



## **Filters for Power Lines (Low leakage current)**

16 to 100 A,  
100 dB from 14 kHz

**Series/Type:        B84263**

Date: January 2004

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## 2- and 4-line-filters

16 to 100 A

Multi-stage

Stopband attenuation 14 kHz to 40 GHz



### Features

- Low volume and low voltage drop
- Practically no leakage current flow on the grounding conductor in normal operation because of the capacitor configuration (capacitive circuit to ground only through neutral)
- Insertion loss to CISPR 17

### Design

The electrical components are incorporated in an RF-tight case of high-grade steel. The cables enter through glands. The RF-tight termination of the openings is produced by specially shaped lids.

The conductors and equipment grounding conductor are connected by threaded bolts. The surface around the fixing holes is left as bare metal (unpainted) to ensure good RF contact with metal surfaces (chassis, ground).

### Protective measures (grounding)

The high capacitances between the lines and ground require special protective measures. If there are no product-specific requirements, protection with a secondary ground wire (cross section min. 10 mm<sup>2</sup>) in accordance with EN 50178 is necessary. For this purpose the filter case has connecting bolts at each end.

Resistors are incorporated in the filter to discharge capacitors after turn-off.

### Scope of supply

Filters are supplied complete with all parts required for RF-tight installation (fixing screws, flanges, RF gaskets, cable glands) and installation instructions.

### Installation

No welding is needed on the shielding wall, so any subsequent installation is quite simple. And the uniform template of the attachment points allows straightforward replacement of 2-line filters by 4-line filters for example.

### Accessories and special versions

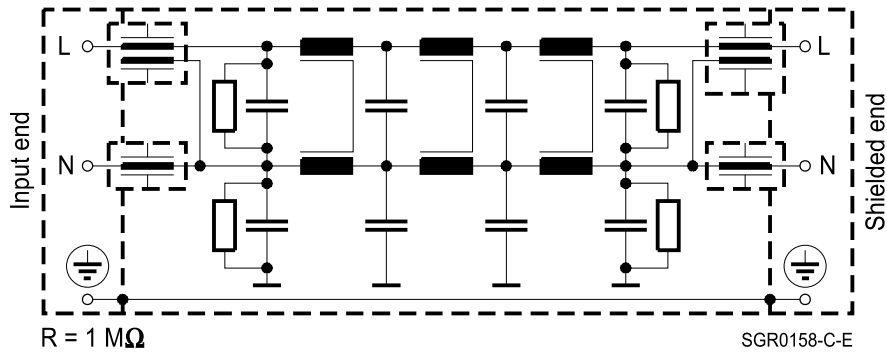
RF-tight flexible connector fittings are available for installation spaced away from the shielding wall. Filters with an EMP protection add-on for surge currents up to 100 kA per line are available on request. To match requirements, filters can be supplied with different kinds of EMC or shielding cable glands.

### Tests

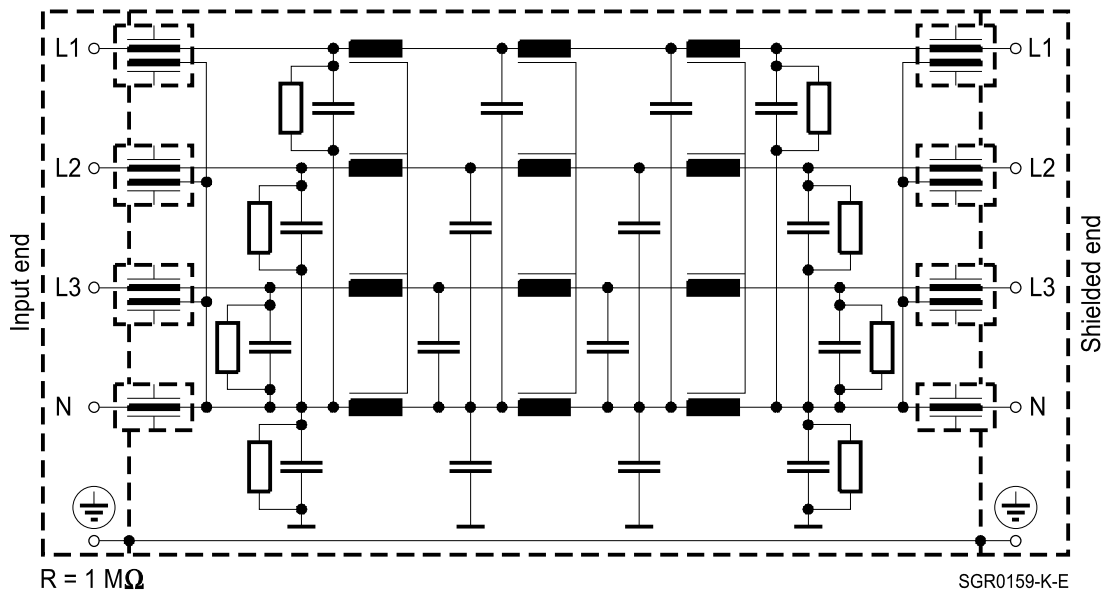
All filters are 100% tested and the results are archived under a filter's serial number. If required, a test report can be generated for the serial number.

