

## FN 3258

## Ultra-compact 3-phase filter

- 7 to 180A current ratings
  - Exceptional attenuation from 150kHz to 30MHz
  - Excellent saturation resistance to 50m cable length
  - Very compact footprint and low weight
- 
- Nennströme von 7 bis 180A
  - Extrem hohe Einfügungsdämpfung von 150kHz–30MHz
  - Hohe Sättigungsfestigkeit bis 50m Motorkabellänge
  - Minimale Grundfläche und geringes Gewicht
- 
- Courants de service de 7 à 180A
  - Excellente atténuation de 150kHz à 30MHz
  - Seuil de saturation élevé pour 50m de câble
  - Encombrement très réduit et construction légère



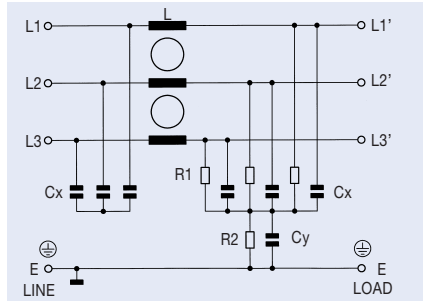
### Technical specifications

Max. operating voltage:	480VAC at 50°C / 520VAC at 50°C (H-types)
Operating frequency:	DC to 60Hz at 50°C
Hipot test voltage:	P ⇒ E 2900VDC for 2s (factory test) P ⇒ P 2800VDC for 2s (factory test)
MTBF at 50°C, 400V per Mil-HB-217F:	300,000h for 30A, 42A, 55A, 75A, 130A, 180A 500,000h for 7A, 16A and 100A types
Protection category:	IP20
Overload:	4 times rated current at switch on, then 1.5 times rated current for 1 minute, once per hour
Temperature range:	-25°C to +100°C
Flammability corresponding to:	UL 94V2
Design corresponding to:	UL 1283, CSA 22.2 No. 8 1986, EN 133200

### Approvals



### Electrical schematic



Filter	Current rating at 50°C (40°C) A	Leakage current <sup>†</sup> 400VAC/50Hz mA	Power loss W	I/O connections	Weight kg
FN 3258 - 7 - 45	7 (7.7)	33.04	3.80	45	0.5
FN 3258 - 16 - 45	16 (17.5)	33.04	6.05	45	0.8
FN 3258 - 30 - 47	30 (32.9)	33.04	11.83	47	1.2
FN 3258 - 42 - 47	42 (46.0)	33.04	15.70	47	1.4
FN 3258 - 55 - 52	55 (60.2)	33.04	25.88	52	1.8
FN 3258 - 75 - 52	75 (82.2)	33.04	32.21	52	3.2
FN 3258 - 100 - 35	100 (109.5)	33.04	34.50	35	4.3
FN 3258 - 130 - 35	130 (142.4)	33.04	43.10	35	4.5
FN 3258 - 180 - 40	180 (197.1)	33.04	58.30	40	6.0

<sup>†</sup>Max. leakage under normal circumstances. Note: if two phases are interrupted, worst case leakage could reach 5.8 times higher levels.

### Dimensions

	7A	16A	30A	42A	55A	75A	100A	130A	180A	Tol.* mm
<b>A</b>	190	250	270	310	250	270		380		± 1
<b>B</b>	70±0.6		85		90	135±1	150±1		170±1	± 0.8
<b>C</b>	40	45	50		85	80	90±0.8		120±0.8	± 0.6
<b>D</b>	160	220	240	280	220	240		350		± 1
<b>E</b>	180	235	255	295	235	255		365		± 0.5
<b>F</b>	20	25	30		60		65		102	± 0.3
<b>G</b>	4.5	5.4				6.5				± 0.2
<b>H</b>	1					1.5±0.2				± 0.1
<b>I</b>	M5			M6			M10			-

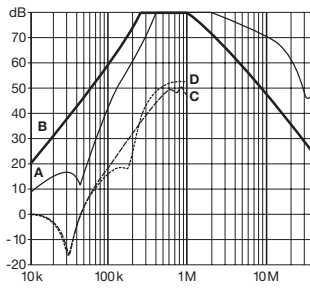
All dimensions in mm; 1 inch = 25.4 mm

\*Measurements share this common tolerance unless otherwise stated.

