



## **Filters for shielded rooms**

250/440 V, 63 ... 250 A

**Series/Type:**            **B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Date:**                    2017-02-02

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## Filters for shielded rooms

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B84299\*1\*B/E001 / B84299\*1\*B/E003

### 2- and 4-line-filters 63 to 250 A

#### Multi-stage

#### Stopband attenuation:

- B84299\*1\*B/E001: 150kHz to 40 GHz

- B84299\*1\*B/E003: 14 kHz to 40 GHz



#### Features

- General-purpose use through design with separate lines without intercoupling
- Use of single chokes. Thus the insertion loss values are not reduced under all operating current conditions and not when operated with artificial mains networks (AMN) or other equipment with high leakage currents
- Insertion loss to EN 55017

#### Design

The electrical components are incorporated in an RF-tight case of stainless 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 have 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.

#### 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.

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**Technical data and measuring conditions**

Rated voltage 2-line filters	$V_{R [L-PE / L-L]}$	250 V
Rated voltage 4-line filters	$V_{R [L-PE / L-L]}$	250/440 V
Rated frequency	$f_R$	50/60 Hz
Rated current	$I_R$	See characteristics
Power dissipation	$P_D$	See characteristics
Test voltage line to line	$V_{test}$	1200 V DC / 2 sec.
Test voltage line to case	$V_{test}$	1200 V DC / 2 sec.
Rated temperature	$T_R$	40 °C
Overload capability (thermal)	$I_{over}$	75 x $I_R$ for 50 ms 10 x $I_R$ for 1 s 2 x $I_R$ for 1 min 1.4 x $I_R$ for 15 min
Leakage current (IEC 60939-1: 2010, Annex A)	$I_{Leak}$	See characteristics
Capacitive reactive current/line	$I_{reactive}$	See characteristics
Max. permissible harmonic distortion (THD)	$THD_{max}$	8 % acc. EN 50160
Climatic category (IEC 60068-1: 1992)		25/085/56
Permissible ambient temperature		-25 ... +40 °C
Degree of protection (IEC 60529: 2013)		IP 20
Max. DC resistance	$R_{DC}$	See characteristics

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**Characteristics and ordering codes**

I <sub>R</sub> A	Mech. version	Attenuation diagram	R <sub>DC</sub> mΩ	P <sub>D</sub> W	I <sub>reactive</sub> A	I <sub>leak</sub> mA	Dimensional drawing	Circuit diagram	Appr. weight kg	Ordering code
<b>2-line filters</b>										
63	C	1	3.5	30	1.1	1100	1	1	18	B84299C1630B001
	D						2			B84299D1630B001
	C	3	8.0	60	4.9	4900	3	3	39	B84299C1630B003
	D						4			B84299D1630B003
100	C	1	2.0	40	1.1	1100	1	1	18	B84299C1101B001
	D						2			B84299D1101B001
	C	3	4.0	80	6.5	6500	5	5	51	B84299C1101B003
	D						6			B84299D1101B003
<b>4-line filters</b>										
63	C	1	3.5	45	1.1	115	7	2	30	B84299C1630E001
	D						8			B84299D1630E001
	C	3	8.0	90	4.9	510	9	4	45	B84299C1630E003
	D						10			B84299D1630E003
100	C	1	2.0	60	1.1	115	7	2	32	B84299C1101E001
	D						8			B84299D1101E001
	C	3	4.0	120	6.5	675	11	6	72	B84299C1101E003
	D						12			B84299D1101E003
150	C	1	0.8	55	1.6	165	13	4	40	B84299C1151E001
	D						14			B84299D1151E001
	C	3	2.0	135	6.5	675	15	6	100	B84299C1151E003
	D						16			B84299D1151E003
250	C	1	0.3	60	1.2	130	17	7	52	B84299C1251E001
	D						18			B84299D1251E001
	C	2	0.5	95	1.6	160	19	8	68	B84299C1251E003
	D						20			B84299D1251E003

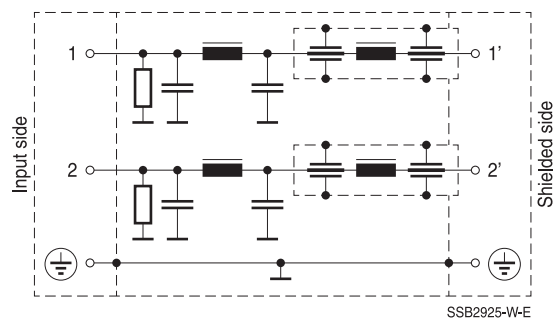
## Filters for shielded rooms

250/440 V, 63 ... 250 A

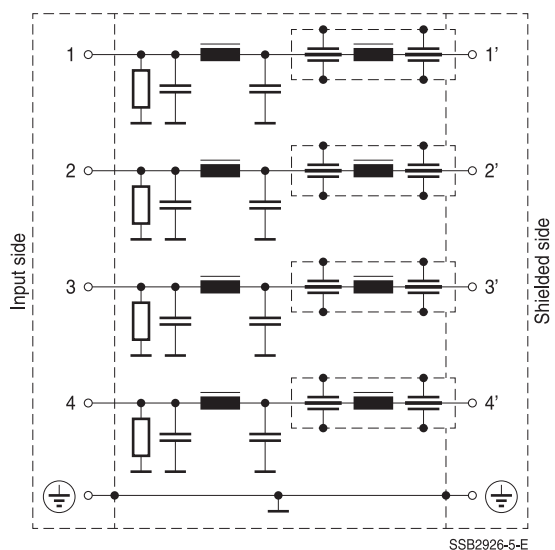
B84299\*1\*B/E001 / B84299\*1\*B/E003

### Typical circuit diagrams

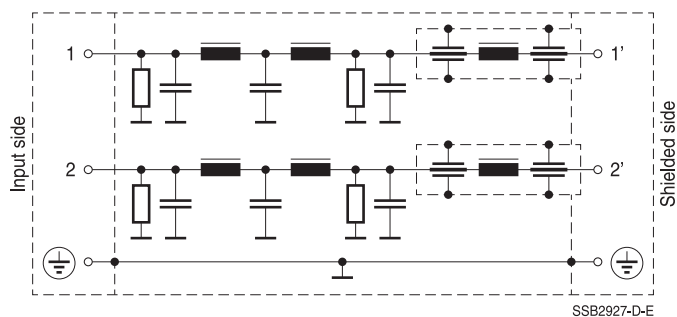
**Circuit diagram 1: 2 line filters 63A/100A with 100 dB from 150 kHz**



**Circuit diagram 2: 4 line filters 63A/100A with 100 dB from 150 kHz**



**Circuit diagram 3: 2 line filters 63A with 100 dB from 14 kHz**

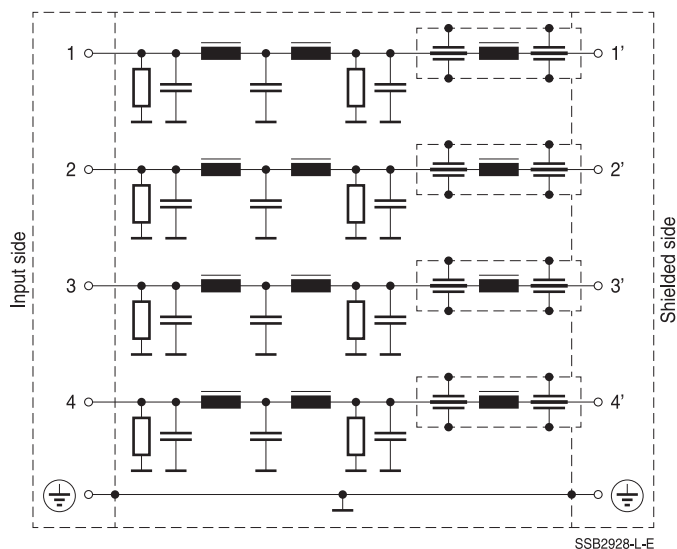


## Filters for shielded rooms

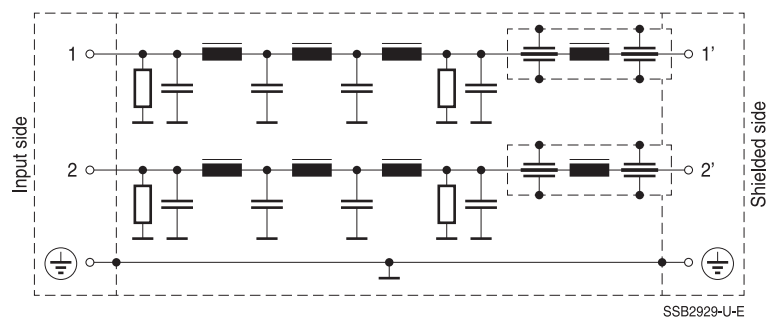
250/440 V, 63 ... 250 A

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**Circuit diagram 4: 4 line filter 63A with 100 dB from 14 kHz and filters 150A with 100 dB at 150 kHz**



**Circuit diagram 5: 2 line filters 100A with 100 dB from 14 kHz**

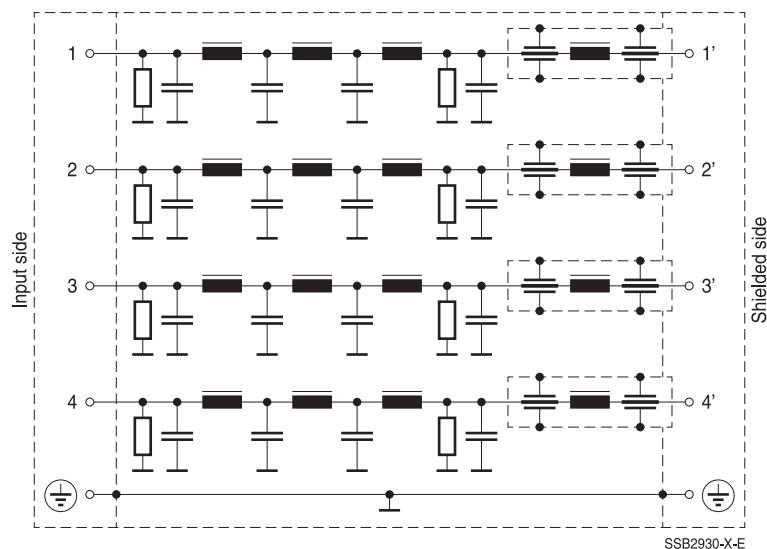


## Filters for shielded rooms

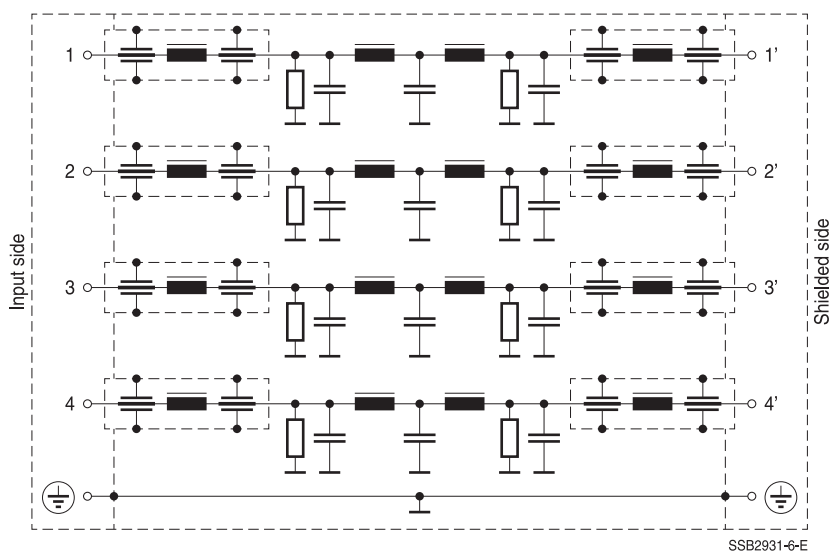
250/440 V, 63 ... 250 A

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**Circuit diagram 6: 4 line filters 100A and 150A with 100 dB from 14 kHz**



