# 3-line filters

# Sine-wave output filter

520 V AC, 4...320 A, 40 °C

| | |
|---|---|
| **Ordering code:** | **B84143V*R227** |
| Date: | 2009-06-17 |
| Version: | 54 |

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## Construction

- 3-line sine-wave output filter

## Features

- Reduction of motor noise and eddy current losses
- dv/dt reduction
- Easy to install
- Compact design
- Degree of protection IP 20 [1)]
- Optimized for long motor cables (up to 1000m) and operation under full load
- Natural cooling

## Applications

- Frequency converters for motor drives, e.g.
  - elevators
  - pumps
  - traction and conveyer systems
  - HVAC systems (heating, ventilation and air conditioning)

## Terminals

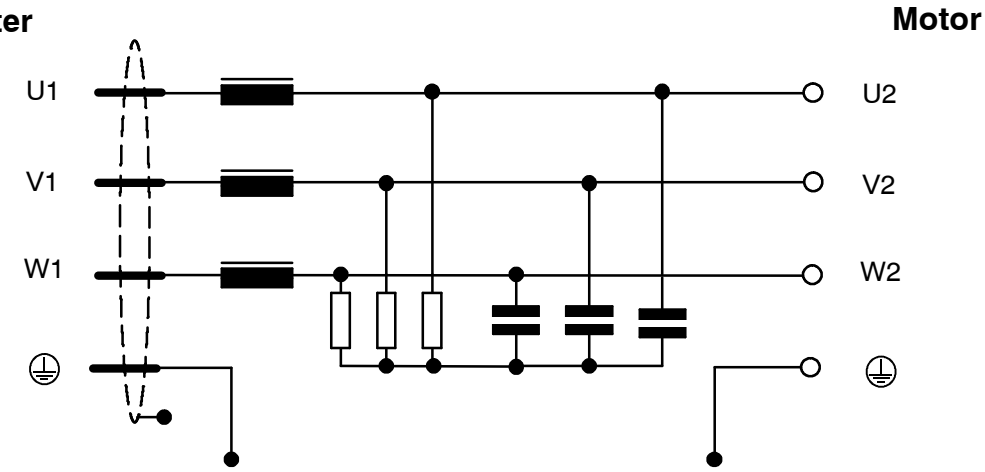
- finger-save terminal blocks up to 180 A; copper bus bars for 250 and 320 A

## Marking

- Marking on component:
  manufacturer's logo, ordering code, rated voltage, rated current,
  rated motor frequency, rated switching frequency, rated temperature,
  climatic category, date code
- Minimum marking on packaging:
  manufacturer's logo, ordering code, date code, quantity

1) To IEC 60529:2001

## Typical circuit diagram




## Technical data and measuring conditions

| | |
|---|---|
| Rated voltage $V_R$ | 4–132A: 520 VAC<br>180–320A: 690 VAC |
| Rated current $I_R$ | Referred to 40°C ambient temperature |
| Test voltage $V_{test}$ | line/line: 3000 VAC, 1min<br>lines/case: 3000 VAC, 1min |
| Frequency Motor<br>Pulse (Switching) | 0–100 Hz<br>see table |
| Overload capability | 1.5 · $I_R$ for 1 min per hour |
| Max. dv/dt on filter input | 5 kV/µs (higher values can be approved individually) |
| Current ($I_R$) derating depending on altitude | from 1000...4000 m: 5 % / 1000 m |
| Current ($I_R$) derating depending on ambient temperature | from 40...60 °C 10 % / 5 °C |
| Climatic category (IEC 60068-1) | 25/100/21 (–25 °C/ +100 °C/ 21 days damp heat test) |