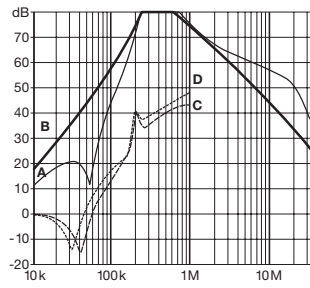
## FN 3258 insertion loss

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

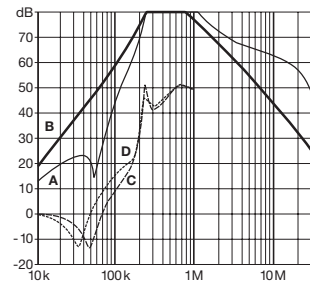
### 7A types



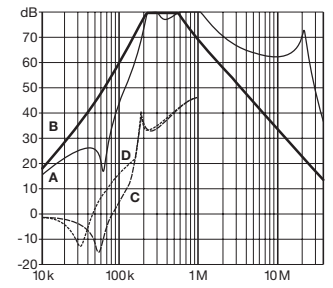
### 16A types



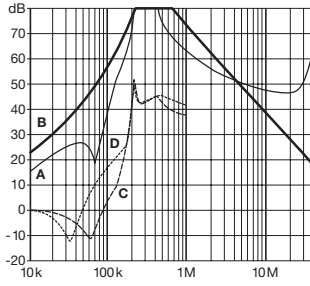
### 30A types



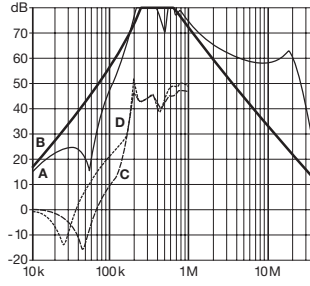
### 42A types



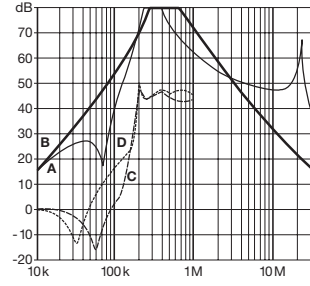
### 55A types



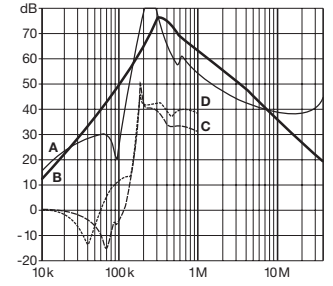
### 75A types



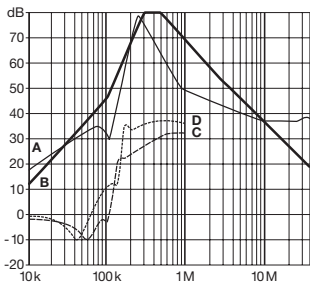
### 100A types



### 130A types



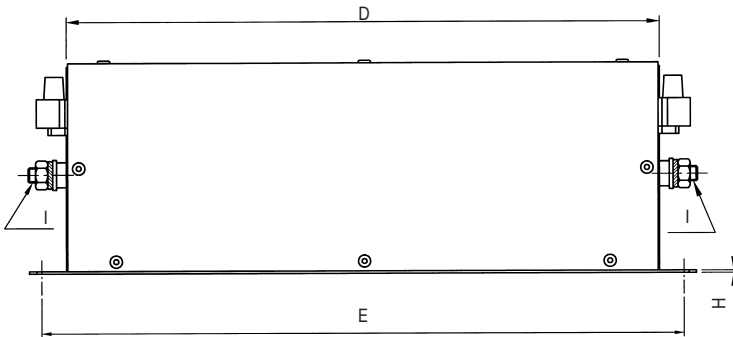
### 180A types



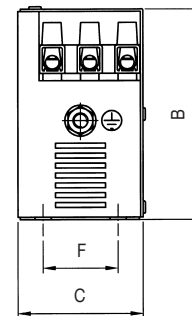
Note: the insertion loss values of the H-types may be different.

