

Selection guide

Selection guide for feedthrough components

| Type | Dia- meter mm | I _R A | V _R AC V | C _R μF | Termi- nal type | Insertion loss in the frequency range (Hz) | | | Page | |
|--------------------------------|---------------------|---------------------|---------------------------|------------------------|--------------------|---|-----------------|-----------------|------|-----|
| | | | | | | 10 ⁵ | 10 ⁶ | 10 ⁷ | | |
| Feedthrough capacitors | | | | | | | | | | |
| B85121A*C160 | 16 | 16 | 110 ... 440 | 0.0025 ... 0.1 | | | | | | 166 |
| B85121A*250 B85121A*E750 | 20 | 25, 75 | 250 ... 440 | 0.035 ... 0.1 | | | | | | 167 |
| B85121A*A250 B85121A*A750 | 30 | 25, 75 | 250 | 1.0 | | | | | | 169 |
| B85121A*A630, A101, A201 | 55 | 63 ... 200 | 250 | 0.5 ... 4.7 | | | | | | 170 |
| Feedthrough filters | | | | | | | | | | |
| B85321A*160 | 16 | 16 | 250 | 2 × 0.0025 | | | | | | 173 |
| B85321A*A250 B85321A*A750 | 30 | 25, 75 | 250 | 2 × 0.1 ... 2 × 1.0 | | | | | | 175 |
| B85321A*A630, A101 ... A501 | 55 | 63 ... 500 | 250 | 2 × 0.5 ... 2 × 4.7 | | | | | | 176 |

Terminal type:



Tab connectors

Axial leads



Soldering tag

Threaded studs

Selection guide

Selection guide for 2-line filters

| Type | I _R | V _R | Power system | Design | Connection type | Insertion loss in the frequency range (Hz) | | | Page |
|------|----------------|----------------|--------------|--------|-----------------|--|-----------------|-----------------|------|
| | A | V | | | | 10 ⁵ | 10 ⁶ | 10 ⁷ | |

General applications, IEC inlet filters

| | | | | | | | | | | | |
|-------------------|----------|-----------|-------|---|--|--|--|--|--|--|-----|
| B84771 NEW | 1 ... 20 | 250 AC/DC | TT/TN | C | | | | | | | 182 |
| B84773 NEW | 1 ... 10 | 250 AC/DC | TT/TN | C | | | | | | | 198 |
| B84776 NEW | 1 ... 10 | 250 AC/DC | TT/TN | C | | | | | | | 206 |
| B84103 | 1 ... 6 | 250 AC/DC | TT/TN | C | | | | | | | 214 |

General applications, SIFI series

| | | | | | | | | | | | | |
|--------------------|----------|-----------|-------|---|--|--|--|--|--|--|--|-----|
| B84111F NEW | 3 ... 36 | 250 AC/DC | TT/TN | C | | | | | | | | 218 |
| B84112G NEW | | | | | | | | | | | | 227 |
| B84113H NEW | | | | | | | | | | | | 238 |
| B84111A | 1 ... 20 | 250 AC/DC | TT/TN | C | | | | | | | | 246 |
| B84115E | | | | | | | | | | | | |

General applications, PCB mounting

| | | | | | | | | | | | |
|---------|-----------|-----------|-------|---|-----------|--|--|--|--|--|-----|
| B84110A | 0.5 ... 6 | 250 AC/DC | TT/TN | P | TT | | | | | | 269 |
| B84110B | 1.4 | 250 AC/DC | TT/TN | P | TT | | | | | | 273 |

Converters and power electronics

| | | | | | | | | | | | | |
|-----------------------------|--------------|-------------------------|-------|---|--|--|--|--|--|--|--|-----|
| B84142*R000 | 10 ... 60 | 250 AC/DC | TT/TN | C | | | | | | | | 276 |
| B84142*G075 | 60 | | | | | | | | | | | |
| B84142A*166 NEW | 10 ... 30 | 250 AC/DC | TT/TN | C | | | | | | | | 283 |
| B84142B*R000 | 8 ... 25 | 250 AC/DC | TT/TN | C | | | | | | | | 287 |
| B84142A*R122 | 8 ... 180 | 300 AC/DC | TT/TN | C | | | | | | | | 292 |
| B84142A*R123 | 12 ... 100 | 520 AC/DC | TT/TN | C | | | | | | | | 301 |
| B84742A*R190 NEW | 25 ... 130 | 500 AC 1000 DC | TT/TN | C | | | | | | | | 307 |
| B84142A/C/J*S081 NEW | 180 ... 1600 | 1000 V DC, 1500 V DC | – | C | | | | | | | | 314 |