**Circuit diagram 7: 4 line filters 250A with 100 dB from 150 kHz**

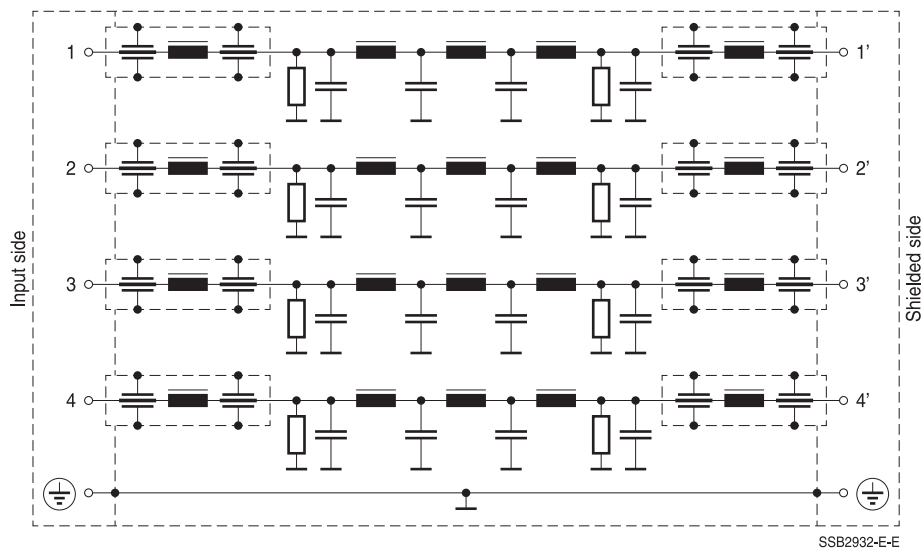


**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

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**Circuit diagram 8: 4 line filters 250A with 100 dB from 110 kHz**



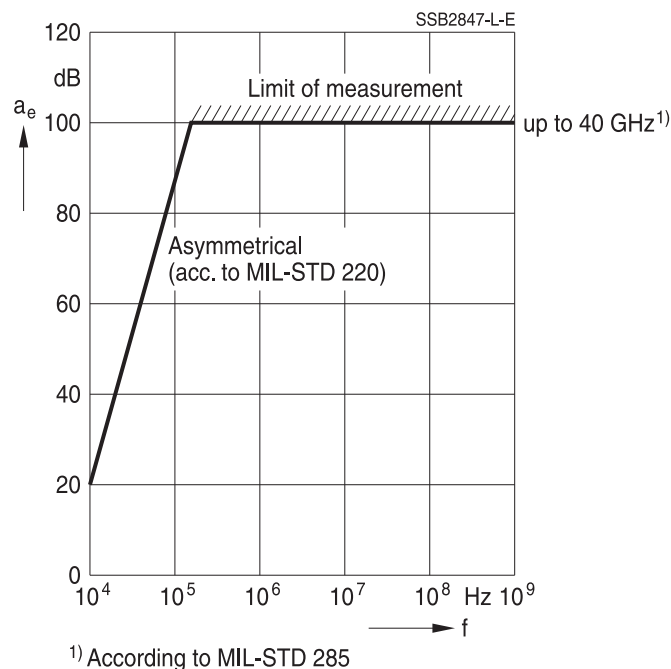
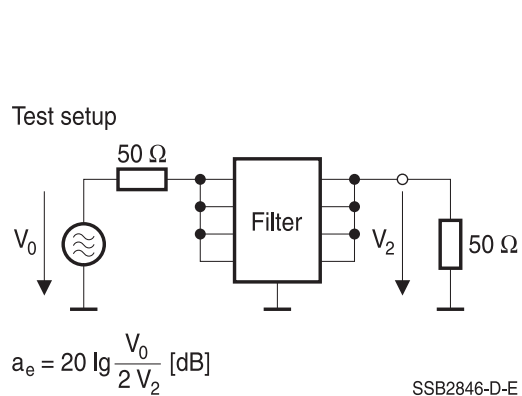


## Filters for shielded rooms

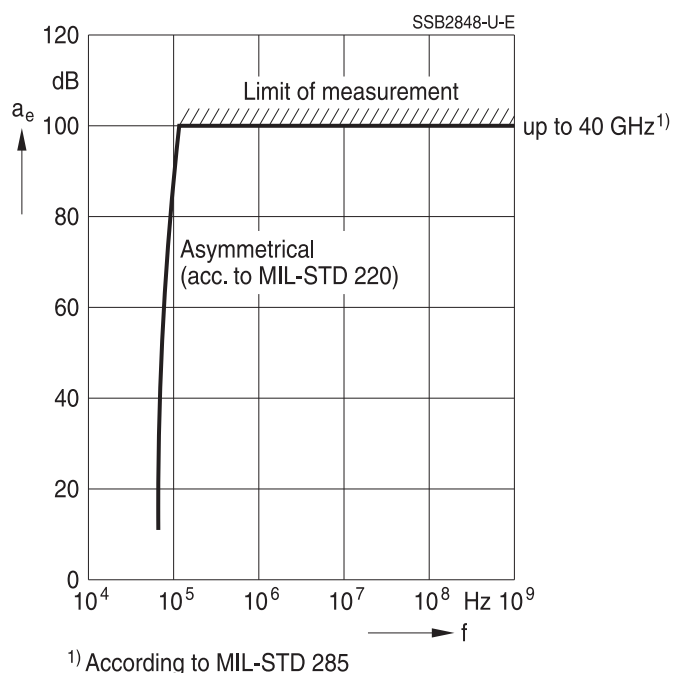
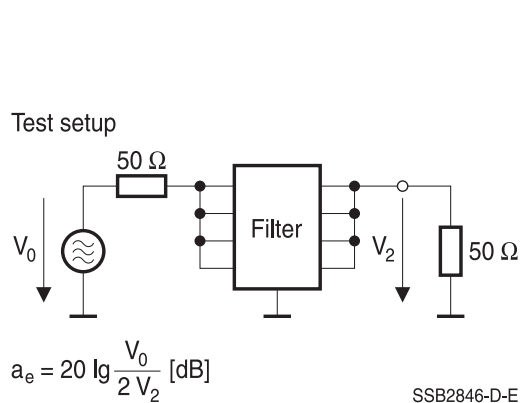
250/440 V, 63 ... 250 A

B84299\*1\*B/E001 / B84299\*1\*B/E003

### Attenuation diagram 1: Filters with 100dB from 150 kHz up to 40 GHz Insertion loss $a_e$ as a function of frequency $f$ (typical values at $Z = 50 \text{ Ohm}$ )

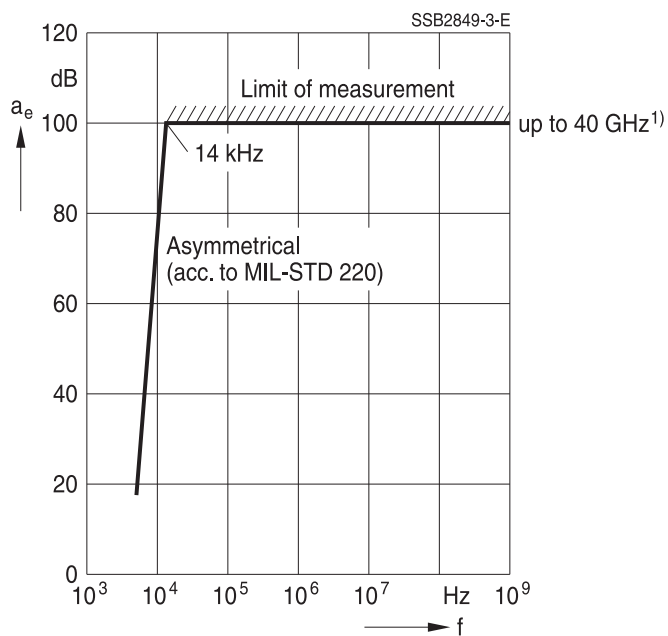
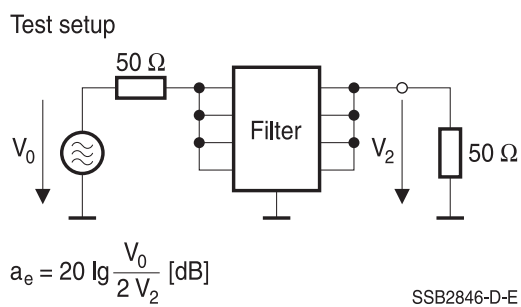


### Attenuation diagram 2: Filters with 100dB from 110 kHz up to 40 GHz Insertion loss $a_e$ as a function of frequency $f$ (typical values at $Z = 50 \text{ Ohm}$ )



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**Attenuation diagram 3: Filters with 100dB from 14 kHz up to 40 GHz**  
**Insertion loss  $a_e$  as a function of frequency  $f$  (typical values at  $Z = 50 \text{ Ohm}$ )**