## Mechanical data

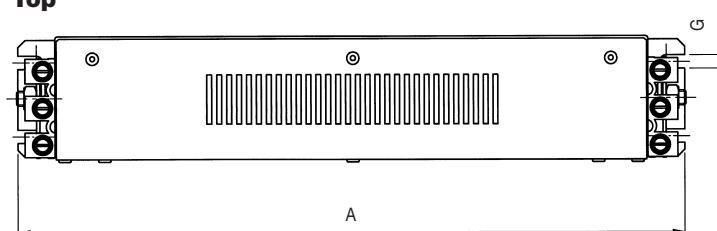
### Side



### Front



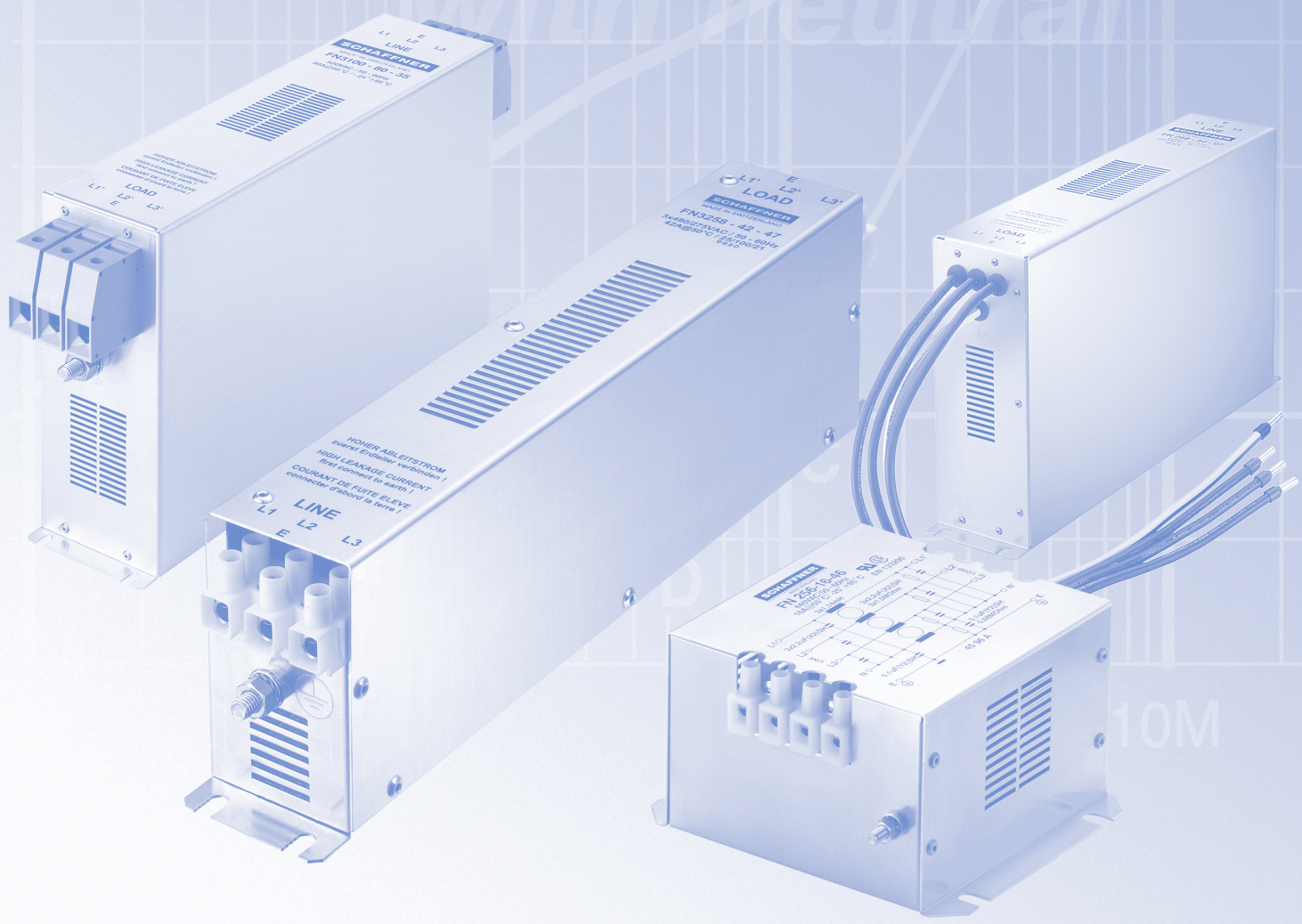
### Top





# Three-phase filters

*without neutral*  
*with neutral*



# Three-phase filters

## CONTENTS

### General information

Filter selection chart.....	176
Ordering information .....	177

### Technical data

#### Three-phase filters

FN 258.....	180
FN 3258.....	182
FN 351.....	184
FN 3359.....	186
FN 3100/FN 3110.....	188

#### Three-phase + neutral filters

FN 256.....	192
FN 354.....	194
FN 355.....	196
FN 356.....	198

## INHALT

### Allgemeine Informationen

Filterübersicht.....	176
Bestellinformationen .....	177

### Technische Daten

#### Dreiphasen-Filter

FN 258.....	180
FN 3258.....	182
FN 351.....	184
FN 3359.....	186
FN 3100/FN 3110.....	188

#### Dreiphasen + Neutralleiter-Filter

FN 256.....	192
FN 354.....	194
FN 355.....	196
FN 356.....	198

## TABLE DES MATIÈRES

### Généralités

Tableau de sélection des filtres.....	176
Pour commander.....	177

### Données techniques

#### Filtres triphasés

FN 258.....	180
FN 3258.....	182
FN 351.....	184
FN 3359.....	186
FN 3100/FN 3110.....	188

#### Filtres triphasés et neutres

FN 256.....	192
FN 354.....	194
FN 355.....	196
FN 356.....	198



**Time to market**

The key reasons for choosing ready-made three-phase filters are convenience and cost. Although you can design your own filter using discrete components, or have a custom solution designed and assembled for you, the timescales involved - especially if safety approvals are required - invariably rule this approach out. The availability of off-the-shelf filters is particularly important to industrial users and system commissioning personnel, who often require next-day delivery of fit-and-forget EMC solutions simply to meet contractual obligations or to avoid incurring penalty clauses.

