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EMI FILTERS FOR MACHINERY AND MACHINE TOOL EQUIPEMENT

SCHAFFNER FN3298 3-PHASE+N FILTER SERIES

INTRODUCTION

The Schaffner FN3298 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.

8A / 16A

25A

36A

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 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

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	8.5W	11.3W	19.4W
Max. DC Resistance @ 25 L - L'	30 mOhm	11 mOhm	6 mOhm	5 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	1 kg	1 kg	1.5 kg	1.9 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 (mm^2)	0.2-10		0.75-16	
Flex Wire (mm^2)	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	900,000 h	800,000 h	800,000 h	700,000 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

PLASTIC MATERIAL

External Plastic Material	Terminal
Flammability (UL 94)	V0
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)	V0
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

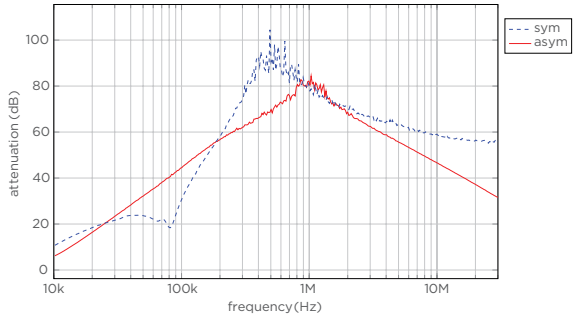
TYPICAL INSERTION LOSS

8A

FN3298-8-103-C25-R65 (823764)

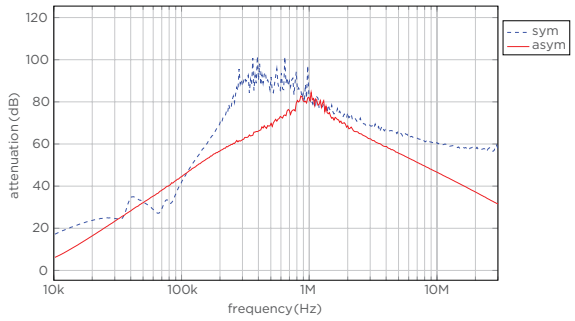
Leakage Current (IEC 60939-3): 1.57 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



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

Per CISPR 17 (50 Ω / 50 Ω)

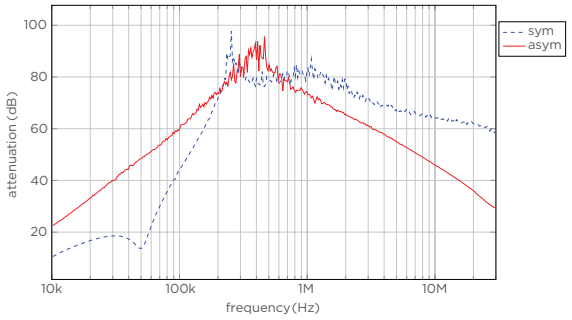


Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

FN3298-8-103-C30-R65 (823763)

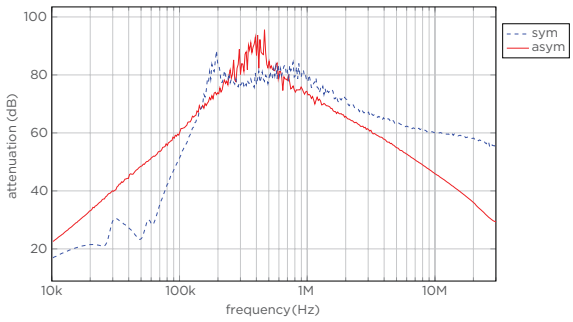
Leakage Current (IEC 60939-3): 10.7 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



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

Per CISPR 17 (50 Ω / 50 Ω)



