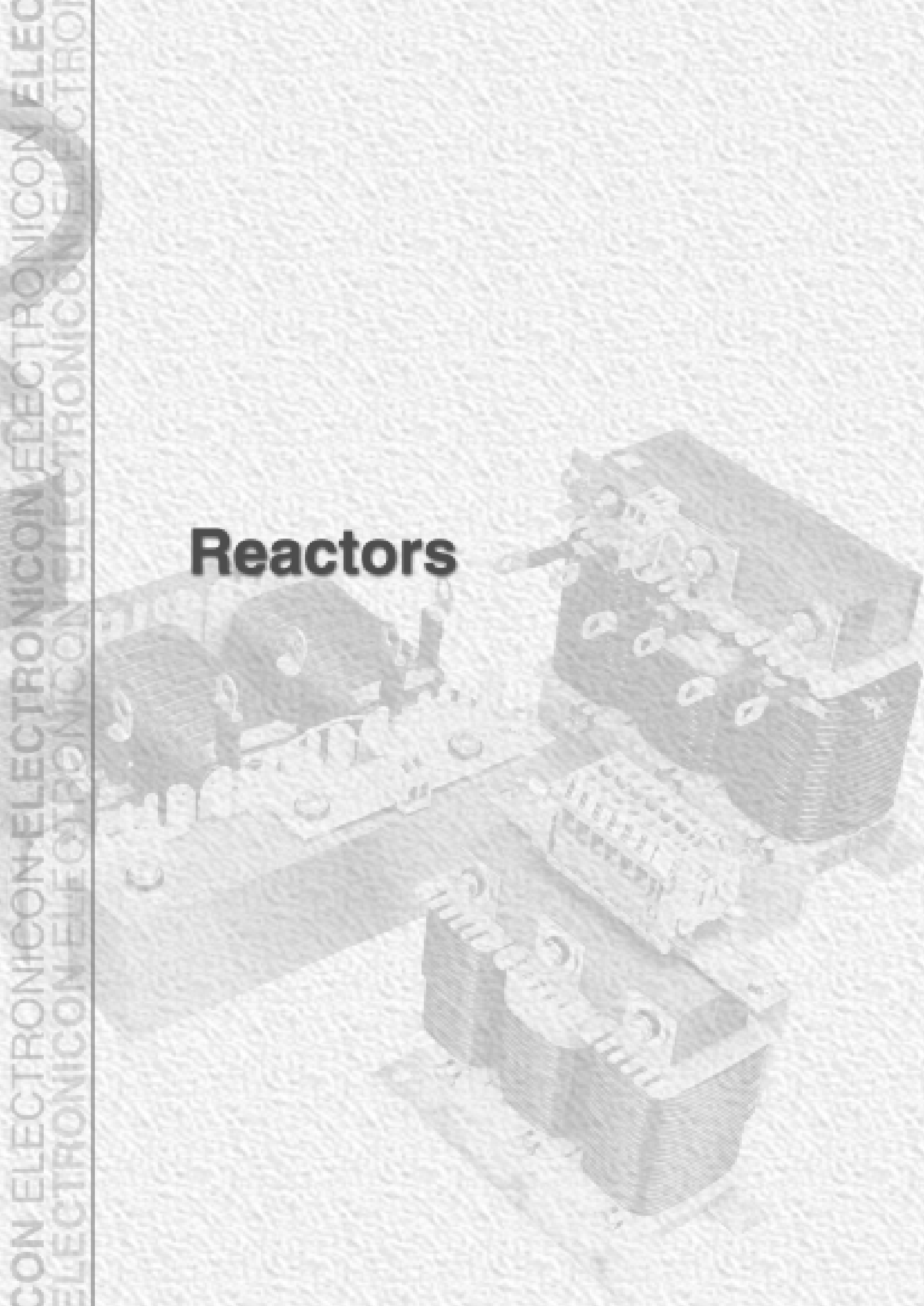
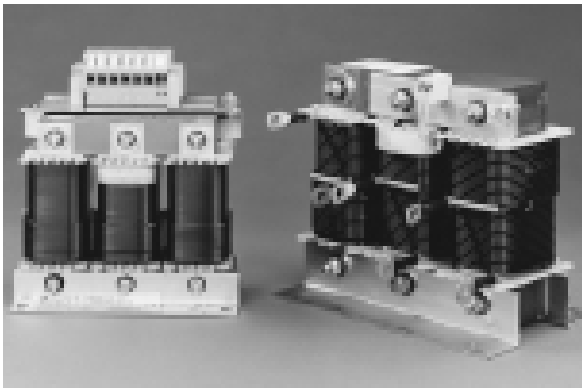
Reactors



Reactors for Detuned Capacitor Banks

A consumer whose load includes a high proportion of variable speed motor drives and/or other harmonic generating loads may require a detuned capacitor system. This would perform the function of power factor improvement whilst preventing any amplification of harmonic currents and voltages caused by resonance between capacitors and inductances in the mains.



ELECTRONICON offers single and three phase filter reactors for this purpose. The low-loss reactors are made of specially selected transformer sheets and manufactured in flat or round copper wire technology. They are dried and impregnated in a vacuum which ensures they can withstand high voltages and maintain a long operating life. Depending on their rated power, the reactors are provided with either terminal blocks or terminal lugs/cables.

If the operating temperature of 120°C is exceeded, the reactor circuit is disconnected by a thermal switch (included as standard).

Adjusted rating

The adjusted reactor is designed to create exactly the required output of reactive power, allowing for the internal voltage rise inside the resonating circuit formed together with the capacitor connected in the circuit. Note that exact sizing of the capacitor is necessary.

Example:
25kvar 400V 50Hz, detuned to 189Hz (p = 7%)*

capacitor:

current for PFC 25kvar 400V 50Hz: $I = \frac{P}{U} = 62.5A$

voltage at capacitor terminations: $U_C = \frac{U}{1 - p} = 430\,V$

adjustment of the capacitance: $C = \frac{I}{U_C \cdot 2\pi \cdot f} = 462\mu F$

(3 x 154µF) → 275.186-615400 (pg. 30)

reactor:

reactance of the capacitor $X_C = \frac{1}{2\pi f \cdot C} = 6.88\Omega$

required reactance of the reactor

$X_L = X_C \cdot p = 6.88\Omega \cdot 0.07 = 0.48\ \Omega$

required inductance $L = \frac{X_L}{2\pi f} = 1.53mH$

→ 444.116-40320 (pg. 50)

Non-adjusted rating

The non-adjusted reactor is matched to a power capacitor with standard rating at mains voltage.
This allows for additional installation of detuning reactors in existing non-detuned systems, however, it will lead to increased output of kvar due to voltage rise inside the resonance circuit.