Design:

- C Compact filter
- P PCB filter

Terminal type:

- Tab connectors
- Litz wires
- Terminal blocks
- Busbars
- TT** Pins
- IEC connectors
- Threaded studs

Selection guide

Selection guide for 3-line filters

| Type | I _R A | V _R AC V | Power system | De- sign | Con- nection type | Motor cable length (m) ¹⁾ | | Insertion loss in the frequency range (Hz) | | | Page |
|----------------------------|---------------------|---------------------------|-----------------|-------------|-------------------------|---|----------------|---|-----------------|-----------------|------|
| | | | | | | Class A | Class B | 10 ⁵ | 10 ⁶ | 10 ⁷ | |
| | | | | | | | | | | | |
| B84143A*R166 NEW | 10 ... 35 | 520 | TT/TN | C | | 25 | 10 | | | | 327 |
| B84143A*R106 NEW | 10 ... 100 | 520 | TT/TN | C | | 25 | 10 | | | | 332 |
| B84143A*R105 | 8 ... 150 | 520 | TT/TN | B | | 25 | 25 | | | | 339 |
| B84143A*R000 | 8 ... 180 | 480 | TT/TN | C | | 50 | 25 | | | | 349 |
| B84143B*R000 | 8 ... 80 | 440 | TT/TN | C | | 100 | 50 | | | | 356 |
| B84143G*R110 | 8 ... 220 | 520 | TT/TN | B | | 25 | 25 | | | | 362 |
| B84143B*R110 | 8 ... 200 | 520 | TT/TN | B | | 50 | 25 | | | | 370 |
| B84143D*R127 NEW | 16 ... 200 | 530 | TT/TN | B | | 300 | 100 ... 200 | | | | 379 |
| B84143+*R410 NEW | 35 ... 230 | 520 | TT/TN | B | | 100 | 50 | | | | 392 |
| B84143B*S080 | 180 | 520 | TT/TN | C | | 25 | 10 | | | | 401 |
| B84143B*S081 | ... 1600 | 760 | | | | | | | | | |
| B84143B*S020 | 150 | 530 | TT/TN | C | | 50 | 20 | | | | 411 |
| B84143B*S021 | ... | 760 | | | | | | | | | |
| B84143B*S024 | 2500 | 690 | IT | | | | | | | | |
| B84143A*R021 | 25 ... 180 | 760 | TT/TN | C | | | | | | | |

Design: C Compact filter
B Book-size filter

Terminal type: Litz wires
 Terminal blocks
 Busbars
 Tab connectors

1) Motor cable lengths for observing the limits according to DIN EN 55011 (2003), typical values. These specifications are designed as a qualitative help in selecting the right filter. The maximum motor cable length depends on several factors, including the pulse frequency, the interference level of the converter and the capacitance of the motor cable; it may in an individual case diverge both upwards and downwards from the specified values. Observance of the limits must always be verified by relevant measurements. On this point, see also chapter "EMC services and EMC laboratory".

Selection guide

Selection guide for 4-line filters

| Type | I _R A | V _R AC V | Lines | Power system | De- sign | Con- nection type | Insertion loss in the frequency range (Hz) | | | Page |
|--|---------------------|---------------------------|-------|-----------------|-------------|-------------------------|---|-----------------|-----------------|------|
| | | | | | | | 10 ⁵ | 10 ⁶ | 10 ⁷ | |
| B84144A*R120 | 8 ... 200 | 520 | 3 + N | TT/TN | C | | | | | 429 |
| B84144A*R140 | 8 ... 200 | 520 | 3 + N | TT/TN | C | | | | | 437 |
| NEW B84144B*S120 B84144B*S121 | 250 ... 600 | 530 | 3 + N | TT/TN | C | | | | | 446 |
| B84144A*R000 | 16 ... 180 | 440 | 3 + N | TT/TN | C | | | | | 450 |
| B84108 | 10, 20 | 440 | 3 + N | TT/TN | C | | | | | 457 |
| B84131 | 6 ... 125 | 440 | 3 + N | TT/TN | C | | | | | 460 |

Design: C Compact filter

Terminal type: Tab connectors
 Threaded studs
 Terminal blocks
 Busbars

Selection guide

Selection guide for line reactors, output chokes and output filters

| Type | I_R A | U_R AC V | u_k % | Terminal | Motor cable length m | Shielded motor cable required | Asym- metric attenuation | Max. $f_M^{1)}$ Hz | Max. $f_P^{2)}$ kHz | Page |
|------|------------|------------------|------------|----------|-------------------------------|-------------------------------------|--------------------------------|--------------------------|---------------------------|------|
|------|------------|------------------|------------|----------|-------------------------------|-------------------------------------|--------------------------------|--------------------------|---------------------------|------|