<sup>1)</sup> According to MIL-STD 285

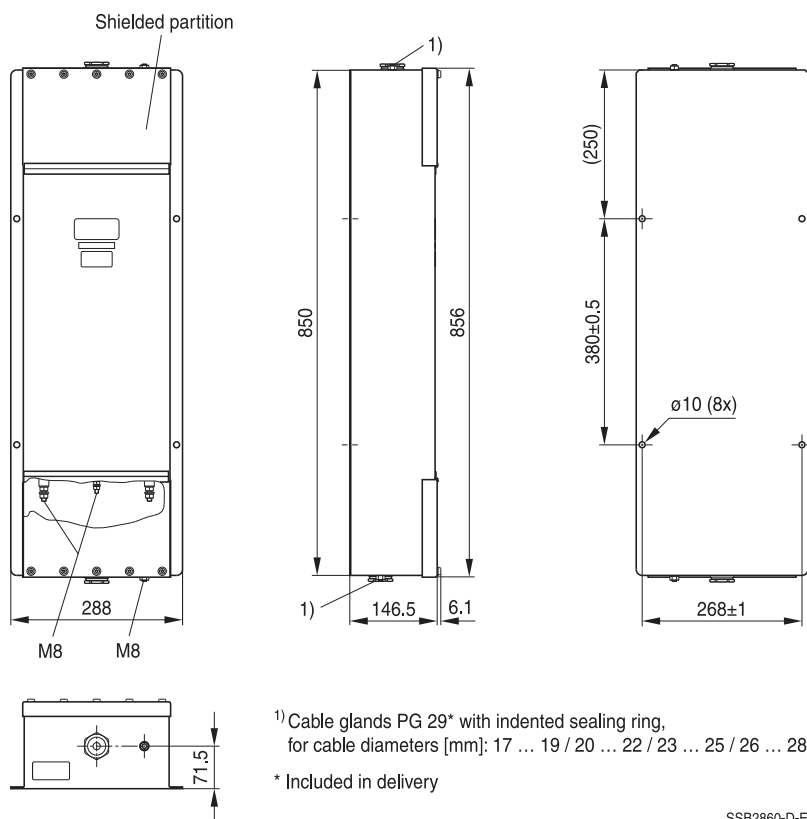
## Filters for shielded rooms

250/440 V, 63 ... 250 A

B84299\*1\*B/E001 / B84299\*1\*B/E003

### Dimensional drawings

**Drawing 1 - B84299C1630B001 (2x63A), B84299C1101B001 (2x100A)**

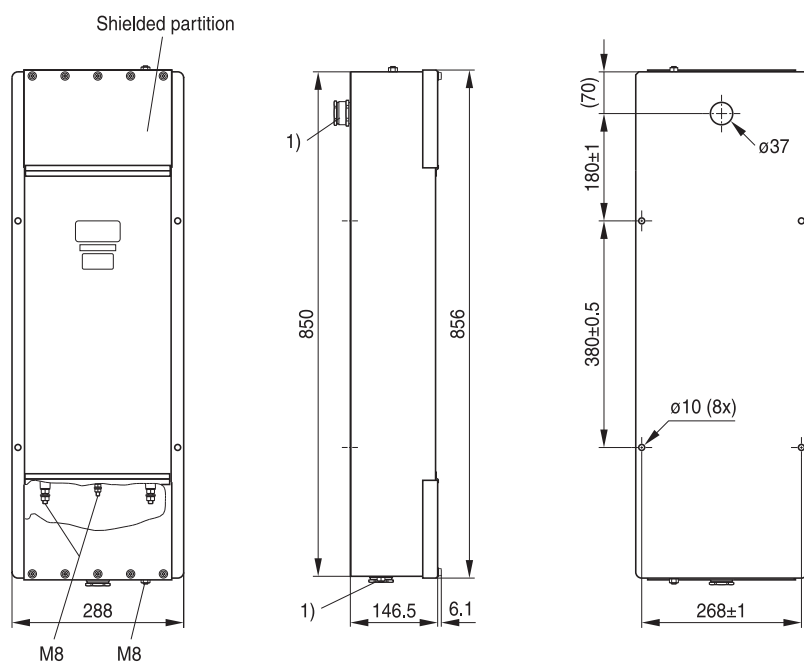


**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 2 - B84299D1630B001 (2x63A), B84299D1101B001 (2x100A)**



<sup>1)</sup> Cable glands PG 29\* with indented sealing ring,  
for cable diameters [mm]: 17 ... 19 / 20 ... 22 / 23 ... 25 / 26 ... 28

\* Included in delivery

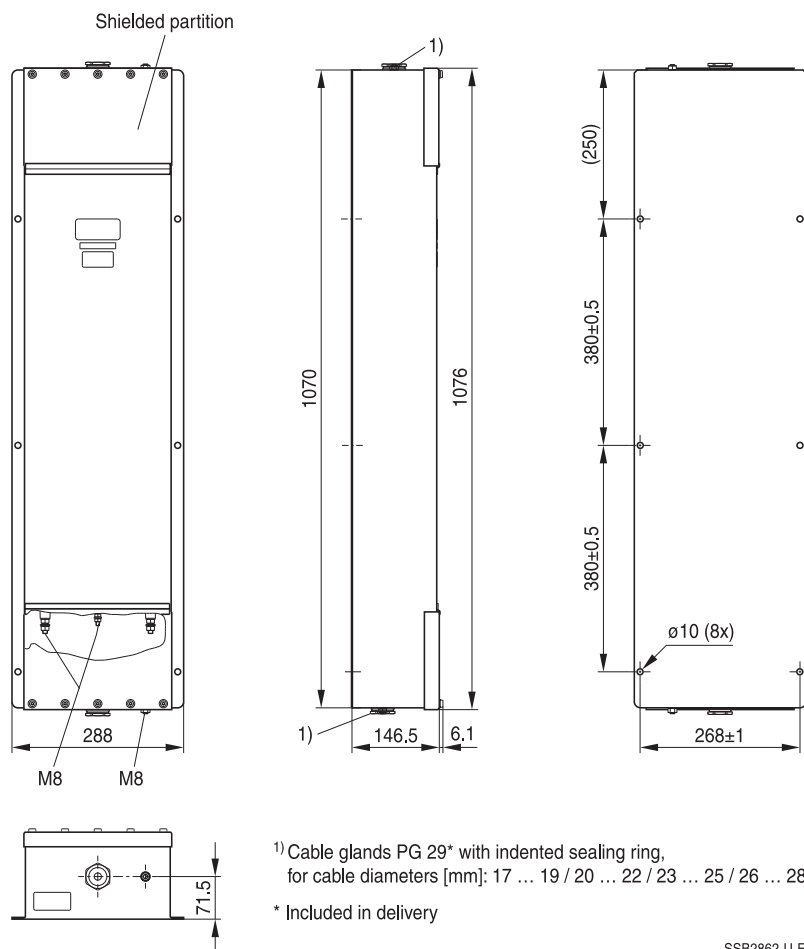
SSB2861-L-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 3 - B84299C1630B003 (2x63A)**



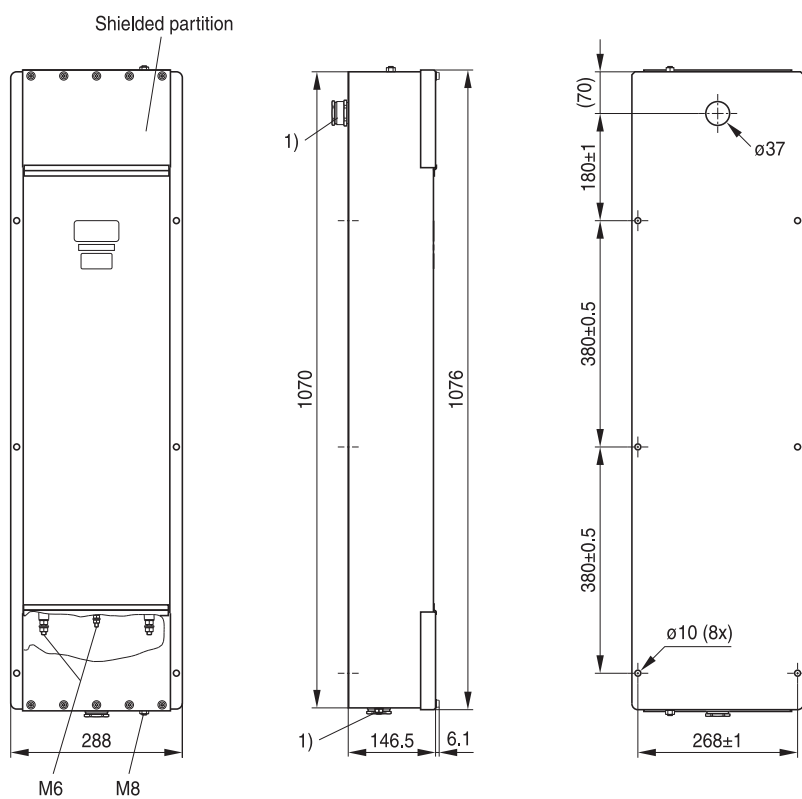
SSB2862-U-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 4 - B84299D1630B003 (2x63A)**



<sup>1)</sup> Cable glands PG 29\* with indented sealing ring,  
for cable diameters [mm]: 17 ... 19 / 20 ... 22 / 23 ... 25 / 26 ... 28

