

Description

An extremely versatile range of rocker switch/thermal circuit breakers (S-type TO CBE to EN 60934 with trip free mechanism) offering the choice of single pole, double pole with single pole protection, and double pole with protection on both poles. Designed for snap-in panel mounting with versions available for three different panel cut-out sizes. Illumination is optional and there is a range of colours and markings for the rocker.

Add on modules:

- Under voltage release coil (for double pole versions only).
- Magnetic trip coil for short circuit protection.
- Magnetic trip coil for remote relay trip.
- Auxiliary contacts for status signalling.

Approved to CBE standard EN 60934 (IEC 60934).

Meets the requirements regarding fire resistance of EN 60335-1 : 2007-02 Safety of household and similar electrical appliances.

Typical applications

Motors, transformers, solenoids, extra low voltage wiring systems, office machines, electro-medical equipment, power supplies, communications systems, medical equipment to EN 60601.

Standard current ratings and typical internal resistance values

Current rating (A)	Internal resistance per pole (Ω)	Current rating (A)	Internal resistance per pole (Ω)
0.1	94	4	0.0435
0.2	24	4.5	0.0435
0.3	12	5	0.0325
0.4	5.30	6	0.0215
0.5	4.20	7	0.0165
0.6	2.90	8	0.0165
0.8	1.50	10	< 0.02
1	0.9	12	< 0.02
1.2	0.80	14	< 0.02
1.5	0.45	15	< 0.02
2	0.27	16	< 0.02
2.5	0.0785	18	< 0.02
3	0.0595	20	< 0.02
3.5	0.0565		

Illumination voltage/power consumption

operating voltage	power consumption		
	Y	R	G
12 V DC	5,2 mA	2 mA	1,4 mA
24 V DC	4,5 mA	2,2 mA	1,6 mA
115 V AC	2,8 mA	1,1 mA	1 mA
230 V AC	2,2 mA	0,9 mA	0,9 mA



Technical data

For further details please see chapter: Technical Information

Voltage rating	AC 240 V; DC 50 V (AC 415 V to special order) (UL: AC 250 V; DC 50 V)		
Current ratings	0.1...20 A (up to 30 A to special order, single pole only)		
Typical life	1-pole AC 240 V: 0.1...20 A 30,000 operations at 1 x I _N , inductive DC 50 V: 0.1...4 A 30,000 operations at 1 x I _N , inductive 4.5...16 A 30,000 operations at 1 x I _N , resistive DC 28 V: 0.1...20 A 30,000 operations at 1 x I _N , inductive 2-pole AC 415 V: 0.1...16 A 10,000 operations at 1 x I _N , inductive AC 240 V: 0.1...16 A 50,000 operations at 1 x I _N , inductive 17...20 A 30,000 operations at 1 x I _N , inductive DC 50 V: 0.1...16 A 50,000 operations at 1 x I _N , inductive 17...20 A 10,000 operations at 1 x I _N , inductive		
Ambient temperature	-30...+60 °C (-22...+140 °F)		
Insulation co-ordination (IEC 60664 and 60664 A)	rated impulse withstand voltage 2.5 kV reinforced insulation in operating area	pollution degree 2	
Dielectric strength (IEC 60664 and 60664A) operating area between poles (2-pole)	test voltage AC 3,000 V AC 1,500 V		
Insulation resistance	> 100 MΩ (DC 500 V)		
Interrupting capacity I _{cn}	0.1...2 A 10 x I _N 2.5...20 A 250 A 2-pole, or 150 A 1-pole		
Interrupting capacity (UL 1077)			
	I _N	U _N	I _{nc}
1, 2-pole	0.1...20 A	AC 250 V	5000 A
1, 2-pole	0.1...20 A	DC 50 V	1000 A
Degree of protection (IEC 60529/DIN 40050)	operating area IP40 (IP54 with water splash protection) terminal area IP00		
Vibration	8 g (57-500 Hz), ± 0.61 mm (10-57 Hz) to IEC 60068-2-6, test Fc 10 frequency cycles/axis		
Shock	30 g (11 ms) to IEC 60068-2-27, test Ea		
Corrosion	96 hours at 5 % salt mist, to IEC 60068-2-11, test Ka		
Humidity	240 hours at 95 % RH, to IEC 60068-2-78, test Cab		
Mass	approx. 33 g (double pole) approx. 27 g (single pole)		

Ordering information

Type No.