Example:
25kvar 400V 50Hz, detuned to 189Hz (p = 7%)*

capacitor:

capacitance of standard capacitor: 498 µF (3 x 166 µF)

→ 275.186-516600 (pg. 24)

reactor:

reactance of the capacitor $X_C = \frac{1}{2\pi f \cdot C} = 6.39\Omega$

required reactance of the reactor

$X_L = X_C \cdot p = 6.39\Omega \cdot 0.07 = 0.45\ \Omega$

required inductance $L = \frac{X_L}{2\pi f} = 1.432\,mH$

→ 444.116-40D20 (pg. 51)

resulting PFC current: $X_{total} = X_C - X_L = 5.94\ \Omega$

$I = \frac{U}{X_{total}} = \frac{400\,V}{6\Omega} = 67.34A$

$Q = U \cdot I =$ **26.9 kvar**

*simplified calculation (single phase)

General Data

Basic Calculations

1. Harmonic Load (continuous operation)

$U_3 = 0.5\%U_R$
$U_5 = 5.0\%U_R$
$U_7 = 5.0\%U_R$

2. Fundamental Harmonic Load

$I_1 = 1.06 \cdot I_R$
(I_R = current of the fundamental harmonic in the detuned capacitor)

3. Thermal Rating

$I_{th} = 1.05 \cdot I_{rms}$

4. Magnetic Rating

$I_{lin} = 2.0 \cdot I_n$ with L (L_{lin}) $\geq 0.95 \cdot L_n$

5. Tolerance

Tolerance of the rated inductance (mean value) across three phases: ± 3%

Construction

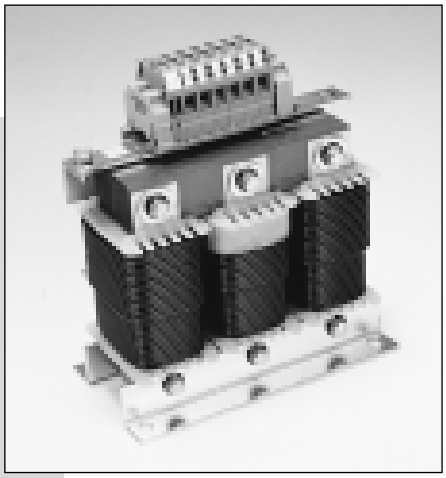
Design	three phase, iron core, double air gap
Protection class	IP00, indoor mounting
Insulation class	T40/B
Cooling	natural cooling
Winding material	copper
Impregnation	polyester resin, class F
Terminals	terminal blocks, cable lags, or temperature-proof flexible cables
Insulation	winding to core 3 kV
Temperature monitoring	temperature switch, response temperature 120 °C
Adjustment accuracy	L=±3%
Standards	VDE 0570 Teil 2/IEC 96/104/CD