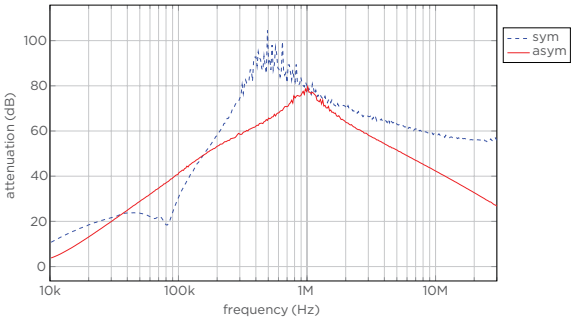
Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

16A

FN3298-16-103-C25-R65 (823766)

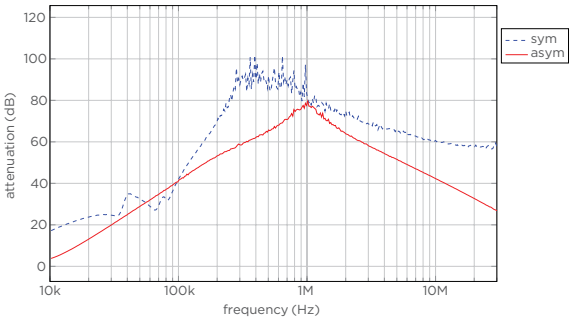
Leakage Current (IEC 60939-3): 1.57 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



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

Per CISPR 17 (50 Ω / 50 Ω)

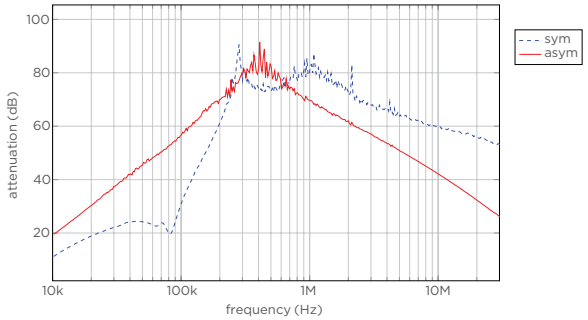


Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

FN3298-16-103-C30-R65 (823765)

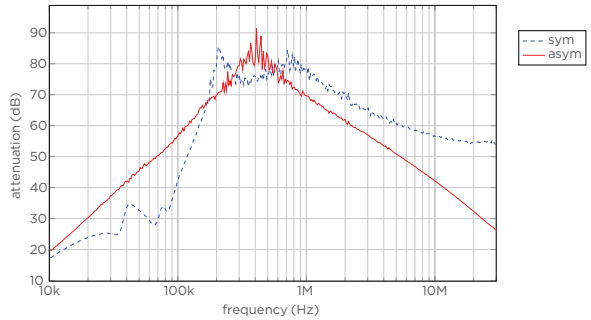
Leakage Current (IEC 60939-3): 10.7 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



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

Per CISPR 17 (50 Ω / 50 Ω)



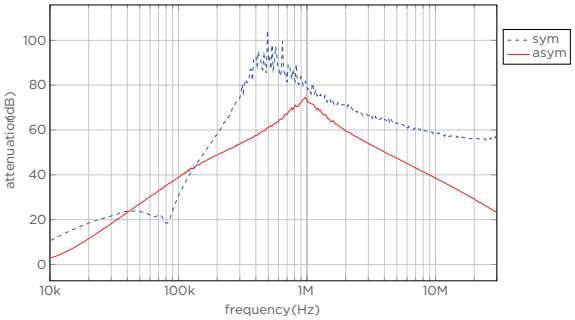
Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

25A

FN3298-25-105-C25-R65 (823768)

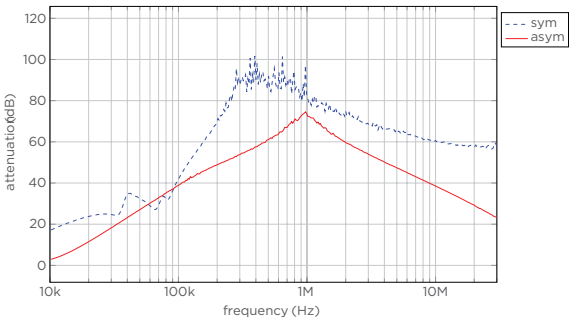
Leakage Current (IEC 60939-3): 1.57 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



