

## Description

The 3120-N...-...T1-... thermal circuit breaker/switch combination unites overcurrent protection and the function of an ON/OFF switch within a single component. The trip element is a thermal bimetal. Type 3120-N...-...T1-... is ideally suited for overload protection of motors, pumps, transformers and cables. After tripping, it can reliably, easily and quickly be reset. The positively trip-free mechanism ensures reliable disconnection of the circuit even with the actuator blocked.

Type 3120-N is also available with thermal-magnetic trip (technical data p. 19 ff).

Type 3120-N is also available as a switch in accordance IEC/EN 61058 (see data sheet switch 3120-N...Q1).



## Typical applications

Medical and laboratory equipment, apparatus and machine construction, professional tools, household and garden appliances, offices machines, audio equipment, machine tools

## Features

- Single or double pole thermal circuit breaker/switch combination
- Voltage ratings: AC 240 V, DC 50 V (AC 415 V upon request)
- Current rating range: 0.1 ... 20 A (up to 30 A upon request)
- Optional: push-in terminals for easy and quick wiring with a long-term stability
- Extendable functionality through appliance inlet module
- Functional extension options with add-on modules for low voltage release, auxiliary contact function, remote trip or fast magnetic trip

## Approvals



## Compliances



## Your benefits

- Maximum equipment availability is ensured by overload protection perfectly matched with the loads (prevention of nuisance tripping) and quick resettability
- Reduced mounting and wiring time
- Space-saving design
- Reduced disposition and storage costs
- Increased overall reliability

## Further information

The current data sheet as well as other relevant documents are available on our website: [www.e-t-a.de/e016](http://www.e-t-a.de/e016)

## Technical data

For detailed technical information please see [www.e-t-a.de/ti\\_e](http://www.e-t-a.de/ti_e)

Voltage ratings	AC 240 V, DC 50 V (AC 415 V upon request)
Current rating range	0.1 ... 20 A (up to 30A upon request for single pole units)

### Typical life 1-pole (EN 60934)

AC 240 V:	0.1...20 A	30,000 operations at 1 x I <sub>N</sub> , inductive
DC 50 V:	0.1...4 A	30,000 operations at 1 x I <sub>N</sub> , inductive
	4.5...16 A	30,000 operations at 1 x I <sub>N</sub> , resistive
DC 28 V:	0.1...20 A	30,000 operations at 1 x I <sub>N</sub> , inductive

### Typical life 2-pole (EN 60934)

AC 240 V:	0.1...16 A	50,000 operations at 1 x I <sub>N</sub> , inductive
	17...20 A	30,000 operations at 1 x I <sub>N</sub> , inductive
DC 50 V:	0.1...16 A	50,000 operations at 1 x I <sub>N</sub> , inductive
	17...20 A	10,000 operations at 1 x I <sub>N</sub> , inductive

Ambient temperature	-30 ... 60 °C
Insulation coordination (IEC 60664)	2.5 kV /2 reinforced insulation at operating area

### Dielectric strength

Operating area pole to pole (2-pole)	test voltage AC 3,000 V test voltage AC 1,500 V
Insulation resistance	> 100 MΩ (DC 500 V)

### Rupture capacity I<sub>cn</sub> (IEC/EN 60934)

	I <sub>N</sub>	U <sub>N</sub>	I <sub>cn</sub>
1-pole, 2-pole	0.1 ... 2 A	AC 240 V / DC 50 V	10 x I <sub>N</sub>
1-pole	2.5 ... 10 A	DC 50 V	50 A
1-pole	2.5 ... 20 A	AC 240 V / DC 28 V	200 A
2-pole	2.5 ... 20 A	DC 50 V	250 A
2-pole	2.5 ... 20 A	AC 240 V / DC 28 V	300 A

### Interrupting capacity I<sub>nc</sub> (UL 1077)

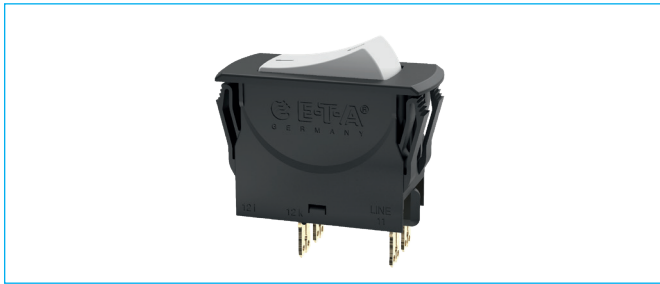
	I <sub>N</sub>	U <sub>N</sub>	I <sub>nc</sub>
1-pole, 2-pole	0.1 ... 20 A	AC 250 V	5,000 A, C, 1
1-pole, 2-pole	0.1 ... 20 A	DC 50 V	1,000 A, C, 1

### Degree of protection (IEC 60529)

Operating area	IP40 with water splash protection IP65
Terminal area	IP00 with water splash protection IP64
Vibration	8 g (57-500 Hz), ± 0.61 mm (10-57 Hz) test to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock	30 g (11 ms) test to IEC 60068-2-27, test Ea
Corrosion	96 hours at 5 % salt mist, test to IEC 60068-2-11, test Ka
Humidity	240 hrs in 95 % RH test to IEC 60068-2-78, test Cab
Mass	approx. 27 g (1-pole) approx. 31 g (2-pole) approx. 42 g (2-pole with PT terminals)

## Current ratings and 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		



## Order numbering code

### Type No.

**3120** thermal rocker-actuated circuit breaker/switch combination

#### Mounting method

**N3** snap-in, mounting cut-out 50.5 x 21.5 mm

**N5** snap-in, mounting cut-out 44.5 x 22 mm

#### Number of poles

**1** 1-pole switching, 1-pole thermally protected

**2** 2-pole switching, 2-pole thermally protected

**5** 2-pole switching, 1-pole thermally protected

#### Style

**1** standard

**3** with actuator guard

**4** with water splash protection (IP65)

**6** version for appliance inlet modules  
X3120-A/-B (only for mounting method N5)

**A** with actuator guard and cross-hole  
(for optional interlock)

#### Terminal design

**PT** push-in terminals

**P7** blade terminals

**H7** as P7, terminals 11 and 21 with flat head screws M3.5 - standard for units with undervoltage release module

**N7** as P7, with additional shunt terminals 12(i) and 22(i)

**G7** as N7, terminals 11 and 21 with additional flat head screws M3.5

#### Trip curve

**T1** thermal trip

#### Actuator

**W** rocker

#### Rocker colour and illumination

**01 .** black without illumination

**02 .** white without illumination

**04 .** red without illumination

**12 . Y** white with illumination

**14 . R** red with illumination

**15 . Y** orange with illumination

**16 . T** blue with illumination

**19 . G** green with illumination

#### Marking of rocker actuator rocker style

**A** (not for style 4)

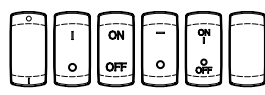
**D**

**F**

**K**

**L**

**X**



#### Illumination voltage range

(= operating voltage)

**1** DC 12 V

**2** DC 24 V

**3** AC 115 V

**4** AC 230 V

**5** DC 48 V

**6** AC 400 V (for 2-pole versions up to 16 A)

#### Current ratings

**0.1 ... 20 A**

**3120-N5 2 4 - PT T1-W 19 D G 4 - 16 A** ordering example

## Order numbering code

### Type No.

**3120** thermal circuit breaker/switch combination with push button actuation

#### Mounting method

**N3** snap-in, mounting cut-out 50.5 x 21.5 mm

**N5** snap-in, mounting cut-out 44.5 x 22 mm

#### Number of poles

**1** 1-pole switching, 1-pole thermally protected

**2** 2-pole switching, 2-pole thermally protected

**5** 2-pole switching, 1-pole thermally protected

#### Style

**D** with actuator guard

**E** with actuator guard and water splash cover

**F** with power-on protection

**V** with power-on protection and water splash cover

#### Terminal design

**PT** push-in terminals

**P7** blade terminals

**H7** as P7, terminals 11 and 21 with flat head screws M3.5 - standard for units with undervoltage release module

**N7** as P7, with additional shunt terminals 12(i) and 22(i)

**G7** as N7, terminals 11 and 21 with additional flat head screws M3.5

#### Trip curve

**T1** thermal trip

#### Actuator

**S** two push buttons

#### Colour of push button/illumination (style D and F without water splash protection)

**GRD** green/red without illumination

**GRDG** green with LED illumination/red without illumination

#### Colour of push button/illumination (style E and V with water splash protection)

**GRX** green/red without illumination

**GRXG** green with LED illumination/red without illumination

#### Illumination voltage range

(= operating voltage)

**1** DC 12 V

**2** DC 24 V

**3** AC 115 V

**4** AC 230 V

**5** DC 48 V

**6** AC 400 V (for 2-pole versions up to 16 A)

#### Current ratings

**0.1 ... 20 A**

**3120-N3 5 V - PT T1-S GRXG - 20 A** ordering example

Please observe our minimum ordering quantities.



## Order numbering code

1

### Type No.

**3120** thermal resettable circuit breaker with push button

### Mounting method

**N3** snap-in, mounting cut-out 50.5 x 21.5 mm

**N5** snap-in, mounting cut-out 44.5 x 22 mm

### Number of poles

**1** 1-pole thermally protected

**2** 2-pole thermally protected

**5** 2-pole, 1-pole thermally protected

### Style

**G** resettable circuit breaker

### Terminal design

**PT** push-in terminals

**P7** blade terminals

**H7** as P7, terminals 11 and 21 with flat head screws M3.5 - standard for units with undervoltage release module

**N7** as P7, with additional shunt terminals 12(i) and 22(j)

**G7** as N7, terminals 11 and 21 with additional flat head screws M3.5

### Trip curve

**T1** thermal trip

### Actuator

**D** one push button

### Colour of push button

**01** black

### Marking of push button

**X** without marking

### Current ratings

**0.1 ... 20 A**

**3120-N3 2 G - PT T1 - D 01 - X 20 A** ordering example

Please observe our minimum ordering quantities.