\* Included in delivery

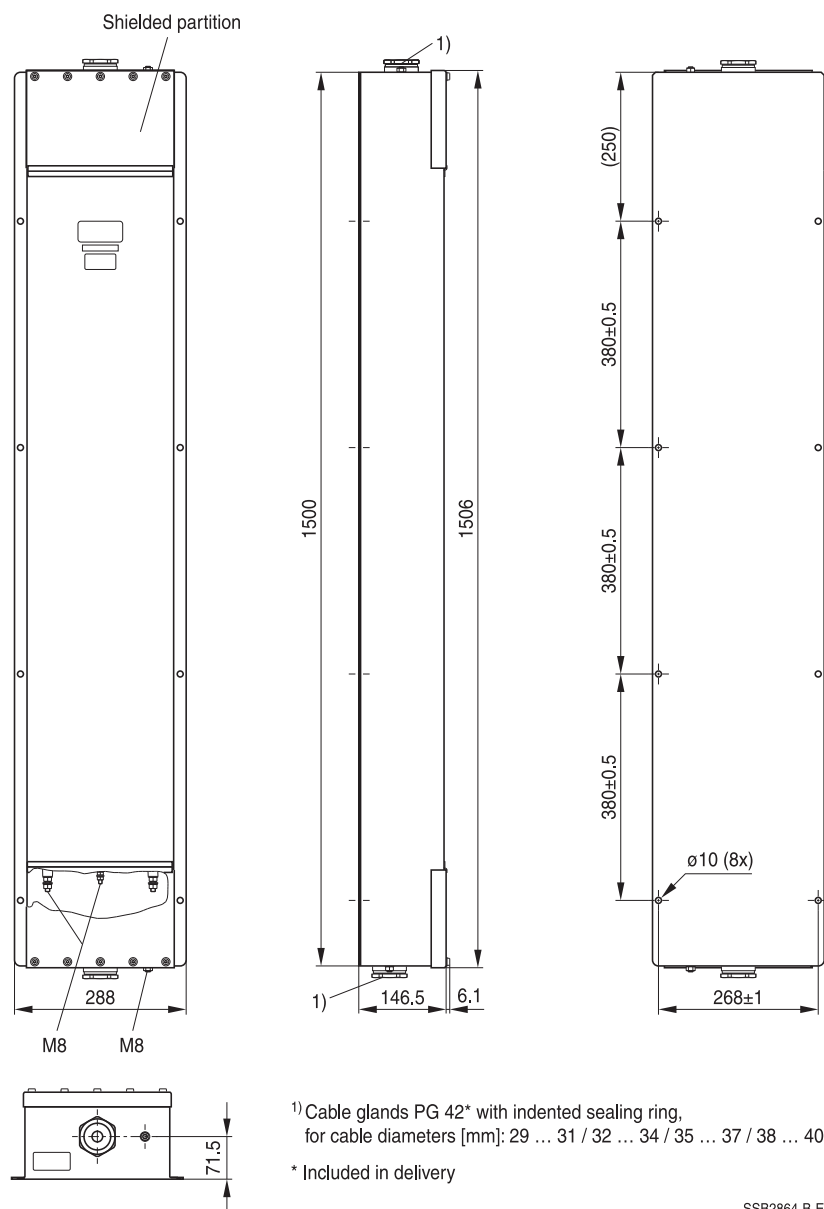
SSB2863-3-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 5 - B84299C1101B003 (2x100A)**

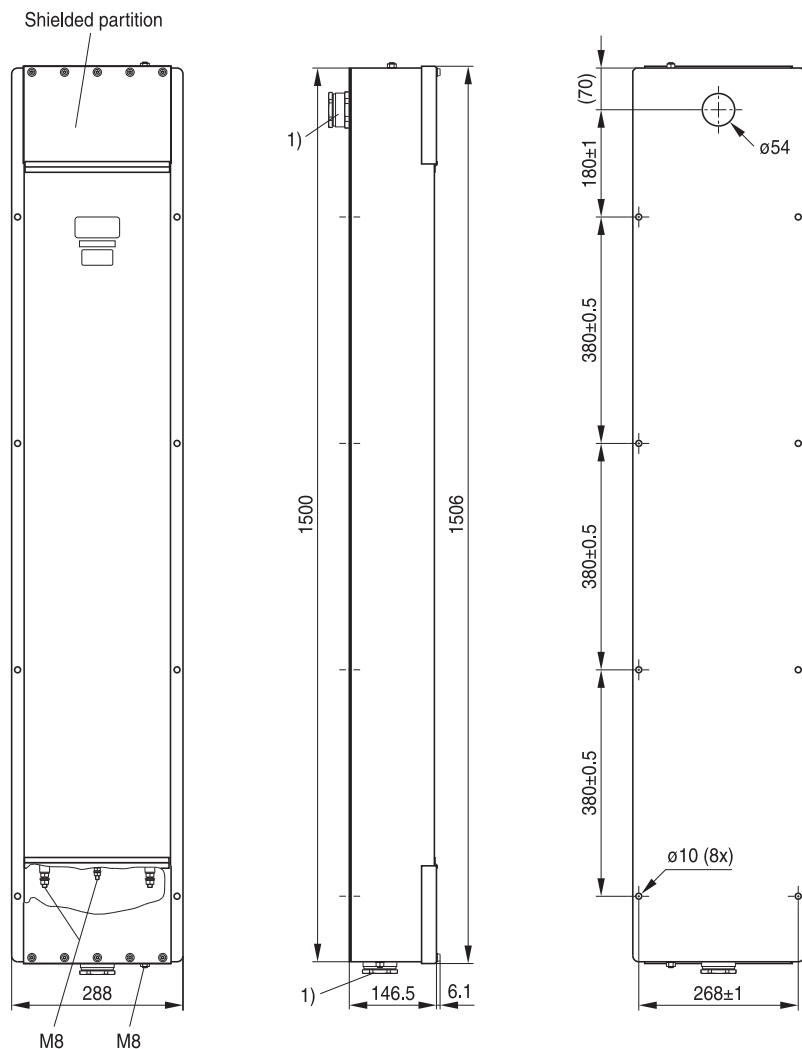


**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 6 - B84299D1101B003 (2x100A)**



<sup>1)</sup> Cable glands PG 42\* with indented sealing ring,  
for cable diameters [mm]: 29 ... 31 / 32 ... 34 / 35 ... 37 / 38 ... 40

\* Included in delivery

SSB2865-J-E

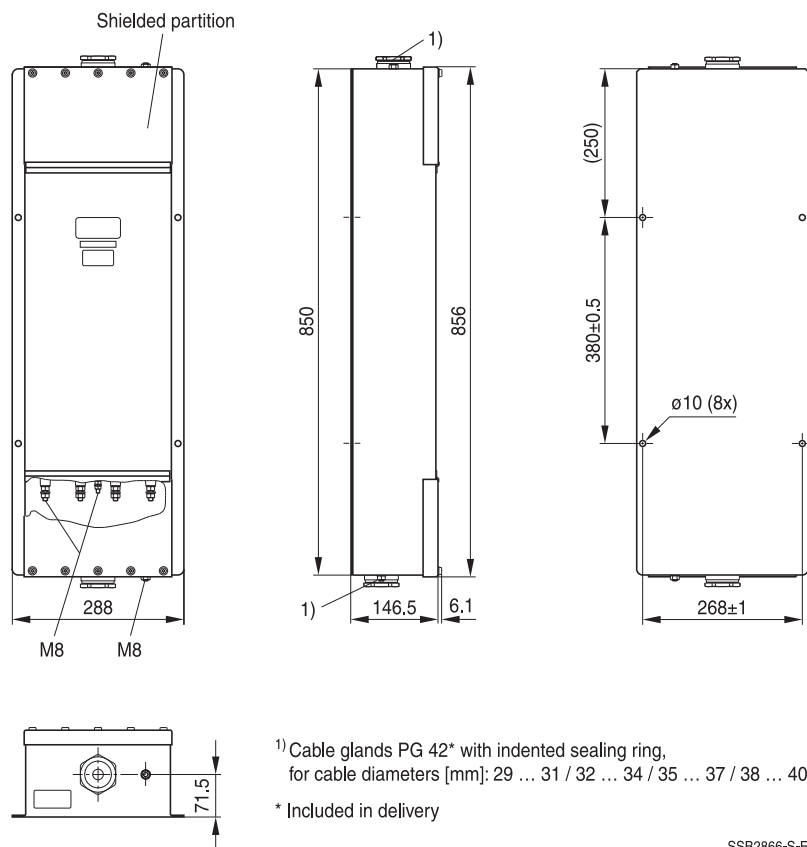


**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 7 - B84299C1630E001 (4x63A), B84299C1101E001 (4x100A)**

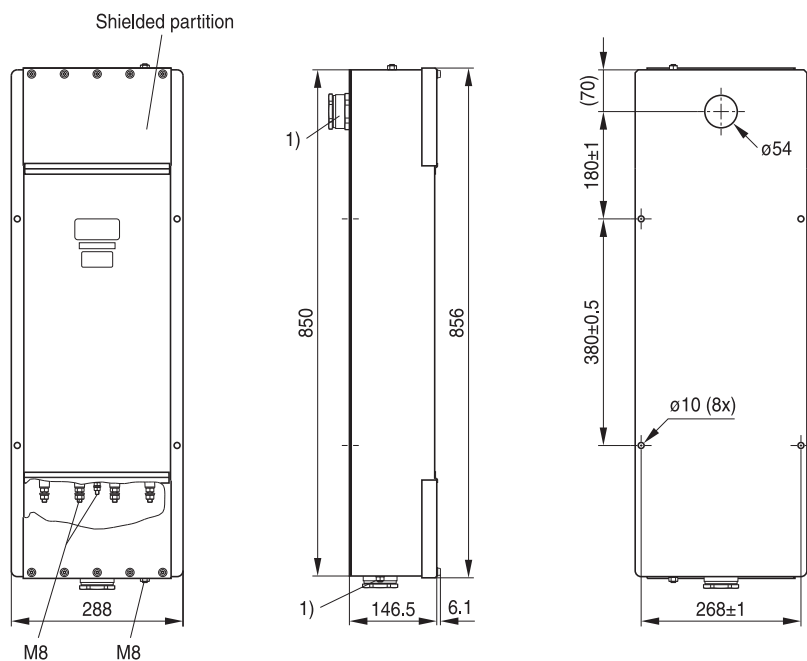


**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 8 - B84299D1630E001 (4x63A), B84299D1101E001 (4x100A)**



<sup>1)</sup> Cable glands PG 42\* with indented sealing ring, for cable diameters [mm]: 29 ... 31 / 32 ... 34 / 35 ... 37 / 38 ... 40