Circuit diagrams

2-line filters

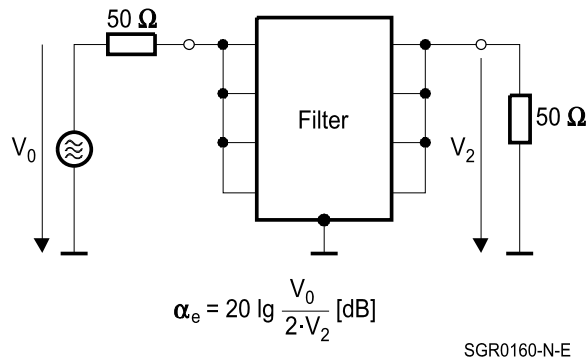
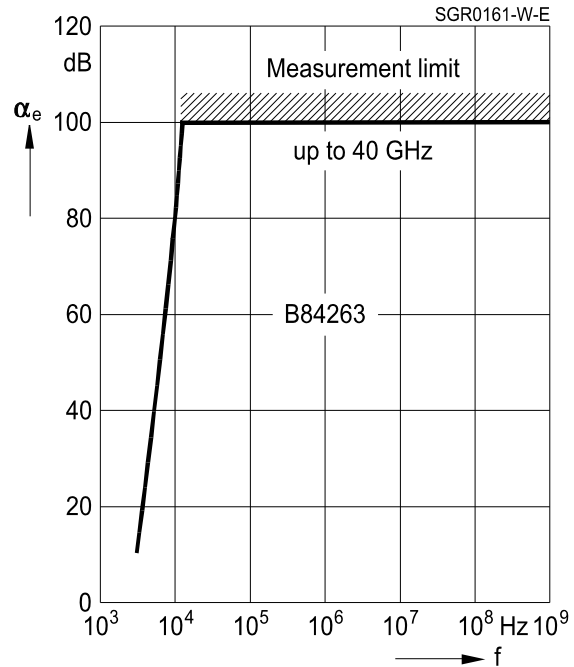


4-line filters



**Insertion loss  $\alpha_e$  (typical values at  $Z = 50 \Omega$ )**

Measurement circuit


 Asymmetrical measurement circuit  
to MIL-STD-220A

**General technical data**

Rated voltage 2-line filters	$V_R$	250	V	Line/line Line/case
Rated voltage 4-line filters	$V_R$	440 250	V V	Line/line Line/case
Rated frequency	$f_R$	50/60	Hz	
Rated current	$I_R$	See characteristics		Referred to +40 °C ambient temperature
Maximum admissible overcurrent	$I_{over}$	75 · $I_R$ for 50 ms 10 · $I_R$ for 1 s 2 · $I_R$ for 1 min 1.4 · $I_R$ for 15 min		
Test voltage	$V_{test}$	1200 VDC, 2 s 1200 VDC, 2 s		Line/line Line/case
Voltage drop/phase	$\Delta V$	<1	%	Of $V_R$ at 50 Hz and $I_R$
Maximum DC resistance	$R_{max}$	See characteristics		Per line

**General technical data (continued)**

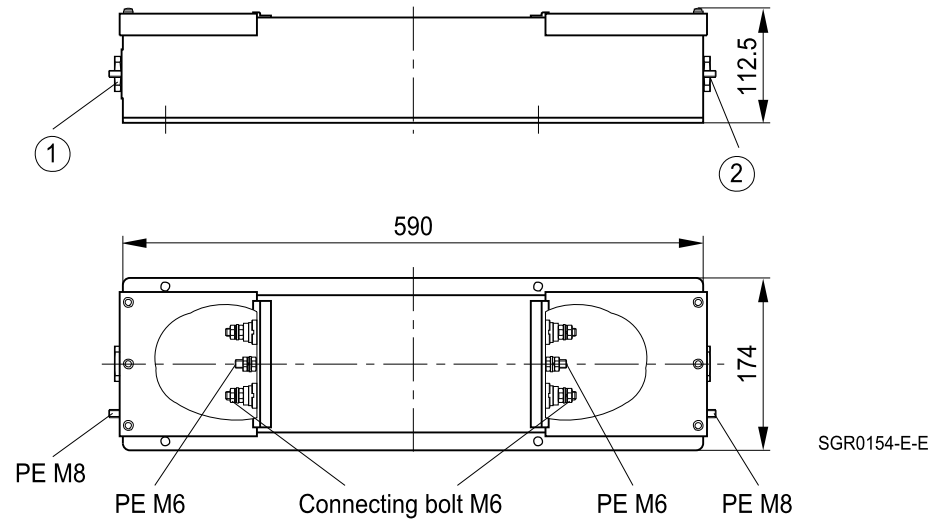
Power dissipation	$P_D$	See characteristics	At rated current $I_R$
Capacitive leakage current	$I_{leak}$	See characteristics	Difference potential N to PE at 50 Hz
Max. permissible harmonic distortion (THD)		8 %	To EN 50160
Permissible ambient temperature	$T_A$	-25/+40 °C	
Climatic category (EN 60068-1)		25/085/56	-25 °C/+85 °C/56 days damp heat test
Mechanical version		C	Cable glands at both ends or flexible connector fitting
		D	Direct connection to shielding wall

**Characteristics and ordering codes**

$I_R$	Mechanical version	$R_{max}$	$P_D$	$I_{leak}$	Dimensional drawing	Page	Approx. weight	Ordering code
A		mΩ	W	mA/V			kg	
<b>2-line filters</b>								
16	C	< 40	< 18	< 2	1	6	8	B84263C0022B013
16	D	< 40	< 18	< 2	2	7	8	B84263D0022B013
40	C	< 20	< 60	< 2.5	3	8	18	B84263C0023B013
40	D	< 20	< 60	< 2.5	4	9	18	B84263D0023B013
<b>4-line filters</b>								
16	C	< 80	< 60	< 2	5	10	25	B84263C1160E003
16	D	< 80	< 60	< 2	6	11	25	B84263D1160E003
40	C	< 30	< 140	< 2.5	7	12	27	B84263C1400E003
40	D	< 30	< 140	< 2.5	8	13	27	B84263D1400E003
100	C	< 6	< 70	< 2.5	9	14	50	B84263C1101E003
100	D	< 6	< 180	< 2.5	10	15	50	B84263D1101E003

