

EMI FILTERS FOR MACHINERY AND MACHINE TOOL EQUIPEMENT

SCHAFFNER FN3297 3-PHASE+N FILTER SERIES

INTRODUCTION

The Schaffner FN3297 3-Phase + neutral filter series are engineered for industrial automation and climate control systems, offering robust electromagnetic interference mitigation.

Designed for 480 VAC nominal operation, they support current ratings from 8 A to 36 A with a 100 kA SCCR and compliance to IEC and UL standards. These filters feature compact construction, front wiring, and withstand surge levels up to 4 kV (L-PE) with high insulation resistance.

APPLICATIONS

- Machine builders
- Climate solution (AC/Heat pump)
- Renewable energy
- Energy storage
- EV charging stations
- HVAC

FEATURES AND BENEFITS

- Compact and effective EMI mitigation
- Choice of performance two performance levels
- Front wiring with easy integration into a cabinet
- SCCR rating of 100kA
- Compliant to Household Standard (IEC60335-1)

APPROVALS

- IEC 60939-3
- UL 60939-3
- CSA C22.2 No. 8
- IEC 60204-1: Insulation resistance: $>> 1 \text{ MOhm}$
- IEC 60335-1: 8.1.4 accessible part, 22.42 protective impedance, 24.1 components comply and 30.2 non-metallic material
- IEC 60225-2-40: 22.116 arcs and sparks from electric components and 22.117 hot surfaces
- RoHS 2011/65/EU, 2015/863/EU
- REACH No. 1907/2006



Technical data of approved types on request



8A / 16A



25A



36A

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SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

Current Ratings @ 50°C amb. Temperature	8 A	16 A	25 A	36 A
Overload Current Rating	1.5 x rated current for 1 minute once per hour			
Nominal Operating Voltage	480/275 VAC			
Rated Operating Voltage	530/305 VAC			
Rated Operating Frequency	50/60 Hz			
Max. Operating Frequency	60 Hz			
Production Line Test Voltage	2.8 kVDC* for 2 s (L/N to PE)			
	2.3 kVDC* for 2 s (L to L)			
	1.6 kVDC* for 2 s (L to N)			
Overvoltage Category (IEC 60664-1)	III			
Typical Power Dissipation	5.8W	9.2W	11.3W	15.6W
Max. DC Resistance @ 25 (L - L')	30 mOhm	12 mOhm	6 mOhm	4 mOhm
Surge (IEC 61000-4-5)	2kV L-L / 4kV L-PE (Level 4)			
Operating altitude	Till 2000 m a.s.l without derating. Higher altitudes derating as in IEC60664-1 applies			
SCCR	100 kA **			

* Repetition with max. 80 % of the specified values

** With overcurrent protection of J-Type current limiting fuses. Fuse rating shall not exceed 150% of filter current rating

MECHANICAL CHARACTERISTICS

Weight	0.7 kg	0.7 kg	1.2 kg	1.4 kg
Line	Push-in Terminal 7.5 mm pitch		Push-in Terminal 10 mm pitch	
Load	Push-in Terminal 7.5 mm pitch		Push-in Terminal 10 mm pitch	
Flex Wire (AWG)	24-8		20-4	
Solid Wire (mm²)	0.2-10		0.75-16	
Flex Wire (mm²)	0.2-6		0.75-16	
PE Screw	Thread M5			
PE Screw Torque (Nm)	2.0-2.2			

ENVIRONMENTAL CHARACTERISTICS

Operating Ambient Temp. Range	-40°C to +100°C *			
Storage Temp. Range	-40°C to +85°C			
Cooling	AN			
Pollution Degree	2 acc. to IEC 60664-1			
Climatic Class	40/100/21 acc. to IEC 60068-1			
MTBF (MIL-HDBK-217F) @ rated voltage/ current/ambient temperature	800,000 h	700,000 h	800,000 h	800,000 h
Shock & Vibration (IEC 60721-3-3:2002)	3M4			
Shock & Vibration (IEC 60721-3-3:2019)	3M12			

* Current is subjected to derating for temperatures above the rated current temperature point

