

High Performance EMC/EMI Filter



- Rated currents up to 15 A
- Excellent attenuation performance
- Complies with IEC/EN 60601-1
- Snap-in versions (S and S1 type)
- Hot inlet versions (HI type)



Performance indicators

Attenuation performance



Rated current [A]



Technical Specifications

| | |
|--|---|
| Maximum continuous operating voltage | 250 VAC, 50/60 Hz |
| Flammability corresponding to | UL 94 V-2 or better |
| Surge pulse protection (Z type) | Helps compliance to IEC61000-4-5 (Differential Mode only) |
| Operating frequency | DC to 400 Hz |
| Rated currents | 1 to 15 A @ 50°C |
| Approvals by rated current | 1 to 10 A (ENEC, CQC) 1 to 15 A (UL, CSA) |
| High potential test voltage | P → PE 2000 VAC for 2 sec (standard types) P → PE 2500 VAC for 2 sec (B types) P → N 1000 VAC for 2 sec |
| Protection category | IP 40 according to IEC 60529 |
| Temperature range (operation and storage) | -25°C to +85°C (25/85/21) |
| Design corresponding to | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939 |

Approvals & Compliances



(CQC except HI-types)

The FN 9233 IEC inlet filter combines an excellent IEC inlet and mains filter with excellent filter attenuation in a small form factor. Choosing the FN 9233 product line brings you the rapid availability of a standard filter associated with the necessary safety acceptances. Standard IEC connector filters are a practical solution helping you to pass EMI system approval in a short time. A wide selection on amperage ratings, output connections, mounting possibilities and filters for medical applications are designed to offer you the desired solution. For types with additional earth line choke please consult the FN 9233 E data sheet.


Features and Benefits

- Exceptional conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- Rear/front or snap-in mounting
- Optional earth line choke see FN 9233 E data sheet
- FN 9233 B versions comply with the requirements of 1MOP acc. to IEC/EN 60601-1 for creepage and clearance, leakage current and high potential testing
- Wide mounting flanges available
- Different output connections offering maximum flexibility for assembly
- Custom-specific versions are available on request

Typical Applications

- Portable electrical and electronic equipment
- Small to medium-sized machines and household equipment
- Single-phase power supplies, switch-mode power supplies
- Test and measurement equipment
- Medical equipment
- Rack mounting equipment