3120 rocker switch/circuit breaker

Mounting

F snap in frame

Size of frame

- 3 to fit mounting cut-out 50.5 x 21.5 mm
panel thickness: 1-6.35 mm (.039-.250 in)
- 5 to fit mounting cut-out 44.5 x 22 mm
panel thickness: 1-4 mm (.039-.157 in)
- 7 to fit mounting cut-out 44.5 x 22 mm
panel thickness: 1-4 mm (.039-.157 in)

Number of poles

- 0 2-pole, unprotected, switch only
- 1 1-pole, thermally protected
- 2 2-pole, thermally protected
- 5 2-pole, 1-pole thermally protected

Mounting frame design (F3 & F5)

- 1 collar height 1 mm
- 3 collar height 9 mm
- 4 collar height 2 mm with water splash protection (IP54)

Mounting frame design (F7)

- R black
- T black with snap-on splash cover

Terminal configuration

- P7 blade terminals, standard for curve T1
(thermal circuit breaker)
- H7 as P7, terminals 11 and 21 with flat head screws M3.5
– standard for units with undervoltage release module
- N7 as P7, but with additional shunt terminals 12(I) and 22(I) –
standard for version Q1 (switch only)

Characteristic curve

- T1 thermal 1.01 - 1.4 x I_N
- Q1 switch only

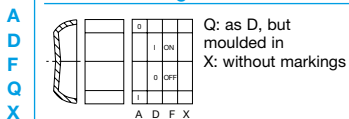
Actuator style

- W standard rocker (F3 & F5)
- A specially designed rocker (F7)

Colour and Illumination

- 01 . rocker black opaque without illumination
- 02 . rocker white opaque without illumination
- 04 . rocker red opaque without illumination
- 14 . R rocker red translucent with LED-illumination
- 15 . Y rocker orange translucent with LED-illumination
- 19 . G rocker green translucent with LED-illumination

Rocker markings for F3 and F5



Rocker markings for F7

- »I« and »O« moulded in

Illumination voltage range

- 1 10 - 14 V DC
- 2 20 - 28 V DC
- 3 90 - 140 V AC
- 4 185 - 275 V AC

Current ratings

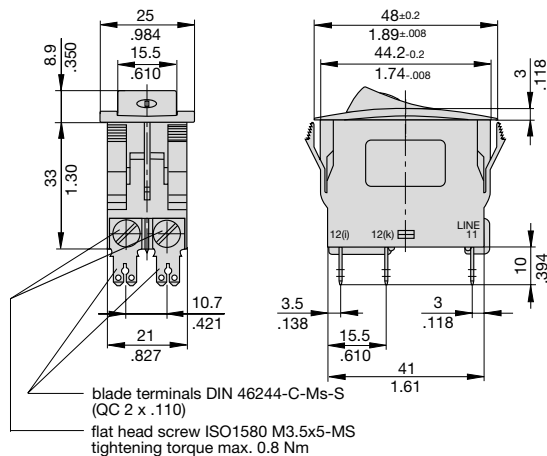
0.1...20 A

3120 - F 7 2 R - P7 T1 - A 14 QR 4 - 10 A ordering example

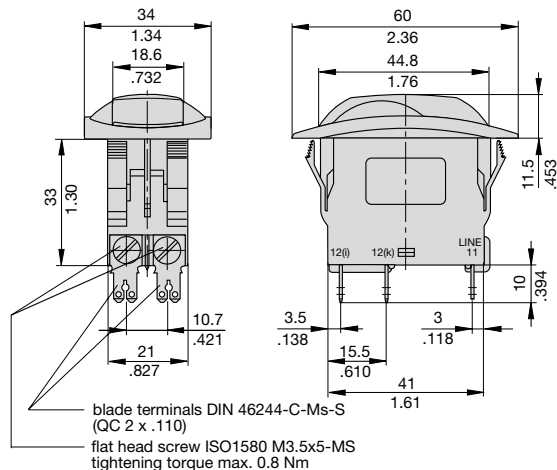
3120 - F . 0 . - N7 Q1 -W.. . . - 20 A (switch)

Dimensions

Style F7.R



Style F7.T



Preferred types

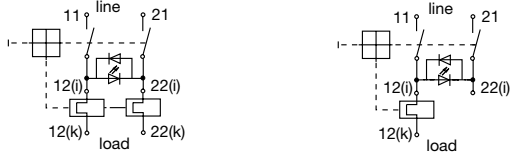
Preferred types	Standard current ratings (A)												
	0.5	1	2	3	4	5	6	8	10	12	15	16	20
Preferred types F3/1-pole protected													
3120-F311-P7T1-W02D-		x			x	x	x	x	x		x		x
Preferred types F3/2-pole protected													
3120-F321-P7T1-W01D-	x	x	x	x	x	x	x	x	x	x	x	x	x
Preferred types F5/2-pole protected													
3120-F521-P7T1-W01D-		x	x	x	x	x	x	x	x	x	x	x	x

