



## **3-line filters for converters and power electronics**

520/300 V, 50/60 Hz, 35 ... 230 A, 50 °C

**Ordering code:** B84143A\*R410, B84143B\*R410  
**Date:** 2009-08-03  
**Version:** 02

### Construction

- 3-line filter
- Metal case
- Book size

### Features

- High insertion loss
- Easy to install
- Compact design
- Degree of protection IP 20 <sup>1)</sup>
- Design complies with IEC 60939, UL 1283, CSA 22.2 No.8
- Optimized for long motor cable and operation under full load
- B84143A\*R410: UL- and cUL approval

### Applications

- Frequency converters and regenerative frequency converters (AFE) for motor drives, e.g.
  - elevators
  - machine tool building
  - pumps
  - traction systems
  - conveyor systems
  - HVAC systems (heating, ventilation and air conditioning)

### Terminals

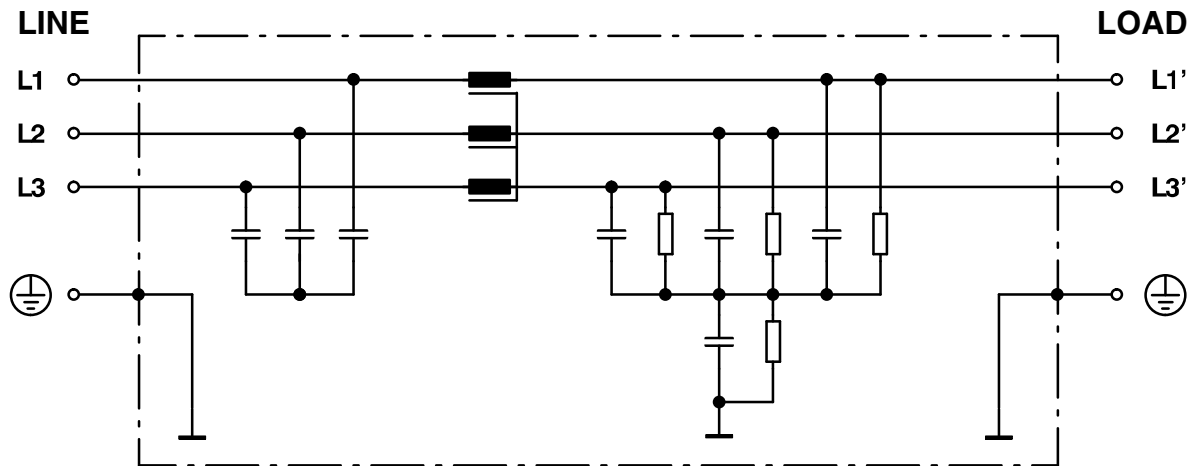
- Finger-save terminal blocks

### Marking

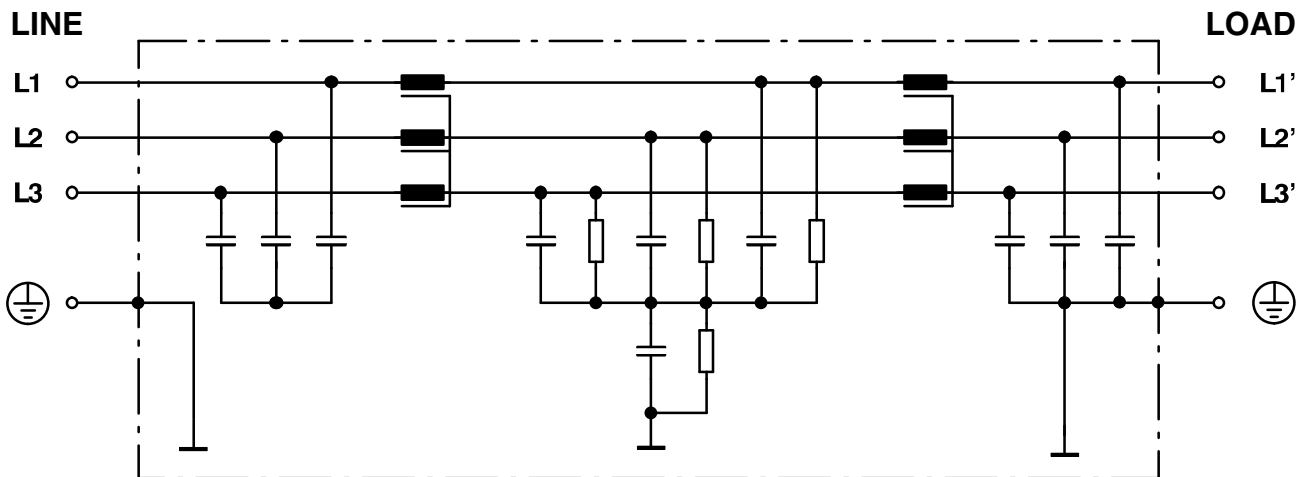
- Marking on component:  
manufacturer's logo, ordering code, rated voltage, rated frequency, rated current, rated temperature, climatic category, date code
- Minimum marking on packaging:  
manufacturer's logo, ordering code, date code, quantity