Line reactors and output chokes

Line reactors

| | | | | | | | | | | |
|---------------------------|--------------|-----|---|--|---|---|-----|---|---|-----|
| B86305L*000 NEW | 4 ... 390 | 520 | 5 | | – | – | low | – | – | 470 |
|---------------------------|--------------|-----|---|--|---|---|-----|---|---|-----|

Output chokes

dv/dt chokes

| | | | | | | | | | | |
|-----------------------|---------------|-----|---|--|----|-----|-----|-----|---------------|-----|
| B86301U NEW | 8 ... 1500 | 520 | 1 | | 50 | yes | low | 400 | 2.5 ... 16 | 475 |
|-----------------------|---------------|-----|---|--|----|-----|-----|-----|---------------|-----|

Output filters

Sine-wave output filters

| | | | | | | | | | | |
|----------------------------|----------------------------|-------------|-------------|--|------|-----|-----|-----|-------------|-----|
| B84143V*R227 NEW | 4 ... 320 ³⁾ | 520, 690 | 5 ... 11 | | 1000 | yes | low | 100 | 6 ... 16 | 483 |
| B84143V*R027 | 6 ... 35 | 440 | 2 | | 100 | yes | low | 100 | 6 ... 16 | 492 |

EMC output filters *SineFormer*

| | | | | | | | | | | |
|---|----------------------------|-------------|-------------|------|------|----|------|-----|---------|-----|
| B84143V*R127 <i>SineFormer</i> | 6 ... 320 ³⁾ | 520, 600 | 5 ... 10 | | 1000 | no | high | 100 | 4 ... 8 | 496 |
| B84143V*R290 <i>SineFormer</i> NEW | 95 ... 320 | 760 | 10 | | 1000 | no | high | 100 | 4 ... 8 | 502 |

Terminal type:

- Terminal blocks
- Busbars


Cable

1) f_M = Motor frequency
 2) f_P = Pulse frequency
 3) Higher currents on request

Selection guide

Selection guide for converter filters

Our experience has shown that the filters listed below have proved their worth in converters for EMC measurements and in practice. However, the following points must be observed:

-  The rated data of the converter (such as the input current, rated voltage and harmonic content) as well as the derating notes in Sections 9, 10 and 11 must be considered without fail when selecting the filters.
- Application-referred measurements must be used to ensure observation of the EMC specifications in each individual case.
- The correct installation of filters and additional measures designed to observe the EMC directive must be assured (on this point, see also the Chapter on "Mounting instructions").

2-line filters (250 V AC) for converters for electric drives

| Motor power (1 AC 230 V) | Recommended suppression filters to: | |
|-----------------------------|---|---|
| | EN 55011, class A EN 61800-3 ¹⁾ , category C2 | EN 55011, class B EN 61800-3 ¹⁾ , category C1 |
| 0.55 kW | B84142A0010A166 | B84142B0008R000 |
| 0.75 kW | B84142A0010A166 | B84142B0008R000 |
| 1.1 kW | B84142A0016A166 | B84142B0012R000 |
| 1.5 kW | B84142A0030R166 | B84142B0025R000 |
| 2.2 kW | B84142A0030R166 | B84142B0025R000 |
| 3.0 kW | B84142A0030R166 | |

1) Table 14 from EN 61800-3, edition 2004

3-line filters (440 V AC) for converters for electric drives (examples)

| Motor power (3 AC 400 V) | Recommended suppression filters to: | |
|-----------------------------|---|---|
| | EN 55011, class A EN 61800-3 ²⁾ , category C2 | EN 55011, class B EN 61800-3 ²⁾ , category C1 |
| 1.5 kW | B84143A0010A166 | B84143B0008R000 |
| | B84143A0008R105 | B84143D0016R127 |
| 2.2 kW | B84143A0010A166 | B84143B0008R000 |
| | B84143A0008R105 | B84143D0016R127 |
| 3.0 kW | B84143A0020A166 | B84143B0016R000 |
| | B84143A0016R105 | B84143D0016R127 |
| 4.0 kW | B84143A0020A166 | B84143B0016R000 |
| | B84143A0016R105 | B84143D0016R127 |
| 5.5 kW | B84143A0020A166 | B84143B0016R000 |
| | B84143A0016R105 | B84143D0016R127 |

