

Two- and four-line filters
16 to 150 A
Multi-stage
Stopband attenuation up to 40 GHz



Features

- General-purpose use through design with separate lines without intercoupling
- Use of single chokes
- Insertion loss to CISPR 17

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 space 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 (diameter min. 10 mm²) 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.

Installation

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

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 a two-line filter by a four-line filter for example.

Accessories and special versions

RF-tight flexible connector fittings in widths of 25 and 40 mm 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.

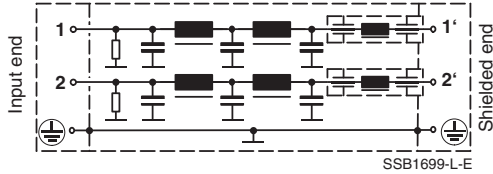
Tests

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.

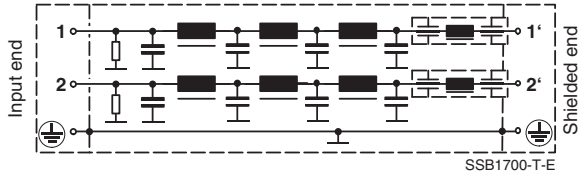
Circuit diagrams

Two-line filters B84299-+1*-B3**

Circuit diagram 1
(16 ... 63 A)

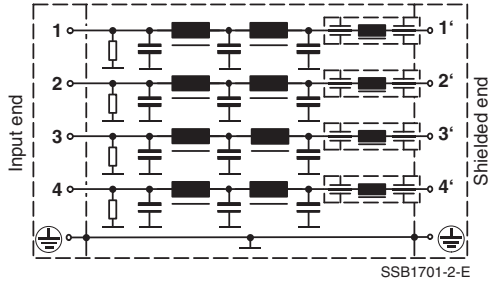


Circuit diagram 2
(100 A)

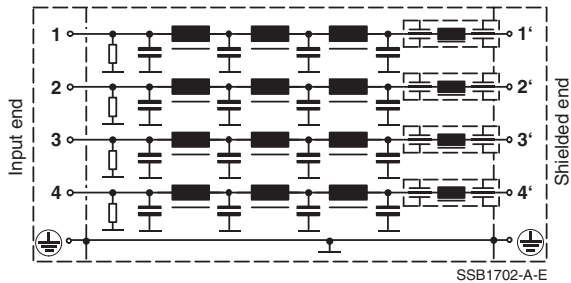


Four-line filters B84299-+1*-E3**

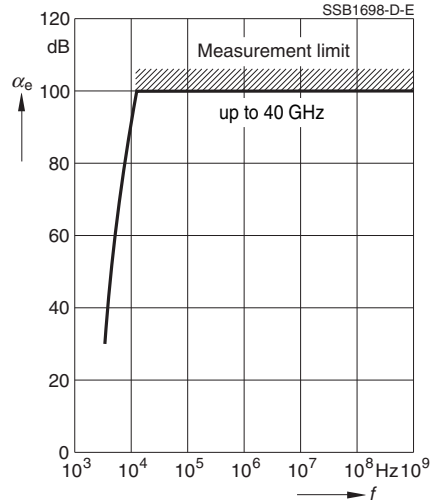
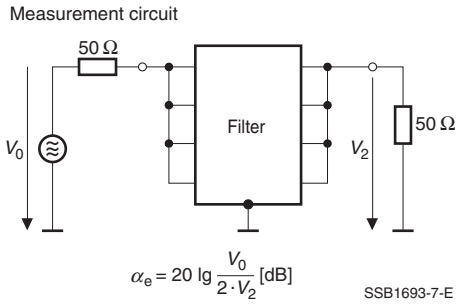
Circuit diagram 3
(16 ... 63 A)



Circuit diagram 4
(100 and 150 A)