<sup>1)</sup> To IEC 60529:2001

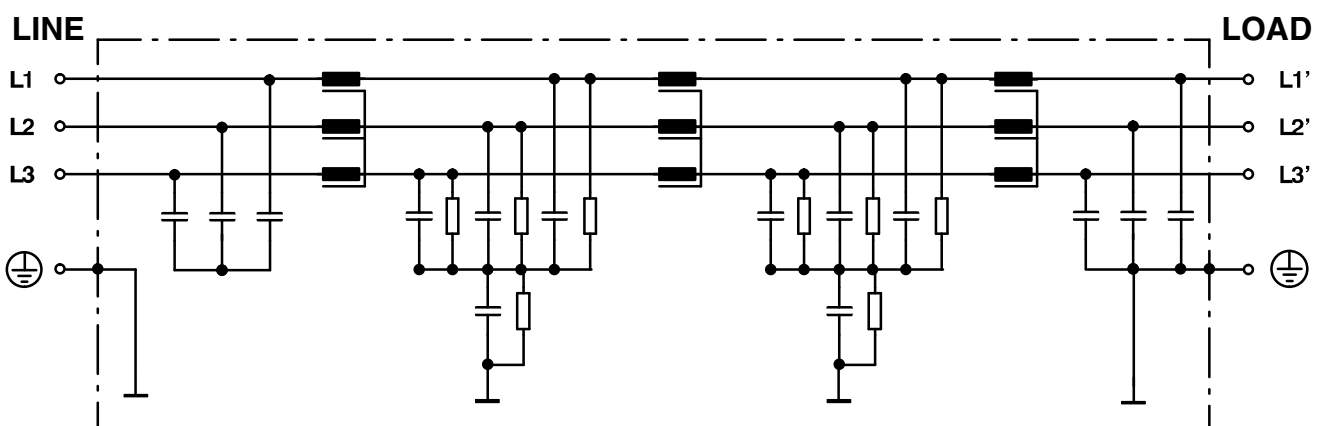
Typical circuit diagram of B84143A0035R410, B84143A0200R410, B84143A0230R410



Typical circuit diagram of B84143A0050R410, B84143A0080R410, B84143A0110R410, B84143A0150R410



Typical circuit diagram of B84143B0200R410, B84143B0230R410



**Technical data and measuring conditions**

Rated voltage	$U_R$	520/300	V AC
Rated frequency	$f_R$	50/60	Hz
Test voltage line to line for 2 s	$U_{test}$	2240	V DC
Test voltage line to case for 2 s	$U_{test}$	2720	V DC
Rated temperature	$T_R$	50	°C
Overload capability (thermal) for 3 min per hour or for 30 s per hour		1.5 x $I_R$ 2.5 x $I_R$	
Climatic category (IEC 60068-1)		25/100/21	