## Customer-specific solutions

Looking for a version you cannot find in our order numbering code?  
Please get in touch.

## Approvals

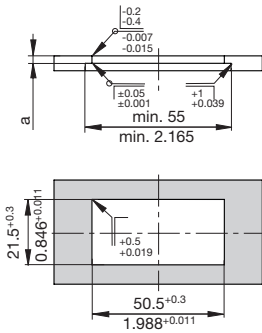
Approval authority	Standard	Voltage ratings	Current rating range	Appr. logos
VDE	IEC/EN 60934	AC 240 V DC 50 V DC 50 V DC 28 V	0.1 A ... 20 A 0.1 ... 20A (2-pole) 0.1 ... 16 A (1-pole) 0.1 A ... 20 A	
UL	UL 1077	AC 250 V AC 250 V DC 50 V AC 250 V	0.1 A ... 16 A (TC1, OL1) 17 A ... 20 A (TC1, OL0) 0.1 A ... 20 A (TC1, OL0) 30 A* (TC1, OL0)	
CSA	C22.2 No 235	AC 250 V AC 250 V DC 50 V AC 250 V	0.1 A ... 16 A (TC1, OL1) 17 A ... 20 A (TC1, OL0) 0.1 A ... 20 A (TC1, OL0) 30 A* (TC1, OL0)	
CQC	GB 17701	AC 240 V DC 50 V	0.1 A...20 A 0.1 A...20 A	
KTL	KC60934	AC 240 V	0.1...20A (2-pole)	

\* 2 poles in parallel

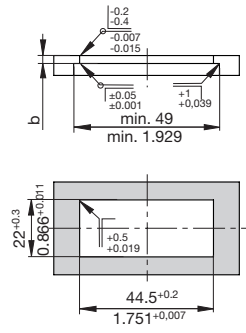
## Mounting method

### Mounting style

Cut-out for mounting style -N3



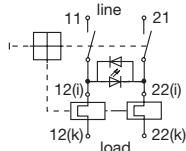
Cut-out for mounting style -N5



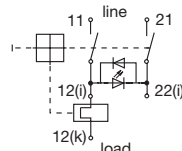
panel thickness	without water splash protection	with water splash protection
a	1 – 6.35 mm	1 – 5.5 mm
b	1 – 4 mm	1 – 3.5 mm

## Schematic diagrams

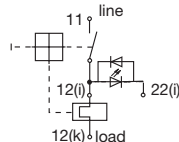
### 2-pole switching and thermally protected



### 2-pole switching and 1-pole thermally protected

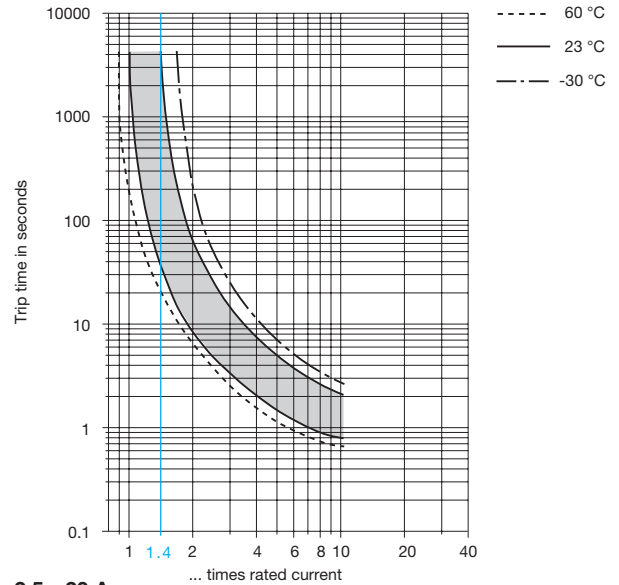


### 1-pole switching and thermally protected

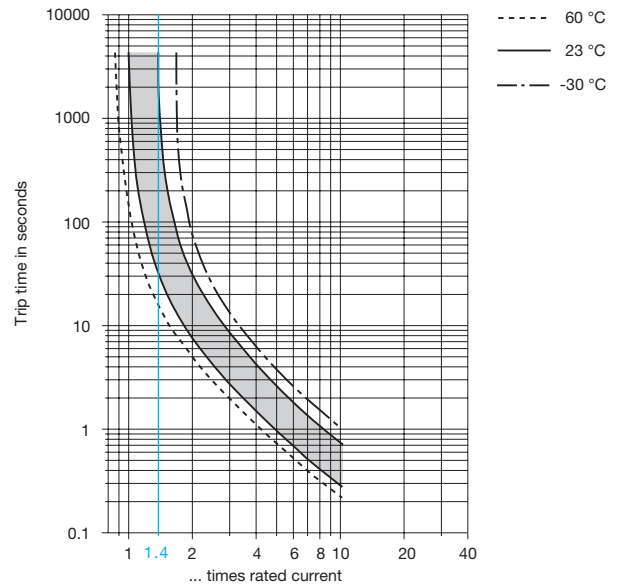


## Time/current characteristics

### 0.1...2 A



### 2.5...20 A

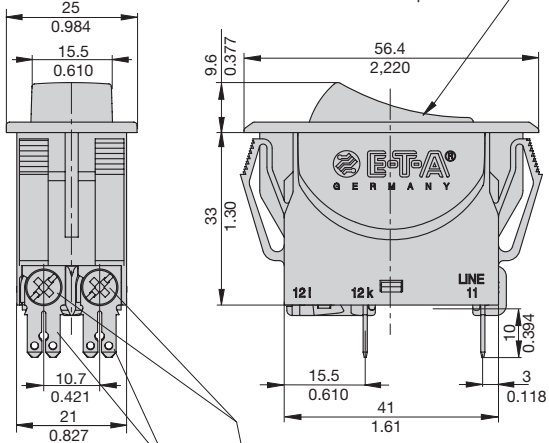


The time/current characteristic depends on the ambient temperature. In order to eliminate nuisance tripping, please multiply the current rating by a derating factor. For detailed technical information please see [www.e-t-a.de/ti\\_d](http://www.e-t-a.de/ti_d)

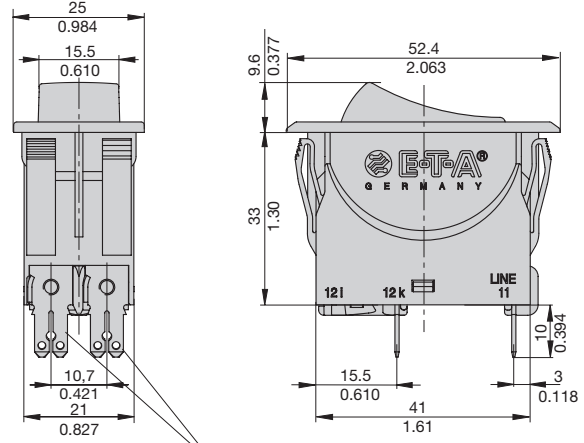
ambient temperature [°C]	-30	-20	-10	0	23	40	50	60
temperature factor	0.8	0.84	0.88	0.92	1	1.08	1.14	1.23