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



General technical data

| | | |
|--|---|--|
| Rated voltage V_R for two-line filters | 250 V | line/line line/case |
| Rated voltage V_R for four-line filters | 440 V 250 V | line/line line/case |
| Rated current I_R | see characteristics (next page) | referred to + 40°C ambient temperature |
| Max. admissible overcurrent I_{over} | $75 \cdot I_R$ for 50 ms $10 \cdot I_R$ for 1 s $2 \cdot I_R$ for 1 min $1,4 \cdot I_R$ for 15 min | |
| Rated frequency f_R | 50/60 Hz | |
| Test voltages V_T | 1200 Vdc, 2 s 1200 Vdc, 2 s | line/line line/case |
| Voltage drop/phase ΔV | < 1 % | of V_R at 50 Hz and I_R |
| DC resistance R_{max} | see characteristics (next page) | per line |
| Power dissipation P_D | see characteristics (next page) | at I_R |
| Capacitive reactive current/line $I_{reactive}$ | see characteristics (next page) | at 400/230V and 50 Hz (typical value) |
| Climatic category | 25/085/56 | (-25 °C/+85 °C/56 days damp heat test) to EN 60068-1 |
| 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} m Ω | P_D W | $I_{reactive}$ A | Dim. drawing | Circuit diagram | Approx. weight kg | Ordering code |
|-------|--------------------|-------------------------|------------|---------------------|--------------|-----------------|----------------------|---------------|
|-------|--------------------|-------------------------|------------|---------------------|--------------|-----------------|----------------------|---------------|

Two-line filters

| | | | | | | | | |
|---------|---|-------|------|-----|---|---|----|-----------------|
| 2 × 16 | C | < 50 | < 30 | 2,7 | 1 | 1 | 28 | B84299-C1160-B3 |
| 2 × 16 | D | < 50 | < 30 | 2,7 | 2 | 1 | 28 | B84299-D1160-B3 |
| 2 × 32 | C | < 20 | < 40 | 2,7 | 1 | 1 | 32 | B84299-C1320-B3 |
| 2 × 32 | D | < 20 | < 40 | 2,7 | 2 | 1 | 32 | B84299-D1320-B3 |
| 2 × 63 | C | < 6 | < 50 | 4,9 | 1 | 1 | 36 | B84299-C1630-B3 |
| 2 × 63 | D | < 6 | < 50 | 4,9 | 2 | 1 | 36 | B84299-D1630-B3 |
| 2 × 100 | C | < 3,5 | < 70 | 6,5 | 3 | 2 | 60 | B84299-C1101-B3 |
| 2 × 100 | D | < 3,5 | < 70 | 6,5 | 4 | 2 | 60 | B84299-D1101-B3 |