\* Included in delivery

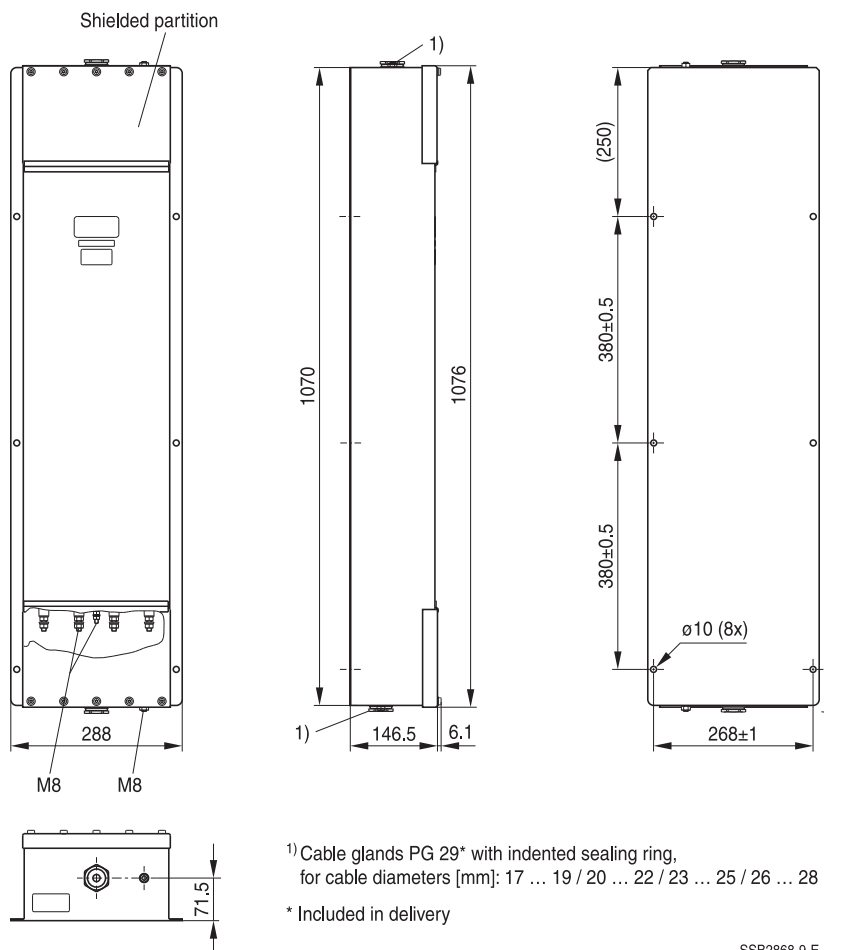
SSB2867-1-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 9 - B84299C1630E003 (4x63A)**



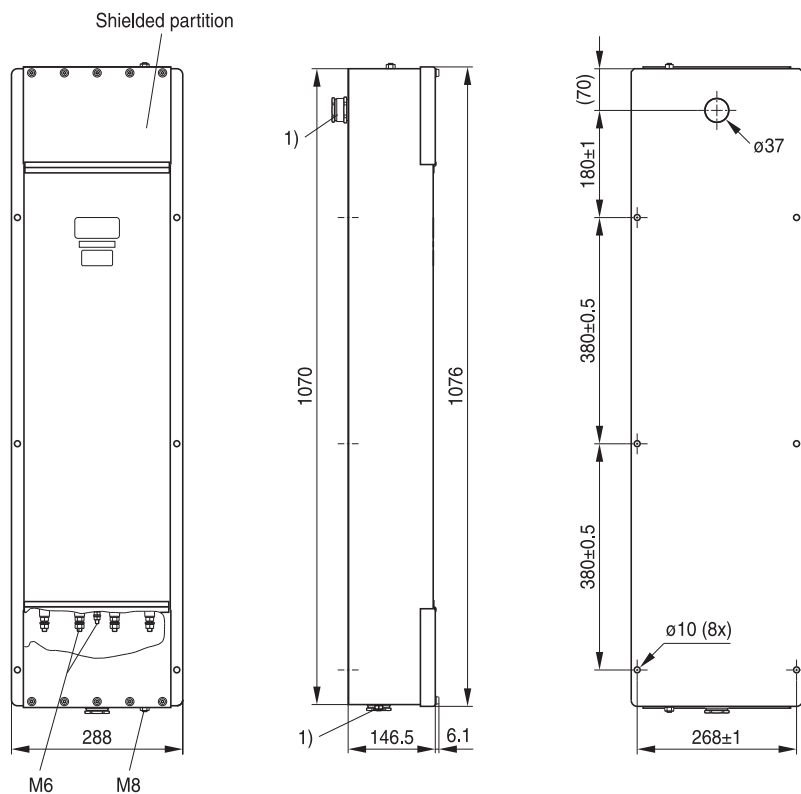
SSB2868-9-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 10 - B84299D1630E003 (4x63A)**



<sup>1)</sup> Cable glands PG 29\* with indented sealing ring,  
for cable diameters [mm]: 17 ... 19 / 20 ... 22 / 23 ... 25 / 26 ... 28

\* Included in delivery

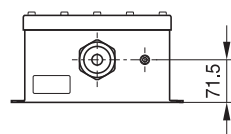
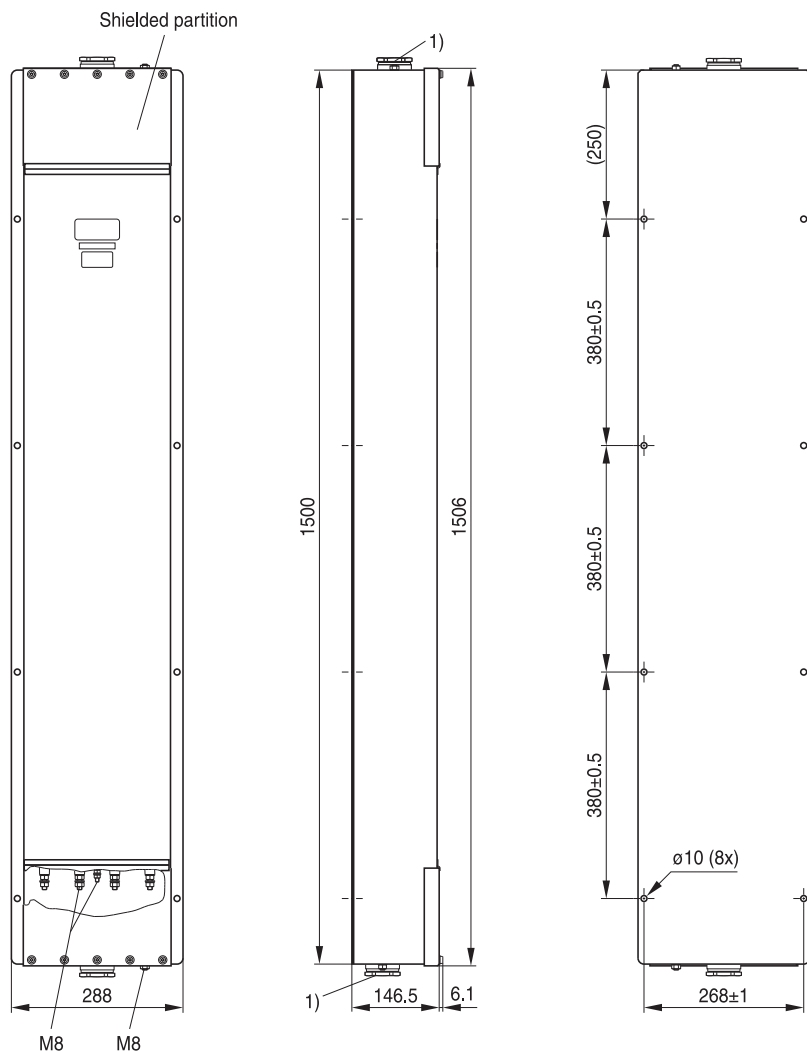
SSB2869-H-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 11 - B84299C1101E003 (4x100A)**



1) Cable glands PG 42\* with indented sealing ring,  
for cable diameters [mm]: 29 ... 31 / 32 ... 34 / 35 ... 37 / 38 ... 40

\* Included in delivery

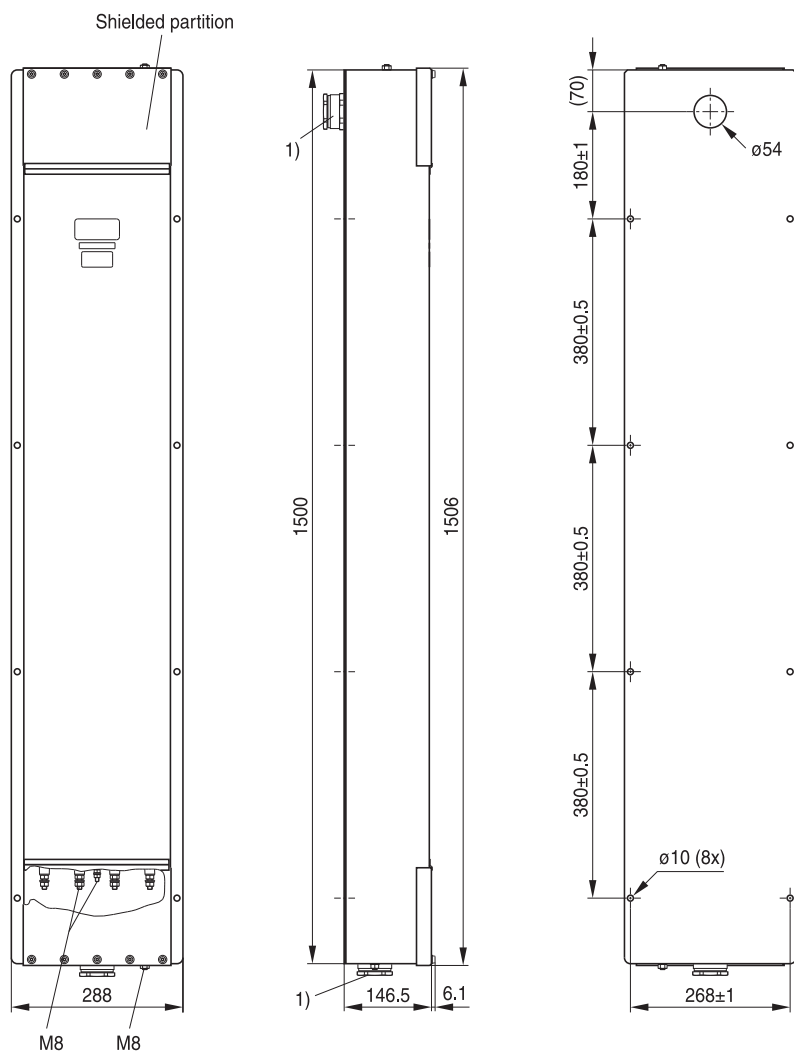
SSB2870-K-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 12 - B84299D1101E003 (4x100A)**



<sup>1)</sup> Cable glands PG 42\* with indented sealing ring, for cable diameters [mm]: 29 ... 31 / 32 ... 34 / 35 ... 37 / 38 ... 40