2) Table 14 from EN 61800-3, edition 2004

Selection guide

| Motor power (3 AC 400 V) | Recommended suppression filters to: | |
|-----------------------------|---|---|
| | EN 55011, class A EN 61800-3 ²⁾ , category C2 | EN 55011, class B EN 61800-3 ²⁾ , category C1 |
| 7.5 kW | B84143A0020A166 B84143A0025R000 | B84143D0025R127 |
| 11 kW | B84143A0035R166 B84143A0036R000 | B84143D0036R127 |
| 15 kW | B84143A0035R166 B84143A0036R000 | B84143D0036R127 |
| 18.5 kW | B84143A0050R105 B84143A0050R000 | B84143D0050R127 |
| 22 kW | B84143A0050R105 B84143A0050R000 | B84143D0050R127 |
| 30 kW | B84143A0066R105 B84143A0080R000 | B84143D0075R127 |
| 37 kW | B84143A0090R105 B84143A0080R000 | B84143D0090R127 |
| 45 kW | B84143A0120R105 B84143A0120R000 | B84143D0120R127 |
| 55 kW | B84143A0150R000 B84143A0150R105 | B84143D0150R127 |
| 75 kW | B84143A0150R000 B84143A0150R105 | B84143D0150R127 |
| 90 kW | B84143A0180R000 B84143B0180S080 B84143G0220R110 | B84143B0200R110 B84143D0200R127 |
| 110 kW | B84143B0250S020 B84143B0250S080 B84143G0220R110 | |
| 132 kW | B84143B0250S020 B84143B0250S080 | |
| 160 kW | B84143B0320S020 B84143B0320S080 | |
| 200 kW | B84143B0400S020 B84143B0400S080 | |
| 250 kW | B84143B0600S020 B84143B0600S080 | |
| 315 kW | B84143B0600S020 B84143B0600S080 | |

2) Table 14 from EN 61800-3, edition 2004

Selection guide

| Motor power (3 AC 400 V) | Recommended suppression filters to: | |
|-----------------------------|---|---|
| | EN 55011, class A EN 61800-3 ²⁾ , category C2 | EN 55011, class B EN 61800-3 ²⁾ , category C1 |
| 400 kW | B84143B1000S020 B84143B1000S080 | |
| 500 kW | B84143B1000S020 B84143B1000S080 | |
| 630 kW | B84143B1600S020 B84143B1600S080 | |
| 710 kW | B84143B1600S020 B84143B1600S080 | |
| 900 kW | B84143B1600S020 B84143B1600S080 | |
| 1100 kW | B84143B2500S020 | |
| 1300 kW | B84143B2500S020 | |
| 1500 kW | B84143B2500S020 | |

2) Table 14 from EN 61800-3, edition 2004

4-line filters for control cabinet interference suppression

| Power (3 AC 400 V) | Recommended suppression filters to: | |
|-----------------------|---|---|
| | EN 55011, class A EN 61800-3 ³⁾ , category C2 | EN 55011, class B EN 61800-3 ³⁾ , category C1 |
| 5.5 kW | B84144A0008R120 | |
| 11 kW | B84144A0016R120 | |
| 17 kW | B84144A0025R120 | |
| 25 kW | B84144A0036R120 | |
| 34.5 kW | B84144A0050R120 | |
| 45.5 kW | B84144A0066R120 | |
| 62 kW | B84144A0090R120 | |
| 83 kW | B84144A0120R120 | |
| 103 kW | B84144A0150R120 | |
| 138 kW | B84144A0200R120 | |
| 172 kW | B84144B0250S120 | B84144B0250S121 |
| 276 kW | B84144B0400S120 | B84144B0400S121 |
| 474 kW | B84144B0600S120 | B84144B0600S121 |

3) Table 14 from EN 61800-3, edition 2004

Selection guide

Selection guide for SIFI EMC 2-line filters

| Field of application | Interference suppression | Increasing insertion loss | Limit class (EN 55011) | Immunity | Type | Page |
|----------------------|---|---------------------------|------------------------|---|--------------------|-------------------------------|
| Office equipment | with linear power supplies | | A | Normal requirements (f > 1 MHz) | B84111F B84111A | 218 246 |
| | with commutator motors | | | | | High requirements (f > 1 MHz) |
| Domestic appliances | with secondary switch-mode power supplies | | A | Like SIFI G/B, additional symmetrical insertion loss in the range 0.1 MHz ... 0.5 MHz | | B84114D |
| | with transistor or thyristor circuits | | | | | A |
| IT equipment | with primary switch-mode power supplies | | B | Very high requirements (f > 0.1 MHz ... 100 MHz) | | |
| | Micro-processor systems | | | | | |
| Electrical tools | | | | | | |
| Optical devices | | | | | | |

* SIFI-A, -B and -C not for new applications; replaced by SIFI-F, -G and -H.