Filter Selection Table

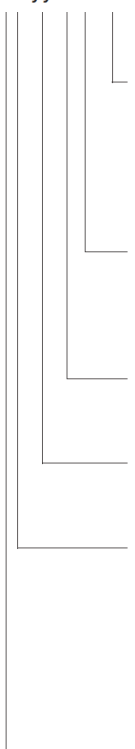
| Filter | Rated current @ 50°C (25°C) | Leakage current* @ 250 VAC/50 Hz (@ 120 VAC/60 Hz) | Inductance L | Capacitance | | | Resistance R | Output connections  | Weight [g] |
|-------------------|--------------------------------|--|-----------------|-------------|-------|------|-----------------|---|---------------|
| | | | | Cx1 | Cx2 | Cy | | | |
| | [A] | [mA] | [mH] | [μF] | [μF] | [nF] | [kΩ] | | |
| FN9233 x-1-06 | 1 (1.2) | 0.31 (0.18) | 22.5 | 0.1 | | 2.2 | | -06 | 37 |
| FN9233 x-3-06 | 3 (3.5) | 0.31 (0.18) | 4.6 | 0.1 | | 2.2 | | -06 | 37 |
| FN9233 x-6-06 | 6 (7.2) | 0.31 (0.18) | 1.6 | 0.1 | | 2.2 | | -06 | 37 |
| FN9233 x-8-06 | 8 (10.6) | 0.31 (0.18) | 0.9 | 0.1 | | 2.2 | | -06 | 37 |
| FN9233 x-10-06 | 10 (11.6) | 0.31 (0.18) | 0.45 | 0.1 | | 2.2 | | -06 | 37 |
| FN9233 x-12-06 | 12 (12) | 0.31 (0.18) | 0.27 | 0.1 | | 2.2 | | -06 | 37 |
| FN9233 x-15-06 | 15 (15) | 0.31 (0.18) | 0.2 | 0.1 | | 2.2 | | -06 | 37 |
| FN9233 x-12-06HI | 12 (12) | 0.31 (0.18) | 0.27 | 0.1 | | 2.2 | | -06 | 37 |
| FN9233 x-15-06HI | 15 (15) | 0.31 (0.18) | 0.2 | 0.1 | | 2.2 | | -06 | 37 |
| FN9233 xR-1-06 | 1 (1.2) | 0.31 (0.18) | 22.5 | 0.1 | | 2.2 | 1000 | -06 | 37 |
| FN9233 xR-3-06 | 3 (3.5) | 0.31 (0.18) | 4.6 | 0.1 | | 2.2 | 1000 | -06 | 37 |
| FN9233 xR-6-06 | 6 (7.2) | 0.31 (0.18) | 1.6 | 0.1 | | 2.2 | 1000 | -06 | 37 |
| FN9233 xR-8-06 | 8 (10.6) | 0.31 (0.18) | 0.9 | 0.1 | | 2.2 | 1000 | -06 | 37 |
| FN9233 xR-10-06 | 10 (11.6) | 0.31 (0.18) | 0.45 | 0.1 | | 2.2 | 1000 | -06 | 37 |
| FN9233 xR-12-06 | 12 (12) | 0.31 (0.18) | 0.27 | 0.1 | | 2.2 | 1000 | -06 | 37 |
| FN9233 xR-15-06 | 15 (15) | 0.31 (0.18) | 0.2 | 0.1 | | 2.2 | 1000 | -06 | 37 |
| FN9233 xR-12-06HI | 12 (12) | 0.31 (0.18) | 0.27 | 0.1 | | 2.2 | 1000 | -06 | 37 |
| FN9233 xR-15-06HI | 15 (15) | 0.31 (0.18) | 0.2 | 0.1 | | 2.2 | 1000 | -06 | 37 |
| FN9233 xB-1-06 | 1 (1.2) | 0.00 | 22.5 | 0.1 | | | 1000 | -06 | 37 |
| FN9233 xB-3-06 | 3 (3.5) | 0.00 | 4.6 | 0.1 | | | 1000 | -06 | 37 |
| FN9233 xB-6-06 | 6 (7.2) | 0.00 | 1.6 | 0.1 | | | 1000 | -06 | 37 |
| FN9233 xB-8-06 | 8 (10.6) | 0.00 | 0.9 | 0.1 | | | 1000 | -06 | 37 |
| FN9233 xB-10-06 | 10 (11.6) | 0.00 | 0.45 | 0.1 | | | 1000 | -06 | 37 |
| FN9233 xB-12-06 | 12 (12) | 0.00 | 0.27 | 0.1 | | | 1000 | -06 | 37 |
| FN9233 xB-15-06 | 15 (15) | 0.00 | 0.2 | 0.1 | | | 1000 | -06 | 37 |
| FN9233 xB-12-06HI | 12 (12) | 0.00 | 0.27 | 0.1 | | | 1000 | -06 | 37 |
| FN9233 xB-15-06HI | 15 (15) | 0.00 | 0.2 | 0.1 | | | 1000 | -06 | 37 |
| FN9233 UF2-1-06 | 1 (1.2) | 0.47 (0.27) | 22.5 | 0.047 | 0.047 | 3.3 | | -06 | 46 |
| FN9233 UF2-3-06 | 3 (3.5) | 0.47 (0.27) | 4.6 | 0.047 | 0.047 | 3.3 | | -06 | 46 |
| FN9233 UF2-6-06 | 6 (7.2) | 0.47 (0.27) | 1.6 | 0.047 | 0.047 | 3.3 | | -06 | 46 |
| FN9233 UF2-8-06 | 8 (10.6) | 0.47 (0.27) | 0.9 | 0.047 | 0.047 | 3.3 | | -06 | 46 |
| FN9233 UF2-10-06 | 10 (11.6) | 0.47 (0.27) | 0.45 | 0.047 | 0.047 | 3.3 | | -06 | 46 |
| FN9233 UF2-12-06 | 12 (12) | 0.47 (0.27) | 0.27 | 0.047 | 0.047 | 3.3 | | -06 | 46 |
| FN9233 UF2-15-06 | 15 (15) | 0.47 (0.27) | 0.2 | 0.047 | 0.047 | 3.3 | | -06 | 46 |

* Maximum leakage under normal operating conditions (acc. to IEC60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

Product selector

Typical electrical schematic

FN 9233xx-yy-..HI-zz



- Snap-in range for S version only
- Blank: Snap-in range 0.7 to 1.5mm
- 20: Snap-in range 1.5 to 2.2mm