## Dimensions

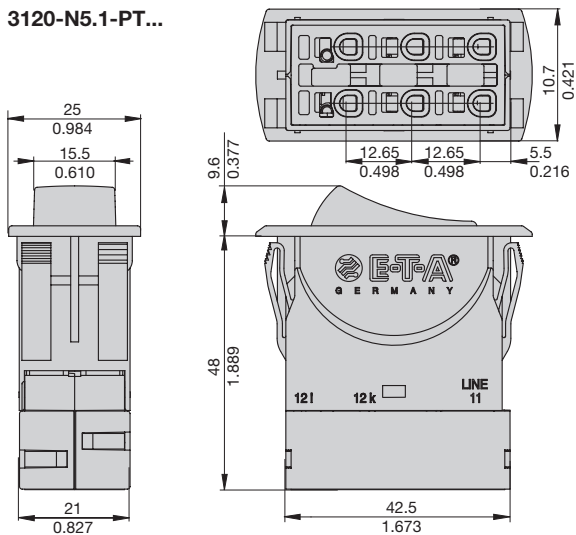
**3120-N3.1-H7...**



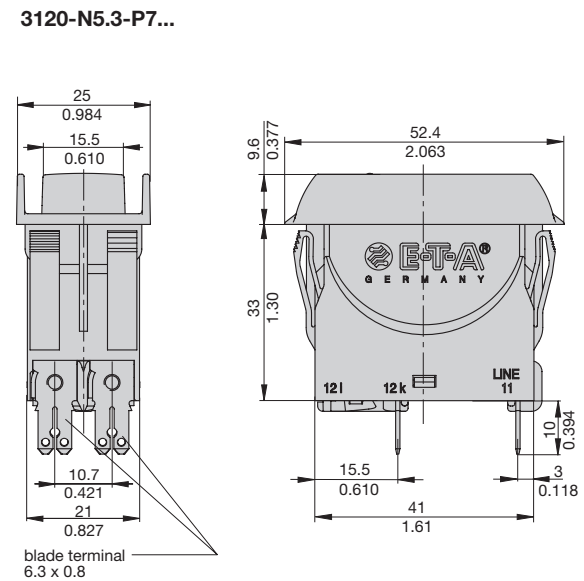
**3120-N5.1-P7...**



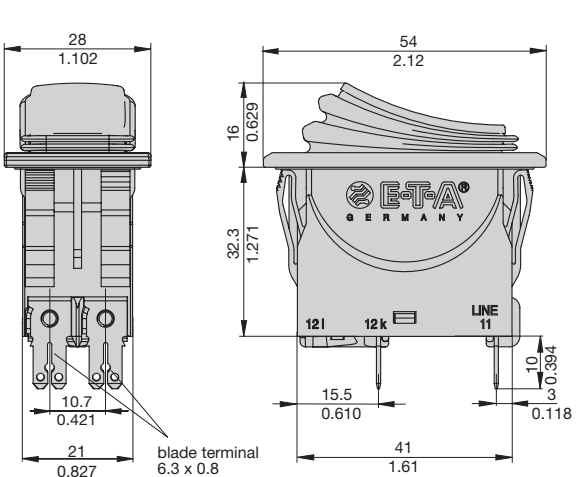
**3120-N5.1-PT...**



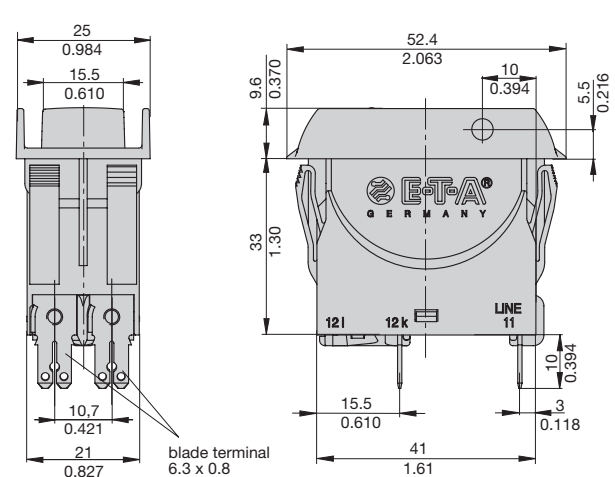
**3120-N5.3-P7...**



**3120-N5.4-P7...**

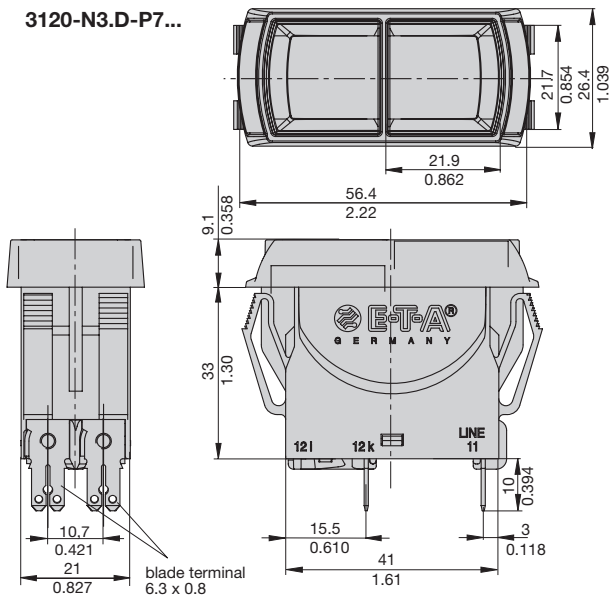


**3120-N5.A-P7...**

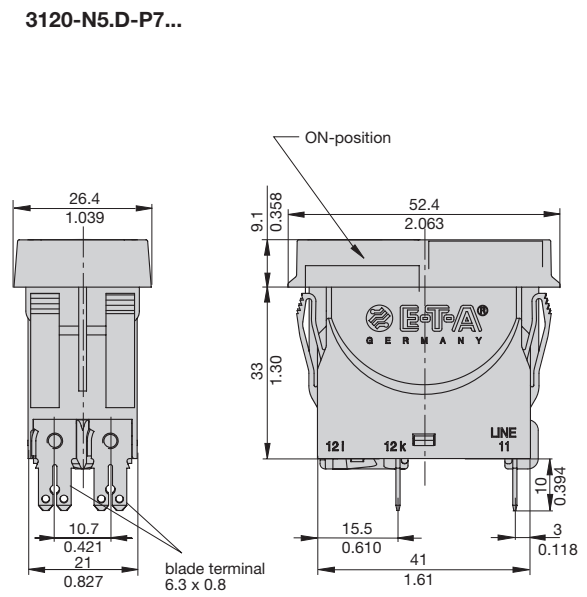


## Dimensions

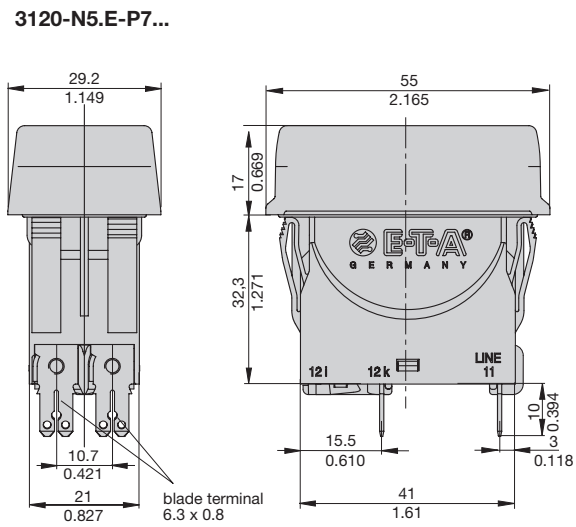
3120-N3.D-P7...



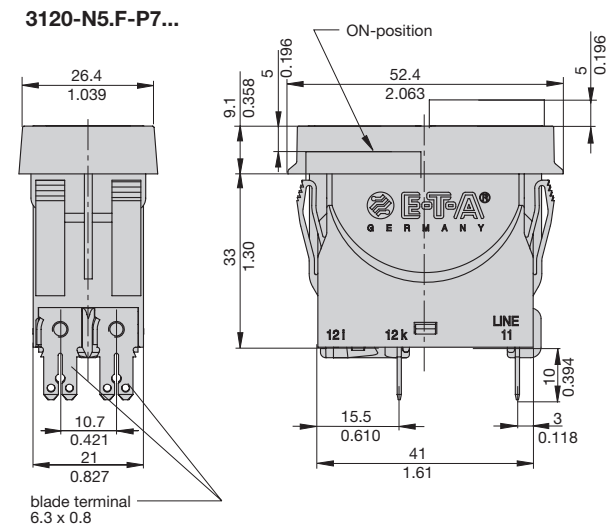
3120-N5.D-P7...



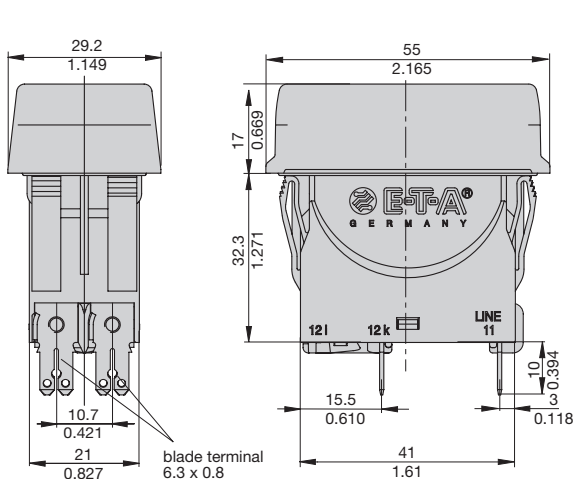
3120-N5.E-P7...



3120-N5.F-P7...

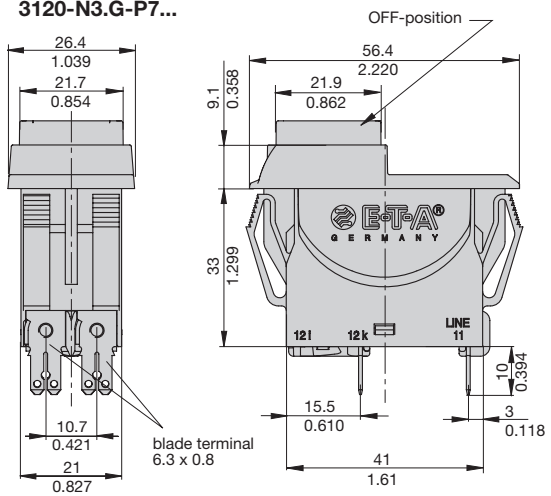


3120-N5.V-P7...

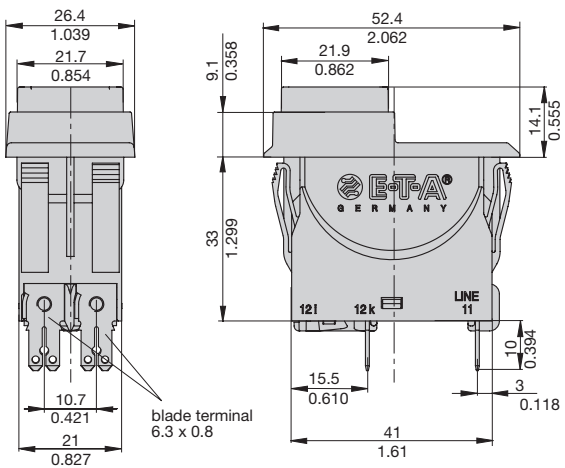


Dimensions

3120-N3.G-P7...



3120-N5.G-P7...