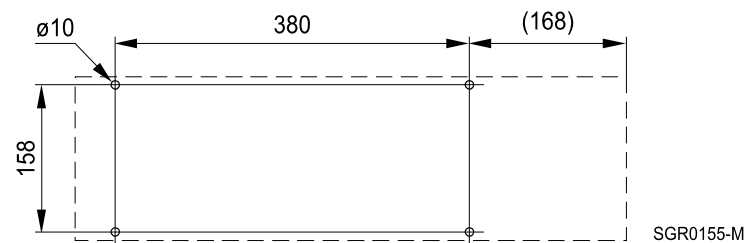
**Dimensional drawings**
**Dimensional drawing 1 (cable glands at both ends)**
**2 x 16 A**

B84263C0022B013



- ① Input end: Cable gland PG 21 (mounted)
- ② Shielded end: Cable gland PG 29/21  
(cable gland PG 29, PG 21 and reducer ring in accessory bag)

Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


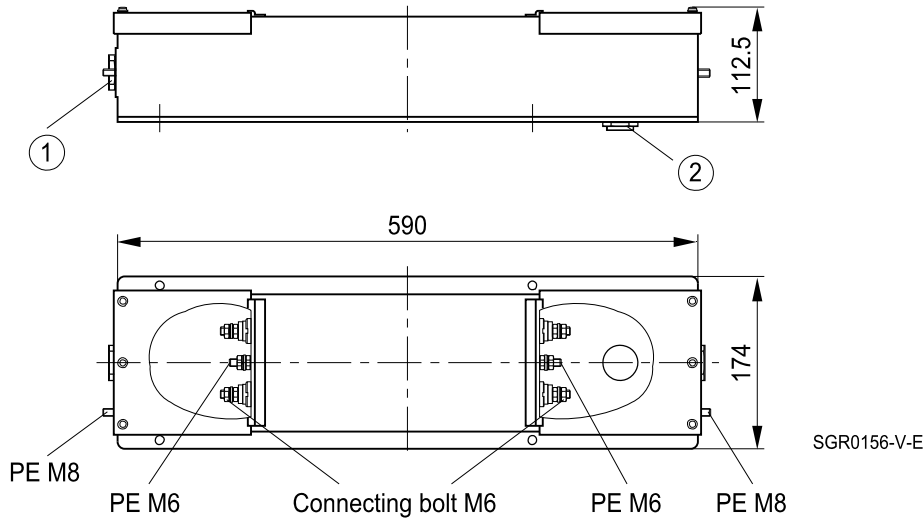
The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm
PG 21	9 to 11 mm	12 to 14 mm	15 to 17 mm	18 to 20 mm

RF-tight connection to shielding wall with connector fitting, see page 16.

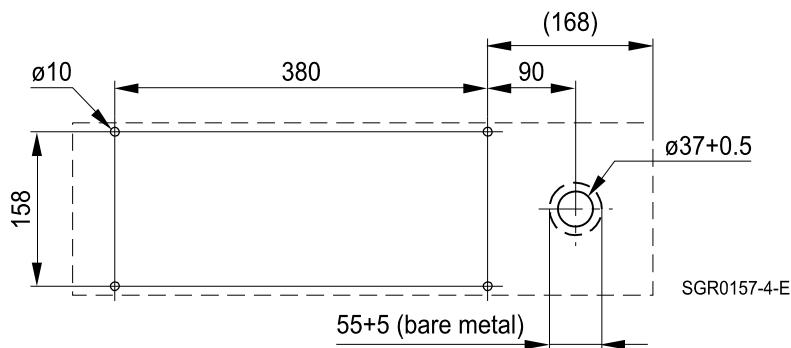
**Dimensional drawing 2 (direct connection to shielding wall)**
**2 x 16 A**

B84263D0022B013



- ① Input end: Cable gland PG 21 (mounted)
- ② Shielded end: Cable gland PG 29/21  
(cable gland PG 29, PG 21 and reducer ring in accessory bag)

Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


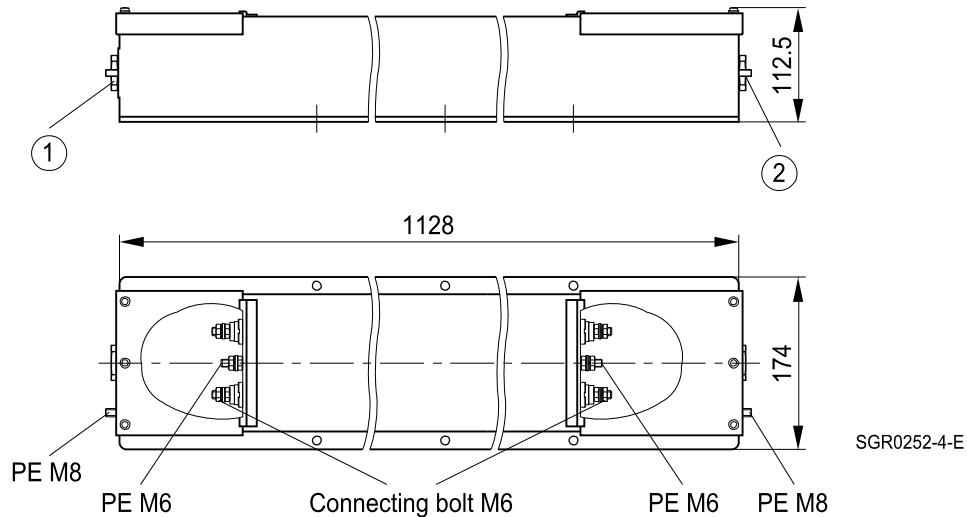
The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm
PG 21	9 to 11 mm	12 to 14 mm	15 to 17 mm	18 to 20 mm

RF-tight connection to shielding wall, see page 16.