Preferred types

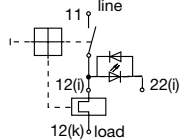
Preferred types F7/2-pole protected	Standard current ratings (A)													
	0.5	1	1.5	2	3	4	5	6	8	10	12	15	16	20
3120-F72R-P7T1-A14QR4	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Internal connection diagrams

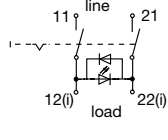
2-pole, thermally protected on both poles **2-pole, thermally protected on one pole only**



1-pole, thermally protected

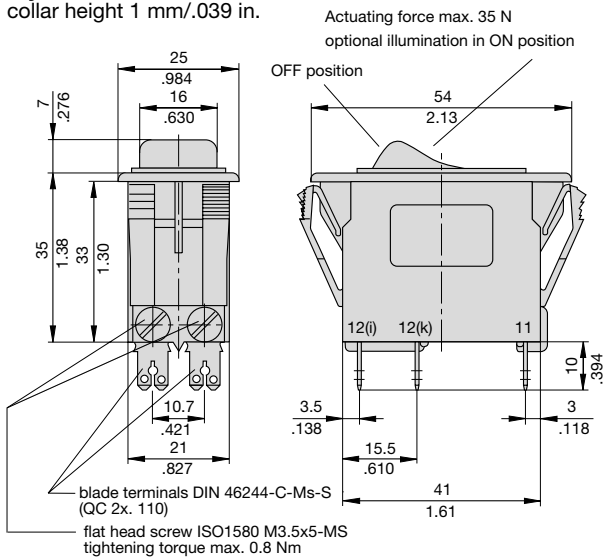


2-pole, unprotected

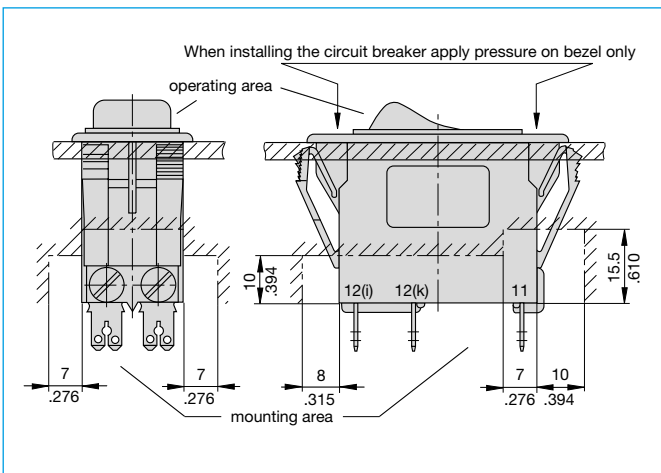


Dimensions

Style F3.1
collar height 1 mm/.039 in.



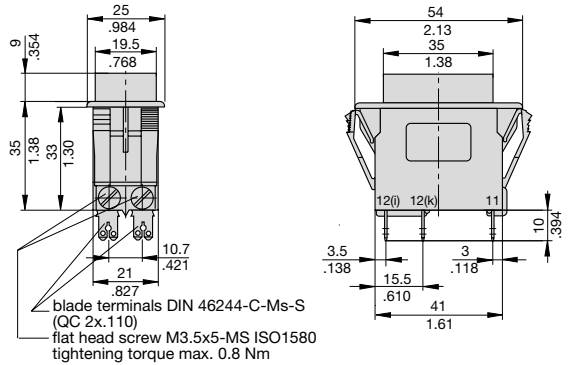
Installation drawing



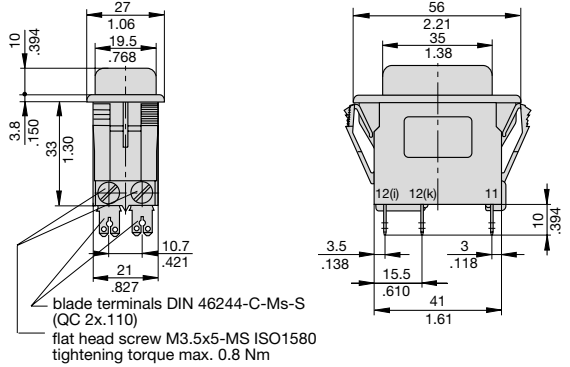
This is a metric design and millimeter dimensions take precedence (mm/inch)

Mounting style variants

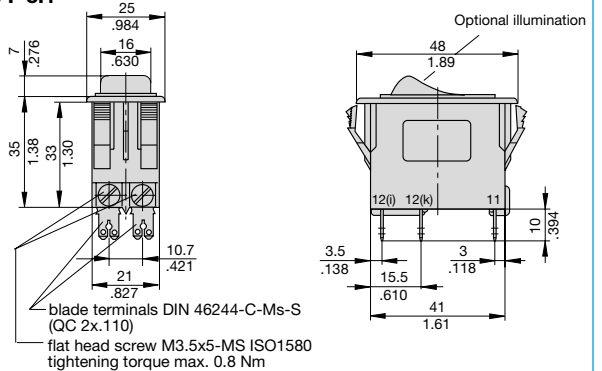
Style F 3.3 collar height 9 mm (.354 in.)



