

Single-phase filters

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INHALT

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FN 352Z	164
FN 700Z	166

Single-phase filters

Schaffner's single-phase filter range

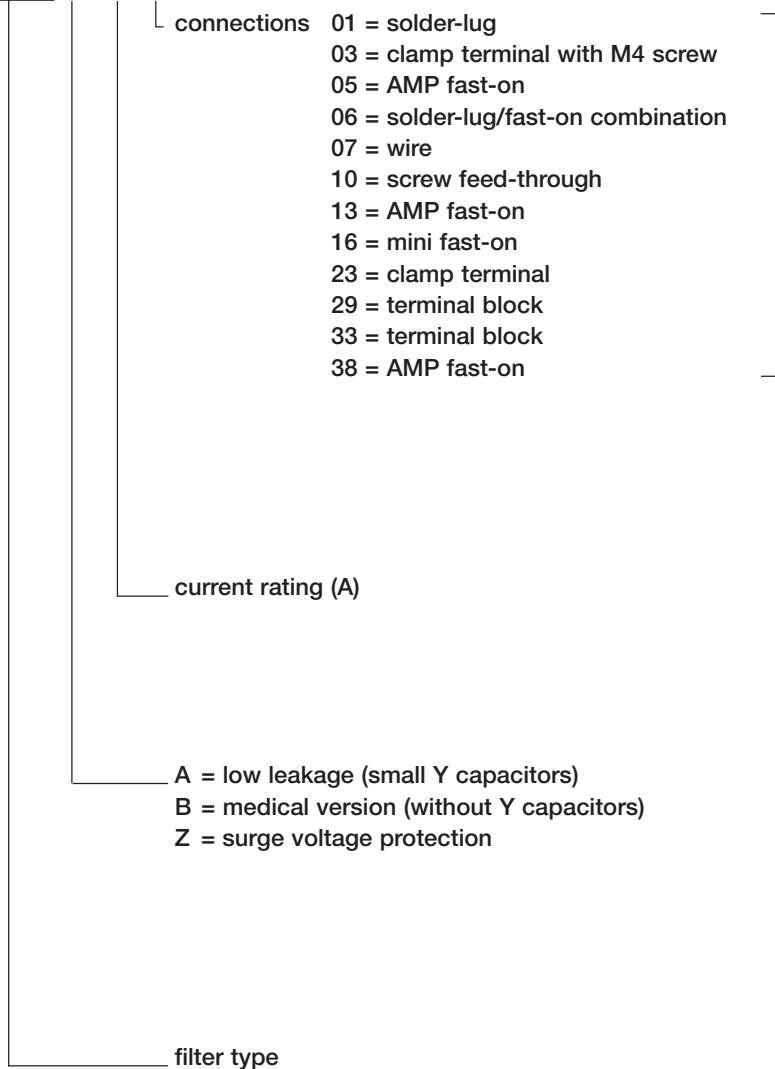
Rapid selection Using the current rating and attenuation performance indicators, together with the major features shown on the right, this table allows you to quickly identify a 'short list' of filter families which are potentially suitable for your application, for subsequent detailed investigation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

Filter family	5 10 15 20 25 30 35 40 45 50										with earth line choke	with overvoltage protection	2 stage	3 stage	with IEC inlet	for SMPS	for medical equipment	NEMP, TEMPEST	for telecom applications	for motor drives	catalog page		
	Current rating [A] Insertion loss 1 standard middle high very high 9																						
FN 250, 350	[Current rating: 20-50, Insertion loss: 15-45]																✓				✓	108	
FN 332	[Current rating: 5-15, Insertion loss: 25-35]										✓						✓					110	
FN 610, 612	[Current rating: 10-50, Insertion loss: 10-20]																✓					116	
FN 2010	[Current rating: 5-50, Insertion loss: 10-20]																✓					120	
FN 2020	[Current rating: 5-50, Insertion loss: 15-25]																✓					122	
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FN 2310	[Current rating: 5-15, Insertion loss: 15-25]																					130	
FN 2330	[Current rating: 5-20, Insertion loss: 15-25]																					132	
FN 2340	[Current rating: 5-20, Insertion loss: 10-20]																					134	
FN 9675/76	[Current rating: 5-20, Insertion loss: 30-50]															✓	✓			✓		136	
FN 343	[Current rating: 5-15, Insertion loss: 25-40]										✓	✓											140
FN 660, 670	[Current rating: 5-20, Insertion loss: 20-35]												✓			✓	✓			✓		142	
FN 680, 685	[Current rating: 5-35, Insertion loss: 25-45]												✓			✓				✓		146	
FN 2060	[Current rating: 5-30, Insertion loss: 15-35]												✓				✓					150	
FN 2070	[Current rating: 5-35, Insertion loss: 20-40]												✓			✓	✓			✓		152	
FN 2080	[Current rating: 5-15, Insertion loss: 25-45]												✓			✓	✓			✓		154	
FN 2320	[Current rating: 5-20, Insertion loss: 15-30]												✓			✓						156	
FN 2350	[Current rating: 5-15, Insertion loss: 15-30]												✓									158	
FN 2360	[Current rating: 5-10, Insertion loss: 25-40]												✓			✓	✓					160	
FN 352Z	[Current rating: 10-30, Insertion loss: 25-45]										✓		✓			✓						164	
FN 700Z	[Current rating: 5-20, Insertion loss: 40-50]										✓		✓	✓	✓	✓		✓				166	

Ordering information

For all single-phase filters

FN 250 & - x / y



for details see page 241

Examples:

FN 670-1.8/07 Type FN 670; current rating 1.8A; with wire connections

FN 350-55/33 Type FN 350; current rating 55A; with safety terminal block connections

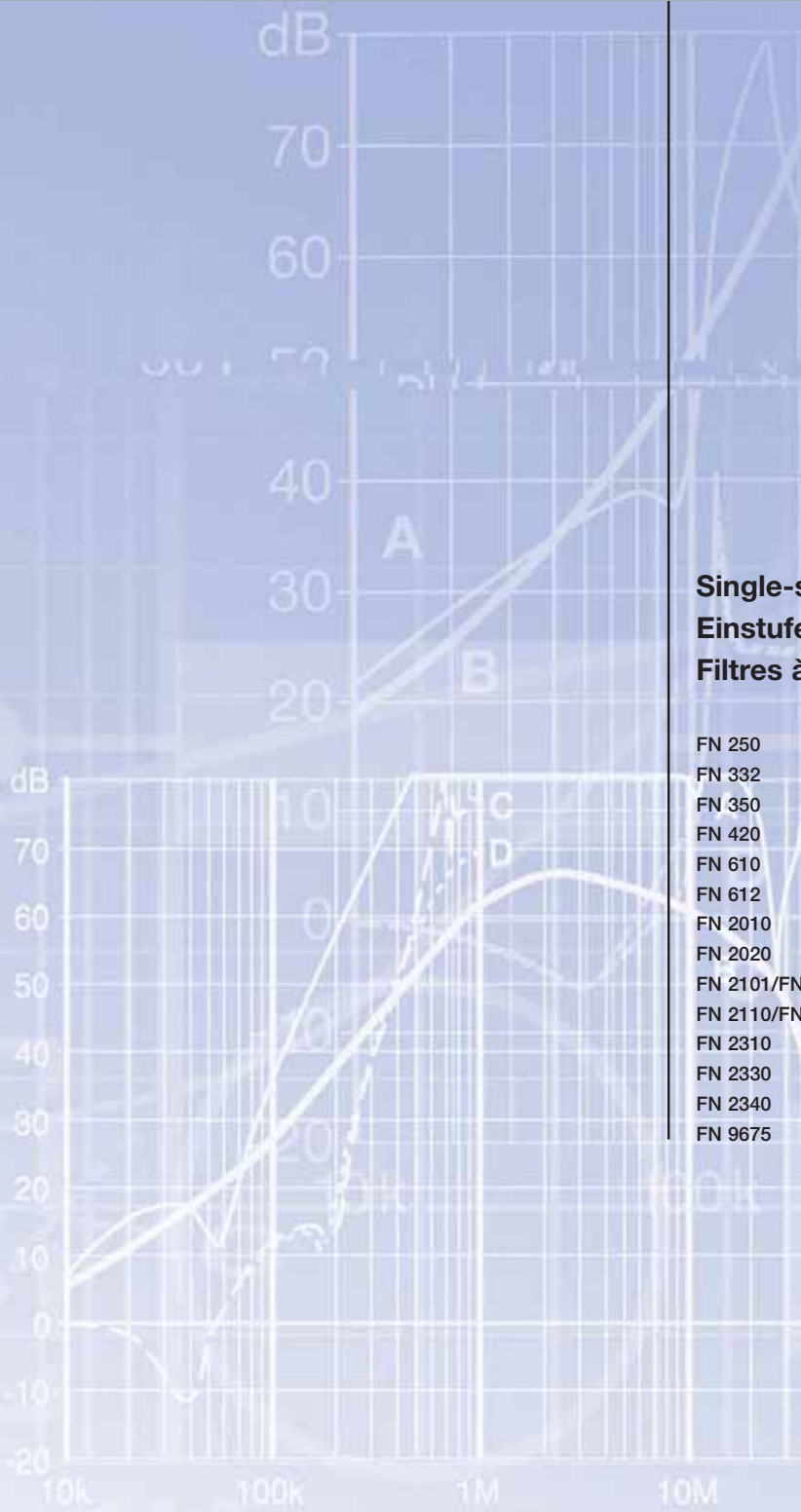
Single-phase filters

Single-stage filters

Einstufen Filter

Filtres à seul-étage





Single-stage filters
Einstufen Filter
Filtres à seul-étage

- FN 250
- FN 332
- FN 350
- FN 420
- FN 610
- FN 612
- FN 2010
- FN 2020
- FN 2101/FN 2102
- FN 2110/FN 2120
- FN 2310
- FN 2330
- FN 2340
- FN 9675

Input filter for motor drives

FN 250

- 6 to 20A current ratings
- compact housings with long wire connections
- meets EN55011(A) for drives with motor cables <20m
- Nennströme von 6 bis 20 A
- Kompaktgehäuse mit langen Anschlußleitungen
- Erfüllt EN55011(A) für Antriebe mit Motorkabel <20m
- courant de service entre 6 et 20 A
- boîtier compact avec longs fils
- conforme à EN55011(A) pour commandes avec câbles moteur <20m



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 250-6/07 is a 6A filter with wire connections.

Approvals



Family	Connections	Current ratings at 40°C (25°)		Capacitance		Res. R MΩ	Power loss W	Inductance L mH	Housing	Weight g
		A	(A)	Cx/Cx1 μF	Cy nF					
FN 250 -6 /??	/07	6	(6.9)	0.47/0.47	15	0.47	2.5	5.7	K11	240
FN 250 -12 /??	/07	12	(13.8)	1/1	15	0.47	6	2.7	K22	310
FN 250 -20 /??	/07	20	(23)	2.2/2	15	0.22	8	1.9	L4	600

Additional specifications

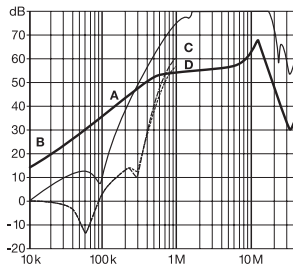
Filter type	Maximum leakage μA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
		VAC	Hz		PN→E VAC	P→N VDC
Standard types	1300	250	50/60	DC to 400	2000	1100

MTBF at 40°C, 230V, per Mil-HB-217F: 295,000 hours.

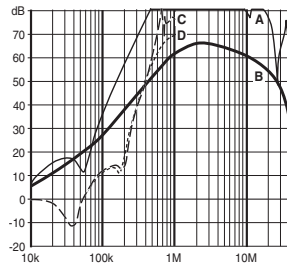
FN 250 insertion loss

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

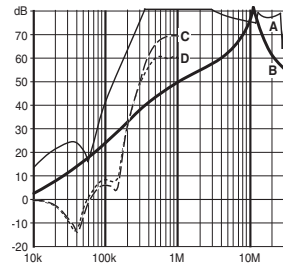
6 amp types



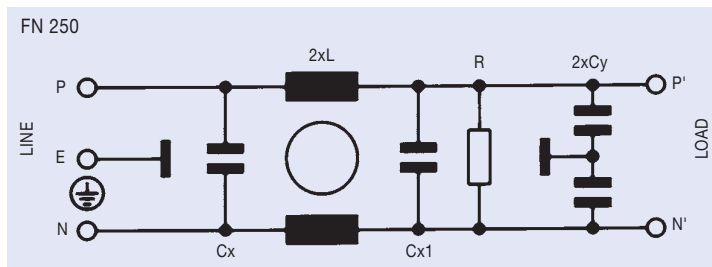
12 amp types



20 amp types



Electrical schematic



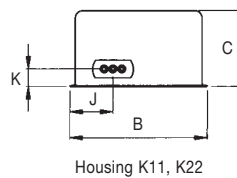
See tables for component values.

Mechanical data

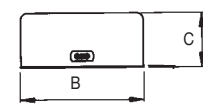
	FN 250-6 K11	FN 250-12 K22	FN 250-20 L4	Tol.* mm
A		85	119	± 0.5
B		54	84.5 ± 1	± 0.5
C	30	40	38	± 1
D	65		98.5 ± 0.5	± 1
E			66	± 0.5
F	75		109	± 0.2
G			51	± 0.1
J	17			± 0.5
K	7			± 0.5
M	5.3		4.4	± 0.1
N	6.3		7.5	± 0.1
W	AWG 16		AWG 14	-
Y	6			± 1
Z	300			+ 10

* Measurements share this common tolerance unless otherwise stated.

FRONT VIEW

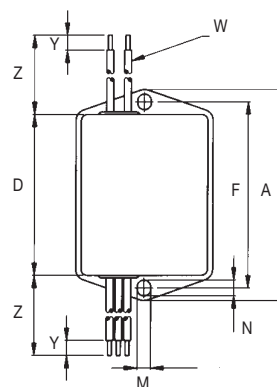


Housing K11, K22

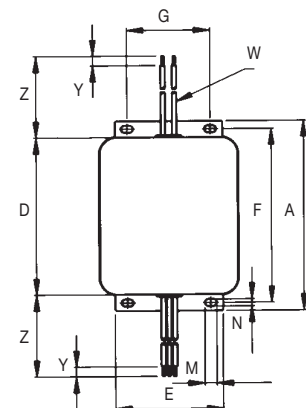


Housing L4

TOP VIEW



Housing K11, K22



Housing L4

All dimensions in mm; 1 inch = 25.4 mm

FN 332

Performance filter

- 1 to 10A current ratings
- compact housing with solder or fast-on connections
- optional surge voltage protection (Z types)
- Nennströme von 1 bis 10A
- Kompaktgehäuse mit Lötflächen oder Steckzungen
- Optionaler Stoßspannungsschutz (Z-Typen)
- courants de service de 1 à 10A
- boîtier compact avec connexions par cosses à souder ou fast-on
- protection contre les surtensions (types Z)





Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 332-6/01 is a 6A filter with solder lug connections.

Approvals



Family	Connections		Current ratings at 40°C (25°) A		Inductance L mH	Housing	Weight g
							
FN 332 -1 /??	/01	/05	1	(1.2)	10	G1	65
FN 332 -3 /??	/01	/05	3	(3.6)	2	G1	65
FN 332 -6 /??	/01	/05	6	(7.3)	0.8	G1	65
FN 332 -10A /??	/01	/05	10	(12)	0.5	G1	70

Additional specifications

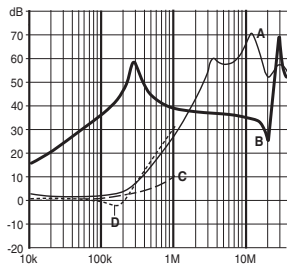
Filter type	Capacitance		Surge current A	Energy absorption J	Maximum leakage µA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
	C _x nF	C _y nF				VAC	Hz		PN→E VAC	P→N VDC
Standard types	15	2.2	-	-	190	250	50/60	DC to 400	2000	1700
FN 332Z types (surge protected)	15	2.2	1200	26	190	250	50/60	DC to 400	2000	350

MTBF at 40°C, 230V, per Mil-HB-217F: 710,000 hours.

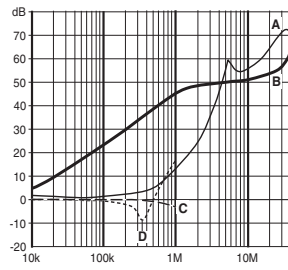
FN 332 insertion loss

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

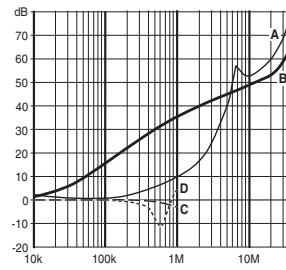
1 amp types



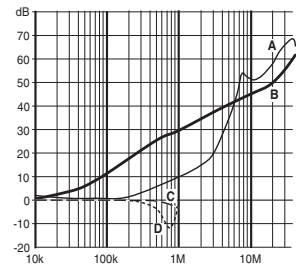
3 amp types



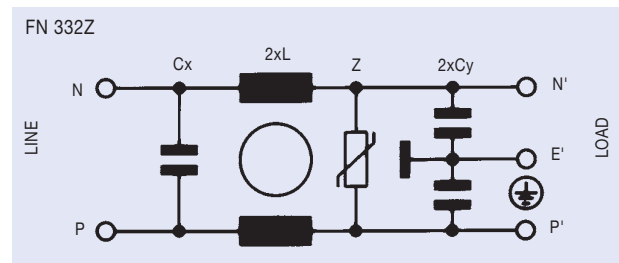
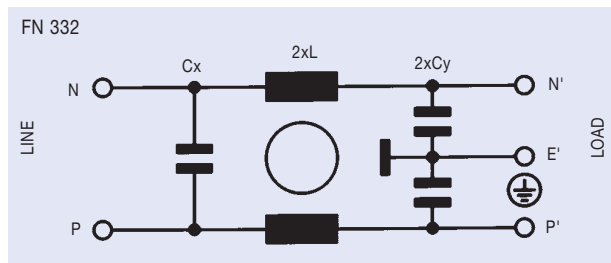
6 amp types



10 amp types



Electrical schematics

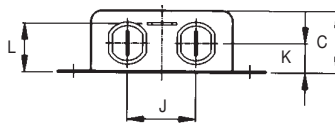


See tables for component values.

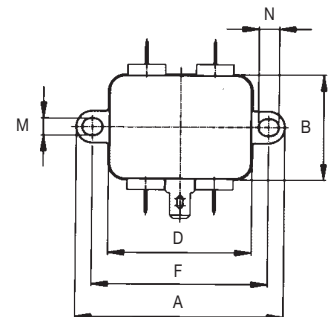
Mechanical data

		Tol. mm
A	45	± 0.5
B	41	± 0.5
C	24.8	± 0.5
D	29	± 0.5
F	37	± 0.4
J	12.5	± 0.2
K	9.6	± 0.2
L	18.7	± 0.5
M	3.5	± 0.1
N	3.9	± 0.1

FRONT VIEW



TOP VIEW



All dimensions in mm; 1 inch = 25.4 mm

High power filter for drives

FN 350

- 8 to 55A current ratings
- screwdriver-connect terminations
- meets EN55011/14/22 VDE 0871/75/78
- meets IEC 950

- Nennströme von 8 bis 55 A
- Schraubklemmanschlüsse
- EN55011/14/22 VDE 0871/75/78 konform
- IEC 950 konform

- courants de service de 8 à 55 A
- connexions par brides
- conforme à EN55011/14/22 VDE 0871/75/78
- conforme à CEI 950



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 350-55/33 is a 55A filter with terminal connections suitable for AWG 6/16mm² wire.

Approvals



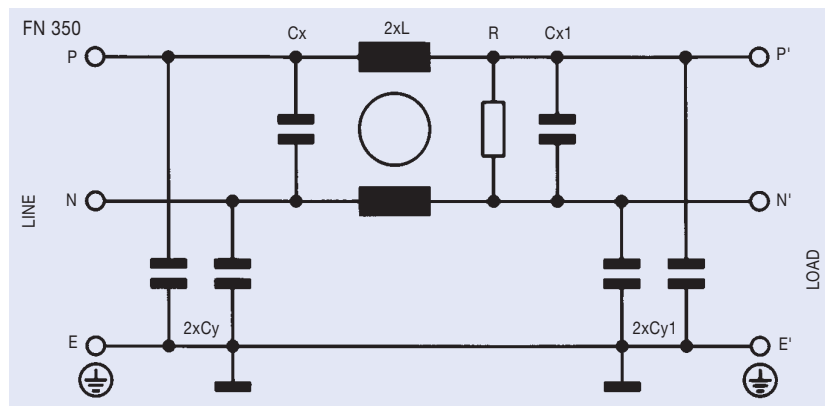
Family	Connections		Current ratings at 40°C (25°) A	Capacitance Cx/Cx1 μF		Inductance L mH	Maximum leakage μA/phase	Power loss W	Housing	Weight g
				Cy/Cy1 nF						
FN 350 -8 /??	/29	-	8 (9.2)	2/0.68	10/47	10	4900	4.2	L21	700
FN 350 -12 /??	/29	-	12 (13.8)	2.2/1	10/47	7.5	4900	5.2	L21	900
FN 350 -20 /??	/29	-	20 (23)	2.2/1	10/47	3.2	4900	5.7	L21	950
FN 350 -30 /??	-	/33	30 (34.5)	2.2/1	15/47	1.3	5300	5.9	L21	950
FN 350 -55 /??	-	/33	55 (63)	4.4/1	33/94	1	11000	8.2	B21	1800

Additional specifications

Filter type	Res R MΩ	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
		VAC	Hz		PN→E VDC	P→N VDC
Standard types	1	250	50/60	DC to 60	2800	1700

MTBF at 40°C, 230V, per Mil-HB-217F: 420,000 hours.

Electrical schematic

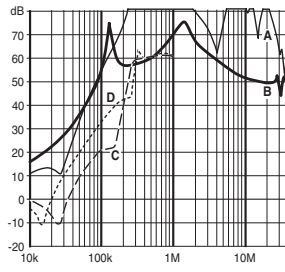


See tables for component values.