\* Included in delivery

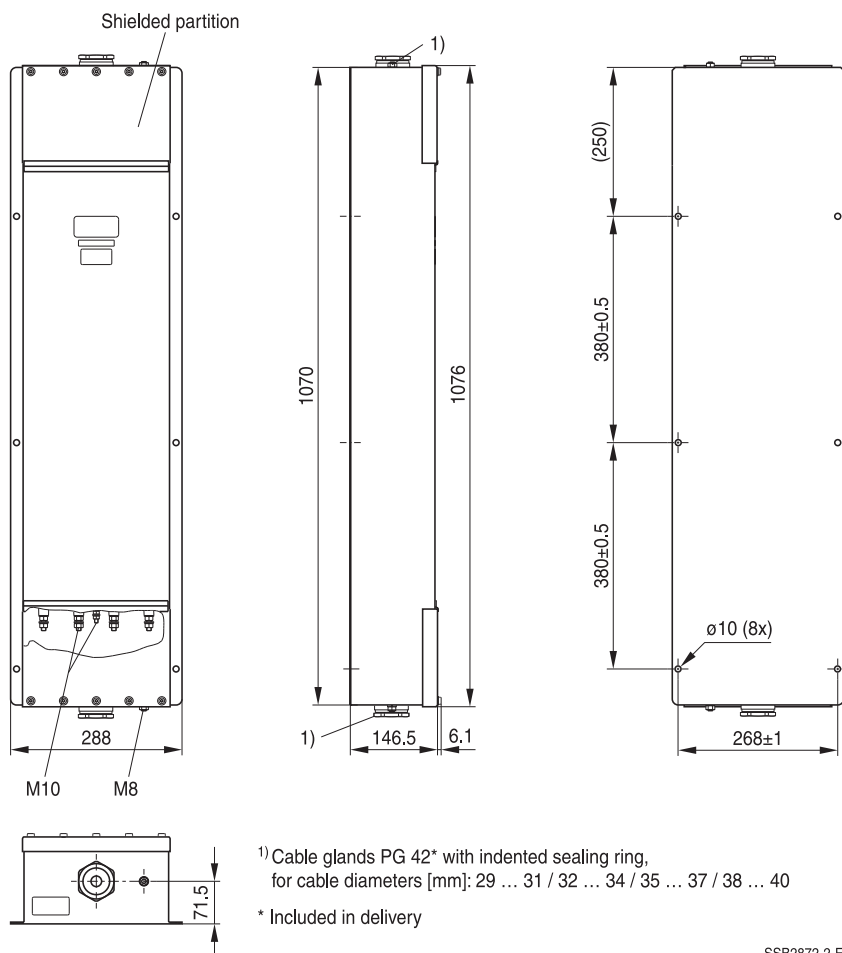
SSB2871-TE

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 13 - B84299C1151E001 (4x150A)**



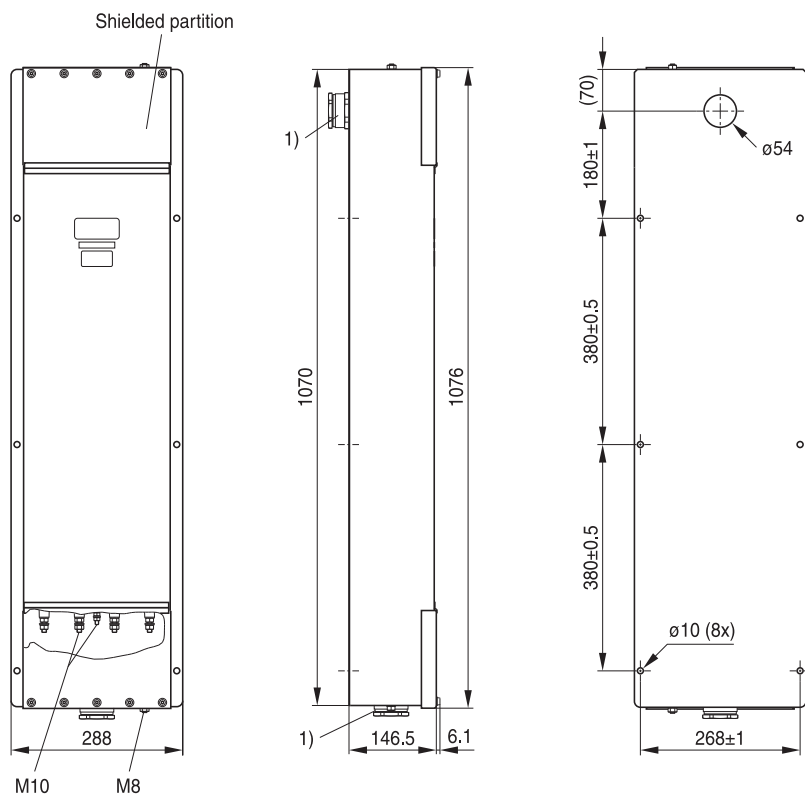
SSB2872-2-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 14 - B84299D1151E001 (4x150A)**



<sup>1)</sup> Cable glands PG 42\* with indented sealing ring, for cable diameters [mm]: 29 ... 31 / 32 ... 34 / 35 ... 37 / 38 ... 40

\* Included in delivery

SSB2873-A-E

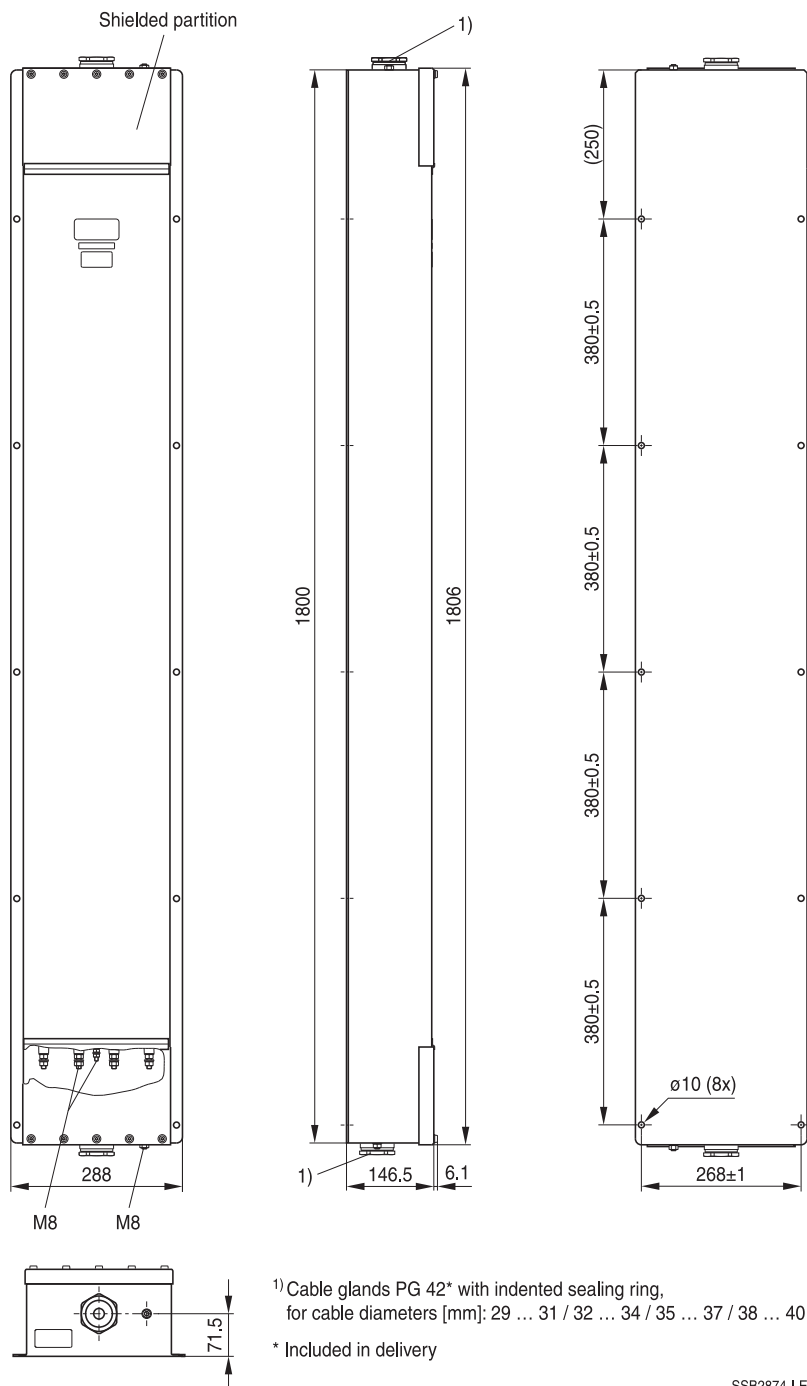


**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 15 - B84299C1151E003 (4x150A)**

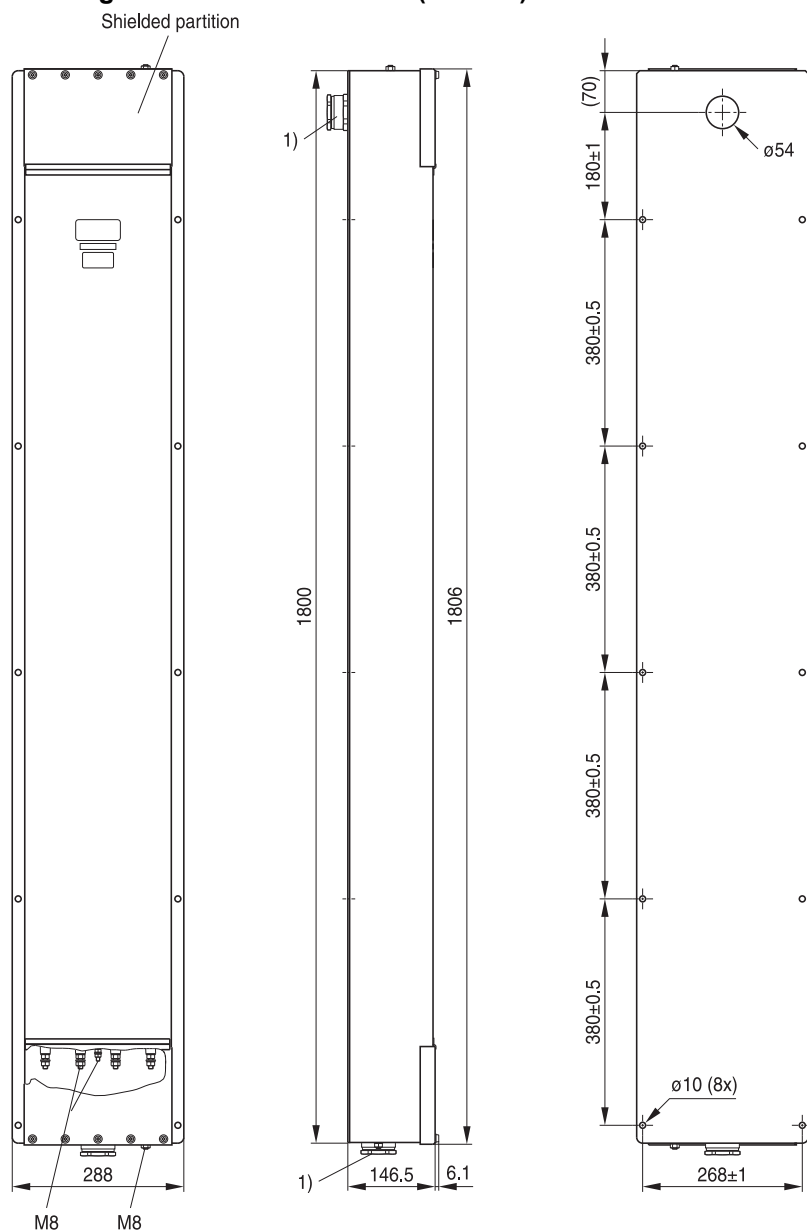


## Filters for shielded rooms

250/440 V, 63 ... 250 A

B84299\*1\*B/E001 / B84299\*1\*B/E003

**Drawing 16 - B84299D1151E003 (4x150A)**



<sup>1)</sup> Cable glands PG 42\* with indented sealing ring,  
for cable diameters [mm]: 29 ... 31 / 32 ... 34 / 35 ... 37 / 38 ... 40

