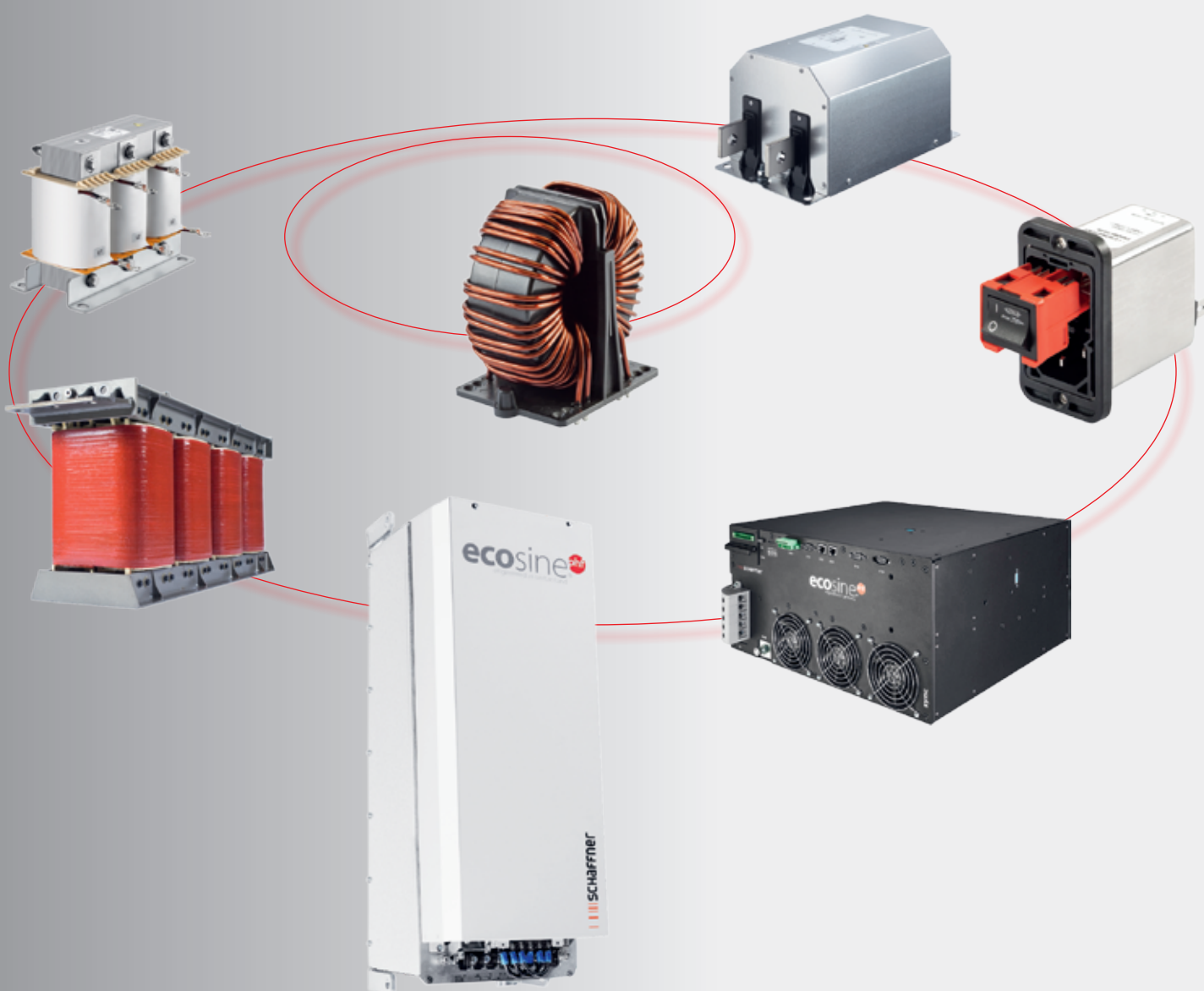








SHORT FORM CATALOG
NOVEMBER 2018

EMC/EMI Components and Power Quality Filters



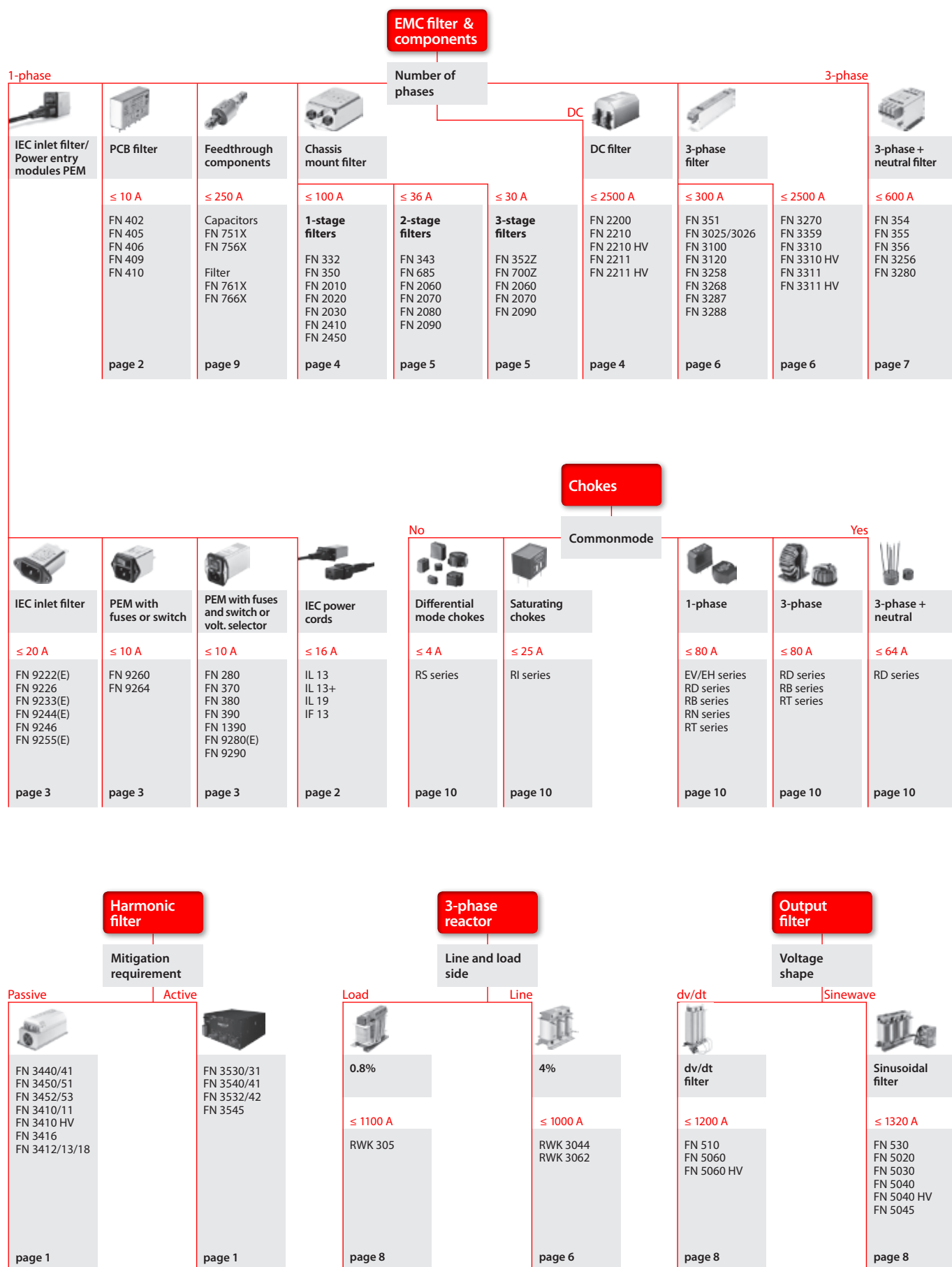
					
Typical applications	EDP & office <ul style="list-style-type: none">– PCs– Printers– PC periphery– Fax machines– Copy machines– Monitors– Plotters– Mainframe computers	Drives & controls <ul style="list-style-type: none">– AC & DC motor drives– SCR drives– Servo drives– Regenerative drives– Rectifiers (AC-DC)– Converters (AC-AC, DC-DC)– Inverters (DC-AC)– Battery chargers	Process automation <ul style="list-style-type: none">– Robotics– Conveyors– Assembly lines– Control units– Mining industry– Chemical industry– Oil production– Metal processing	Elevators & cranes <ul style="list-style-type: none">– Elevators for people and goods– Escalators– Cranes– Lifts– Hoists– Dumbwaiters	Consumer <ul style="list-style-type: none">– Amplifiers, video, TV, s– Receivers, s– Laundry m– Tumblers– Cooking ec– Induction h– Exercise ma– Coffee mac
Line reactors and harmonic filters 		FN 3410/11 (page 1) FN 3412/13 (page 1) FN 3416/18 (page 1) FN 3440/41 (page 1) FN 3450/51 (page 1) FN 3452/53 (page 1) RWK 3044 (page 6) RWK 3062 (page 6)	FN 3410/11 (page 1) FN 3412/13 (page 1) FN 3416/18 (page 1) FN 3530/31 (page 1) FN 3532 (page 1) FN 3545 (page 1) RWK 3044 (page 6) RWK 3062 (page 6)	FN 3410/11 (page 1) FN 3412/13 (page 1) FN 3416/18 (page 1) FN 3530/31 (page 1) FN 3532 (page 1) FN 3545 (page 1) RWK 3044 (page 6) RWK 3062 (page 6)	