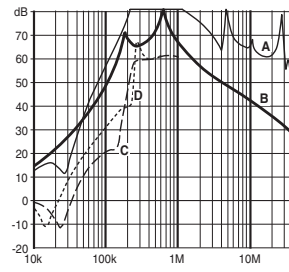
FN 350 insertion loss

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

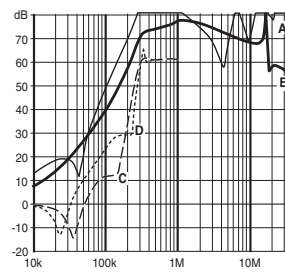
8 amp types



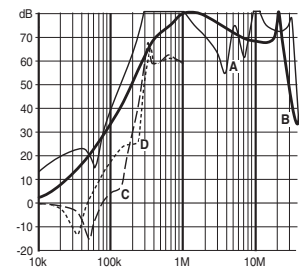
12 amp types



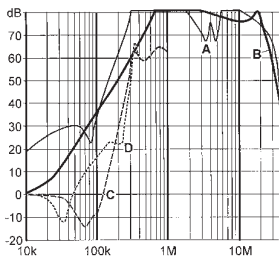
20 amp types



30 amp types



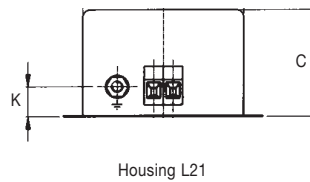
55 amp types



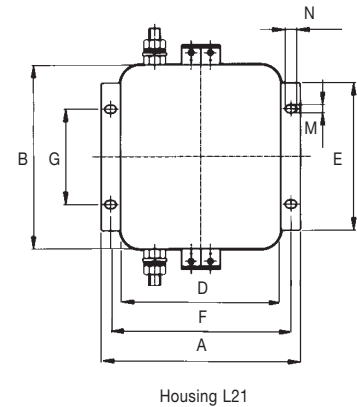
Mechanical data

FN 350 -8-12-20		FN 350-30	Tol. mm
L21			
A	105		± 0.5
B	99.5		± 0.5
C	57		± 1
D	84.5		± 1
E	79		± 0.5
F	95		± 0.2
G	51		± 0.1
K	16	19	± 0.5
M	4.4		± 0.1
N	6		± 0.1

FRONT VIEW

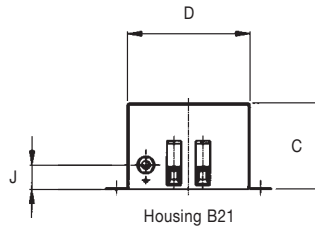


TOP VIEW

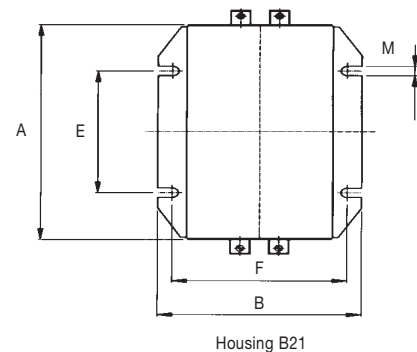


FN 350-55		Tol. mm
B21		
A	180	± 0.5
B	115	± 0.5
C	60	± 0.5
D	85	± 0.5
E	115	± 0.3
F	100	± 0.5
J	17	± 0.5
M	6.4	± 0.1

FRONT VIEW



TOP VIEW



All dimensions in mm; 1 inch = 25.4 mm

Versatile easy-mount filter

FN 420

- 0.6-6.5A current ratings
- low profile case
- designed for easy-mounting
- Nennströme von 0,6 bis 6,5 A
- Flaches Gehäuse
- Einfache Montage
- courants de service de 0,6 à 6,5 A
- boîtier à hauteur réduite
- conçu pour un montage simple




Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 422-4/13 is a 4A filter with mini fast-on connections.

Approvals



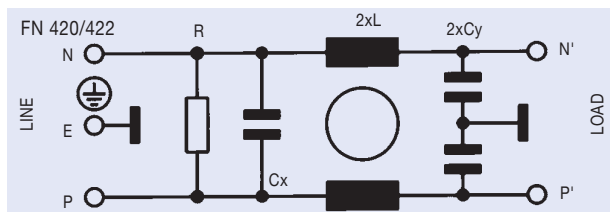
Family	Connections 	Current ratings at 40°C (25°) A	Inductance L mH
FN 42? -0.6 /??	/13	0.6 (0.7)	22.5
FN 42? -1 /??	/13	1 (1.2)	13
FN 42? -2.5 /??	/13	2.5 (3)	3.4
FN 42? -4 /??	/13	4 (4.8)	2
FN 42? -6.5 /??	/13	6.5 (7.3)	0.75

Additional specifications

Filter type	Capacitance		Res. R MΩ	Maximum leakage μA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage		Housing	Weight g
	C _x nF	C _y nF			VAC	Hz		PN→E VAC	P→N VDC		
FN 420 types	150	2.2	1	190	250	50/60	DC to 400	2000	1700	A7B	70
FN 422 types	150	4.7	1	190	250	50/60	DC to 400	2000	1700	A7B	70

MTBF at 40°C, 230V, per Mil-HB-217F: 625,000 hours.

Electrical schematic

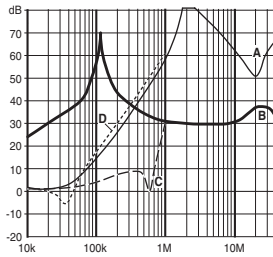


See tables for component values.

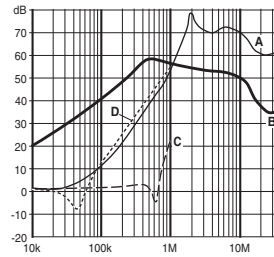
FN 420 insertion loss

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

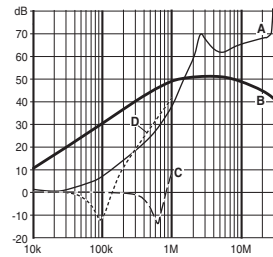
FN 420 0.6 amp types



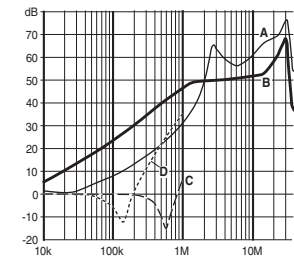
FN 420 1 amp types



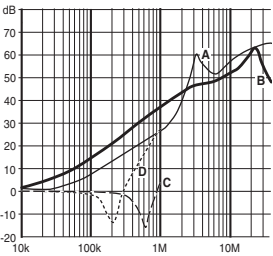
FN 420 2.5 amp types



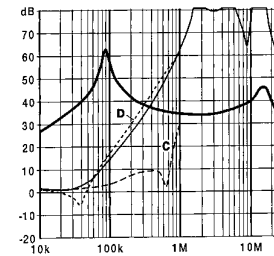
FN 420 4 amp types



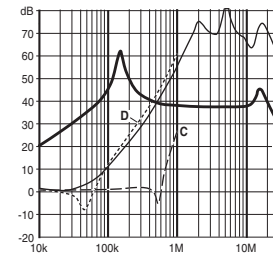
FN 420 6.5 amp types



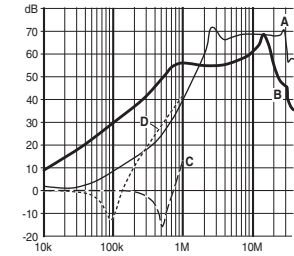
FN 422 0.6 amp types



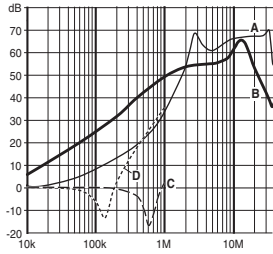
FN 422 1 amp types



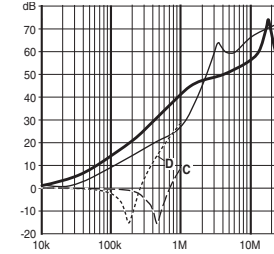
FN 422 2.5 amp types



FN 422 4 amp types



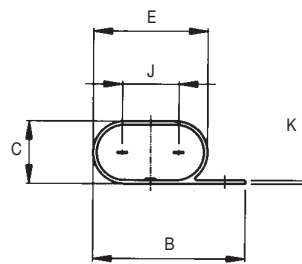
FN 422 6.5 amp types



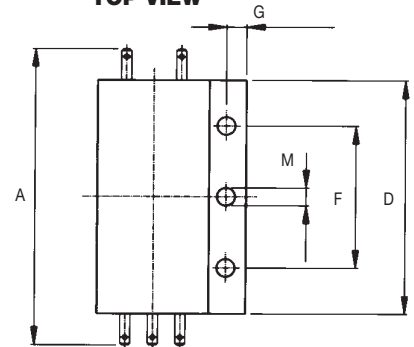
Mechanical data

		Tol. mm
A	83	± 0.5
B	41	± 0.3
C	17	± 0.3
D	65.8	± 0.2
E	31	± 0.5
F	40	± 0.2
G	5.5	± 0.3
J	15.2	± 0.3
K	1	± 0.1
M	∅5	± 0.1

FRONT VIEW



TOP VIEW



All dimensions in mm; 1 inch = 25.4 mm

General-purpose filter

FN 610

- current ratings from 1 to 30A
- general-purpose filtering performance
- optional medical version (B types)
- optional safety version (A types)
- Nennströme von 1 bis 30 A
- Universelle Filterleistung
- Für medizinische Geräte als Option (Typ B)
- Optionale Sicherheitsversion (Typ A)
- courants de service de 1 à 30 A
- filtrage universel
- version pour appareils médicaux en option (type B)
- version pour la sécurité en option (type A)



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 610-10/06 is a 10A filter with fast-on connections.

Approvals



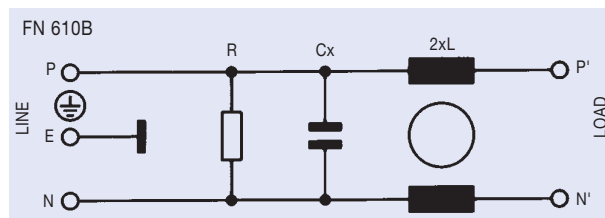
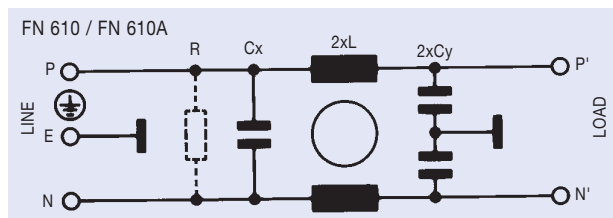
Family	Connections			Current ratings at 40°C (25°) A	Inductance L mH	Housing	Weight	
							?? ^g	/07
FN 610 -1 /??	-	/06	/07	1 (1.15)	3	F1	55	65
FN 610 -3 /??	-	/06	/07	3 (3.4)	2	F1	60	70
FN 610 -6 /??	-	/06	/07	6 (6.9)	0.75	F1	60	70
FN 610 -10 /??	-	/06	/07	10 (11.5)	0.45	F2	85	95
FN 610 -20 /??	-	/06	-	20 (23)	0.48	J1	220	-
FN 610 -30 /??	/03	-	-	30 (34)	0.61	L1	630	-

Additional specifications

Filter type	Capacitance		Res. R MΩ	Maximum leakage μA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
	C _x nF	C _y nF			VAC	Hz		PN→E VAC	P→N VAC
Standard types	33	2.2	-	190	250	50/60	DC to 400	2000	1700
A types (safety)	33	0.47	1	40	250	50/60	DC to 400	2500	1700
B types (medical)	33	-	1	2	250	50/60	DC to 400	2500	1700

MTBF at 40°C, 230V, per Mil-HB-217F: 1,200,000 hours.

Electrical schematics

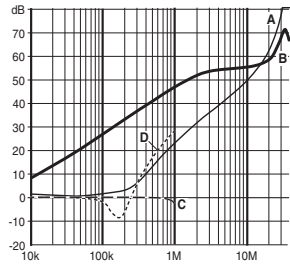


See tables for component values.

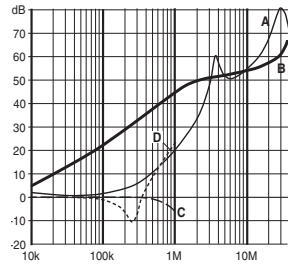
FN 610 insertion loss

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

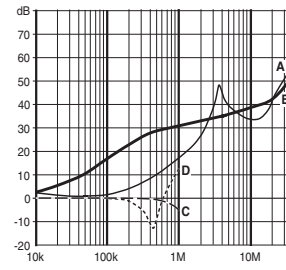
1 amp types



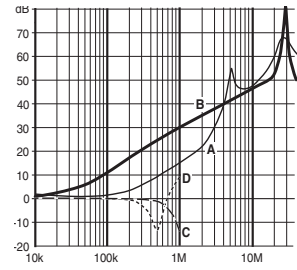
3 amp types



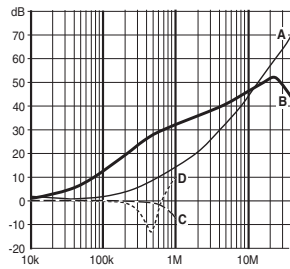
6 amp types



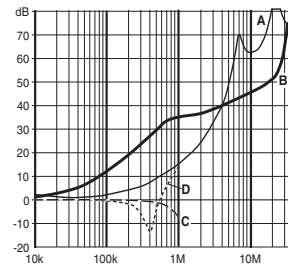
10 amp types



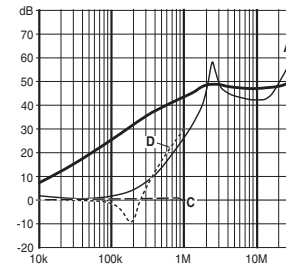
20 amp types



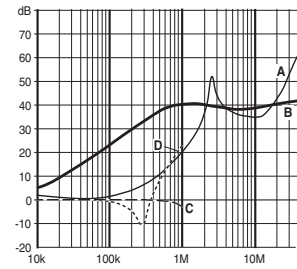
30 amp types



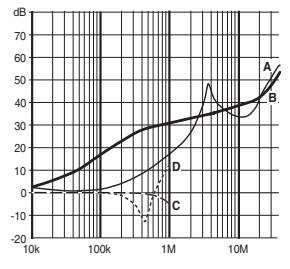
1 amp (A types)



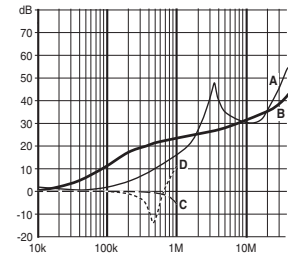
3 amp (A types)



6 amp (A types)



10 amp (A types)

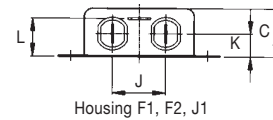


Mechanical data

	FN 610 -1-3-6 F1	FN 610 -10 F2	FN 610 -20 J1	Tol.* mm	FN 610 -30 L1	Tol. mm
A	64	71		± 0.5	105	± 0.5
B	33		52.6	± 0.5	99.5	± 1
C	19		29	± 0.5	38	± 1
D		44	50.5 ± 1	± 0.3	84.5	± 1
F	54		61	± 0.2	79	± 0.5
J		21		± 0.5	95	± 0.2
K	9		14	± 0.5	51	± 0.1
L	15		20	± 0.5	40	± 0.5
M		5.3		± 0.1	9.5	± 0.5
N		6.3		± 0.1	19	± 0.5
Y		6		± 1	4.4	± 0.1
Z		140		+ 5	6	± 0.1

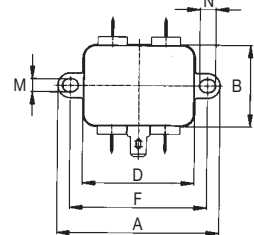
* Measurements share this common tolerance unless otherwise stated.

FRONT VIEW



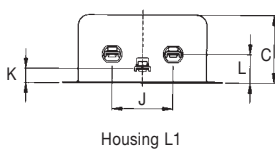
Housing F1, F2, J1

TOP VIEW



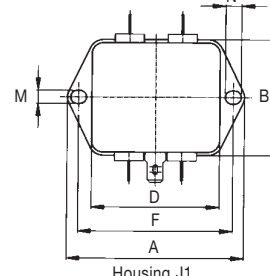
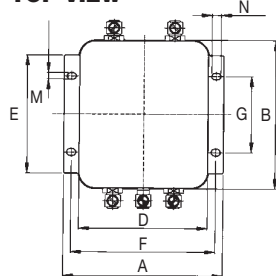
Housing F1, F2

FRONT VIEW



Housing L1

TOP VIEW



Housing J1

All dimensions in mm; 1 inch = 25.4 mm

General-purpose filter

FN 612

- current ratings from 1 to 100A
 - good differential mode attenuation
 - four choices of connector
 - optional medical versions (B type)
- Nennströme von 1 bis 100 A
 - Gute differentielle Dämpfung
 - Vier Anschlußarten
 - Für medizinische Geräte als Option (Typ B)
- courants de service de 1 à 100 A
 - bonne atténuation en mode différentiel
 - quatre types de connexions
 - version pour appareils médicaux en option (type B)



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 612-1/06 is a 1A filter with fast-on connections.

Approvals



Family	Connections				Current ratings at 40°C (25°) A	Inductance L mH	Housing	Weight g				
								/03	/06	/07	/10	/24
FN 612 -1 /??	-	/06	/07	-	1 (1.15)	3	H1	-	80	90	-	-
FN 612 -3 /??	-	/06	/07	-	3 (3.4)	2	H2	-	115	125	-	-
FN 612 -6 /??	-	/06	/07	-	6 (6.9)	0.75	H2	-	115	125	-	-
FN 612 -10 /??	-	/06	/07	-	10 (11.5)	0.45	H2	-	115	125	-	-
FN 612 -20 /??	/03	/06	-	/10	20 (23)	0.48	H2	290	260	-	290	-
FN 612 -30 /??	/03	-	-	/10	30 (34)	0.61	L1	630	-	-	630	-
FN 612 -80 /??	-	-	-	/24	80 (92)	0.2	L3	-	-	-	-	700
FN 612 -100/??	-	-	-	/24	100 (115)	0.2	L2	-	-	-	-	1100

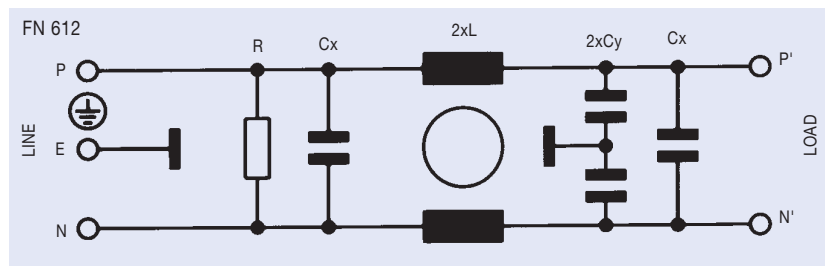
Additional specifications

Filter type	Capacitance		Res. R MΩ	Maximum leakage μA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
	Cx nF	Cy nF			VAC	Hz		PN→E VAC	P→N VDC
Standard types (up to 30A)	100	2.2	1	190	250	50/60	DC to 400	2000	1700
Standard types (80/100A)	470/1000	4.7	1*	450	250	50/60	DC to 400	2000	1700
B types (medical up to 30A)	100	-	1	2	250	50/60	DC to 400	2500	1700
B types (medical 80/100A)	470/1000	-	1*	2	250	50/60	DC to 400	2500	1700

MTBF at 40°C, 230V, per Mil-HB-217F: 800,000 hours.

*470k for 100A types

Electrical schematic

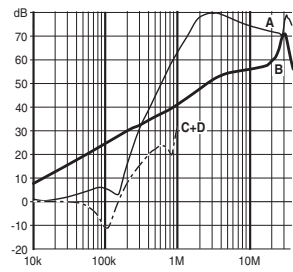


See tables for component values.

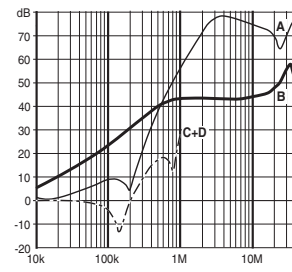
FN 612 insertion loss

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

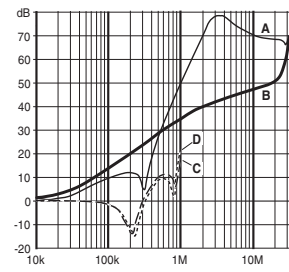
1 amp types



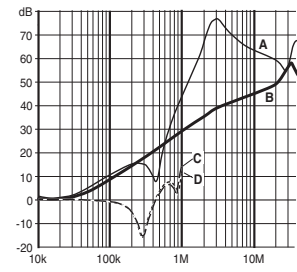
3 amp types



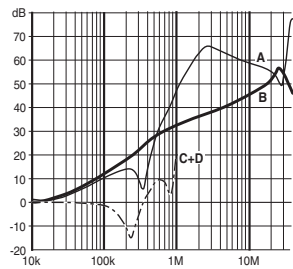
6 amp types



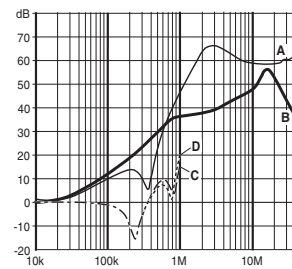
10 amp types



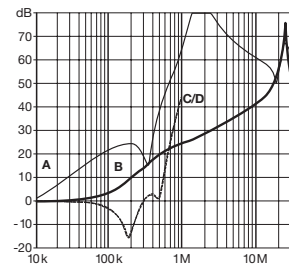
20 amp types



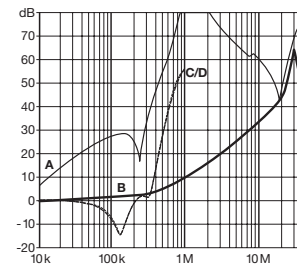
30 amp types



80 amp types



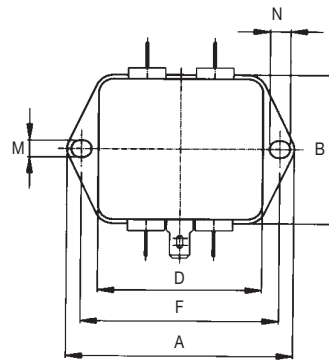
100 amp types



Mechanical data

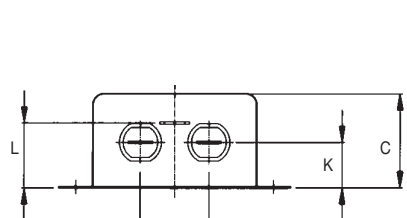
	FN 612 -1 H1	FN 612 -3-6-10 H2	FN 612 -20 H2	Tol. mm
A	71		85	± 0.5
B	46.6		54	± 1
C	22	29	40	± 1
D		50.5	65	± 1
F	61		75	± 0.2
J	21		27	± 0.5
K	10.5		12	± 0.5
L	16.5	24.5	29.5	± 0.5
M		5.3		± 0.1
N		6.3		± 0.1
Y		6		± 1
Z		140		+ 5

TOP VIEW



Housing H1, H2

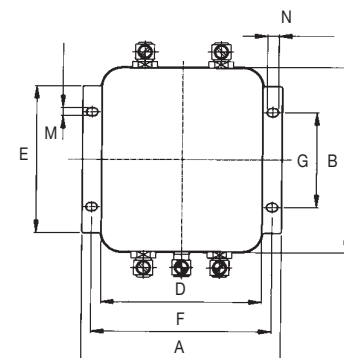
FRONT VIEW



Housing H1, H2

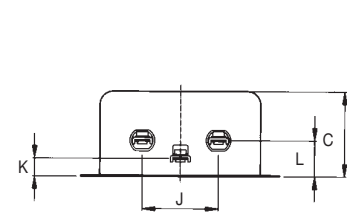
	FN 612 -30 L1	FN 612 -80 L3	FN 612 -100 L2	Tol. mm
A		105		± 0.5
B		99.5		± 1
C	38	45	57	± 1
D		84.5		± 1
E		79		± 0.5
F		95		± 0.2
G		51		± 0.1
J		40		± 0.5
K		9.5		± 0.5
L		19		± 0.5
M		4.4		± 0.1
N		6		± 0.1

TOP VIEW



Housing L1, L2, L3

FRONT VIEW



Housing L1, L2, L3

All dimensions in mm; 1 inch = 25.4 mm

FN 2010

General-purpose filter

- current ratings from 1 to 60A
 - general-purpose filtering performance
 - optional medical versions (B types)
 - optional safety versions (A types)
-
- Nennströme von 1 bis 60A
 - Filterleistung für Universaleinsatz
 - Optionale medizinische Versionen (Typ B)
 - Optionale Sicherheitsversionen (Typ A)
-
- courants de service de 1 à 60A
 - filtrage universel
 - en option version pour appareils médicaux (type B)
 - en option version pour la sécurité (type A)



Filter selection table

Choose the filter FN xxxx-x with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 2010-10/06 is a 10A filter with fast-on connections.

