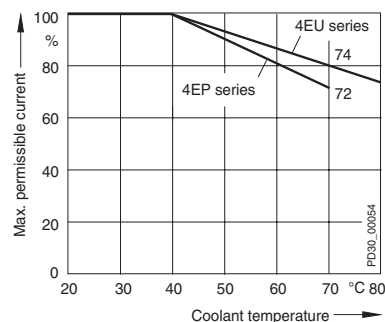


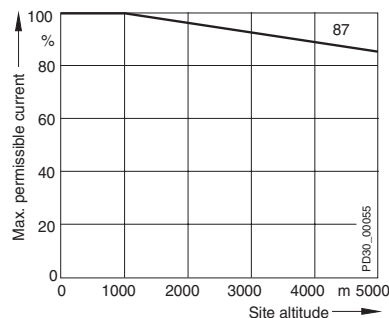
General

Deviations of rated values at site altitudes > 1000 m

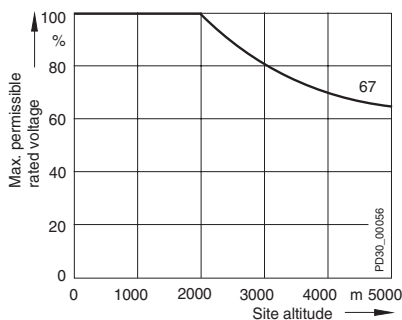
Reduction of the rated voltage and rated current, depending on the site altitude and coolant temperature



Deviation of the permissible direct current of rated direct current I_{dn} , or permissible alternating current of rated alternating current I_n (at coolant temperatures $\neq 40^\circ\text{C}$)
Characteristic curve 74 applies to reactors 4EU, 4ET, 4PK
Characteristic curve 72 applies to reactors 4EP, 4EM, 4EF11



Deviation of permissible direct current of rated direct current I_{dn} , or permissible alternating current of rated alternating current I_n (at site altitudes > 1000 m above sea level)



Reduction of rated voltage for insulation (at site altitudes > 2000 m above sea level)

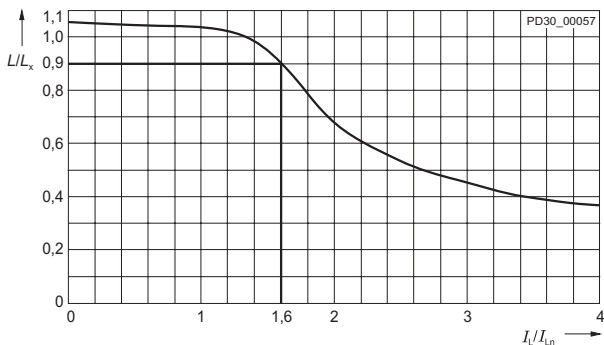
Inductance curve

Commutating reactors and mains reactors

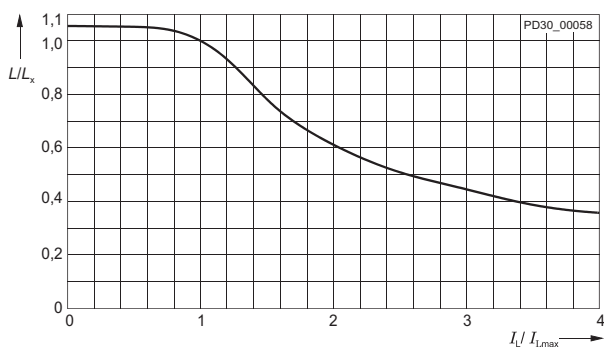
Commutating reactors and mains reactors differ greatly with regard to the inductance curve. The inductance is almost constant through to the rated current I_{Ln} .

- Mains reactors still have 90% of their rated inductance at a 1.6-fold rated current I_{Ln} .
- Commutating reactors have a residual inductance of 60% at a 2.0-fold rated current I_{Ln} .

Typical inductance curves over the reactor current are shown in the following illustrations:



Typical curve of the inductance of a **mains reactor** over the reactor current



Typical curve of the inductance of a **commutating reactor** over the reactor current

Voltage drop ΔU or reference voltage drop u_D

In the case of **three-phase reactors**, the voltage drop ΔU per reactor phase when loaded with the maximum continuous thermal current I_{thmax} and line frequency $f = 50$ Hz or 60 Hz.

The percent voltage drop u_D can be calculated using the following formula:

For converter connection B6

$$u_D = \frac{\Delta U \times 100 \times \sqrt{3}}{U_N} \quad \text{in \%}$$

The inductance per reactor phase is as follows:

$$L_x = \frac{\Delta U}{I_{thmax} \times \omega}$$

$$\omega = 2 \pi \times f$$

with f = line frequency (50 Hz or 60 Hz)

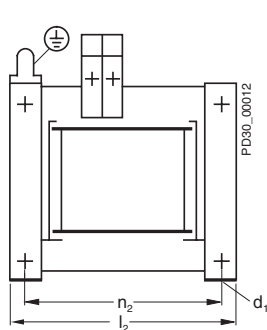
Recommended supply voltage U_N , reference voltage drop u_D and insulation rating

The "Selection and ordering data" table specifies a recommended supply voltage U_N for the reactors. The percent voltage drops u_D assigned to the reactors apply to the relevant recommended supply voltage U_N .