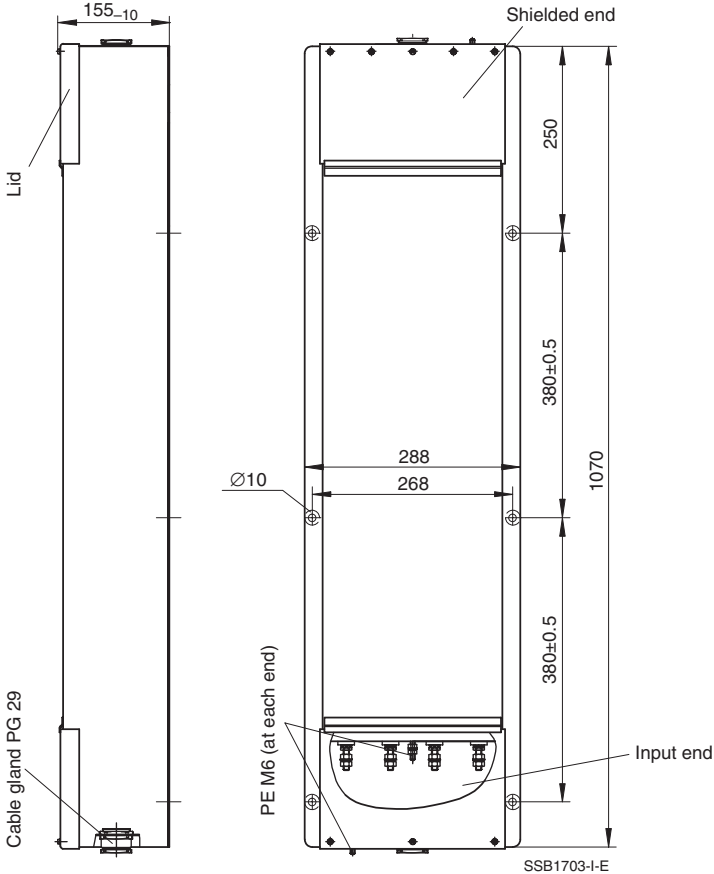
Four-line filters

| | | | | | | | | |
|---------|---|-------|-------|-----|---|---|----|-----------------|
| 4 × 16 | C | < 50 | < 40 | 2,7 | 1 | 3 | 30 | B84299-C1160-E3 |
| 4 × 16 | D | < 50 | < 40 | 2,7 | 2 | 3 | 30 | B84299-D1160-E3 |
| 4 × 32 | C | < 20 | < 60 | 2,7 | 1 | 3 | 35 | B84299-C1320-E3 |
| 4 × 32 | D | < 20 | < 60 | 2,7 | 2 | 3 | 35 | B84299-D1320-E3 |
| 4 × 63 | C | < 6 | < 70 | 4,9 | 1 | 3 | 40 | B84299-C1630-E3 |
| 4 × 63 | D | < 6 | < 70 | 4,9 | 2 | 3 | 40 | B84299-D1630-E3 |
| 4 × 100 | C | < 3,5 | < 100 | 6,5 | 3 | 4 | 60 | B84299-C1101-E3 |
| 4 × 100 | D | < 3,5 | < 100 | 6,5 | 4 | 4 | 60 | B84299-D1101-E3 |
| 4 × 150 | C | < 2 | < 140 | 6,5 | 5 | 4 | 95 | B84299-C1151-E3 |
| 4 × 150 | D | < 2 | < 140 | 6,5 | 6 | 4 | 95 | B84299-D1151-E3 |

Dimensional drawing 1

16-, 32- and 63-A filters

Mechanical version C (cable glands at both ends)



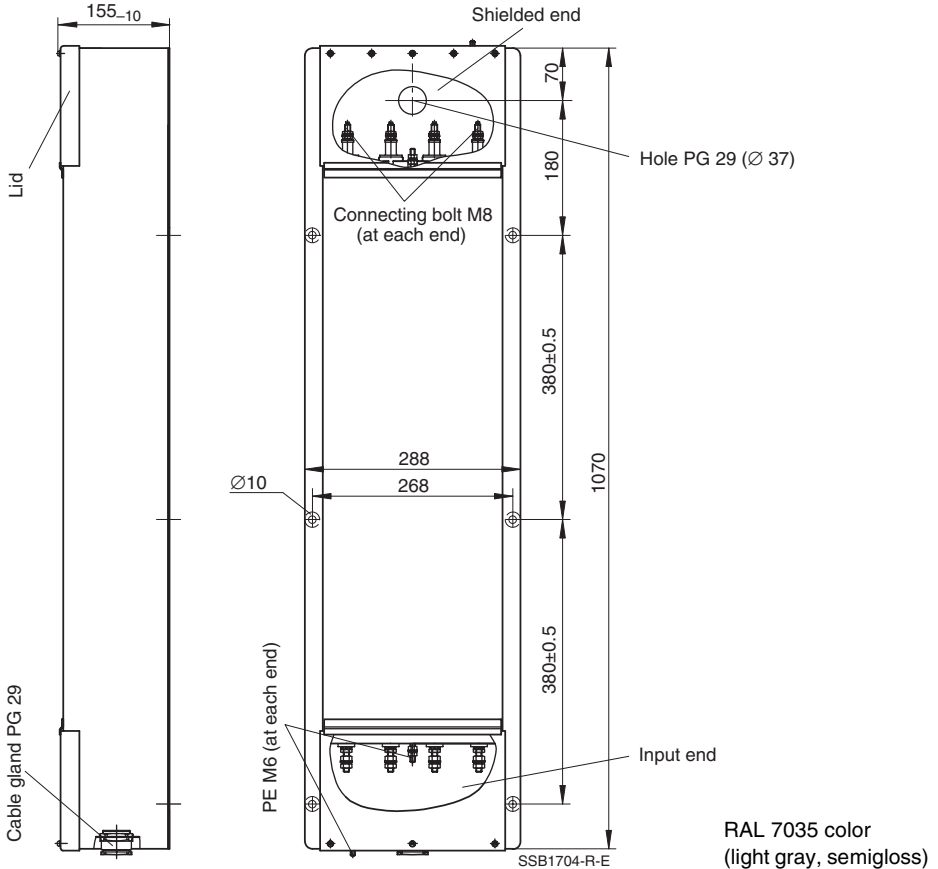
| I/R A | Fittings | Suitable for cable outer diameter | Package | Suitable for cable outer diameter |
|----------|--|--|--|---|
| 16 32 | Cable gland PG 29 with cutout sealing ring | 17 to 19 mm 20 to 22 mm 23 to 25 mm 26 to 28 mm | Cable gland PG 21 and reducer rings | 9 to 11 mm 12 to 14 mm 15 to 17 mm 18 to 20 mm |
| 63 | | | — | — |

