













Typical Applications	Automotive <ul style="list-style-type: none"> - Hybrid vehicles - Fuel-cell vehicles - DC/DC converters for the 42V supply - Chargers for electric vehicles - Emitters and receivers for sensors etc. 	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"> - Frequency inverters - Current converters - Servo drives - Converters for energy regeneration - AC/DC converters - Solar converters - Thyristor controllers 	Process Automation <ul style="list-style-type: none"> - Robotics - Conveyors - Assembly lines - Pumps - 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
Feedthrough Components 	Customized feedthrough solutions for automotive applications	FN 756x (page 1) FN 766x (page 1)		FN 751x (page 1) FN 761x (page 1)	
PCB Filters 	Customized PCB filters for automotive applications	FN 402 (page 2) FN 405 (page 2) FN 406 (page 2) FN 410 (page 2)			
IEC Inlet Filters 		FN 9222 (page 3) FN 9226 (page 3) FN 9260 (page 3) FN 280 (page 3) FN 390 (page 3)			
Single-Phase Filters 	Custom designs for alternative automotive technologies	FN 343 (page 5) FN 6xx (page 4/5) FN 2020 (page 4) FN 2060 (page 5) FN 23x0 (page 4/5)	FN 350 (page 4) FN 2070 (page 5) FN 2080 (page 5) FN 2410 (page 4) FN 2412 (page 4) FN 967x (page 4)	FN 350 (page 4) FN 2070 (page 5) FN 2080 (page 5) FN 2410 (page 4) FN 2412 (page 4) FN 2415 (page 5)	FN 670 (page 5) FN 680 (page 5) FN 685 (page 5) FN 2070 (page 5) FN 2080 (page 5) FN 241x (page 4/5)
Three-Phase Filters 		FN 3258 (page 6)	FN 258 (page 6) FN 351 (page 6) FN 3100 (page 6) FN 3258 (page 6) FN 3270 (page 6) FN 3359 (page 6)	FN 258 (page 6) FN 3100 (page 6) FN 3120 (page 6) FN 3258 (page 6) FN 3275 (page 6) FN 3359 (page 6)	FN 258 (page 6) FN 3100 (page 6) FN 3258 (page 6)
Three-Phase and Neutral Line Filters 		FN 256 (page 7) FN 354 (page 7) FN 355 (page 7) FN 3256 (page 7)	FN 256 (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)	
Output Filters and Load Reactors 			RWK 305 (page 8) FN 5x0 (page 8) FN 50xx (page 8)	RWK 305 (page 8) FN 510 (page 8) FN 5010 (page 8) FN 5020 (page 8) FN 5030 (page 8)	RWK 305 (page 8) FN 510 (page 8) FN 520 (page 8) FN 5010 (page 8)
Line Reactors and Harmonics Filters 	Customized reactor solutions for alternative automotive technologies	FN 3400 (page 6)	RWK 212 (page 6) RWK 213 (page 6) FN 3400 (page 6)	RWK 212 (page 6) FN 3400 (page 6)	RWK 212 (page 6) FN 3400 (page 6)
RFI Suppression Chokes 	RN series (page 9) Custom chokes	EV/EH series (page 9) RD series (page 9) RN series (page 9)	RD series (page 9) RI series (page 9)	RD series (page 9)	RD series (page 9)
Pulse Transformers 	Customized transducers	IT series (page 10/11)	IT series (page 10/11)		

This illustration only contains a few typical products and applications. Schaffner is also active in numerous other industry segments. Most standard components can be customized to meet special requirements. For more information and support please go to www.schaffner.com to find your local partner within Schaffner's global network.