PCB filters 	FN 402 (page 2) FN 405 (page 2) FN 406 (page 2) FN 409 (page 2) FN 410 (page 2)				FN 402 FN 405 FN 406 FN 409 FN 410
IEC inlet filters and Power entry modules 	FN 280 (page 3) FN 390 (page 3) FN 9222(E) (page 3) FN 9233(E) (page 3) FN 9244(E) (page 3) FN 9255(E) (page 3) FN 9264 (page 3) FN 9280(E) (page 3) FN 9290 (page 3) IL 13 (page 2) IL 13+ (page 2) IL 19 (page 2) IF 13 (page 2)				FN 280 FN 390 FN 9222(E) FN 9233(E) FN 9255(E) FN 9260 FN 9280(E) FN 9290 IL 13 IL 13+ IL 19 IF 13
Single-phase filters and DC filters 	FN 343 (page 5) FN 20x0 (page 4/5)	FN 350 (page 4) FN 2070 (page 5) FN 2080 (page 5) FN 2090 (page 5) FN 241x (page 4/5) FN 2200 (page 4) FN 2210/FN 2210 HV (page 4) FN 2211/FN 2211 HV (page 4)	FN 350 (page 4) FN 2070 (page 5) FN 2080 (page 5) FN 2090 (page 5) FN 241x (page 4/5)	FN 685 (page 5) FN 2070 (page 5) FN 2080 (page 5) FN 241x (page 4/5)	FN 332 FN 20x0
Three-phase filters 	FN 3025/26 (page 6) FN 3258 (page 6) FN 3268 (page 6)	FN 3025/26 (page 6) FN 3100 (page 6) FN 3258 (page 6) FN 3268 (page 6) FN 3270 (page 6) FN 3287 (page 6) FN 3288 (page 6) FN 3310/FN 3310 HV (page 6) FN 3311/FN 3311 HV (page 6) FN 3359 (page 6)	FN 3025/26 (page 6) FN 31xx (page 6) FN 3258 (page 6) FN 3268 (page 6) FN 3270 (page 6) FN 3287 (page 6) FN 3288 (page 6) FN 3310/FN 3310 HV (page 6) FN 3311/FN 3311 HV (page 6) FN 3359 (page 6)	FN 3100 (page 6) FN 3258 (page 6) FN 3268 (page 6) FN 3287 (page 6) FN 3288 (page 6)	FN 3258 FN 3268 FN 3025 FN 3026