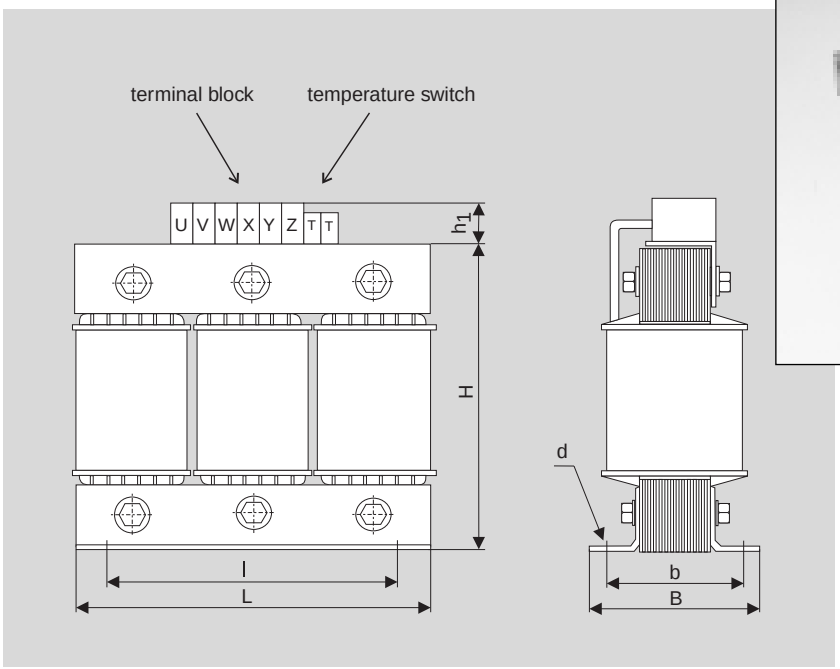
FK-Dr

Designs

Type 1

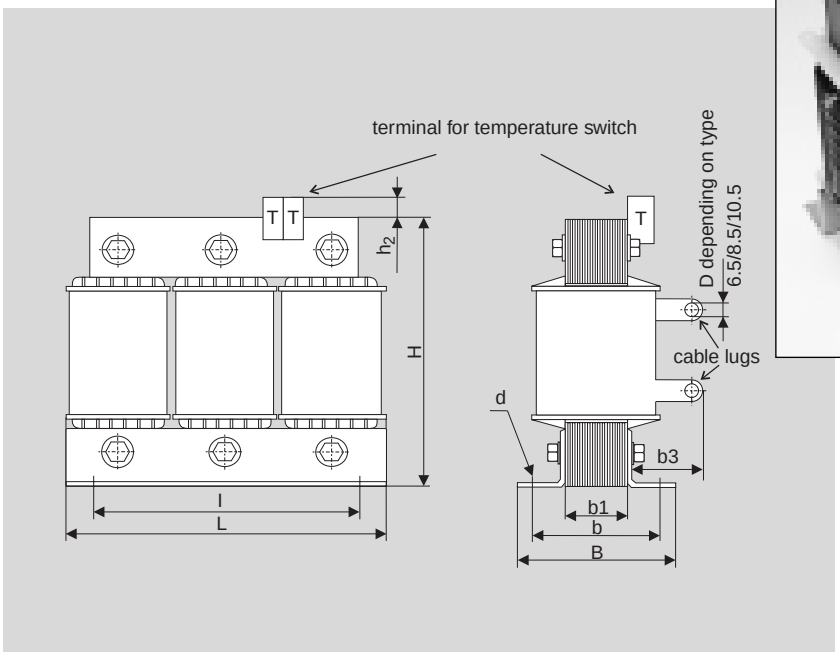
Screw terminals, terminal block





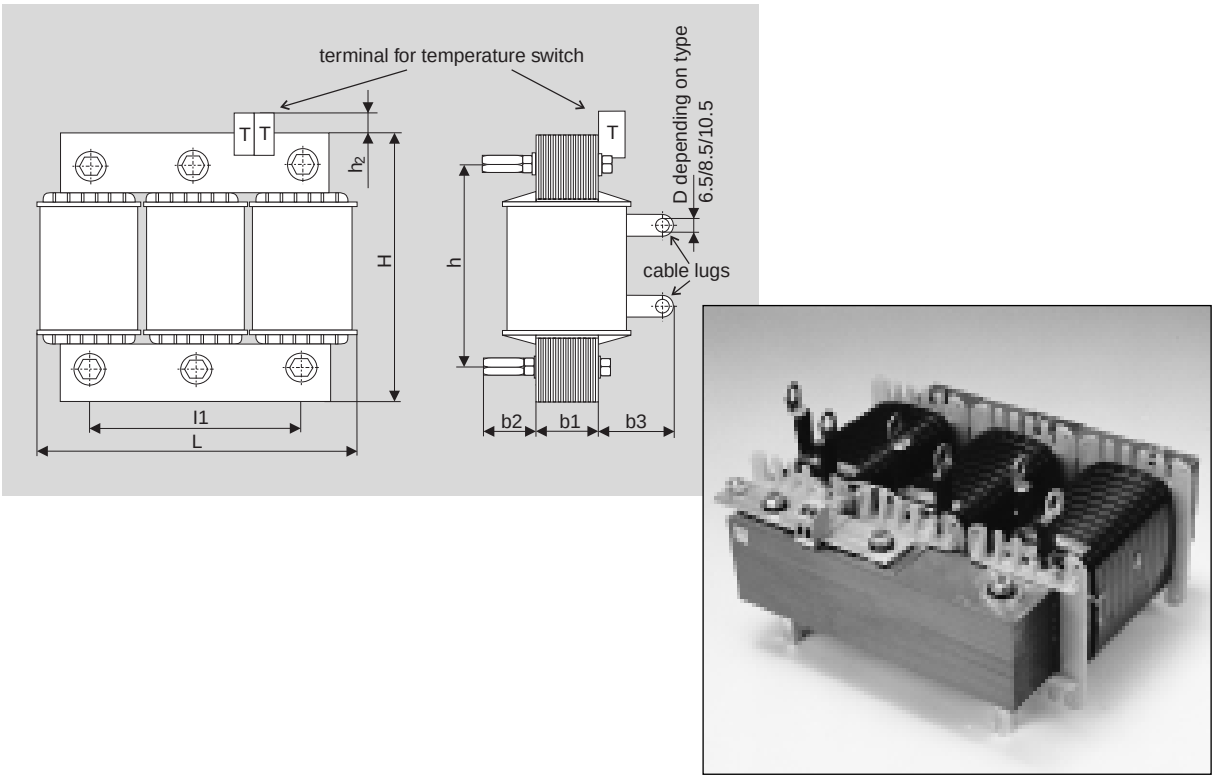
Type 2

Screw connection with cable lug



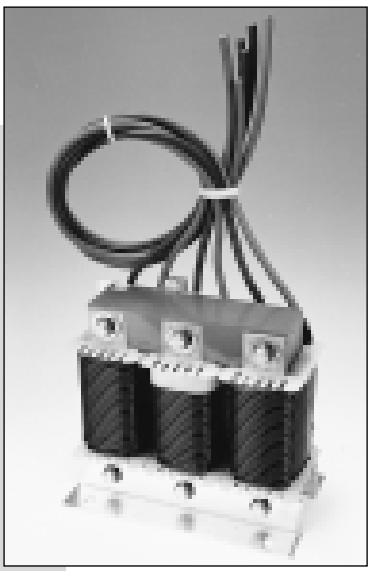
Type 3

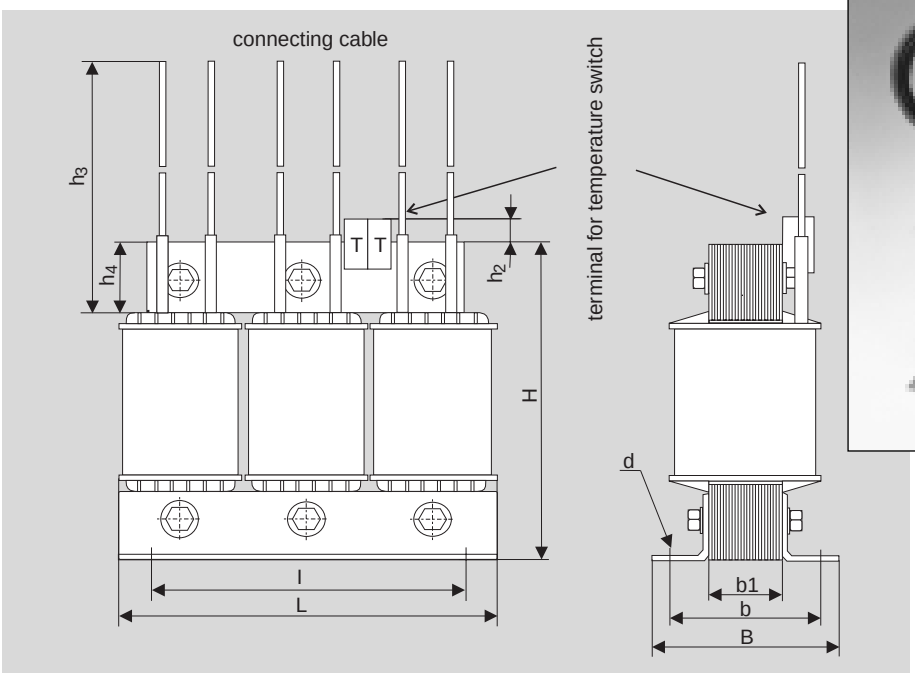
Screw connection with cable, for horizontal mounting