1

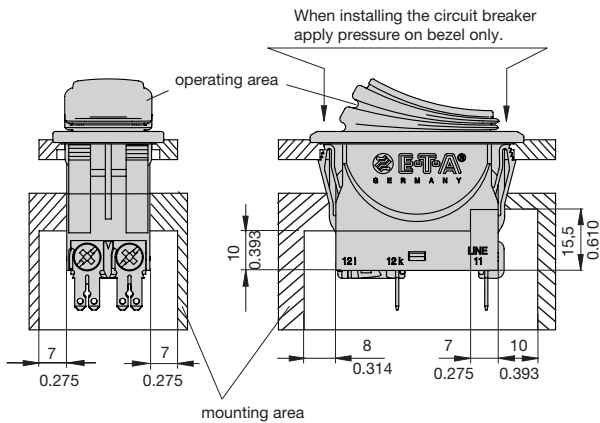


## Cable cross sections PT terminals

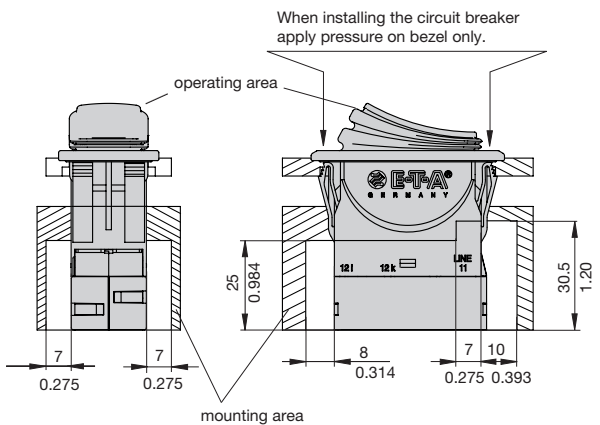
cable	cross section with direct push-in wiring
rigid	1...4 mm <sup>2</sup> (stripping length: 10 mm)
flexible with wire end ferrule (with or without plastic sleeve)	0.5...2.5 mm <sup>2</sup>
cable	cross section when opening the push-in terminals
rigid	0.5...4 mm <sup>2</sup> (stripping length: 10 mm)
flexible without wire end ferrule	0.5...2.5 mm <sup>2</sup>

## Installation drawing

### 3120 with blade terminals



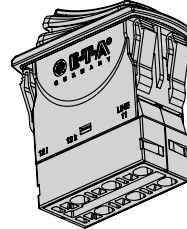
### 3120 with push-in terminals



## Terminal types

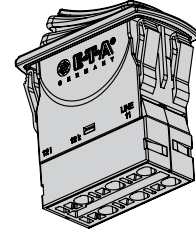
### 2-pole switching and 2-pole thermally protected

3120-N524-PT

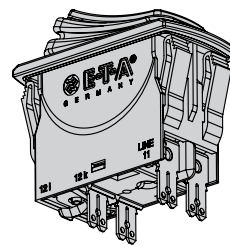


### 2-pole switching and 1-pole thermally protected

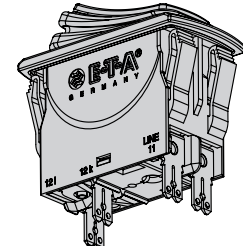
3120-N554-PT



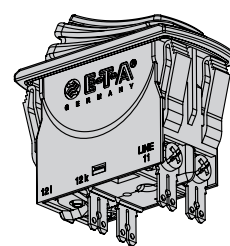
3120-N524-P7



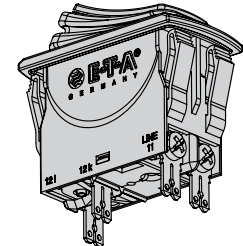
3120-N554-P7



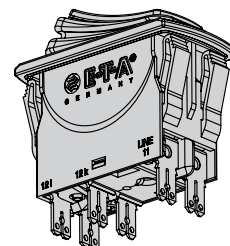
3120-N524-H7



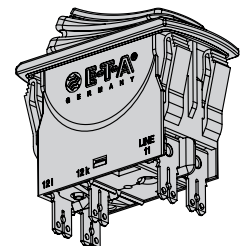
3120-N554-H7



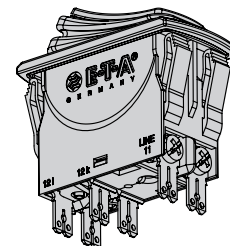
3120-N524-N7



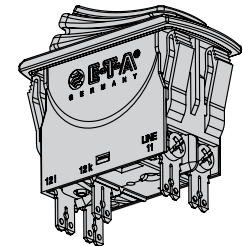
3120-N554-N7



3120-N524-G7

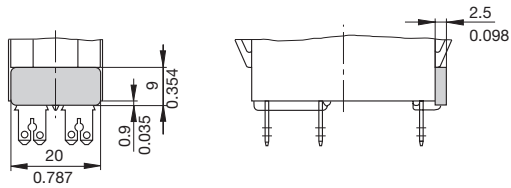


3120-N554-G7

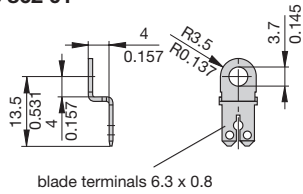


## Accessories

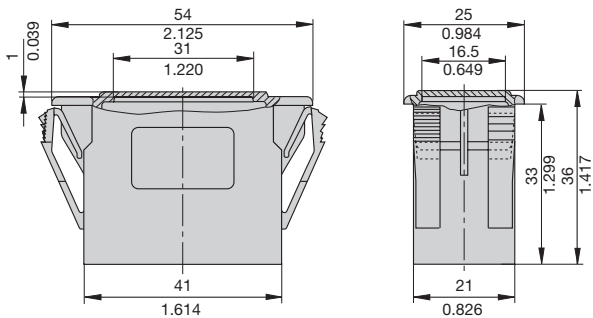
**Insulated cover**  
Y 303 068 01



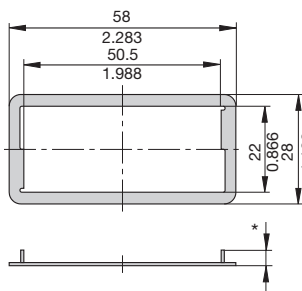
**Terminal adapter**  
Y 303 862 01



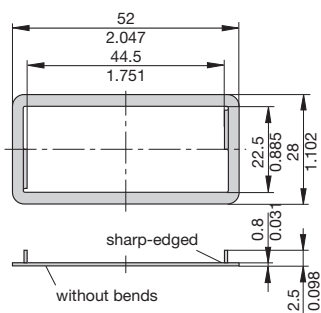
**Blanking piece in -N3 frame**  
Y 303 885 31



**Spacer for 3120-N3...**  
Y 303 675 01/02

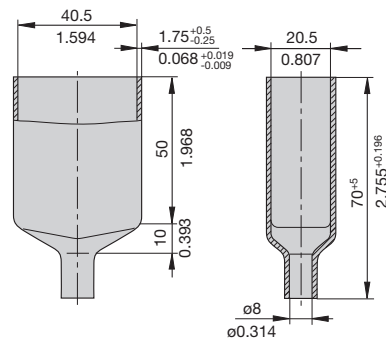


**Spacer for 3120-N5...**  
Y 303 676 01



\* Y 303 675 01 suitable for panel thickness < 2 mm  
\* Y 303 675 02 suitable for panel thickness < 4 mm

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



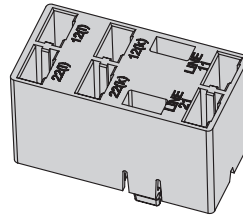
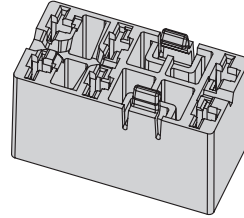
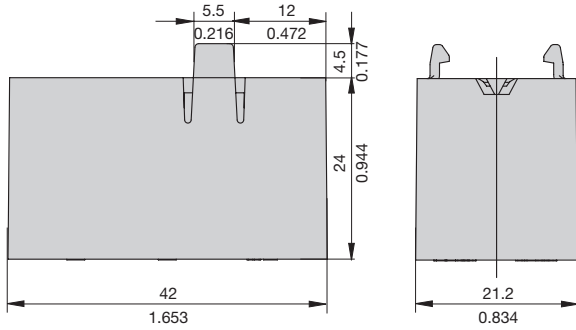
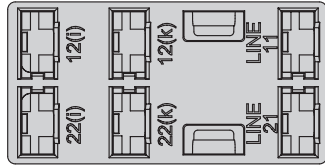
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## Accessories

### Plug-in connector

#### Y 31214001

Connecting cables can be pre-wired. Two retaining clips ensure a tight fit.



#### Benefits:

- Reduced installation time and costs for final assembly
- Quick replacement of devices

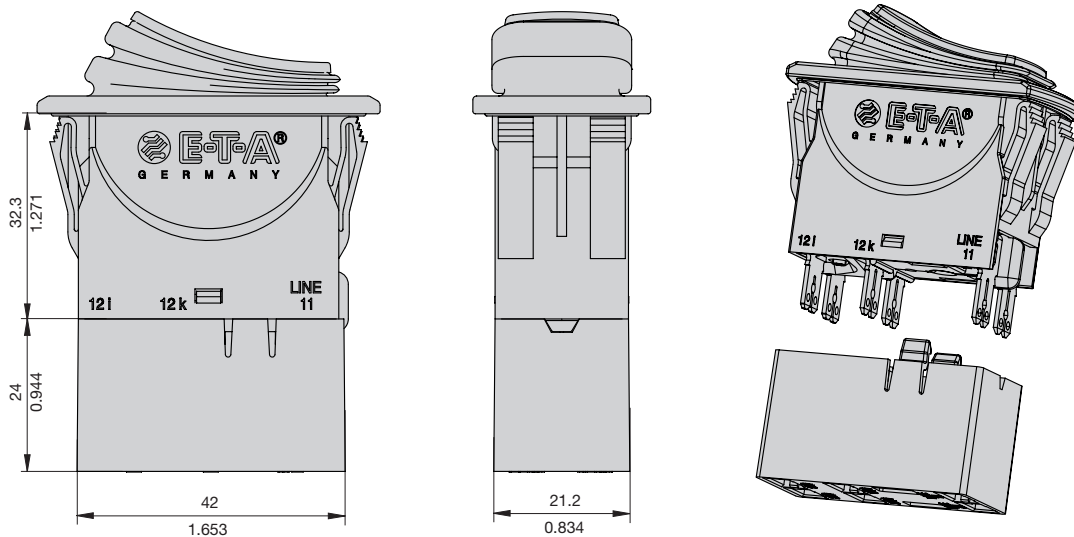
#### Note:

Delivery without receptacles.

Dimensions of receptacles (width 6.3 mm) are in accordance with DIN 46340 part 3, shape A.