Approvals



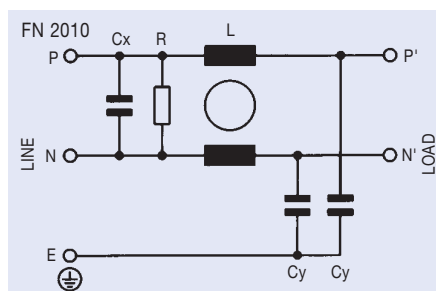
Filter	Connections			Current ratings at 40°C (25°) A	Inductance L mH	Capacitance		Resistance R MΩ	Housing	Weight g
						Cx μF	Cy nF			
FN 2010-1 /??	/06	/07	-	1 (1.15)	12	0.1	4.7	1	F3	65
FN 2010-3 /??	/06	/07	-	3 (3.45)	2.5	0.1	4.7	1	F3	65
FN 2010-6 /??	/06	/07	-	6 (6.9)	1	0.1	4.7	1	F3	65
FN 2010-10 /??	/06	/07	-	10 (11.5)	0.8	0.1	4.7	1	F2	85
FN 2010-12 /??	/06	/07	-	12 (13.8)	0.7	0.1	4.7	1	F2	85
FN 2010-16 /??	/06	/07	-	16 (18.4)	0.65	0.1	4.7	1	H2	140
FN 2010-20 /??	/06	/07	/08	20 (23)	0.6	0.1	4.7	1	K1	210
FN 2010-30 /??	-	-	/08	30 (34.5)	0.67	0.47	10	1	P	470
FN 2010-60 /??	-	-	/24	60 (69)	1	1.5	10	0.33	L2	1100

Additional specifications

Filter type	Maximum operating voltage		Operating frequency Hz	Hipot test voltage		MTBF Per Mil-HB-217F at 40°C 230V hours	Maximum leakage mA/phase
	VAC	Hz		PN→E VAC	P→N VDC		
Standard types	250	50/60	DC to 400	2000	1700	800 000	0.4*
B medical types (no Y capacitors)	250	50/60	DC to 400	2500	1700	800 000	0.002
A safety types (lower capacitance)	250	50/60	DC to 400	2500	1700	800 000	0.040

* 1mA for 30A and 60A versions

Electrical schematic

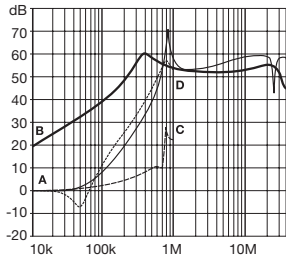


See tables for component values.

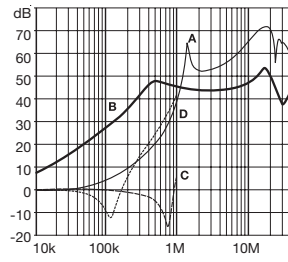
FN 2010 insertion loss

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

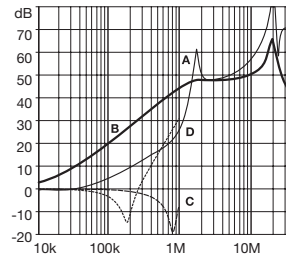
1A types



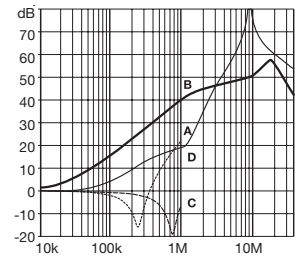
3A types



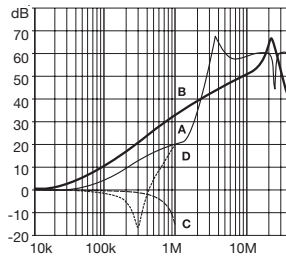
6A types



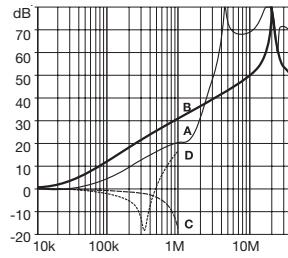
10A types (12A*)



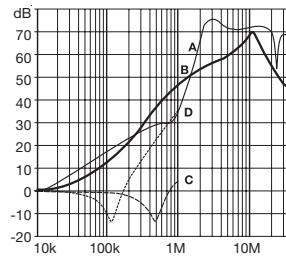
16A types



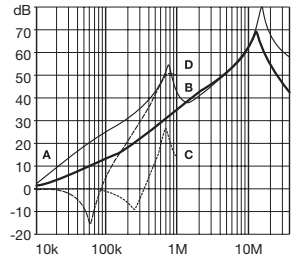
20A types



30A types



60A types



* attenuation performance of the 12A version is similar to the 10A component.

Mechanical data

Housing style	F2	F3	H2	K1	Tol.* ± mm
A	64 ± 0.3		71	85	± 0.5
B	35		46.6	54	± 0.5
C	29.3	24.3	29.3	30.3	± 0.5
D	43.5		50.5	64.8	± 0.5
F	54		61	75	± 0.3
J	21			27	± 0.2
K	8.3 [§] /9.3		10.8/8.3 [§]	12.3	± 0.5
L	15.3		19.3	20.8	± 0.5
M		5.3			± 0.1
N		6.3			± 0.1
P		0.7			± 0.1
S		20.1/30.5 [§]		19.9/21.4 [§]	± 0.5

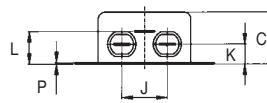
§ with /07 connections
 † with /08 connections
 wire length of /07: 140 +5 mm

* Measurements share this common tolerance unless otherwise stated.

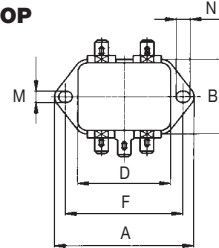
Housing style	P	L2	Tol.* ± mm
A	113.5	105 ± 0.5	± 1
B	57.5	99.5	± 1
C	45.4 ± 1.2	57.6	± 1
D	94	84.5	± 1
F	103	95	± 0.3
J	25	40	± 0.2
K	12.4	10.1	± 0.5
L	32.4	20	± 0.5
M		4.4	± 0.1
N		6	± 0.1
P	0.9	79	± 0.1
R		51	± 0.2
S	15.5		± 0.5

* Measurements share this common tolerance unless otherwise stated.

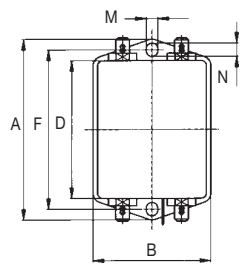
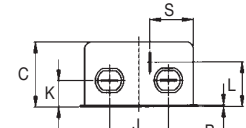
FRONT



TOP

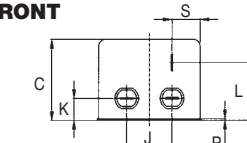


Housings F2 and F3

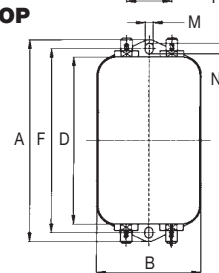


Housings H2, K1

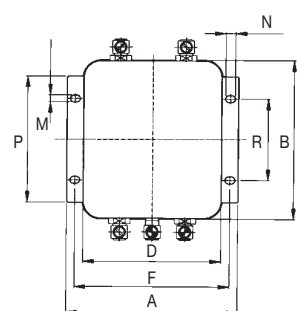
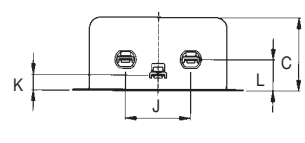
FRONT



TOP



Housing P



Housing L2

All dimensions in mm; 1 inch = 25.4 mm

FN 2020

General-purpose filter

- current ratings from 1 to 60A
 - high differential mode attenuation
 - optional medical versions (B types)
 - optional safety versions (A types)
- Nennströme von 1 bis 60A
 - Hohe Dämpfung im symmetrischen Betrieb
 - Optionale medizinische Versionen (Typ B)
 - Optionale Sicherheitsversionen (Typ A)
- courants de service de 1 à 60 A
 - bonne atténuation en mode différentiel
 - en option version pour appareils médicaux (type B)
 - en option version pour la sécurité (type A)



Filter selection table

Choose the filter FN xxxx-x with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 2020-10/06 is a 10A filter with fast-on connections.

Approvals



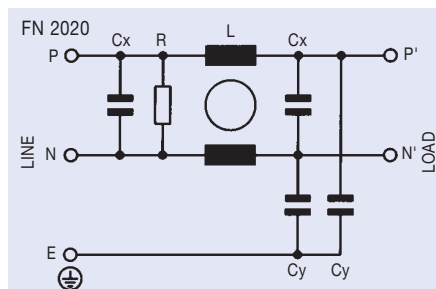
Filter	Connections			Current ratings at 40°C (25°) A	Inductance L mH	Capacitance		Resistance R MΩ	Housing	Weight g
						Cx μF	Cy nF			
FN 2020-1 /??	/06	/07	-	1 (1.15)	12	0.15	4.7	1	F2	80
FN 2020-3 /??	/06	/07	-	3 (3.45)	2.5	0.15	4.7	1	F2	80
FN 2020-6 /??	/06	/07	-	6 (6.9)	1	0.15	4.7	1	F2	80
FN 2020-10 /??	/06	/07	-	10 (11.5)	0.8	0.15	4.7	1	F2	85
FN 2020-12 /??	/06	/07	-	12 (13.8)	0.7	0.15	4.7	1	F2	85
FN 2020-16 /??	/06	/07	-	16 (18.4)	0.65	0.15	4.7	1	H2	140
FN 2020-20 /??	/06	-	/08	20 (23)	0.6	0.15	4.7	1	K1	210
FN 2020-30 /??	-	-	/08	30 (34.5)	0.67	0.47	10	0.47	P	470
FN 2020-60 /??	-	-	/24	60 (69)	1	1.5	10	0.22	L2	1100

Additional specifications

Filter type	Maximum operating voltage		Operating frequency Hz	Hipot test voltage		MTBF Per Mil-HB-217F at 40°C 230V hours	Maximum leakage mA/phase
	VAC	Hz		PN→E VAC	P→N VDC		
Standard types	250	50/60	DC to 400	2000	1700	600 000	0.4*
B medical types (no Y capacitors)	250	50/60	DC to 400	2500	1700	600 000	0.002
A safety types (lower capacitance)	250	50/60	DC to 400	2500	1700	600 000	0.040

* 1mA for 30A and 60A versions

Electrical schematic

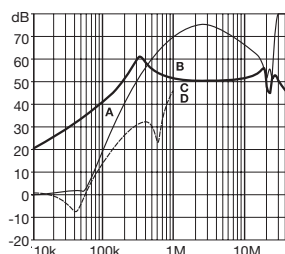


See tables for component values.

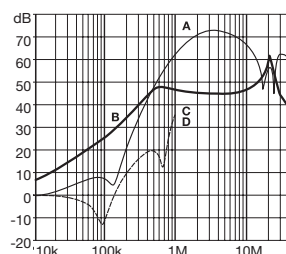
FN 2020 insertion loss

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

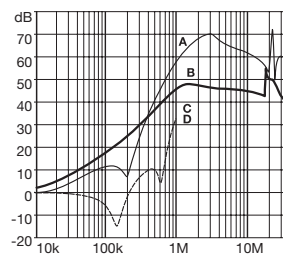
1A types



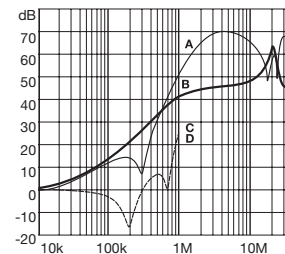
3A types



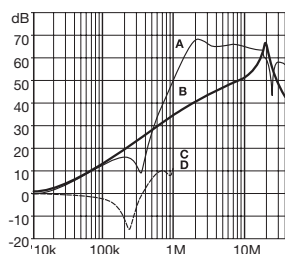
6A types



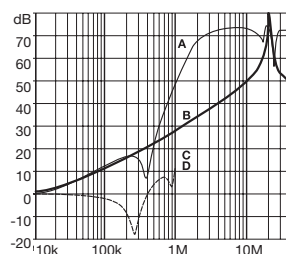
10A types (12A*)



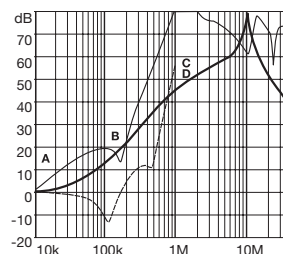
16A types



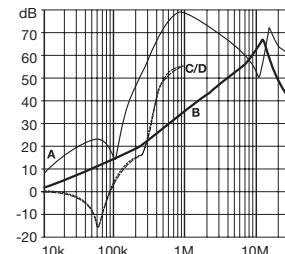
20A types



30A types



60A types



* attenuation performance of the 12A version is similar to the 10A component.

Mechanical data

Housing style	F2	H2	K1	Tol.* ± mm
A	64 ± 0.3	71	85	± 0.5
B	35	46.6	54	± 0.5
C	29.3		30.3	± 0.5
D	43.5	50.5	64.8	± 0.5
F	54	61	75	± 0.3
J	21		27	± 0.2
K	8.3 [§] /9.3	10.8/8.3 [§]	12.3/8.3 [§]	± 0.5
L	15.3	19.3	20.8/23.3	± 0.5
M	5.3			± 0.1
N	6.3			± 0.1
P	0.7			± 0.1
S		20.1/30.5 [§]	19.9/34.9 [§] /21.4 [†]	± 0.5

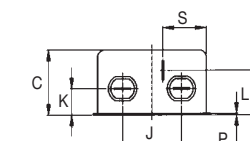
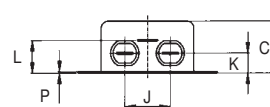
§ with /07 connections
 † with /08 connections
 wire length of /07: 140 +5 mm

* Measurements share this common tolerance unless otherwise stated.

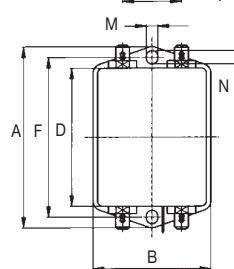
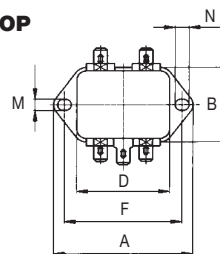
Housing style	P	L2	Tol.* ± mm
A	113.5	105 ± 0.5	± 1
B	57.5	99.5	± 1
C	45.4 ± 1.2	57.6	± 1
D	94	84.5	± 1
F	103	95	± 0.3
J	25	40	± 0.2
K	12.4	10.1	± 0.5
L	32.4	20	± 0.5
M	4.4		± 0.1
N	6		± 0.1
P	0.9	79	± 0.1
R	51		± 0.2
S	15.5		± 0.5

* Measurements share this common tolerance unless otherwise stated.

FRONT



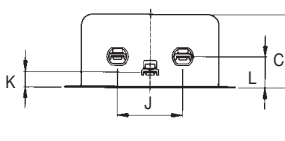
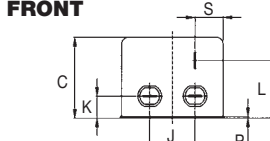
TOP



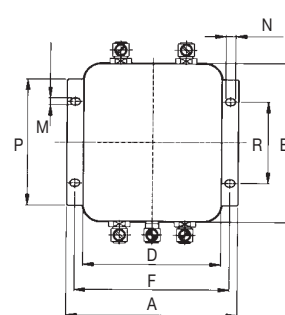
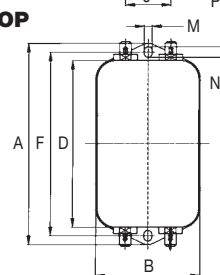
Housings F2

Housings H2, K1

FRONT



TOP



Housing P

Housing L2

All dimensions in mm; 1 inch = 25.4 mm

Compact feedthrough chassis-mounting filter

SCHAFFNER

FN 2101 / FN 2102

- 3 to 16A current ratings
- X1 capacitors for extra immunity to high voltage transients
- performance maintained at high frequencies
- additional choke option for higher differential-mode attenuation
- Nennströme von 3 bis 16 A
- X1-Kondensator für äußerste Störfestigkeit gegen hohe Spannungs-Transienten
- Leistung wird auch bei hohen Frequenzen beibehalten
- Optional zusätzliche Drossel für eine höhere Gegentakt-Dämpfung
- De 3 à 16 A
- Condensateurs X1 pour une immunité supplémentaire aux transitoires haute tension
- Performances maintenues aux hautes fréquences
- Self en option pour une atténuation supérieure en mode différentiel



Technical specifications

Maximum operating voltage: 250VAC at 60°C

Maximum operating frequency: DC to 400Hz at 60°C

Hipot test voltage: PN→E 2000VAC; P→N 1200VAC

MTBF at 60°C, 230V per Mil-HB-217F: FN 2101 1,384,000 hours; FN 2102 945,000 hours

Temperature range: -25°C to +100°C

Flammability class: UL 94V2

Approvals

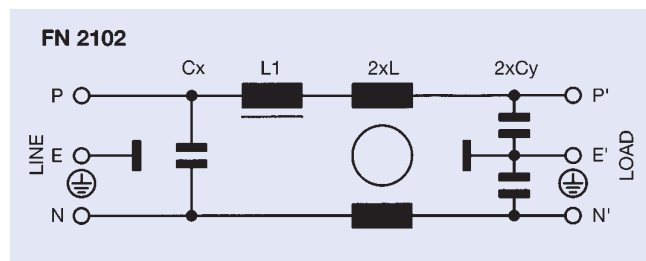
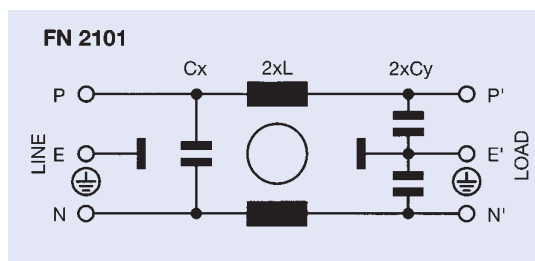


Filter	Current ratings at 60°C* (25°C) A	Leakage current (230V/50Hz) mA/phase	Power loss max. W	Component values				Weight g
				L mH	L1 μH	Cx μF	Cy nF	
FN 2101-3/06	3 (4.0)	0.29	0.92	2.5	-	0.1	3.3	52
FN 2101-6/06	6 (8.2)	0.29	1.36	0.69	-	0.1	3.3	52
FN 2101-10/06	10 (13.6)	0.29	1.64	0.23	-	0.1	3.3	55
FN 2101-16/06	16 (19.6)	0.29	3.1	0.12	-	0.1	3.3	57
FN 2102-3/06	3 (4.0)	0.29	1.44	1.45	93	0.1	3.3	60
FN 2102-6/06	6 (8.2)	0.29	1.8	0.5	21	0.1	3.3	62
FN 2102-10/06	10 (13.6)	0.29	2.4	0.14	9.8	0.1	3.3	66
FN 2102-16/06	16 (19.6)	0.29	4.0	0.048	2.8	0.1	3.3	66

*16A types at 50°C approved

Note: the line side of the filter is always fitted with wire terminals.

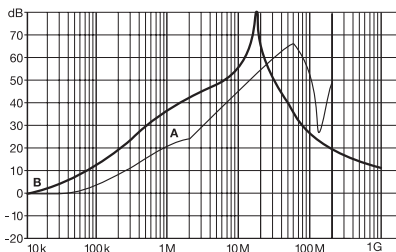
Electrical schematics



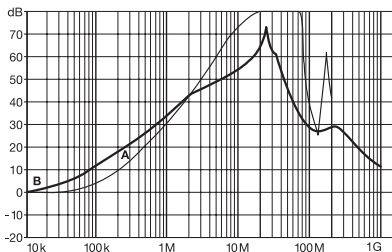
FN 2101 / FN 2102 insertion loss

Per CISPR 17; A = 50Ω/50Ω sym, B = 50Ω/50Ω asym

FN 2101

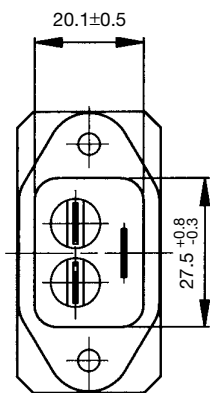


FN 2102

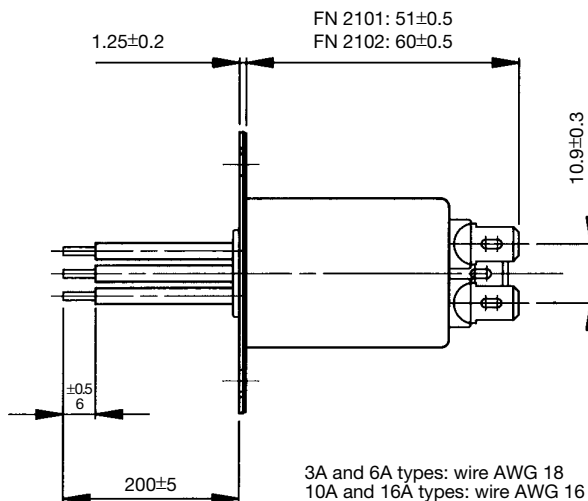


Mechanical data

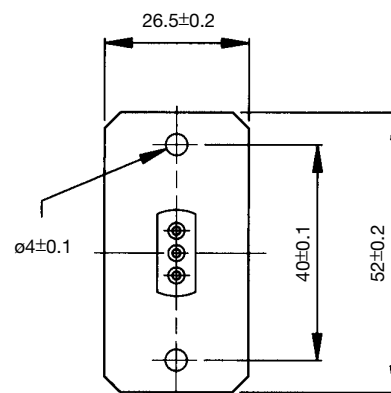
FRONT



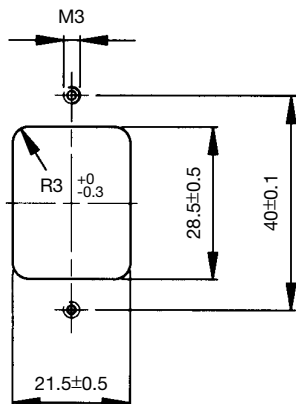
SIDE



END



PANEL CUT-OUT



All dimensions in mm; 1 inch = 25.4 mm

Chassis-mounting filter with feedthrough options

SCHAFFNER

FN 2110/FN 2120

- 10 to 40A current ratings
- X1 capacitors for extra immunity to high voltage transients
- performance maintained at high frequencies
- additional X capacitor option for higher differential-mode attenuation
- Nennströme 10 bis 40 A
- X1 Kondensator für äußerste Störfestigkeit gegen hohe Spannungs-Transienten
- Leistung wird auch bei hohen Frequenzen beibehalten
- Optional zusätzlicher X-Kondensator für eine höhere Gegentakt-Dämpfung
- De 10 à 40 A
- Condensateurs X1 pour une immunité supplémentaire aux transitoires haute tension
- Performances maintenues aux hautes fréquences
- Condensateur X supplémentaire en option pour une atténuation supérieure en mode différentiel



Technical specifications

Maximum operating voltage: 250VAC at 40°C

Maximum operating frequency: DC to 400Hz at 40°C

Hipot test voltage: PN→E 2000VAC; P→N 1100VDC

MTBF at 40°C, 230V per Mil-HB-217F: FN 2110 ≥ 1,228,000 hours; FN 2120 ≥ 903,000 hours

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 +85°C

Flammability class: UL 94V0

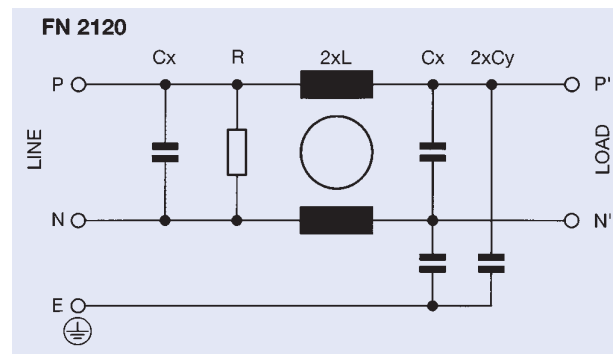
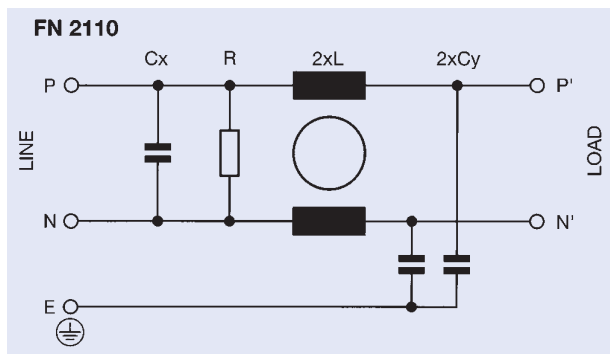
Approvals



Filter	Current ratings at 40°C (25°C) A	Leakage current (230V/50Hz) mA/phase	Power loss max. W	Component values				Connections*			Weight g
				L mH	Cx μF	Cy nF	R MΩ				
FN 2110-10/??	10 (11.5)	0.4	2.4	0.8	0.22	4.7	1	/06	/07	-	150
FN 2110-20/??	20 (23.0)	0.4	4.0	0.6	0.22	4.7	1	/06	/07	/08	260
FN 2110-30/??	30 (34.6)	0.86	5.4	0.67	0.47	10	1	-	/07	/08	470
FN 2110-40/??	40 (46.0)	0.86	9.6	0.5	0.47	10	1	-	/07	/08	700
FN 2120-10/??	10 (11.5)	0.4	2.4	0.8	0.22	4.7	1	/06	/07	-	150
FN 2120-20/??	20 (23.0)	0.4	4.0	0.6	0.22	4.7	1	/06	/07	/08	260
FN 2120-30/??	30 (34.6)	0.86	5.4	0.67	0.47	10	1	-	/07	/08	470
FN 2120-40/??	40 (46.0)	0.86	9.6	0.5	0.47	10	1	-	/07	/08	700

*Note: /07 connection only on load side.