Type 4

Flexible temperature proof cable





FK-Dr

Dimensions

core size	mm														
3UI...	L	B	H	b	b1	b2	b3	d	h	h1	h2	h3	h4	l	l1
75/26,5	155	78	140	58	27	25		8	102	55		x	25	130	100
75/41,5	155	92	140	72	42	25		8	102	55		x	25	130	100
90/31,5	190	82	165	58	32	35		8	123	55		x	30	170	120
90/41,5	190	92	165	68	42	35		8	123	55		x	30	170	120
90/51,5	190	102	165	78	52	35		8	123	55		x	30	170	120
102/57	210	117	185	97	58	35		8	139	55		x	34	175	136
105/55	210	115	185	95	56	35	65	8	139	55	10	x	35	175	140
114/40	230	124	205	98	40	45	77	8	155	55	10	x	38	180	152
114/64	230	148	205	122	64	45	77	8	155	55	10	x	38	180	152
120/41	240	121	215	95	41	45	75	11	163		5	x	40	190	160
120/51	240	131	215	105	51	45	75	11	163		5	x	40	190	160
120/61	240	141	215	115	61	45	75	11	163		5	x	40	190	160
120/66	240	146	215	120	66	45	75	11	163		5	x	40	190	160
120/71	240	151	215	125	71	45	75	11	163		5	x	40	190	160
120/75	240	155	215	129	75	45	75	11	163		5	x	40	190	160
132/72	265	152	235	126	72	45	75	11	179		5	x	44	215	176
150/50	300	150	265	118	50	45	85	11	205		2		50	240	200
150/52	300	152	265	120	52	45	85	11	205		2		50	240	200
150/65	300	165	265	133	64	45	85	11	205		2		50	240	200
150/77	300	177	265	145	77	45	85	11	205		2		50	240	200
150/92	300	192	265	160	92	45	85	11	205		2		50	240	200
150/103	300	203	265	171	103	45	85	11	205		2		50	240	200

x Silicon cable - Standard length 500 and 800 mm

List of terms and abbreviations used in the data charts

U_R (V)	rated voltage
f_R (Hz)	rated frequency
f_r (Hz)	resonance frequency
p (%)	detuning factor
N_c (kvar)	compensating power of the detuned system at U_R
C (µF)	capacitance in delta connection
L_R (mH)	rated inductance
I_1 (A)	fundamental current at permanent 6% overvoltage
I_{th} (A)	thermal current
L/B/H (mm)	length / width / height without terminations
l/b (mm)	dimensions of mounting holes
h_1 (mm)	height of terminal blocks
h_2 (mm)	height of terminations for thermal switch
c (mm)	dimensions of terminations
d (mm)	diameter of fixation holes
D (mm)	diameter of the hole for electrical screw connection

FK-Dr

3 phase

Adjusted Rating

Resonance frequency f_0 : 227Hz (3.78H) p = 7% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 250V$
FK-Dr 10/230/60/7/Dla	10	3 x 1.06	26.6	40	90/41.5	1	8.5	425.094-24370	3 x 154
FK-Dr 12.5/230/60/7/Dla	12.5	3 x 0.84	33.3	45	90/51.5	1	10.5	428.095-24370	3 x 199
FK-Dr 20/230/60/7/Dla	20	3 x 0.53	53.2	60	120/51	2.3	16	440.125-24370	3 x 311
FK-Dr 25/230/60/7/Dla	25	3 x 0.42	66.5	75	120/61	2.3	19	444.126 24370	3 x 394

Resonance frequency f_0 : 252Hz (4.2H) p = 5.67% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 250V$
FK-Dr 10/230/60/5.67/Dla	10	3 x 0.84	26.6	35	90/41.5	1	8	425.094-24170	3 x 154
FK-Dr 12.5/230/60/5.67/Dla	12.5	3 x 0.68	33.3	40	90/51.5	1	10	428.095-24170	3 x 199
FK-Dr 20/230/60/5.67/Dla	20	3 x 0.42	53.2	55	120/51	2.3	15	440.125-24170	3 x 311
FK-Dr 25/230/60/5.67/Dla	25	3 x 0.34	66.5	70	120/51	2.3	17	444.125-24170	3 x 394

Non-adjusted (fixed) Rating

Resonance frequency f_0 : 227Hz (3.78H) p = 7% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 250V$
FK-Dr 10/230/60/7/D	10.8	3 x 0.98	28.6	40	90/41.5	1	10	425.094-24D70	3 x 167
FK-Dr 12.5/230/60/7/D	13.4	3 x 0.79	35.8	50	90/51.5	1	12	428.095-24D70	3 x 209
FK-Dr 20/230/60/7/D	21.5	3 x 0.49	57.2	65	120/51	2.3	16	440.125-24D70	3 x 333
FK-Dr 25/230/60/7/D	26.9	3 x 0.39	71.5	80	120/61	2.3	18	444.126-24D70	3 x 418

Resonance frequency f_0: 252Hz (4.2H) p = 5.67% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 250V$
FK-Dr 10/230/60/5.67/D	10.6	3 x 0.80	26.6	35	90/41.5	1	8.5	425.094-24B70	3 x 167
FK-Dr 12.5/230/60/5.67/D	13.3	3 x 0.64	33.4	40	90/51.5	1	10.5	428.095-24B70	3 x 209
FK-Dr 20/230/60/5.67/D	21.2	3 x 0.40	53.2	60	120/51	2.3	16	440.125-24B70	3 x 333
FK-Dr 25/230/60/5.67/D	26.5	3 x 0.32	66.5	70	120/61	2.3	19	444.126-24B70	3 x 418

Other values available on request.
Single phase reactors available on request.

3 phase

Adjusted Rating

Resonance frequency f_0: 189Hz (3.78H) p = 7% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 440V$
FK-Dr 5/400/50/7/Dla	5	3 x 7.67	7.6	45	75/41.5	1.4	5.5	407.074-40310	3 x 31
FK-Dr 6.25/400/50/7/Dla	6.25	3 x 6.00	9.6	55	90/31.5	1.4	6.5	412.093-40310	3 x 39
FK-Dr 10/400/50/7/Dla	10	3 x 3.83	15.3	60	90/51.5	2.3.4	9.5	425.095-40310	3 x 62
FK-Dr 12.5/400/50/7/Dla	12.5	3 x 3.07	19.1	70	90/51.5	1.4	10	428.095-40310	3 x 77
FK-Dr 20/400/50/7/Dla	20	3 x 1.91	30.6	90	114/64	2.3.4	21	440.116-40320	3 x 123
FK-Dr 25/400/50/7/Dla	25	3 x 1.53	38.2	105	114/64	2.3.4	22.5	444.116-40320	3 x 154
FK-Dr 50/400/50/7/Dla	50	3 x 0.77	76.5	160	150/77	2.3	39	458.157-40320	3 x 308

