

Three-phase dv/dt Reactor for Efficient Motor Protection

SCHAFFNER
energy efficiency and reliability



- Reduction of drive output voltage dv/dt
- Reduction of motor temperature
- Increase of motor service life
- Compact and economic open frame design
- Standard catalog reactors up to 1100A
- UL rated materials used

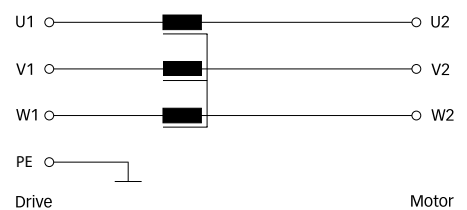
Approvals



Technical specifications

Maximum continuous operating voltage:	3x 500/288VAC
Motor frequency:	60Hz max.
Switching frequency:	2 to 16kHz
Rated currents:	4 to 1100A @ 40°C
Motor cable length:	30m max. @ 16kHz (derating curve next page)
Impedance (uk):	0.8% @ 400VAC, 50Hz & rated current
Typical dv/dt reduction:	≥ factor 5
High potential test voltage:	P → E 3000VAC for 3 sec P → P 3000VAC for 3 sec
Protection category:	IP00 (KL types according to VBG 4)
Overload capability:	2x rated current at switch on for 30 seconds 1.5x rated current for 1 minute, once per hour
Temperature range (operation and storage):	-25°C to +100°C (25/100/21)
Insulation class:	T40/F (155°C)
Flammability corresponding to:	UL 94V-2 or better
Design corresponding to:	EN 61558-2-20 (VDE 0570-2-20), UL508C, CSA C22.2 NO.14
MTBF @ 40°C/400V (Mil-HB-217F):	>200,000 hours

Typical electrical schematic



Features and benefits

- Efficient reduction of high output voltage dv/dt from IGBT motor drives.
- Protection of motor coil insulation from premature aging and destruction.
- Significantly increased service life of electric motors.
- High reliability and secured production up time for mission critical applications.
- Reduced converter pulse load.
- Less interference propagation towards neighboring equipment of lines.
- „Output filter“ with low impedance, ideal for processes requiring exceptional precision and reproducibility of movements.
- Vacuum impregnation for reduced humming noise and high durability.

Typical applications

- Servo drives
- Close loop vector drives
- Motor drive applications with short motor cables
- Machinery comprising servo or torque motors
- Robots
- Pick and place machines

Reactor selection table

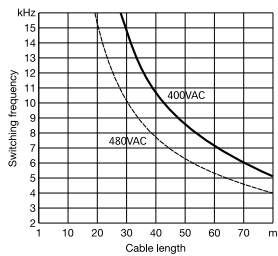
Reactor	Rated current @ 40°C [A]	Typical motor power rating* [kW]	Nominal inductance [mH]	Typical power loss** [W]	Input/Output connections			Total [kg]	Weight	
					KL	KS	S		Cu. [kg]	Al. [kg]
RWK 305-4-KL	4	1.5	1.47	22	KL			1.2	0.14	
RWK 305-7.8-KL	7.8	3	0.754	25	KL			1.2	0.28	
RWK 305-10-KL	10	4	0.588	30	KL			1.8	0.22	
RWK 305-14-KL	14	5.5	0.42	34	KL			2.2	0.35	
RWK 305-17-KL	17	7.5	0.346	38	KL			2.5	0.5	
RWK 305-24-KL	24	11	0.245	45	KL			2.5	0.5	
RWK 305-32-KL	32	15	0.184	55	KL			3.9	0.56	
RWK 305-45-KL	45	22	0.131	60	KL			6.1	0.7	
RWK 305-60-KL	60	30	0.098	65	KL			6.1	1.3	
RWK 305-72-KL	72	37	0.082	70	KL			6.1	1.6	
RWK 305-90-KL	90	45	0.065	75	KL			7.4	2.4	
RWK 305-110-KL	110	55	0.053	90	KL			8.2	2.4	
RWK 305-124-KS	124	55	0.047	110		KS		8.2	2.4	
RWK 305-143-KS	143	75	0.041	115		KS		10.7	2.7	
RWK 305-156-KS	156	75	0.038	120		KS		10.7	2.85	
RWK 305-170-KS	170	90	0.035	130		KS		10.7	3.8	
RWK 305-182-KS	182	90	0.032	140		KS		16	2.8	
RWK 305-230-KS	230	132	0.026	180		KS		22	3.5	
RWK 305-280-KS	280	160	0.021	220		KS		29	2.8	
RWK 305-330-KS	330	160	0.018	240		KS		32	3.5	
RWK 305-400-S	400	200	0.015	330			S	34	3.8	2
RWK 305-500-S	500	250	0.012	340			S	35	5.4	3.3
RWK 305-600-S	600	355	0.01	380			S	37	5.4	3.3
RWK 305-680-S	680	400	0.009	410			S	38	7.2	3.5
RWK 305-790-S	790	450	0.007	590			S	43	10.5	3.5
RWK 305-910-S	910	500	0.006	740			S	49	12	3
RWK 305-1100-S	1100	630	0.005	760			S	66	12	3.5

* General purpose four-pole (1500r/min) AC induction motor rated 400V/50Hz.