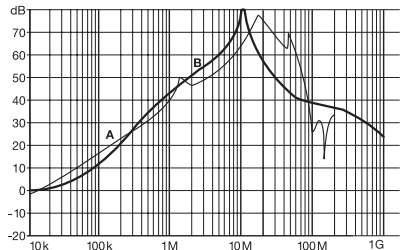
Electrical schematics



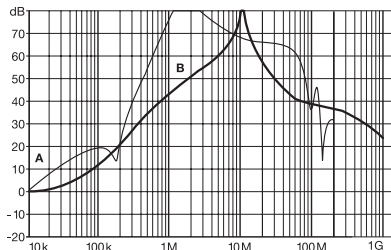
FN 2110 / FN 2120 insertion loss

Per CISPR 17; A = 50Ω/50Ω sym, B = 50Ω/50Ω asym

FN 2110



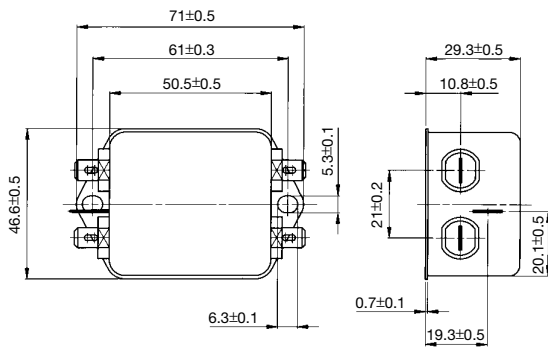
FN 2120



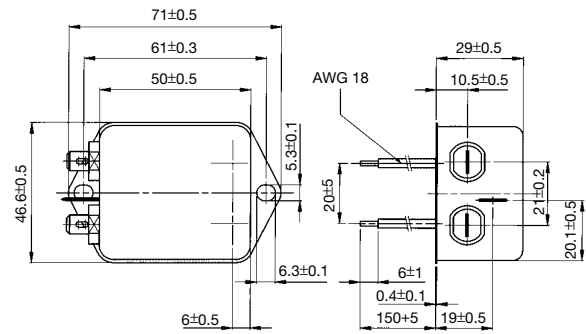
Mechanical data

10A versions

/06 connection

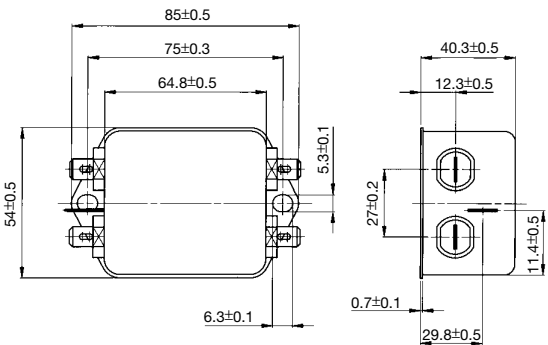


/07 connection

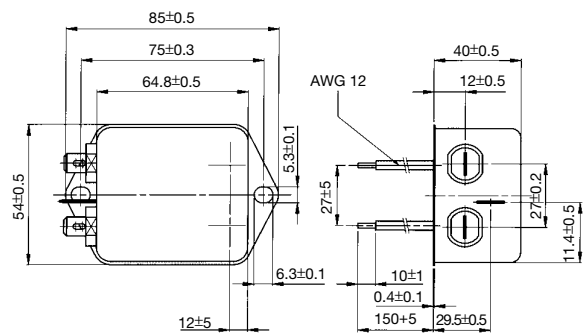


20A versions

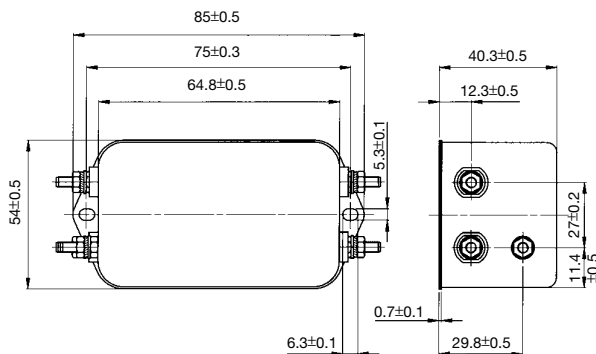
/06 connection



/07 connection



/08 connection



All dimensions in mm; 1 inch = 25.4 mm



Single-phase chassis-mounting filter FN 2310

- Current ratings from 3 to 10A
- High differential and common mode attenuation
- UL-rated materials
- Nennströme von 3 bis 10A
- Hohe Gleich- und Gegentaktdämpfung
- UL konformes Material
- Courants de service de 3 à 10A
- Bonne atténuation en modes différentiel et commun
- Matériaux UL



Filter selection table

Filter	Conn. / Housing		Current ratings @40°C (25°C) [A]	Inductance		Capacitance		Resistance R [MΩ]	Weight [g]
				L [mH]	L1 [μH]	Cx [μF]	Cy [nF]		
FN2310X-3-06	Fast-on	K2	3 (3.35)	36.9	-	0.47	4	1	240
FN2310X-6-06	Fast-on	K2	6 (6.7)	19.3	-	0.47	4	1	250
FN2310X-10-06	Fast-on	P	10 (11.2)	9.6	75	1.5	4	1	470
FN2310H-10-06	Fast-on	P	10 (11.2)	9.6	75	1.5	10	1	470

Approvals



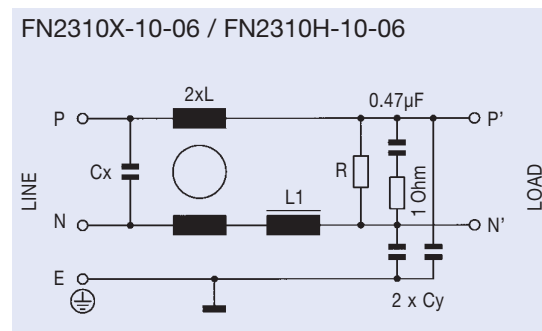
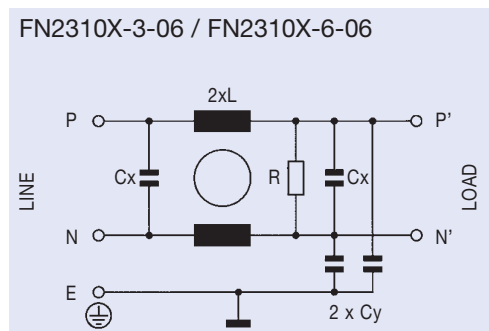
Additional specifications

Filter type	Maximum operating voltage		Operating frequency [Hz]	Hipot test voltage		Maximum leakage @ 230VAC/50Hz [mA]	Temperature range
	[VAC]	[Hz]		PN→E [VAC]	P→N [VDC]		
All types	250	50/60	DC to 60	2000	1100	0.69*	-25°C - +100°C

MTBF at 40°C, 230V, per Mil-HB-217F: 1,700,000 hours.

* 1.73mA for FN2310H-10-06

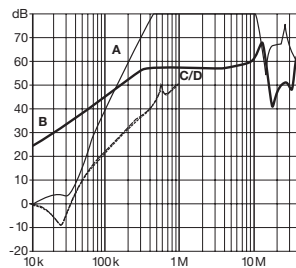
Electrical schematics



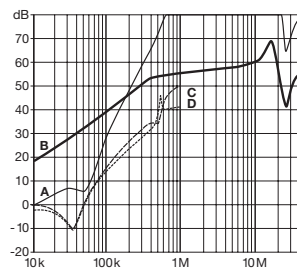
FN 2310 insertion loss

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

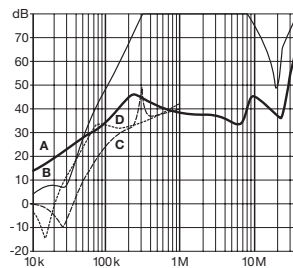
3 amp types



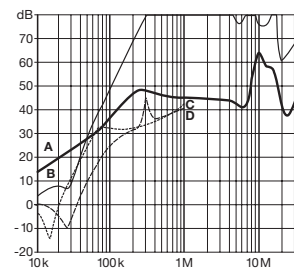
6 amp types



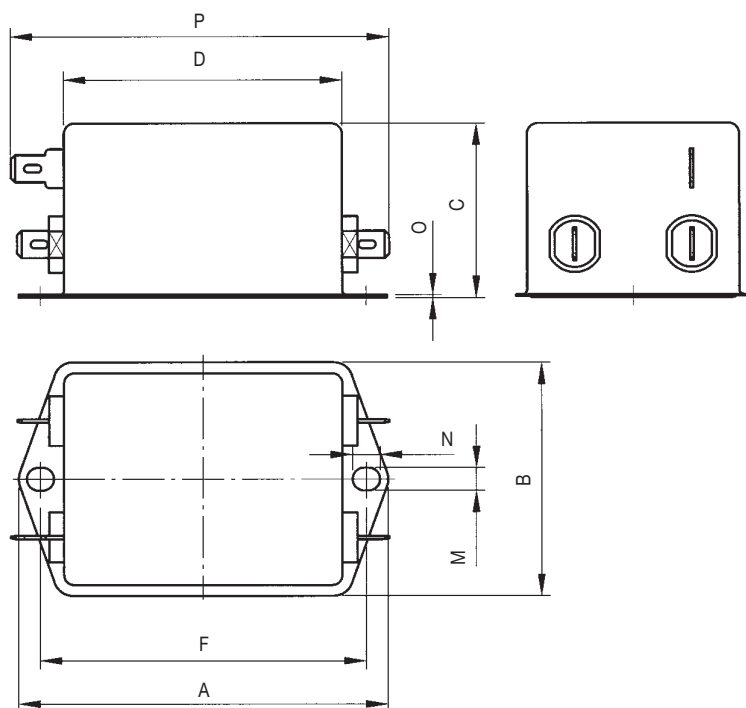
10 amp (X-types)



10 amp (H-types)



Mechanical data



	FN2310X		FN2310H		Tol.*
	3A	6A	10A	10A	[mm]
A	85		113.5 ± 1		± 0.5
B	54		57.5 ± 1		± 0.5
C	40.3		45.5 ± 1.2		± 0.5
D	64		94 ± 1		± 0.5
F	75		103.5		± 0.3
M	5.3		4.4		± 0.1
N	6.3		6		± 0.1
O	0.7		1		± 0.1
P	87		117		± 1

* Measurements share this common tolerance unless otherwise stated.

All dimensions in mm; 1 inch = 25.4mm.

Single-phase chassis-mounting filter FN 2330

- Current ratings from 3 to 20A
- High differential and common mode attenuation
- UL-rated materials
- Nennströme von 3 bis 20A
- Hohe Gleich- und Gegentaktdämpfung
- UL konformes Material
- Courants de service de 3 à 20A
- Bonne atténuation en modes différentiel et commun
- Matériaux UL



Filter selection table

Filter	Conn. / Housing		Current ratings @40°C (25°C) [A]	Inductance		Capacitance		Resistance R [MΩ]	Weight [g]
				L [mH]	L1 [μH]	Cx [μF]	Cy [nF]		
FN2330Y-3-07	AWG20	K1	3 (3.35)	7.3	-	0.33	5.5	1	170
FN2330Y-10-06	Fast-on	P	10 (11.2)	7.3	-	0.33	5.5	1	420
FN2330X-20-10	Screw	P	20 (22.4)	6.0	-	0.33	4	1	500
FN2330H-20-10	Screw	P	20 (22.4)	6.0	-	0.33	10	1	500

Approvals



Additional specifications

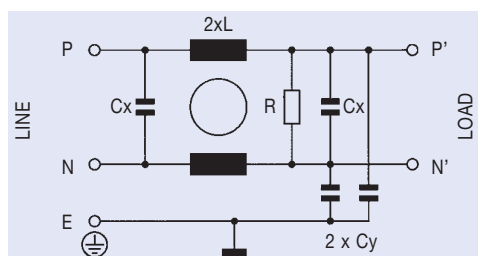
Filter type	Maximum operating voltage		Operating frequency [Hz]	Hipot test voltage		Maximum leakage @ 230VAC/50Hz [mA]	Temperature range
	[VAC]	[Hz]		PN→E [VAC]	P→N [VDC]		
All types	250	50/60	DC to 60	2000	1100	0.95*	-25°C - +100°C

MTBF at 40°C, 230V, per Mil-HB-217F: 1,400,000 hours.

* 0.69mA for FN2330X-20-10

* 1.72mA for FN2330H-20-10

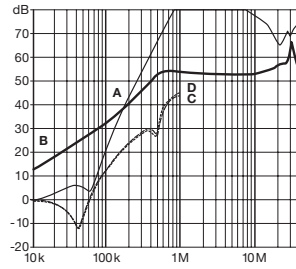
Electrical schematic



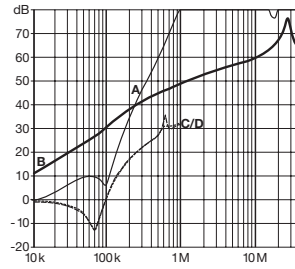
FN 2330 insertion loss

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

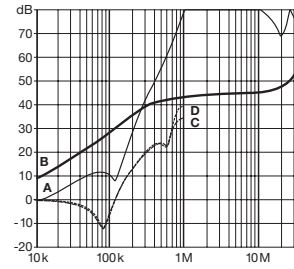
3 amp types



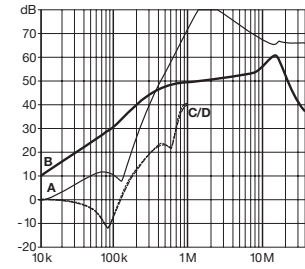
10 amp types



20 amp (X-types)

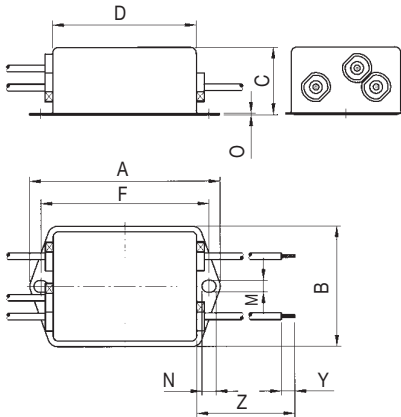


20 amp (H-types)



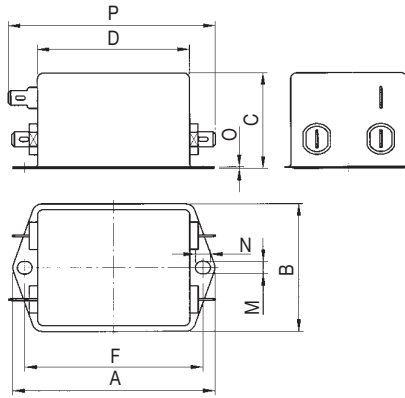
Mechanical data

-3A



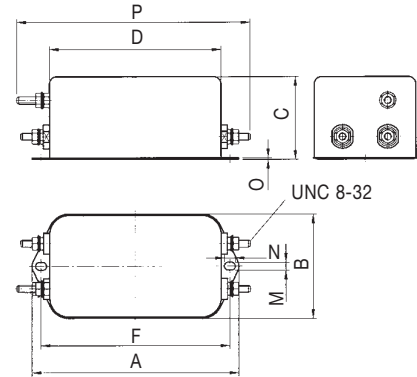
Housing K1

-10A



Housing P

-20A



Housing P

	FN2330Y		FN2330X		FN2330H		Tol.*
	3A	10A	20A	20A			[mm]
A	85 ± 0.5		113.5				± 1
B	54 ± 0.5		57.5				± 1
C	30.3 ± 0.5		45.5				± 1
D	64 ± 0.5		94				± 1
F	75		103.5				± 0.3
M	5.3		4.4				± 0.1
N	6.3		6				± 0.1
O	0.7		1				± 0.1
P		117		128			± 1
Y	6						± 0.5
Z	100						+ 5

* Measurements share this common tolerance unless otherwise stated.

All dimensions in mm; 1 inch = 25.4mm.

Single-phase chassis-mounting filter FN 2340

- Current ratings from 2 to 20A
- Improved differential mode performance
- UL-rated materials
- Nennströme von 2 bis 20A
- Erhöhte symmetrische Dämpfung
- UL konformes Material
- Courants de service de 2 à 20A
- Bonne atténuation en mode différentiel
- Matériaux UL



Filter selection table

Approvals



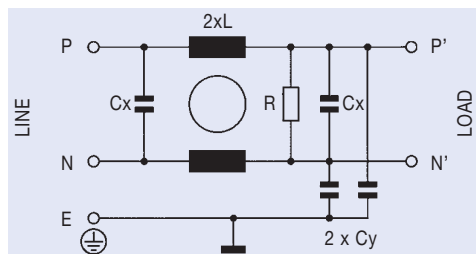
Filter	Conn. / Housing		Current ratings @40°C (25°C) [A]	Inductance		Capacitance		Resistance R [MΩ]	Weight [g]
				L [mH]	L1 [μH]	Cx [μF]	Cy [nF]		
FN2340Y-2-06	Fast-on	H1	2 (2.25)	0.52	-	0.1	5.5	1	85
FN2340Y-3-06	Fast-on	H2	3 (3.35)	1.7	-	0.1	5.5	1	115
FN2340Y-5-06	Fast-on	H2	5 (5.6)	0.54	-	0.1	5.5	1	115
FN2340Y-10-06	Fast-on	J1	10 (11.2)	0.54	-	0.1	5.5	1	125
FN2340Y-20-06	Fast-on	K2	20 (22.4)	0.43	-	0.1	5.5	1	230
FN2340Y-20-10	Screw	K2	20 (22.4)	0.43	-	0.1	5.5	1	255

Additional specifications

Filter type	Maximum operating voltage		Operating frequency [Hz]	Hipot test voltage		Maximum leakage @ 230VAC/50Hz [mA]	Temperature range
	[VAC]	[Hz]		PN→E [VAC]	P→N [VAC]		
All types	250	50/60	DC to 60	2000	760	0.94	-25°C - +100°C

MTBF at 40°C, 230V, per Mil-HB-217F: 3,000,000 hours.

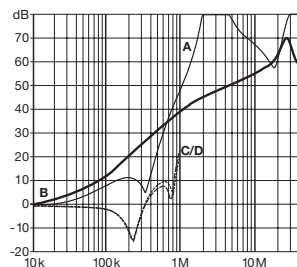
Electrical schematic



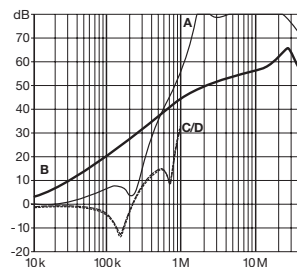
FN 2340 insertion loss

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

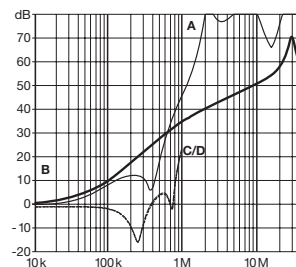
2 amp types



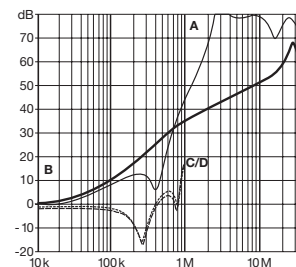
3 amp types



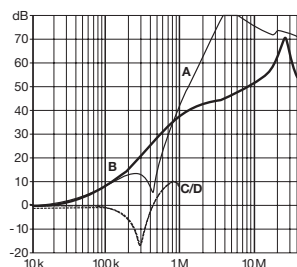
5 amp types



10 amp types

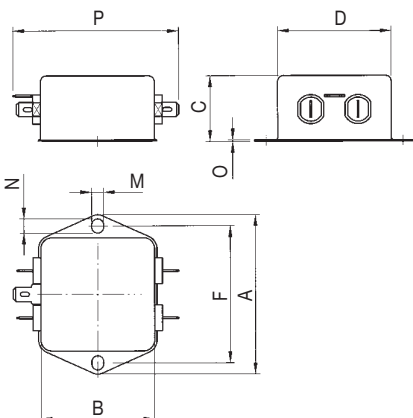


20 amp types



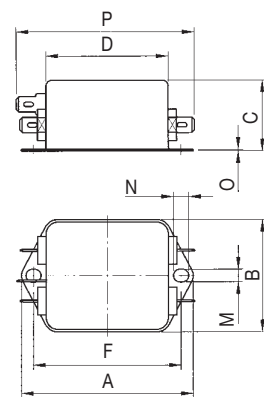
Mechanical data

-2A, -10A, -20A (-06)



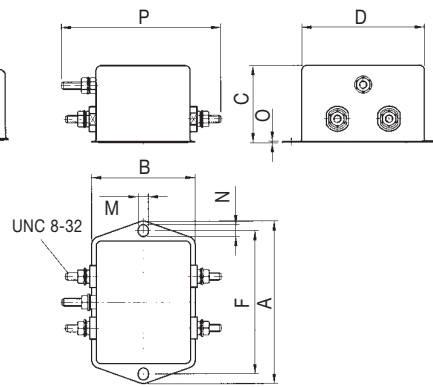
Housing H1, J1, K2

-3A, -5A



Housing H2

-20A (-10)



Housing K2

FN2340Y

	2A	3A	5A	10A	20A (-06)	20A (-10)	Tol. [mm]
A	71				85		± 0.5
B		46.6		50.5	54		± 0.5
C	22.3	29.3			40		± 0.5
D	50.5				64		± 0.5
F	61				75		± 0.3
M	5.3						± 0.1
N	6.3						± 0.1
O	0.7						± 0.1
P	67.6	74		73.6	72	83	± 1

All dimensions in mm; 1 inch = 25.4mm.