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

Per CISPR 17 (50 Ω / 50 Ω)

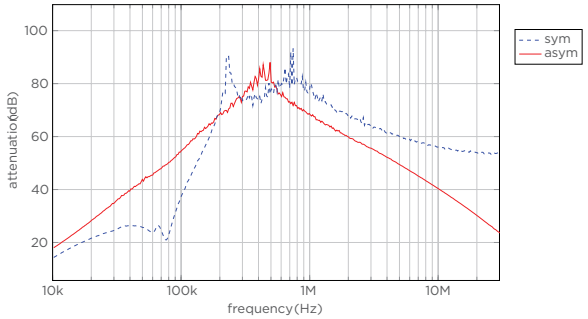


Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

FN3298-25-105-C30-R65 (823767)

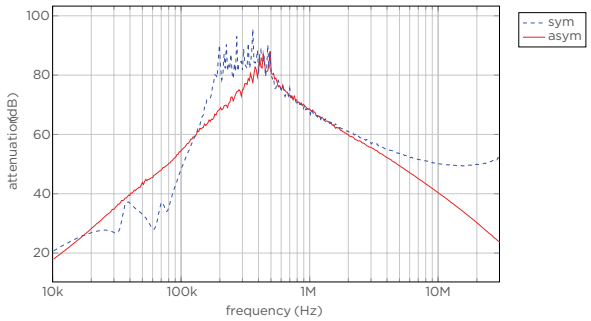
Leakage Current (IEC 60939-3): 10.7 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



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

Per CISPR 17 (50 Ω / 50 Ω)



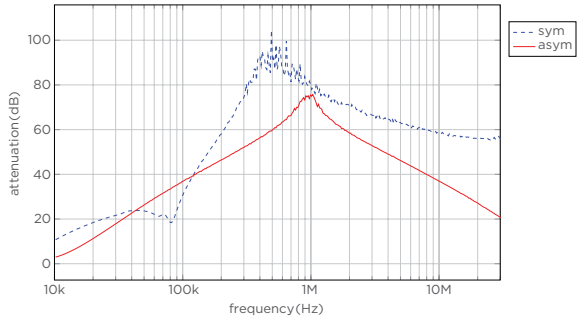
Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

36A

FN3298-36-105-C25-R65 (823770)

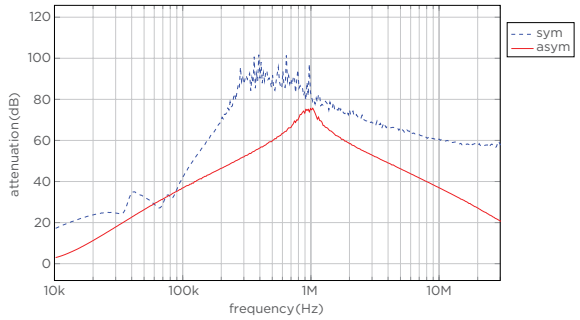
Leakage Current (IEC 60939-3): 1.57 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)



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

Per CISPR 17 (50 Ω / 50 Ω)

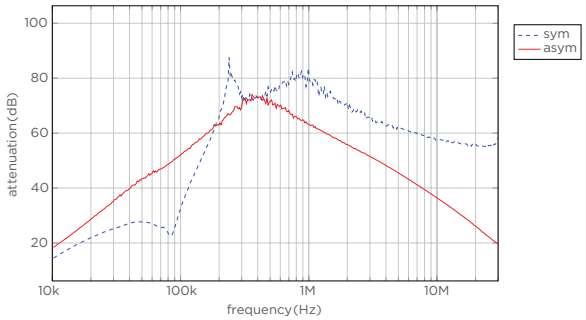


Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-N

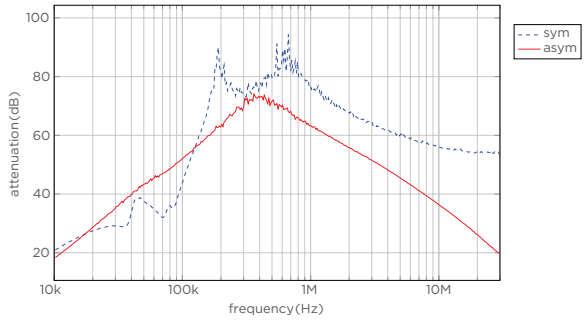
FN3298-36-105-C30-R65 (823769)