- Blank: Standard IEC inlet type C14
- HI: Hot IEC inlet type C16 (12 and 15A types only)

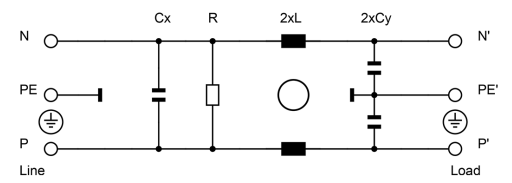
- 06: Faston 6.3 x 0.8mm (spade/soldering)

- 1 to 15: Rated current

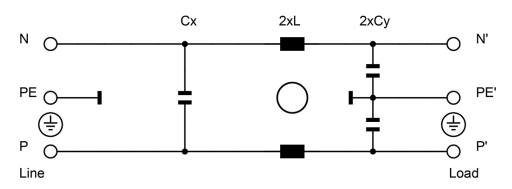
- Blank: Standard version
- R: Bleed resistor
- B: Medical version (with bleed resistor and without Y2-capacitor)
- F2: 2 X-capacitors and higher Y-capacitor value

- Blank: Standard housing with mounting flanges
- U: Housing with wider mounting flanges
- S: Snap-in version, snapper on vertical side
- S1: Snap-in version, snapper on horizontal side

Standard, R and B types



F2 types

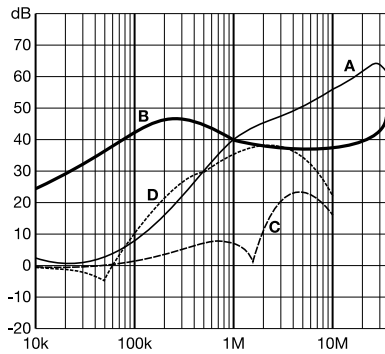


For example: FN 9233-15-06, FN 9233 S1B-10-06-20, FN 9233 R-12-06HI

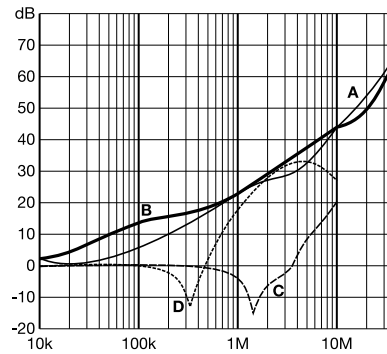
Typical Filter Attenuation

Per CISPR 17; A=50 Ω/50 Ω sym; B=50 Ω/50 Ω asym; C=0.1 Ω/100 Ω sym; D=100 Ω/0.1 Ω sym