Resonance frequency f_0: 210Hz (4.2H) p = 5.67% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 440V$
FK-Dr 5/400/50/5.67/Dla	5	3 x 6.12	7.6	50	75/41.5	1.4	5.5	407.074-40110	3 x 31
FK-Dr 6.25/400/50/5.67/Dla	6.25	3 x 4.89	9.6	55	90/31.5	1.4	6.5	412.093-40110	3 x 39
FK-Dr 10/400/50/5.67/Dla	10	3 x 3.06	15.3	65	90/51.5	1.4	10	425.095-40110	3 x 62
FK-Dr 12.5/400/50/5.67/Dla	12.5	3 x 2.45	19.1	75	90/51.5	1.4	10.5	428.095-40110	3 x 77
FK-Dr 20/400/50/5.67/Dla	20	3 x 1.53	30.6	105	114/64	2.3.4	19.5	440.116-40120	3 x 123
FK-Dr 25/400/50/5.67/Dla	25	3 x 1.22	38.2	120	114/64	2.3.4	22	444.116-40120	3 x 154
FK-Dr 50/400/50/5.67/Dla	50	3 x 0.61	76.5	170	150/77	2.3	44	458.157-40120	3 x 308

Resonance frequency f_0: 134Hz (2.82H) p = 14% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 480V$
FK-Dr5/400/50/14/Dla	5	3 x 16.58	7.6	45	90/51.5	1.4	9.5	407.095-40510	3 x 29
FK-Dr 6.25/400/50/14/Dla	6.25	3 x 13.26	9.6	55	90/51.5	1.4	10	412.095-40510	3 x 36
FK-Dr 10/400/50/14/Dla	10	3 x 8.29	15.3	75	120/41	1.4	15	425.124-40510	3 x 58
FK-Dr 12.5/400/50/14/Dla	12.5	3 x 6.66	19.1	85	114/64	1.4	19	428.116-40510	3 x 72
FK-Dr 20/400/50/14/Dla	20	3 x 4.14	30.6	90	120/71	2.3.4	27	440.127-40520	3 x 115
FK-Dr 25/400/50/14/Dla	25	3 x 3.31	38.2	150	150/65	2.3.4	35	444.156-40520	3 x 144
FK-Dr 50/400/50/14/Dla	50	3 x 1.65	76.5	215	150/92	2.3	63	458.159-40520	3 x 288

Other values available on request.
Single phase reactors available on request.

3 phase

Non-adjusted (fixed) Rating

Resonance frequency f_0: 189Hz (3.78H) p = 7% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 440V$
FK-Dr 5/400/50/7/Dnla	5.4	3 x 7.13	8.2	45	75/41.5	1.4	5.5	407.074-40D10	3 x 33
FK-Dr 6.25/400/50/7/Dnla	6.7	3 x 5.70	10.3	55	90/31.5	1.4	6.5	412.093-40D10	3 x 42
FK-Dr 10/400/50/7/Dnla	10.8	3 x 3.56	16.5	60	90/51.5	2.3.4	9.5	425.095-40D10	3 x 68
FK-Dr 12.5/400/50/7/Dnla	13.4	3 x 2.85	20.6	70	90/51.5	1.4	10	428.095-40D10	3 x 82
FK-Dr 20/400/50/7/Dnla	21.5	3 x 1.78	32.9	90	114/64	2.3.4	21	440.116-40D20	3 x 137
FK-Dr 25/400/50/7/Dnla	26.9	3 x 1.43	41.1	105	114/64	2.3.4	22.5	444.116-40D20	3 x 166
FK-Dr 50/400/50/7/Dnla	53.8	3 x 0.71	82.3	160	150/77	2.3	39	458.157-40D20	3 x 332

Resonance frequency f_0: 210Hz (4.2H) p = 5.67% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 440V$
FK-Dr 5/400/50/5.67/Dnla	5.3	3 x 5.77	8.1	50	75/41.5	1.4	6	407.074-40B10	3 x 33
FK-Dr 6.25/400/50/5.67/Dnla	6.6	3 x 4.62	10.1	50	90/31.5	1.4	9	412.093-40B10	3 x 42
FK-Dr 10/400/50/5.67/Dnla	10.6	3 x 2.89	16.2	70	90/41.5	1.4	10.5	425.094-40B10	3 x 68
FK-Dr 12.5/400/50/5.67/Dnla	13.3	3 x 2.31	20.3	75	90/51.5	1.4	11.5	428.095-40B10	3 x 82
FK-Dr 20/400/50/5.67/Dnla	21.2	3 x 1.44	32.4	105	114/64	2.3.4	19.5	440.116-40B20	3 x 137
FK-Dr 25/400/50/5.67/Dnla	26.5	3 x 1.15	40.5	120	114/64	2.3.4	22	444.116-40B20	3 x 166
FK-Dr 50/400/50/5.67/Dnla	53	3 x 0.58	81.1	170	150/77	2.3	44	458.157-40B20	3 x 332

Resonance frequency f_0: 134Hz (2.82H) p = 14% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 480V$
FK-Dr5/400/50/14/Dnla	5.8	3 x 14.26	8.9	60	90/51.5	1.4	9.5	407.095-40F10	3 x 33
FK-Dr 6.25/400/50/14/Dnla	7.3	3 x 14.41	11.1	65	90/51.5	1.4	10.5	415.095-40F10	3 x 42
FK-Dr 10/400/50/14/Dnla	11.6	3 x 7.13	17.8	85	120/41	1.4	17	425.124-04F10	3 x 66
FK-Dr 12.5/400/50/14/Dnla	14.5	3 x 5.70	22.2	90	114/64	1.4	22	428.116-40F10	3 x 84
FK-Dr 20/400/50/14/Dnla	23.3	3 x 3.56	35.6	120	150/52	2.3.4	32	440.155-40F20	3 x 132
FK-Dr 25/400/50/14/Dnla	29.1	3 x 2.85	44.5	165	150/77	2.3.4	35	444.157-40F20	3 x 166
FK-Dr 50/400/50/14/Dnla	58.1	3 x 1.43	97.8	215	150/103	2.3	65	458.160-40F20	3 x 332

Other values available on request.
Single phase reactors available on request.