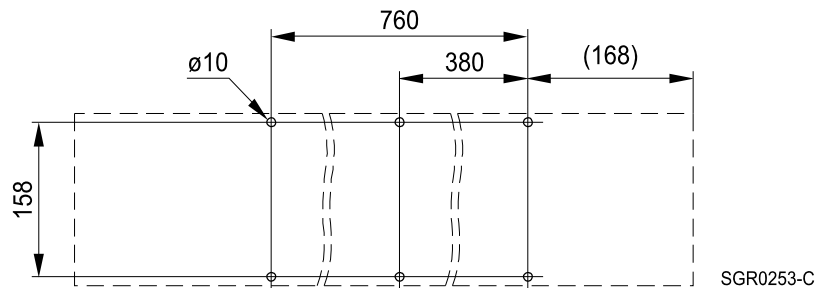
**Dimensional drawing 3 (cable glands at both ends)**
**2 x 40 A**

B84263C0023B013



- ① Input end: Cable gland PG 21 (mounted)
- ② Shielded end: Cable gland PG 29/21  
(cable gland PG 29, PG 21 and reducer ring in accessory bag)

Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

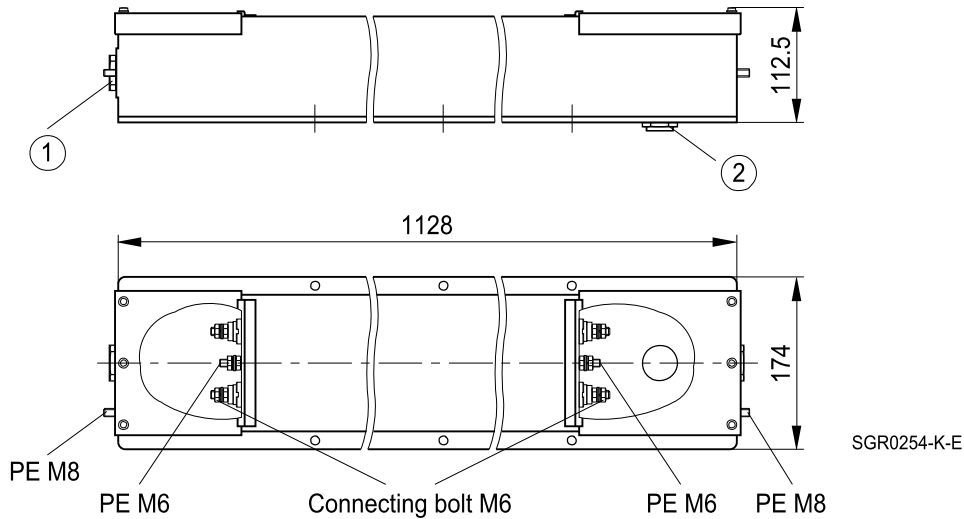
PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm
PG 21	9 to 11 mm	12 to 14 mm	15 to 17 mm	18 to 20 mm

RF-tight connection to shielding wall with connector fitting, see page 16.

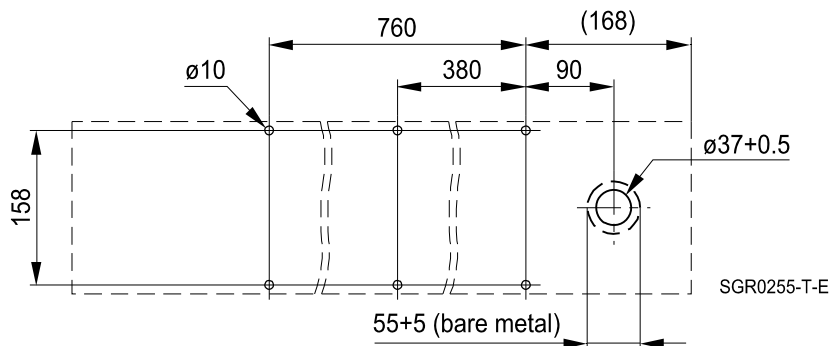


**Dimensional drawing 4 (direct connection to shielding wall)**
**2 x 40 A**

B84263D0023B013



- ① Input end: Cable gland PG 21 (mounted)
  - ② Shielded end: Cable gland PG 29/21  
(cable gland PG 29, PG 21 and reducer ring in accessory bag)
- Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