Three-phase and neutral line filters 	FN 354 (page 7) FN 355 (page 7) FN 3256 (page 7)	FN 356 (page 7) FN 3256 (page 7) FN 3280 (page 7)	FN 356 (page 7) FN 3256 (page 7) FN 3280 (page 7)		FN 354 FN 355
Output filters and load reactors 		FN 5x0 (page 8) FN 5020 (page 8) FN 5030 (page 8) FN 5040 (page 8) FN 5040 HV (page 8) FN 5045 (page 8) RWK 305 (page 8) FN 5060/FN 5060 HV (page 8)	FN 510 (page 8) FN 5020 (page 8) FN 5030 (page 8) FN 5040 (page 8) FN 5040 HV (page 8) FN 5045 (page 8) RWK 305 (page 8) FN 5060/FN 5060 HV (page 8)	FN 510 (page 8) FN 5040 (page 8) FN 5040 HV (page 8) FN 5045 (page 8) RWK 305 (page 8) FN 5060 HV (page 8)	
Feedthrough components 	FN 756x (page 9) FN 766x (page 9)	FN 756x (page 9) FN 766x (page 9)	FN 751x (page 9) FN 761x (page 9)		
EMC/EMI chokes 	EV/EH series (page 10) RD series (page 10) RN series (page 10) RB series (page 10) RT series (page 10) RS series (page 10)	RD series (page 10) RI series (page 10) RB series (page 10) RT series (page 10) RS series (page 10)	RD series (page 10) RN series (page 10) RT series (page 10) RS series (page 10)	RD series (page 10) RN series (page 10) RT series (page 10) RS series (page 10)	EV/EH series RD series RN series RT series RS series
Pulse transformers 	IT series (page 11)	IT series (page 11)		IT series (page 11)	

This illustration only contains a few typical products and applications. Schaffner is also active in numerous other industry segments. Most standard con



