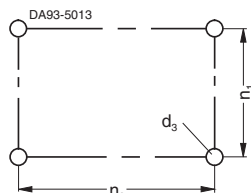
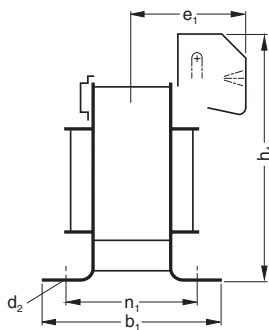
The rated voltage for the insulation specified in the "Selection and ordering data" table also allows the use of reactors at voltages that deviate from the recommended supply voltage U_N , but that are smaller or the same as the rated voltage of the insulation. The reference voltage drop u_D then changes and can be calculated using the formula shown in the Section "Voltage drop ΔU or reference voltage drop u_D ".

A reactor with the reference voltage drop u_D specified as a percent value has the same effect on the system as a transformer with the same u_K .

Dimensional drawings



4EM ($I_{Ln} \leq 20$ A)



Mounting holes

4EM ($I_{Ln} \leq 20$ A)

Terminal 8WA9 200

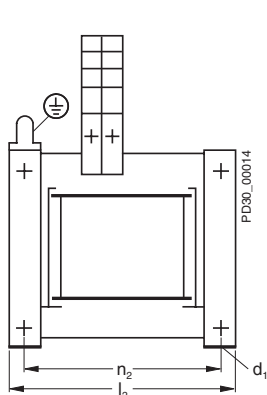
Cross-sections: solid: 0.5 mm² to 6 mm²
finely stranded: 1.5 mm² to 4 mm²

4EM (I_{Ln} 22.4 to 40 A)

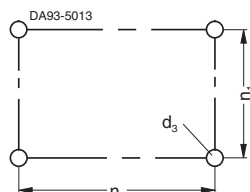
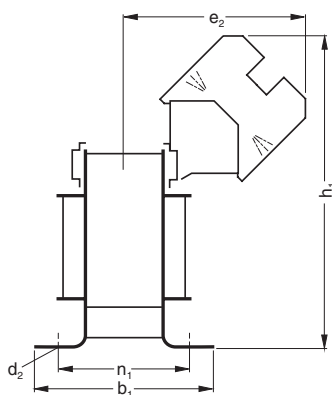
Terminal RKW 110 or TRKSD 10

Cross-sections: solid: 1 mm² to 16 mm²
finely stranded: 1 mm² to 10 mm²

Type	Rated alternating current I_{Ln}	b_1	d_1	d_2	d_3	e_1 max	h_1 max	l_2 max	n_1	n_2
Rated alternating current for terminal connections, for user-defined arrangement of reactors										
4EM46	up to 40 A	51	3.6	7	M3	53.0	85.0	61	39	50.0
4EM47	up to 40 A	60	4.8	9	M4	54.0	89.0	67	45	55.0
4EM48	up to 40 A	69	4.8	9	M4	56.5	98.0	79	53	65.0
4EM49	up to 40 A	85	4.8	9	M4	65.0	103.0	85	69	70.0
4EM50	up to 40 A	97	5.8	11	M5	66.0	111.5	97	77	80.0
4EM51	up to 40 A	111	5.8	11	M5	73.0	111.5	97	91	80.0
4EM52	up to 40 A	115	5.8	11	M5	70.5	131.0	121	92	100.0
4EM61	up to 40 A	110	5.8	11	M5	73.5	118.0	106	92	87.5



4EM (I_{Ln} 22 to 50 A)



Mounting holes

4EM (I_{Ln} 22 to 50 A)

Terminal 8WA1 204

Cross-sections: solid: 0.5 mm² to 6 mm²
stranded: 10 mm² to 25 mm²
finely stranded: 2.5 mm² to 16 mm²

Type	Rated alternating current I_{Ln}	b_1	d_1	d_2	d_3	e_2 max	h_1 max	l_2 max	n_1	n_2
Rated alternating current for terminal connections, for user-defined arrangement of reactors										
4EM49	22 to 50 A	85	4.8	9	M4	75	120.0	85	69	70.0
4EM50	22 to 50 A	97	5.8	11	M5	76	128.5	97	77	80.0
4EM51	22 to 50 A	111	5.8	11	M5	83	128.5	97	91	80.0
4EM53	22 to 50 A	120	7.0	13	M6	79	168.5	151	92	125.0
4EM61	22 to 50 A	110	5.8	11	M5	83	135.5	106	92	87.5
4EM62	22 to 50 A	135	5.8	11	M5	90	148.0	121	112	100.0