Ready-made filters provide a convenient single-source solution. The following guide to Schaffner's three-phase products - with brief details on key parameters - will help you to identify one or more filters for closer review of specifications. From this initial selection, a review of the circuit diagram and detailed specifications in the following pages will tell you if the module is suitable for your application, allowing you to choose a unit (or units) for trial. Schaffner's application engineers, based in numerous sales outlets around the world, are available to provide in-depth advice if you require it.

**General technical information**

**Insertion loss**

The insertion loss characteristics of the filters are measured in accordance with the CISPR 17

standard. Two test conditions are specified in Section 4.2 of the CISPR 17 standard, namely input and output impedances of 50/50Ω and 0.1/100Ω.

In general, three-phase filters perform the same in the face of differential interference as in the 50Ω insertion loss test. In order to show the performance under realistic conditions, Schaffner also shows the attenuation curves obtained from the 0.1/100Ω test, which are more meaningful for common mode interference. The inductance of the chokes used in the filters can change under load because of a saturation effect, which can also affect insertion loss.

**Flammability classification**

All the filters in this catalog comply with the requirements of UL 94V2 or UL 94V0.

**Climatic classification**

Schaffner three-phase filters comply with the climatic classification 25/085/21 according to DIN IEC 68 Part 1 (ambient temperature -25 to +85°C) or 25/100/21 (+ 100 °C).

**Component tolerances**

Parameter	- Tol.	+ Tol.	Test
Inductance	30%	50%	1kHz
Capacitance	20%	20%	1kHz
Resistance	10%	10%	DC

**Current ratings**

The nominal currents stated refer to an ambient temperature of θ<sub>N</sub> = 40°C or θ<sub>N</sub> = 50°C. The maximum operating current at any other ambient temperature θ can be calculated by means of the following formula:

$$I = I_N \sqrt{(85 - \theta)/(85 - \theta_N)}$$

**Leakage current**

**Operational conditions**

The values given in the technical filter specifications are based on IEC 1000-2-4, section 5.5, and the following conditions: nominal voltage 440VAC for standard types, 520VAC for H types, 690VAC for HV types; nominal frequency 50Hz; tolerance of capacitance ± 20%; unsymmetrical input voltage ± 3%.