RF-tight connection to shielding wall, see page 33.

Dimensional drawing 2

16-, 32- and 63-A filters

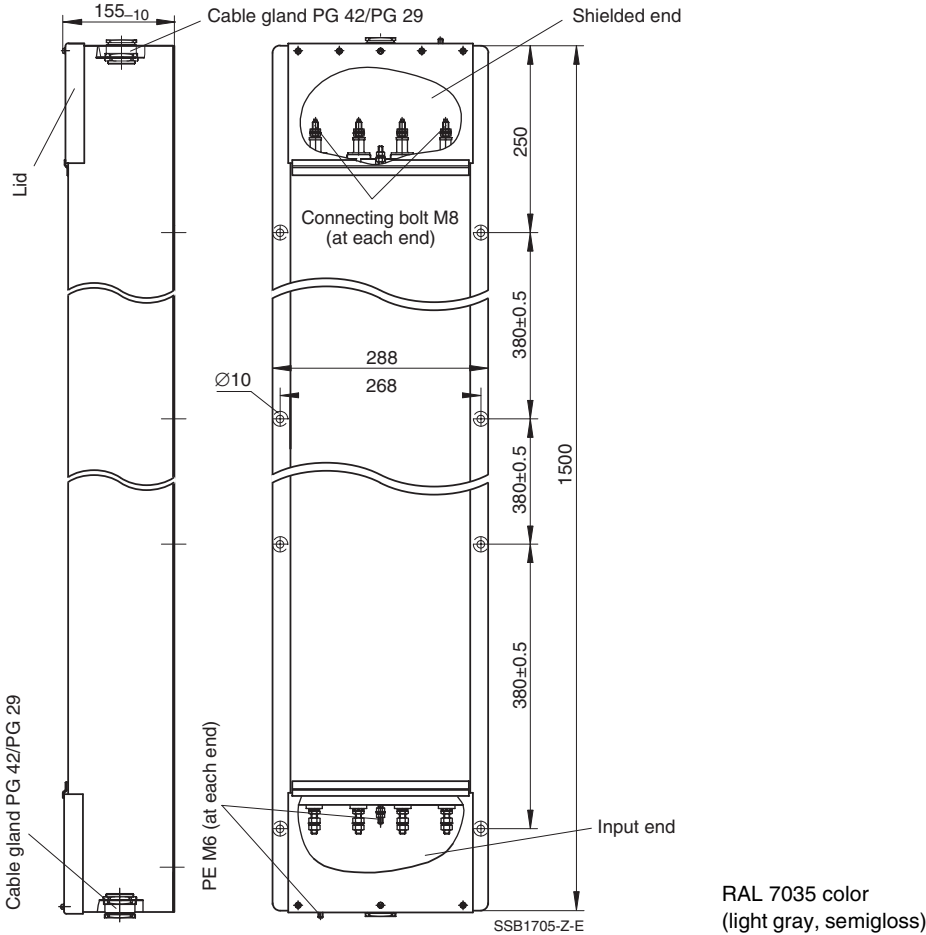
Mechanical version D (direct connection to shielding wall)