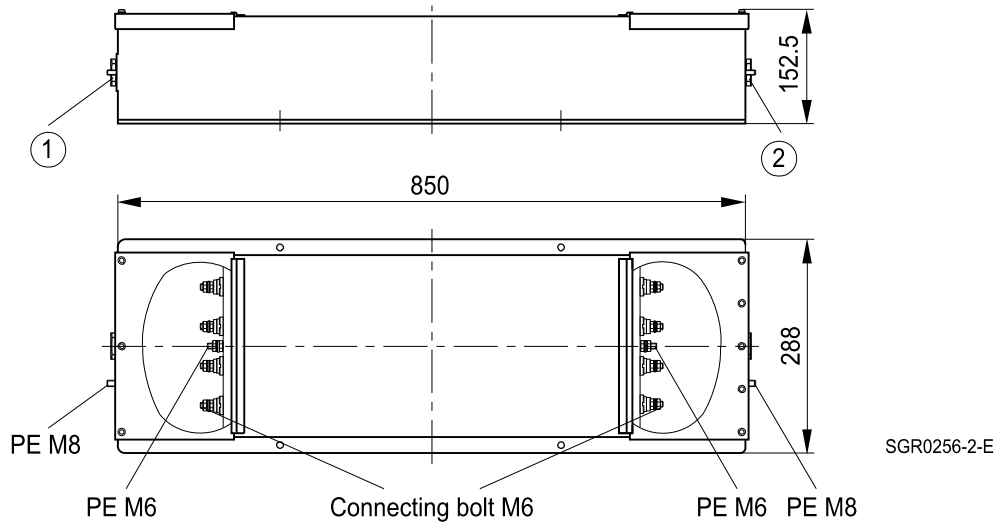
The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm
PG 21	9 to 11 mm	12 to 14 mm	15 to 17 mm	18 to 20 mm

RF-tight connection to shielding wall, see page 16.

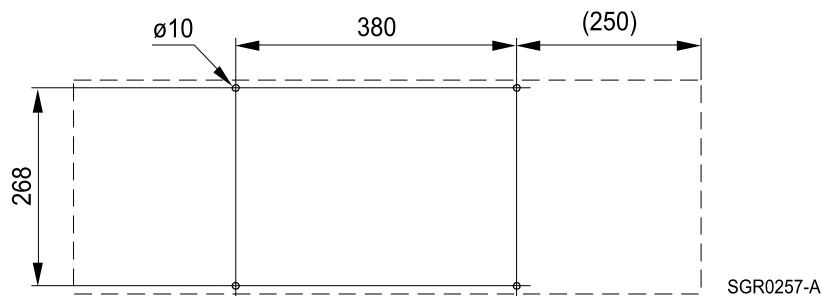
**Dimensional drawing 5 (cable glands at both ends)**
**4 x 16 A**

B84263C1160E003



- ① Input end: Cable gland PG 29/21  
(PG 29 mounted, PG 21 and reducer ring in accessory bag)
- ② Shielded end: Cable gland PG 29/21  
(cable gland PG 29, PG 21 and reducer ring in accessory bag)

Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


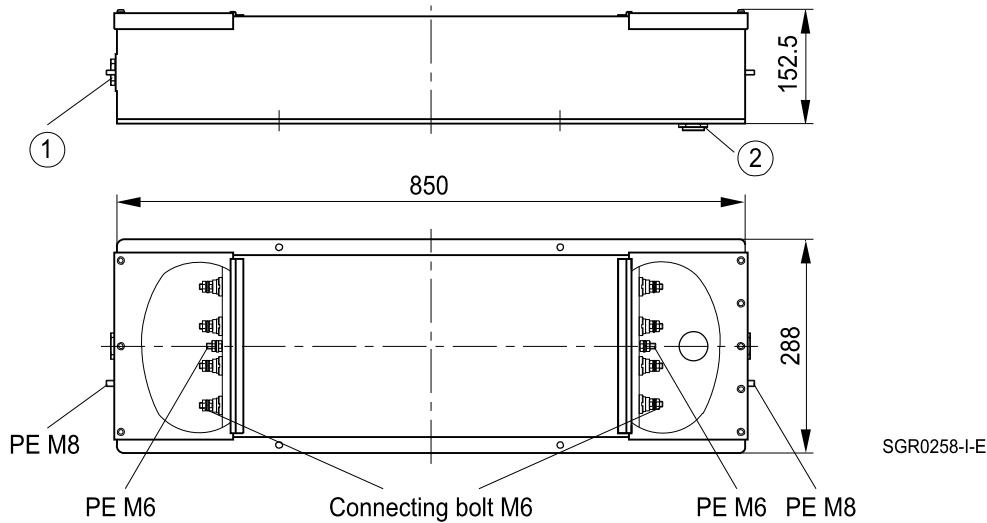
The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm
PG 21	9 to 11 mm	12 to 14 mm	15 to 17 mm	18 to 20 mm

RF-tight connection to shielding wall with connector fitting, see page 16.

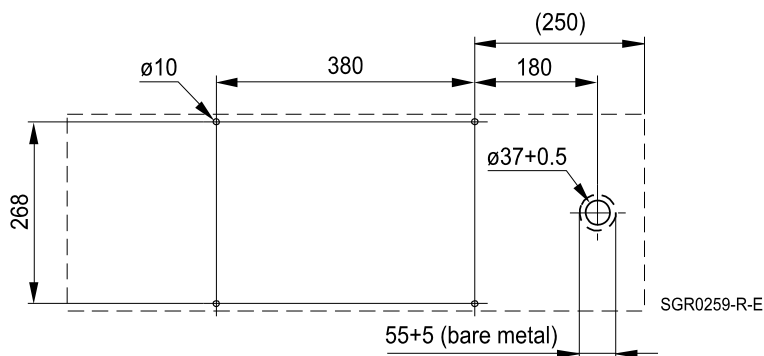
**Dimensional drawing 6 (direct connection to shielding wall)**
**4 x 16 A**