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PLASTIC MATERIAL

External Plastic Material	Terminal
Flammability (UL 94)	VO
GWFI (IEC 60695-2-12)	960 °C
GWIT (IEC 60695-2-13)	775 °C
CTI (UL 746C)	PLC 0
Ball Pressure (IEC 60695-10-2)	165 °C
External Plastic Material	Frame
Flammability (UL 94)	VO
GWFI (IEC 60695-2-12)	960 °C
GWIT (IEC 60695-2-13)	700 °C
CTI (UL 746C)	PLC 3
Ball Pressure (IEC 60695-10-2)	210 °C

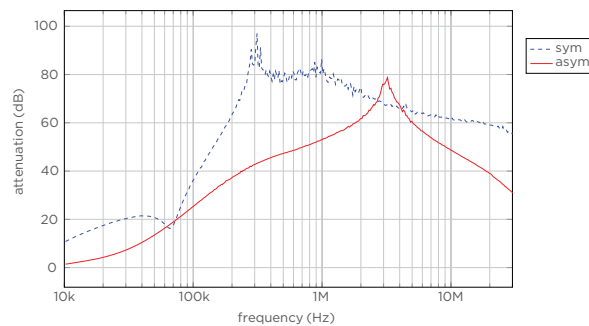
TYPICAL INSERTION LOSS

8A

FN3297-8-103-C19-R66 (823748)

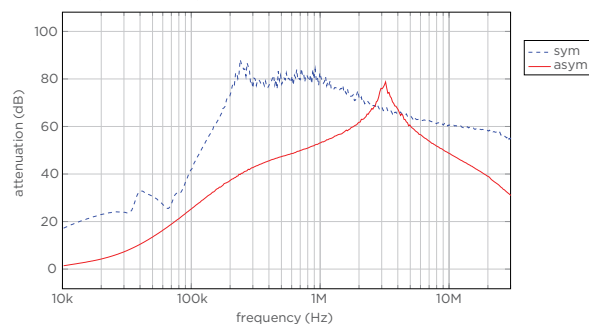
Leakage Current (IEC 60939-3): 0.314 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-L

Per CISPR 17 (50 Ω / 50 Ω)

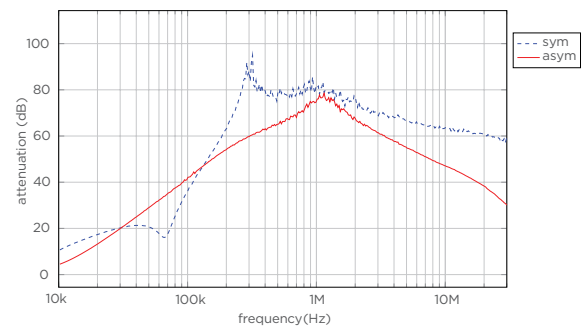


Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

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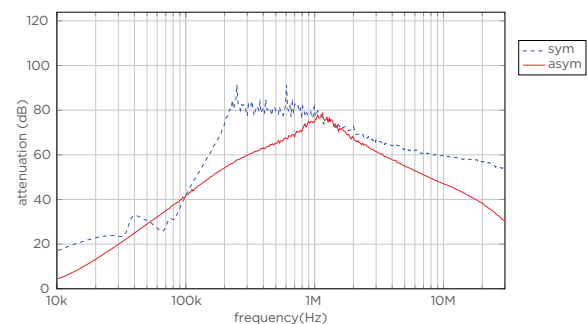
Leakage Current (IEC 60939-3): 2.136 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-L

Per CISPR 17 (50 Ω / 50 Ω)



Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

EMI FILTERS FOR MACHINERY AND MACHINE TOOL EQUIPEMENT

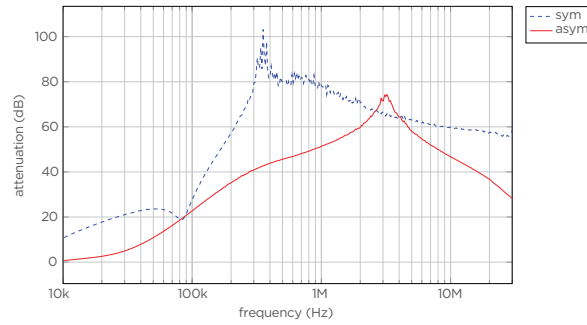
SCHAFFNER FN3297 3-PHASE+N FILTER SERIES

16A

FN3297-16-103-C19-R66 (823750)

