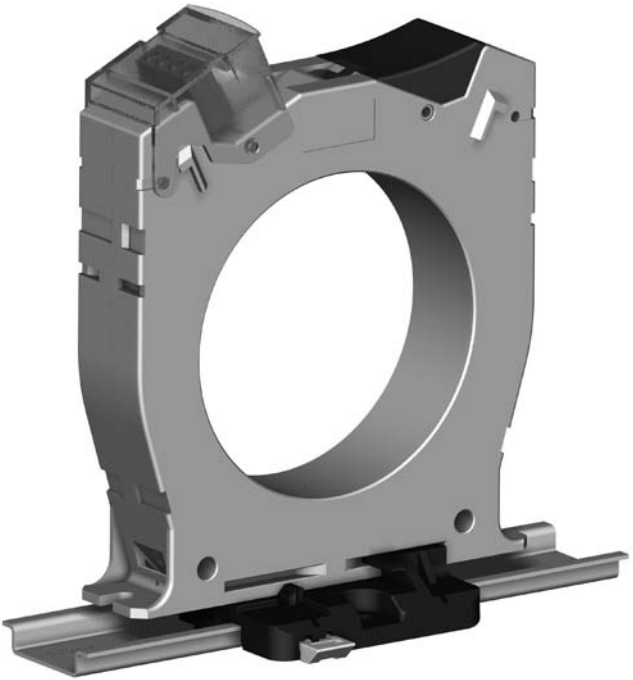
socomec

USER INSTRUCTIONS EN

ΔIC / ΔIP

Differential toroid



USER INSTRUCTIONS

EN

ΔIC / ΔIP Differential toroid

Contents

Preliminary operations

Check the following points upon delivery of the package containing the toroid:

- the packaging and product are in good condition
- the product reference corresponds to your order
- the contents of the package:
  - 1 product
  - 1 cover (***ΔIP*** only)
  - 1 detachable terminal block (mounted)
  - 1 mounting accessory (***ΔIP*** only)
  - 1 Quick Start

Warning

⚠ Risk of electrocution, burns or explosion.

- the devices must only be installed and serviced by qualified personnel
- Switch off all power supplies before working on or in the equipment.
- Always use an appropriate voltage detection device to confirm the absence of voltage.
- Replace all devices, doors and covers before switching on the power to this equipment.
- Ensure that no metal objects are allowed to fall in the cabinet (risk of electrical arcing).

Failure to observe these safety instructions will expose the technician and those around him to the risk of serious injury or death.

⚠ Risk of damaging device

- If the toroid is dropped, there is a risk that the magnetic elements will be altered and the toroid should ideally be replaced.
- Ensure that the toroid is connected to the measuring or protection equipment indicated on the toroid.

In detail

ΔIC / RESYS - DIRIS A80

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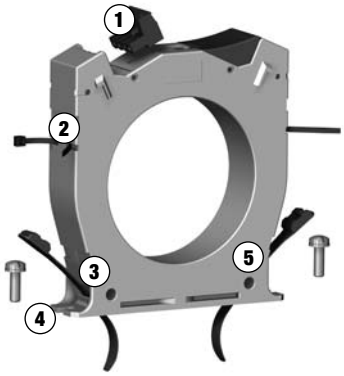
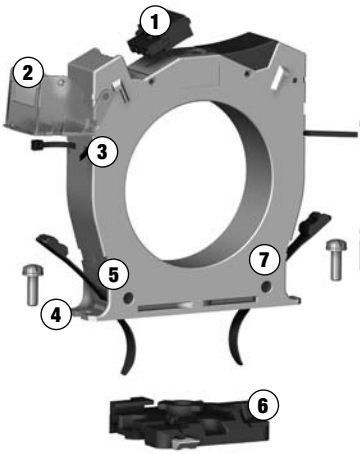


① Detachable screw terminal block
② Opening for fixing cables using clamps
③ Opening for fixing the toroid using clamps
④ Screwed connections
⑤ Opening for bracket mounting screw