Style F 3.4
collar height 2 mm (.079 in.), with water splash protection

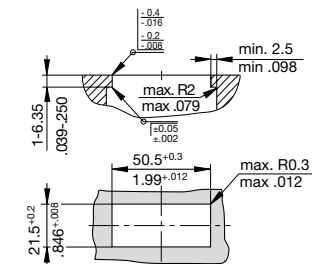


Style F 5.1

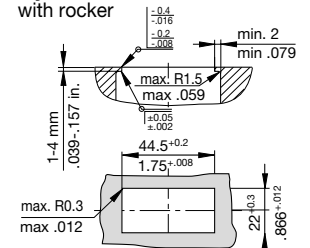


Cut-out dimensions

Cut-out for mounting style -F3
with rocker and push button



Cut-out for mounting style -F5/-F7
with rocker



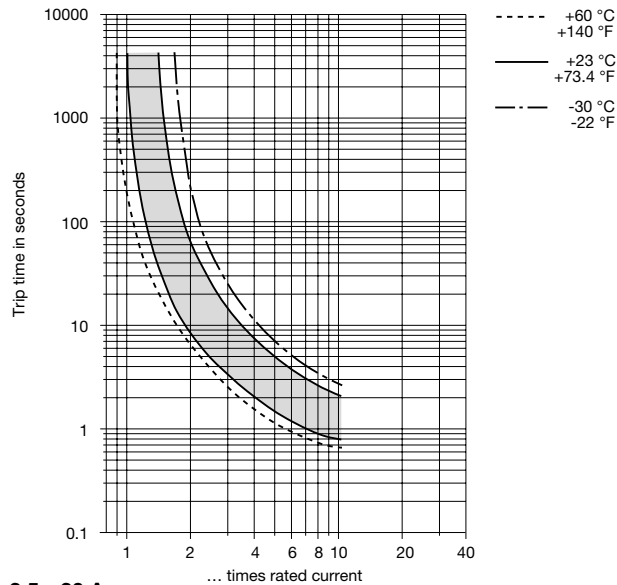
panel thickness	mm	1.2 ^{+0.4}	1.6 ^{+0.8}	2.4 ⁺¹
inch		.047 ^{+0.016}	.063 ^{+0.031}	.094 ^{+0.039}
dimension	mm	45 ^{+0.2}	45 ^{+1.1}	45 ^{+2.2}
	inch	1.77 ^{+0.008}	1.77 ^{+0.043}	1.77 ^{+0.087}

Edges of working parts: ISO 13715

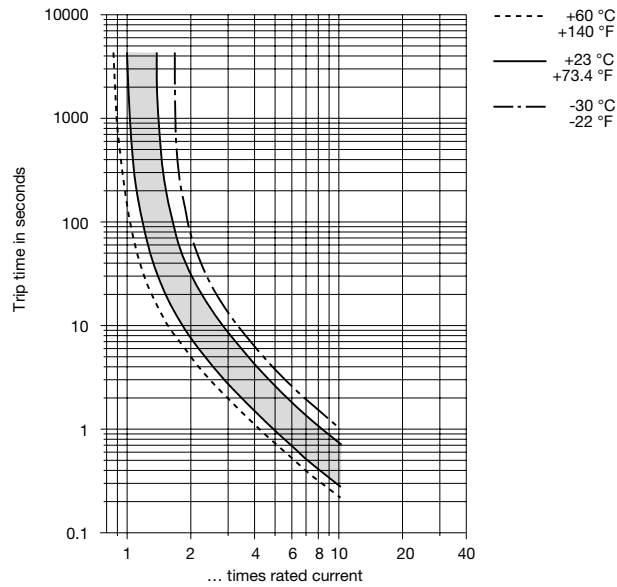
Typical time/current characteristics

single or double pole load

0.1...2 A



2.5...20 A



The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section Technical information.