**Characteristics and ordering codes**

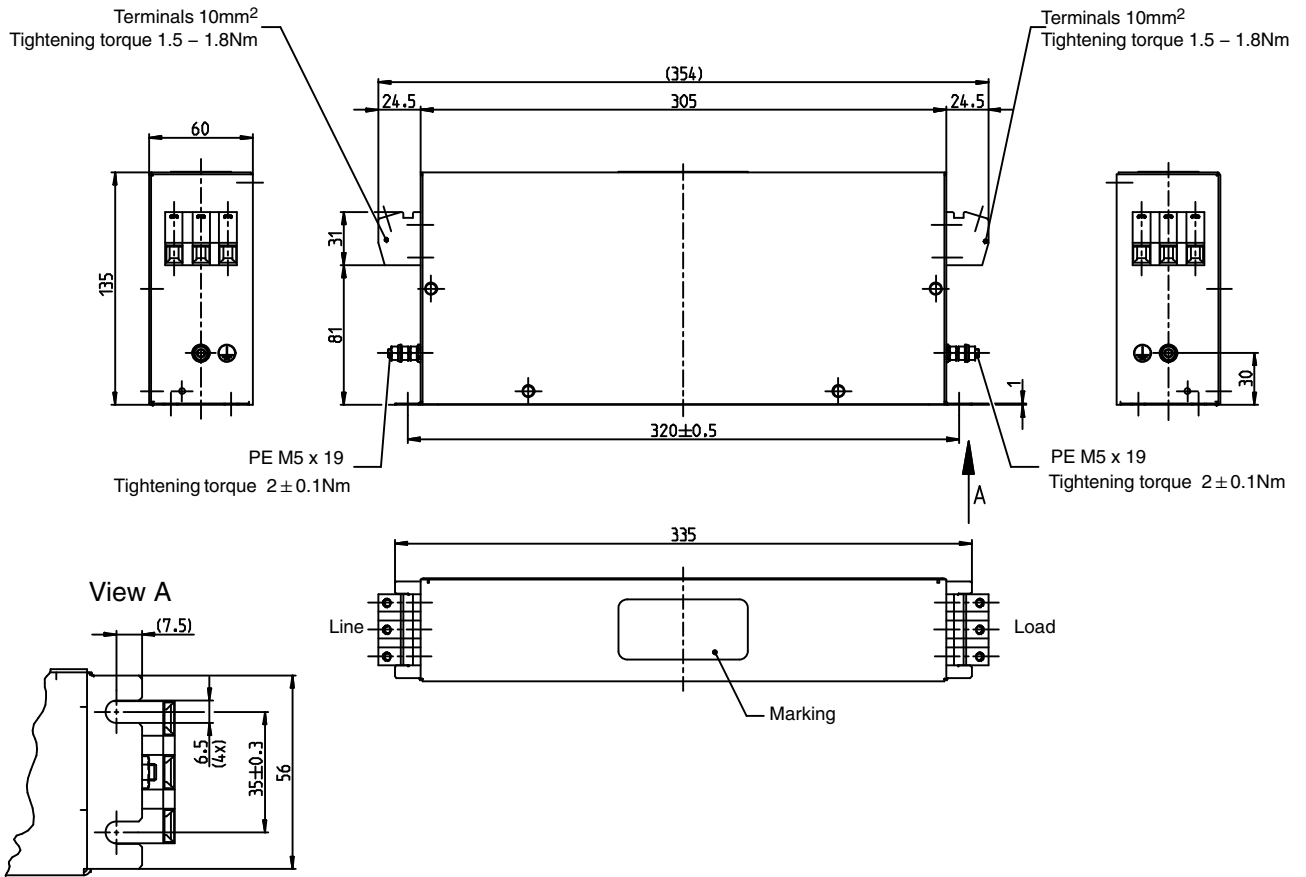
$U_R$ AC	$I_R$	Terminal cross section	$I_{leak}^{2)}$	$R_{typ}$	Approx. weight	Ordering code	Approvals	
							mm <sup>2</sup>	mA
V	A							
520/300	35	10	14	2.9	2.5	B84143A0035R410	X	X
	50	25	15	1.6	4.5	B84143A0050R410	X	X
	80	50	15	0.9	8.5	B84143A0080R410	X	X
	110	50	15	0.65	9.0	B84143A0110R410	X	X
	150	95	15	0.6	13.5	B84143A0150R410	X	X
	200	95	10	0.3	14.0	B84143A0200R410	X	X
	230	95	10	0.25	14.5	B84143A0230R410	X	X
	200	95	18	0.39	19.0	B84143B0200R410	–	–
	230	95	18	0.35	19.0	B84143B0230R410	–	–

X = approval granted

2) Calculation according draft proposal IEC 60939-1 Ed. 3 (2008-10-29), annex A, "Calculation of leakage current".