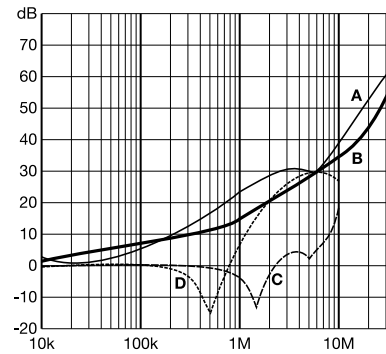
FN 9233: 1 and 3 A types



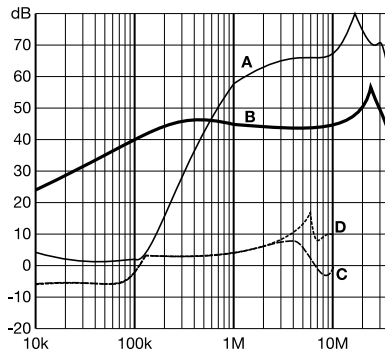
FN 9233: 6 to 10 A types



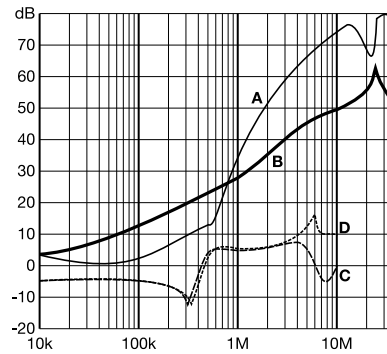
FN 9233: 12 and 15 A types



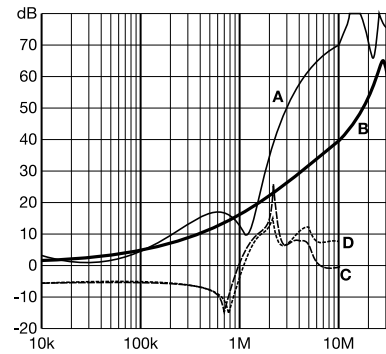
FN 9233 UF2: 1 and 3 A types



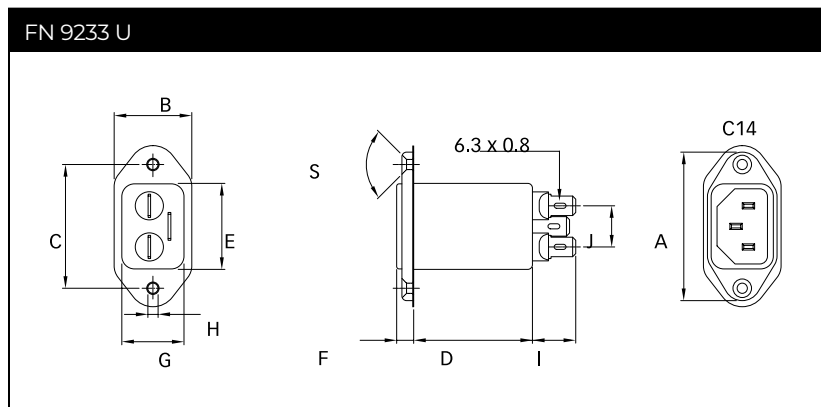
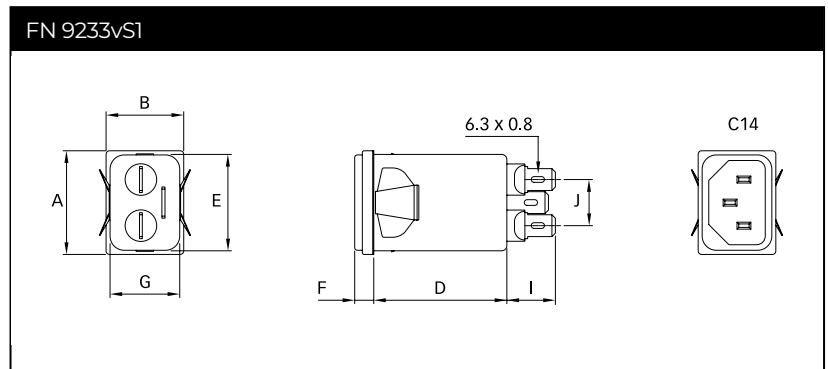
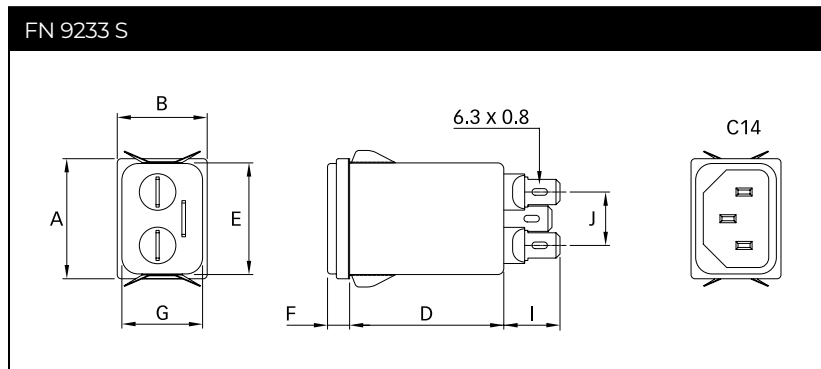
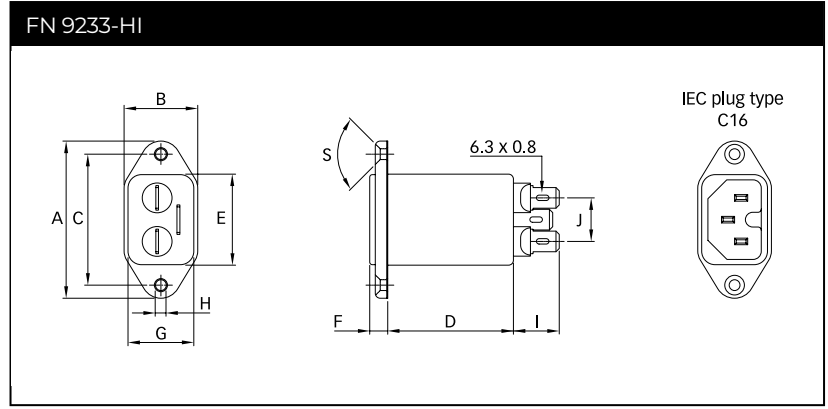
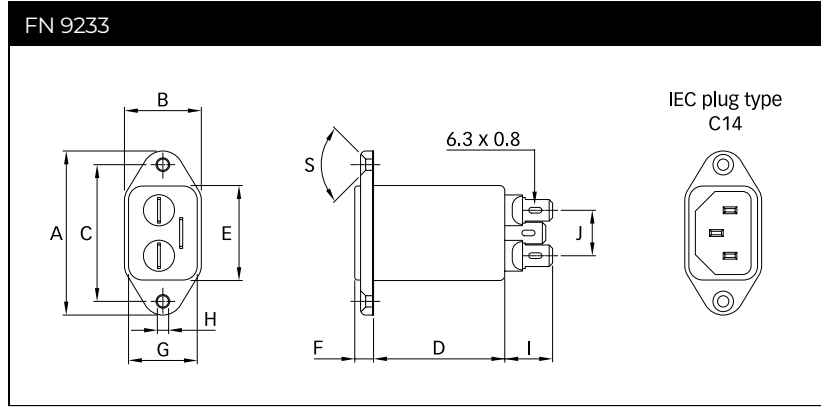
FN 9233 UF2: 6 to 10 A types