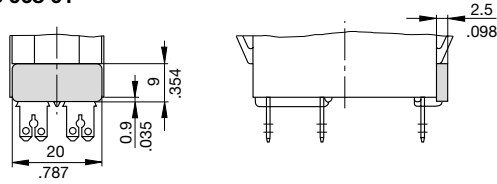
Ambient temperature	°F	-22	-4	+14	+32	+73.4	+104	+122	+140
temperature	°C	-30	-20	-10	0	+23	+40	+50	+60
Derating factor		0.8	0.76	0.84	0.92	1	1.08	1.16	1.24

Approvals

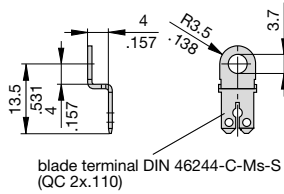
Authority	Standard	Rated voltage	Current ratings
VDE	IEC/EN 60934	3 AC 415 V AC 240 V DC 50 V DC 50 V DC 28 V	0.1 A...16 A (2-pole) 0.1 A...20 A 0.1 A...20 A (2-pole) 0.1 A...4 A (1-pole) 0.1 A...20 A
UL	UL 1077	AC 250 V DC 50 V AC 250 V	0.1 A...20 A 0.1 A...20 A 30 A (2 poles in parallel)
CSA	C22.2 No 235	AC 250 V DC 50 V AC 250 V	0.1 A...20 A 0.1 A...16 A 30 A (2 poles in parallel)
CQC	GB 17701	AC 240 V DC 50 V	0.1 A...20 A 0.1 A...20 A

Accessories

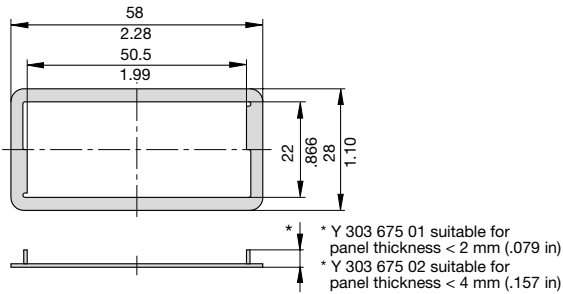
**Insulated cover
Y 303 068 01**



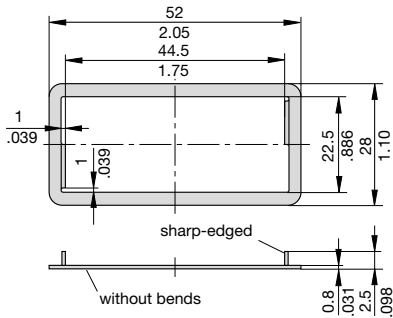
**Terminal adapter
Y 303 862 01**



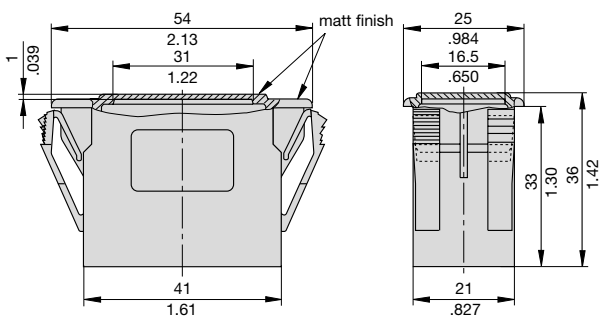
**Spacer for 3120-F3...
Y 303 675 01/02**



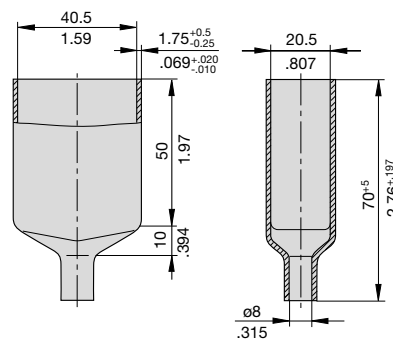
**Spacer for 3120-F5...
Y 303 676 01**



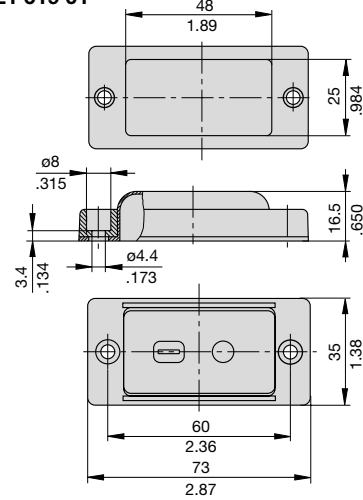
**Blanking piece in -F3 frame
Y 303 885 31**



**Rear terminal shroud black (IP64)
Y 304 275 01**



**Water splash cover, transparent (IP66)
for style -F5..
X 221 619 01**



This is a metric design and millimeter dimensions take precedence (mm/inch)

All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.