3 phase

Adjusted Rating

Resonance frequency f_0: 189Hz (3.78H) p = 7% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 465V$
FK-Dr 10/415/50/7/Dla	10	3 x 4.13	14.7	40	90/41.5	1.4	8	425.094-42310	3 x 59
FK-Dr 12.5/415/50/7/Dla	12.5	3 x 3.30	18.3	45	90/51.5	1.4	10	428.095-42310	3 x 72
FK-Dr 20/415/50/7/Dla	20	3 x 2.06	29.5	60	105/55	2.3.4	16.5	440.108-42320	3 x 115
FK-Dr 25/415/50/7/Dla	25	3 x 1.65	36.8	70	114/64	2.3.4	18	444.116-42320	3 x 143
FK-Dr 50/415/50/7/Dla	50	3 x 0.82	73.7	105	150/77	2.3	40	458.157-42320	3 x 286

Resonance frequency f_0: 210Hz (4.2H) p = 5.67% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 465V$
FK-Dr 10/415/50/5.67/Dla	10	3 x 3.29	14.7	30	90/41.5	1.4	8	425.094-42110	3 x 58
FK-Dr 12.5/415/50/5.67/Dla	12.5	3 x 2.63	18.3	35	90/51.5	1.4	10	428.095-42110	3 x 72
FK-Dr 20/415/50/5.67/Dla	20	3 x 1.65	29.5	50	105/55	2.3.4	16.5	440.108-42120	3 x 115
FK-Dr 25/415/50/5.67/Dla	25	3 x 1.32	36.8	60	114/64	2.3.4	18	444.116-42120	3 x 145
FK-Dr 50/415/50/5.67/Dla	50	3 x 0.66	73.7	95	150/65	2.3	40	458.156-42120	3 x 290

Non-adjusted (fixed) Rating

Resonance frequency f_0 : 189Hz (3.78H) p = 7% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 465V$
FK-Dr 10/415/50/7/Dnla	10.8	3x 3.82	15.9	40	90/41.5	1.4	8.5	425.094-42D10	3 x 62
FK-Dr 12.5/415/50/7/Dnla	13.4	3x 3.08	19.7	45	90/51.5	1.4	10	428.095-42D10	3 x 77
FK-Dr 20/415/50/7/Dnla	21.5	3x 1.92	31.7	70	105/55	2.3.4	16.5	440.108-42D20	3 x 123
FK-Dr 25/415/50/7/Dnla	26.9	3x 1.53	39.6	80	114/64	2.3.4	18	444.116-42D20	3 x 154
FK-Dr 50/415/50/7/Dnla	53.8	3x 0.77	79.3	115	150/77	2.3	40	458.157-42D20	3 x 308

Resonance frequency f_0 : 210Hz (4.2H) p = 5.67% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 465V$
FK-Dr 10/415/50/5.67/Dnla	10.6	3 x 3.11	15.64	35	90/41.5	1.4	8.5	425.094-42B10	3 x 62
FK-Dr 12.5/415/50/5.67/Dnla	13.3	3 x 2.49	19.6	40	90/51.5	1.4	10	428.095-42B10	3 x 77
FK-Dr 20/415/50/5.67/Dnla	21.2	3 x 1.55	31.2	55	105/55	2.3.4	16.5	440.108-42B20	3 x 123
FK-Dr 25/415/50/5.67/Dnla	26.5	3 x 1.24	39	65	114/64	2.3.4	18	444.116-42B20	3 x 154
FK-Dr 50/415/50/5.67/Dnla	53	3 x 0.62	78.1	95	150/77	2.3	40	458.157-42B20	3 x 308

Other values available on request.
Single phase reactors available on request.

3 phase

Adjusted Rating

Resonance frequency f_0: 227Hz (3.78H) p = 7% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 440V$
FK-Dr 10/400/60/7/Dla	10	3 x 3.19	15.3	40	90/41.5	1.4	8	425.094-40360	3 x 51
FK-Dr 12.5/400/60/7/Dla	12.5	3 x 2.56	19.1	45	90/51.5	1.4	9	428.095-40360	3 x 62
FK-Dr 20/400/60/7/Dla	20	3 x 1.60	30.6	65	105/55	1.2.3.4	15	440.108-40370	3 x 100
FK-Dr 25/400/60/7/Dla	25	3 x 1.28	38.3	80	120/51	1.2.3.4	17	444.125-40370	3 x 128
FK-Dr 50/400/60/7/Dla	50	3 x 0.64	76.5	120	150/65	2.3	32	458.156-40370	3 x 256

Resonance frequency f_0: 252Hz (4.2H) p = 5.67% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 440V$
FK-Dr 10/400/60/5.67/Dla	10	3 x 2.55	15.3	35	90/41.5	1.4	7.5	425.094-40160	3 x 52
FK-Dr 12.5/400/60/5.67/Dla	12.5	3 x 2.04	19.1	40	90/41.5	1.4	8	428.094-40160	3 x 65
FK-Dr 20/400/60/5.67/Dla	20	3 x 1.28	30.6	65	120/41	1.2.3.4	13	440.124-40170	3 x 104
FK-Dr 25/400/60/5.67/Dla	25	3 x 1.02	38.2	70	120/41	1.2.3.4	15	444.124-40170	3 x 130
FK-Dr 50/400/60/5.67/Dla	50	3 x 0.51	76.5	115	132/72	2.3	27	458.137-40170	3 x 261

3-Phase Reactors, non-adjusted (fixed) rating

Resonance frequency f_0: 227Hz (3.78H) p = 7% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 440V$
FK-Dr 10/400/60/7/D	10.8	3 x 2.92	15.3	40	90/51.5	1.4	9	425.094-40D60	3 x 57
FK-Dr 12.5/400/60/7/D	13.4	3 x 2.38	19.1	45	90/51.5	1.4	10	428.094-40D60	3 x 68
FK-Dr 20/400/60/7/D	21.5	3 x 1.49	30.6	75	120/51	2.3.4	16	440.125-40D70	3 x 111
FK-Dr 25/400/60/7/D	26.9	3 x 1.19	38.3	80	120/51	2.3.4	18	444.125-40D70	3 x 137
FK-Dr 50/400/60/7/D	53.8	3 x 0.59	76.5	130	150/65	2.3	33	458.156-40D70	3 x 274

Resonance frequency f_0: 252Hz (4.2H) p = 5.67% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 440V$
FK-Dr 10/400/60/5.67/D	10.6	3 x 2.41	15.3	35	90/41.5	1.4	8	425.094-40B60	3 x 57
FK-Dr 12.5/400/60/5.67/D	13.3	3 x 1.92	19.1	40	90/51.5	1.4	10	428.095-40B60	3 x 68
FK-Dr 20/400/60/5.67/D	21.2	3 x 1.20	30.6	65	120/41	2.3.4	14	440.124-40B70	3 x 111
FK-Dr 25/400/60/5.67/D	26.5	3 x 0.96	38.2	75	120/51	2.3.4	16	444.125-40B70	3 x 137
FK-Dr 50/400/60/5.67/D	53	3 x 0.48	76.5	120	132/72	2.3	28	458.137-40B70	3 x 274

Other values available on request.
Single phase reactors available on request.