Consumer Goods <ul style="list-style-type: none"> - Amplifiers, audio, video, TV, screens - Receivers, decoders - Laundry machines - Tumblers - Cooking equipment - Induction heaters - Exercise machines - Coffee machines 	Medical <ul style="list-style-type: none"> - X-ray - CAT scanners - Defibrillators - Laboratory equipment - Analysers - Measurement devices - MRI, MSI, EEG, ECG - Test equipment 	Military <ul style="list-style-type: none"> - Security systems - Surveillance - Communication equipment - Aircraft, ships, tanks, submarines - Radar systems - Navigation systems 	Building Automation <ul style="list-style-type: none"> - Heating - Ventilation - Air conditioning - Security systems - Control units - Pumps - Self-ballasted lighting equipment - Autom. window shades 	Power Generation & Supply <ul style="list-style-type: none"> - SMPS, UPS - DC/DC converters - Gen-sets - Wind turbines - Solar panels - Fuel cells - Gas turbines - Power factor control 	Telecom/Datacom <ul style="list-style-type: none"> - Base stations for GSM, UMTS, GPRS - Power line communications - Network technology - Servers - Telephone installations - Broadcast installations 	Machinery <ul style="list-style-type: none"> - Machine tools - Printing machines - Packaging machines - Extruders - Wood working mach. - Milling/drilling mach. - Laser cutting machines - Welding machines - Grinding machines
	FN 751x (page 1) FN 756x (page 1) FN 761x (page 1) FN 766x (page 1)	FN 751x (page 1) FN 756x (page 1) FN 761x (page 1) FN 766x (page 1) ACARA AFC (page 1)		FN 751x (page 1) FN 756x (page 1) FN 761x (page 1) FN 766x (page 1) ACARA AFC (page 1)	FN 751x (page 1) FN 756x (page 1) FN 761x (page 1) FN 766x (page 1) ACARA AFC (page 1)	FN 751x (page 1) FN 761x (page 1) FN 766x (page 1) ACARA AFC (page 1)
FN 402 (page 2) FN 405 (page 2) FN 406 (page 2) FN 410 (page 2)	FN 402B (page 2) FN 406B (page 2)	FN 406 (page 2) FN 410 (page 2)	FN 406 (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)	
FN 32x (page 3) FN 9222 (page 3) FN 9260 (page 3) FN 280 (page 3) FN 3x0 (page 3)	FN 329B (page 3) FN 9222B (page 3) FN 9246B (page 3) FN 9260B (page 3) FN 280B (page 3)	Customized filter solutions with military connectors	FN 9246 (page 3)	FN 922x (page 3) FN 9246 (page 3) FN 9260 (page 3) FN 280 (page 3) FN 3x0 (page 3)	FN 9246 (page 3)	
FN 332 (page 4) FN 6xx (page 4/5) FN 20x0 (page 4/5) FN 23x0 (page 4/5)	FN 332 (page 4) FN 20x0B (page 4/5) FN 2360 (page 5) FN 700Z (page 5)	FN 352Z (page 5) FN 700Z (page 5)	FN 350 (page 4) FN 660 (page 5) FN 670 (page 5) FN 2060 (page 5) FN 2070 (page 5)	FN 660 (page 5) FN 670 (page 5) FN 2060 (page 5) FN 2070 (page 5) FN 967x (page 4)	FN 700Z (page 5) FN 6020 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) FN 2415 (page 5)
FN 3258 (page 6)	FN 258P (page 6) FN 258L (page 6)	FN 258 (page 6) FN 3258 (page 6) FN 3359 (page 6)	FN 258 (page 6) FN 351 (page 6) FN 3258 (page 6)	FN 258 (page 6) FN 3100 (page 6) FN 3120 (page 6) FN 3258 (page 6) FN 3359 (page 6)	FN 6030 Customized three-phase telecom filters	FN 258 (page 6) FN 3100 (page 6) FN 3120 (page 6) FN 3258 (page 6) FN 3275 (page 6) FN 3359 (page 6)
FN 256 (page 7) FN 354 (page 7) FN 355 (page 7)	FN 256 (page 7) FN 354 (page 7) FN 355 (page 7)	FN 354 (page 7)	FN 256 (page 7) FN 3256 (page 7)	FN 256 (page 7) FN 356 (page 7) FN 3256 (page 7) FN 3280 (page 7)	FN 256 (page 7) FN 354 (page 7)	FN 356 (page 7) FN 3256 (page 7) FN 3280 (page 7)
		RWK 305 (page 8) FN 510 (page 8) FN 520 (page 8) FN 530 (page 8)	RWK 305 (page 8) FN 510 (page 8) FN 5010 (page 8)	Customized reactor and filter solutions for (alternative) energy production and feeding power into the network		RWK 305 (page 8) FN 510 (page 8)
FN 3400 (page 6)	FN 3400 (page 6)	RWK 212 (page 6)	FN 3400 (page 6)	Customized reactor and filter solutions for (alternative) energy production and feeding power into the network		RWK 212 (page 6) RWK 213 (page 6) FN 3400 (page 6)
EV/EH series (page 9) RD series (page 9) RN series (page 9)	EV/EH series (page 9) RD series (page 9) RN series (page 9)	RD series (page 9) RN series (page 9)	EV/EH series (page 9) RD series (page 9) RI series (page 9) RN series (page 9)	EV/EH series (page 9) RD series (page 9) RN series (page 9)	EV/EH series (page 9) RN series (page 9)	RD series (page 9)
	IT series (page 10/11)	IT series (page 10/11)	IT series (page 10/11)	IT series (page 10/11)	IT series (page 10/11)	

Single-Phase Filters for Chassis Mounting.