**Worst case conditions**

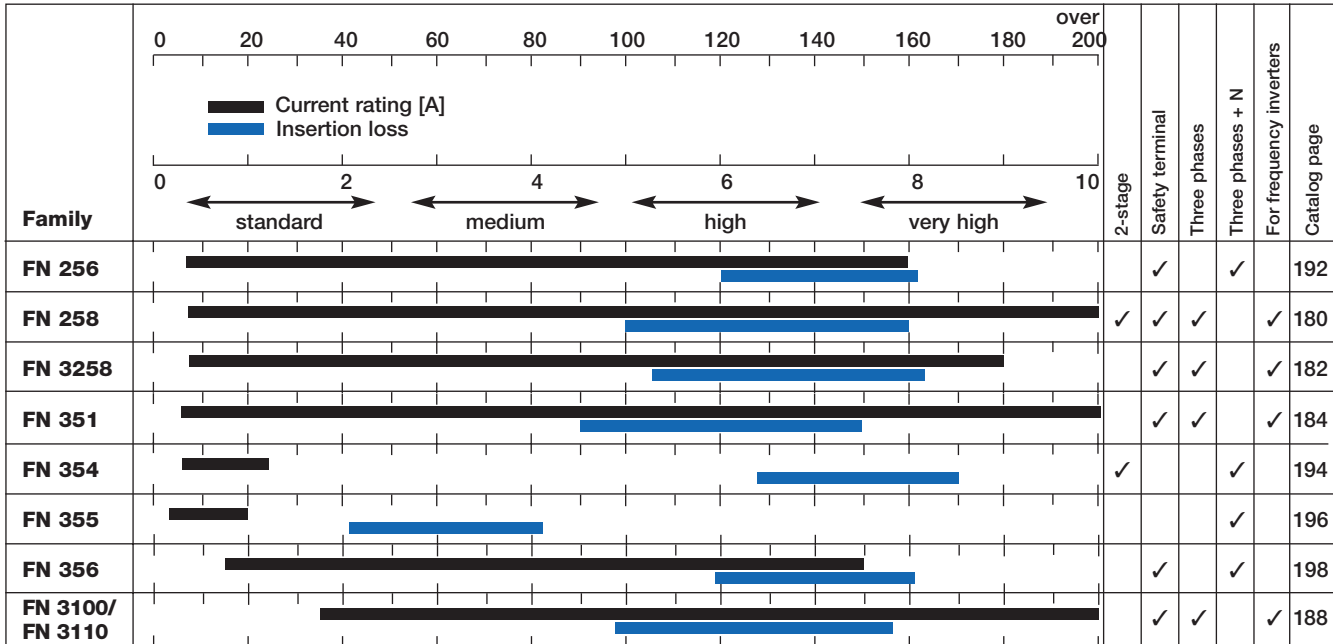
Worst case conditions are based on the assumption that two of the three lines were disconnected. For the calculation of the leakage current the voltage of one phase towards the ground UP→E 50Hz is used; capacitance tolerance ± 20%.

**The values calculated under worst case conditions are equal to the values corresponding to the operational conditions on standard Japanese networks. In the case of a network with a neutral line, the values corresponding to the European operational conditions are equal to the Japanese operational conditions with a neutral line.**

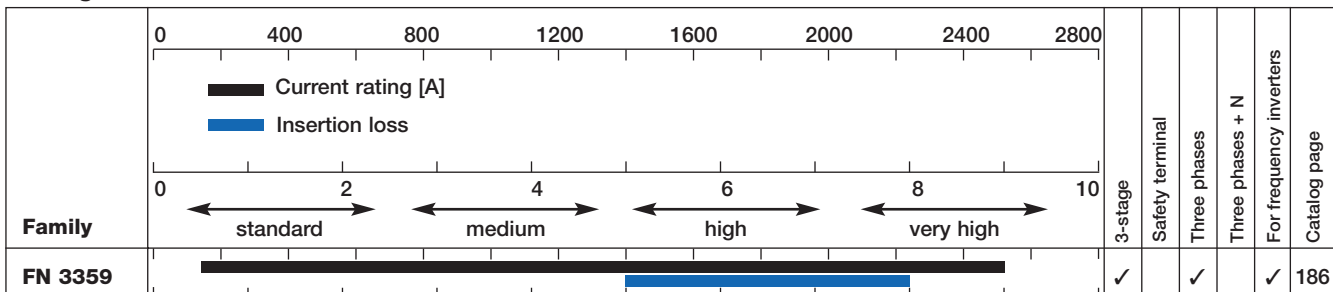
**Schaffner's 3-phase chassis-mounting filter range**