B84263D1160E003



- ① Input end: Cable gland PG 29/21  
(PG 29 mounted, PG 21 and reducer ring in accessory bag)
- ② Shielded end: Cable gland PG 29/21  
(cable gland PG 29, PG 21 and reducer ring in accessory bag)

Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


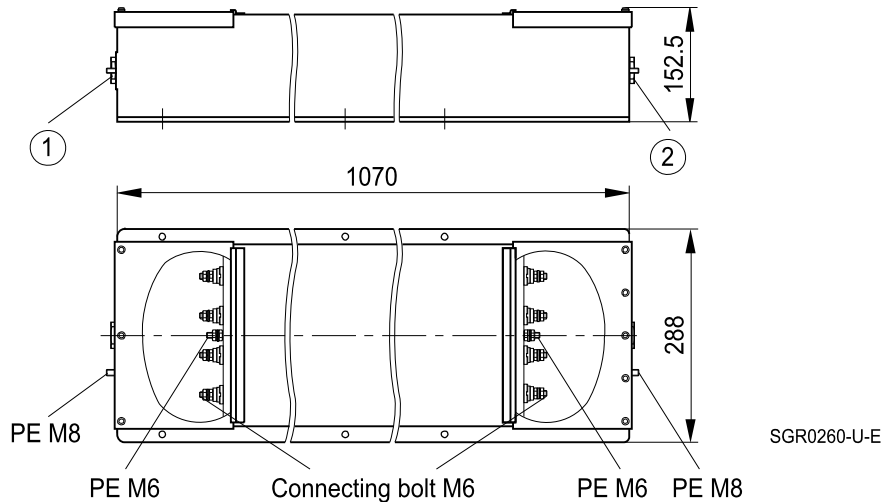
The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm
PG 21	9 to 11 mm	12 to 14 mm	15 to 17 mm	18 to 20 mm

RF-tight connection to shielding wall, see page 16.

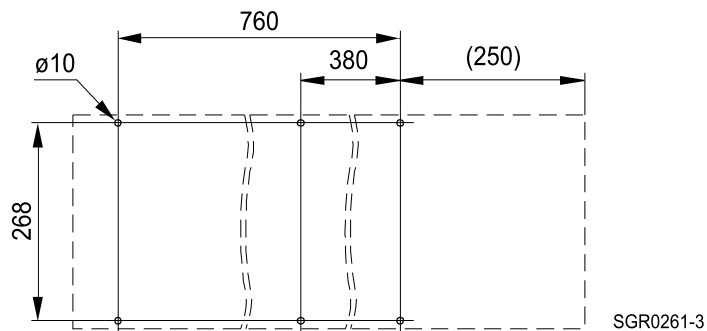
**Dimensional drawing 7 (cable glands at both ends)**
**4 x 40 A**

B84263C1400E003



- ① Input end: Cable gland PG 29/21  
(PG 29 mounted, PG 21 and reducer ring in accessory bag)
- ② Shielded end: Cable gland PG 29/21  
(cable gland PG 29, PG 21 and reducer ring in accessory bag)

Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


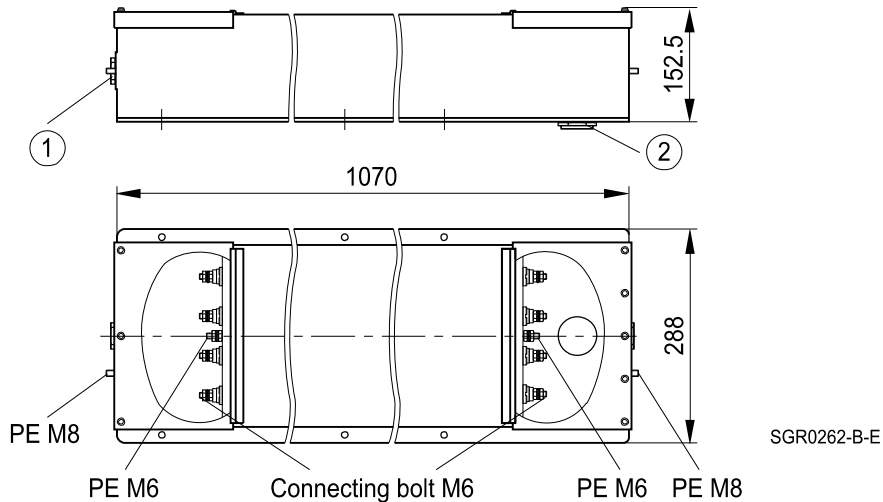
The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm
PG 21	9 to 11 mm	12 to 14 mm	15 to 17 mm	18 to 20 mm

RF-tight connection to shielding wall with connector fitting, see page 16.