					
Electronics – Audio, video, screens – Decoders – Machines – Equipment – Heaters – Machines – Phones	Medical – X-ray equipment – CAT scanners – Defibrillators – Laboratory equipment – Analyzers – Measurement devices – MRI, MSI, EEG, ECG – Test equipment – Hospitals	Building automation – HVAC – Security systems – Control units – Pumps – Self-ballasted lighting equipment – Autom. window shades – Water treatment – Office buildings	Power & energy – SMPS, UPS – DC/DC converters – Gen-sets – Wind turbines – Fuel cells – Gas turbines – UPS – PV systems	Telecom & datacom – Base stations for GSM, UMTS, GPRS – Power line communications – Network technology – Servers – Telephone installations – Broadcast installations – Data centers	Machinery – Machine tools – Printing machines – Packaging machines – Extruders – Wood working mach. – Milling/drilling mach. – Laser cutting machines – Welding machines – Grinding machines
	FN 3530/31 (page 1) FN 3532/42 (page 1) FN 3540/41 (page 1) FN 3545 (page 1)	FN 3410/11 (page 1) FN 3412/13 (page 1) FN 3416/18 (page 1) FN 3440/41 (page 1) FN 3450/51 (page 1) FN 3452/53 (page 1) FN 3530/31 (page 1) FN 3532/42 (page 1) FN 3540/41 (page 1) FN 3545 (page 1) RWK 3044 (Seite 6) RWK 3062 (Seite 6)	FN 3530/31 (page 1) FN 3532/42 (page 1) FN 3540/41 (page 1) FN 3545 (page 1) RWK 3044 (page 6) RWK 3062 (page 6)	FN 3530/31 (page 1) FN 3532/42 (page 1) FN 3540/41 (page 1) FN 3545 (page 1)	FN 3410/11 (page 1) FN 3412/13 (page 1) FN 3416/18 (page 1) FN 3530/31 (page 1) FN 3532 (page 1) FN 3545 (page 1) RWK 3044 (page 6) RWK 3062 (page 6)
(page 2) (page 2) (page 2) (page 2) (page 2)	FN 402B (page 2) FN 406B (page 2)	FN 406 (page 2) FN 409 (page 2) FN 410 (page 2)	FN 402 (page 2) FN 405 (page 2) FN 406 (page 2) FN 409 (page 2) FN 410 (page 2)	FN 409 (page 2)	
(page 3) (page 3) (page 3) (page 3) (page 3) (page 3) (page 3) (page 3) (page 2) (page 2) (page 2) (page 2)	FN 280B (page 3) FN 9222(E)B (page 3) FN 9233(E)B (page 3) FN 9244(E)B (page 3) FN 9255(E)B (page 3) FN 9246B (page 3) FN 9260B (page 3) FN 9264 (page 3) FN 9280B (page 3) FN 9290B (page 3) IL 13 (page 2) IL 13+ (page 2) IL 19 (page 2) IF 13 (page 2)	FN 9246 (page 3)	FN 280 (page 3) FN 390 (page 3) FN 9222(E) (page 3) FN 9233(E) (page 3) FN 9244(E) (page 3) FN 9255(E) (page 3) FN 926x (page 3) FN 9280(E) (page 3) FN 9290 (page 3)	FN 9246 (page 3) FN 9255(E) (page 3)	
(page 4) (page 4/5)	FN 332 (page 4) FN 20x0B (page 4/5) FN 700Z (page 5)	FN 350 (page 4) FN 2060 (page 5) FN 2070 (page 5) FN 2090 (page 5)	FN 2030 (page 4) FN 2060 (page 5) FN 2070 (page 5) FN 2090 (page 5) FN 2200 (page 4) FN 2210/FN 2210 HV (page 4) FN 2211/FN 2211 HV (page 4)	FN 700Z (page 5) Customized single-phase telecom filters	FN 350 (page 4) FN 2070 (page 5) FN 2080 (page 5) FN 2410 (page 4) FN 2412 (page 4)
(page 6) (page 6) (page 6) (page 6)	FN 258L (page 6) FN 3025/26 (page 6) FN 3268 (page 6) FN 3287 (page 6) FN 3288 (page 6)	FN 351 (page 6) FN 3025/26 (page 6) FN 3258 (page 6) FN 3268 (page 6) FN 3287 (page 6) FN 3288 (page 6)	FN 3025/26 (page 6) FN 3100 (page 6) FN 3120 (page 6) FN 3258 (page 6) FN 3268 (page 6) FN 3287 (page 6) FN 3288 (page 6) FN 3310/FN 3310 HV (page 6) FN 3311/FN 3311 HV (page 6) FN 3359 (page 6)	Customized three-phase telecom filters	FN 3100 (page 6) FN 3120 (page 6) FN 3258 (page 6) FN 3268 (page 6) FN 3270 (page 6) FN 3287 (page 6) FN 3288 (page 6) FN 3310/FN 3310 HV (page 6) FN 3311/FN 3311 HV (page 6) FN 3359 (page 6)
(page 7) (page 7)	FN 354 (page 7) FN 355 (page 7)	FN 3256 (page 7)	FN 356 (page 7) FN 3256 (page 7) FN 3280 (page 7)	FN 354 (page 7)	FN 356 (page 7) FN 3256 (page 7) FN 3280 (page 7)
		FN 510 (page 8) FN 5040 (page 8) FN 5040 HV (page 8) FN 5045 (page 8) RWK 305 (page 8) FN 5060 (page 8) FN 5060 HV (page 8)	Customized reactor and filter solutions for (renewable) energy production and feeding power into the network		FN 510 (page 8) FN 5040 (page 8) FN 5040 HV (page 8) FN 5045 (page 8) RWK 305 (page 8) FN 5060 (page 8) FN 5060 HV (page 8)
	FN 751x (page 9) FN 756x (page 9) FN 761x (page 9) FN 766x (page 9)		FN 751x (page 9) FN 756x (page 9) FN 761x (page 9) FN 766x (page 9)	FN 751x (page 9) FN 756x (page 9) FN 761x (page 9) FN 766x (page 9)	FN 751x (page 9) FN 761x (page 9)
(page 10) (page 10) (page 10) (page 10) (page 10)	EV/EH series (page 10) RD series (page 10) RN series (page 10) RB series (page 10) RT series (page 10) RS series (page 10)	EV/EH series (page 10) RD series (page 10) RI series (page 10) RN series (page 10) RB series (page 10) RT series (page 10) RS series (page 10)	EV/EH series (page 10) RD series (page 10) RN series (page 10) RB series (page 10) RT series (page 10) RS series (page 10)	EV/EH series (page 10) RN series (page 10) RB series (page 10) RT series (page 10) RS series (page 10)	RD series (page 10) RB series (page 10) RT series (page 10) RS series (page 10)
	IT series (page 11)	IT series (page 11)	IT series (page 11)	IT series (page 11)	

Components can be customized to meet special requirements.

Product selection chart



Active and passive harmonic filters. Harmonic filters help to obtain compliance with international standards like e.g. IEEE 519-1992 or EN 61000-3-12, and with local utility codes. They reduce electrical and thermal stress upon the electrical infrastructure, eliminate the risk of harmonics-related reliability problems, and support long-term energy efficiency and cost savings. Ecosine passive filters are the industry standard for 6-pulse rectifiers and non-regenerative motor drives to achieve the often specified level of < 5% THDi. Active harmonic filters are suitable for mixed load installations and applications with dynamic behaviour. Ecosine active harmonic filters provide latest generation digital technology. With a response time of less than 100 µs an efficient harmonics mitigation, power factor correction, and load balancing are achieved in real time.