Leakage Current (IEC 60939-3): 10.7 mA @ Rated Voltage and 50 Hz

Per CISPR 17 (50 Ω / 50 Ω)

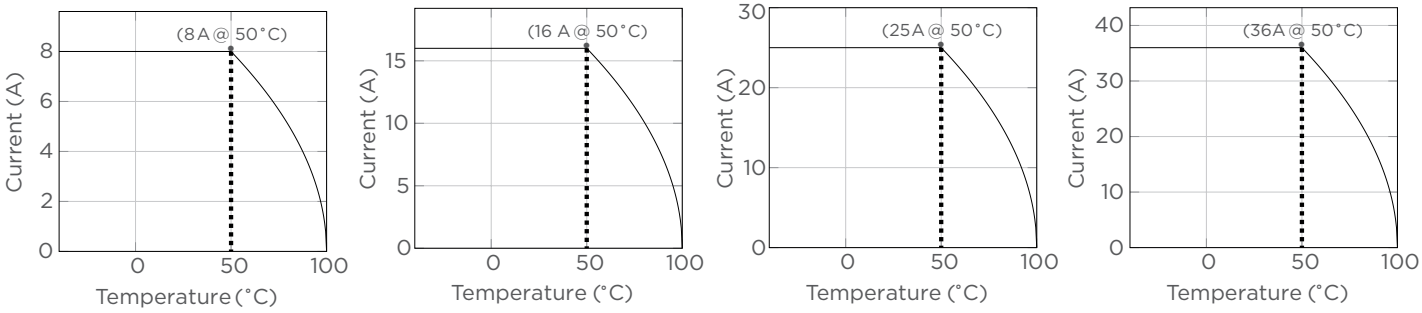


Typical Insertion Loss: Asym: 3L/N-GND, Sym:L-L



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

DERATING CURVE

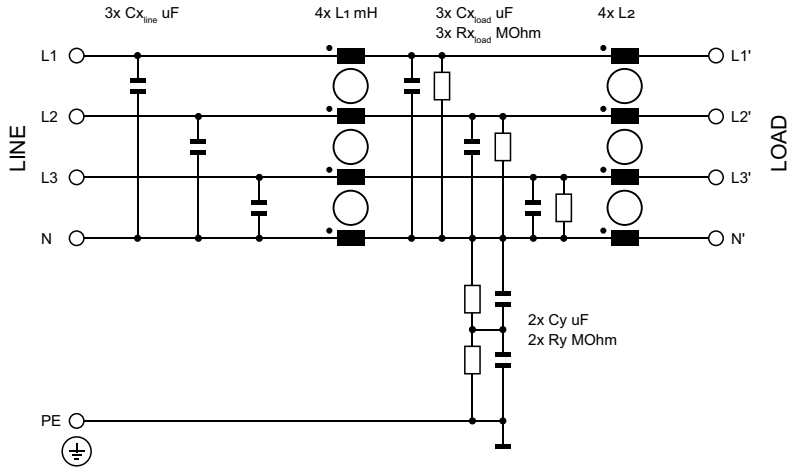


$$I = I_N \cdot \sqrt{\frac{\Theta_{max} - \Theta_{act}}{\Theta_{max} - \Theta_N}}$$