Compact performance filter

FN 9675

- current ratings from 3 to 16A
- economic high-performance filter
- screw or fast-on connections
- Nennströme von 3 bis 16 A
- Wirtschaftliches Hochleistungsfilter
- Schraub- oder Steckanschlüsse
- courants de service de 3 à 16 A
- filtre haute performance peu onéreux
- connexions par vis ou fast-on



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 9675-3/06 is a 3A filter with fast-on connections.

Approvals



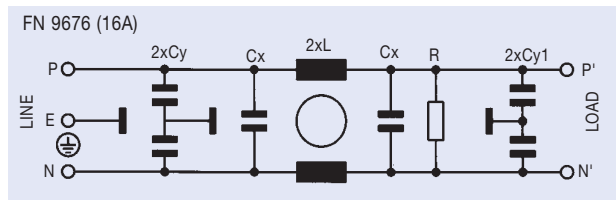
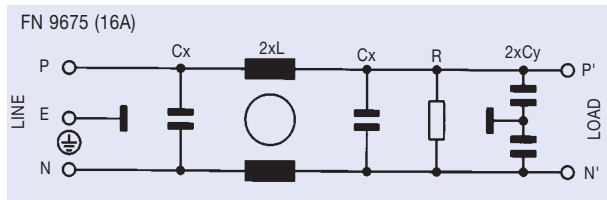
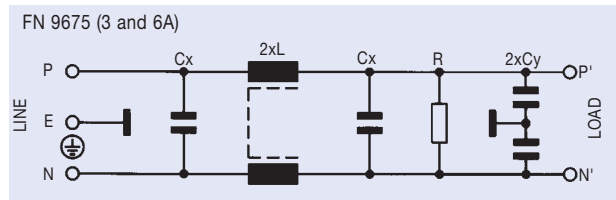
Family	Connections		Current ratings at 40°C (25°) A	Inductance L mH	Capacitance Cx/Cx1 nF	Housing	Weight g
FN 9675 -3 /??	-	/06	3 (3.5)	18	680/680	K21	270
FN 9675 -6 /??	-	/06	6 (6.9)	3	680/680	K21	270
FN 9675 -16/??	/03	-	16 (18.4)	10.2	1000/1000	L2	850
FN 9676 -16/??	/03	-	16 (18.4)	10.2	1000/1000	L2	1050

Additional specifications

Filter type	Capacitance Cy/Cy1 nF	Res. R MΩ	Maximum leakage µA/phase	Maximum operating voltage VAC Hz	Operating frequency Hz	Hipot test voltage PN→E VAC P→N VDC	
FN 9675 types	4.7/-	0.47	410	250 50/60	DC to 400	2000	1700
FN 9676 types	6.8/15	0.47	1900	250 50/60	DC to 400	2000	1700

MTBF at 40°C, 230V, per Mil-HB-217F: 280,000 hours (FN 9675); 400,000 hours (FN 9676).

Electrical schematics

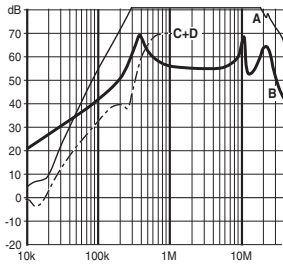


See tables for component values.

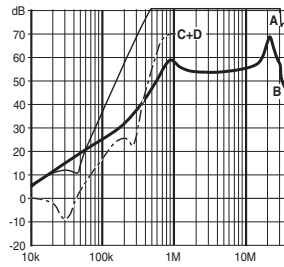
FN 9675 insertion loss

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

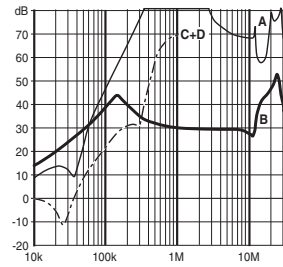
3 amp types



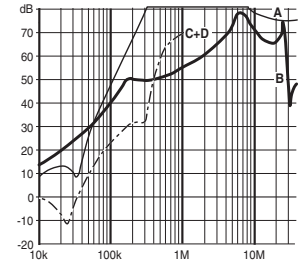
6 amp types



16 amp FN 9675



16 amp FN 9676

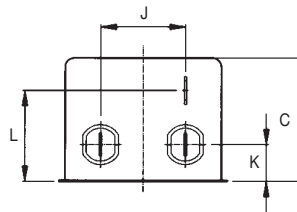


Mechanical data

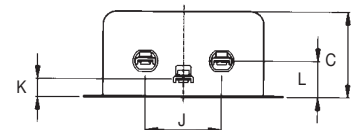
	FN 9675 -3-6 K21	FN 967x -16 L2	Tol.* mm
A	85	105	± 0.5
B	54	99.5 ± 1	± 0.5
C	40	57	± 1
D	65	84.5	± 1
E		79	± 0.5
F	75	95	± 0.2
G		51	± 0.1
J	27	40	± 0.5
K	12	11	± 0.5
L	29.5	19	± 0.5
M	5.3	4.4	± 0.1
N	6.3	6	± 0.1

* Measurements share this common tolerance unless otherwise stated.

FRONT VIEW

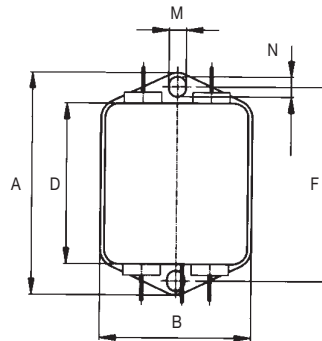


Housing K21

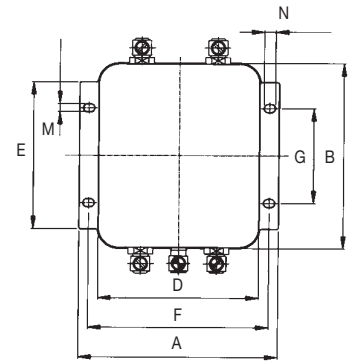


Housing L2

TOP VIEW



Housing K21



Housing L2

All dimensions in mm; 1 inch = 25.4 mm

Single-phase filters

Two-stage filters

Zweistufen Filter

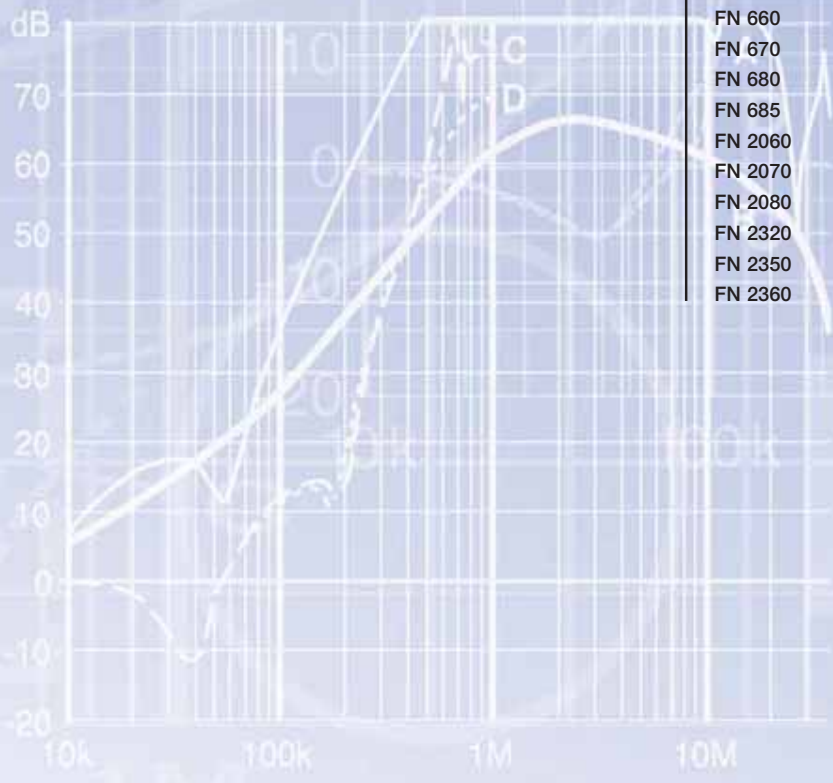
Filtres à double-étage





Two-stage filters
Zweistufen Filter
Filtres à double-étage

- FN 343
- FN 660
- FN 670
- FN 680
- FN 685
- FN 2060
- FN 2070
- FN 2080
- FN 2320
- FN 2350
- FN 2360



FN 343

Two-stage filter

- 1 to 10A current ratings
- 2-stage design with earth line choke
- Nennströme von 1 bis 10 A
- Zweistufen-Design mit Erdleiterdrossel
- courants de service de 1 à 10 A
- conception à double-étage avec self de terre





Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 343-3/01 is a 3A filter with solder connections.

Approvals



Family	Connections		Current ratings at 40°C (25°) A	Inductance L/L ₁ /L ₂ mH	Housing	Weight g
						
FN 343 -1 /??	/01	/05	1 (1.15)	5.6/10/0.4	J2	160
FN 343 -3 /??	/01	/05	3 (3.4)	1.1/2/0.4	J2	160
FN 343 -6 /??	/01	/05	6 (6.9)	0.43/0.77/0.4	J2	160
FN 343 -10 /??	/01	/05	10 (11.5)	0.27/0.66/0.4	J2	170

Additional specifications

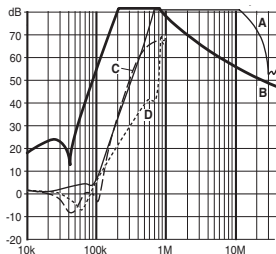
Filter type	Capacitance		Res. R MΩ	Maximum leakage µA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
	C _x /C _{X1} nF	C _y nF			VAC	Hz		PN→E VAC	P→N VAC
Standard types	100/100	2.2	1	190	250	50/60	DC to 400	2000	1700

MTBF at 40°C, 230V, per Mil-HB-217F: 970,000 hours.

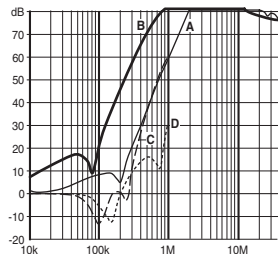
FN 343 insertion loss

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

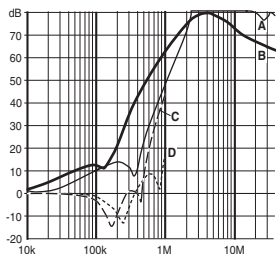
1 amp types



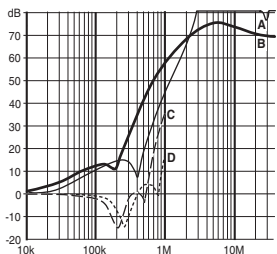
3 amp types



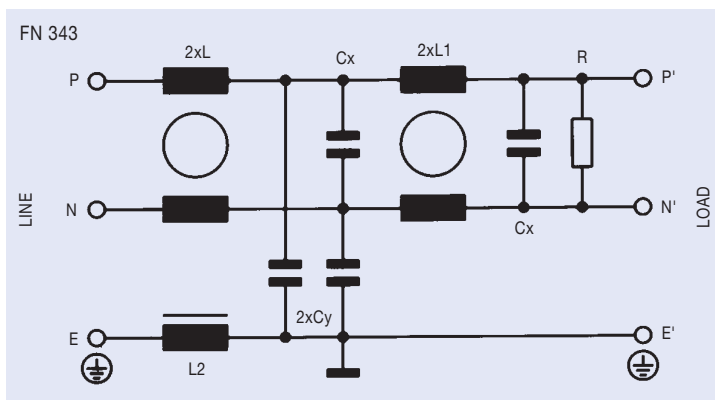
6 amp types



10 amp types



Electrical schematic

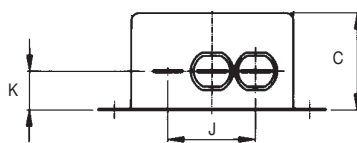


See tables for component values.

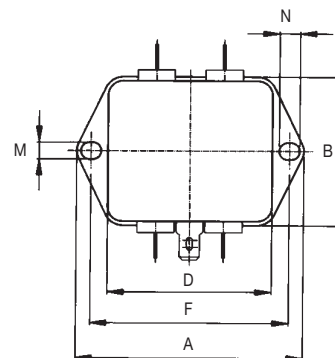
Mechanical data

		Tol. mm
A	70	± 0.5
B	69	± 0.5
C	30	± 1
D	49.8	± 1
F	60	± 0.2
J	27	± 0.5
K	12	± 0.5
M	5.3	± 0.1
N	6.3	± 0.1

FRONT VIEW



TOP VIEW



All dimensions in mm; 1 inch = 25.4 mm

Two-stage general-purpose filter

FN 660

- current ratings from 1 to 20A
 - high differential and common mode attenuation
 - four choices of output connector
 - optional medical versions (B type)
- Nennströme von 1 bis 20 A
 - Gute differentielle und Gleichtakt-Dämpfung
 - Vier Anschlußarten
 - Für medizinische Geräte als Option (Typ B)
- courants de service de 1 à 20 A
 - bonne atténuation en modes différentiel et commun
 - quatre types de connexions de sortie
 - version pour appareils médicaux en option (type B)



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 660-3/07 is a 3A filter with wire connections.

Approvals



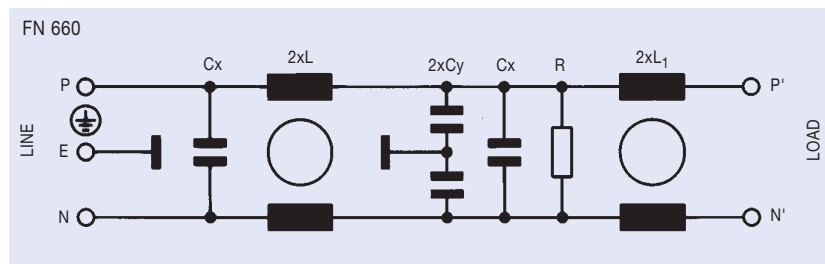
Family	Connections				Current ratings at 40°C (25°) A	Inductance L/L1 mH	Housing	Weight g			
								/03	/06	/07	/10
FN 660 -1 /??	-	/06	/07	-	1 (1.15)	3/3	H21	-	115	125	-
FN 660 -3 /??	-	/06	/07	-	3 (3.4)	2/2	K1	-	170	180	-
FN 660 -6 /??	-	/06	/07	-	6 (6.9)	0.75/0.75	K1	-	170	180	-
FN 660 -10 /??	-	/06	/07	-	10 (11.5)	0.45/0.45	K21	-	230	240	-
FN 660 -16 /??	/03	/06	-	/10	16 (18.4)	0.44/0.44	K2	290	260	-	290
FN 660 -20 /??	/03	/06	-	/10	20 (23)	0.48/0.48	L1	600	590	-	640

Additional specifications

Filter type	Capacitance		Res. R MΩ	Maximum leakage μA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
	Cx nF	Cy nF			VAC	Hz		PN→E VAC	P→N VAC
Standard types	150	2.2	1	190	250	50/60	DC to 400	2000	1700
B types (medical)	150	-	1	2	250	50/60	DC to 400	2500	1700

MTBF at 40°C, 230V, per Mil-HB-217F: 350,000 hours (for VDE-approved current ratings).

Electrical schematic

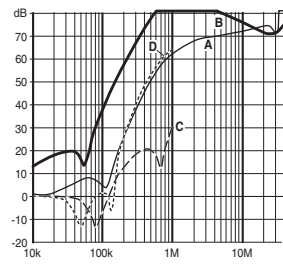


See tables for component values.

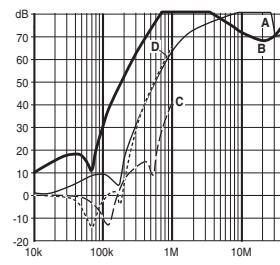
FN 660 insertion loss

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

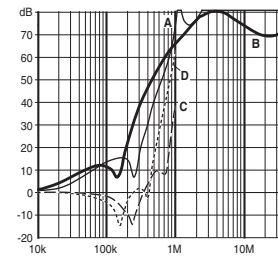
1 amp types



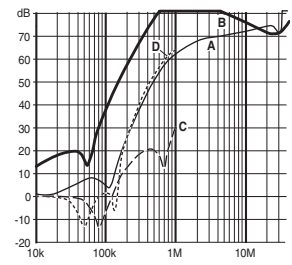
3 amp types



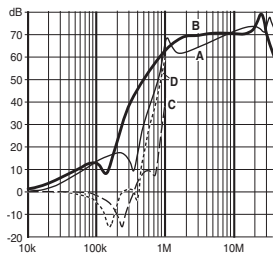
6 amp types



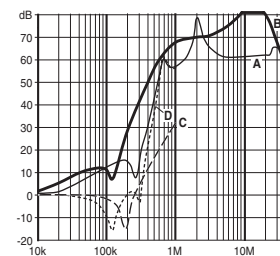
10 amp types



16 amp types



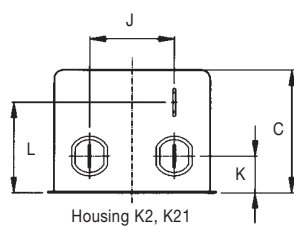
20 amp types



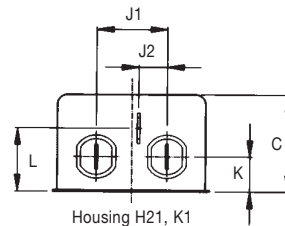
Mechanical data

	FN 660-1 H21	Tol. mm
A	71	± 0.5
B	46.6	± 1
C	29	± 1
D	50.5	± 1
F	61	± 0.2
J	21 ^(J1) 8.5 ^(J2)	± 0.5
K	10.5	± 0.3
L	19	± 0.5
M	5.3	± 0.1
N	6.3	± 0.1
Y	6	± 1
Z	140	+ 5

FRONT VIEW

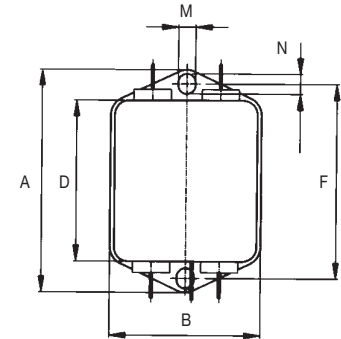


Housing K2, K21



Housing H21, K1

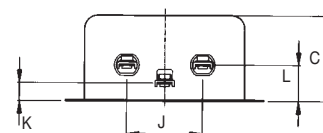
TOP VIEW



Housing H21, K1, K2, K21

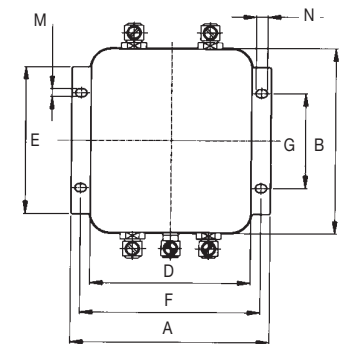
	FN 660 -3-6 K1	FN 660 -10/-16 K2, K21	FN 660 -20 L1	Tol.* mm
A		85	105	± 0.5
B		54	99.5 ± 1	± 0.5
C	30	40	38	± 1
D		65	84.5	± 1
E			79	± 0.5
F		75	95	± 0.2
G			51	± 0.1
J	27 ^(J1) 8.5 ^(J2)	27	40	± 0.5
K	7	12	9.5	± 0.5
L		29.5	19	± 0.5
M		5.3	4.4	± 0.1
N		6.3	6	± 0.1
W	AWG 16			-
Y		6		± 1
Z	300	140 + 5		+ 10

FRONT VIEW



Housing L1

TOP VIEW



Housing L1

* Measurements share this common tolerance unless otherwise stated.

All dimensions in mm; 1 inch = 25.4 mm

Two-stage performance filter

FN 670

- current ratings from 1.8 to 10A
- very high differential and common mode attenuation
- good high frequency attenuation
- Nennströme von 1,8 bis 10 A
- Sehr hohe differentielle und Gleichtakt-Dämpfung
- Gute Hochfrequenzdämpfung
- courants de service de 1,8 à 10 A
- très bonne atténuation en modes différentiel et commun
- bonne atténuation à des hautes fréquences



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 670-3/06 is a 3A filter with fast-on connections.

Approvals



Family	Connections		Current ratings at 40°C (25°) A	Inductance L/L1 mH	Housing	Weight g	
	/06	/07				/06	/07
FN 670 -1.8 /??	/06	/07	1.6 (1.8)	7.2/7.2	K2	225	240
FN 670 -3 /??	/06	/07	2.5 (3)	12.2/1.8	K2	240	245
FN 670 -6 /??	/06	/07	5 (6)	7/7	K2	245	260
FN 670 -10 /??	/06	/07	8.0 (10)	10.4/2.7	L1	570	620

Additional specifications

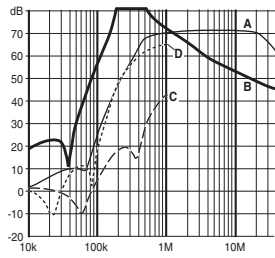
Filter type	Capacitance		Res. R MΩ	Maximum leakage μA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
	Cx/Cx1 nF	Cy nF			VAC	Hz		PN→E VAC	P→N VAC
Standard types	470/150	2.2	0.47	190	250	50/60	DC to 400	2000	1700

MTBF at 40°C, 230V, per Mil-HB-217F: 300,000 hours (for VDE-approved current ratings).

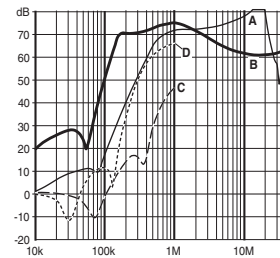
FN 670 insertion loss

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

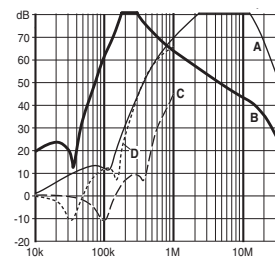
1.8 amp types



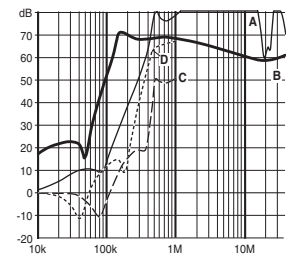
3 amp types



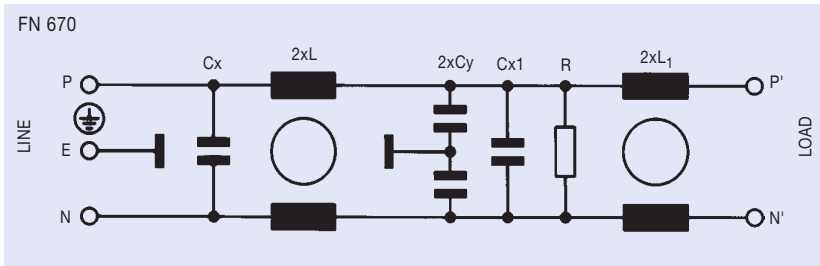
6 amp types



10 amp types



Electrical schematic



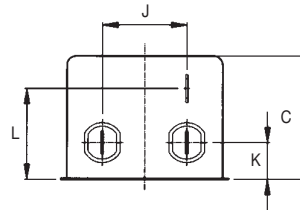
See tables for component values.

Mechanical data

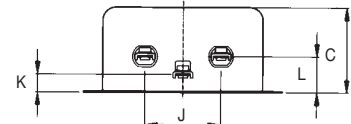
	FN 670-1.8 /-3/-6	FN 670-10	Tol.* mm
A	K2	L1	± 0.5
B	85	105	± 0.5
C	54	99.5 ± 1	± 0.5
D	40	38	± 1
E	65	84.5	± 1
F		79	± 0.5
G	75	95	± 0.2
H		51	± 0.1
I	27	40	± 0.5
J	12	9.5	± 0.5
K	29.5	19	± 0.5
L	5.3	4.4	± 0.1
M	6.3	6	± 0.1
N		6	± 1
O	6		± 1
P	140		+ 5

* Measurements share this common tolerance unless otherwise stated.

