3–line sine–wave EMC output filters for converters and power electronics

≫ *SineFormer* ≪

690 VAC, 95A, 180 A, 320A, 40 °C

Ordering code:	**B84143V*R290**
Date:	2008–02–04
Version:	01

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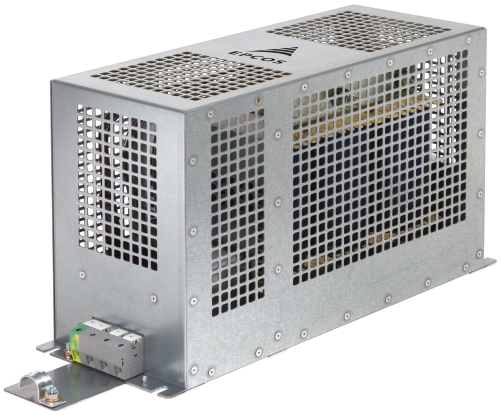
Construction

- 3–line sinus emc output filter
- Metal case



Features

- Supersede shielded motor cables
- Motor noise reduction
- Reduction of bearing current
- dv/dt reduction
- Easy to install
- Compact design
- Degree of protection IP 20 [1)]
- Design complies with
  EN 60939, UL 1283, CSA 22.2 No.8
- Optimized for long motor cable (up to 1000 m)
  and operation under full load
- No integrated forced ventilation (maintenance–free)
- Connection to converter DC–link is not necessary
- Reducing eddy current losses

Applications

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

Terminals

- Line side (to converter): shielded cable up to 180 A
- Load side (to motor): save to touch terminals up to 180 A

Marking

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

1) To IEC 60529:2001

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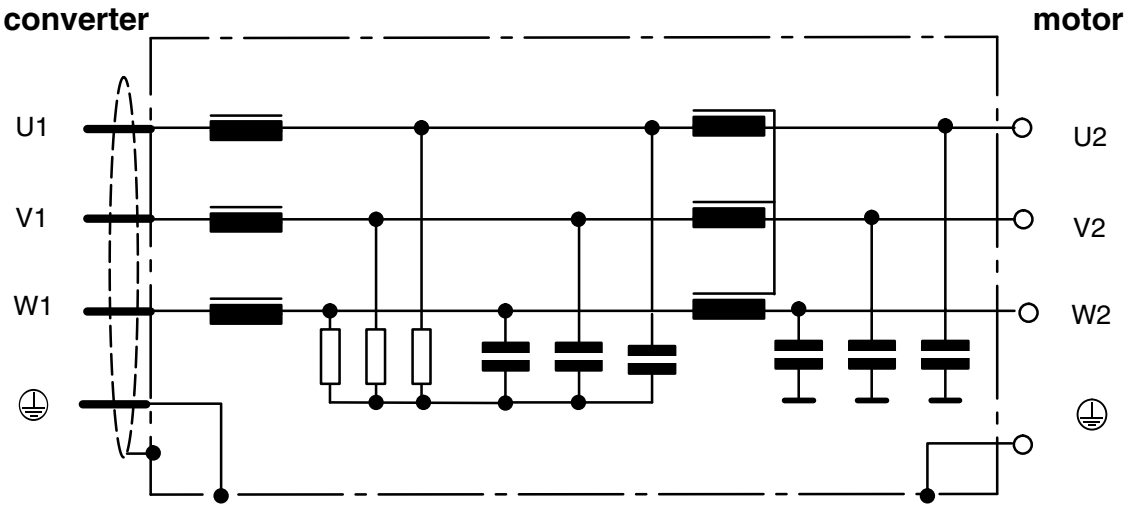
Typical circuit diagram



Technical data and measuring conditions

Rated voltage U_R	760 VAC
Rated current I_R	Referred to 40°C ambient temperature
Test voltage U_P	2200 V DC, 2 s (line/line) 2800 V DC, 2 s (line/case)
Frequency Motor Pulse (Switch)	0 – 100 Hz 4–8 kHz; (320 A: 2,5–3 kHz)
Overload capability	1.5 · I_R for 60 s per hour
Max. dv/dt on Filter input	5 kV/µs
Convection distance to other devices	See page 5
Climatic category	In accordance with EN 60068–1 25/100/21 (–25 °C/ +100 °C/ 21 days damp heat test)
Vibration (Sine) Shock (half sine)	According to DIN IEC60068–2–6 10 cycle, 1 Oct./min., 3–13 Hz: 3 mm,13–200 Hz: 1 *g* 15 *g*, 11 ms, 3 axis, 3 shocks per direction 18 total
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
Temperature *	Inside iron–choke ∼130 °C; housing ∼70 °C
Noise *	∼72 dB(A)