Description - Appliance inlet module X3120-A/-B

The appliance inlet module X3120 with circuit breaker type 3120-F5/-F7/-F8 combines up to four functions within a single component: A C14/C20 appliance inlet, a rocker-actuated or push button switch and resettable overcurrent protection and a filter. Screw-type mounting from the front or from the rear.

Typical applications

Electrical medical apparatus, laboratory equipment, professional audio equipment and office machines.

Approvals

X3120-A – C14 inlet

Authority	Standard	Voltage ratings	Max. current
ENEC	IEC/EN 60320-1	AC 240 V	10 A
UL/CSA	UL 498	AC 250 V	15 A
CQC	CCC	AC 250 V	10 A

Approvals X3120-A – filter

Design corresponding to UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939

X3120-B – C20 inlet

Authority	Standard	Voltage ratings	Max. current
ENEC	IEC/EN 60320-1	AC 240 V	16 A
UL/CSA	UL 498	AC 240 V	20 A

Selection current rating of the filter

Current rating circuit breaker	Minimum current rating of the filter
0,1...1 A	1 A
1,2...3 A	3 A
3,5...6 A	6 A
7...8A	8 A
9...10 A	10 A
12 A	12 A
14...15 A	15 A

Circuit breaker type 3120 with thermal release protects the filter in case of overloads.

For the protection of the filter in the event of higher overcurrents we recommend circuit breaker type 3120 with thermal-magnetic release (3120...M1...).

Further technical information upon request.



Order numbering code

Type No.	
X3120	Appliance inlet module for circuit breaker type 3120
Module	
A	appliance inlet C14 (with filter)
B	appliance inlet C20 (without filter)
Mounting	
04	screw-type mounting
Filter	
00	without filter
01	general performance IEC inlet filter
03	general performance IEC inlet filter, medical version
06	high performance IEC inlet filter, medical version
Filter current rating	
00	without filter
01	1 A
03	3 A
06	6 A
08	8 A
10	10 A
12	12 A
15	15 A
Version	
01	not wired; mounting position 3120: OFF position to connector
11	wired; mounting position 3120: OFF position to connector
Assembly status	
M	module supplied with circuit breaker 3120 and filter (module A) fitted
X3120- B 04 00 00 01 M	ordering example

All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.

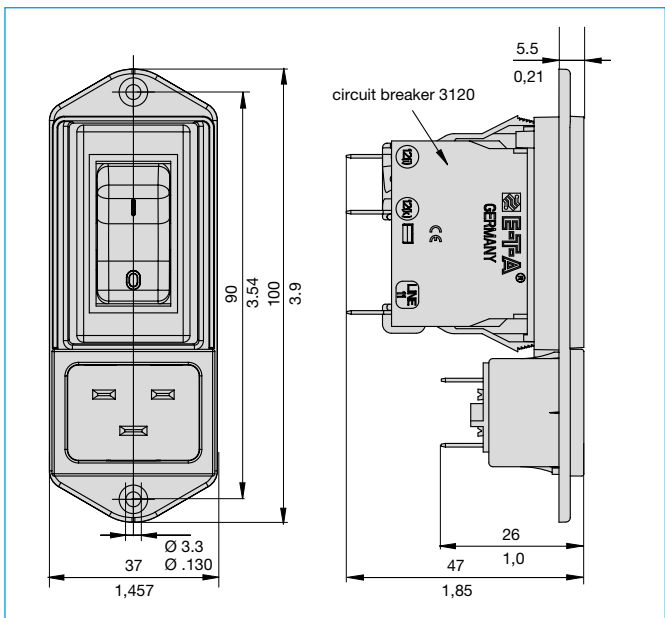
Technical Data (type X3120-B, without filter)

Rated voltage	AC 240 V
Current rating (inlet)	16 A (IEC) 20 A (UL/CSA)
Ambient temperature	-25°C ...+60°C
Number of poles	L, N + earth
Protection class:	I
Mounting method:	screw-type mounting (front or rear)
Connection:	blade terminals DIN 46244 6.3 mm x 0.8 mm
Housing material:	thermoplastics, black UL94V-0
Appliance inlet:	C20 according to IEC/EN 60320-1, UL498
Mains switch:	Circuit breaker 3120-F5/-F7/-F8 (3120-F8 with push button actuation: technical data upon request)