Approvals *		<div><div></div> Rated power [kW/HP]</div> <div><div></div> Rated mitigation current [A]</div>						Features										Typical applications						
<div><div><div>UL</div><div>US LISTED</div></div><div>CE</div><div><div>c</div><div>UL</div><div>®</div><div>US</div></div></div>		Nom. voltage	0	100	200	300	400	500	For 50 Hz grids	For 60 Hz grids	For 6-pulse diode rectifiers without L_{dc}	For 6-pulse diode rectifiers with L_{dc}	For 6-pulse SCR rectifiers	THDi < 5%	Power factor correction	Load balancing	3-phase/3-wire	3-phase/4-wire	AC motor drives	DC motor drives/welding	HVAC + building technology	Industry	Water/wastewater	Mixed (complex) loads
FN 3440		380–415 VAC	<div><div>1.1</div><div>200 kW</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div>¹⁾</div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3441		380–415 VAC	<div><div>1.1</div><div>200 kW</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3450		440–500 VAC	<div><div>1.1</div><div>250 kW</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div>¹⁾</div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3451		440–500 VAC	<div><div>1.1</div><div>250 kW</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3410		380–500 VAC	<div><div></div><div>200</div><div>400 kW</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3411		380–500 VAC	<div><div></div><div>200</div><div>400 kW</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3410 HV		690 VAC	<div><div>7.5</div><div>250 kW</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div>²⁾</div>	<div><div></div>³⁾</div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3416		200–500 VAC	<div><div>2.5</div><div>200 kW</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3452		440–480 VAC	<div><div>1.5</div><div>300 HP</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div>¹⁾</div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3453		440–480 VAC	<div><div>1.5</div><div>300 HP</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3412		380–480 VAC	<div><div></div><div>300</div><div>500 HP</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3413		380–480 VAC	<div><div></div><div>300</div><div>500 HP</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3418		200–480 VAC	<div><div>2.5</div><div>250 HP</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3530/31		380–480 VAC	<div><div>60 A</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3540/41		380–415 VAC	<div><div>60 A</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3532	 <div>High speed bus</div>	380–480 VAC	<div><div></div><div>120 A</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3542	 <div>High speed bus</div>	380–415 VAC	<div><div></div><div>120 A</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
FN 3545		200–480/415 VAC	<div><div>60</div><div>300 A</div></div>					<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>

* Products evaluated by one or more of the above certification agencies. For details please consult the detailed data sheet.

¹⁾ 5% THDi is not guaranteed when FN 3440, FN 3450 and FN 3452 filters are applied to SCRs






















²⁾ With and up to 45 A filters

³⁾ 60 A–320 A filters












PCB filters. Very compact EMI suppression components can directly be mounted on printed circuit boards of low-power office, medical, telecom and IT equipment, DC/DC converters and power supplies etc. Ideal low cost solution for manufacturers who have planned for EMC compliance throughout the equipment design process already.

Approvals *													Features							Typical applications						

IEC inlet filters / Power entry modules. All the advantages of IEC connector, EMC/EMI filter, fuses, switch and voltage selector combined in a powerful compact all-in-one solution. Ideal for computers, monitors and office equipment like printers and copy machines.

Approvals *			Attenuation performance Rated current [A]					Features								Typical applications							
     								With earth line choke	For fuse(s)	With switch (1-pole)	With switch (2-pole)	With voltage selector	For PCB mounting	Snap-in version	Extra wide mounting	IT equipment	Medical equipment	Switch-mode power supplies	Office equipment	Prof. audio, TV, VCR	Telecommunication	Light industrial equipment	General purpose
Filter family	Max. voltage		0	4	8	12	16	20															
FN 9222 FN 9222E 	250 VAC		1					20															
FN 9226 	250 VAC		1				10																
FN 9233 FN 9233E 	250 VAC		1					15															
FN 9244 FN 9244E 	250 VAC		1					15															
FN 9246 	250 VAC		1					20															
NEW FN 9255 	250 VAC		2					20															
NEW FN 9255E 	250 VAC		2					15															
FN 9260 	250 VAC		1					10															
FN 9264 	250 VAC		1					10															
FN 9280 FN 9280E 	250 VAC		1					10															
FN 9290 	250 VAC		1					10															
FN 280 	250 VAC		1					10															
FN 370 	250 VAC		2					6															
FN 380 	250 VAC		2					6															
FN 390 FN 1390 	250 VAC		1					10															











Single-phase and DC filters. Single-phase filters for chassis or DIN-rail mounting are key for EMC compliance of higher power office equipment and low to medium power industrial applications. A broad selection of electrical and mechanical features allows a specific choice and deployment for countless applications. DC filters are specifically optimized for applications with DC supply like e.g. PV inverters.