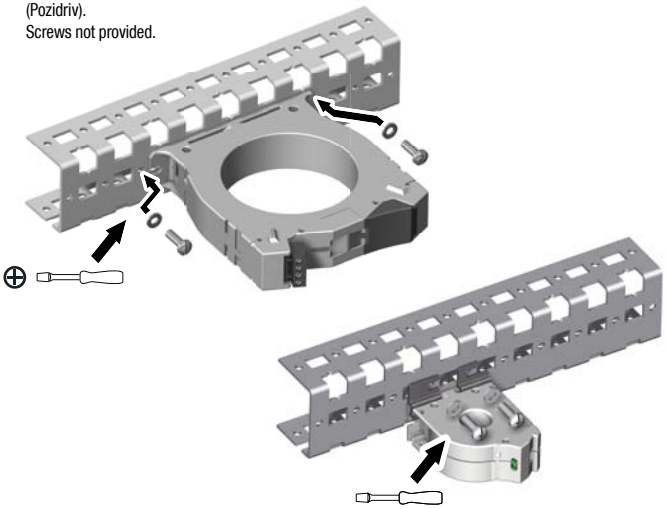
ΔIP / ISOM



①Detachable push-in terminal block
②Sealable protective cover
③ Opening for fixing cables using clamps
④ Screwed connections
⑤ Opening for fixing the toroid using clamps
⑥ Rotary mounting for DIN rail
⑦ Opening for bracket mounting screw

Direct screw mounting

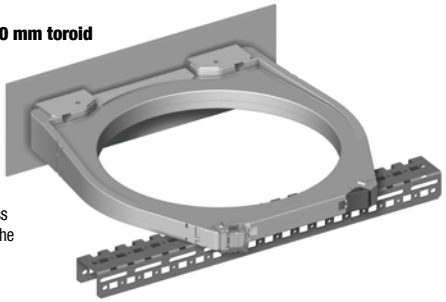
■ Toroid mounted with 2 M4/1.5 Nm max. (Ø 15, 30 and 50 mm) screws, 2xM5/3.5 Nm max. (Ø 80 mm) screws, 2xM6/6 Nm max. (Ø 120 mm) screws or 4xM6/6 Nm max. (Ø 200 and 300 mm) screws + DIN433 washers. Use of self-cutting pan head screws, metric thread, Z-shaped cruciform (Pozidriv).
Screws not provided.



Clamp mounting (for toroid Ø 15 to 120 mm)

■ Toroid mounted with clamps of width 9 mm min. - 12 mm max., min. clamping radius less than 25 mm.
Clamps not supplied.

Mounting a Ø 300 mm toroid

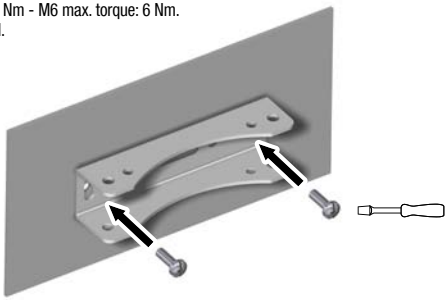


Fit an additional cross member to support the toroid.

Metal bracket mounting (order as an accessory)

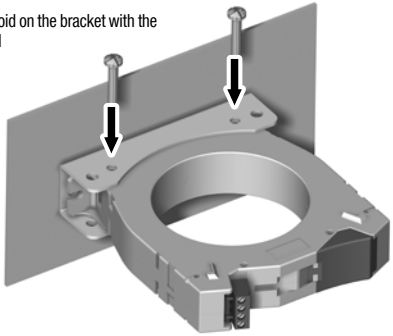
STEP 1

- Mounting the bracket on a plate using M5 or M6 screws.
  M5 max. torque: 3.5 Nm - M6 max. torque: 6 Nm.
  Screws not provided.



STEP 2

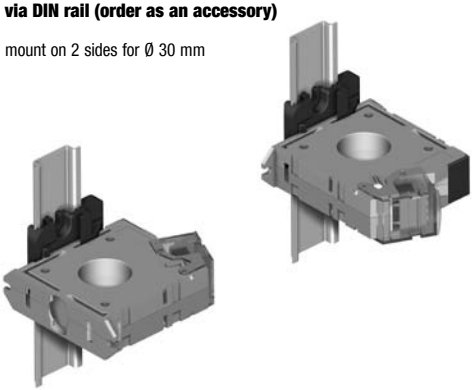
- Mounting the toroid on the bracket with the screws supplied



ΔIP (30, 50, 80 & 120 mm)

Mounting via DIN rail (order as an accessory)

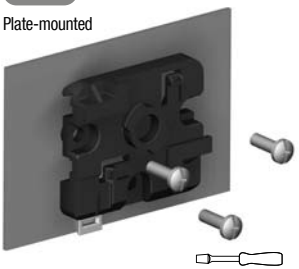
- Option to mount on 2 sides for Ø 30 mm toroid.