*) see cautions and warnings

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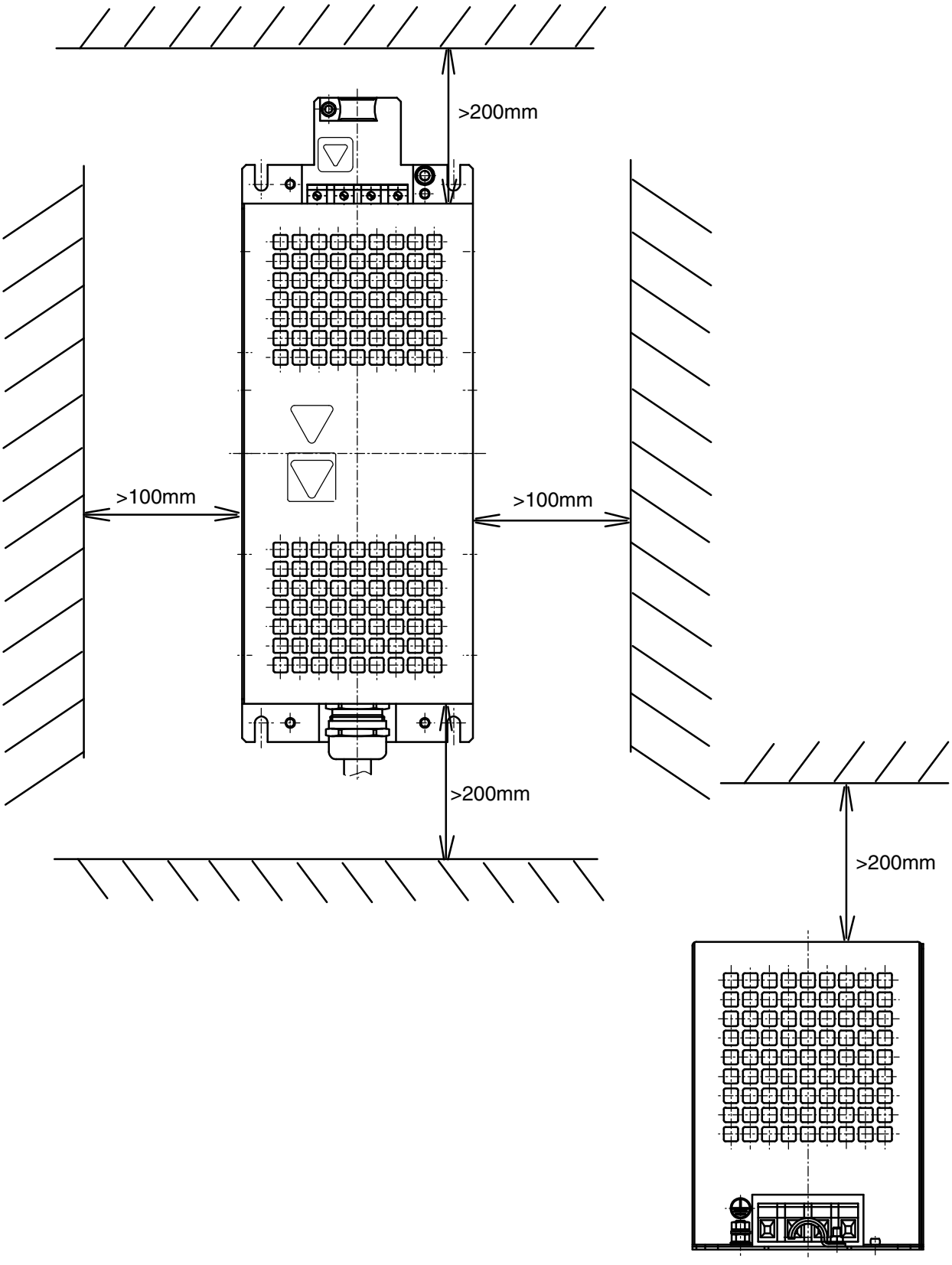
Characteristics and ordering codes

I_R	Terminal	Voltage drop	Losses at 100 Hz	R_{typ}	Approx. weight	Ordering code	Approvals		
A	mm^2	%	W	mΩ	kg				
95 (120 A*)	50	10	250	8	99	B84143V0095R290			
180	150	10	400	6	125	B84143V0180R290			
320 (400 A*)	see page 9	10	750	1	235	B84143V0320R290			