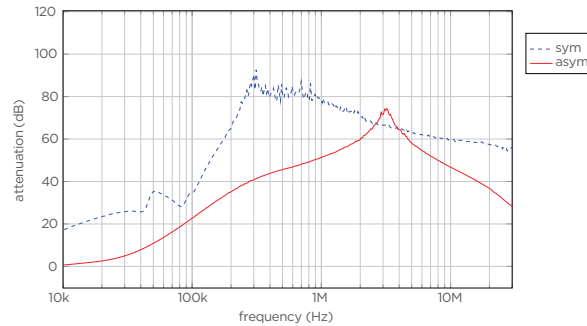
Leakage Current (IEC 60939-3): 0.314 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-L

Per CISPR 17 (50 Ω / 50 Ω)

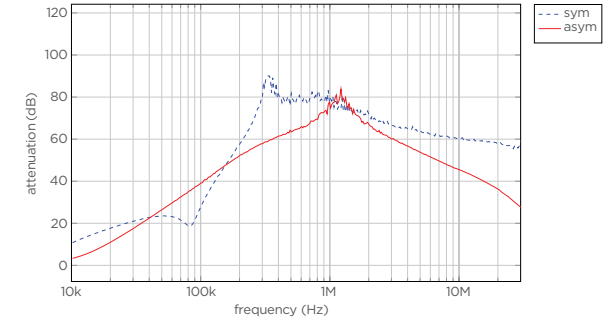


Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

FN3297-16-103-C24-R66 (823749)

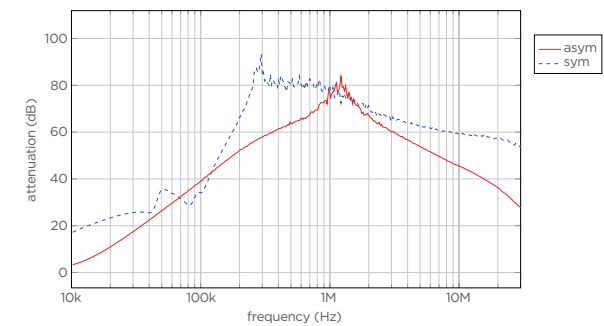
Leakage Current (IEC 60939-3): 2.136 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-L

Per CISPR 17 (50 Ω / 50 Ω)



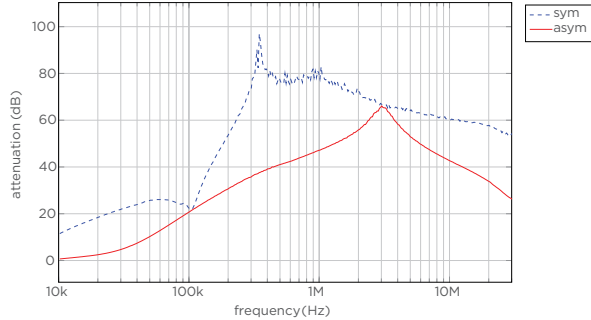
Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

25A

FN3297-25-105-C19-R66 (823752)

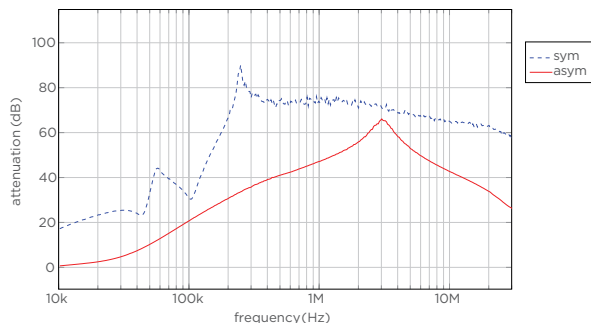
Leakage Current (IEC 60939-3): 0.314 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-L

Per CISPR 17 (50 Ω / 50 Ω)

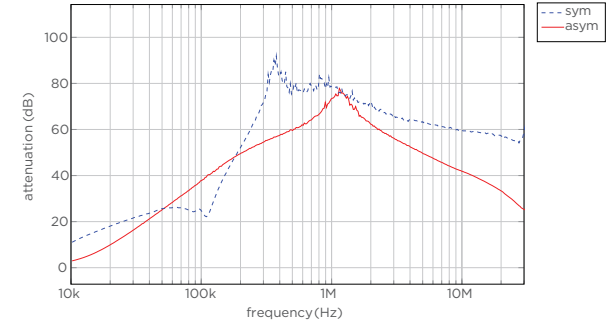


Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

FN3297-25-105-C24-R66 (823751)

