## Power Supplies



Data		ZS20-1A	ZS20-1B	ZS20-1C
Input Data	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 %)
Output Data	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
General Data	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)
Mounting	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
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 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
	External Data	Storage Temperature	-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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