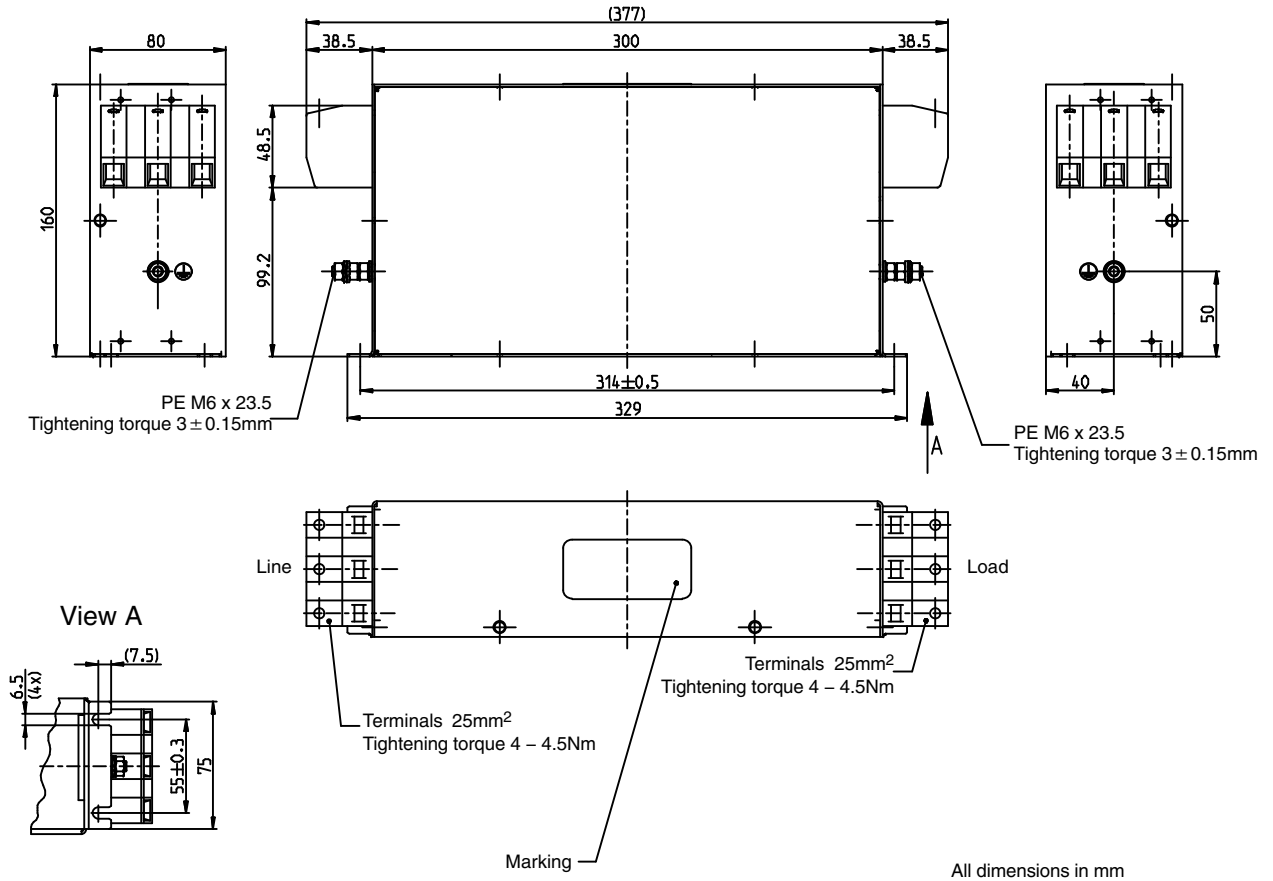
Dimensional drawings

B84143A0035R410

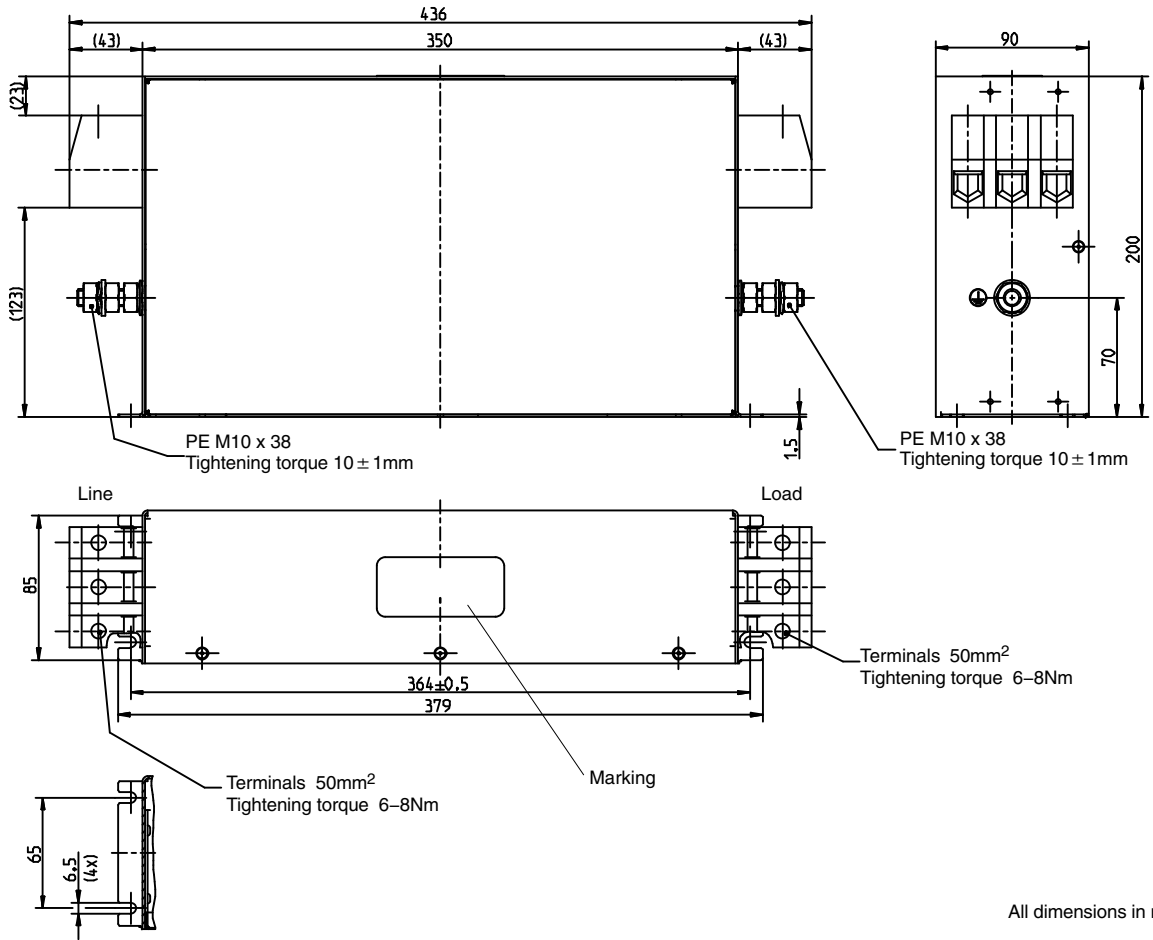


All dimensions in mm

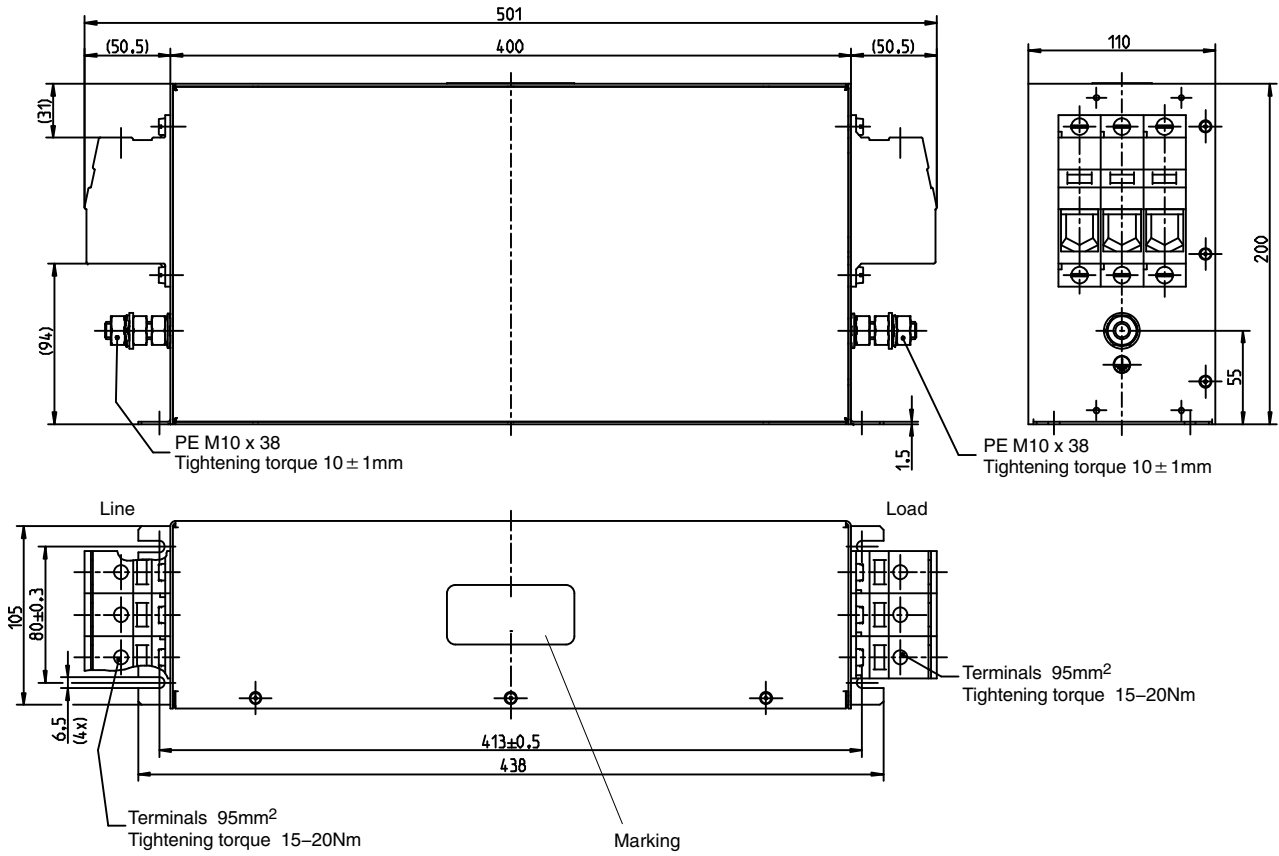
B84143A0050R410



B84143A0080R410, B84143A0110R410



