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

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 thermo-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.

The 3120-N type is also available with thermal-magnetic trip. (technical data p. 21 ff.)

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

3120-N...-...T1-...

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
- Expandable 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
- Suitable for use in medical equipment according to IEC/EN 60601

Approval logos

Conformity

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

Technical data

For detailed technical information please see 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 ... 20 A (up to 30A upon request for 1-pole devices only)
Typical life 1-pole (EN 60934)	
AC 240 V:	0.1 ... 20 A 30,000 cycles at 1 x I_N, inductive
DC 50 V:	0.1 ... 4 A 30,000 cycles at 1 x I_N, inductive
	4.5 ... 16 A 30,000 cycles at 1 x I_N, resistive
DC 28 V:	0.1 ... 20 A 30,000 cycles at 1 x I_N, inductive
Typical life 2-pole (EN 60934)	
AC 240 V:	0.1 ... 16 A 50,000 cycles at 1 x I_N, inductive
	17 ... 20 A 30,000 cycles at 1 x I_N, inductive
DC 50 V:	0.1 ... 16 A 50,000 cycles at 1 x I_N, inductive
	17 ... 20 A 10,000 cycles at 1 x I_N, 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_{cn} (IEC/EN 60934)

	I_N	U_N	I_{cn}
1-pole, 2-pole	0.1 ... 2 A	AC 240 V / DC 50 V	10 x I_N
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_{nc} (UL 1077)

	I_N	U_N	I_{nc}
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
Terminal area	IP00

Other degrees of protection possible, depending on selected variant, see further details in data sheet.

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 hours 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		

Ordering information

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 accordion-style seal, IP65
- **6** Version with shorter flange (only for mounting method N5)
- **7** With water splash cover (IP54 in the actuation area) and shorter flange
- **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 devices 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

Opaque

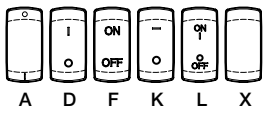
01 .	Black	without illumination
02 .	White	without illumination
04 .	Red	without illumination

Translucent (when named with Y/R/T/G the rocker is illuminated)

12 . (Y)	White	without illumination (illuminated)
14 . (R)	Red	without illumination (illuminated)
15 . (Y)	Orange	without illumination (illuminated)
16 . (T)	Blue	without illumination (illuminated)
19 . (G)	Green	without illumination (illuminated)

Marking of rocker

- **A** (not for style 4)
- **D**
- **F**
- **K**
- **L**
- **X**



3120-N5 2 4 - PT T1-W 19 D G ... Ordering example

Illumination voltage (= 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 rating

0.1 ... 20 A

Terminal shroud (optional)

- **A** With terminal shroud, mounted*

3120-N5 2 4 - PT T1-W 19 D G 4 - 16 A - (A) Ordering - example

* Optional. If -A is added to the order designation, the 3120 is supplied with the mounted terminal shroud. Only available in combination with -P7 or -N7 terminal design variants.

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

Ordering information

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 IP54
- **F** With power-on protection
- **V** With power-on protection and water splash cover IP54

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 rating

- **0.1 ... 20 A**

Terminal shroud (optional)

- **A** With terminal shroud, mounted*

3120-N3 5 V - PT T1-S GRD - 20 A - (A) Ordering - example

Ordering information

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(i)
- **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
- **02** White opaque
- **04** Red opaque (UL/CSA approval only)
- **09** Green opaque

Marking of the push button

- **X** Without marking

Current rating

- **0.1 ... 20 A**

Terminal shroud (optional)

- **A** With terminal shroud, mounted*

3120-N3 2 G - PT T1 - D 01 - X 20 A - (A) Ordering - example

Please observe our minimum ordering quantities.

* Optional. If -A is added to the order designation, the 3120 is supplied with the mounted terminal shroud. Only available in combination with -P7 or -N7 terminal design variants.