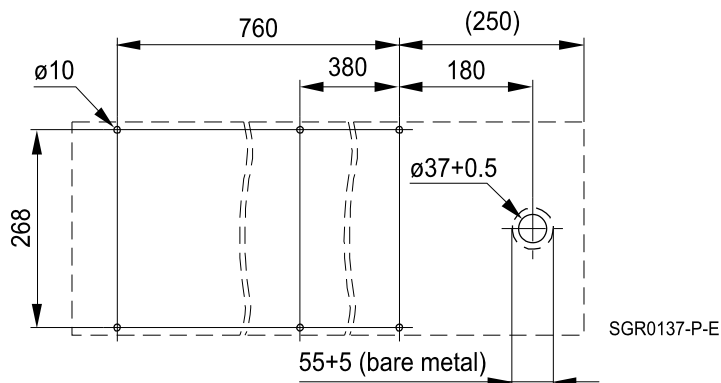
**Dimensional drawing 8 (direct connection to shielding wall)**
**4 x 40 A**

B84263D1400E003



- ① Input end: Cable gland PG 29/21  
(PG 29 mounted, PG 21 and reducer ring in accessory bag)
- ② Shielded end: Cable gland PG 29/21  
(cable gland PG 29, PG 21 and reducer ring in accessory bag)

Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


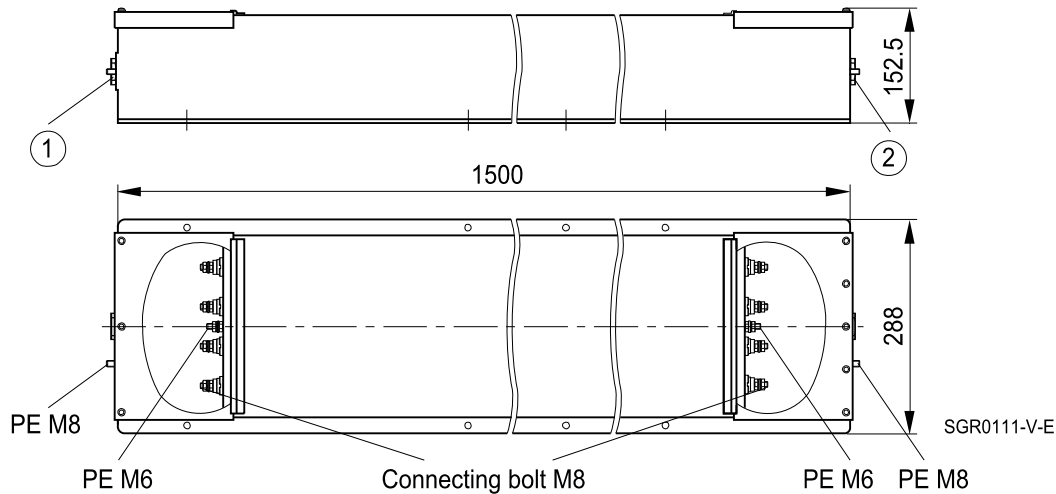
The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm
PG 21	9 to 11 mm	12 to 14 mm	15 to 17 mm	18 to 20 mm

RF-tight connection to shielding wall, see page 16.

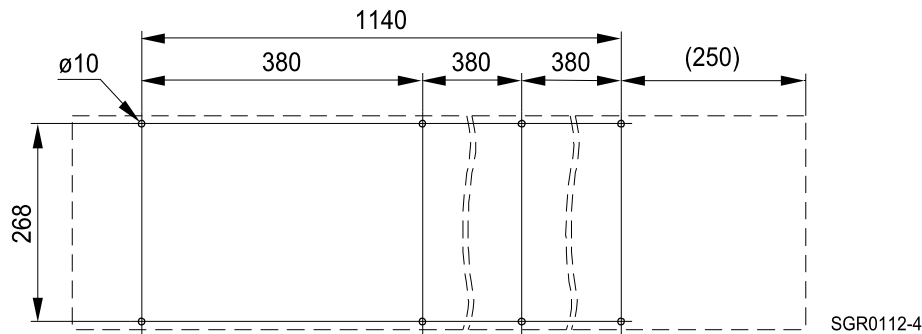
**Dimensional drawing 9 (cable glands at both ends)**
**4 x 100 A**

B84263C1101E003



- ① Input end: Cable gland PG 42/29  
(PG 42 mounted, PG 29 and reducer ring in accessory bag)
- ② Shielded end: Cable gland PG 42/29  
(cable gland PG 42, PG 29 and reducer ring in accessory bag)

Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


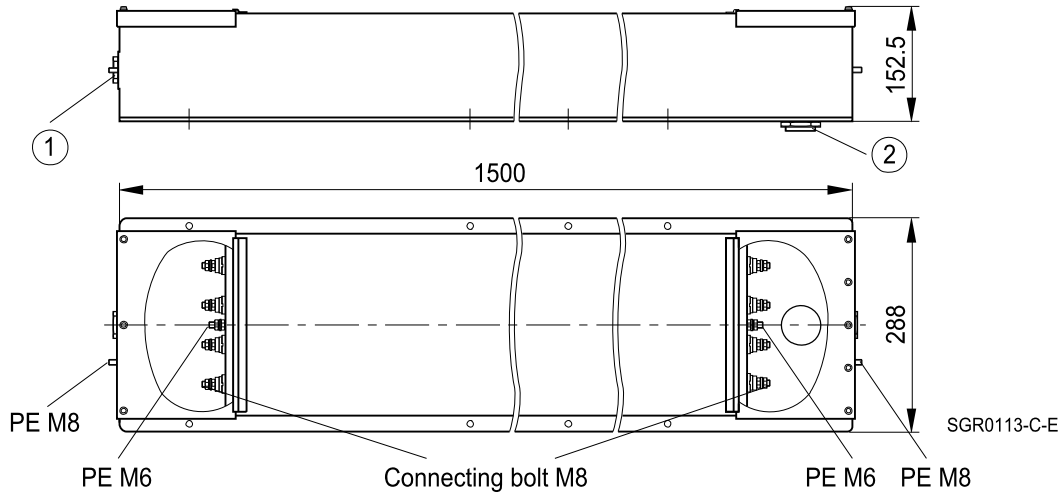
The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

PG 42	29 to 31 mm	32 to 34 mm	35 to 37 mm	38 to 40 mm
PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm

RF-tight connection to shielding wall with connector fitting, see page 16.