Single-phase filters for chassis 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.

Filter Family	Max. Voltage	Attenuation performance			Features											Typical Applications					
		standard	high	very high	1-stage filter circuit	2-stage filter circuit	3-stage filter circuit	With earth line choke	With over voltage 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	Military applications	Office, test & measure. equip.	General purpose	
FN 332	250VAC	1 - 10			■				■		■		■							■	
FN 350	250VAC	8	55		■								■		■				■		
FN 610	250VAC	1	30		■						■		■							■	
FN 612	250VAC	1		100	■								■						■	■	
FN 2010	250VAC	1	60		■						■		■							■	
FN 2020	250VAC	1	60		■						■		■						■	■	
FN 2310	250VAC	3 - 10			■															■	■
FN 2330	250VAC	3	20		■															■	■
FN 2340	250VAC	2	20		■																■
FN 2410	250VAC 520VAC (H)	8		100	■					■			■		■						
FN 2412	250VAC 520VAC (H)	8	45		■					■		■	■		■	■					
FN 9675/76	250VAC	3	16		■								■		■					■	



Filter Family	Max. Voltage	Attenuation performance			Features												Typical Applications							
		standard	high	very high	1-stage filter circuit	2-stage filter circuit	3-stage filter circuit	With earth line choke	With over voltage protection	Low frequency attenuation	High frequency attenuation	Choice of connection style	NEMP, TEMPEST protection	Power supplies, SMPS	Medical equipment	Single-phase motor drives	Control unit in machine tools	Military applications	Office, test & measure. equip.	General purpose				
FN 343	250VAC	1 - 10	40 - 60		■	■													■	■				
FN 660	250VAC	1 - 20	40 - 60		■						■		■	■					■	■				
FN 670	250VAC	1.8 - 10	40 - 60		■					■	■		■	■					■					
FN 680	250VAC	1 - 10	40 - 60		■				■		■		■	■					■					
FN 685	250VAC	10 - 36	40 - 60		■				■		■		■	■										
FN 2060	250VAC	1 - 30	40 - 60		■						■		■	■					■	■				
FN 2070	250VAC	1 - 36	40 - 60		■					■	■		■	■	■				■					
FN 2080	250VAC	1 - 16	40 - 60		■				■		■		■	■										
FN 2320	250VAC	3 - 20	40 - 60		■														■	■				
FN 2350	250VAC	2 - 10	40 - 60		■														■	■				
FN 2360	250VAC	3 - 6	40 - 60		■								■	■					■	■				
FN 2415	250VAC	6 - 16	40 - 60		■											■	■							
FN 352Z	250VAC	6 - 30	40 - 60			■		■	■				■	■					■	■				
FN 700Z	250VAC	6 - 20	80 - 100			■		■	■			■	■	■					■	■				

Three-Phase Filters and Line Reactors. EMC 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 and harmonics filters, 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.

Filter Family	Max. Voltage	Attenuation performance			Features										Typ. Applications					
		standard	high	very high	Multi-stage filter circuit	Safety connector blocks	Busbar connection	Optional protective covers	Offering EMC compliance	Less commutation notches	Form factor (I) improvement	Inrush current limitation	Harmonics reduction	4% impedance	2% impedance	Inverters, servo drives	Energy regeneration drives	Machinery, machine tools	Industrial automation	General purpose
FN 258	480VAC 690VAC (HV)	7	250		■	■			■							■		■	■	■
FN 351	440VAC 520VAC (H)	5	280			■		■								■			■	■
FN 3100/3110	520VAC (3100) 480VAC (3110)	35	300			■		■								■	■	■	■	
FN 3120	520VAC (H)	25	230			■		■								■	■	■	■	
FN 3258	480VAC 520VAC (H)	7	180			■		■								■			■	■
FN 3270	520VAC (H)	10		1000		■	■	■	■							■			■	■
FN 3275	520VAC (H)	10		1000		■	■	■	■										■	■
FN 3359	520VAC 690VAC (HV)	150		2500		■		■	■							■	■	■	■	
FN 3400	480VAC	8 - 24				■	■		■	■	■	■	■	■	■	■		■	■	■
RWK 212	500VAC	2		2300		■	■		■	■	■	■	■	■	■	■		■	■	■
RWK 213	500VAC	60		500		■	■		■	■	■	■	■	■	■	■		■	■	■

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 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.