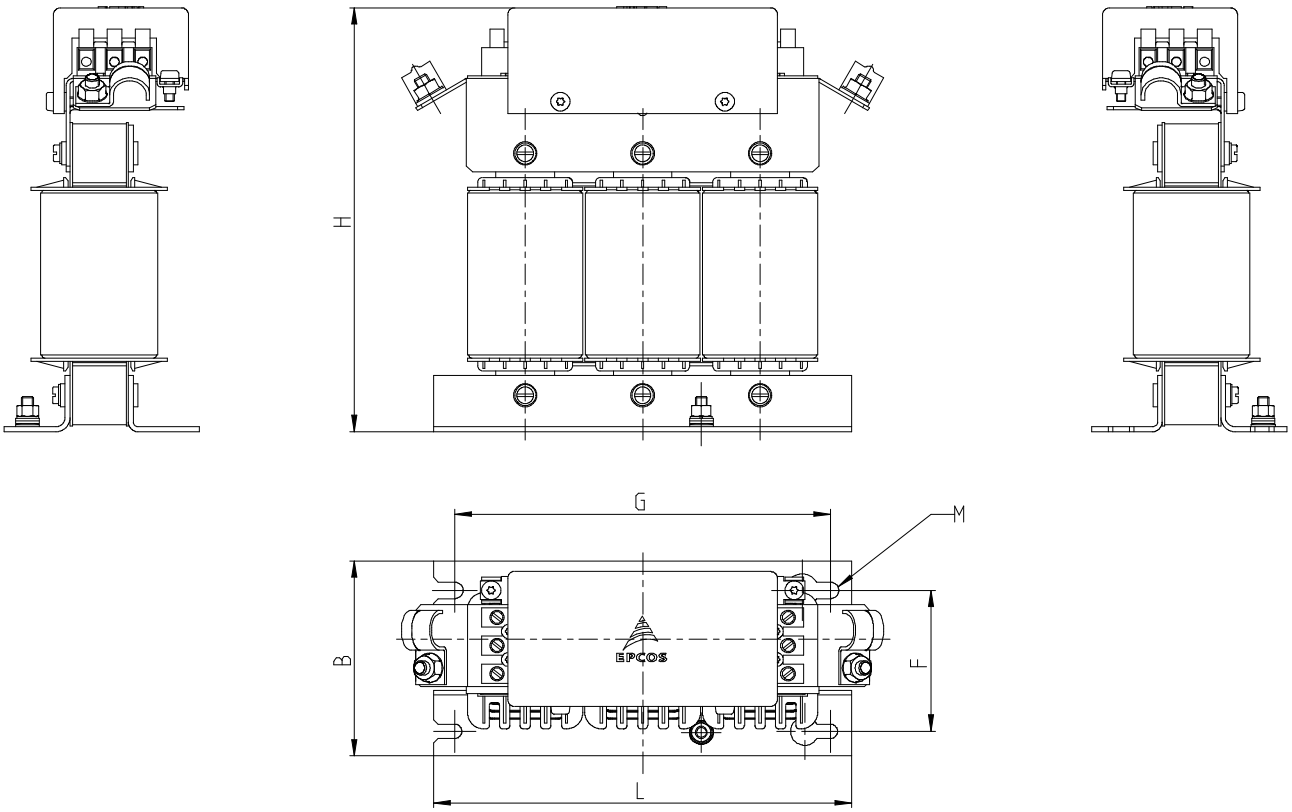
## Characteristics and ordering codes

| $V_R$ V | $I_R$ A | Terminal cross section $mm^2$ | Resonance frequency Hz | Induc-tance mH | Min. pulse frequency 1) kHz | Max. pulse frequency kHz | $R_{typ}$ mΩ | Rated power losses 2) W | Approx. weight kg | Ordering code |
|---|---|---|---|---|---|---|---|---|---|---|
| 520 | 4 | 4 | 1000 | 12.0 | 1.8 | 16 | 375 | 40 | 3.3 | B84143V0004R227 |
| | 6 | 4 | 1170 | 8.5 | 1.9 | 16 | 274 | 45 | 3.5 | B84143V0006R227 |
| | 11 | 4 | 1300 | 4.5 | 2.2 | 16 | 71 | 55 | 5.3 | B84143V0011R227 |
| | 16 | 4 | 1230 | 3.0 | 2.0 | 10 | 35 | 60 | 8.5 | B84143V0016R227 |
| | 25 | 6 | 1100 | 2.5 | 1.9 | 10 | 28 | 100 | 20 | B84143V0025R227 |
| | 33 | 6 | 1190 | 1.8 | 2.0 | 10 | 20 | 150 | 18 | B84143V0033R227 |