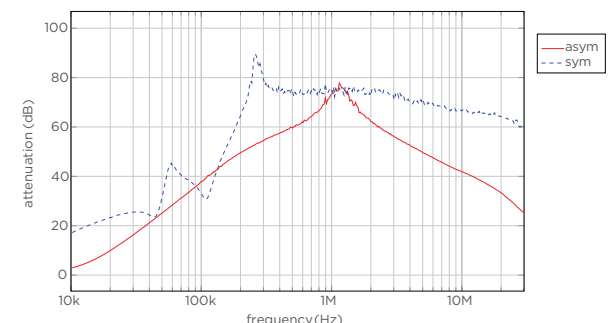
Leakage Current (IEC 60939-3): 2.136 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-L

Per CISPR 17 (50 Ω / 50 Ω)



Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

EMI FILTERS FOR MACHINERY AND MACHINE TOOL EQUIPEMENT

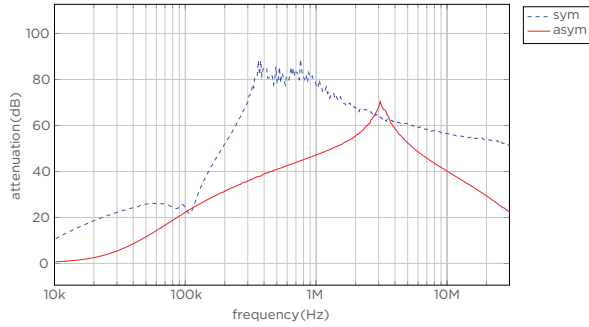
SCHAFFNER FN3297 3-PHASE+N FILTER SERIES

36A

FN3297-36-105-C19-R66 (823754)

Leakage Current (IEC 60939-3): 0.314 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)

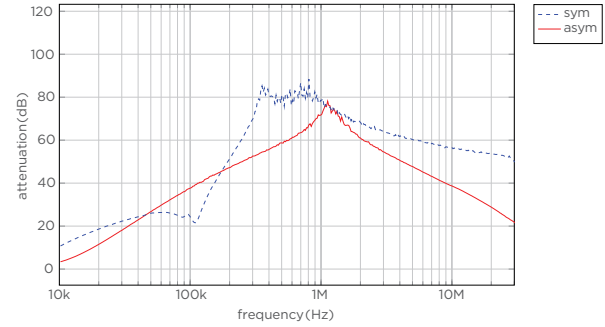


Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-L

FN3297-36-105-C24-R66 (823753)

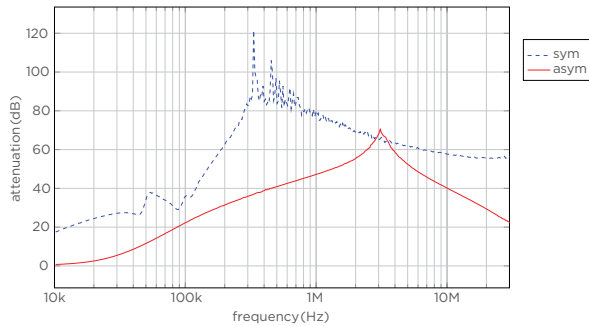
Leakage Current (IEC 60939-3): 2.136 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



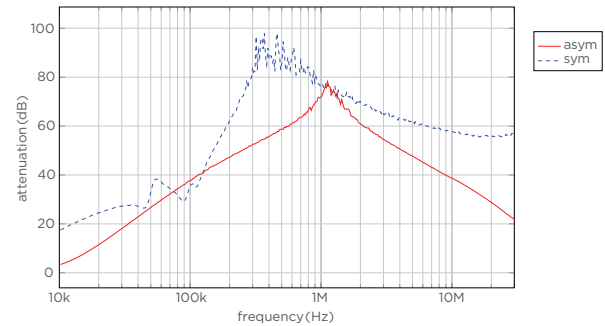
Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-L

Per CISPR 17 (50 Ω / 50 Ω)