** Exact value depends upon the motor cable type and length, switching frequency, motor frequency and further stray parameters within the system.

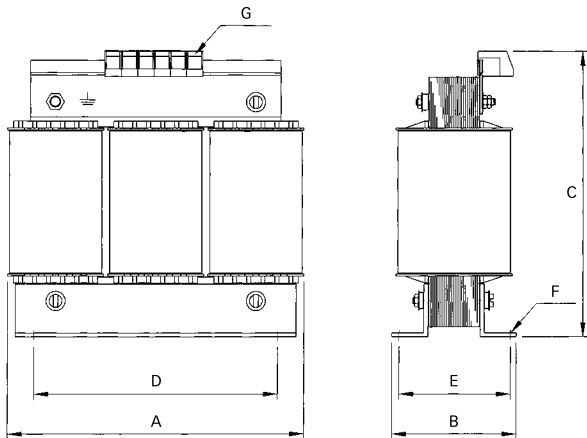
Reactor derating

The maximum admissible motor cable length depends mainly on the switching frequency and the drive output voltage. The applicable value for a given application can be found in the derating curve below.

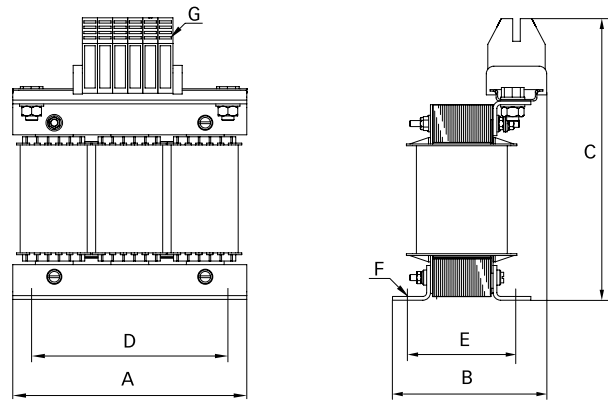


Mechanical data

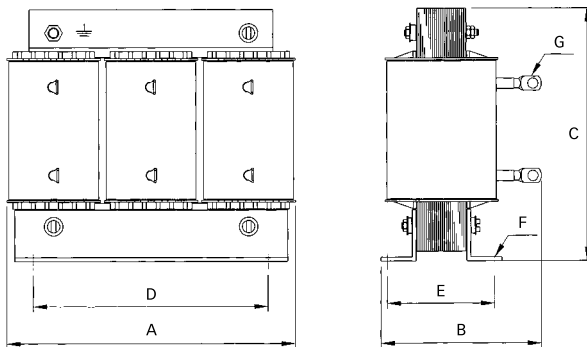
4 to 45A types



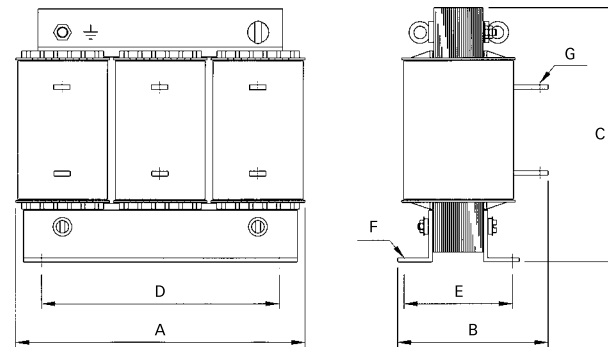
60 to 110A types



124 to 330A types



400 to 1100A types



Dimensions

	A	B	C	D	E	F	G
4 and 7.8A	100	max. 60	max. 115	56	34	4.8 x 9	2.5mm ²
10A	100	max. 70	max. 115	56	43	4.8 x 9	2.5mm ²
14A	125	max. 70	max. 135	100	45	5 x 8	2.5mm ²
17A	125	max. 75	max. 135	100	55	5 x 8	2.5mm ²
24A	125	max. 75	max. 135	100	55	5 x 8	4mm ²
32A	155	max. 95	max. 170	130	56	8 x 12	10mm ²
45A	155	max. 110	max. 190	130	72	8 x 12	10mm ²
60 and 72A	155	max. 125	max. 190	130	70	8 x 12	16mm ²
90A	190	max. 115	max. 225	170	57	8 x 12	35mm ²
110A	190	max. 130	max. 220	170	67	8 x 12	35mm ²
124A	190	max. 180	max. 160	170	67	8 x 12	Ø8
143A	190	max. 180	max. 160	170	77	8 x 12	Ø8
156 and 170A	190	max. 180	max. 160	170	77	8 x 12	Ø10
182A	210	max. 180	max. 185	175	97	8 x 12	Ø10
230A	240	220	220	190	119	11 x 15	Ø12
280A	240	235	220	190	133	11 x 15	Ø12
330A	240	240	220	190	135	11 x 15	Ø12
400 and 500A	240	220	325	190	119	11 x 15	Ø11
600 and 680A	240	230	325	190	128	11 x 15	Ø14
790A	300	218	355	240	136	11 x 15	2 x Ø11
910A	300	228	355	240	148	11 x 15	2 x Ø11
1100A	360	250	380	310	144	11 x 15	2 x Ø11

All dimensions in mm; 1 inch = 25.4mm
Tolerances according: ISO 2768-m / EN 22768-m

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May 2011

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