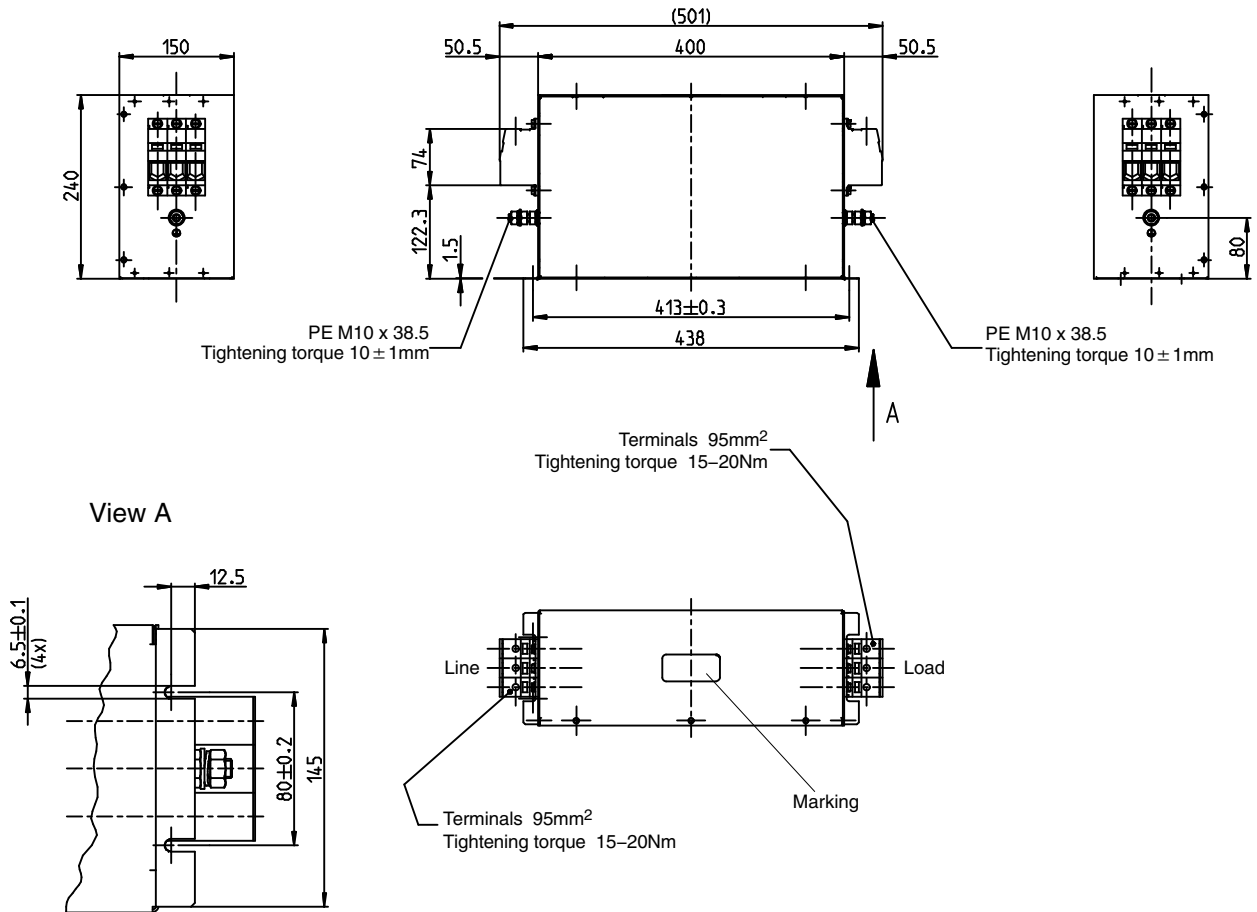
B84143A0150R410, B84143A0200R410, B84143A0230R410



All dimensions in mm



B84143B0200R410, B84143B0230R410

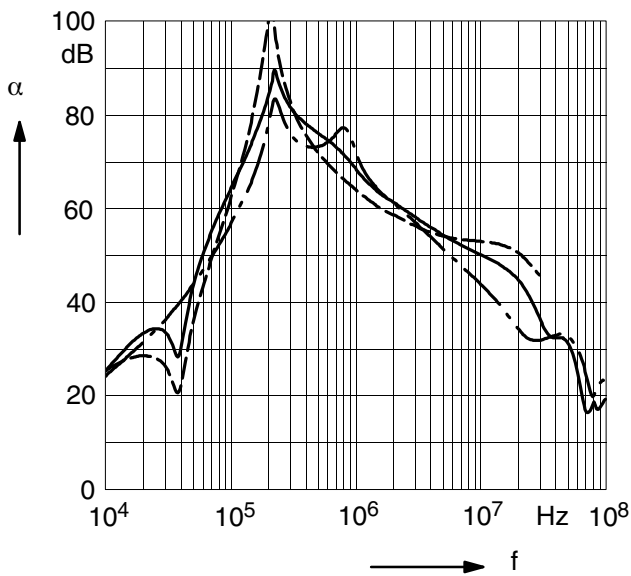


All dimensions in mm