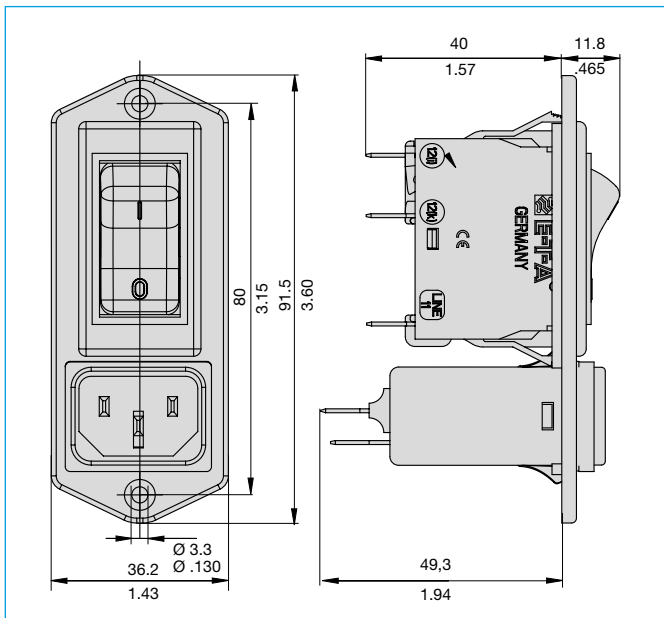
Technical Data (type X3120-A with filter)

Rated voltage	AC 250 V
Current rating (inlet)	10 A (IEC) 15 A (UL/CSA)
Current rating (filter)	1 A, 3 A, 6 A, 8 A, 10 A, 12 A, 15 A
Ambient temperature	-25°C ...+60°C
Number of poles	L, N + earth
Protection class:	I
Mounting method:	screw-type mounting (front or rear)
Connection:	blade terminals DIN 46244 6.3 mm x 0.8 mm
Housing material:	thermoplastics, black UL94V-0
Appliance inlet:	C14 according to IEC/EN 60320-1, UL498
Mains switch:	Circuit breaker 3120-F5/-F7/-F8 (3120-F8 with push button actuation: technical data upon request)

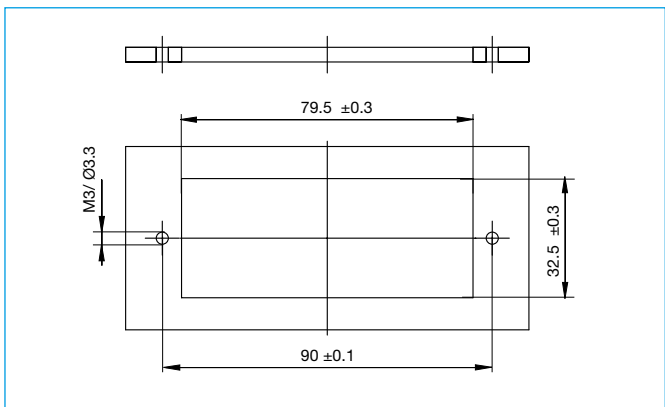
Dimensions (type X3120-B)



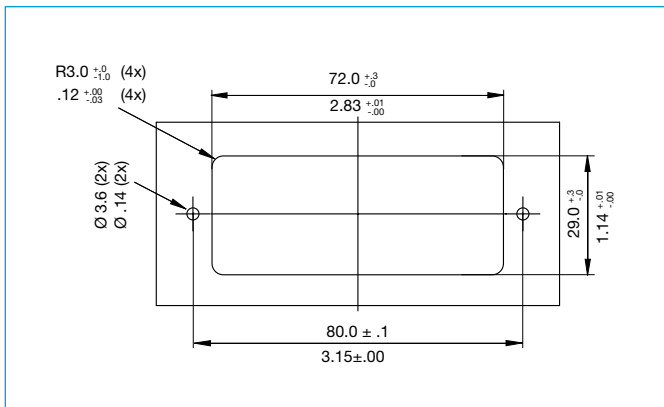
Dimensions (type X3120-A)



Cut-out dimensions (type X3120-B)



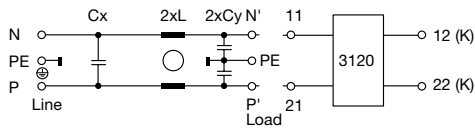
Cut-out dimensions (type X3120-A)