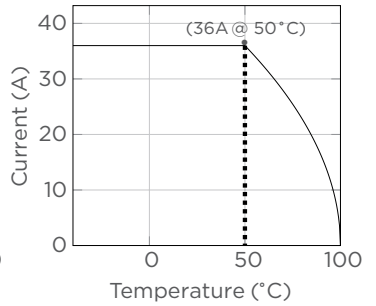
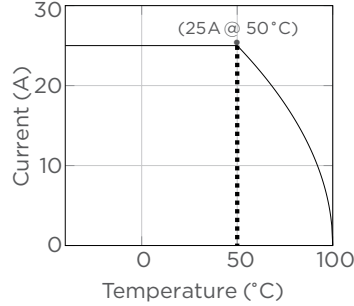
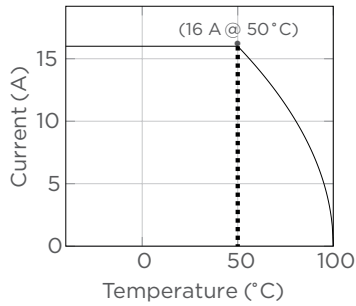
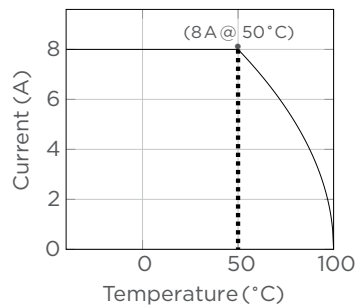
Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

Per CISPR 17 (50 Ω / 50 Ω)



Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

DERATING CURVE



$$I = I_N \cdot \sqrt{\frac{\theta_{max} - \theta_{act}}{\theta_{max} - \theta_N}}$$

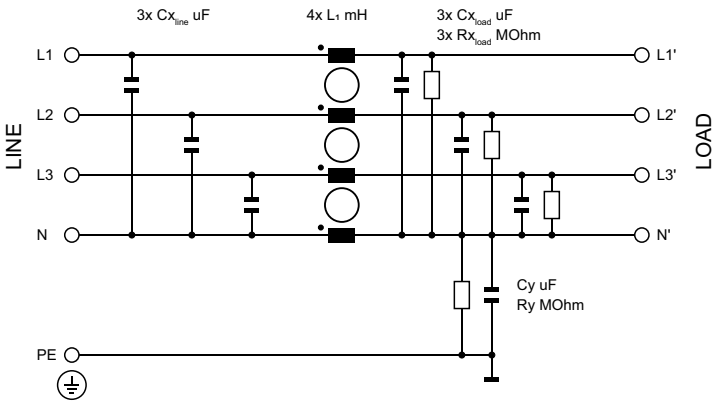
for $\theta_{act} > \theta_N$ and $\theta_{act} < \theta_{max}$

I_N	Rated current at N
θ_{act}	Actual ambient temperature
θ_N	Temperature at which the rated current is defined
θ_{max}	Rated maximum temperature of the component

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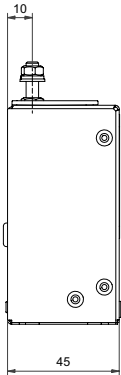
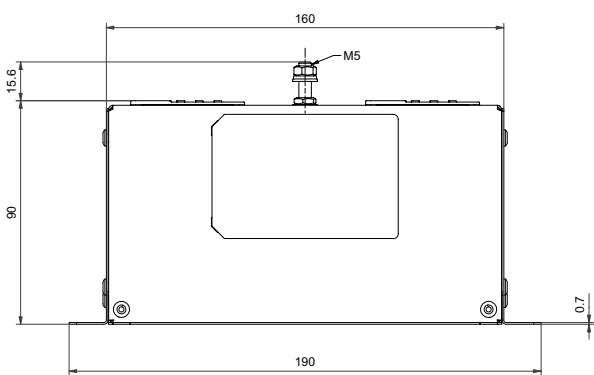
LINE DIAGRAM