**Rapid selection** Using the current rating and attenuation performance indicators, together with the major features shown on the right, this table allows you to quickly identify a 'short list' of filter families which are potentially suitable for your application, for subsequent detailed investigation using the technical specifications on the following pages.

**For currents up to 300A**



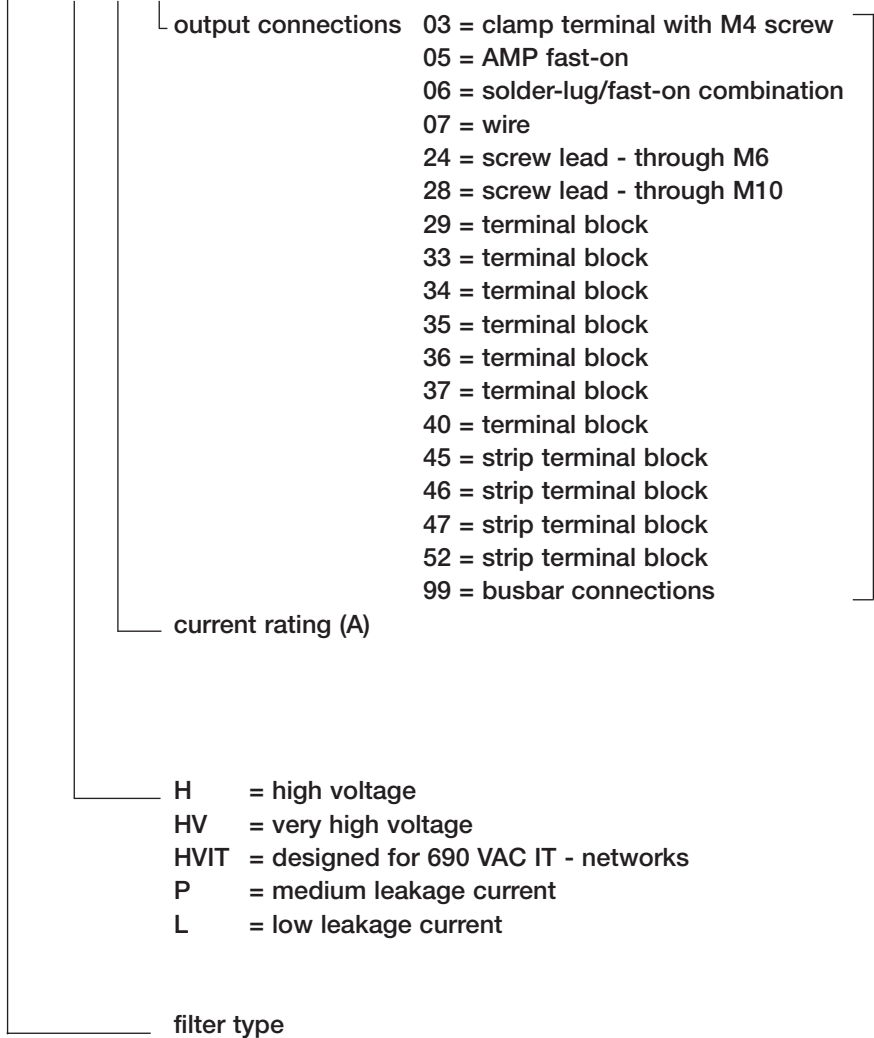
**For high currents**



# Ordering information

## For all three-phase filters

FN 258 & - x / y



for details see page 235

### Examples:

- FN 351H-50/33** Type FN 351H (high voltage); current rating 50A; with safety terminal block connections
- FN 258L-55/07** Type FN 258L (low leakage current); current rating 55A; with wire output connections
- FN 3359-1600/99** Type FN 3359; current rating 1600 A; with busbar connections