EN Mounting via plate support or DIN rail (order as an accessory)

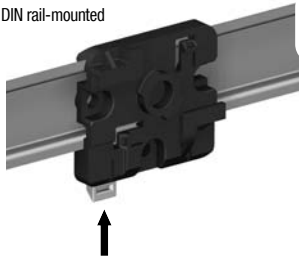
STEP 1

Plate-mounted



Secured with 3 M5 screws, tightening torque 3.5Nm

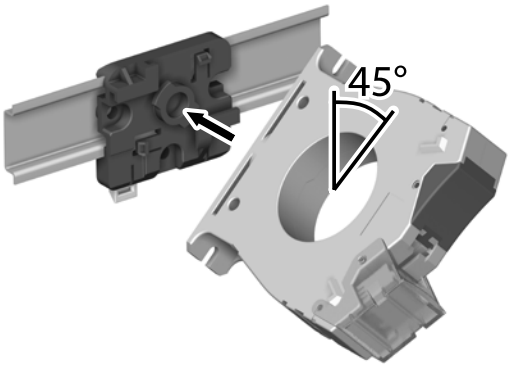
DIN rail-mounted



Screws not provided

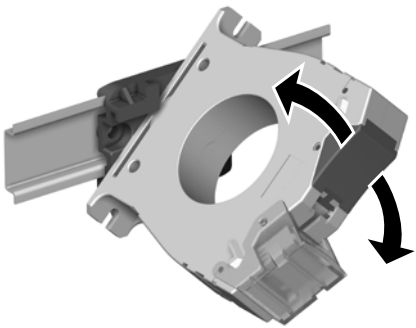
STEP 2

■ Offer up the toroid at an angle of 45° and press.

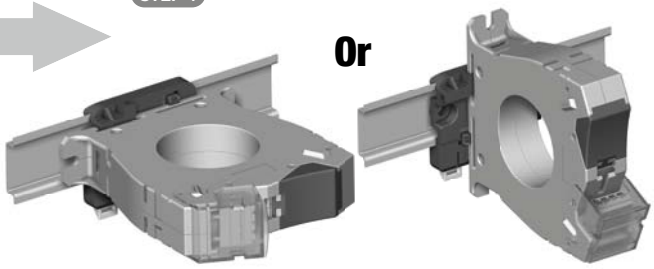


STEP 3

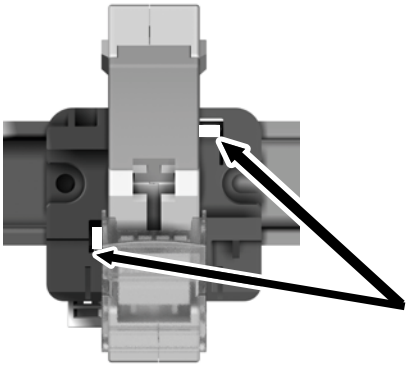
■ Turn the toroid 45° in the desired direction.



STEP 4

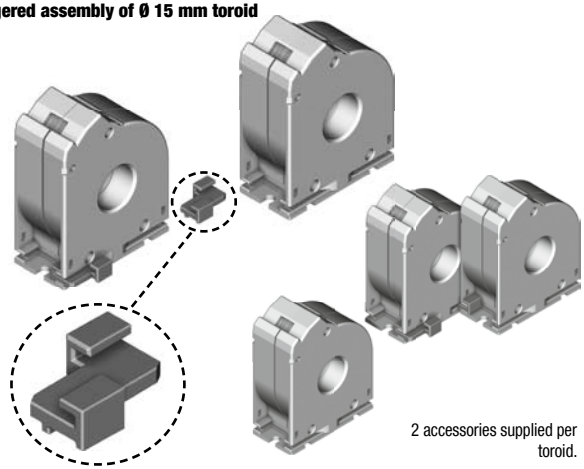


Dismantling the toroid



- Press the 2 clips simultaneously and turn.