\* Included in delivery

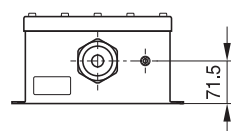
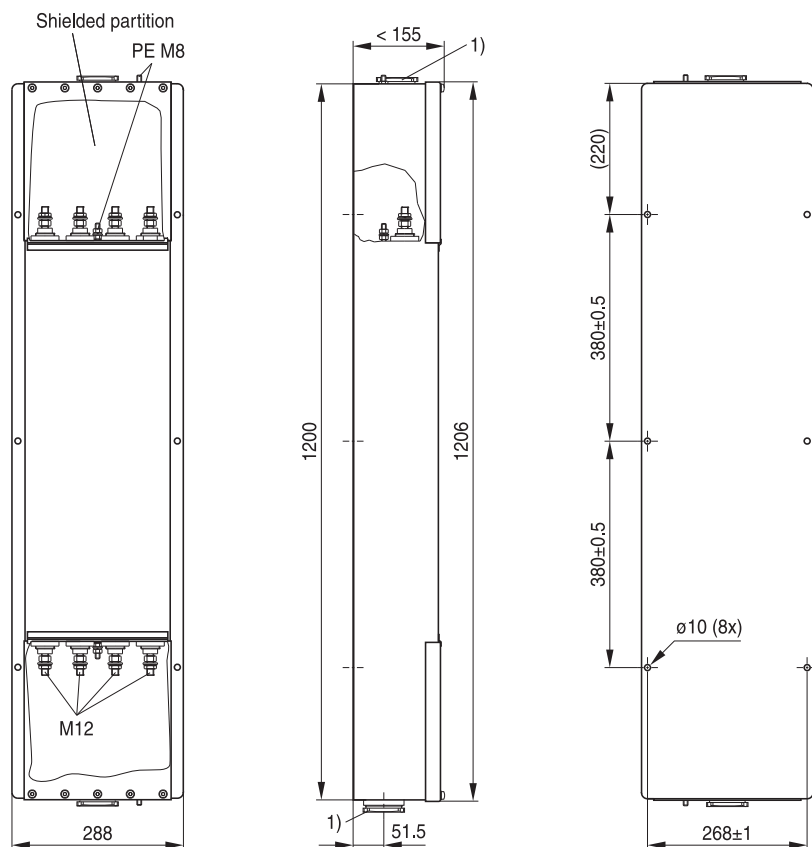
SSB2875-R-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 17 - B84299C1251E001 (4x250A)**



<sup>1)</sup> Cable glands PG 48\* with indented sealing ring,  
for cable diameters [mm]: 38 ... 41 / 42 ... 44 / 45 ... 47 / 48 ... 51

\* Included in delivery

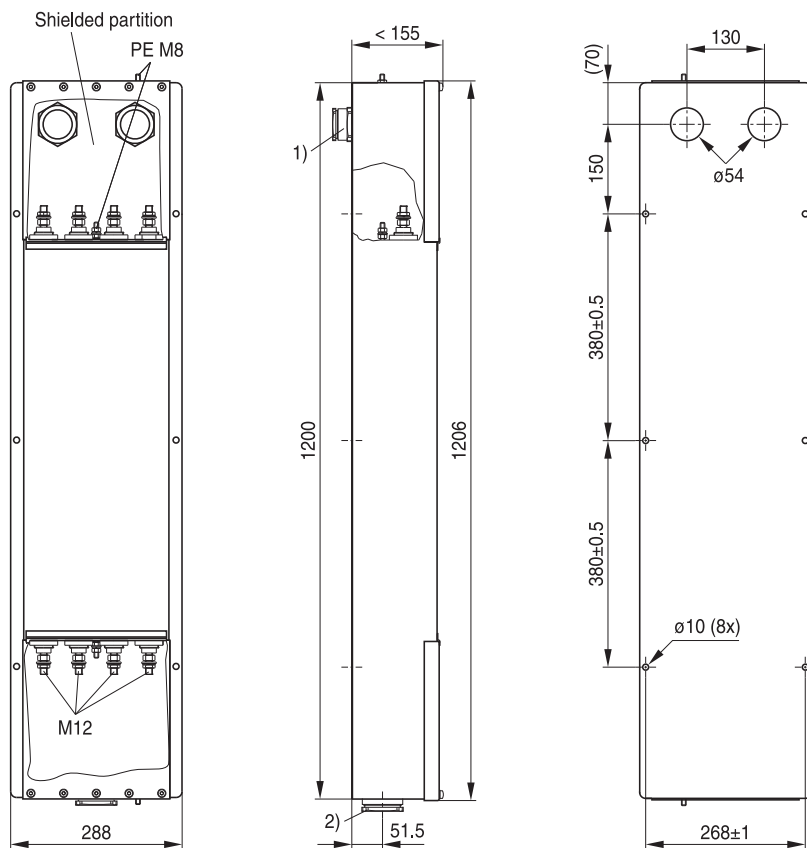
SSB2876-Z-E

## Filters for shielded rooms

250/440 V, 63 ... 250 A

B84299\*1\*B/E001 / B84299\*1\*B/E003

**Drawing 18 - B84299D1251E001 (4x250A)**



<sup>1)</sup> Cable glands PG 42\* with indented sealing ring,  
for cable diameters [mm]: 29 ... 31 / 32 ... 34 / 35 ... 37 / 38 ... 40

<sup>2)</sup> Cable glands PG 48\* with indented sealing ring,  
for cable diameters [mm]: 38 ... 41 / 42 ... 44 / 45 ... 47 / 48 ... 51