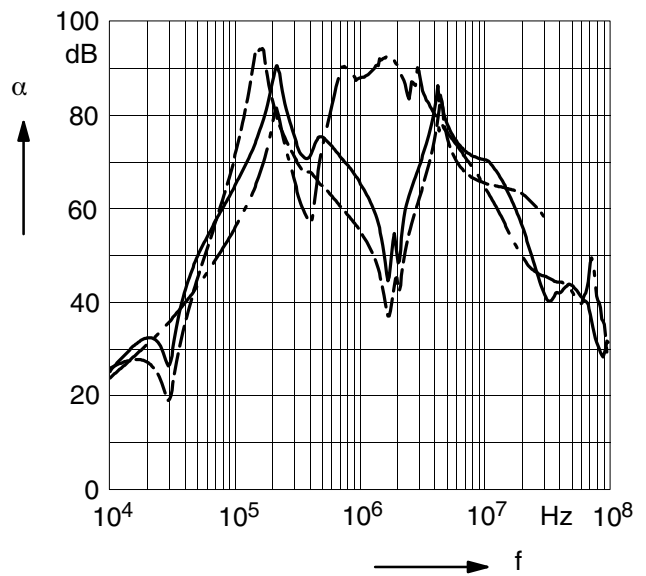
**Insertion loss** (typical values at  $Z = 50 \Omega$ )

- unsymmetrical, adjacent branches terminated
- · - common mode, all branches in parallel (asymmetrical)
- - - differential mode (symmetrical)