Smart Part Description	Cx _{line} [uF]	L ₁ [mH]	Cx _{load} [uF]	Rx _{load} [MOhm]	Cy [nF]	Ry [MOhm]
FN3297-8-103-C24-R66	3.3	1.21	3.3	R6- = 1.5	C24 = 680	R-6 = 1.5
FN3297-8-103-C19-R66	3.3	1.21	3.3	R6- = 1.5	C19 = 100	R-6 = 1.5
FN3297-16-103-C24-R66	3.3	0.93	3.3	R6- = 1.5	C24 = 680	R-6 = 1.5
FN3297-16-103-C19-R66	3.3	0.93	3.3	R6- = 1.5	C19 = 100	R-6 = 1.5
FN3297-25-105-C24-R66	3.3	0.8	3.3	R6- = 1.5	C24 = 680	R-6 = 1.5
FN3297-25-105-C19-R66	3.3	0.8	3.3	R6- = 1.5	C19 = 100	R-6 = 1.5
FN3297-36-105-C24-R66	3.3	0.8	3.3	R6- = 1.5	C24 = 680	R-6 = 1.5
FN3297-36-105-C19-R66	3.3	0.8	3.3	R6- = 1.5	C19 = 100	R-6 = 1.5

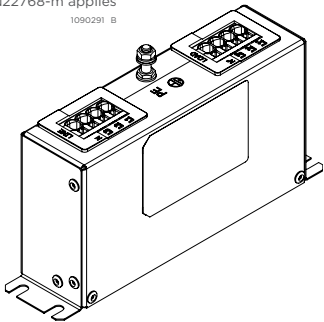
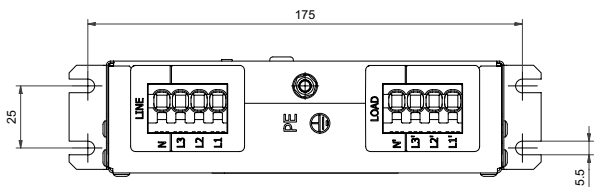
DIMENSIONS (Unit: mm)

8A / 16A



For dimensions [mm] without tolerances:
ISO2768-m/EN22768-m applies

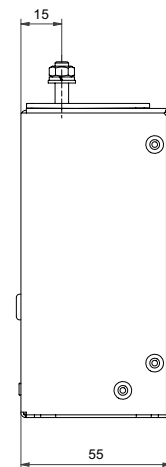
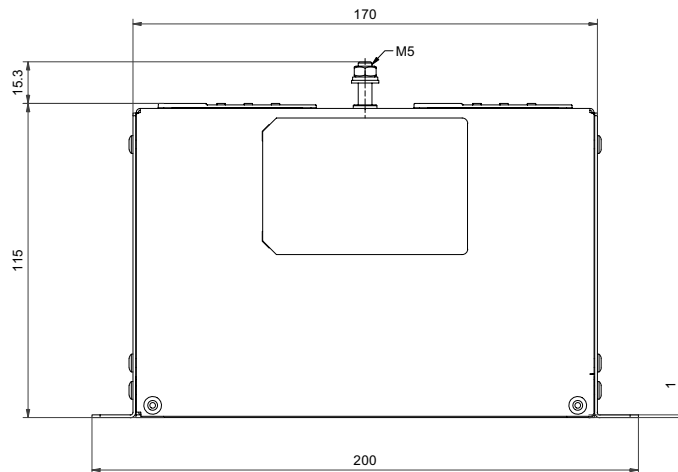
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EMI FILTERS FOR MACHINERY AND MACHINE TOOL EQUIPEMENT

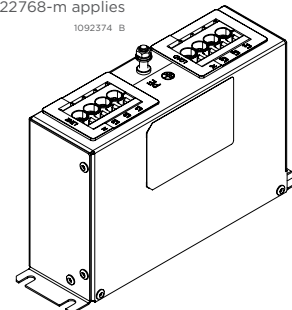
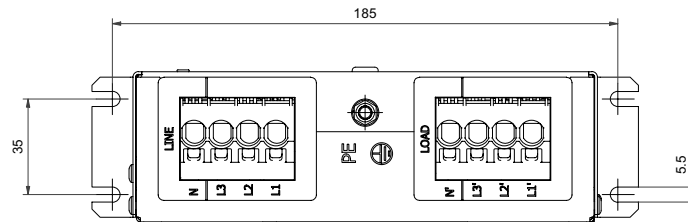
SCHAFFNER FN3297 3-PHASE+N FILTER SERIES