Approvals *							Features										Typical applications							
		<div><div></div> Attenuation performance</div> <div><div></div> Rated current [A]</div>																						
		<div><div>standard</div><div>high</div><div>very high</div></div>					1-stage filter circuit	2-stage filter circuit	3-stage filter circuit	For DC applications	With overvoltage protection	Low frequency attenuation	High frequency attenuation	Choice of connection style	DIN-rail mounting	Power supplies, SMPS	Medical equipment	Single-phase motor drives	Control unit in machine tools	PV inverters	Office, test & measure. equip.	General purpose		
Filter family	Max. voltage	0	20	40	60	80	100																	
FN 332	 250 VAC	1–10						■			■										■			
FN 350	 250 VAC	8			55			■							■		■				■			
FN 2010	 250 VAC	1			60			■					■			■					■			
FN 2020	 250 VAC	1			60			■					■			■				■	■			
FN 2030	 250 VAC	1		30				■		■	■	■	■			■				■	■			
FN 2200	 1200 VDC			25			2300	■		■		■	■			■			■		■			
FN 2210	 1000 VDC						250–2300	■		■		■	■			■				■	■			
FN 2211																								
FN 2210 HV	 1500 VDC						250–2300	■		■		■	■			■				■	■			
FN 2211 HV																								
FN 2410	 250 VAC 520 VAC (H)	8					100	■				■				■		■						
FN 2412	 250 VAC 520 VAC (H)	8			45			■				■			■	■		■	■					
FN 2450	 250 VAC	1		20				■				■	■			■	■				■	■		

* Products evaluated by one or more of the above certification agencies. For details please consult the detailed data sheet.

Approvals *



Approvals *		Max. voltage	Attenuation performance					Features								Typical applications							
    IEC/EN 60939			Rated current [A]					1-stage filter circuit	2-stage filter circuit	3-stage filter circuit	With earth line choke	With overvoltage protection	Low frequency attenuation	High frequency attenuation	Choice of connection style	TEMPEST protection	Power supplies, SMPS	Medical equipment	Single-phase motor drives	Control unit in machine tools	Interception protection	Office, test & measure. equip.	General purpose
Filter family		0	20	40	60	80	100																
FN 343		250 VAC	1-10						■		■											■	■
FN 2060		250 VAC	1	30					■						■		■	■				■	■
FN 2070		250 VAC	1	36					■					■	■		■	■	■			■	
FN 2080		250 VAC	1	16					■				■		■		■	■	■				
FN 2090		250 VAC	1	30					■			■	■	■	■		■	■	■				
FN 700Z		250 VAC	6	20							■		■	■	■		■	■			■	■	

* Products evaluated by one or more of the above certification agencies. For details please consult the detailed data sheet.

Three-phase filters and line reactors. EMC/EMI filter solutions for industrial applications like motor drives and machine tools. Furthermore, these types of filters are also suitable for mainframe computer systems, large uninterruptible power supplies, medical equipment, wind turbine power stations and a vast array of other three-phase power electronics. Line reactors, also operated on the line side of power drive systems, efficiently protect inverter electronics and DC link capacitors from inrush, peak and short-circuit currents. Additionally, low-frequency interference and harmonics are reduced significantly.

Approvals *








— Attenuation performance
— Rated current [A]

standard high very high

Approvals *			Attenuation performance		Rated current [A]		Features												Typical applications																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
							Multi-stage filter circuit	Safety connector blocks	Busbar connection	Optional protective covers	Standard protective covers	Offering EMC compliance	Low leakage current	Less commutation notches	Inrush current limitation	Harmonics reduction	4% impedance	Inverters, servo drives	Energy regeneration drives	Machinery, machine tools	Industrial automation	General purpose	Power and energy																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Filter family	Max. voltage	standard						high						very high																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		0	200	400	600	800	>1000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								











* Products evaluated by one or more of the above certification agencies. For details please consult the detailed data sheet.

Three-phase and neutral line filters. Three-phase and neutral line filters are a compact solution for the interference suppression on the mains input of cabinets and control units of equipment, ranging from industrial applications like machine tools to sensitive medical installations. These typically involve separate and often insufficiently filtered frequency inverters and SMPS, causing current imbalance and significant interference problems. As individual elements they may be interference-suppressed already. The conjunction of several switching components in the same cabinet and a non-EMC conscious cabling will rise the demand for an additional EMC/EMI filter on the mains input of the whole installation. Many times this is the only way to get the CE mark for the cabinet in accordance with the EMC directive.

Approvals *			<div><div></div> Attenuation performance</div> <div><div></div> Rated current [A]</div>			Features								Typical applications							
Filter family	Max. voltage	<div><div>standard</div><div>high</div><div>very high</div></div> <div><div>0</div><div>120</div><div>240</div><div>360</div><div>480</div><div>600</div></div>				1-stage filter circuit	2-stage filter circuit	Safety connector blocks	Faston connectors	Offering EMC compliance	For asymmetrical loads	Broadband attenuation	Very low leakage current	For entire systems, install.	Machinery, machine tools	Industrial automation	Power supplies	Medical equipment	For high frequency appl.	High power office equipment	General purpose
			FN 354		440 VAC	<div><div>4-25</div></div>		■		■	■		■					■	■	■	■
FN 355		440 VAC	<div><div>3-20</div></div>		■		■	■			■					■		■	■		
FN 356		440 VAC	<div><div>16</div><div>150</div></div>		■		■		■	■		■		■	■						
FN 3256		520 VAC (H)	<div><div>8</div><div>160</div></div>		■		■		■	■		■	■	■	■			■	■		
FN 3280		520 VAC (H)	<div><div>8</div><div>600</div></div>		■	■		■	■	■		■	■	■	■						

* Products evaluated by one or more of the above certification agencies. For details please consult the detailed data sheet.