FRONT VIEW

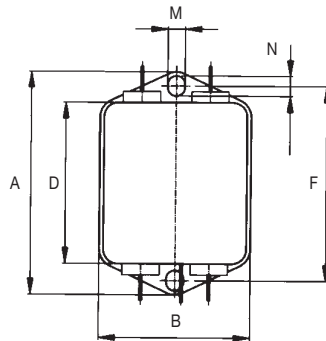


Housing K2

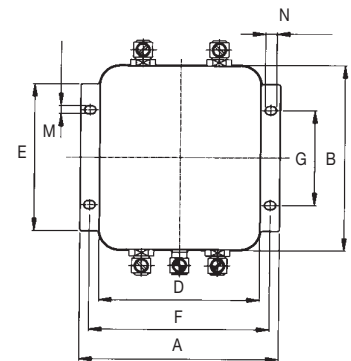


Housing L1

TOP VIEW



Housing K2



Housing L1

All dimensions in mm; 1 inch = 25.4 mm

FN 680

Two-stage performance filter

- current ratings from 1 to 10A
- very high differential and common mode attenuation
- good low frequency attenuation
- Nennströme von 1 bis 10 A
- Sehr hohe differentielle und Gleichtakt-Dämpfung
- Gute Niederfrequenzdämpfung
- courants de service de 1 à 10 A
- très bonne atténuation en modes différentiel et commun
- bonne atténuation à des basses fréquences





Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 682-4/07 is a 4A filter with wire connections.

Approvals



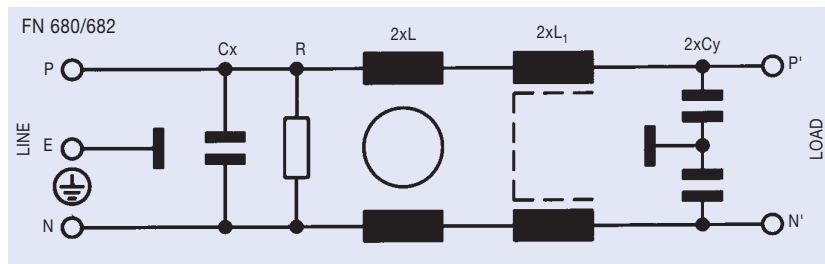
Family	Connections		Current ratings at 40°C (25°) A	Inductance L/L ₁ mH	Housing	Weight g	
						/06	/07
FN 680 -1 /??	/06	/07	1 (1.2)	22.5/1.2	J11	120	130
FN 680 -2.5 /??	/06	/07	2.5 (3)	16/0.27	K2	230	245
FN 682 -4 /??	/06	/07	4 (4.8)	8/0.08	K2	250	255
FN 682 -6.5 /??	/06	/07	6.5 (7.8)	4.1/0.055	L1	590	600
FN 682 -10 /??	/06	/07	10 (12)	4/0.04	L2	950	970

Additional specifications

Filter type	Capacitance		Res. R MΩ	Maximum leakage μA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
	C _x nF	C _y nF			VAC	Hz		PN→E VAC	P→N VDC
FN 680 types	220	4.7	1	410	250	50/60	DC to 400	2000	1700
FN 682 types (4A)	1000	22	0.33	1900	250	50/60	DC to 400	2000	1700
FN 682 types (6.5-10A)	470	22	0.47	1900	250	50/60	DC to 400	2000	1700

MTBF at 40°C, 230V, per Mil-HB-217F: 1,400,000 hours.

Electrical schematic

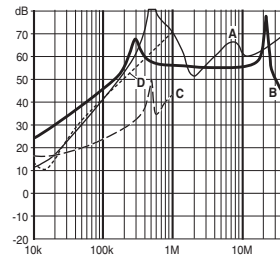


See tables for component values.

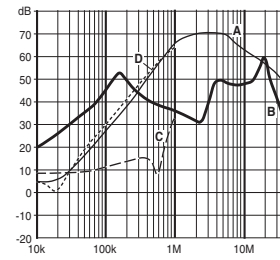
FN 680 insertion loss

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

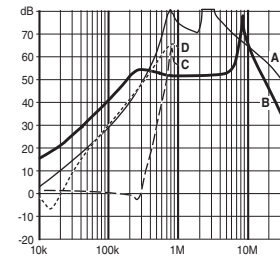
1 amp types



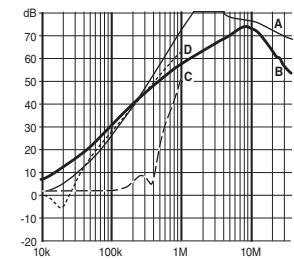
2.5 amp types



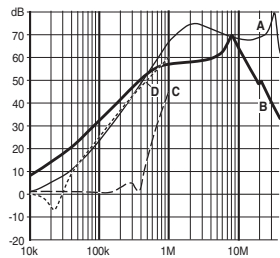
4 amp types



6.5 amp types



10 amp types



Mechanical data

FN 680-1

J11

		Tol. mm
A	71	± 0.5
B	52.6	± 0.5
C	29	± 0.5
D	50.5	± 1
F	61	± 0.2
J	21	± 0.5
K	14	± 0.5
L	20	± 0.5
M	5.3	± 0.1
N	6.3	± 0.1
Y	6	± 1
Z	140	+ 5

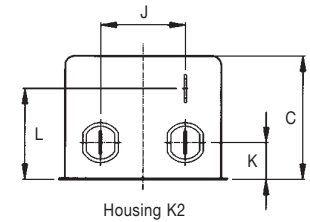
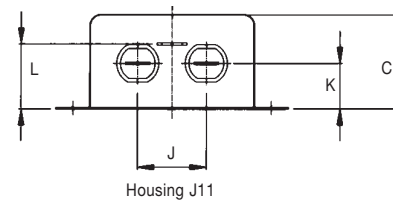
FN 680-2.5 FN 682-6.5 FN 682-10 FN 682-4

	K2	L1	L2	Tol.* mm
A	85	105		± 0.5
B	54	99.5 ± 1		± 0.5
C	40	38	57	± 1
D	65	84.5		± 1
E		79		± 0.5
F	75	95		± 0.2
G		51		± 0.1
J	27	40		± 0.5
K	12	9.5		± 0.5
L	29.5	19		± 0.5
M	5.3	4.4		± 0.1
N	6.3	6		± 0.1
Y		6		± 1
Z		140		+ 5

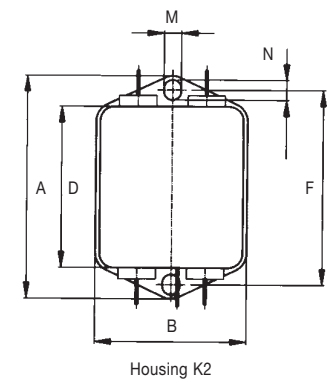
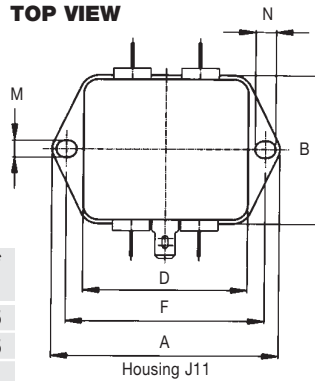
* Measurements share this common tolerance unless otherwise stated.

All dimensions in mm; 1 inch = 25.4 mm

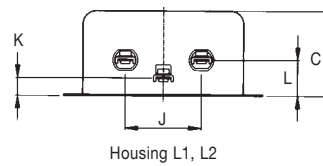
FRONT VIEW



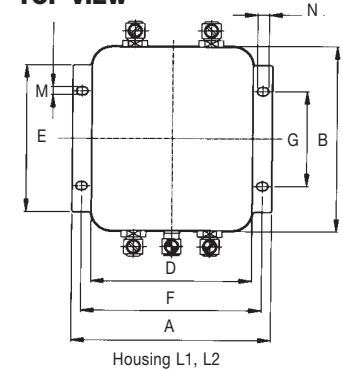
TOP VIEW



FRONT VIEW



TOP VIEW



High-power performance filter

FN 685

- current ratings from 10 to 36A
- excellent attenuation characteristics
- Nennströme von 10 bis 36 A
- Ausgezeichnetes Dämpfungsverhalten
- courants de service de 10 à 36A
- excellentes caractéristiques d'atténuation



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 685-10/06 is a 10A filter with fast-on connections.

Approvals



Family	Connections			Current ratings at 40°C (25°) A	Inductance L/L1 mH	Housing	Weight g
FN 685 -10 /??	/03	/06	-	10 (12)	4.2/0.04	B7A	1200
FN 685 -16 /??	/03	/06	-	16 (19.2)	2.3/0.04	B7A	1350
FN 686 -25 /??	-	-	/23	25 (30)	1.35/0.04	B23	2350
FN 686 -36 /??	-	-	/23	36 (43.2)	0.8/0.03	B23	2850

Additional specifications

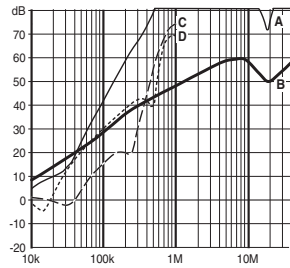
Filter type	Capacitance		Res. R MΩ	Maximum leakage μA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
	Cx/Cx1 nF	Cy nF			VAC	Hz		PN→E VAC	P→N VDC
FN 685 types	470/220	4.7	0.33	410	250	50/60	DC to 400	2000	1700
FN 686 types	470/220	22	0.33	1900	250	50/60	DC to 400	2000	1700

MTBF at 40°C, 230V, per Mil-HB-217F: 400,000 hours.

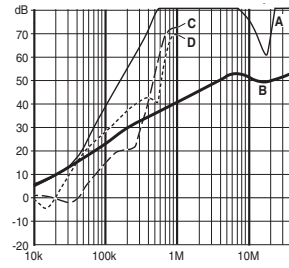
FN 685 insertion loss

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

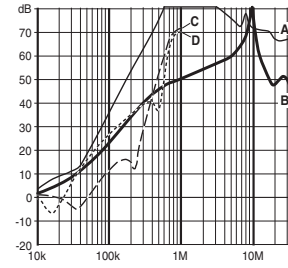
10 amp types



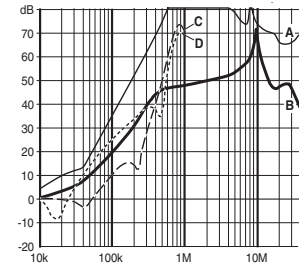
16 amp types



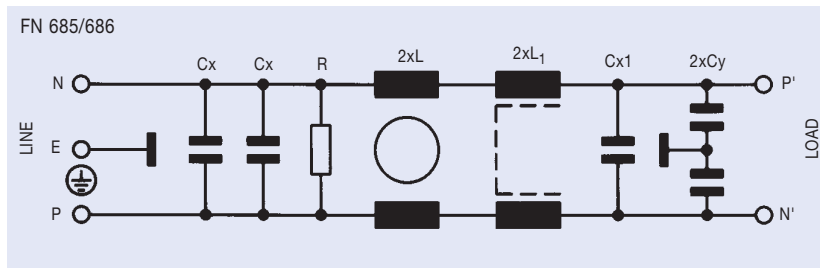
25 amp types



36 amp types



Electrical schematic



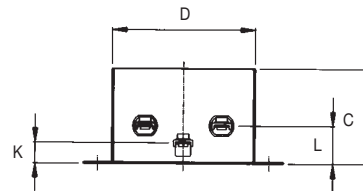
See tables for component values.

Mechanical data

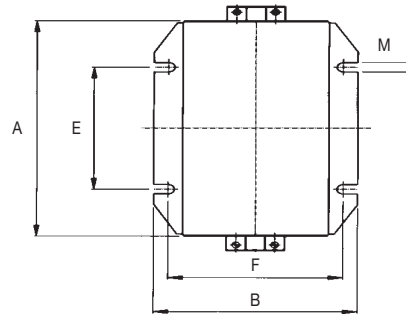
	FN 685	FN 686	Tol.* mm
	B7A	B23	
A	150	170	± 0.5
B	105	129 ± 1	± 0.5
C	50	60	± 0.5
D	75	100	± 0.5
E	85	115 ± 0.2	± 0.1
F	90	113 ± 0.2	± 0.5
K	11	15	± 0.5
L	20	24	± 0.5
M	6.5		± 0.1

* Measurements share this common tolerance unless otherwise stated.

FRONT VIEW



TOP VIEW



All dimensions in mm; 1 inch = 25.4 mm

Multi-stage general-purpose filter

FN 2060

- current ratings from 1 to 30A
 - high differential and common mode attenuation
 - optional medical versions (B types)
 - optional safety versions (A types)
- Nennströme von 1 bis 30A
 - Hohe Gleich- und Gegentaktdämpfung
 - Optionale medizinische Versionen (Typ B)
 - Optionale Sicherheitsversionen (Typ A)
- courants de service de 1 à 30 A
 - bonne atténuation en modes différentiel et commun
 - en option version pour appareils médicaux (type B)
 - en option version pour la sécurité (type A)



Filter selection table

Choose the filter FN xxxx-x with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 2060-10/06 is a 10A filter with fast-on connections.

Approvals



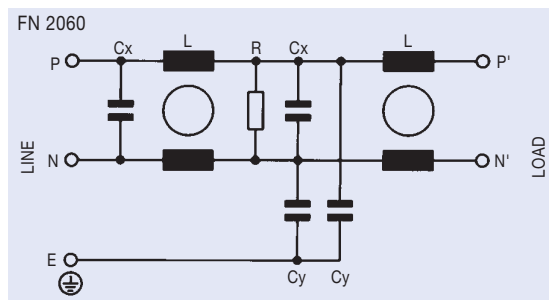
Filter	Connections			Current ratings at 40°C (25°) A	Inductance L mH	Capacitance		Resistance R MΩ	Housing	Weight g
						Cx μF	Cy nF			
FN 2060-1 /??	/06	/07	-	1 (1.15)	12	0.22	4.7	1	H2	120
FN 2060-3 /??	/06	/07	-	3 (3.45)	2.5	0.22	4.7	1	H2	120
FN 2060-6 /??	/06	/07	-	6 (6.9)	0.97	0.22	4.7	1	H2	120
FN 2060-10 /??	/06	/07	-	10 (11.5)	0.8	0.47	4.7	0.47	K1	190
FN 2060-12 /??	/06	/07	-	12 (13.8)	0.58	0.47	4.7	0.47	K1	190
FN 2060-16 /??	/06	/07	/08	16 (18.4)	0.65	0.33	4.7	1	K2	260
FN 2060-20 /??	/06	-	/08	20 (23)	0.6	1	4.7	0.22	P	480
FN 2060-30 /??	-	-	/08	30 (34.5)	0.6	1	10	0.22	L2	950

Additional specifications

Filter type	Maximum operating voltage		Operating frequency Hz	Hipot test voltage		MTBF Per Mil-HB-217F at 40°C 230V hours	Maximum leakage mA/phase
	VAC	Hz		PN→E VAC	P→N VDC		
Standard types	250	50/60	DC to 400	2000	1700	450 000	0.4*
B medical types (no Y capacitors)	250	50/60	DC to 400	2500	1700	450 000	0.002
A safety types (lower capacitance)	250	50/60	DC to 400	2500	1700	450 000	0.040

* 1mA for 30A version

Electrical schematic

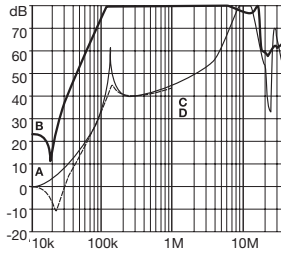


See tables for component values.

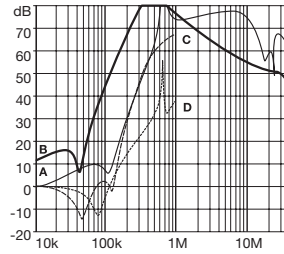
FN 2060 insertion loss

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

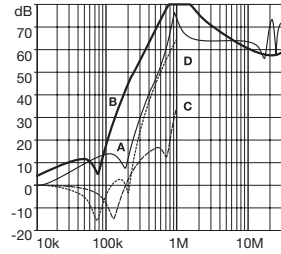
1A types



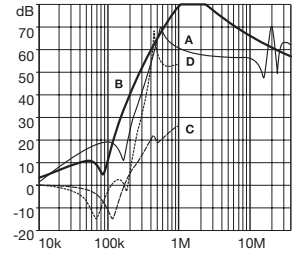
3A types



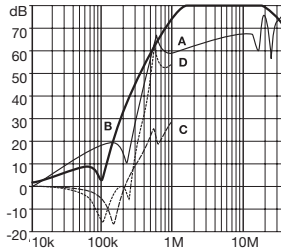
6A types



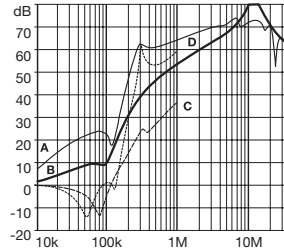
10A types (12A*)



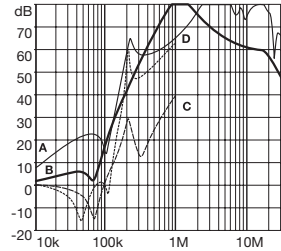
16A types



20A types



30A types



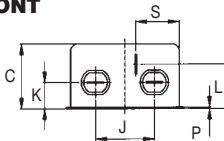
* attenuation performance of the 12A version is similar to the 10A component.

Mechanical data

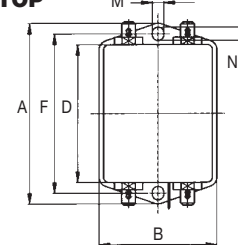
Housing style	H2	K1	K2	Toi. ± mm
A	71	85		± 0.5
B	46.6	54		± 0.5
C	29.3	30.3	40.3	± 0.5
D	50.5	64.8		± 0.5
F	61	75		± 0.3
J	21	27		± 0.2
K	10.8/8.3 [§]	12.3/8.3 [§]		± 0.5
L	19.3	20.8/23.3	29.8	± 0.5
M		5.3		± 0.1
N		6.3		± 0.1
P		0.7		± 0.1
S	20.1/30.5 [§]	19.9/34.9 [§]	11.4/34.9 [§]	± 0.5

[§] with /07 connections
wire length of /07: 140 +5 mm

FRONT

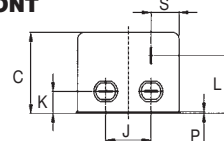


TOP

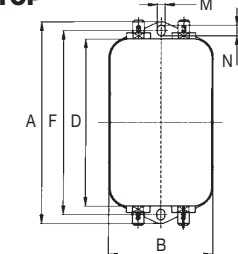


Housings H2, K1 and K2

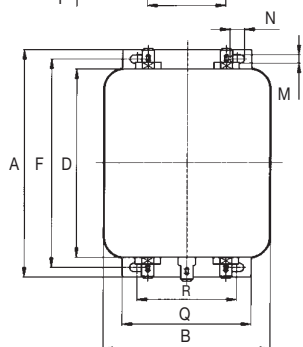
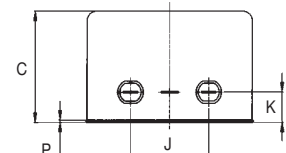
FRONT



TOP



Housing P



Housing L2

Housing style	P	L2	Toi.* ± mm
A	113.5	119 ± 0.5	± 1
B	57.5	85.5	± 1
C	45.4 ± 1.2	57.6	± 1
D	94	98.5	± 1
F	103	109	± 0.3
J	25	40	± 0.2
K	12.4	15.6	± 0.5
L	32.4		± 0.5
M	4.4	4.4	± 0.1
N	6	7.4	± 0.1
P	0.9	1.2	± 0.1
Q		66	± 0.3
R		51	± 0.2
S	15.5		± 0.5

* Measurements share this common tolerance unless otherwise stated.

All dimensions in mm; 1 inch = 25.4 mm

Multi-stage performance filter

FN 2070

- current ratings from 1 to 36A
 - very high differential and common mode attenuation
 - good high-frequency attenuation
 - optional medical versions (B types)
- Nennströme von 1 bis 36A
 - Sehr hohe Gleich- und Gegentaktdämpfung
 - Gute Hochfrequenzdämpfung
 - Optionale medizinische Versionen (Typ B)
- courants de service de 1 à 36A
 - très bonne atténuation en modes différentiel et mode commun
 - bonne atténuation à des hautes fréquences
 - en option version pour appareils médicaux (type B)



Filter selection table

Choose the filter FN xxxx-x with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 2070-10/06 is a 10A filter with fast-on connections.

Approvals

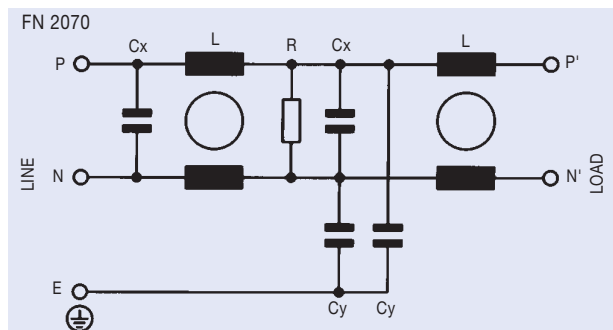


Filter	Connections			Current ratings at 40°C (25°) A	Inductance L mH	Capacitance		Resistance R MΩ	Housing	Weight g
	/06	/07	/08			Cx μF	Cy nF			
FN 2070-1 /??	/06	/07	-	1 (1.15)	22	0.33	4.7	1	K1	190
FN 2070-3 /??	/06	/07	-	3 (3.45)	9.8	0.47	4.7	0.47	K2	250
FN 2070-6 /??	/06	/07	-	6 (6.9)	7.8	1	4.7	0.22	P	450
FN 2070-10 /??	/06	/07	-	10 (11.5)	4.5	1	4.7	0.22	Q	730
FN 2070-12 /??	/06	/07	-	12 (13.8)	3.25	1	4.7	0.22	Q	730
FN 2070-16 /??	/06	/07	/08	16 (18.4)	2.8	1	4.7	0.22	L2	1000
FN 2070-25 /??	-	-	/08	25 (28.75)	2	2.2	4.7	0.22	Q	760
FN 2070-36 /??	-	-	/08	36 (41.4)	1.23	2.2	4.7	0.22	Q	790

Additional specifications

Filter type	Maximum operating voltage		Operating frequency Hz	Hipot test voltage		MTBF Per Mil-HB-217F at 40°C 230V hours	Maximum leakage mA/phase
	VAC	Hz		PN→E VAC	P→N VDC		
Standard types	250	50/60	DC to 400	2000	1700	400 000	0.4
B medical types (no Y capacitors)	250	50/60	DC to 400	2500	1700	400 000	0.002
A safety types (lower capacitance)	250	50/60	DC to 400	2500	1700	400 000	0.040

Electrical schematic

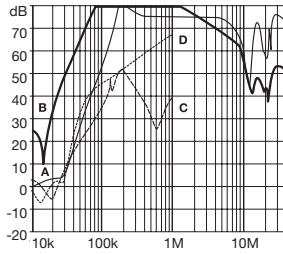


See tables for component values.