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

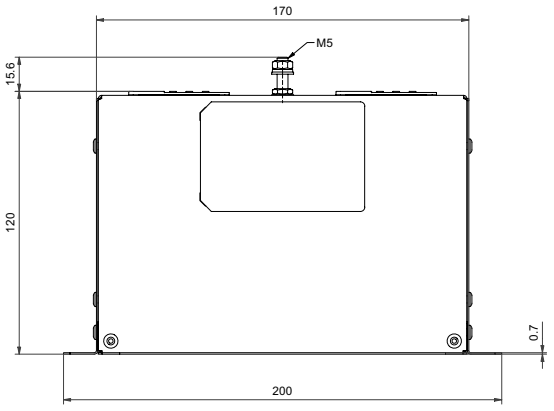
LINE DIAGRAM

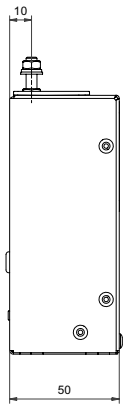


Smart Part Description	Cx$_{line}$ [uF]	L1 [mH]	Cx$_{load}$ [uF]	Rx$_{load}$ [MOhm]	Cy [uF]	L2 [uH]	Ry [MOhm]
FN3298-8-103-C30-R65	3.3	1.96	3.3	R6- = 1.5	C30 = 2x6.8	3.4	R-5 = 2x 1
FN3298-8-103-C25-R65	3.3	1.96	3.3	R6- = 1.5	C25 = 2x1	3.4	R-5 = 2x 1
FN3298-16-103-C30-R65	3.3	1.25	3.3	R6- = 1.5	C30 = 2x6.8	3.4	R-5 = 2x 1
FN3298-16-103-C25-R65	3.3	1.25	3.3	R6- = 1.5	C25 = 2x1	3.4	R-5 = 2x 1
FN3298-25-105-C30-R65	6.8	1.08	3.3	R6- = 1.5	C30 = 2x6.8	3	R-5 = 2x 1
FN3298-25-105-C25-R65	6.8	1.08	3.3	R6- = 1.5	C25 = 2x1	3	R-5 = 2x 1
FN3298-36-105-C30-R65	6.8	1.01	3.3	R6- = 1.5	C30 = 2x6.8	3	R-5 = 2x 1
FN3298-36-105-C25-R65	6.8	1.01	3.3	R6- = 1.5	C25 = 2x1	3	R-5 = 2x 1

DIMENSIONS (Unit: mm)

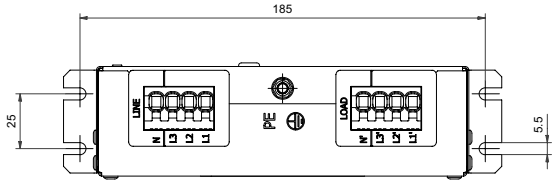
8A / 16A

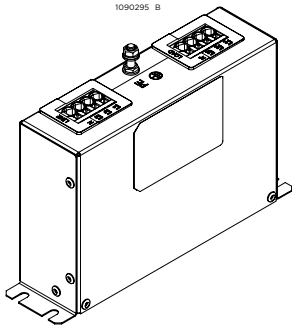




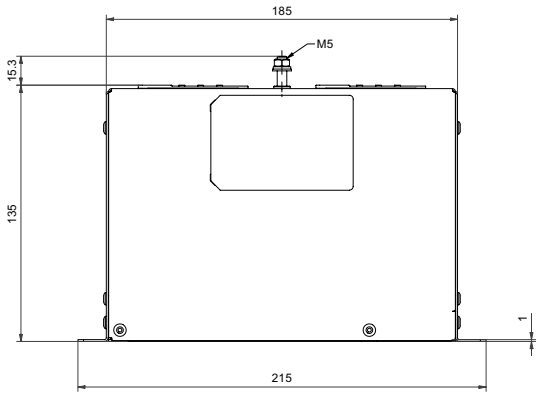
For dimensions [mm] without tolerances:
ISO2768-m/EN22768-m applies