| I_R A | Fittings | Suitable for cable outer diameter | Package | Suitable for cable outer diameter |
|------------|--|--------------------------------------|--|--------------------------------------|
| 16 | Cable gland PG 29 with cutout sealing ring | 17 to 19 mm | Cable gland PG 21 and reducer rings | 9 to 11 mm |
| 32 | | 20 to 22 mm | | 12 to 14 mm |
| | | 23 to 25 mm | | 15 to 17 mm |
| | | 26 to 28 mm | | 18 to 20 mm |
| 63 | | | — | — |

RF-tight connection to shielding wall, see page 33.

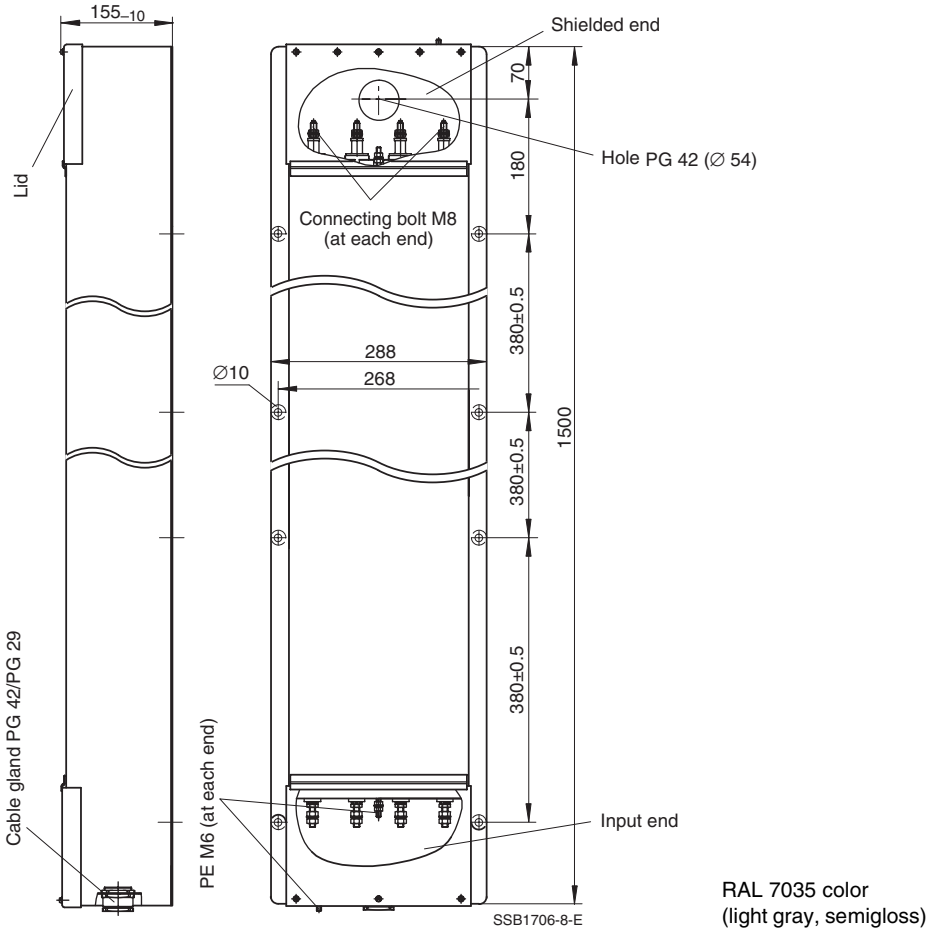
Dimensional drawing 3 – 100-A filters
 Mechanical version C (cable glands at both ends)



| I _R A | Fittings | Suitable for cable outer diameter | Package | Suitable for cable outer diameter |
|---------------------|--|--|--|--|
| 100 | Cable gland PG 42 with cutout sealing ring | 29 to 31 mm 32 to 34 mm 35 to 37 mm 38 to 40 mm | Cable gland PG 29 with cutout sealing ring | 17 to 19 mm 20 to 22 mm 23 to 25 mm 26 to 28 mm |

RF-tight connection to shielding wall, see page 33.