Output filters and load reactors. Output components for motor protection and the improvement of system reliability, availability and functionality. Deployed at the output side of frequency inverters, these filters ensure reliable operation by avoiding expensive downtimes of installations, manufacturing plants, machinery and a vast array of other industrial and domestic motor drive applications due to premature motor damage. An appropriate output solution will even allow the deployment of unshielded motor cables, the use of multiple motors in parallel on the same drive or the retrofit of modern drives in existing installations with old motors and unshielded cabling.


Approvals *									Features											Typ. applications				
cUL [®] us			Typical motor power [kW] Rated current [A]																					
Filter family	Max. voltage		0 0	60 200	120 400	180 600	240 800	300 >1000	dv/dt restriction	Overvoltage restriction	Motor temperature reduction	Red. acoustic motor noise	Sym. sinusoidal output signal	Asym. sinusoidal output signal	Eliminat. of bearing damage	Replaces cable shields	Connection to DC link required	Improves overall EMC	Reduces equipment downtime	Motor drives	Servo drives, torque motors	High-speed motor applications	Appl. with long unshield. cabl.	Retrofit of motor drives
FN 510	 520 VAC	<div><div>1.5–30</div><div>4–66</div></div>							■	■	■							■	■	■	■			
FN 530	 520 VAC	<div><div>1.5–7.5</div><div>4–16</div></div>							■	■	■	■	■	■	■	■	■	■	■	■			■	■
FN 5020	 500 VAC	<div><div>11 55</div><div>25–120</div></div>							■	■	■	■	■					■	■	■		■		
FN 5030**	 500 VAC	<div><div>11 55</div><div>25–120</div></div>									■	■		■	■	■	■	■	■	■		■	■	■
FN 5040	 500 VAC	<div><div>1.1 630</div><div>4.5 1200</div></div>							■	■	■	■	■					■	■	■				■
FN 5040 HV	 690 VAC	<div><div>7.5 1200</div><div>13 1320</div></div>							■	■	■	■	■					■	■	■				■
FN 5045	 500 VAC	<div><div>1.1 630</div><div>4.5 1200</div></div>							■	■	■	■	■					■	■	■				■
FN 5060	 500 VAC	<div><div>5 630</div><div>12 1100</div></div>							■	■	■							■	■	■	■			
FN 5060 HV	 690 VAC	<div><div>7.5 1000</div><div>16 1200</div></div>							■	■	■							■	■	■	■			
RWK 305	 500 VAC	<div><div>1.5 630</div><div>4 1100</div></div>							■		■							■	■	■	■			

* Products evaluated by one or more of the above certification agencies. For details please consult the detailed data sheet.

** Additional output filter module to be operated in conjunction with FN 5040/45 or FN 5020.

Feedthrough components. Interference suppression up into the GHz range for high-tech applications such as IT, telecom, server and networking equipment.

Approvals *							Features							Typical applications									
 		<div><div></div> Capacitance [nF]</div> <div><div></div> Rated current [A]</div> <div><div></div> Attenuation performance</div>					AC capacitors	DC capacitors	AC filters	DC filters	Very high performance	Y2 capacitor class	Y4 capacitor class	Medical equipment	Professional power supplies	Power electronic equipment	Telecommunication	Scientific equipment	Test and measurement equip.	Security systems	IT, server and network		
Feedthrough capacitors	Max. voltage	0	1000	2000	3000	4000																5000	
		0	50	100	150	200	250																
FN 7510 	300 VAC	2.2–47 10		100																			
FN 7511 	300 VAC	4.7–220 10				200																	
FN 7512 	300 VAC	47–100 16		63																			
FN 7513 	300 VAC	100 16																					
FN 7560 	130 VDC	10–100 10				200																	
FN 7561 	130 VDC	47–470			63		200																
FN 7562 	130VDC	100–1000 16					200																
FN 7563 	130 VDC	470 16					200																

Feedthrough filters			standard			high			very high																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
FN 7611		300 VAC	<div><div>10</div><div></div><div>250</div></div>			<div><div></div><div></div><div></div></div>			<div><div></div><div></div><div></div></div>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

* Products evaluated by one or more of the above certification agencies. For details please consult the detailed data sheet.














EMC/EMI chokes. An extensive selection of discrete EMC/EMI chokes with various inductance and current ratings allows optimized circuitry for EMC compliance to be designed easily and economically.

Approvals *								Features							Typical applications								
		<div><div></div> Inductance value [mH]</div>						For common-mode noise	Saturating chokes	Single-choke	Dual-choke	Triple-choke	Quad-choke	PCB mounting	With flying leads	Frequency converters, UPS	Medical equipment	Traction systems	DC/DC or AC/DC converters	Switch-mode power supplies	Home electronics, TV, balasts	Battery chargers	Heaters, air conditioners
Choke family	Max. voltage	0	20	40	60	80	100																
EV/EH series	250 VAC	0.5 0.3-5					90																
RN series	300 VAC 300 VDC	0.4 0.3-10					100																
RD 5000 series	600 VAC 850 VDC	1-10 6-16																					
RD 6000 series	600 VAC 850 VDC	1.5 15 6-16																					
RD 7000 series	600 VAC 850 VDC	0.2 25 6 36																					
RD 8000 series	600 VAC 850 VDC	0.2-12 16 64																					
RT series	600 VAC 425 VDC	 																					
RB series	600 VAC 1000 VDC	0.2-3 16 50 (80)**																					
RI series	500 VAC	1.5 25																					
RS series	250 VAC	0.003-3.6 0.5-4																					

* Products evaluated by one or more of the above certification agencies. For details please consult the detailed data sheet.