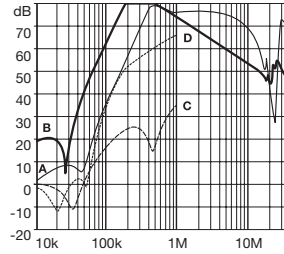
FN 2070 insertion loss

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

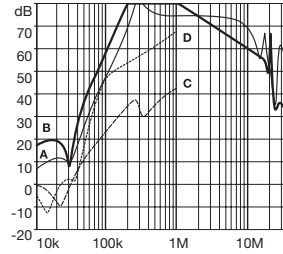
1A types



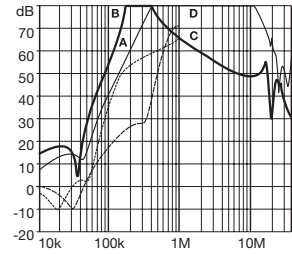
3A types



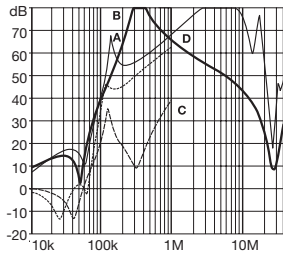
6A types



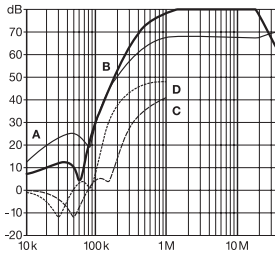
10A types (12A*)



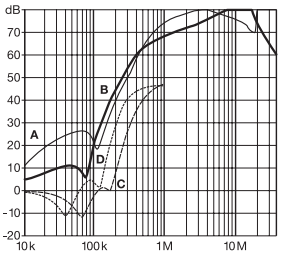
16A types



25A types



36A types



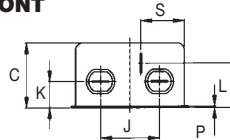
* attenuation performance of the 12A version is similar to the 10A component.

Mechanical data

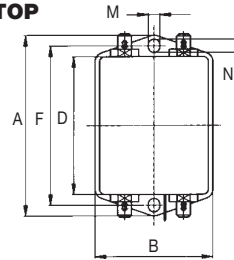
Housing style	K1	K2	Tol. ± mm
A	85		± 0.5
B	54		± 0.5
C	30.3	40.3	± 0.5
D	64.8		± 0.5
F	75		± 0.3
J	27		± 0.2
K	12.3/8.3 [§]		± 0.5
L	20.8/23.3	29.8	± 0.5
M	5.3		± 0.1
N	6.3		± 0.1
P	0.7		± 0.1
S	19.9/34.9 [§]	11.4/34.9 [§]	± 0.5

§ with /07 connections
wire length of /07: 140 +5 mm

FRONT



TOP



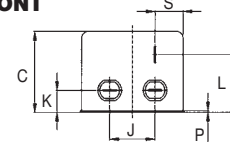
Housings K1 and K2

Housing style	P	Q	L2	Tol.* ± mm
A	113.5	156	119 ± 0.5	± 1
B	57.5		85.5	± 1
C	45.4 ± 1.2		57.6	± 1
D	94	130.5	98.5	± 1
F	103	143	109	± 0.3
J	25		40	± 0.2
K	12.4/8.4 [§]		15.6/8.6 [§]	± 0.5
L	32.4			± 0.5
M	4.4	5.3	4.4	± 0.1
N	6		7.4	± 0.1
P	0.9		1.2	± 0.1
Q			66	± 0.3
R			51	± 0.2
S	15.5/38 [§]			± 0.5

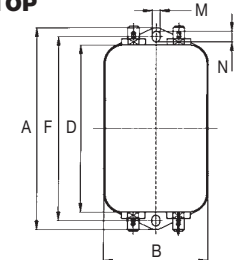
§ with /07 connections
wire length of /07: 140 +5 mm

* Measurements share this common tolerance unless otherwise stated.

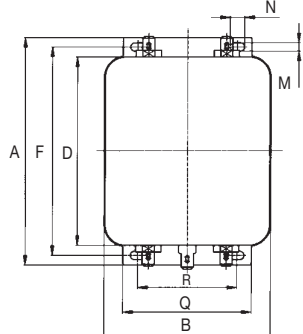
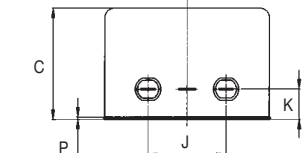
FRONT



TOP



Housing P and Q



Housing L2

All dimensions in mm; 1 inch = 25.4 mm

Multi-stage high-performance filter FN 2080

- current ratings from 1 to 16A
 - very high differential and common mode attenuation
 - good low-frequency attenuation
 - optional medical versions (B types)
- Nennströme von 1 bis 16A
 - Sehr hohe Gleich- und Gegentaktdämpfung
 - Gute Niederfrequenzdämpfung
 - Optionale medizinische Versionen (Typ B)
- courants de service de 1 à 16 A
 - très bonne atténuation en modes différentiel et commun
 - bonne atténuation à des basses fréquences
 - en option version pour appareils médicaux (type B)



Filter selection table

Choose the filter FN xxxx-x with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 2080-10/06 is a 10A filter with fast-on connections.

Approvals

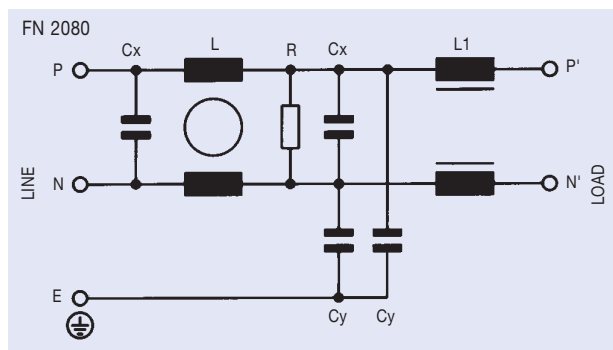


Filter	Connections			Current ratings at 40°C (25°) A	Inductance		Capacitance		Resistance R MΩ	Housing	Weight g
					L	L1	Cx	Cy			
FN 2080-1 /??	/06	/07	-	1 (1.15)	22	0.49	0.33	4.7	1	K1	200
FN 2080-3 /??	/06	/07	-	3 (3.45)	9.8	0.16	0.47	4.7	0.47	K2	270
FN 2080-6 /??	/06	/07	-	6 (6.9)	7.8	0.11	1	4.7	0.22	P	470
FN 2080-10 /??	/06	/07	-	10 (11.5)	4.5	0.06	1	4.7	0.22	Q	750
FN 2080-12 /??	/06	/07	-	12 (13.8)	3.25	0.05	1	4.7	0.22	Q	750
FN 2080-16 /??	/06	/07	/08	16 (18.4)	2.8	0.043	1	4.7	0.22	L2	1020

Additional specifications

Filter type	Maximum operating voltage		Operating frequency Hz	Hipot test voltage		MTBF Per Mil-HB-217F at 40°C 230V hours	Maximum leakage mA/phase
	VAC	Hz		PN→E VAC	P→N VDC		
Standard types	250	50/60	DC to 400	2000	1700	350 000	0.4
B medical types (no Y capacitors)	250	50/60	DC to 400	2500	1700	350 000	0.002
A safety types (lower capacitance)	250	50/60	DC to 400	2500	1700	350 000	0.040

Electrical schematic

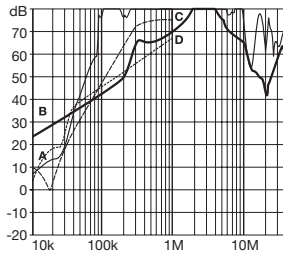


See tables for component values.

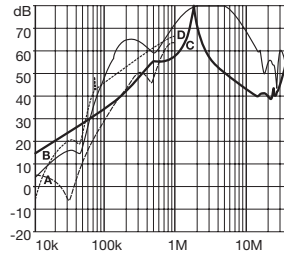
FN 2080 insertion loss

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

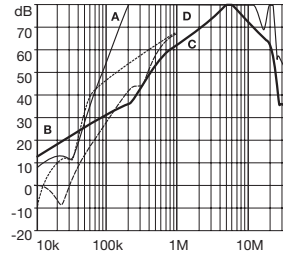
1A types



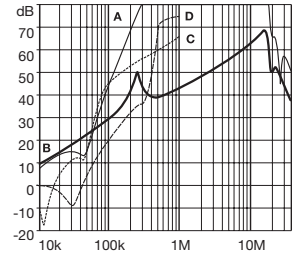
3A types



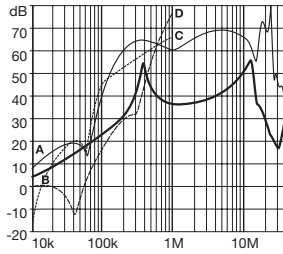
6A types



10A types (12A*)



16A types



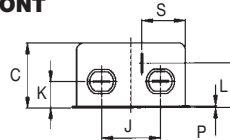
* attenuation performance of the 12A version is similar to the 10A component.

Mechanical data

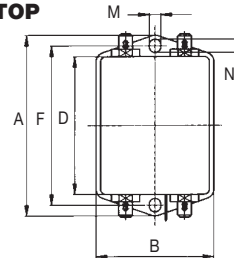
Housing style	K1	K2	Tol. ± mm
A		85	± 0.5
B		54	± 0.5
C	30.3	40.3	± 0.5
D		64.8	± 0.5
F		75	± 0.3
J		27	± 0.2
K	12.3/8.3 [§]		± 0.5
L	20.8/23.3	29.8	± 0.5
M		5.3	± 0.1
N		6.3	± 0.1
P		0.7	± 0.1
S	19.9/34.9 [§]	11.4/34.9 [§]	± 0.5

§ with /07 connections
wire length of /07: 140 +5 mm

FRONT

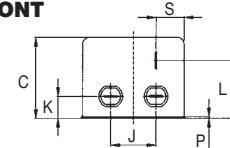


TOP

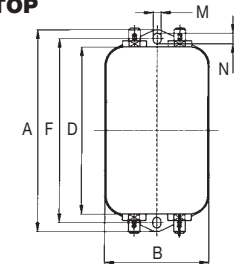


Housings K1 and K2

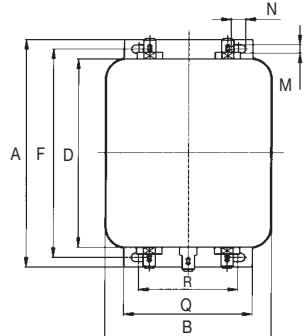
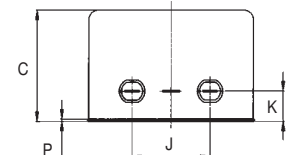
FRONT



TOP



Housing P and Q



Housing L2

Housing style	P	Q	L2	Tol.* ± mm
A	113.5	156	119 ± 0.5	± 1
B	57.5		85.5	± 1
C	45.4 ± 1.2		57.6	± 1
D	94	130.5	98.5	± 1
F	103	143	109	± 0.3
J	25		40	± 0.2
K	12.4/8.4 [§]		15.6/8.6 [§]	± 0.5
L	32.4			± 0.5
M	4.4	5.3	4.4	± 0.1
N	6		7.4	± 0.1
P	0.9		1.2	± 0.1
Q			66	± 0.3
R			51	± 0.2
S	15.5/38 [§]			± 0.5

§ with /07 connections
wire length of /07: 140 +5 mm

* Measurements share this common tolerance unless otherwise stated.

All dimensions in mm; 1 inch = 25.4 mm

Single-phase chassis-mounting filter FN 2320

- Current ratings from 3 to 20A
- Broadband attenuation characteristics
- UL-rated materials
- Nennströme von 3 bis 20A
- Breitbandige Dämpfungseigenschaften
- UL konformes Material
- Courants de service de 3 à 20A
- Atténuation large bande
- Matériaux UL



Filter selection table

Filter	Conn. / Housing		Current ratings @40°C (25°C) [A]	Inductance		Capacitance		Resistance R [MΩ]	Weight [g]
				L [mH]	L1 [μH]	Cx [μF]	Cy [nF]		
FN2320Y-3-06	Fast-on	H2	3 (3.35)	1.1	30	0.33	5.5	1	125
FN2320Y-6-06	Fast-on	K2	6 (6.7)	1.9	70	0.33	5.5	1	275
FN2320Y-10-06	Fast-on	K2	10 (11.2)	1.3	40	0.33	5.5	1	285
FN2320Y-20-06	Fast-on	L1	20 (22.4)	1.0	30	0.33	5.5	1	600

Approvals

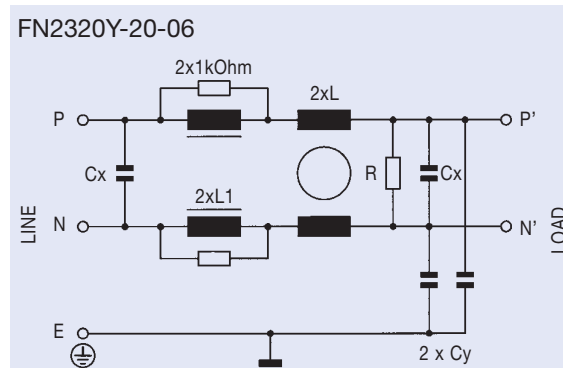
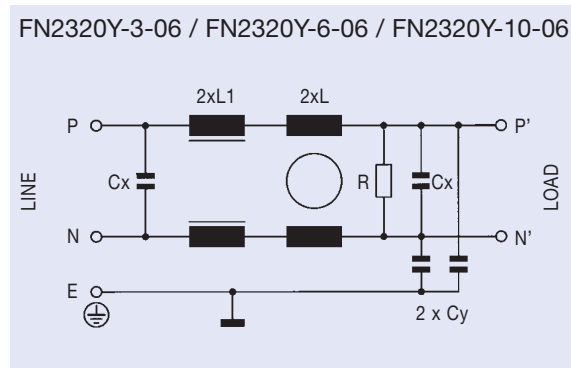


Additional specifications

Filter type	Maximum operating voltage		Operating frequency [Hz]	Hipot test voltage		Maximum leakage @ 230VAC/50Hz [mA]	Temperature range
	[VAC]	[Hz]		PN→E [VAC]	P→N [VDC]		
All types	250	50/60	DC to 60	2000	1100	0.94	-25°C - +100°C

MTBF at 40°C, 230V, per Mil-HB-217F: 1,300,000 hours.

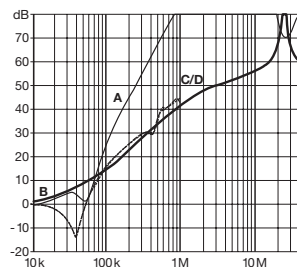
Electrical schematics



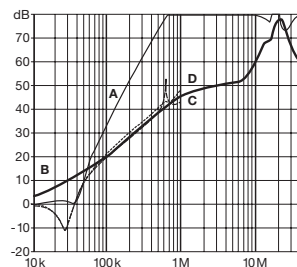
FN 2320 insertion loss

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

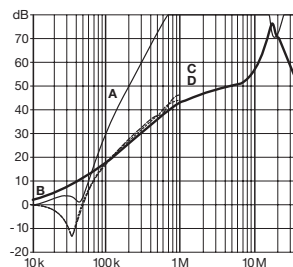
3 amp types



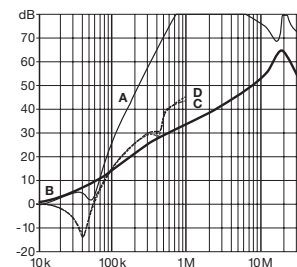
6 amp types



10 amp types

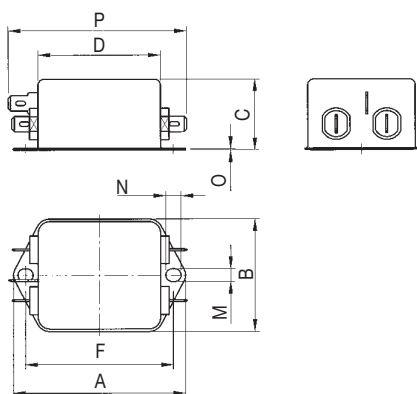


20 amp types



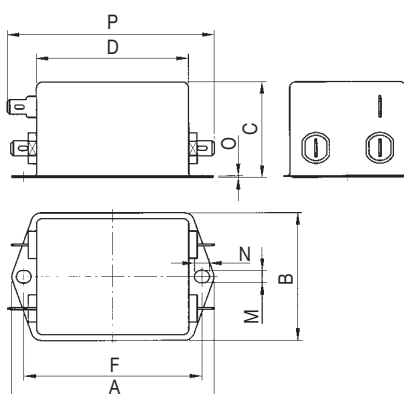
Mechanical data

-3A



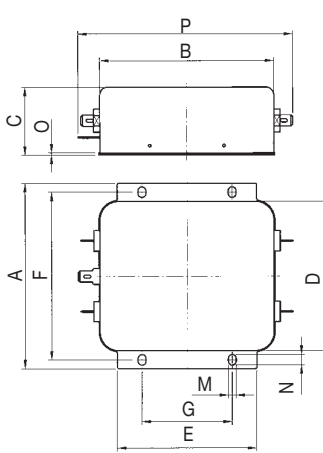
Housing H2

-6A, -10A



Housing K2

-20A



Housing L1

FN2320Y

	3A	6A	10A	20A	Tol.* [mm]
A	71	85		105	± 0.5
B	46.6	54		98.5 ± 1	± 0.5
C	29.3	40.3		38.6 ± 1	± 0.5
D	50.5	64		84.5 ± 1	± 0.5
E				79	± 0.5
F	61	75		95	± 0.3
G				51	± 0.1
M		5.3		4.4	± 0.1
N		6.3		6	± 0.1
O		0.7		1.2	± 0.1
P	74	87		121.6	± 1

* Measurements share this common tolerance unless otherwise stated.

All dimensions in mm; 1 inch = 25.4mm.

Single-phase chassis-mounting filter FN 2350

- Current ratings from 2 to 10A
- Exceptional differential and common mode attenuation
- UL-rated materials
- Nennströme von 2 bis 10A
- Sehr hohe Gleich- und Gegentaktdämpfung
- UL konformes Material
- Courants de service de 2 à 10A
- Très bonne atténuation en modes différentiel et commun
- Matériaux UL



Filter selection table

Filter	Conn. / Housing		Current ratings @40°C (25°C) [A]	Inductance		Capacitance		Resistance R [MΩ]	Weight [g]
				L [mH]	L1 [mH]	Cx [μF]	Cy [nF]		
FN2350Y-2-06	Fast-on	H2	2 (2.25)	0.52	0.52	0.1	5.5	1	115
FN2350Y-3-06	Fast-on	K1	3 (3.35)	1.7	1.7	0.1	5.5	1	175
FN2350Y-5-06	Fast-on	K1	5 (5.6)	0.54	0.54	0.1	5.5	1	175
FN2350Y-10-06	Fast-on	K2	10 (11.2)	0.54	0.54	0.1	5.5	1	225

Approvals

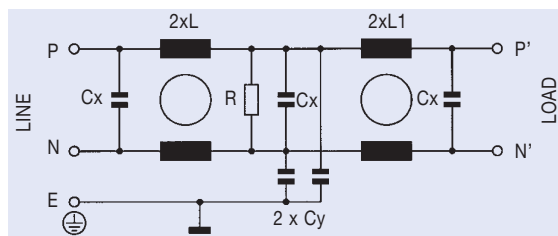


Additional specifications

Filter type	Maximum operating voltage		Operating frequency [Hz]	Hipot test voltage		Maximum leakage @ 230VAC/50Hz [mA]	Temperature range
	[VAC]	[Hz]		PN→E [VAC]	P→N [VAC]		
All types	250	50/60	DC to 60	2000	760	0.94	-25°C - +100°C

MTBF at 40°C, 230V, per Mil-HB-217F: 2,200,000 hours.

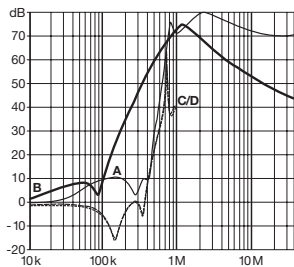
Electrical schematic



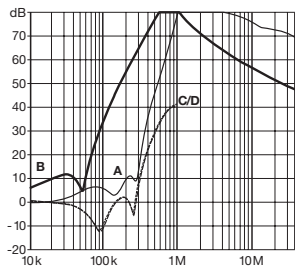
FN 2350 insertion loss

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

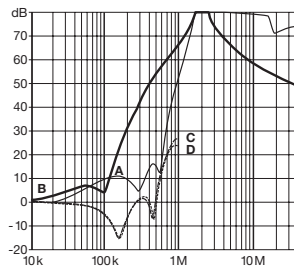
2 amp types



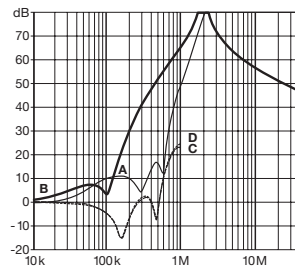
3 amp types



5 amp types

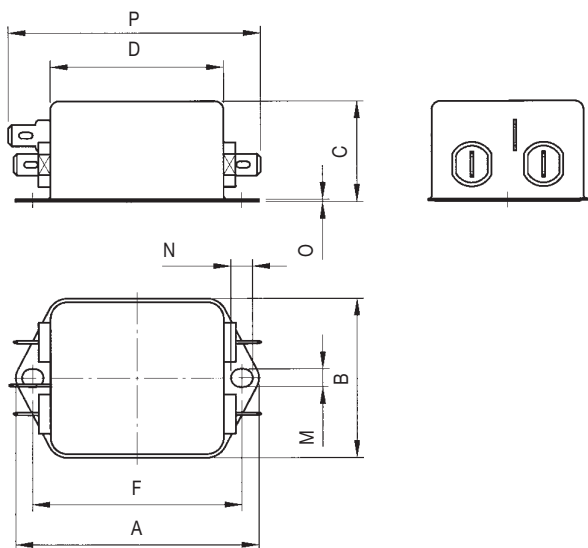


10 amp types



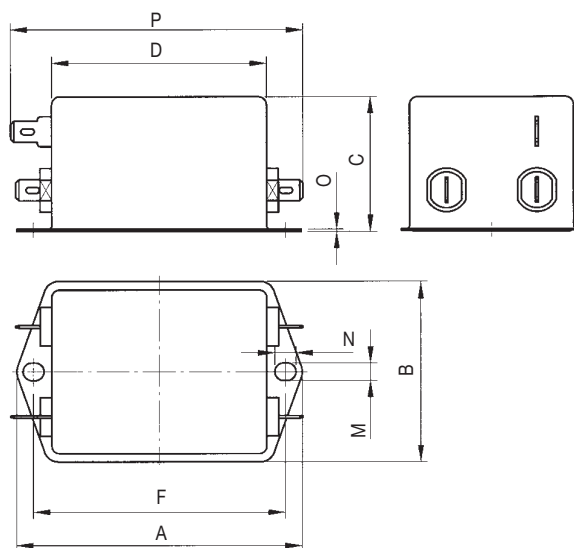
Mechanical data

-2A, -3A, -5A



Housing H2, K1

-10A



Housing K2

FN2350Y					Tol. [mm]
	2A	3A	5A	10A	
A	71		85		± 0.5
B	46.6		54		± 0.5
C	29.3		30.3	40.3	± 0.5
D	50.5		64		± 0.5
F	61		75		± 0.3
M			5.3		± 0.1
N			6.3		± 0.1
O			0.7		± 0.1
P	74		87		± 1

All dimensions in mm; 1 inch = 25.4mm.