Customer-specific solutions

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

Approvals

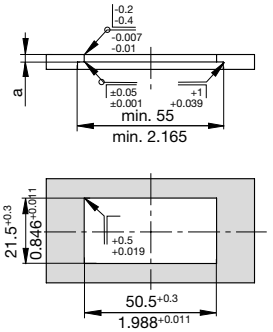
Approval authority	Standard	Rated voltage	Current rating range	Appr.-marks
VDE	IEC/EN 60934	AC 240 V DC 50 V DC 50 V DC 28 V	0.1 A ... 20 A 0.1 ... 20 A (2-pole) 0.1 ... 16 A (1-pole) 0.1 A ... 20 A	
UL	UL 1077	AC 250 V AC 250 V DC 50 V AC 250 V	0.1 A ... 16 A (TC1, OL1) 17 A ... 20 A (TC1, OL0) 0.1 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 ... 20 A (2-pole)	

* 2 poles in parallel

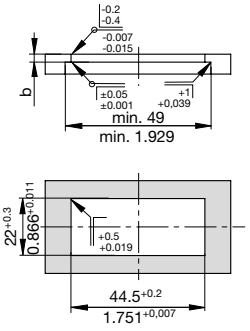
Mounting method

Mounting method

mounting cut-out -N3



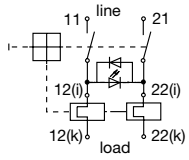
mounting cut-out -N5



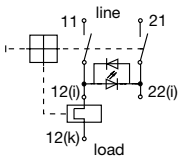
Panel thickness	Style variants 1/3/6/7/A/D/F/G	Style variants 4, E and V
a	1 – 6.35 mm	1 – 5.5 mm
b	1 – 4 mm	1 – 3.2 mm

Schematic diagrams

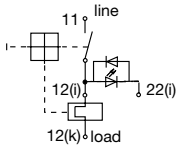
2-pole switching and 2-pole thermally protected