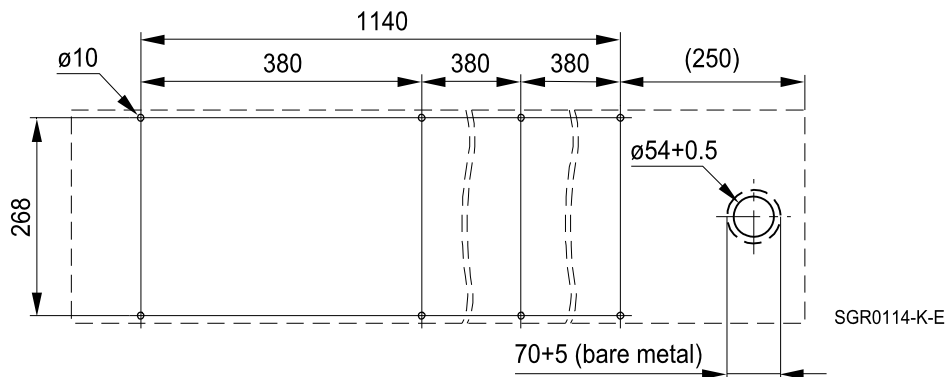
**Dimensional drawing 10 (direct connection to shielding wall)**
**4 x 100 A**

B84263D1101E003



- ① Input end: Cable gland PG 42/29  
(PG 42 mounted, PG 29 and reducer ring in accessory bag)
- ② Shielded end: Cable gland PG 42/29  
(cable gland PG 42, PG 29 and reducer ring in accessory bag)

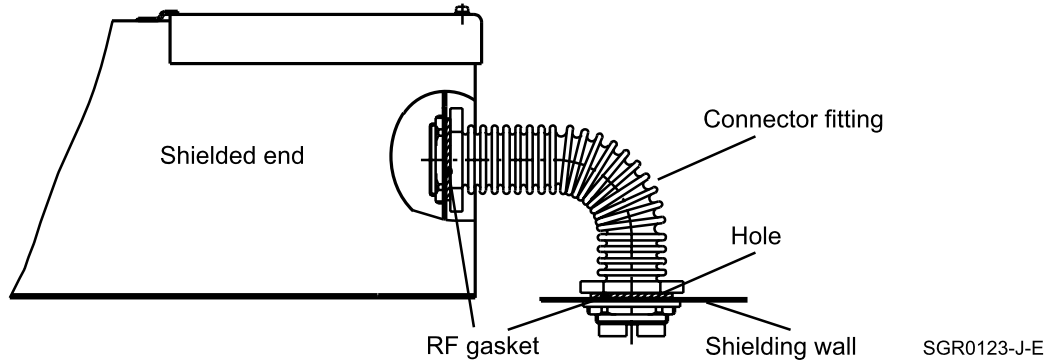
Paint color: RAL 7035 (light gray, semigloss)

**Fixing dimensions**


The cable glands (with cutout sealing ring) are suitable for the following overall cable diameter:

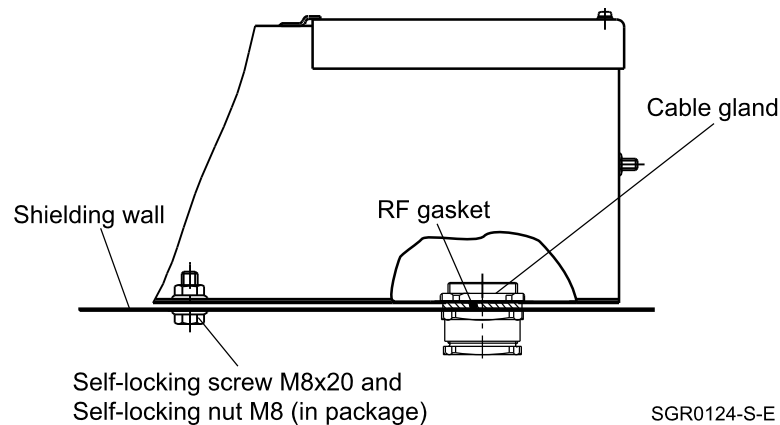
PG 42	29 to 31 mm	32 to 34 mm	35 to 37 mm	38 to 40 mm
PG 29	17 to 19 mm	20 to 22 mm	23 to 25 mm	26 to 28 mm

RF-tight connection to shielding wall, see page 16.

**RF-tight connection to shielding wall with connector fitting (mechanical version C)**


Cable gland	Connector fitting (must be ordered separately)	Ordering code	Hole in shielding wall	Bare metal area on shielding wall
PG 29	Nominal width 25 mm	B84298A0042L***	∅ 37 +0.5 mm	∅ 55 +5 mm
PG 42	Nominal width 40 mm	B84298A0044L***	∅ 54 +0.5 mm	∅ 70 +5 mm

(\*\*\*: add required length in cm (see also chapter "Installation accessories").

**RF-tight connection to shielding wall (mechanical version D)**


Cable gland	Parts for RF-tight mounting (in accessory bag)	Required hole in shielding wall	Bare metal area on shielding wall
PG 21	Suitable cable gland with long thread, RF gasket and check nut.	∅ 37 +0.5 mm	∅ 55 +5 mm
PG 29		∅ 54 +0.5 mm	∅ 70 +5 mm
PG 42			