Filter Family	Max. Voltage	Performance		Features										Typical Applications									
		Attenuation performance	Current rating [A]	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 supply	Medical equipment	For high frequency appl.	High power office equipment	General purpose				
FN 256	480VAC 520VAC (H)	8	160	■				■	■		■			■	■	■	■	■					
FN 354	440VAC	4 25			■		■	■		■					■	■	■	■					
FN 355	440VAC	3 20		■			■	■		■					■		■	■					
FN 356	440VAC	16	150	■		■		■	■		■		■	■									
FN 3256	520VAC (H)	8	160	■		■		■	■		■	■	■	■			■	■					
FN 3280	520VAC (H)	8	160		■	■		■	■	■	■	■	■	■									











Output Filters and Load Reactors for Motor Drives. 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.














Filter Family	Max. Voltage	Typical motor power [kW]						Features										Typ. Applications					
		0	60	120	180	240	>300	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. cabling	Retrofit of motor drives
FN 510	520VAC	0.75 - 30	4 - 66					■	■	■						■	■	■	■				
FN 520	520VAC	1.5 - 7.5	4 - 16					■	■	■	■	■				■	■	■					
FN 530	520VAC	1.5 - 7.5	4 - 16					■	■	■	■	■	■	■	■	■	■	■			■	■	
FN 5010	440VAC 690VAC (HV)	0.75 - 300	2.5 - 610					■	■	■	■	■				■	■	■				■	
FN 5020	500VAC	11 - 55	25 - 120					■	■	■	■	■				■	■	■		■			
FN 5030*	500VAC	11 - 55	25 - 120							■	■	■	■	■	■	■	■	■		■	■	■	
RWK 305	500VAC	0.75 - 1000	2 - 2300					■	■							■	■	■	■				

* additional output filter module to be operated in conjunction with FN 5010 or FN 5020

RFI Suppression Chokes

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

Choke Family	Max. Voltage	Inductance value [mH]		Current rating [A]		Features								Typical Applications																	
		0	20	40	60	80	100	0	20	40	60	80	100	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	SMPS	Home electronics, TV, ballasts	Battery chargers	Heaters, air conditioners		
RD 5000 series 	600VAC 850VDC	1 - 10	6 - 16										■		■	■					■		■								
RD 6000 series 	600VAC 850VDC	1.5 - 15	6 - 16										■		■	■					■	■	■								
RD 7000 series 	600VAC 850VDC	0.2 - 25	6 - 36										■		■	■	■				■	■	■								
RD 8000 series 	600VAC 850VDC	0.2 - 12	16 - 64										■		■	■	■				■	■	■								
RN series 	250VAC	0.7 - 100	0.3 - 10										■		■						■	■	■		■	■	■	■	■	■	■
EV/EH 20 series 	250VAC	0.82 - 33	0.3 - 2										■		■						■	■	■		■	■	■	■	■	■	■
EV/EH 24 series 	250VAC	0.5 - 44	0.5 - 4										■		■						■	■	■		■	■	■	■	■	■	■
EV/EH 28 series 	250VAC	1.1 - 36	1 - 5										■		■						■	■	■		■	■	■	■	■	■	■
EV/EH 35 series 	250VAC	3.6 - 90	1 - 5										■		■						■	■	■		■	■	■	■	■	■	■
RI series 	500VDC	1.5 - 25											■	■	■						■	■	■		■	■	■	■	■	■	■

Pulse Transformer	Nominal Voltage	Voltage-time area [Vμs]						Features							Typical Applications								
		0 0	1000 0.6	2000 1.2	3000 1.8	4000 2.4	5000 3	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 233	 500VAC	300 0.25							■					■	■	■	■	■	■	■	■		■
IT 242	 500VAC	250 0.1							■					■	■	■	■	■	■	■	■		■
IT 243	 500VAC	250 0.1							■					■	■	■	■	■	■	■	■		■
IT 253	 500VAC	180 0.25							■					■	■	■	■	■	■	■	■		■
IT 246	 750VAC	200 0.1								■				■	■	■	■		■	■			■
IT 248	 750VAC	350 0.25								■				■	■	■	■		■	■			■
IT 362	 1000VAC				3500						■				■	■	■	■		■	■		
IT 249	 500VAC	330 0.25									■			■	■	■	■	■	■	■	■	■	■
IT 260	 500VAC	200 0.1									■			■	■		■	■	■	■	■	■	■
IT 314	 380VAC	500 0.25	1											■	■	■		■	■	■	■	■	■
IT 154	 500VAC	600 0.1												■	■	■		■	■	■	■	■	■
IT 234	 500VAC	300 0.25												■	■	■		■	■	■	■	■	■
IT 244	 500VAC	200 0.1												■	■	■		■	■	■	■	■	■