FN 9233 UF2: 12 and 15 A types

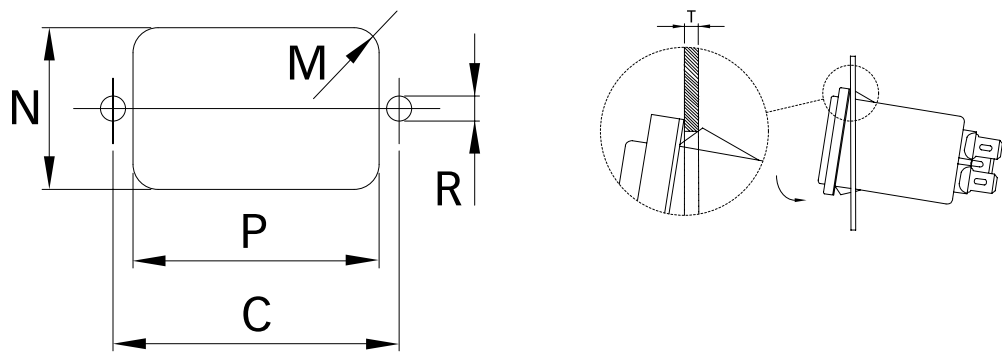


Mechanical Data



FN 9233 UF2: 1 and 3 A types

FN 9233 UF2: 6 to 10 A types



Dimensions

| | FN 9233 | FN 9233 U | FN 9233 UF2 | FN 9233 S | FN 9233 S1 | FN 9233-HI | Tol. |
|------------|---------|-----------|-------------|-----------|------------|------------|---------|
| A | 48 | 48 | 48 | 29.9 | 29.9 | 48 | |
| B | 22.4 | 25 | 25 | 22.4 | 22.4 | 22.4 | |
| C | 40 | 40 | 40 | | | 40 | ±0.2 |
| D | 38.25 | 38.25 | 47.1 | 38.25 | 38.25 | 38.25 | |
| E | 27.8 | 27.7 | 27.7 | 27.8 | 27.8 | 27.8 | +0.6/-0 |
| F | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | |
| G | 20.1 | 20.1 | 20.1 | 20.1 | 20.1 | 20.1 | +0.6/-0 |
| H | Ø3.3 | Ø3.3 | Ø3.3 | | | Ø 3.3 | |
| I | 14 | 14 | 14 | 14 | 14 | 14 | |
| J | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | |
| M | R ≤3 | R ≤3 | R ≤3 | R ≤1.5 | R ≤1.5 | R ≤3 | |
| N | 21.5 | 21.5 | 21.5 | 20.8 | 21.9 | 21.5 | |
| P | 28.5 | 28.5 | 28.5 | 29.4 | 28.5 | 28.5 | |
| R* | M3 | M3 | M3 | | | M3 | |
| S | 90° | 90° | 90° | | | 90° | |
| T** | | | | 0.7 - 1.5 | 0.7 - 1.5 | | |
| T** | | | | 1.5 - 2.2 | 1.5 - 2.2 | | |

* Recommended torque for M3 (90° countersunk flat head) is 0.5 Nm

** For selecting the panel thickness, please refer to the filter selector table.

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

Please visit www.schaffner.com to find more details on connectors.