25A

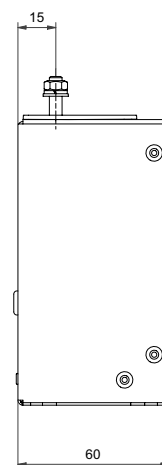
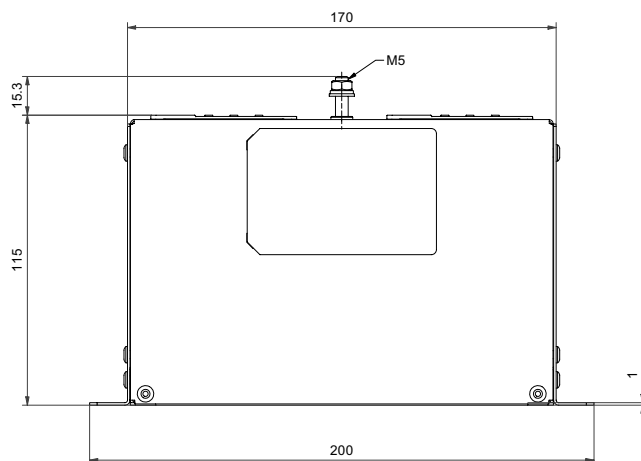


For dimensions [mm] without tolerances:
ISO2768-m/EN22768-m applies

1092374 B

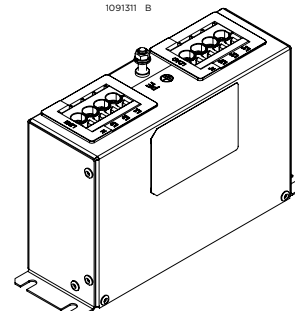
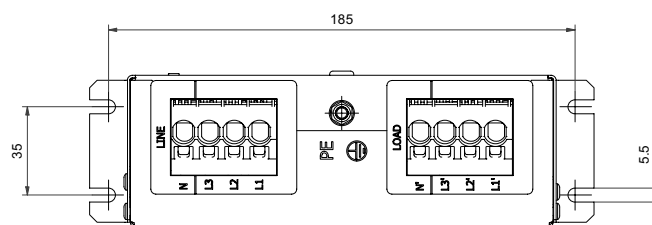


36A



For dimensions [mm] without tolerances:
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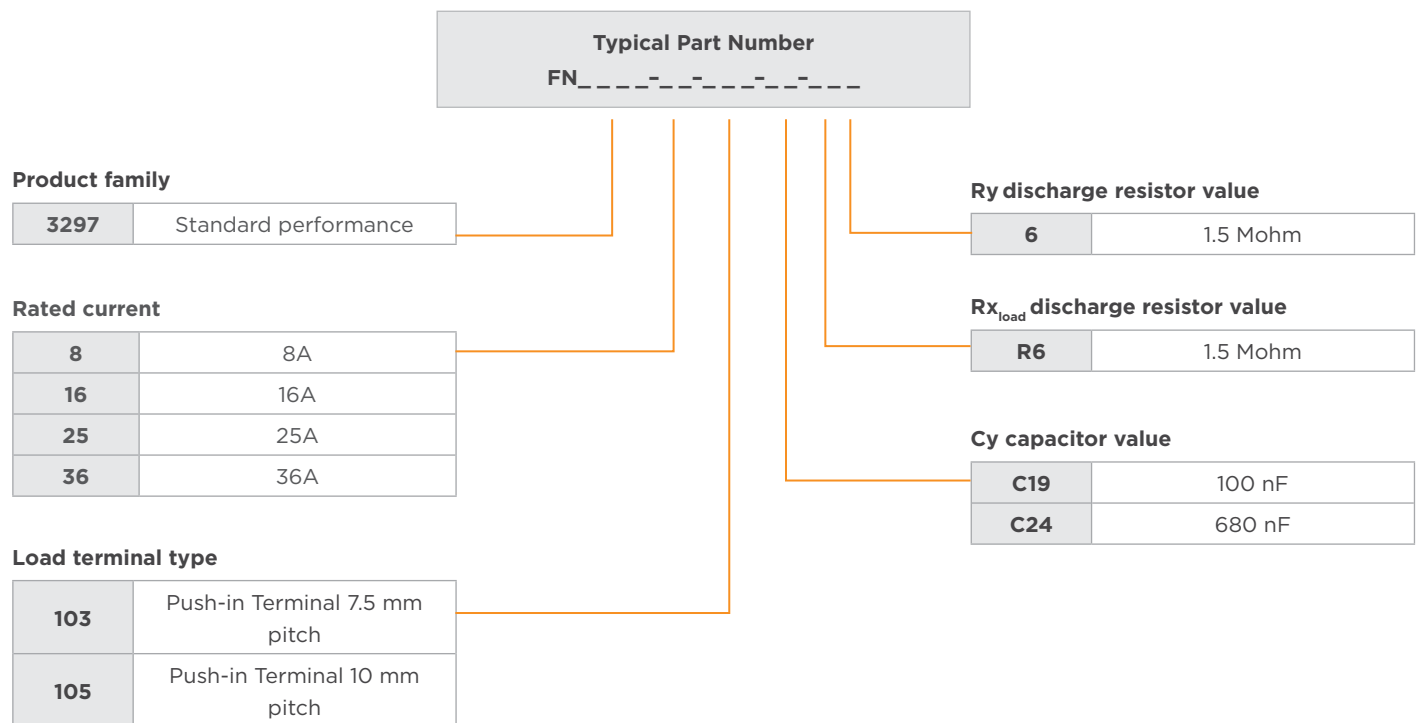
1091311 B