Staggered assembly of Ø 15 mm toroid



2 accessories supplied per toroid.

Mechanical characteristics

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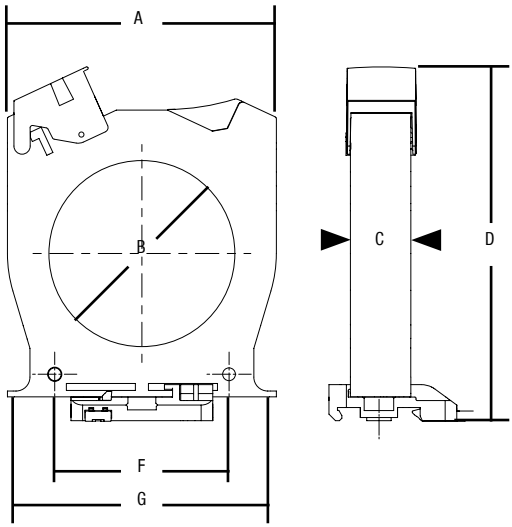
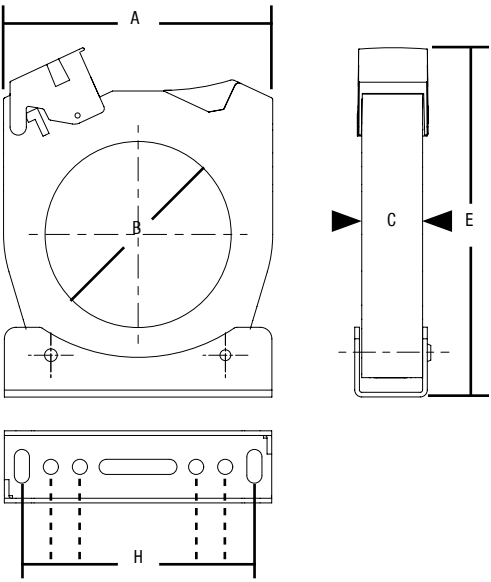
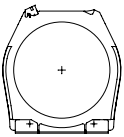


	Ø 15 mm	Ø 30 mm	Ø 50 mm
ΔIC *ΔIP* *ΔIP/8*	4950 6015 4750 6015 4750 8015	4950 6030 4750 6030 4750 8030	4950 6050 4750 6050
A (mm)	53	92	102,5
B (mm)	17,3	30	50
C (mm)	26	26	26
D (mm)	81	103,5	125
E (mm)	71	112	133
F (mm)	27,8	50	50
G (mm)	50	85	90
H (mm)	-	25/50	25/50
Weight (kg) ΔIC Weight (kg) ΔIP Weight (kg) ΔIP/8	0,10 0,10 0,12	0,13 0,15 0,18	0,18 0,27



Ø 80 mm	Ø 120 mm	Ø 200 mm	Ø 300 mm
			
4950 6080 4750 6080	4950 6120 4750 6120	4950 6200 4750 6200	4950 6300 4750 6300
116	163	253	370
80	120	200	300
26	26	51	50
142,5	182,5	274	390
152	192	282	150
75	100	150	200
105	150	175 x 41,2	250 x 41,5
50/75/100	50/75/100	50/100/175	200/225/250 x 25
0,22 0,38	0,38 0,72	0,88 1,74	1,72 3,60