Electrical schematics X3120-A

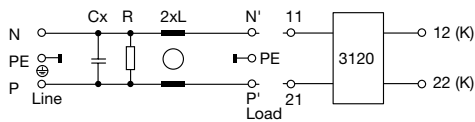
X3120-A0401

General performance filter



X3120-A0403 und X3120-A0406

Medical version



X3120-A0401 and X3120-A0403 - General performance filter

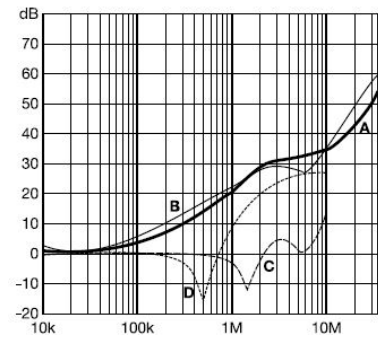
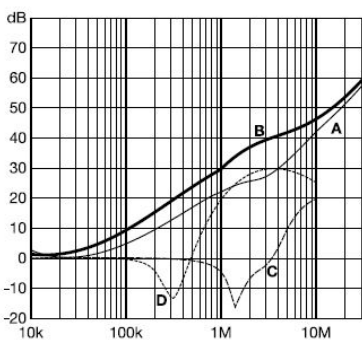
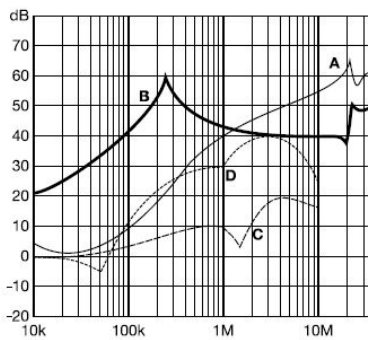
Typical filter attenuation: Per CISPR 17

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

1 and 3 A types

6 to 10 A types

12 and 15 A types



X3120-A0406 - High performance filter

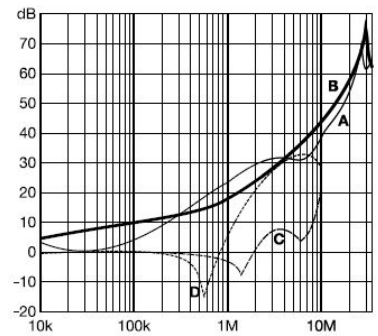
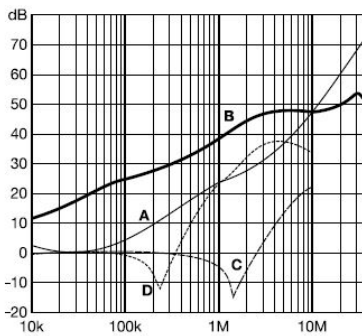
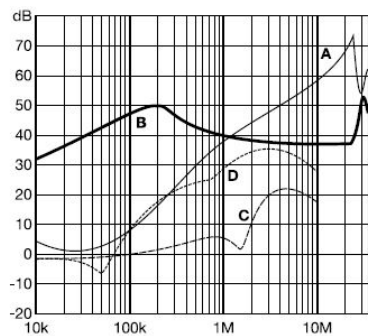
Typical filter attenuation: Per CISPR 17

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

1 and 3 A types

6 to 10 A types

12 and 15 A types



Filter selection table

Filter	Rated current 50°C (25°C) A	Leakage current 250VAC/50 Hz µA	Inductance L mH	Capacitance Cx µF	Capacitance Cy nF	Resistance R kΩ
X3120-A040101..M	1 (1.2)	373	12	0.1	2.2	
X3120-A040103..M	3 (3.5)	373	2.5	0.1	2.2	
X3120-A040106..M	6 (7.2)	373	0.78	0.1	2.2	
X3120-A040108..M	8 (10.6)	373	0.5	0.1	2.2	
X3120-A040110..M	10 (11.6)	373	0.225	0.1	2.2	
X3120-A040112..M	12 (12)	373	0.11	0.1	2.2	
X3120-A040115..M	15 (15)	373	0.075	0.1	2.2	
X3120-A040301..M	1 (1.2)	2	12	0.1		1000
X3120-A040303..M	3 (3.5)	2	2.5	0.1		1000
X3120-A040306..M	6 (7.2)	2	0.78	0.1		1000
X3120-A040308..M	8 (10.6)	2	0.5	0.1		1000
X3120-A040310..M	10 (11.6)	2	0.225	0.1		1000
X3120-A040312..M	12 (12)	2	0.11	0.1		1000
X3120-A040315..M	15 (15)	2	0.075	0.1		1000
X3120-A040601..M	1 (1.2)	2	59.53	0.1		1000
X3120-A040603..M	3 (3.5)	2	13.45	0.1		1000
X3120-A040606..M	6 (7.2)	2	4.1	0.1		1000
X3120-A040608..M	8 (10.6)	2	2.3	0.1		1000
X3120-A040610..M	10 (11.6)	2	1.02	0.1		1000
X3120-A040612..M	12 (12)	2	0.58	0.1		1000
X3120-A040615..M	15 (15)	2	0.4	0.1		1000