3 phase

Adjusted Rating

Resonance frequency f_0: 227Hz (3.78H) p = 7% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 480V$
FK-Dr 10/440/60/7/Dla	10	3 x 3.86	13.9	40	90/41.5	1.4	8	425.094-44360	3 x 43
FK-Dr 12.5/440/60/7/Dla	12.5	3 x 3.09	17.4	45	90/51.5	1.4	10	428.095-44360	3 x 54
FK-Dr 20/440/60/7/Dla	20	3 x 1.93	27.8	65	105/55	2.3.4	15	440.108-44370	3 x 85
FK-Dr 25/440/60/7/Dla	25	3 x 1.55	34.8	75	120/51	2.3.4	17	444.125-44370	3 x 108
FK-Dr 50/440/60/7/Dla	50	3 x 0.77	70	120	132/72	2.3	28	458.137-44370	3 x 215

Resonance frequency f_0: 252Hz (4.2H) p = 5.67% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 480V$
FK-Dr 10/440/60/5.67/Dla	10	3 x 3.09	13.9	35	90/41.5	1.4	8	425.094-44160	3 x 43
FK-Dr 12.5/440/60/5.67/Dla	12.5	3 x 2.47	17.4	40	90/41.5	1.4	9	428.094-44160	3 x 54
FK-Dr 20/440/60/5.67/Dla	20	3 x 1.53	27.8	55	120/41	2.3.4	14	440.124-44170	3 x 86
FK-Dr 25/440/60/5.67/Dla	25	3 x 1.23	34.8	65	120/41	2.3.4	15	444.124-44170	3 x 108
FK-Dr 50/440/60/5.67/Dla	50	3 x 0.62	70	110	120/75	2.3	25	458.327-44170	3 x 215

Non-adjusted (fixed) Rating

Resonance frequency f_0: 227Hz (3.78H) p = 7% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 480V$
FK-Dr 10/440/60/7/D	10.8	3 x 3.59	15	40	90/41.5	1.4	9.5	425.094-44D60	3 x 46
FK-Dr 12.5/440/60/7/D	13.4	3 x 2.88	18.7	45	90/51.5	1.4	10.5	428.095-44D60	3 x 57
FK-Dr 20/440/60/7/D	21.5	3 x 1.80	29.9	70	120/41	2.3.4	15.5	440.124-44D70	3 x 92
FK-Dr 25/440/60/7/D	26.9	3 x 1.44	37.4	80	120/51	2.3.4	17	444.125-44D70	3 x 115
FK-Dr 50/440/60/7/D	53.8	3 x 0.72	74.8	130	150/65	2.3	31	458.156-44D70	3 x 230

Resonance frequency f_0: 252Hz (4.2H) p = 5.67% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 480V$
FK-Dr 10/440/60/5.67/D	10.6	3 x 2.91	14.75	35	90/41.5	1.4	9	425.094-44B60	3 x 46
FK-Dr 12.5/440/60/5.67/D	13.3	3 x 2.33	18.4	40	90/51.5	1.4	10	428.095-44B60	3 x 57
FK-Dr 20/440/60/5.67/D	21.2	3 x 1.46	29.5	65	120/41	2.3.4	15	440.124-44B70	3 x 92
FK-Dr 25/440/60/5.67/D	26.5	3 x 1.16	36.9	70	120/51	2.3.4	18	444.125-44B70	3 x 115
FK-Dr 50/440/60/5.67/D	53	3 x 0.58	73.7	115	132/72	2.3	28	458.137-44B70	3 x 230

Other values available on request.
Single phase reactors available on request.

3 phase

Adjusted Rating

Resonance frequency f_0: 227Hz (3.78H) p = 7% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 525V$
FK-Dr 10/480/60/7/Dla	10	3 x 4.60	12.8	40	90/41.5	1.4	8.5	425.094-48360	3 x 38
FK-Dr 12.5/480/60/7/Dla	12.5	3 x 3.68	15.9	45	90/51.5	1.4	10	428.095-48360	3 x 48
FK-Dr 20/480/60/7/Dla	20	3 x 2.30	25.5	65	105/55	2.3.4	14	440.108-48360	3 x 71
FK-Dr 25/480/60/7/Dla	25	3 x 1.84	31.9	75	120/51	2.3.4	16	444.125-48370	3 x 96
FK-Dr 50/480/60/7/Dla	50	3 x 0.92	63.8	120	132/72	2.3	27	458.137-48370	3 x 180

Resonance frequency f_0: 252Hz (4.2H) p = 5.67% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 525V$
FK-Dr 10/480/60/5.67/Dla	10	3 x 3.67	12.8	35	90/41.5	1.4	8	425.094-48160	3 x 38
FK-Dr 12.5/480/60/5.67/Dla	12.5	3 x 2.94	15.9	40	90/41.5	1.4	9	428.094-48160	3 x 48
FK-Dr 20/480/60/5.67/Dla	20	3 x 1.84	25.5	60	120/41	2.3.4	13	440.124-48170	3 x 71
FK-Dr 25/480/60/5.67/Dla	25	3 x 1.47	31.9	70	120/41	2.3.4	15	444.124-48170	3 x 96
FK-Dr 50/480/60/5.67/Dla	50	3 x 0.73	63.8	105	132/72	2.3	30	458.137-48170	3 x 180

Non-adjusted (fixed) Rating

Resonance frequency f_0: 227Hz (3.78H) p = 7% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 525V$
FK-Dr 10/480/60/7/D	10.8	3 x 4.28	13.7	40	90/41.5	1.4	9	425.094-48D60	3 x 38
FK-Dr 12.5/480/60/7/D	13.4	3 x 3.42	17.1	45	90/51.5	1.4	10.5	428.095-48D60	3 x 48
FK-Dr 20/480/60/7/D	21.5	3 x 2.14	27.4	70	120/41	2.3.4	15	440.124-48D70	3 x 77
FK-Dr 25/480/60/7/D	26.9	3 x 1.71	34.3	80	120/51	2.3.4	17	444.125-48D70	3 x 96
FK-Dr 50/480/60/7/D	53.8	3 x 0.86	68.6	130	150/65	2.3	31	458.156-48D70	3 x 192