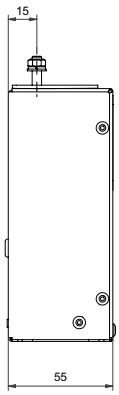
1090295 B





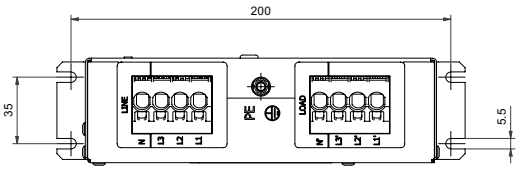
25A

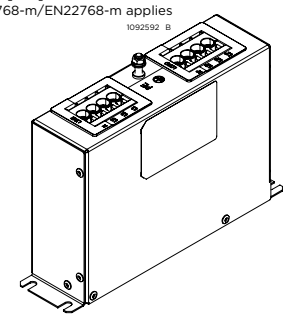




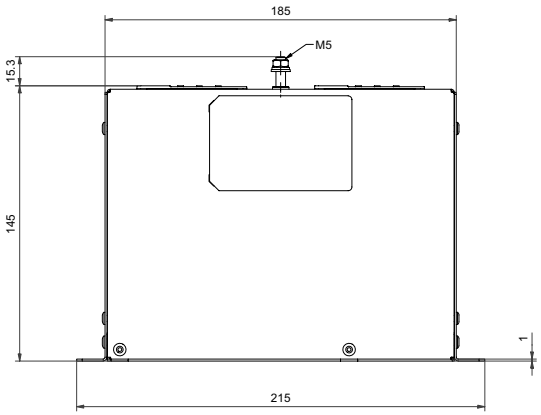
For dimensions [mm] without tolerances:
ISO2768-m/EN22768-m applies

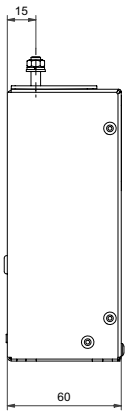
1092592 B





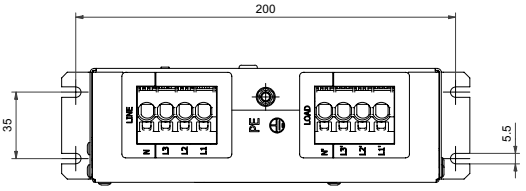
36A

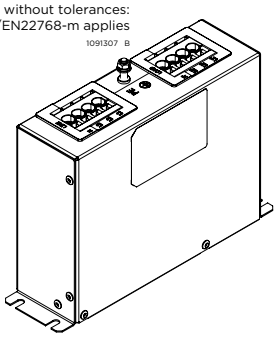




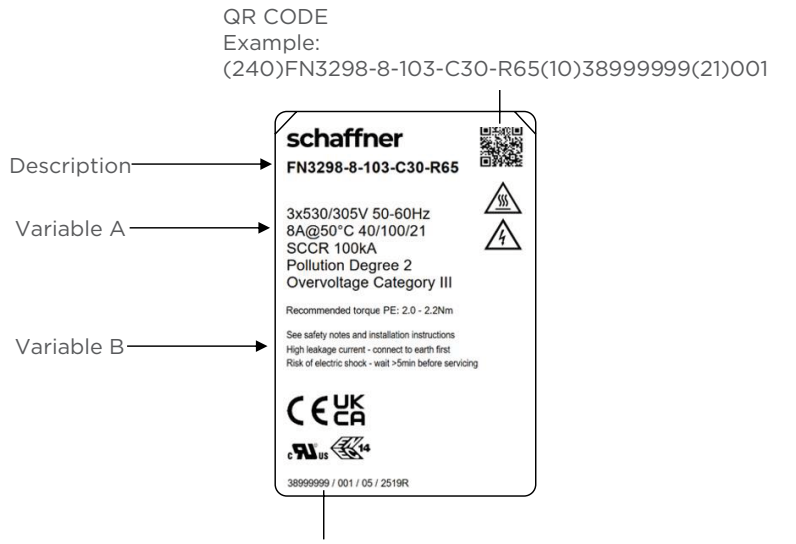
For dimensions [mm] without tolerances:
ISO2768-m/EN22768-m applies