Connection

EN

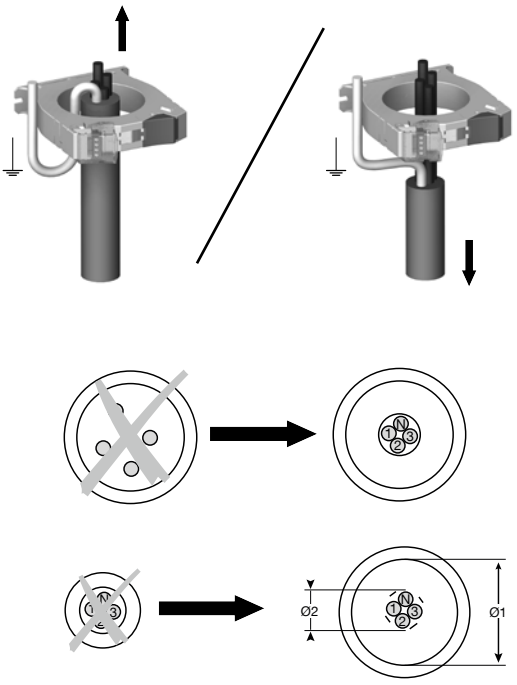
Conductor openings

■ Selection of toroids based on the power circuit and min. IΔn value recommended for high homopolar current (as per 6xIn tests in accordance with CEI 60947-2 appendix M)

Rated operational current In	Max. cross-section per conductor	Toroid	IΔn
36 A	6 mm²	***ΔIC/ΔIP*** ø 15	30 mA
65 A	25 mm²	***ΔIC/ΔIP*** ø 30	30 mA
85 A	50 mm²	***ΔIC/ΔIP*** ø 50	30 mA
160 A	95 mm²	***ΔIC/ΔIP*** ø 80	100 mA
250 A	240 mm²	***ΔIC/ΔIP*** ø 120	300 mA (ΔIP:100)
400 A	2 x 185 mm²	***ΔIC/ΔIP*** ø 200	300 mA
630 A	2 x 240 mm²	***ΔIC/ΔIP*** ø 300	300 mA

Note: With Cu 3 P+N cables

Recommendation for commissioning toroids in relation to the power cables



Ø1 ≥ 2 x Ø2

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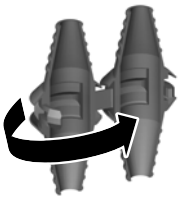
Using the centring device for Ø30 to 120 mm toroids (order as an accessory)

Patent application filed

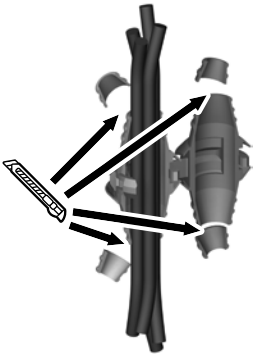
STEP 1

■ Open and secure the wires or cables



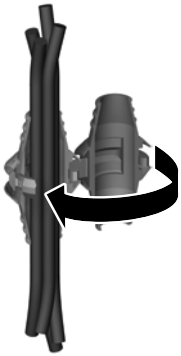
STEP 2

■ Adapt the centring device to the cable cross section



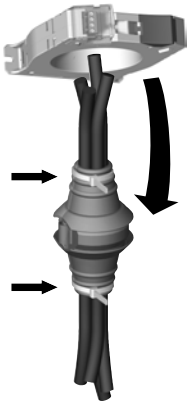
STEP 3

■ Close the centring device



STEP 4

■ Fit and tighten the clamps



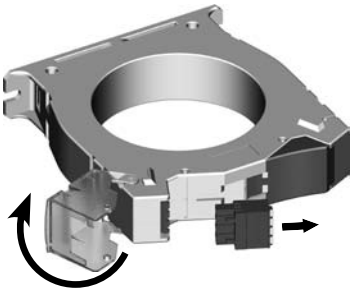
STEP 5

■ Insert the centring device in the toroid

Connecting the toroid

STEP 1

- Open the cover (accessory for ***ΔIC***)
- Remove the detachable terminal block



STEP 2

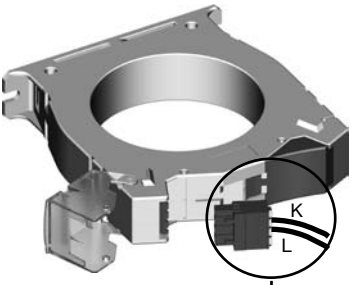
Cable terminals K (x1) and L (x1)

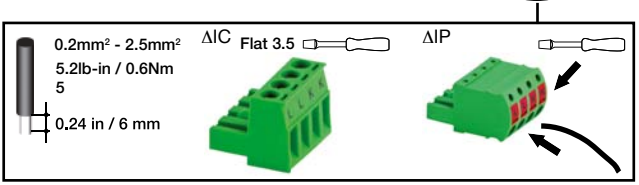
ΔIC: screw terminal block

- 3.5 mm straight screwdriver, max. torque 0.6 Nm, cross section 0.2 to 2.5 mm² (recommendation 0.8 mm²)