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PRODUCT CODE STRUCTURE



PRODUCT SELECTION INFORMATION

S.No	TE Description	TE Part Number
1	FN3297-8-103-C24-R66	823747-SF
2	FN3297-8-103-C19-R66	823748-SF
3	FN3297-16-103-C24-R66	823749-SF
4	FN3297-16-103-C19-R66	823750-SF
5	FN3297-25-105-C24-R66	823751-SF
6	FN3297-25-105-C19-R66	823752-SF
7	FN3297-36-105-C24-R66	823753-SF
8	FN3297-36-105-C19-R66	823754-SF

DISCLAIMER

1. Product suitability for a given application must ultimately be determined by the user (the party that is putting the product into operation) on a case by case basis. Product functionality and suitability must be determined with proper verification within the final application. Neither Schaffner nor its subsidiaries will assume liability for any consequential downtimes or damages resulting from use of products outside their specifications or due to incomplete verification in application.

2. Do not attempt to install, operate, maintain or inspect any product until you have read and understood the related safety notes and installation guidelines delivered with the product. If not available, general safety and installation notes are available on Schaffner Website: www.schaffner.com.

Non-qualified persons are not allowed to install or maintain Schaffner products!

3. The user is responsible to observe compliance with all local installation and electrical regulations.

4. All products must have their safety earth connected using properly dimensioned connectors. It is recommended to avoid chaining safety earth of multiple equipment together.

5. Warnings, cautions and notes as displayed on the product label must be observed at all times.

6. Overcurrent or overvoltage applied to products or resulting from an improper setup (i.e. resonances) may cause substantial damages, represent a fire hazards and lead to body injury or death.

7. Unless specifically indicated in datasheet, products do not contain any protection components. Suitable overcurrent and overvoltage protection circuits must be placed upstream of the product to avoid any consequential damage in case of any system malfunction.

8. Products with capacitive elements can have significant amount of stored energy. If misused or mishandled it could lead to body harm, damage and eventually fire hazard.

9. Products have limited lifetime and are subject to ageing effects heavily depending on operating conditions and environment. Schaffner recommends to regularly check any inbuilt capacitance to ensure constant performance and considering replacement after 12 years from initial commissioning unless otherwise indicated. Even when properly operated as in specifications, it is not possible to rule out single malfunctioning or failures of components happening before the usual lifetime.

User is responsible to evaluate the environment in the application and eventually perform preventive maintenance before the above recommendation. User shall also evaluate risk of possible failures and implement proper containment actions to avoid damage or injury.

10. Schaffner reserves the right to change raw materials used in this product during its life cycle on the companys own discretion, mainly for the purpose of managing and maintaining a capable international supplier base and for ensuring prompt product availability at all times. All changes having no impact on form, fit, function and technical specifications according to company internal evaluation will be carried out without notification.

Stricter change management process can be implemented on request.

We are here to help



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