1091307 B





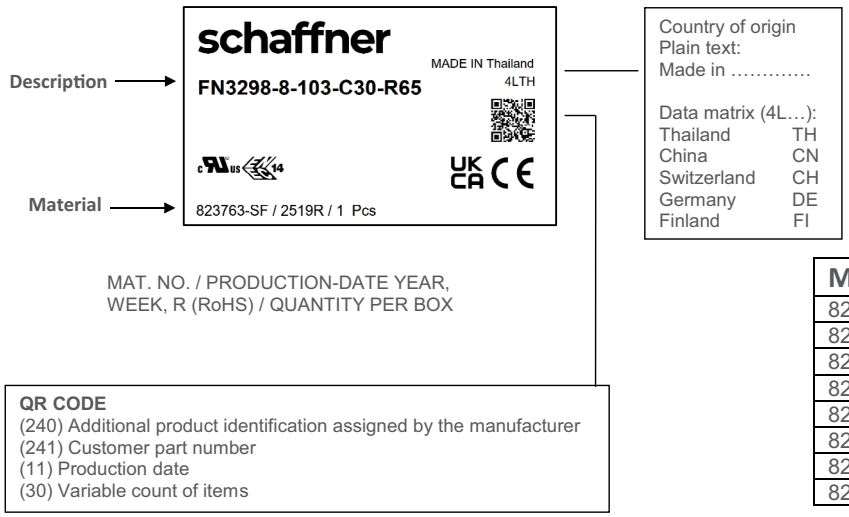
PRODUCT LABEL



Schaffner Internal Serial Number
Work order with counter created
in SAP 123456780 001
Note: Production place
05 for Thailand
88 for China

Material	Description	Variable A	Variable B
823763-SF	FN3298-8-103-C30-R65	8A@50°C 40/100/21	X
823764-SF	FN3298-8-103-C25-R65	8A@50°C 40/100/21	
823765-SF	FN3298-16-103-C30-R65	16A@50°C 40/100/21	X
823766-SF	FN3298-16-103-C25-R65	16A@50°C 40/100/21	
823767-SF	FN3298-25-105-C30-R65	25A@50°C 40/100/21	X
823768-SF	FN3298-25-105-C25-R65	25A@50°C 40/100/21	
823769-SF	FN3298-36-105-C30-R65	36A@50°C 40/100/21	X
823770-SF	FN3298-36-105-C25-R65	36A@50°C 40/100/21	

BOX LABEL



Material	Description
823763-SF	FN3298-8-103-C30-R65
823764-SF	FN3298-8-103-C25-R65
823765-SF	FN3298-16-103-C30-R65
823766-SF	FN3298-16-103-C25-R65
823767-SF	FN3298-25-105-C30-R65
823768-SF	FN3298-25-105-C25-R65
823769-SF	FN3298-36-105-C30-R65
823770-SF	FN3298-36-105-C25-R65

PRODUCT CODE STRUCTURE

Typical Part Number
FN_ _ _ _-_ _-_ _ _-_ _-_ _ _

Product family

3298	High performance

Rated current

8	8A
16	16A
25	25A
36	36A

Load terminal type

103	Push-in Terminal 7.5 mm pitch
105	Push-in Terminal 10 mm pitch

Ry discharge resistor value

5	1 Mohm

Rx_{load} discharge resistor value

R6	1.5 Mohm

Cy capacitor value

C25	1 uF
C30	6.8 uF

PRODUCT SELECTION INFORMATION

S.No	TE Description	TE Part Number
1	FN3298-8-103-C30-R65	**823763-SF**
2	FN3298-8-103-C25-R65	**823764-SF**
3	FN3298-16-103-C30-R65	**823765-SF**
4	FN3298-16-103-C25-R65	**823766-SF**
5	FN3298-25-105-C30-R65	**823767-SF**
6	FN3298-25-105-C25-R65	**823768-SF**
7	FN3298-36-105-C30-R65	**823769-SF**
8	FN3298-36-105-C25-R65	**823770-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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