ΔIP: push-in terminal block

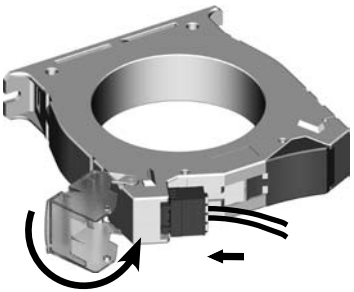
- wire with end ferrule, cross section 0.2 to 2.5 mm²





STEP 3

- Reconnect the detachable terminal block
- Close the cover (accessory for ***ΔIC***)



STEP 4

- Seal the cover (optional)

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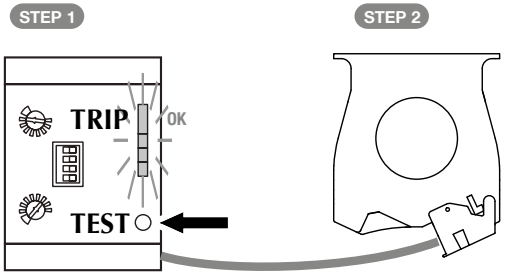
Testing the toroid

STEP 1 Connect the toroid to the relay (example below with RESYS M40 relay: see relay manual for connection details)

STEP 2 The final tests must be confirmed by "Test OK" (see table below)

Periodic testing must be carried out on the device to ensure compliance with regulations and to check the installation's connection and normative earth resistance values.

		Bar graph flashing
	"Trip" LED and "Alarm" relay activated	
> Permanent test		
Test OK	NO	NO
Toroid input short circuit	NO	NO
Relay/Toroid connection break	YES	NO
> Press "test" button (> 1s)		
Test OK	YES	YES
Toroid input short circuit	NO	NO
Relay/Toroid connection break	YES	NO



References/electrical and environmental specifications

		Ø15	Ø15/8	
ΔIC reference		4950 **6015**	-	
ΔIP reference		4750 **6015**	4750 **8015**	
IEC 60664-1 insulation coordination				
Insulation voltage		800 V		
Surge voltage		8 kV		
Degree of pollution		III		
Measurement circuit				
Rated primary current		10 A	1 A	
Rated secondary current		0.0167 A	0.000125 A	
Winding ratio Kn		10/0.0167	1/0.000125	
ΔIC rated load		Max 47 Ω	-	
ΔIP rated load		Max 180 Ω	Max 2400 Ω	
ΔIC rated output (under maximum operating conditions)		0.02 VA	-	
ΔIP rated output (under maximum operating conditions)		0.05 VA	0.05 VA	
Frequency domain		42 – 3 KHz	42 – 3 KHz	
Secondary protection by Transil diode		Yes	Yes	
IΔn setting range recommended if there are pulsed DC current components		30mA to 3A	30mA to 3A	
Environment				
Operating temperature		-25°C..+70°C		
Storage temperature		-25°C..+70°C		
Climatic class - Mechanical conditions as per IEC 60721		3K5/3M4		
Transport IEC 60721-3-2		2K5/2M2		
IEC 60721-3-1 long-term storage		1K5/1M3		
Connection/Wiring				
Connection type				
Flexible/rigid cross-section		0.2..2.5mm²/0.14mm² ...1.5mm²		
Stripping length		6mm		
DLD connection distance				
Single wire ≥ 0.75 mm²		0...1m		
Twisted single wire ≥ 0.75 mm²		0...10m		
Shielded cable ≥ 0.75 mm²		0...40m		
Recommended cable (shielding, shielding connected in a single location (terminal I), no earth connection		J-Y(ST)Ymin 2x0.8		
Other features				
Internal IP rating		IP40		
Terminal block IP rating		IP20		
Flammability class		M5		
Product standards		IEC60044-1		
Homologation (pending)		UL1053		
Centring device		-		
Bracket		4750 **8015**		
Sealable cover		-		
DIN rail mounting kit		4950 **0031**		
Spare detachable screw terminal block		-		
Spare detachable push-in terminal block		-		