2-pole switching and 1-pole thermally protected

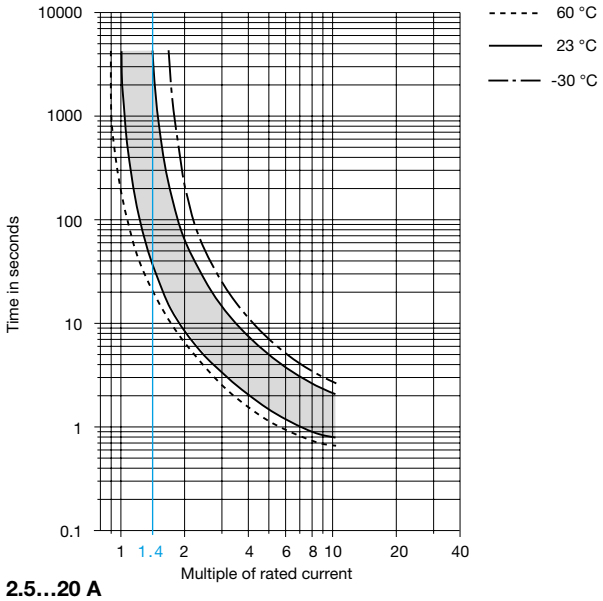


1-pole switching and 1-pole thermally protected

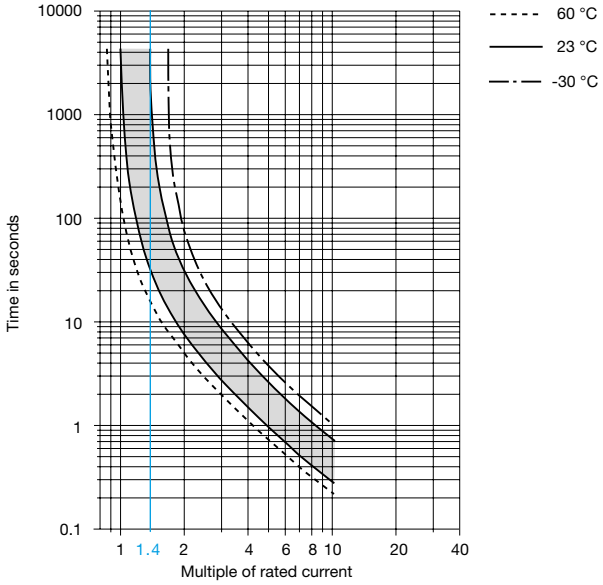


Time/current characteristics

0.1...2 A



2.5...20 A

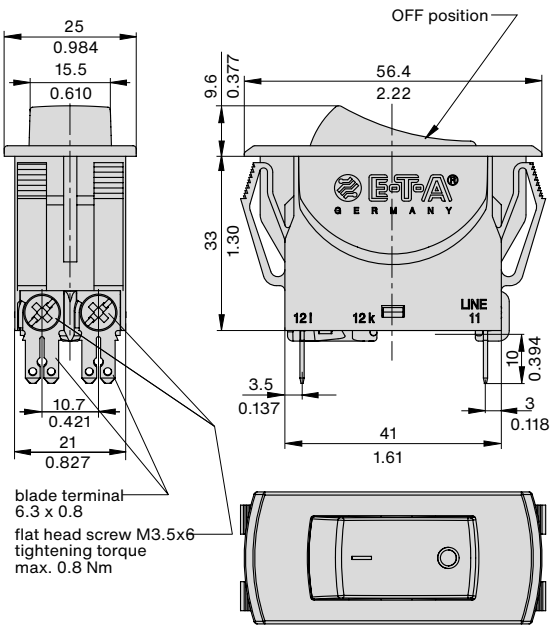


The time/current characteristic depends on the ambient temperature. In order to eliminate nuisance or late tripping, please multiply the current rating of the circuit breaker by a temperature factor (see chapter Technical Information) For detailed technical information please see www.e-t-a.de/ti_e

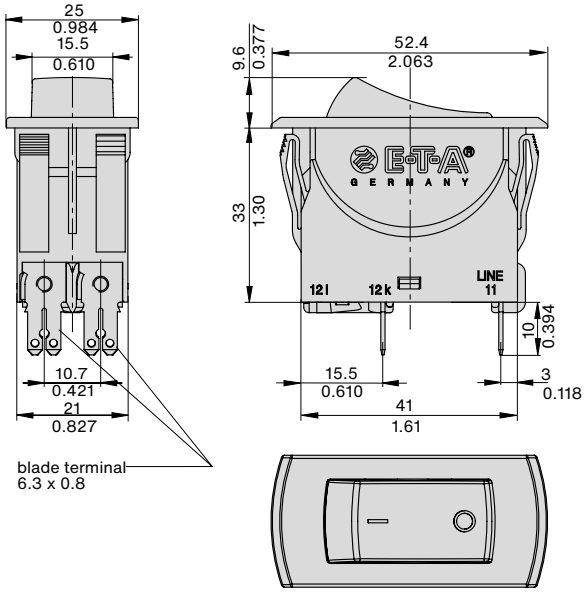
Ambient temperature [°C]	-30	-20	-10	0	23	40	50	60
Temperature factor	0.8	0.84	0.88	0.92	1	1.08	1.14	1.23

Dimensions

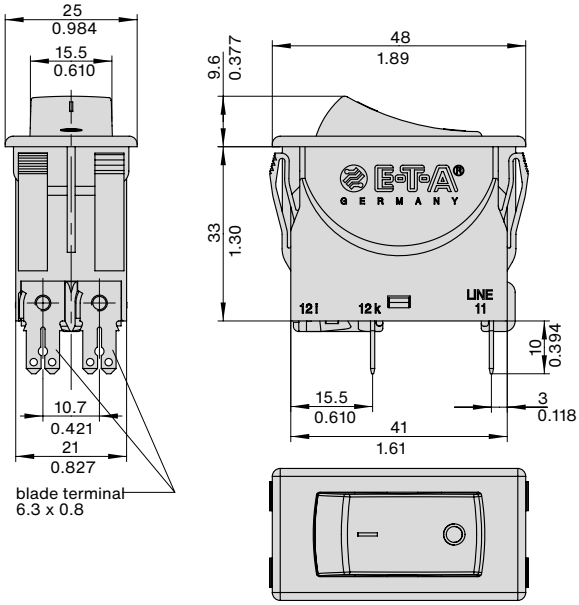
3120-N3.1-H7...