Single-phase chassis-mounting filter FN 2360

- Current ratings of 3 and 6A
- Medical versions (B types)
- UL-rated materials
- Nennströme von 3 und 6A
- Versionen für medizinische Anwendungen (B-Typen)
- UL konformes Material
- Courants de service de 3 et 6A
- Version pour appareils médicaux (type B)
- Matériaux UL



Filter selection table

Filter	Conn. / Housing		Current ratings @40°C (25°C) [A]	Inductance		Capacitance		Resistance R [MΩ]	Weight g
				L [mH]	L1 [mH]	Cx [μF]	Cy [nF]		
FN2360W-3-06	Fast-on	K2	3 (3.35)	32.3	0.4	0.47	3	1	300
FN2360B-3-06	Fast-on	K2	3 (3.35)	32.3	0.4	0.47	-	1	300
FN2360X-6-06	Fast-on	P	6 (6.7)	48.2	1.7	1.5	4	1	500
FN2360B-6-06	Fast-on	P	6 (6.7)	48.2	1.7	1.5	-	1	500

Approvals



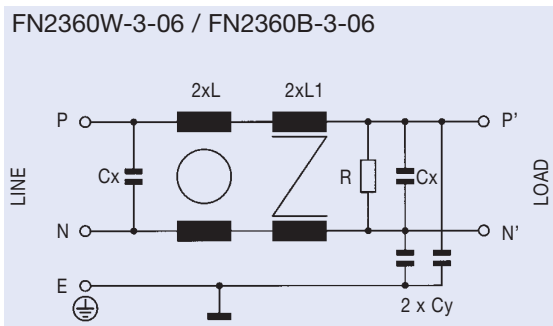
Additional specifications

Filter type	Maximum operating voltage		Operating frequency [Hz]	Hipot test voltage		Maximum leakage @ 230VAC/50Hz [mA]	Temperature range
	[VAC]	[Hz]		PN→E [VAC]	P→N [VDC]		
Standard types	250	50/60	DC to 60	2000	1100	0.52 *	-25°C - +100°C
B medical types	250	50/60	DC to 60	2500	1100	0.004	-25°C - +100°C

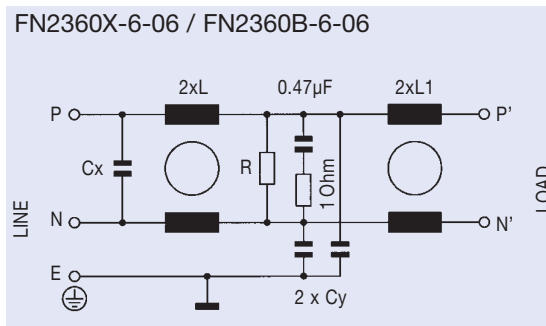
MTBF at 40°C, 230V, per Mil-HB-217F: 2,400,000 hours.

* 0.70mA for FN2360X-6-06

Electrical schematics



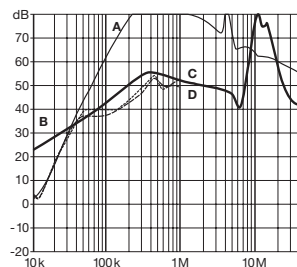
Note: Medical types (B-types) without Y-capacitors.



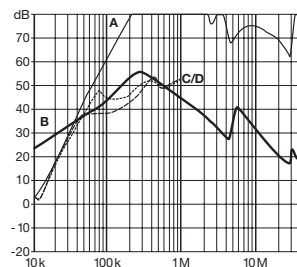
FN 2360 insertion loss

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

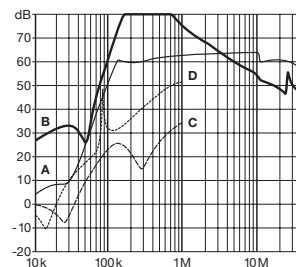
3 amp (W-types)



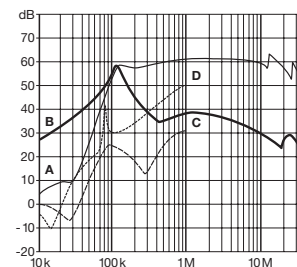
3 amp (B-types)



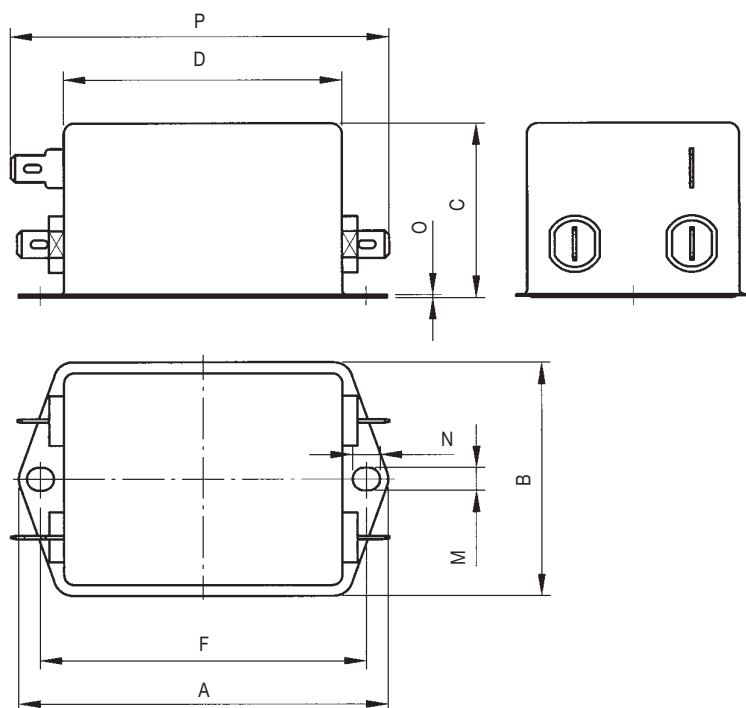
6 amp (X-types)



6 amp (B-types)



Mechanical data



FN2360

	FN2360W-3-06	FN2360B-3-06	FN2360X-6-06	FN2360B-6-06	Tol.* [mm]
A	85		113.5 ± 1		± 0.5
B	54		57.5 ± 1		± 0.5
C	40.3		45.5 ± 1		± 0.5
D	64		94 ± 1		± 0.5
F	75		103.5		± 0.3
M	5.3		4.4		± 0.1
N	6.3		6		± 0.1
O	0.7		1		± 0.1
P	87		117		± 1

* Measurements share this common tolerance unless otherwise stated.

All dimensions in mm; 1 inch = 25.4mm.

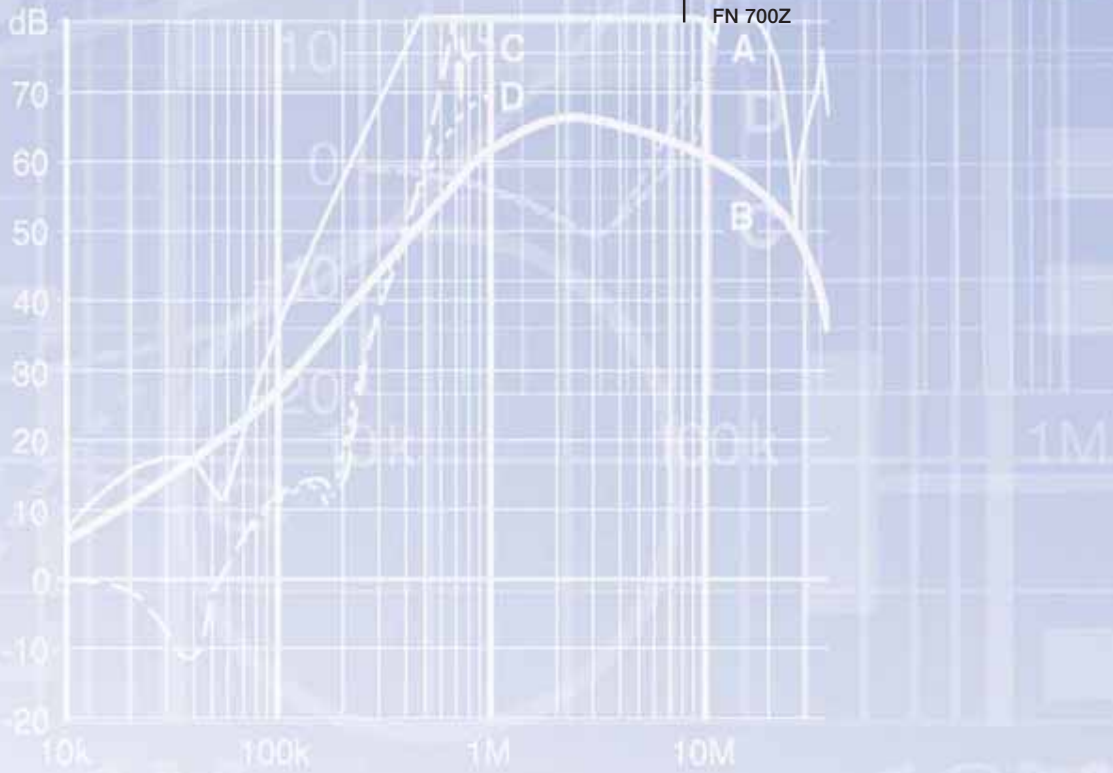
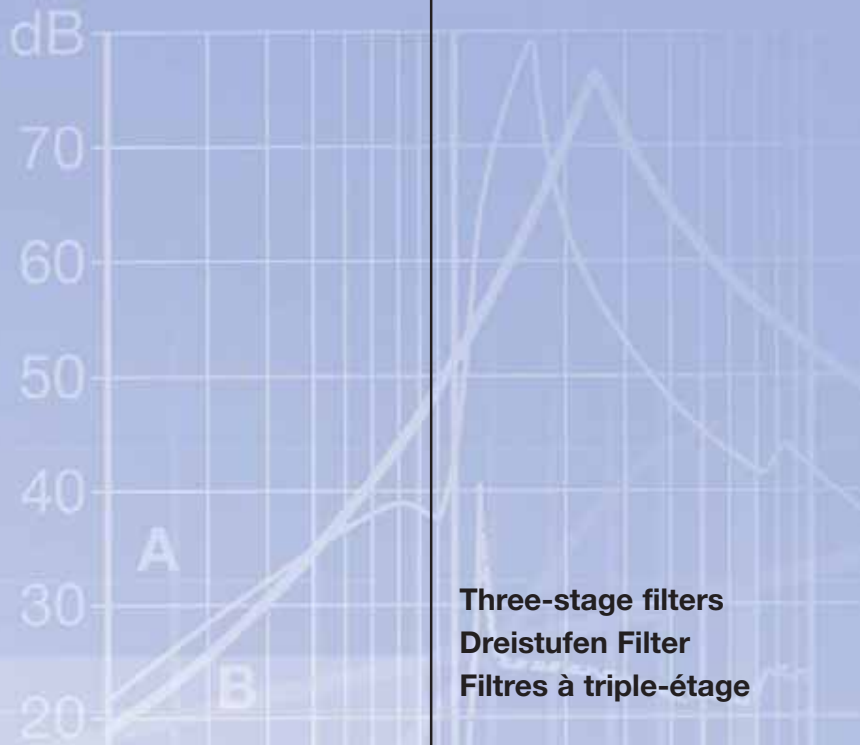
Single-phase filters

Three-stage filters

Dreistufen Filter

Filtres à triple-étage





FN 352Z

Multi-stage filter

- 6 to 30A current ratings
- integral surge voltage protection to 2kA
- solder or screwdriver connections
- Nennströme von 6 bis 30 A
- Eingebauter Stoßspannungsschutz bis 2kA
- Löt- oder Schraubanschlüsse
- courants de service de 6 à 30 A
- protection interne contre les surtensions jusqu'à 2kA
- connexions par brides ou cosses à souder



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 352Z-6/06 is a 6A filter with fast-on connections.

Approvals



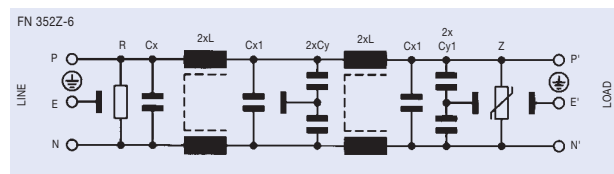
Family	Connections		Current ratings at 40°C (25°) A	Capacitance Cx/Cx1 nF		Res. R MΩ	Inductance L/L ₁ /L ₂ mH	Maximum leakage μA/phase	Housing	Weight g
				Cy/Cy1 nF	Z					
FN 352Z -6 /??	/06	-	6 (7.2)	470/220	3.3/1.5	0.47	3/3/-	420	B22	575
FN 352Z -10 /??	-	/29	10 (12)	220/220	15/15	0.47	5/0.06/0.003	1300	B8	1320
FN 352Z -20 /??	-	/29	16 (20)	220/220	15/15	0.47	3.5/0.06/0.0035	1300	B13	2950
FN 353Z -30 /??	-	/33	24 (30)	470/220	15/15	0.23	2.3/0.025/0.035	1300	B13	3100

Additional specifications

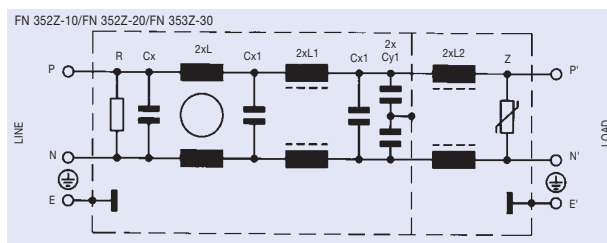
Filter type	Energy absorption J	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
		VAC	Hz		PN→E VAC	P→N VDC
Standard types	40	250	50/60	DC to 400	2000	350

MTBF at 40°C, 230V, per Mil-HB-217F: 230,000 hours.

Electrical schematics



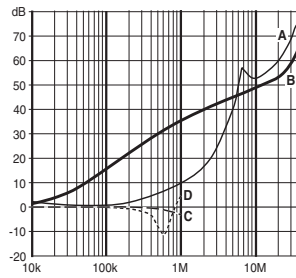
See tables for component values.



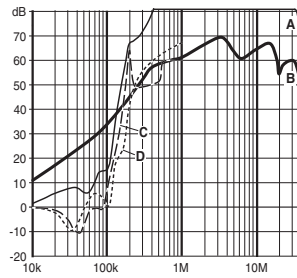
FN 352Z insertion loss

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

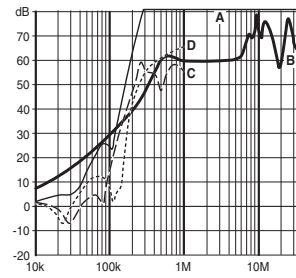
6 amp types



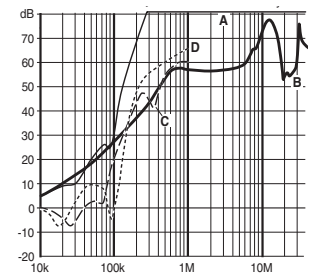
10 amp types



20 amp types



30 amp types

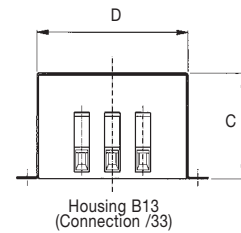
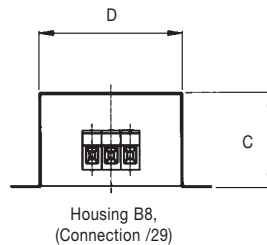
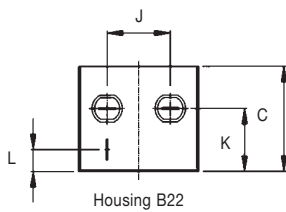


Mechanical data

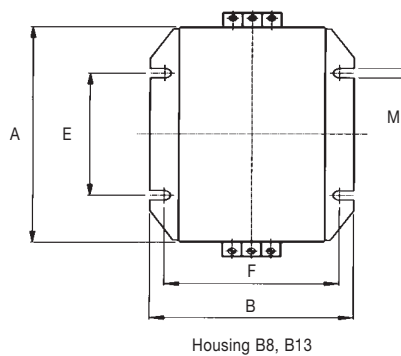
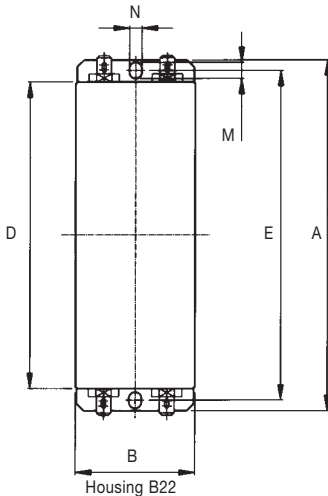
	FN 352Z-6 B22	FN 352Z-10 B8	FN 352Z-20 FN 353Z-30 B13	Tol.* mm
A	152	150.5	200	± 0.5
B	51	126 ⁺⁰ ₋₁	150	± 0.5
C	45	55.25	65	± 0.5
D	133	100.5	119.5	± 0.5
E	143 ± 0.3	85	115	± 0.1
F		112 ⁺⁰ _{-0.4}	135 - 0.6	± 0.5
J	27			± 0.5
K	27			± 0.5
L	9.5			± 0.5
M	7		6.4	± 0.1
N	5.3			± 0.1

* Measurements share this common tolerance unless otherwise stated.

FRONT VIEW



TOP VIEW



All dimensions in mm; 1 inch = 25.4mm.

FN 700Z

Three-stage filter

- current ratings from 6 to 20A (6 and 10A options with IEC inlets)
- TEMPEST / NEMP
- attenuation to 3GHz
- protection against high surge voltages

- Nennströme von 6 bis 20 A (6 und 10 A mit IEC Anschlüssen)
- TEMPEST / NEMP
- Dämpfung bis 3 GHz
- Schutz gegen hohe Stoßspannungen

- courants de service de 6 à 20 A (versions de 6A et 10A avec entrées IEC)
- TEMPEST / NEMP
- atténuation jusqu'à 3 GHz
- protection contre les surtensions élevées



Filter selection table

Choose the family FN xxx with the required current rating and features, and add /?? to determine input/output (line/load) connection style. Example: FN 700Z-20/03 is a 20A filter with M4 screw clamp connections.

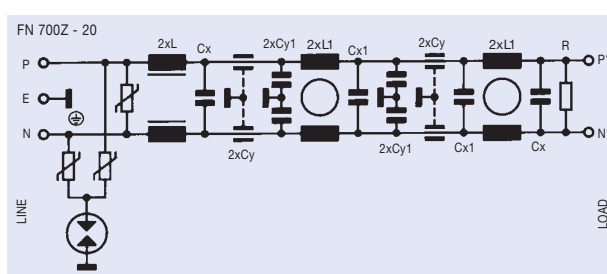
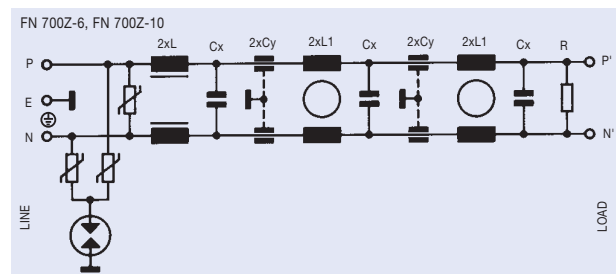
Family	Connections		Current ratings at 40°C (25°) A	Res R MΩ	Inductance		Housing	Weight g
					L μH	L1 mH		
FN 700Z -6 /??	-	/06	6 (6.9)	0.33	50	17.1	B24	2000
FN 700Z -10 /??	-	/06	10 (11.6)	0.33	50	9.4	B25	2300
FN 700Z -20 /??	/03	-	20 (23)	0.33	60	5.5	B26	3500

Additional specifications

Filter type	Capacitance		Maximum leakage μA/phase	Maximum operating voltage		Operating frequency Hz	Hipot test voltage	
	Cx/Cx1 μF	Cy/Cy1 nF		VAC	Hz		PN→E VAC	P→N VAC
6A/10A types	1/-	2.5/-	440	250	50/60	DC to 400	590	590
20A types	1/2.2	5/10	2600	250	50/60	DC to 60	590	590

MTBF at 40°C, 230V, per Mil-HB-217F: 450,000 hours.

Electrical schematics

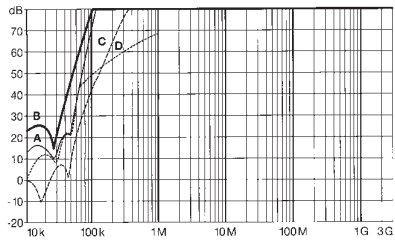


See tables for component values.

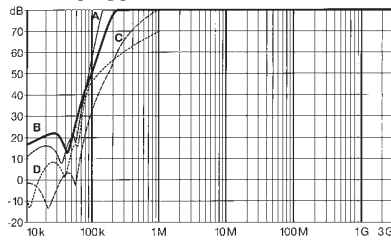
FN 700Z insertion loss

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

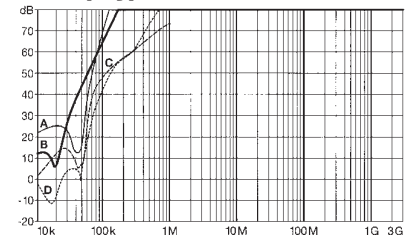
6 amp types



10 amp types



20 amp types

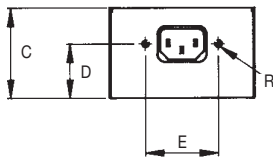


Mechanical data

	FN 700Z-6 B24	FN 700Z-10 B25	FN 700Z-20 B26	Tol.* mm
A	200	250	275	± 0.3
B	80		110	± 0.3
C	50			± 0.2
D	30		34 ± 0.2	± 0.3
E	40		94 ± 0.2	± 0.1
F	85	100	112.5	± 0.2
G	85	100	112.5	± 0.2
H	15	25		± 0.3
J	40		60 ± 0.5	± 0.3
K	30		25 ± 0.3	± 0.5
L	20		35 ± 0.5	± 0.3
M	50		94 ± 0.1	± 0.2
R	M4			-

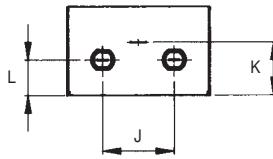
* Measurements share this common tolerance unless otherwise stated.

FRONT VIEW



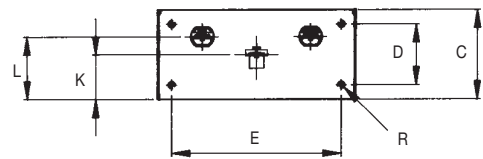
Housing B24, B25

BACK VIEW



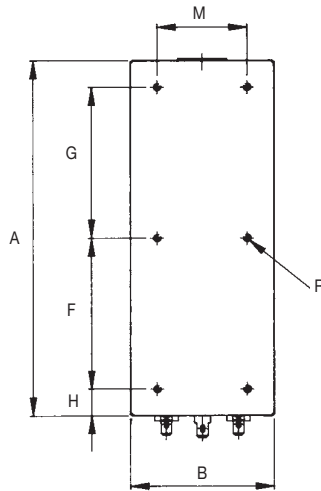
Housing B24, B25

FRONT VIEW



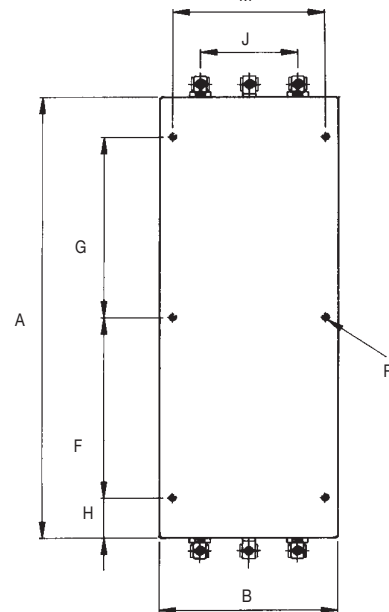
Housing B26

BOTTOM VIEW



Housing B24, B25

BOTTOM VIEW



Housing B26

All dimensions in mm; 1 inch = 25.4mm.