Examples of suitable receptacles: Stocko RSB 7916 F6,3-1 / Klauke type 2730 / Vogt type 3832d.67 / TE FASTON Terminals 250 Series / Delphi Packard 58 Series

Plug-in connector mounted on circuit breaker:



# E-T-A® 3120-N...-...T1-... Thermal Circuit Breaker

## Description – X3120-A/-B appliance inlet modules

The X3120 appliance inlet module with 3120-N5.6 circuit breaker type combines up to four functions within a single component: C14/ C20 inlet plug, an ON/ OFF switch, resettable overcurrent protection and a line 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 plugs			
Approval authority	Standard	Voltage ratings	Max. rated 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

X3120-A - filter	
Design to UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939	

X3120-B – C20 inlet plugs			
Approval authority	Standard	Voltage ratings	Max. rated current
ENEC	IEC/EN 60320-1	AC 240 V	16 A
UL/CSA	UL 498	AC 240 V	20 A

## Selection of filter rating

Current rating of circuit breaker	Min. rating of filter
0.1 ... 1 A	1 A
1.2 ... 3 A	3 A
3.5 ... 6 A	6 A
7 ... 8 A	8 A
9 ... 10 A	10 A
12 A	12 A
14 ... 15 A	15 A

The 3120-N5.6 thermal circuit breaker protects the line filter in the event of an overload.

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

Further technical information p 19 ff.

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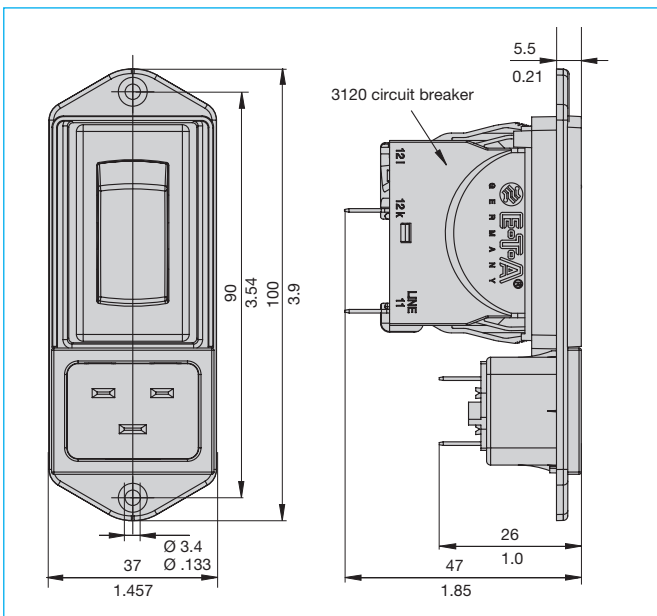
## Order numbering code

<b>Type No.</b>	<b>X3120</b> appliance inlet module for circuit breaker type 3120-N
<b>Module</b>	<b>A</b> inlet plug C14 (with filter) <b>B</b> inlet plug C20 (without filter)
<b>Mounting method</b>	<b>04</b> screw-type mounting
<b>Filter</b>	<b>00</b> without <b>01</b> standard line filter <b>03</b> standard line filter for medical equipment <b>06</b> high-power line filter for medical equipment
<b>Filter rating (for module A only)</b>	<b>01</b> 1 A <b>03</b> 3 A <b>06</b> 6 A <b>08</b> 8 A <b>10</b> 10 A <b>12</b> 12 A <b>15</b> 15 A
<b>Version</b>	<b>01</b> not wired, mounting position 3120-N: OFF position at connector <b>11</b> wired; mounting position 3120-N: OFF position at connector
<b>Supply status</b>	<b>M</b> module supplied with mounted 3120-N circuit breaker and filter (module A)
<b>Ordering example</b>	<b>X3120-A 04 01 08 01 M</b>

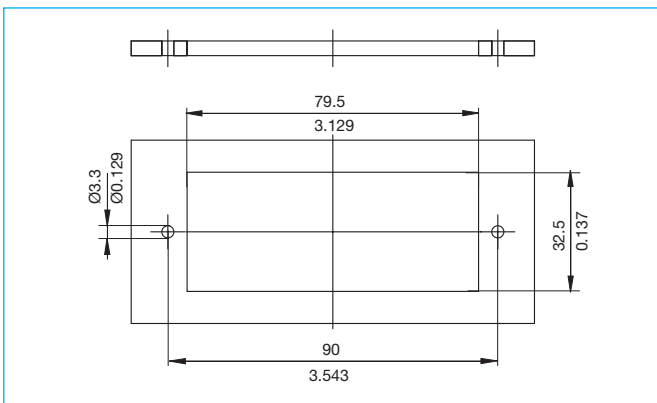
## Technical data (X3120-B, without filter)

Voltage ratings	AC 240 V
Current rating (appliance inlet)	16 A (IEC) 20 A (UL/CSA)
Operating temperature	-25 °C ... +60 °C
Number of poles	L, N + mass
Degree of Protection	I
Mounting method	screw-type mounting (from the front or from the rear)
Terminal design	blade terminals DIN 46244 6.3 mm x 0.8 mm
Housing material	thermoplastics, black, UL94V-0
Appliance inlet	C20 to IEC/EN 60320-1, UL498
Main switch	circuit breaker for equipment protection 3120-N5.6

## Dimensions (X3120-B)



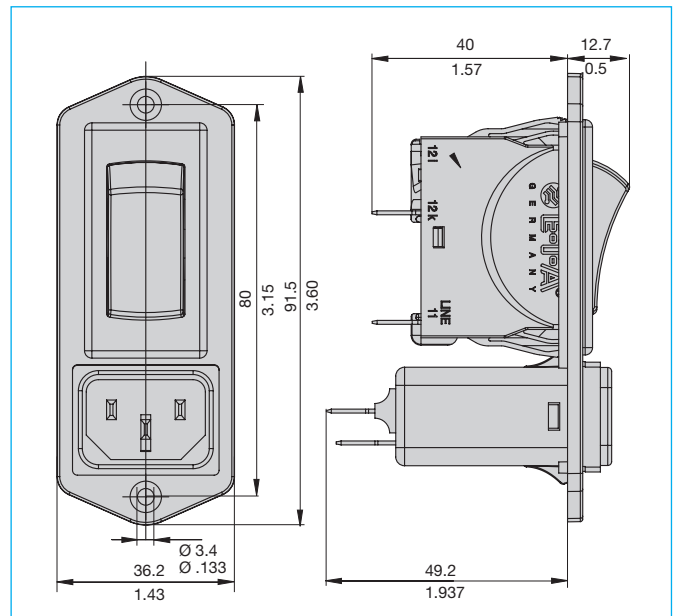
## Mounting cut-out (X3120-B)



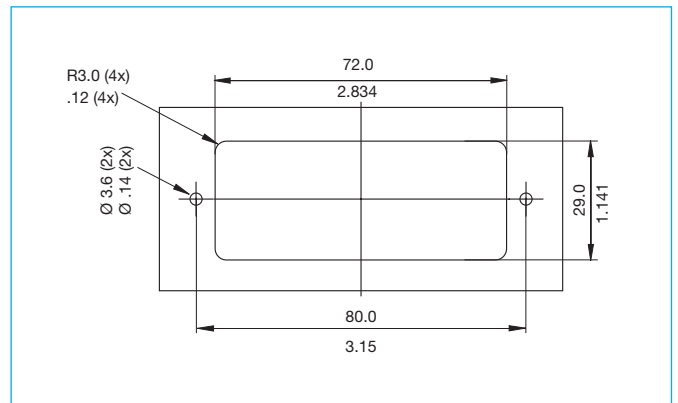
## Technical data (X3120-A, with filter)

Voltage ratings	AC 250 V
Current rating (appliance inlet)	10 A (IEC) 15 A (UL/CSA)
Ratings of filter	1 A, 3 A, 6 A, 8 A, 10 A, 12 A, 15 A
Operating temperature	-25 °C ... +60 °C
Number of poles	L, N + mass
Degree of Protection	I
Mounting method	screw-type mounting (from the front or from the rear)
Terminal design	blade terminals DIN 46244 6.3 mm x 0.8 mm
Housing material	thermoplastics, black, UL94V-0
Appliance inlet	C14 according to IEC60320-1, UL 498
Main switch	circuit breaker for equipment protection 3120-N5.6

## Dimensions (X3120-A)



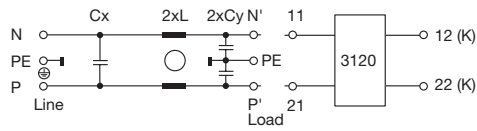
## Mounting cut-out (X3120-A)