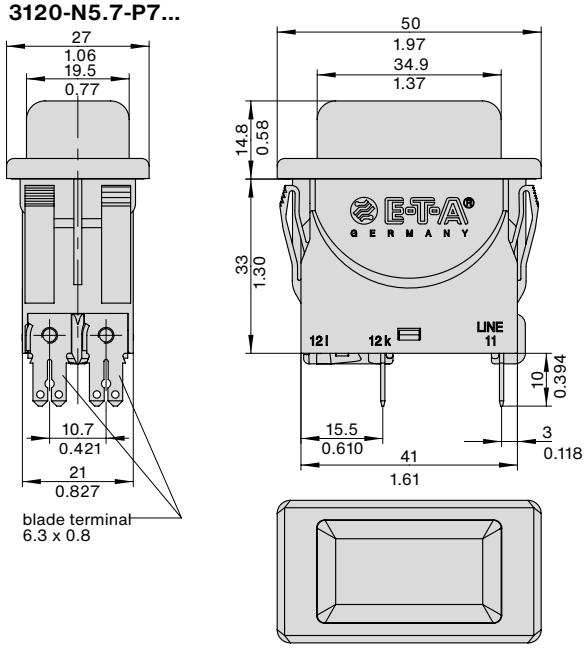
3120-N5.1-P7...



3120-N5.6-P7...

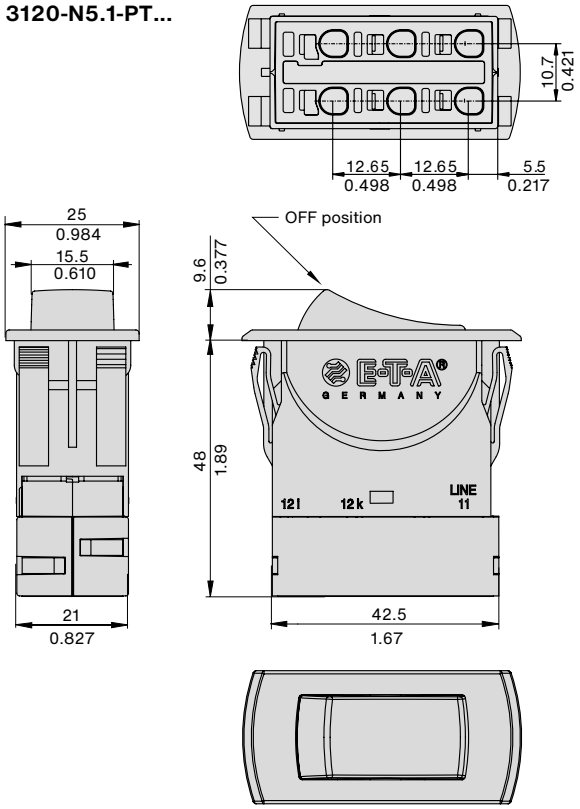


3120-N5.7-P7...