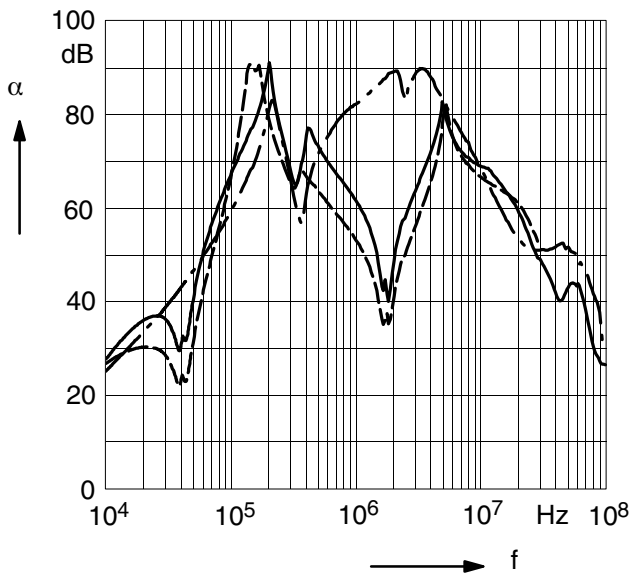
B84143A0035R410



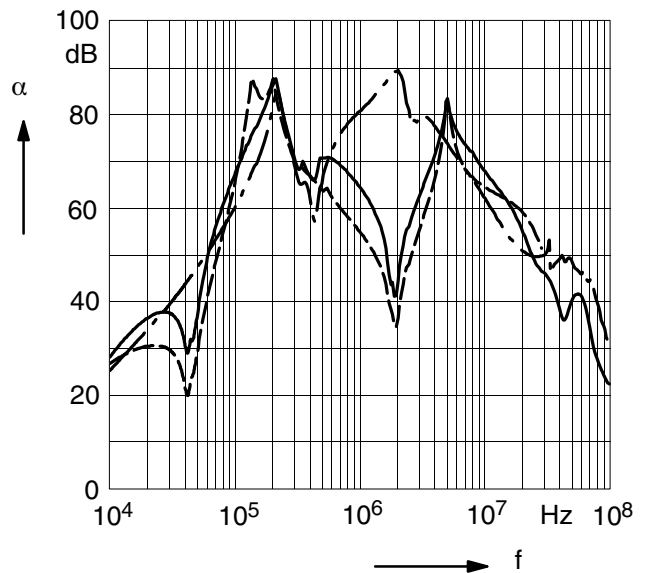
B84143A0050R410



B84143A0080R410



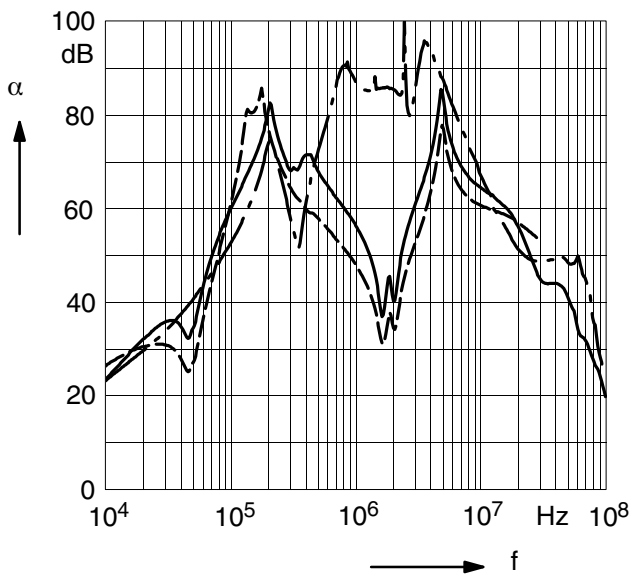
B84143A0110R410



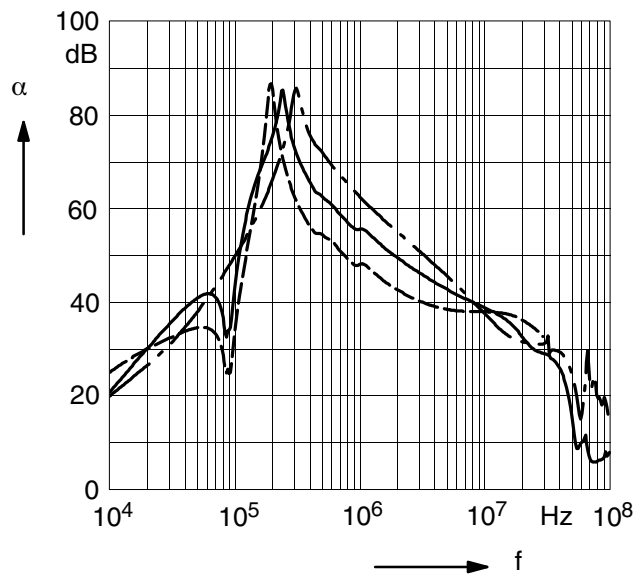
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- · - common mode, all branches in parallel (asymmetrical)
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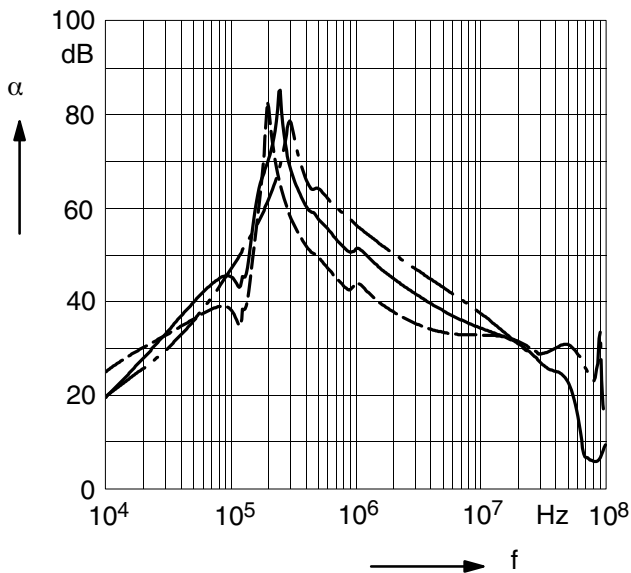
B84143A0150R410