## Schematic diagram X3120-A

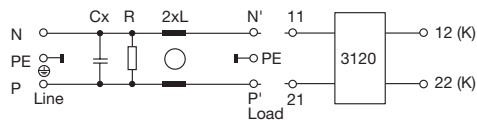
### X3120-A0401

General performance filter



### X3120-A0403 und X3120-A0406

High-performance filters for medical version

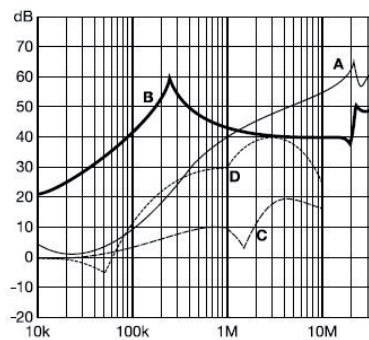


## X3120-A0401 and X3120-A0403 – standard filters

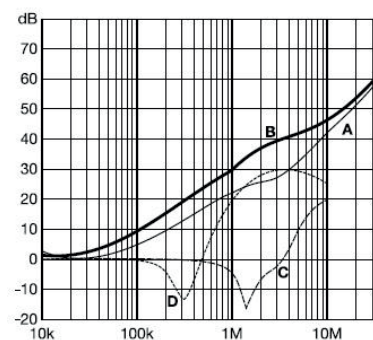
Typical filter attenuation: to CISPR 17

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

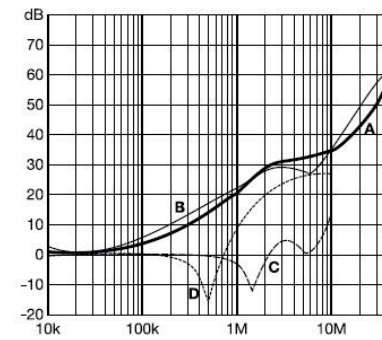
1 and 3 A models



6 – 10 A models



12 and 15 A models

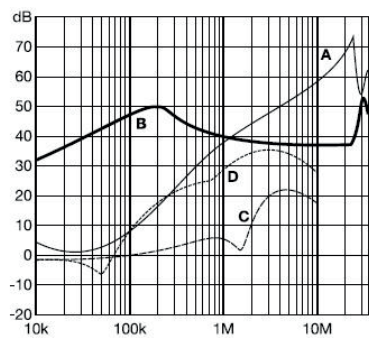


## X3120-A0406 – high-power filters

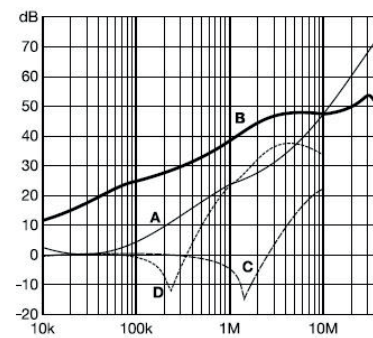
Typical filter attenuation: to CISPR 17

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

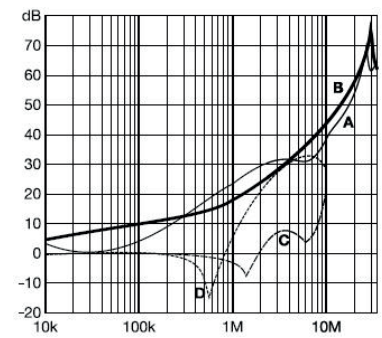
1 and 3 A models



6 – 10 A models



12 and 15 A models



**Filter selection table**

Filter	Rating 50°C (25°C) A	Leakage current 250VAC/50Hz μA	Inductance L mH	Capacity Cx μF	Capacity 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



## Description X3120-U undervoltage release module

The undervoltage release module reliably excludes personal injury through automatic re-start after voltage dip or power failure.

**Note:** Basic unit 3120-N...-H7 or -G7 requires screw terminals. Not possible in combination with PT terminals.

Please observe the following in combination with design version 4: In the event of voltage dip or power failure, the undervoltage release module trips the circuit breaker.

The rocker actuator will go into centre position. Reset is effected in two steps:

- Step 1: Switch rocker into OFF position.
- Step 2: Reset circuit breaker.

Not possible with style configurations D and E.

## Typical applications

All machines that could cause personal injury upon automatic re-start, e.g. drilling machines, electric saws, meat cutting machines etc.

The X3120-U02 version allows set up of a cost-effective safety circuit via the physically isolated undervoltage release module, which enables implementation for example of a remote disconnection with emergency stop.

## Order numbering code

### Type No.

**X3120** module for type 3120-N

### Module

**U** undervoltage release module

### Design

**00** standard (without separate connections)

**01** 1 blade terminal 2.8x0.8

**02** 2 blade terminals 2.8x0.8

### Voltage ratings

**00** AC 230/240 V 50/60 Hz

**01** AC 120 V 50/60 Hz

**02** AC 100 V 50/60 Hz

**03** DC 24 V

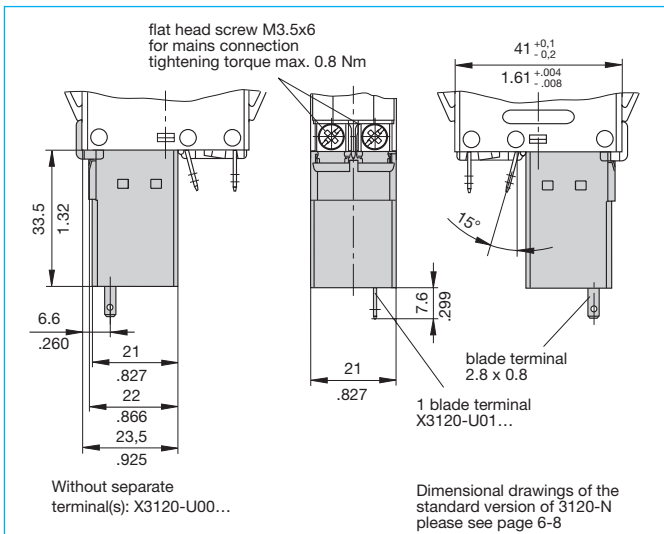
**04** AC 400 V 50/60 Hz

### Supply status

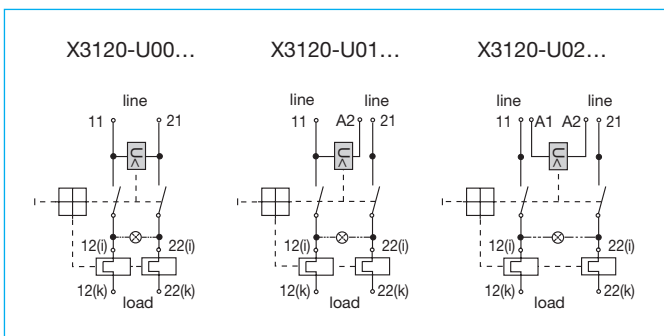
**M** module mounted to circuit breaker 3120-N

**X3120-U 00 00 M** ordering example

## Dimensions – undervoltage release module



## Schematic diagrams



## Technical data

Voltage ratings	AC 100 V; AC 120 V; AC 230/240 V; AC 400 V (50/60 Hz) DC 24 V
Voltage tolerances	+ 10 %/- 15 %
Typical life	20,000 cycles
Current consumption	approx. 2.5 mA
Release values	$0.2 \times U_N < U < 0.7 \times U_N$ (at a rated voltage of AC 100 V the device can trip at 70 V and must trip at 20 V)
Trip time	< 20 ms
Reset value	$\geq 85 \% U_N$
Ambient temperature	-30 ... 60 °C
Vibration	8 g (57-500 Hz), $\pm 0.61$ mm (10-57 Hz) test to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock	30 g (11 ms) test to IEC 60068-2-27, test Ea
Corrosion	48 hours at 5 % salt mist, test to IEC 60068-2-11, test Ka
Humidity	240 hrs in 95 % RH test to IEC 60068-2-78, test Cab
Mass	approx. 56 g (including base unit)

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## Description X3120-S auxiliary contact module

Add-on module for circuit breaker type 3120-N. The auxiliary contact module has a change-over contact as signal contact and is operated with actuation of the CBE.

**Note:** Only possible with terminal designs N7 and P7.

## Typical applications

Status monitoring of CBE and/or the connected loads.

## Order numbering code

### Type No.

**X3120** module for type 3120-N

### Module

**S** auxiliary contact module

### Design

**0** change-over contact

### Terminal design

**1** blade terminals DIN 46244-A6.3-0.8

### Key for rated power

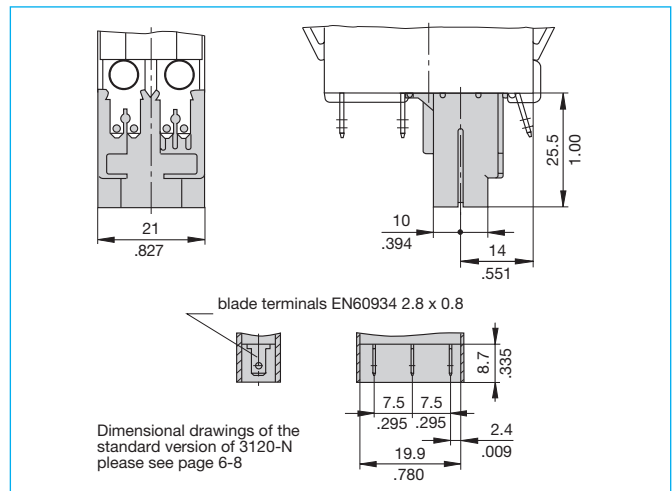
<b>A</b> AC 10 V – AC 250 V	0.1 ... 4 A
DC 12 V	0.1 ... 4 A
DC 24 V	0.1 ... 4 A
DC 60 V	0.1 ... 1 A
DC 110 V	0.1 ... 0.5 A
DC 220 V	0.1 ... 0.25 A
<b>B</b> AC 5 V – AC 250 V	5 ... 100 mA
DC 5 V – DC 250 V	5 ... 100 mA

### Supply status

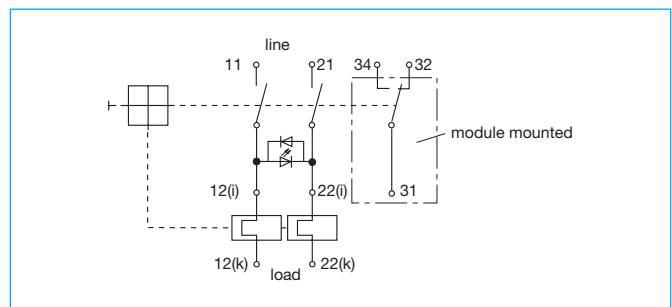
**M** module mounted to circuit breaker 3120-N

**X3120-S 0 1 A M** ordering example

## Dimensions – auxiliary contact module



## Schematic diagram



## Technical data

Voltage ratings	AC 250 V, DC 250 V
Current ratings	0.1...4 A / 5...100 mA
Typical life	50,000 cycles
Ambient temperature	-30 ... 60 °C
<b>Dielectric strength</b>	
Between main and auxiliary circuit	test voltage AC 3,000 V
Insulation resistance	> 100 MOhm (DC 500 V)
Vibration	6 g (57-500 Hz), ± 0.46 mm (10-57 Hz) test to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock	15 g (11 ms) test to IEC 60068-2-27, test Ea
Corrosion	96 hours at 5 % salt mist, test to IEC 60068-2-11, test Ka
Humidity	240 hrs in 95 % RH test to IEC 60068-2-78, test Cab
Mass	approx. 41 g (including base unit)

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## Description X3120-M remote trip module

A module which adds remote trip capability to all versions of type 3120-N. A voltage applied across the coil will cause trip of the main switch/circuit breaker mechanism.