| | 50 | 10 | 1330 | 1.2 | 2.2 | 10 | 11 | 190 | 25 | B84143V0050R227 |
| | 66 | 25 | 1210 | 0.95 | 2.0 | 8 | 8 | 250 | 26 | B84143V0066R227 |
| | 75 | 25 | 1050 | 0.86 | 1.9 | 8 | 6.5 | 320 | 38 | B84143V0075R227 |
| | 95 | 50 | 1120 | 0.75 | 2.0 | 8 | 5.7 | 330 | 52 | B84143V0095R227 |
| | 132 | 50 | 910 | 0.52 | 1.8 | 8 | 3.2 | 380 | 67 | B84143V0132R227 |
| 690 | 180 | 150 | 870 | 0.4 | 1.6 | 6 | 3.1 | 480 | 74 | B84143V0180R227 |
| | 250 | busbars | 890 | 0.32 | 1.6 | 6 | 1.8 | 560 | 91 | B84143V0250R227 |
| | 320 | busbars | 780 | 0.25 | 1.6 | 6 | 1.3 | 950 | 121 | B84143V0320R227 |

1) lowest frequency in converter pulse spectrum.

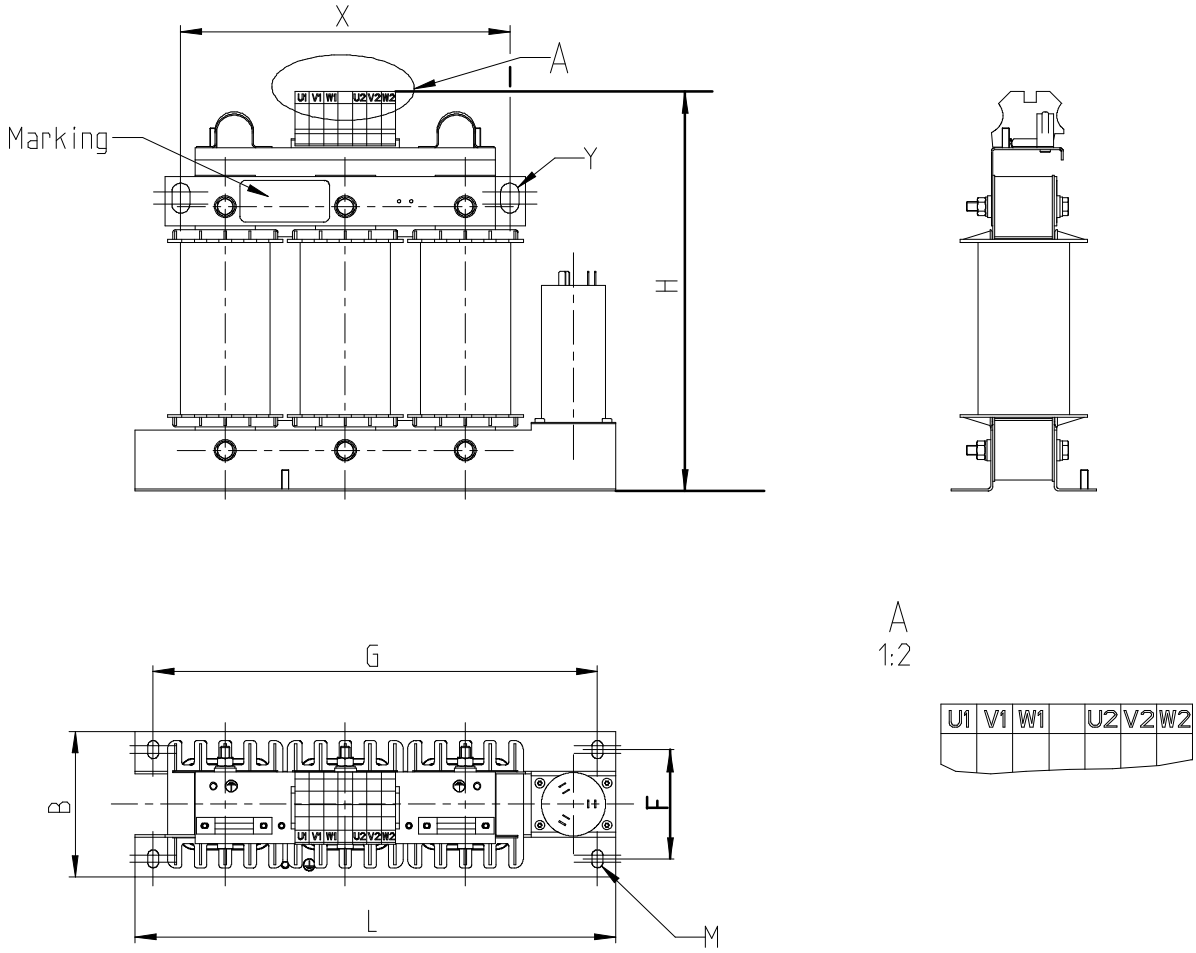
2) typical value. Varies with type and lenght of motor cable, pulse frequency and modulation mode.