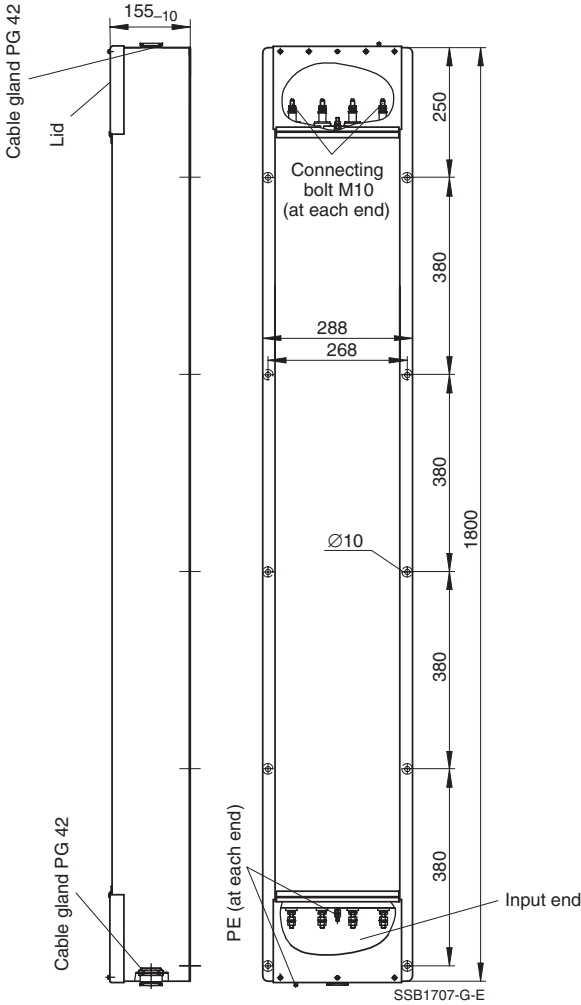
Dimensional drawing 4 – 100-A filters
 Mechanical version D (direct connection to shielding wall)



| /R A | Fittings | Suitable for cable outer diameter | Package | Suitable for cable outer diameter |
|---------|--|--|--|--|
| 100 | Cable gland PG 42 with cutout sealing ring | 29 to 31 mm 32 to 34 mm 35 to 37 mm 38 to 40 mm | Cable gland PG 29 with cutout sealing ring | 17 to 19 mm 20 to 22 mm 23 to 25 mm 26 to 28 mm |

RF-tight connection to shielding wall, see page 33.

Dimensional drawing 5 – 150-A filters
 Mechanical version C (cable glands at both ends)



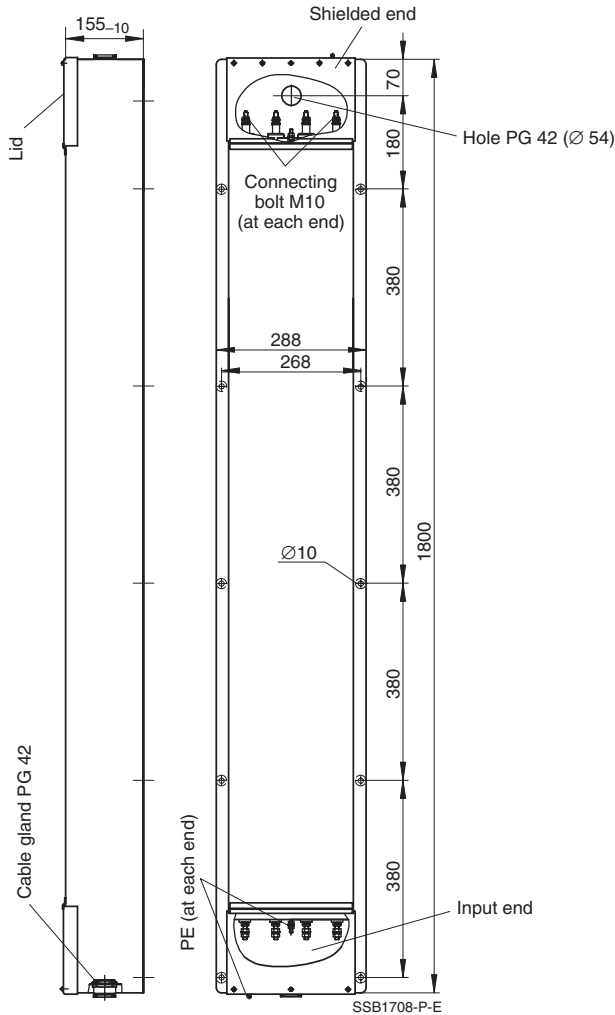
RAL 7035 color
 (light gray, semigloss)