**Note:** Not possible in combination with PT terminals.

## Typical applications

Electrical remote trip of safety systems.

## Order numbering code

### Type No.

**X3120** module for type 3120-N

#### Module

**M** magnetic trip module

#### Design

**2** magnetic remote trip coil

#### Terminal design

**P7** blade terminals DIN 46244-A6.3-0.8

#### Supply status

**M** module mounted to circuit breaker 3120-N

#### Voltage ratings

**AC 120, 230 V**

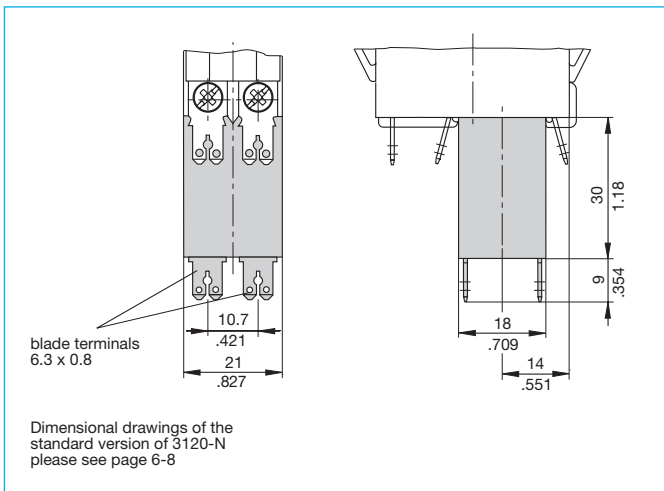
**DC 12, 24 V**

**X3120-M 2 P7 M -12 V** ordering example

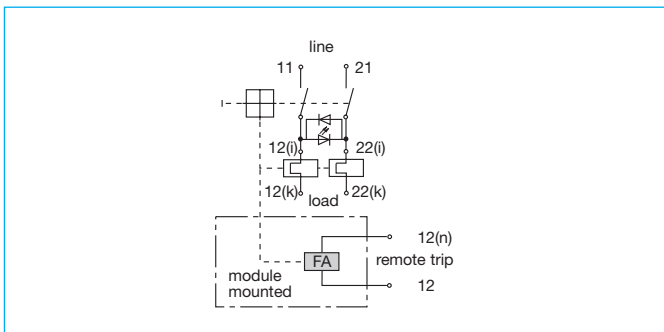
## Standard voltage ratings and typical internal resistance values

Voltage ratings	Internal internal resistance (Ω)	Voltage ratings	internal internal resistance (Ω)
DC 12 V	0.78	AC 120 V	71.0
DC 24 V	3.3	AC 230 V	312

## Dimensions – remote trip module



## Schematic diagram



## Technical data

Voltage ratings	AC 120...230 V; DC 12...24 V
Power consumption	approx. 200 Watt
Pulse operation	20 ms < t <sub>ON</sub> < 100 ms t <sub>OFF</sub> > 10 sec
Trip time	< 20 ms
Typical life	50,000 operations at U <sub>N</sub>
ambient temperature	-30 ... 60 °C
<b>Dielectric strength</b>	
Between main and trip current circuit	test voltage AC 3,000 V
Insulation resistance	> 100 MOhm (DC 500 V)
Vibration	8 g (57-500 Hz), ± 0.61 mm (10-57 Hz) test to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock	30 g (11 ms) test to IEC 60068-2-27, test Ea
Corrosion	96 hours at 5 % salt mist, test to IEC 60068-2-11, test Ka
Humidity	240 hrs in 95 % RH test to IEC 60068-2-78, test Cab
Mass	approx. 56 g (including base unit)

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**Description**

The 3120-N...-...M1-... thermal-magnetic circuit breaker/switch combination unites overcurrent protection and the function of an ON/OFF switch within a single component. The integral thermobimetal ensures ideally matched overload protection. The magnetic trip module trips the circuit breaker/switch combination at overload currents from four times rated current within milliseconds.

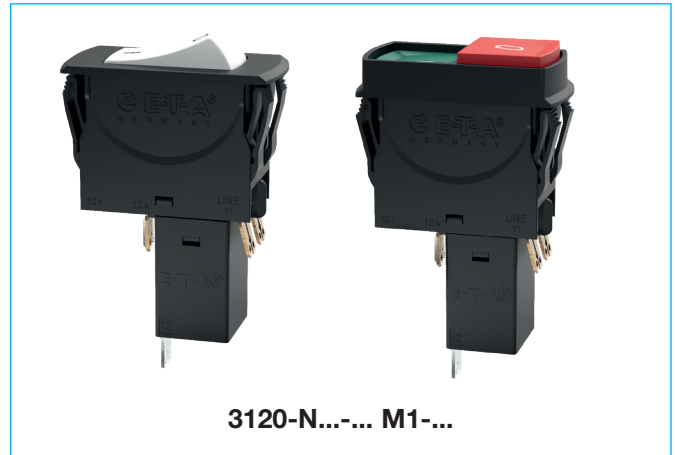
The 3120-N...-...M1-... meets the fire resistance requirements to EN 60335-1: 2007-02 Household and similar electrical appliances – Safety.

**Typical applications**

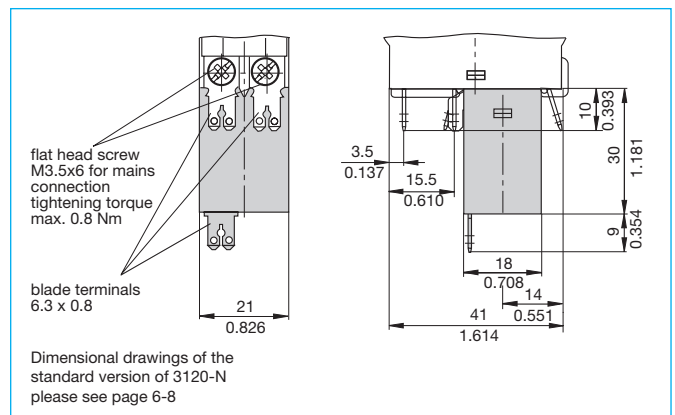
Electric motors, household appliances and office machines, electrical tools, power supplies, charging rectifiers

**Current ratings and internal resistance values**

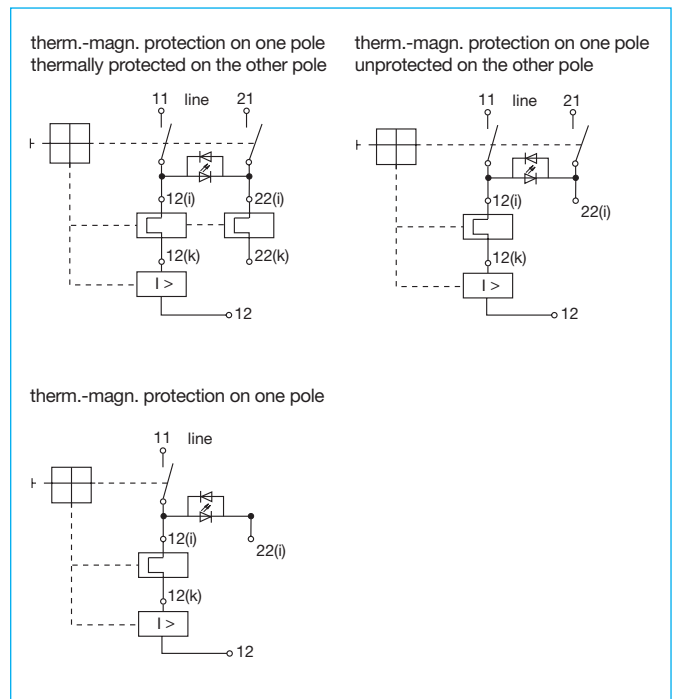
Current rating (A)	Internal resistance per pole (Ω)	
	thermal-magnetic	thermal 1.15 -1.38 x I <sub>N</sub>
0.1	165	94
0.2	42.5	24
0.3	20.2	12
0.4	9.7	5.40
0.5	7.17	4.30
0.6	4.9	3
0.8	2.65	1.50
1	1.49	0.9
1.2	1.25	0.7
1.5	0.74	0.45
2	0.49	0.29
2.5	0.20	0.0785
3	0.14	0.0595
3.5	0.114	0.0565
4	0.092	0.0435
5	0.06	0.0325
6	0.043	0.0215
7	0.030	0.0215
8	0.029	0.02
10	0.021	0.02
12	< 0.02	< 0.02
14	< 0.02	< 0.02
15	< 0.02	< 0.02
16	< 0.02	< 0.02



**Dimensions – magnetic trip module**



**Schematic diagrams**



## Technical data

For further details please see: [www.e-t-a.de/ti\\_e](http://www.e-t-a.de/ti_e)

Rated voltage AC 240 V, DC 50 V (AC 415 V upon request)

Current rating range 0.1...16 A

### Typical life 1-pole

AC 240 V: 0.1...16 A 30,000 operations at  $1 \times I_N$ , inductive  
 DC 50 V: 0.1...4 A 30,000 operations at  $1 \times I_N$ , inductive  
 4.5...16 A 30,000 operations at  $1 \times I_N$ , resistive  
 DC 28 V: 0.1...16 A 30,000 operations at  $1 \times I_N$ , inductive