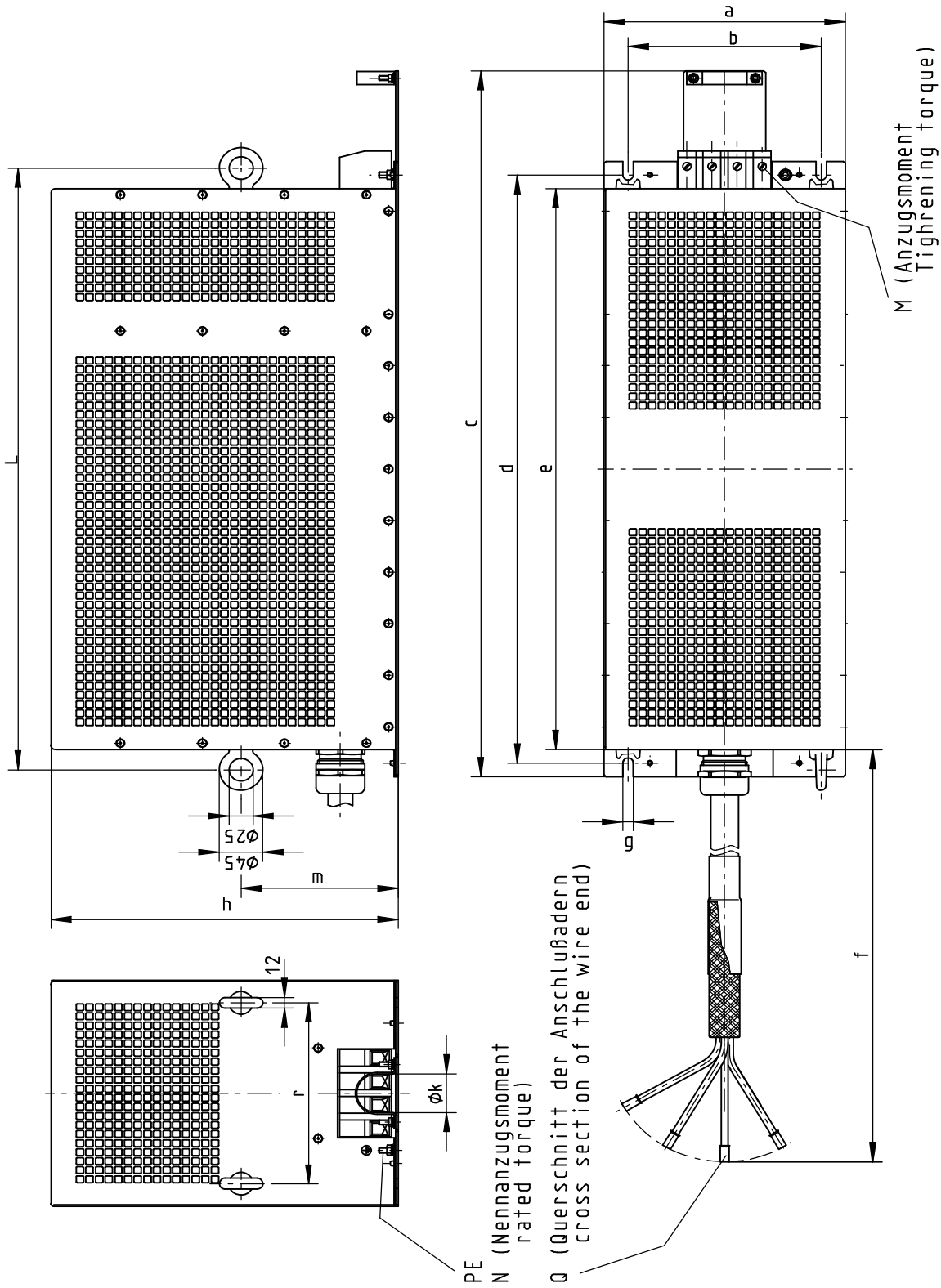
X = New ordering code will notified to UL file

*) = Calculated for duty cycle (Ed.) 60%. Acceleration max. 6 s, brake max. 6 s @ 1x minute

Convection space (cabinet fan recommended)