## Dimensional drawings (capacitor wiring removed in picture)



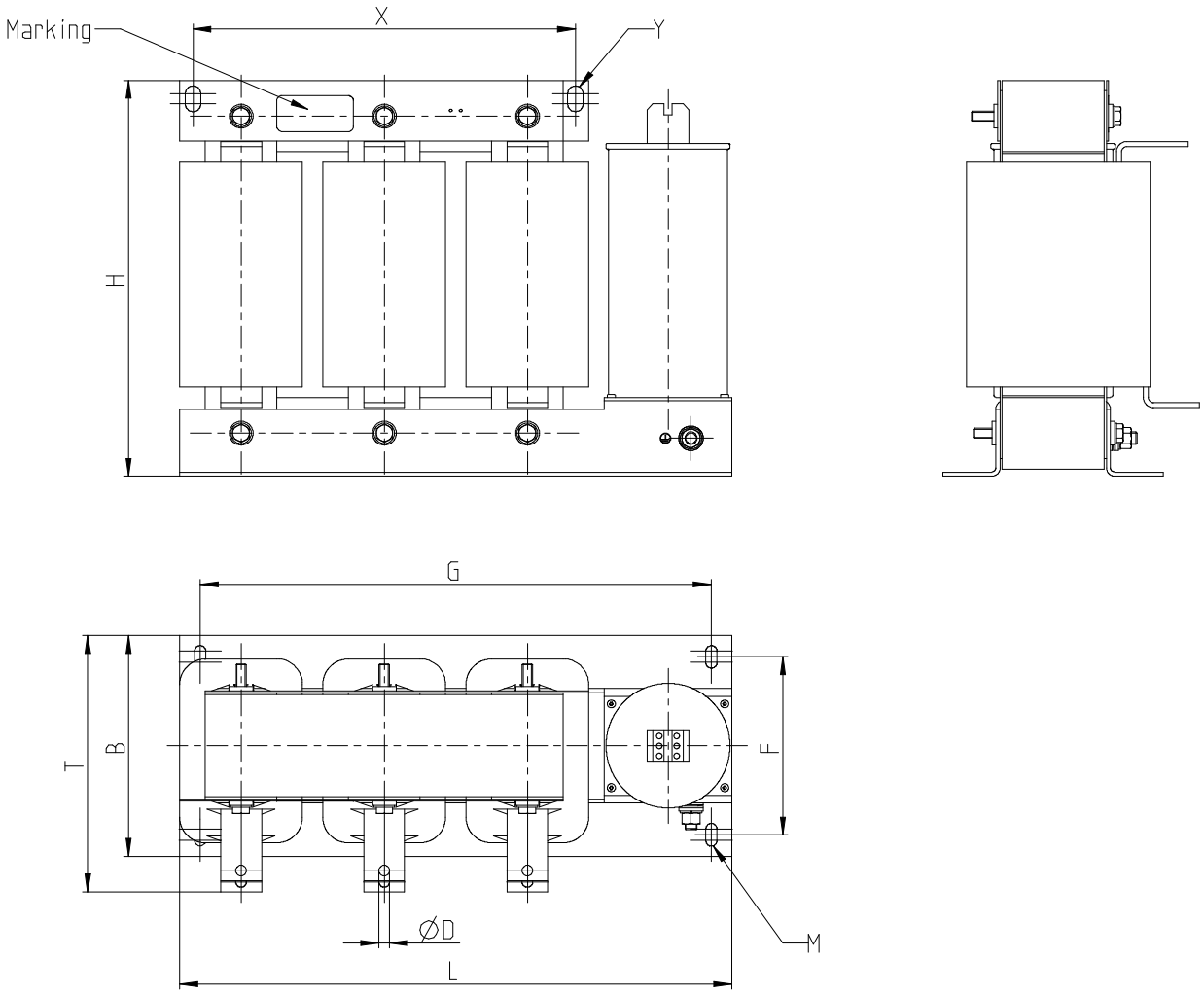

| Ordering code | L | B | H max. | G | F | M |
|---|---|---|---|---|---|---|
| B84143V0004R227 | 178 | 83 | 210 | 160 | 60 | M6 |
| B84143V0006R227 | 178 | 83 | 210 | 160 | 60 | M6 |
| B84143V0011R227 | 178 | 98 | 210 | 160 | 75 | M6 |
| B84143V0016R227 | 220 | 100 | 230 | 200 | 75 | M6 |
| B84143V0025R227 | 275 | 120 | 290 | 255 | 92 | M6 |
| B84143V0033R227 | 275 | 120 | 290 | 255 | 92 | M6 |

## Dimensional drawings (capacitor wiring removed in picture)




| Ordering code | L | B | H max. | G | F | M | X | Y |
|---|---|---|---|---|---|---|---|---|
| B84143V0050R227 | 400 | 121 | 350 | 370 | 91 | 9x15 | 274 | 15x25 |
| B84143V0066R227 | 400 | 121 | 350 | 370 | 91 | 9x15 | 274 | 15x25 |
| B84143V0075R227 | 400 | 146 | 350 | 370 | 116 | 9x15 | 274 | 15x25 |
| B84143V0095R227 | 440 | 161 | 400 | 400 | 125 | 9x15 | 324 | 15x25 |
| B84143V0132R227 | 440 | 176 | 400 | 400 | 140 | 9x15 | 324 | 15x25 |
| B84143V0180R227 | 500 | 191 | 400 | 460 | 155 | 9x15 | 324 | 15x25 |

## Dimensional drawings (capacitor wiring removed in picture)




| Ordering code | L | B | H | G | F | ØD | T | X | Y | M |
|---|---|---|---|---|---|---|---|---|---|---|
| B84143V0250R227 | 540 | 216 | 410 | 500 | 174 | 12,5 | 290 | 374 | 15x25 | 11x22 |
| B84143V0320R227 | 540 | 246 | 460 | 500 | 204 | 12,5 | 320 | 374 | 15x25 | 11x22 |

## Cautions and warnings

- Please note the advices in our data book “EMC Filters” (latest edition); attention should be paid to the chapter “General safety notes”.
- 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. Sine-wave 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 sine-wave 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 sine-wave 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).
- Sine-wave filters must be protected in the application against impermissible exceeding of the rated currents by overcurrent protective circuitry.
- The converter pulse frequency must not exceed the specified range to avoid resonancies and uncontrolled heating of the sine-wave filter.

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