### Typical life 2-pole

AC 240 V: 0.1...16 A 50,000 operations at  $1 \times I_N$ , inductive  
 DC 50 V: 0.1...16 A 50,000 operations at  $1 \times I_N$ , inductive

Ambient temperature -30... 60 °C

Insulation coordination (IEC 60664) 2.5 kV / 2 reinforced insulation in the operating area

Dielectric strength  
 Operating area test voltage AC 3000 V  
 Current path/current path test voltage AC 1500 V

Insulation resistance > 100 MOhm (DC 500 V)

Rupture capacity  $I_{cn}$  (IEC/EN 60934)

	$I_N$	$U_N$	$I_{cn}$
1-pole, 2-pole	0.1 ... 2 A	AC 240 V / DC 28 V	$100 \times I_N$
1-pole	0.1 ... 10 A	DC 50 V	50 A
1-pole	2.5 ... 16 A	AC 240 V / DC 28 V	200 A
2-pole	0.1 ... 2 A	DC 50 V	$10 \times I_N$
2-pole	2.5 ... 16 A	DC 50 V	250 A
2-pole	2.5 ... 16 A	AC 240 V / DC 28 V	300 A

Interrupting capacity  $I_{nc}$  (UL 1077)

	$I_N$	$U_N$	$I_{nc}$
1-pole, 2-pole	0.1 ... 10 A	AC 250 V	2,000 A, C, 1
1-pole, 2-pole	0.1 ... 16 A	AC 125 V	1,000 A, C, 1

### Degree of protection (IEC 60529)

Operating area	IP40 with water splash protection IP65
Terminal area	IP00 with water splash protection IP64
Vibration	8 g (57-500 Hz) $\pm$ 0.61 mm (10-57 Hz) test to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock resistance	30 g (11 ms) test to IEC 60068-2-27, test Ea
Corrosion	96 hrs in 5 % salt mist test to IEC 60068-2-11, test Ka
Humidity	240 hrs in 95 % RH test to IEC 60068-2-78, test Cab
Mass	approx. 53 g (2-pole) approx. 50 g (1-pole)

## Approvals

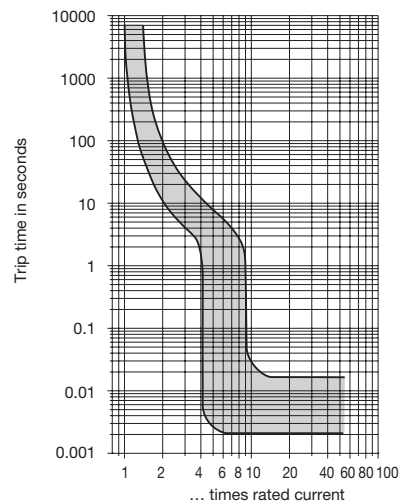
Approval authority	Standard	Voltage ratings	Current rating range
VDE	IEC/EN 60934	AC 240 V DC 50 V	0.1 ... 16 A 0.1 ... 16 A
UL	UL 1077	AC 250 V AC 125 V	0.1 ... 10 A 0.1 ... 16 A
CSA	C22.2 No 235	AC 250 V DC 125 V	0.1...10 A 0.1...14 A
CQC (CCC)	GB 17701	AC 240 V DC 50 V	0.1...16 A 0.1...16 A

## Time/current characteristics

Single or double pole load

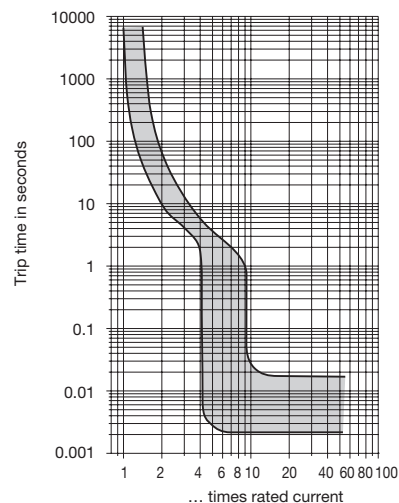
0.1...2 A

AC/DC <sup>1)</sup>



2.5...16 A

AC/DC <sup>1)</sup>



<sup>1)</sup> Magnetic tripping currents are increased by 25% on DC supplies.

The time/current characteristic depends on the ambient temperature. In order to eliminate nuisance tripping, please multiply the current rating by a derating factor.

ambient temperature [°C]	-30	-20	-10	0	23	40	50	60
temperature factor	0.8	0.84	0.88	0.92	1	1.08	1.14	1.23



**Order numbering code**

**Type No.**

**3120** thermal-magnetic circuit breaker/switch combination with rocker actuation

**Mounting method**

**N3** snap-in, mounting cut-out 50.5 x 21.5 mm

**N5** snap-in, mounting cut-out 44.5 x 22 mm

**Number of poles**

**1** 1-pole switching, 1-pole thermal-magnetically protected

**2** 2-pole switching, 2-pole protected (pole one: thermal-magnetically protected, pole two: thermally protected)

**5** 2-pole switching, 1-pole thermal-magnetically protected

**Style**

**1** standard

**3** with actuator guard

**4** with water splash protection (IP65)

**6** version for appliance inlet modules

X3120-A/B (only for mounting method N5)

with actuator guard and cross-hole

**Terminal design**

**P7** blade terminals

**H7** as P7, terminals 11 and 21 with additional flat head screws M3.5

**N7** as P7, with additional shunt terminals 12(i) and 22(i)

**G7** as N7, terminals 11 and 21 with additional flat head screws M3.5

**Trip curve**

**M1** medium delay, thermal- 1.01-1.4 x I<sub>N</sub>; magnetic 4-9 x I<sub>N</sub> AC

**Actuator**

**W** rocker

**Rocker colour and illumination**

**01 .** black without illumination

**02 .** white without illumination

**04 .** red without illumination

**12 . Y** white with illumination

**14 . R** red with illumination

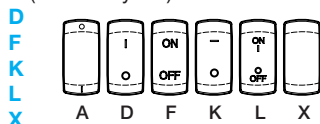
**15 . Y** orange with illumination

**16 . T** blue with illumination

**19 . G** green with illumination

**Marking of rocker actuator rocker style**

**A** (not for style 4)



**Illumination voltage range**

(= operating voltage)

**1** DC 12 V

**2** DC 24 V

**3** AC 115 V

**4** AC 230 V

**5** DC 48 V

**6** AC 400 V (for 2-pole versions)

**Current ratings**

**0.1 ... 16 A**

**3120-N5 2 4 - M1-W 19 D G 4 - 16 A** ordering example



**Order numbering code**

**Type No.**

**3120** thermal-magnetic circuit breaker/switch combination with push button actuation

**Mounting method**

**N3** snap-in, mounting cut-out 50.5 x 21.5 mm

**N5** snap-in, mounting cut-out 44.5 x 22 mm

**Number of poles**

**1** 1-pole switching, 1-pole thermal-magnetically protected

**2** 2-pole switching, 2-pole protected (pole one: thermal-magnetically protected, pole two: thermally protected)

**5** 2-pole switching, 1-pole thermal-magnetically protected

**Style**

**D** with actuator guard

**E** with actuator guard and water splash cover

**F** with power-on protection

**V** with power-on protection and water splash cover

**Terminal design**

**P7** blade terminals

**H7** as P7, terminals 11 and 21 with additional flat head screws M3.5

**N7** as P7, with additional shunt terminals 12(i) and 22(i)

**G7** as N7, terminals 11 and 21 with additional flat head screws M3.5

**Trip curve**

**M1** medium delay, thermal- 1.01-1.4 x I<sub>N</sub>; magnetic 4-9 x I<sub>N</sub> AC

**Actuator**

**S** two push buttons

**Colour of push button/illumination (style D and F without water splash protection)**

**GRD** green/red without illumination

**GRDG** green with LED illumination/red without illumination

**Colour of push button/illumination (style E and V with water splash protection)**

**GRX** green/red without illumination

**GRXG** green with LED illumination/red without illumination

**Illumination voltage range**

(= operating voltage)

**1** DC 12 V

**2** DC 24 V

**3** AC 115 V

**4** AC 230 V

**5** DC 48 V

**6** AC 400 V (for 2-pole versions)

**Current ratings**

**0.1 ... 16 A**

**3120-N3 5 V - P7 M1-S GRXG - 16 A** ordering example

Please observe our minimum ordering quantities.





1

**Order numbering code**

<b>Type No.</b>	
<b>3120</b>	thermal magnetic resettable circuit breaker with push button
<b>Mounting method</b>	
<b>N3</b>	snap-in, mounting cut-out 50.5 x 21.5 mm
<b>N5</b>	snap-in, mounting cut-out 44.5 x 22 mm
<b>Number of poles</b>	
<b>1</b>	1-pole thermal-magnetically protected
<b>2</b>	2-pole protected (pole one: thermal-magnetically protected, pole two: thermally protected)
<b>5</b>	2-pole, 1-pole thermal-magnetically protected
<b>Style</b>	
<b>G</b>	resettable circuit breaker
<b>Terminal design</b>	
<b>P7</b>	blade terminals
<b>H7</b>	as P7, terminals 11 and 21 with additional flat head screws M3.5
<b>N7</b>	as P7, with additional shunt terminals 12(i) and 22(i)
<b>G7</b>	as N7, terminals 11 and 21 with additional flat head screws M3.5
<b>Trip curve</b>	
<b>M1</b>	medium delay, thermal- 1.01-1.4 x I <sub>N</sub> ; magnetic 4-9 x I <sub>N</sub> AC
<b>Actuator</b>	
<b>D</b>	one push button
<b>Colour of push button</b>	
<b>01</b>	black
<b>Marking of push button</b>	
<b>X</b>	without marking
<b>Current ratings</b>	
<b>0.1 ... 16 A</b>	
<b>3120-N3 2 G - P7 M1 - D 01 - X 16 A</b>	ordering example

Please observe our minimum ordering quantities.

**Customer-specific solutions**

Looking for a version you cannot find in our order numbering code? Please get in touch.