Dimensional drawings B84143V0095R290



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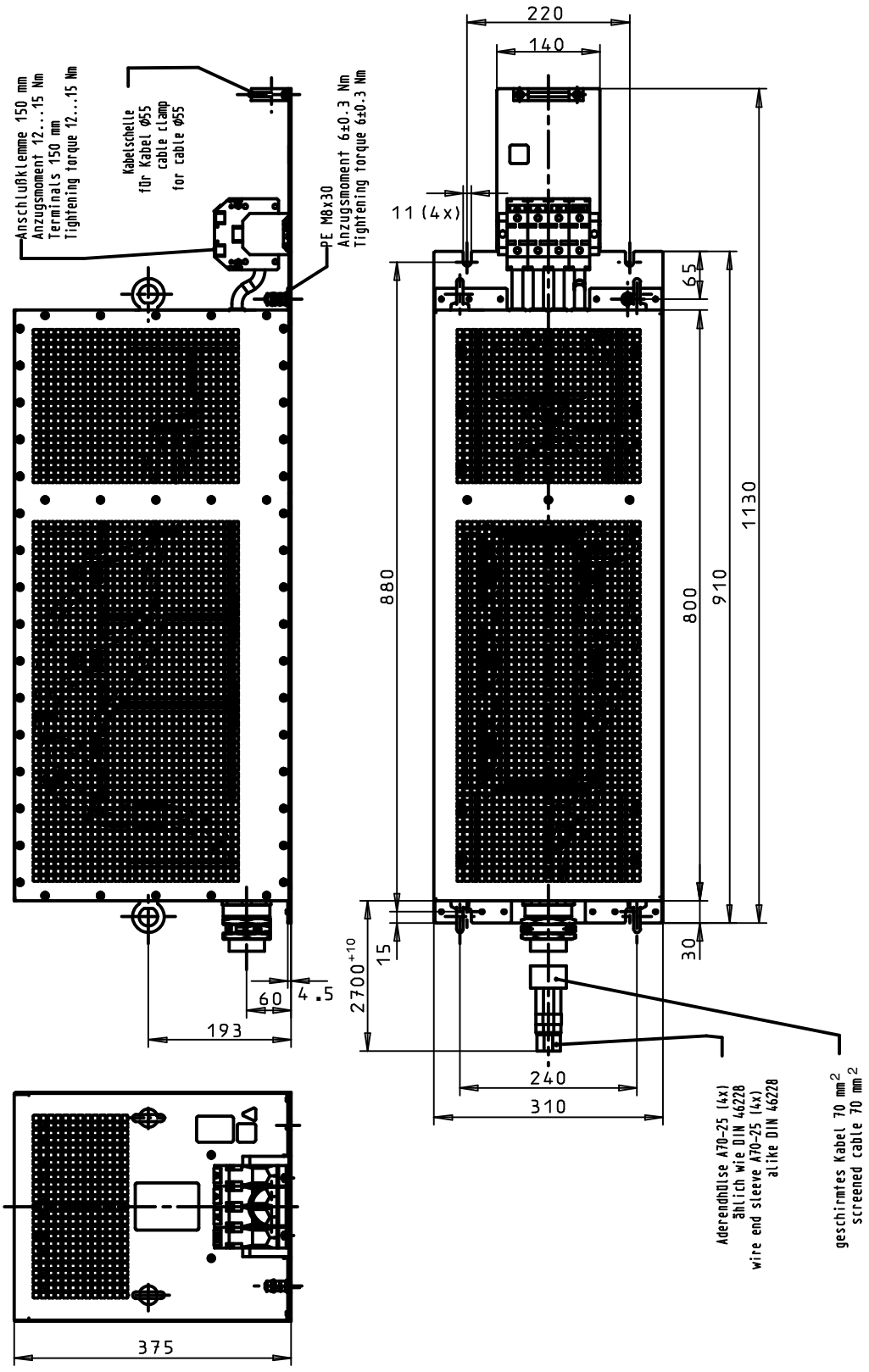
Dimension data for previous page B84143V0095R290