B84143A0200R410

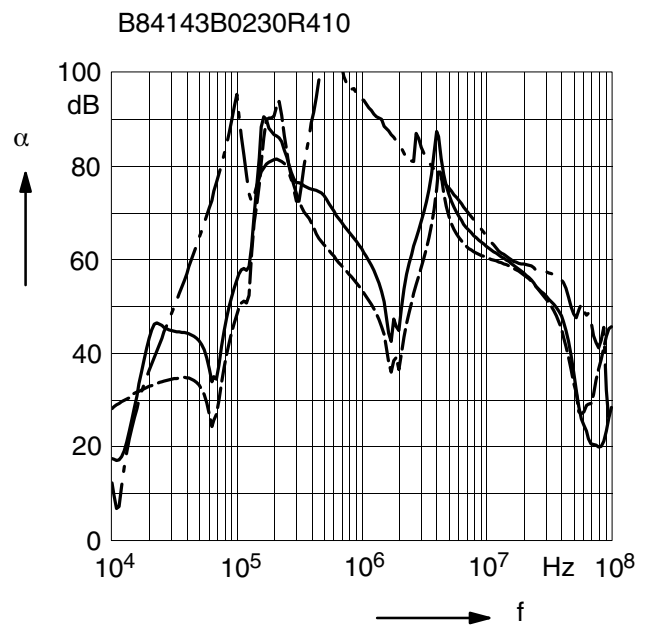
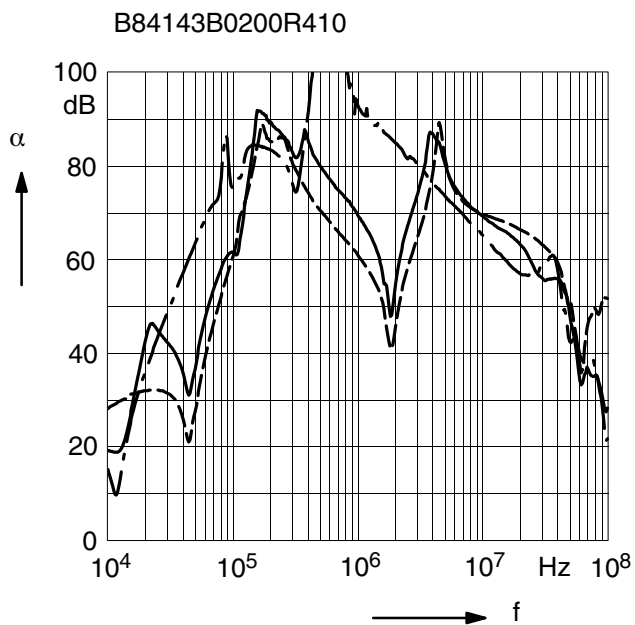


B84143A0230R410



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

- unsymmetrical, adjacent branches terminated
- common mode, all branches in parallel (asymmetrical)
- - - differential mode (symmetrical)



### Caution 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. EMC 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 EMC 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 EMC 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).
- EMC filters must be protected in the application against impermissible exceeding of the rated currents by overcurrent protective.
- In case of leakage currents  $> 3.5 \text{ mA}$  you shall mount the PE conductor stationary with the required cross section before beginning of operation and save it against disconnecting. For leakage currents  $I_L^{4)} < 10 \text{ mA}$  the PE conductor must have a KU value <sup>3)</sup> of 4.5; for leakage currents  $I_L \geq 10 \text{ mA}$  the PE conductor must have a KU value of 6.

3) 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.

A value of KU = 4.5 with respect to interruptions is attained:

– with a permanently connected protective earth circuit  $\geq 1.5 \text{ mm}^2$

– with a protective earth circuit  $\geq 2.5 \text{ mm}^2$  connected via shroud connectors (IEC 60309–2).

KU = 6 with respect to interruptions is achieved for fixed–connection lines  $\geq 10 \text{ mm}^2$  where the type of connection and line layout correspond to the requirements for PEN conductors as specified in relevant standards.

4)  $I_L$  = leakage current let–go

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