EN

	Ø30	Ø15/8	Ø 50	Ø 80	Ø 120	Ø 200	Ø 300
	4950 **6030**	-	4950 **6050**	4950 **6080**	4950 **6120**	4950 **6200**	4950 **6300**
	4750 **6030**	4750 **8030**	4750 **6050**	4750 **6080**	4750 **6120**	4750 **6200**	4750 **6300**
	800 V 8 kV III		800 V 8 kV III	800 V 8 kV III	800 V 8 kV III	800 V 8 kV III	800 V 8 kV III
	10 A 0.0167 A 10/0.0167 Max 47 Ω Max 180 Ω 0.02 VA 0.05 VA 42 – 3 KHz Yes 30mA to 3A	1 A 0.000125 A 1/0.000125 - Max 2400 Ω - 0.05 VA 42 – 3 KHz Yes 30mA to 3A	10 A 0.0167 A 10/0.0167 Max 47 Ω Max 180 Ω 0.02 VA 0.05 VA 42 – 3 KHz Yes 30mA to 3A	10 A 0.0167 A 10/0.0167 Max 47 Ω Max 180 Ω 0.02 VA 0.05 VA 42 – 3 KHz Yes 30mA to 5A	10 A 0.0167 A 10/0.0167 Max 47 Ω Max 180 Ω 0.02 VA 0.05 VA 42 – 3 KHz Yes 30mA to 5A	10 A 0.0167 A 10/0.0167 Max 47 Ω Max 180 Ω 0.02 VA 0.05 VA 42 – 3 KHz Yes 30mA to 5A	10 A 0.0167 A 10/0.0167 Max 47 Ω Max 180 Ω 0.02 VA 0.05 VA 42 – 3 KHz Yes 30mA to 10A
	-25°C..+70°C -25°C..+70°C 3K5/3M4 2K5/2M2 1K5/1M3		-25°C..+70°C -25°C..+70°C 3K5/3M4 2K5/2M2 1K5/1M3	-25°C..+70°C -25°C..+70°C 3K5/3M4 2K5/2M2 1K5/1M3	-25°C..+70°C -25°C..+70°C 3K5/3M4* 2K5/2M2 1K5/1M3	-25°C..+70°C -25°C..+70°C 3K5/3M4 2K5/2M2 1K5/1M3	-25°C..+70°C -25°C..+70°C 3K5/3M4* 2K5/2M2 1K5/1M3
	0.2..2.5mm² 8...9mm 0...1m 0...10m 0...40m J-Y(ST)Ymin 2x0.8		0.2..2.5mm² 8...9mm 0...1m 0...10m 0...40m J-Y(ST)Ymin 2x0.8	0.2..2.5mm² 8...9mm 0...1m 0...10m 0...40m J-Y(ST)Ymin 2x0.8	0.2..2.5mm² 8...9mm 0...1m 0...10m 0...40m J-Y(ST)Ymin 2x0.8	0.2..2.5mm² 8...9mm 0...1m 0...10m 0...40m J-Y(ST)Ymin 2x0.8	0.2..2.5mm² 8...9mm 0...1m 0...10m 0...40m J-Y(ST)Ymin 2x0.8
	IP40 IP20 M5 IEC60044-1 UL1053		IP40 IP20 M5 IEC60044-1 UL1053	IP40 IP20 M5 IEC60044-1 UL1053	IP40 IP20 M5 IEC60044-1 UL1053	IP40 IP20 M5 IEC60044-1 UL1053	IP40 IP20 M5 IEC60044-1 UL1053
	4950 **0011**		4950 **0012**	4950 **0013**	4950 **0014**	-	-
	4950 **0001**		4950 **0002**	4950 **0003**	4950 **0003**	4950 **0004**	4950 **0005**
	4950 **0020**		4950 **0020**	4950 **0020**	4950 **0020**	4950 **0020**	4950 **0020**
	4950 **0031**		4950 **0031**	4950 **0031**	4950 **0031**	-	-
	4950 **0041**		4950 **0041**	4950 **0041**	4950 **0041**	4950 **0041**	4950 **0041**
	4950 **0040**		4950 **0040**	4950 **0040**	4950 **0040**	4950 **0040**	4950 **0040**

* with mounting bracket

539 541 B - EN - 12/12

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