\* Included in delivery

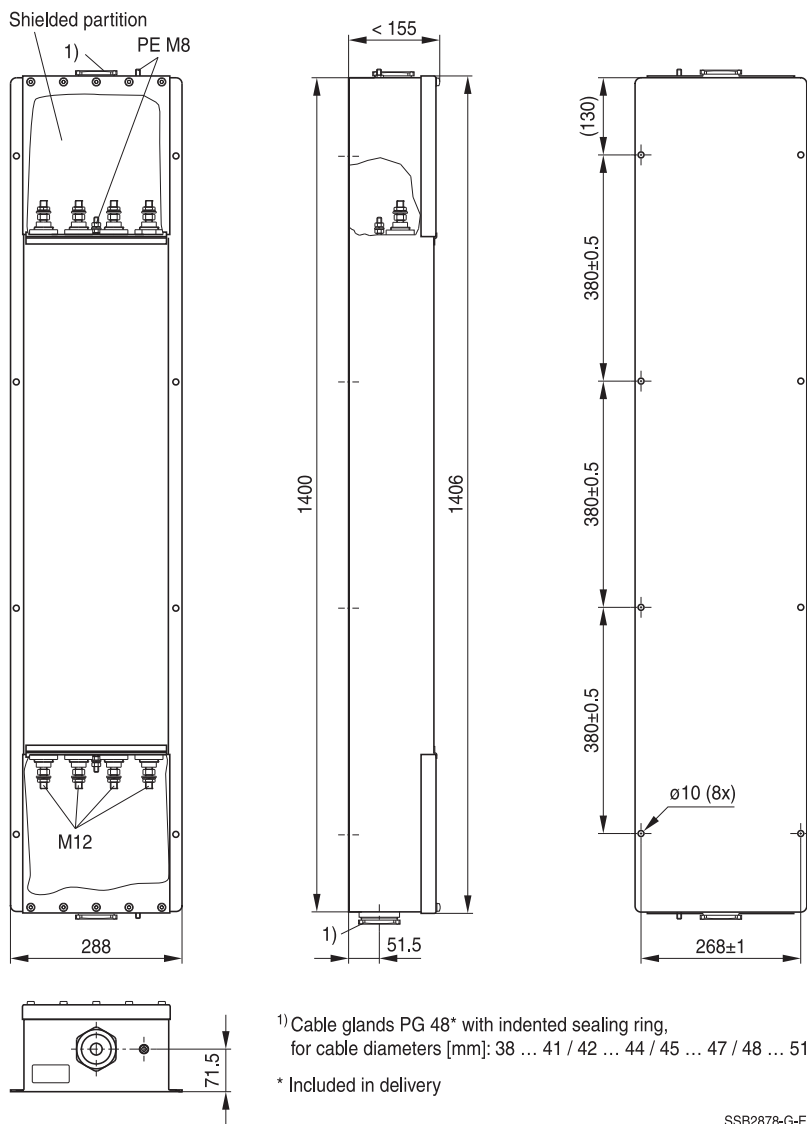
SSB2877-8-E

**Filters for shielded rooms**

**250/440 V, 63 ... 250 A**

**B84299\*1\*B/E001 / B84299\*1\*B/E003**

**Drawing 19 - B84299C1251E003 (4x250A)**

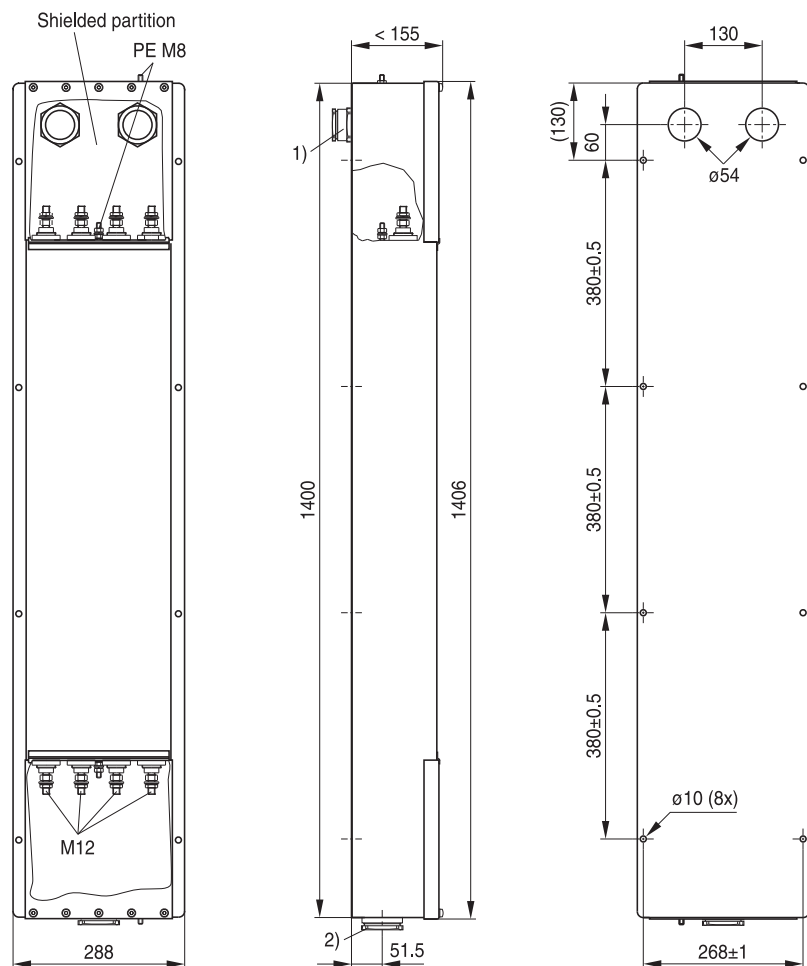


## Filters for shielded rooms

250/440 V, 63 ... 250 A

B84299\*1\*B/E001 / B84299\*1\*B/E003

**Drawing 20 - B84299D1251E003 (4x250A)**



1) Cable glands PG 42\* with indented sealing ring,  
for cable diameters [mm]: 29 ... 31 / 32 ... 34 / 35 ... 37 / 38 ... 40

2) Cable glands PG 48\* with indented sealing ring,  
for cable diameters [mm]: 38 ... 41 / 42 ... 44 / 45 ... 47 / 48 ... 51

\* Included in delivery

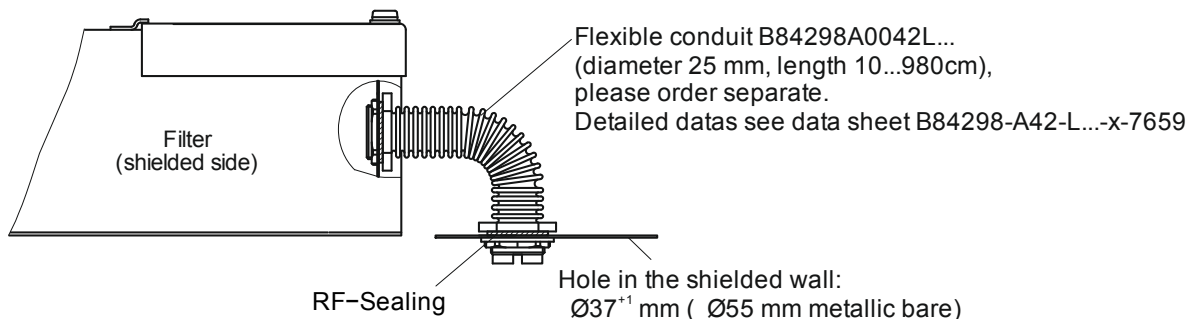
SSB2879-P-E

## Filters for shielded rooms

250/440 V, 63 ... 250 A

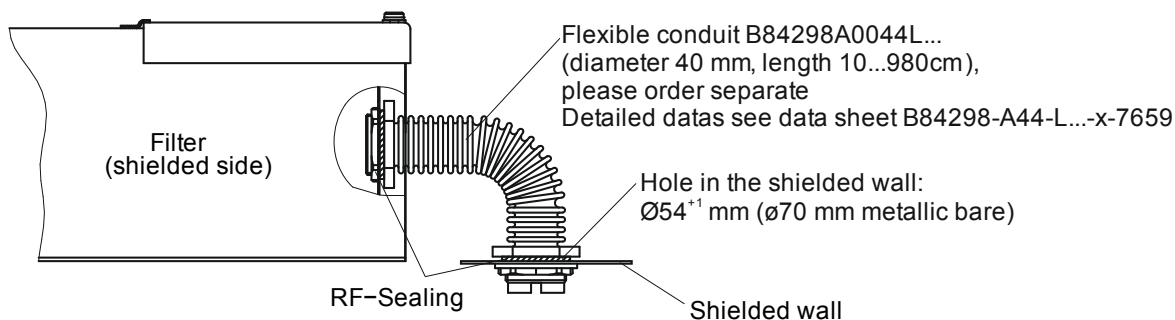
B84299\*1\*B/E001 / B84299\*1\*B/E003

### RF-tight connection of types B84299C... with connection hole 37 mm



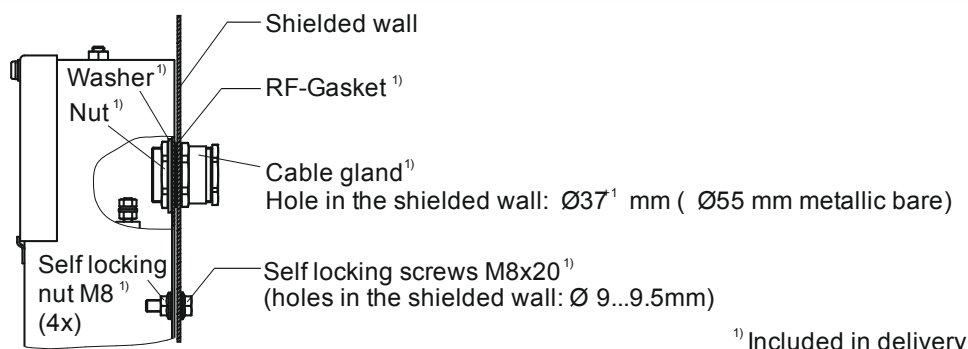
Note: The bending radius of the flexible conduit depends on the used type of cable

### RF-tight connection of types B84299C... with connection hole 54 mm



Note: The bending radius of the flexible conduit depends on the used type of cable

### RF-tight connection of types B84299D... with connection hole 37 mm

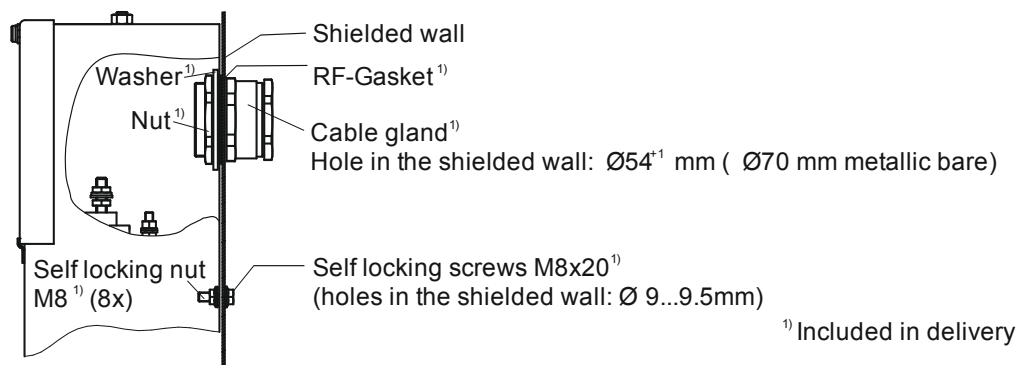


## Filters for shielded rooms

250/440 V, 63 ... 250 A

B84299\*1\*B/E001 / B84299\*1\*B/E003

### RF-tight connection of types B84299D... with connection hole 54 mm





## Cautions and warnings

Please read all safety and warning notes carefully before installing the filter and putting it into operation. The same applies to the warning signs on the filter. Please ensure that the signs are not removed nor their legibility impaired by external influences.

Death, serious bodily injury and substantial material damage to equipment may occur if the appropriate safety measures are not carried out or the warnings in the text are not observed.

## Using according to the terms

The filters may be used only for their intended application within the specified values in low voltage networks in compliance with the instructions given in the data sheets and the data book.

The conditions at the place of application must comply with all specifications for the filter used.

## Warning

- It shall be ensured that only qualified persons (electricity specialists) are engaged on work such as planning, assembly, installation, operation, repair and maintenance. They must be provided with the corresponding documentation.
- Danger of electric shock. Filters contain components that store an electric charge. Dangerous voltages can continue to exist at the filter terminals for longer than five minutes even after the power has been switched off.
- The protective earth connections shall be the first to be made when the filter is installed and the last to be disconnected. Depending on the magnitude of the leakage currents, the particular specifications for making the protective earth connection must be observed.
- Impermissible overloading of the filter or filter, such as with circuits able to cause resonances, impermissible voltages at higher frequencies etc. can lead to bodily injury and death as well as cause substantial material damages (e.g. destruction of the filter housing).
- Filters must be protected in the application against impermissible exceeding of the rated currents by overcurrent protective devices.
- In case of leakage currents  $>3.5$  mA you shall mount the PE conductor stationary with the required cross section before beginning of operation and save it against disconnecting. For leakage currents  $I_L^1 \leq 10$  mA the PE conductor must have a KU value<sup>2</sup> of 4.5<sup>3</sup>; for leakage currents  $I_L > 10$  mA the PE conductor must have a KU value of 6<sup>4</sup>.
- Because the product can become very hot during operation, there is the risk of burns if touched. The product can remain hot for some time after the power is switched off!

## Display of ordering codes for EPCOS products

The ordering code for one and the same EPCOS product can be represented differently in data sheets, data books, other publications, on the EPCOS website, or in order-related documents such as shipping notes, order confirmations and product labels. **The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products.** Detailed information can be found on the Internet under [www.epcos.com/orderingcodes](http://www.epcos.com/orderingcodes)

<sup>1</sup>  $I_L$  = leakage current let-go

<sup>2</sup> The KU value (symbol KU) is a classification parameter of safety-referred failure types designed to ensure protection against hazardous body currents and excessive heating.

<sup>3</sup>  $I_L$  = leakage current let-go

<sup>4</sup> KU = 6 with respect to interruptions is achieved for fixed-connection lines  $\geq 10$  mm<sup>2</sup> where the type of connection and installation correspond to the requirements for PEN conductors as specified in relevant standards.

## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule we are either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether a product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
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