Accessories

IL 13P IEC C13 Rewireable Connectors with Locking System



IEC
Lock+
REWIREABLE

The locking system has a tensile force of typical 300N. It is recommended to use it with flange mount filters. For details refer to our Application Note "Using IEC Lock Power Cords with IEC Inlets and Filters".

Schaffner power connector with IEC lock guard against accidental disconnection of all electrical appliances with an IEC inlet. No exchange or modification of the IEC inlet or IEC inlet filter system is needed. Easy retrofit .for all electronic equipments and devices

[Technical Data Sheet >](#)

IL 13P IEC C13 Rewireable Angled Connectors with Locking System



- Protects appliances that are vulnerable to vibration
- Connector cannot be accidentally pulled or vibrated out of the inlet
- Space availability/constraints
- Different angles for ease of access
- Space saving
- Release locking mechanism
- Prevents accidental disconnection

[Technical Data Sheet >](#)

Power Cord with angled Locking System C13



- Protects appliances that are vulnerable to vibration
- Connector cannot be accidentally pulled or vibrated out of the inlet
- Space availability/constraints
- Different angles for ease of access
- Space saving
- Release locking mechanism
- Prevents accidental disconnection

[Technical Data Sheet >](#)

Headquarters, Global Innovation and Development

Switzerland

Schaffner Group

Industrie Nord
Nordstrasse 11e
4542
Luterbach
+41 32 681 66 26
info@schaffner.com

Sales and Application Centers

Finland

Schaffner Oy

Lohjanharjuntie 1109
8500
Lohja
+358 50 468 7284
finlandsales@schaffner.com

France

Schaffner EMC S.A.S.

16-20 Rue Louis Rameau
95875
Bezons
+33 1 34 34 30 60
francesales@schaffner.com

Germany

Schaffner Deutschland GmbH

Schoemperlenstrasse 12B
76185
Karlsruhe
+49 721 56910
germanysales@schaffner.com

India

Schaffner India Pvt. Ltd

Regus World Trade Centre
WTC 22nd Floor Unit No 2238 Brigade
Gateway Campus 26/1 Dr. Rajkumar Road
Malleshwaram (W)
560055
Bangalore
+91 8067935355
indiasales@schaffner.com

United Kingdom

Schaffner Ltd.

Suite 1 Oakmede Place
Terrace Road
RG42 4JF
Binfield
+44 118 9770070
uksales@schaffner.com

United States

Schaffner EMC Inc.

52 Mayfield Avenue
Edison, New Jersey
+1 732 225 9533
usasales@schaffner.com

Sweden

Schaffner EMC AB

Östermalmstrorg 1
114 42
Stockholm
+46 8 5050 2425
swedensales@schaffner.com

Switzerland

Schaffner EMV AG

Industrie Nord
Nordstrasse 11e
4542
Luterbach
+41 32 681 66 26
switzerlandsales@schaffner.com

Taiwan

Schaffner EMV Ltd.

U-Town
20 Floor-2 No 97 Section 1 XinTai 5th Road
XiZhi District
22175
New Taipei City
+886 226975500
taiwansales@schaffner.com

Italy

Schaffner EMC S.r.l.

Via Ticino, 30
20900
Monza (MB)
+39 039 21 41 070
italysales@schaffner.com

Japan

Schaffner EMC K.K.

ISM Sangenjaya
7F 1-32-12 Kamiyama Setagaya-ku
154-0011
Tokyo
+81 3 5712 3650
japansales@schaffner.com

Singapore

Schaffner EMC Pte Ltd.

Blk 3015A Ubi Road 1 #05-09 Kampong Ubi
Industrial Estate
408705
Singapore
+65 63773283
singaporesales@schaffner.com

To find your local partner within
Schaffner's global network schaffner.com

© 2023 Schaffner Group

The content of this document has been carefully checked and understood. However, neither Schaffner nor its subsidiaries assume any liability whatsoever for any errors or inaccuracies of this document and the consequences thereof. Published specifications are subject to change without notice. Product suitability for any area of application must ultimately be determined by the customer. In all cases, products must never be operated outside their published specifications. Schaffner does not guarantee the availability of all published products. This disclaimer shall be governed by substantive Swiss law and resulting disputes shall be settled by the courts at the place of business of Schaffner Holding AG. Latest publications and a complete disclaimer can be downloaded from the Schaffner website. All trademarks recognized.