Resonance frequency f_0: 252Hz (4.2H) p = 5.67% — linearity 2.0 I_R

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 525V$
FK-Dr 10/480/60/5.67/D	10.6	3 x 3.46	13.5	35	90/41.5	1.4	8.5	425.094-48B60	3 x 38
FK-Dr 12.5/480/60/5.67/D	13.3	3 x 2.77	16.9	45	90/41.5	1.4	10	428.094-48B60	3 x 48
FK-Dr 20/480/60/5.67/D	21.2	3 x 1.73	27	65	120/41	2.3.4	14	440.124-48B70	3 x 77
FK-Dr 25/480/60/5.67/D	26.5	3 x 1.39	33.8	75	120/51	2.3.4	16	444.125-48B70	3 x 96
FK-Dr 50/480/60/5.67/D	53	3 x 0.69	67.5	110	132/72	2.3	25	458.137-48B70	3 x 192

Other values available on request.
Single phase reactors available on request.

3 phase (600V/60Hz)

Non-adjusted (fixed) Rating

Resonance frequency f_0: 227Hz (3.78H) p = 7% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 690V$
FK-Dr 10/600/60/7/Dnla	10.8	3x 6.69	11	40	90/51.5	1.4	10	425.095-60D60	3 x 25
FK-Dr 12.5/600/60/7/Dnla	13.4	3x 5.35	13.7	50	90/51.5	1.4	11	428.095-60D60	3 x 31
FK-Dr 20/600/60/7/Dnla	21.5	3x 3.34	21.9	75	120/41	2.3.4	15	440.124-60D70	3 x 49
FK-Dr 25/600/60/7/Dnla	26.9	3x 2.67	27.4	80	120/51	2.3.4	17	444.125-60D70	3 x 62
FK-Dr 50/600/60/7/Dnla	53.8	3x 1.34	54.8	130	150/65	2.3	31	458.156-60D70	3 x 124

Resonance frequency f_0: 252Hz (4.2H) p = 5.67% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 690V$
FK-Dr 10/600/60/5.67/Dnla	10.6	3x 5.41	10.8	35	90/41.5	1.4	8	425.094-60B60	3 x 25
FK-Dr 12.5/600/60/5.67/Dnla	13.3	3x 4.33	13.5	40	90/51.5	1.4	10	428.095-60B60	3 x 31
FK-Dr 20/600/60/5.67/Dnla	21.2	3x 2.71	21.6	65	120/41	2.3.4	13	440.124-60B70	3 x 49
FK-Dr 25/600/60/5.67/Dnla	26.5	3x 2.17	27	75	120/51	2.3.4	16	444.126-60B70	3 x 62
FK-Dr 50/600/60/5.67/Dnla	53	3x 1.08	54	120	132/72	2.3	27	458.137-60B70	3 x 124

3 phase (690V/50Hz)

Adjusted Rating

Resonance frequency f_0: 189Hz (3.78H) p = 7% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 760V$
FK-Dr 12.5/690/50/7/Dla	12.5	3 x 9.13	11.1	50	120/41	1.4	12	428.124-69310	3 x 26
FK-Dr 25/690/50/7/Dla	25	3 x 4.56	22.2	80	120/51	2.3.4	18	444.125-69320	3 x 52
FK-Dr 50/690/50/7/Dla	50	3 x 2.28	44.3	130	150/77	2.3	40	458.157-69320	3 x 104

Resonance frequency f_0: 210Hz (4.2H) p = 5.67% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 760V$
FK-Dr 12.5/690/50/5.67/Dla	12.5	3 x 7.29	11.1	45	120/41	1.4	11	428.124-69110	3 x 26
FK-Dr 25/690/50/5.67/Dla	25	3 x 3.64	22.2	75	120/51	2.3.4	16	444.125-69120	3 x 53
FK-Dr 50/690/50/5.67/Dla	50	3 x 1.82	44.3	130	150/77	2.3	43	458.157-69120	3 x 105

Resonance frequency f_0: 134Hz (2.82H) p = 14% **linearity 2.0 I_R**

Type designation	N_c (kvar)	L_R (mH)	I_1 (A)	Loss power (W)	core size 3UI...	terminal option	Weight (kg)	order code standard version	C (µF) $U_R \geq 800V$
FK-Dr 12.5/690/50/14/Dla	12.5	3 x 19.70	11.1	80	120/51	1.4	18	428.125-69510	3 x 24
FK-Dr 25/690/50/14/Dla	25	3 x 9.87	22.2	120	150/65	2.3.4	34	444.156-69520	3 x 48
FK-Dr 50/690/50/14/Dla	50	3 x 4.93	44.3	190	150/103	2.3	54	458.160-69520	3 x 96

Other values available on request.
Single phase reactors available on request.

Reactors

code no.	core size 3 UI ...	reactor dimensions	pcs./pallet L x B x H (mm)	pallet height (mm)
4**.072-...	75 / 26,5	155 x 78 x 140	48	350
4**.074-...	75 / 41,5	155 x 92 x 140	36	350
4**.093-...	90 / 31,5	190 x 82 x 165	33	350
4**.094-...	90 / 41,5	190 x 92 x 165	27	350
4**.095-...	90 / 51,5	190 x 102 x 165	24	350
4**.105-...	102 / 57	210 x 117 x 185	21	550
4**.114-...	114 / 40	230 x 124 x 205	21	550
4**.116-...	114 / 64	230 x 148 x 205	18	550
4**.124-...	120 / 41	240 x 121 x 215	16	550
4**.125-...	120 / 51	240 x 131 x 215	14	550
4**.126-...	120 / 61	240 x 141 x 215	12	550
4**.326-...	120 / 66	240 x 146 x 215	12	550
4**.127-...	120 / 71	240 x 151 x 215	12	550
4**.327-...	120 / 75	240 x 155 x 215	12	550
4**.137-...	132 / 72	265 x 152 x 325	12	550
4**.155-...	150 / 52	300 x 152 x 265	12	550
4**.156-...	150 / 65	300 x 165 x 265	10	550
4**.157-...	150 / 77	300 x 177 x 265	10	550
4**.159-...	150 / 92	300 x 192 x 265	8	550
4**.160-...	150 / 103	300 x 203 x 265	8	550