| /R | Fittings | Suitable for cable outer diameter | | Package |
|-------|---|-----------------------------------|----------------------------|---------|
| 150 A | Cable gland PG 42 with cutout sealing ring | 29 to 31 mm 32 to 34 mm | 35 to 37 mm 38 to 40 mm | — |

RF-tight connection to shielding wall, see page 33.

Dimensional drawing 6 – 150-A filters

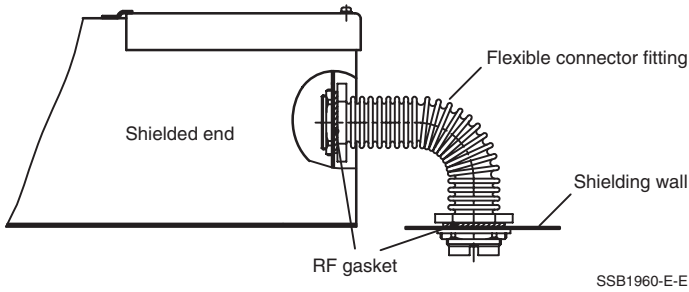
Mechanical version D (direct connection to shielding wall)


 RAL 7035 color
 (light gray, semigloss)

| I _R | Fittings | Suitable for cable outer diameter | | Package |
|----------------|---|-----------------------------------|----------------------------|---------|
| 150 A | Cable gland PG 42 with cutout sealing ring | 29 to 31 mm 32 to 34 mm | 35 to 37 mm 38 to 40 mm | — |

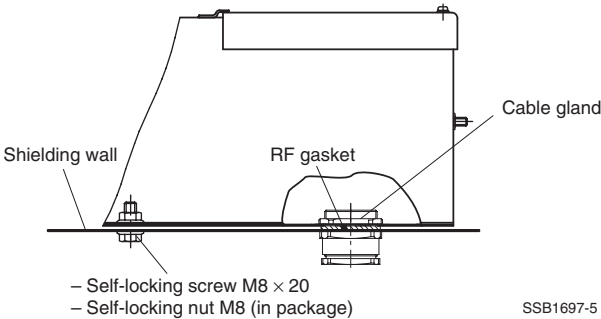
RF-tight connection to shielding wall, see page 33.

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



| I _R A | Flexible connector fitting (must be ordered separately) | Ordering code ¹⁾ |
|---------------------|--|-----------------------------|
| 16 ... 63 | Width 25 mm | B84298-A42-L** |
| 100, 150 | Width 40 mm | B84298-A44-L** |

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



| I _R A | Cable gland | Hole in shielding wall | Bare metal area on shielding wall | Package |
|---------------------|---|------------------------|--------------------------------------|--------------|
| 16 ... 63 | PG 29 with long thread and RF gasket | ∅ 37 + 0,5 mm | ∅ 55 +5 mm | Check nut |
| 100, 150 | PG 42 with long thread and RF gasket | ∅ 54 + 0,5 mm | ∅ 70 +5 mm | |

1) ** add required length in cm (see also page 107 ff)

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