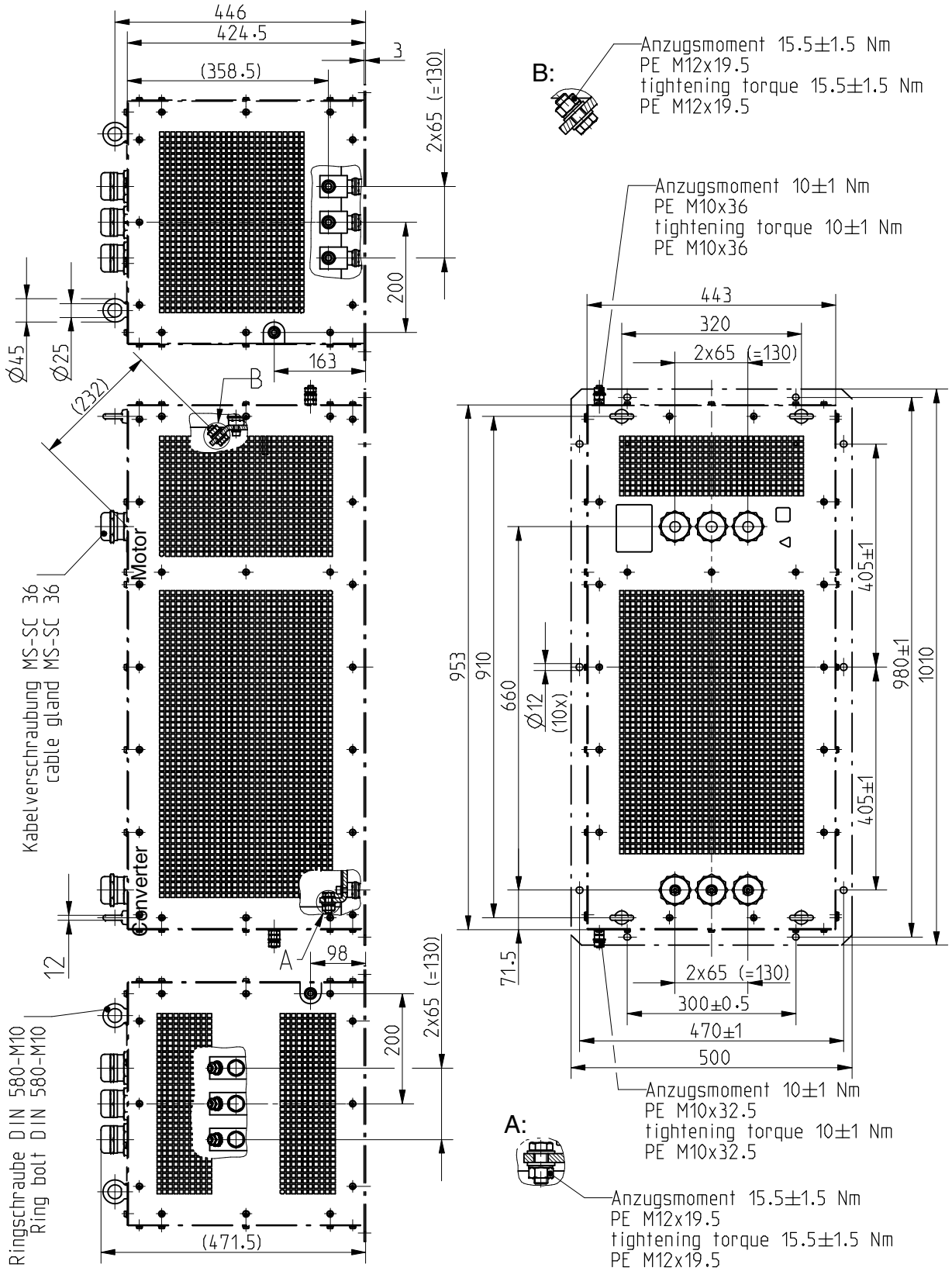
	a	b	c	d	e	f	h	g	Øk	l	m	r	M	PE N	Q
B84143V0095R290	250	200	780	650	620	1600	360	11	Ø43	665	163	200	6–8Nm	M6x15.5 3±0.15Nm	35mm2

Dimensions (mm)

Dimensional drawing B84143V0180R290



Dimensional drawing B84143V0320R290



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. SineFormer 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 SineFormer 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 SineFormer, 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).
- SineFormer must be protected in the application against impermissible exceeding of the rated currents by overcurrent protective.
- 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 [4] < 10 mA the PE conductor must have a KU value [3] of 4.5; for leakage currents $I_L \geq 10$ mA the PE conductor must have a KU value of 6.
- The information, specifications and values contained in this data sheet are based on our knowlege of typical requirements that are often placed on SineFormer. It is incumbent on the customer to check and decide whether this SineFormer is suitable for use in a particular application. In particular the values with regard to “temperature” and “noise” have to be observed.

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 ≥ 1.5 mm^2
– with a protective earth circuit ≥ 2.5 mm^2 connected via shroud connectors (IEC 60309–2).
KU = 6 with respect to interruptions is achieved for fixed–connection lines ≥ 10 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

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 statement cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is 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 an EPCOS 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 passive electronic components or failure before end of their usual service life time 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 a passive 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 a passive electronic component.
3. **The warnings, cautions and product–specific notes must be observed**.
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet (www.epcos.com/material). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.

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