** forced cooling

Pulse transformers. They provide a proper galvanic separation between gate drive circuitry and high voltage path in IGBT, thyristor, triac, power MOSFET and DC/DC converter circuits.

Pulse transformer	Nominal voltage	Voltage-time area [Vμs]						Features										Typical applications					
		Ignition current [A]																					
		0	1000	2000	3000	4000	5000	1 : 1	1 : 1 : 1	2 : 1	2 : 1 : 1	3 : 1	3 : 1 : 1	PCB	Faston	Galvanic separation	Thyristors, triac and IGBTs	Driving power MOSFETs	Line coupling transformers	DC/DC converters	Power supplies	Home automation systems	Monitoring systems
IT 155/237 	500 VAC	500 0.1–0.25	1100					■						■		■	■	■		■	■	■	■
IT 245/255/258 	750 VAC	250–500 0.1	1					■						■		■	■	■		■	■	■	■
IT 239 	1000 VAC	350 0.25						■						■		■	■	■			■		
IT 370 	1000 VAC	4000 0.1	1					■						■		■	■	■			■		
IT 364 	3000 VAC	5000 0.1	3					■							■	■	■	■					
IT 213 	380 VAC	450 0.25							■					■		■	■	■	■	■	■	■	■
IT 312/313 	380 VAC	450 0.25	1200 1						■					■		■		■	■	■	■	■	■
IT 143/233/242 IT 243/253 	500 VAC	180–800 0.025–0.25							■					■		■	■	■	■	■	■		■
IT 246/248 	750 VAC	200–350 0.1–0.25								■				■		■	■	■		■	■		■
IT 249 	500 VAC	350 0.25									■			■		■	■	■	■	■	■	■	■
IT 260 	500 VAC	200 0.1										■		■		■		■	■	■	■	■	■
IT 314 	380 VAC	500 0.25	1											■	■	■		■	■	■	■	■	■
IT 234/244 IT 154 	500 VAC	200–600 0.1–0.25												■	■	■		■	■	■	■	■	■

EMC Support

EMI measurement and EMC engineering services. In addition to offering one of the world's most comprehensive ranges of standard filter products, Schaffner offers the full complement of measurement and engineering services, along with customized product development, to support equipment manufacturers and users.

EMC/EMI testing. Schaffner operates the most sophisticated EMC test facilities available anywhere today with extensive investment in specialized test equipment and application engineering teams. As a global provider these services are distributed at several locations throughout the world.

Service available at these locations include:

- open field testing
- harmonics instrumentation for current and voltage up to the 50th harmonic
- emission and immunity tests according to European and international standards (EN, IEC, FCC, CISPR)

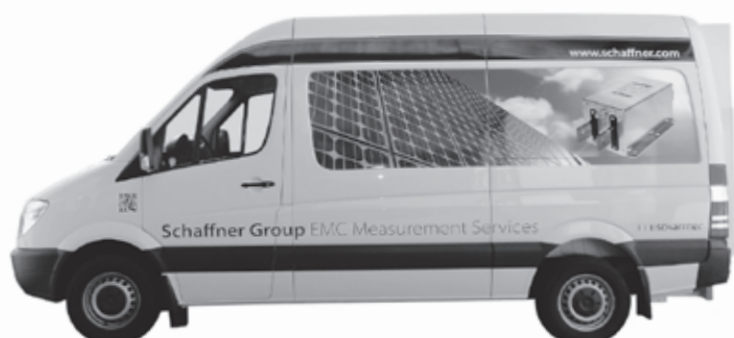
Additional services available at the accredited testing facility in Switzerland:

- 500 kW full load test set-up for motor drives
- safety testing and environmental simulation for passive components for electromagnetic interference suppression according to European, international and North American standards

Engineering services. Schaffner has the world's most engineering experience in solving EMC problems. In addition to testing and measuring services, Schaffner can provide the expert engineering support to help you bring your equipment to market quickly and efficiently.

Services available include:

- custom filter design – to optimize filter performance and solve space, layout, mounting or connection problems
- circuit and equipment design – advising on circuit and equipment or enclosure design to overcome EMC problems
- turnkey component design and build





The Schaffner Group is the international leader in the development and production of solutions which ensure the efficient and reliable operation of electronic systems. The Group's broad range of products and services includes EMC/EMI components, harmonic filters and magnetic components as well as the development and implementation of customized solutions. Schaffner components are deployed in energy-efficient drive systems and electronic motor controls, in wind power and photovoltaic systems, rail technology, machine tools and robotics as well as power supplies for numerous electronic devices in sectors such as medical technology or telecommunications. Schaffner provides on-site service to customers around the world through an efficient, global organization and makes ongoing investments in research, development, production and sales to systematically expand its position as leader on the international market.

A global one-stop shop

EMC/EMI filters

- PCB filters
- IEC inlet filters / Power entry modules
- DC filters
- Single-phase filters
- Three-phase filters
- Three-phase + neutral line filters
- Open frame filters

EMC/EMI chokes

Feedthrough filters and capacitors

Automotive components

Customized solutions

Power Quality products

- Line reactors
- dv/dt reactors and filters
- Sine wave filters
- Harmonic filters
- Regen reactors and filters
- Transformers

Customized solutions

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and development center**

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