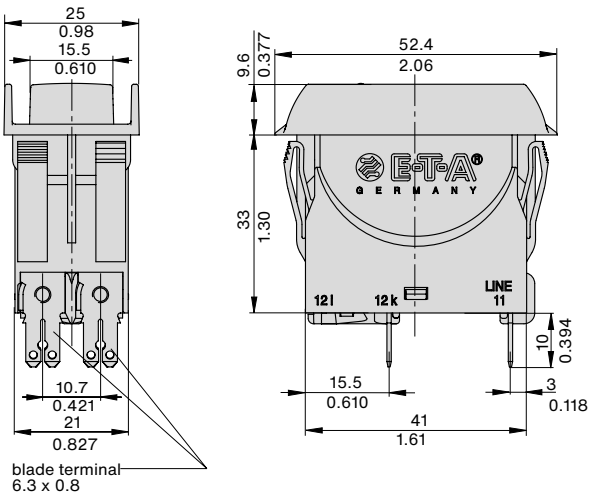


Dimensions

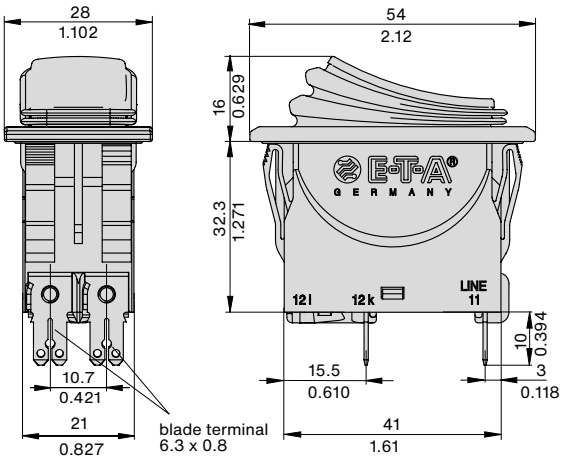
3120-N5.1-PT...



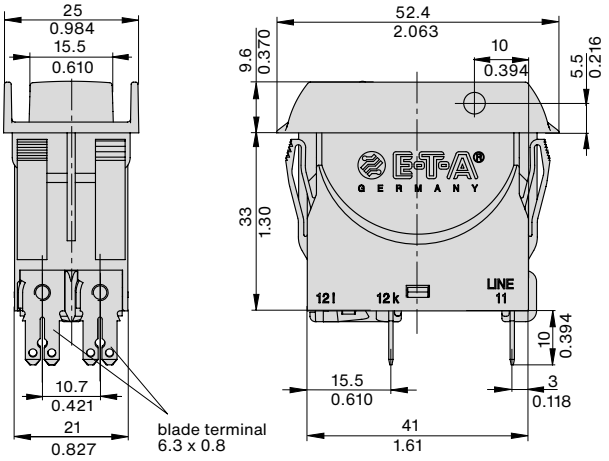
3120-N5.3-P7...



3120-N5.4-P7...

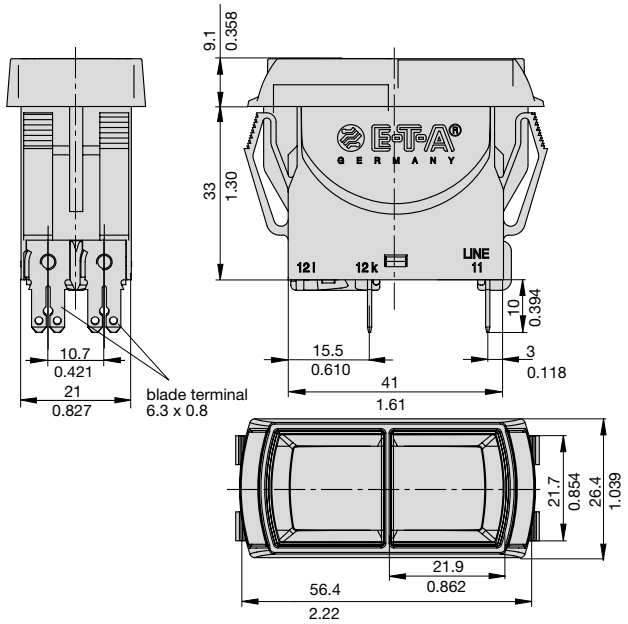


3120-N5.A-P7...



Dimensions

3120-N3.D-P7...



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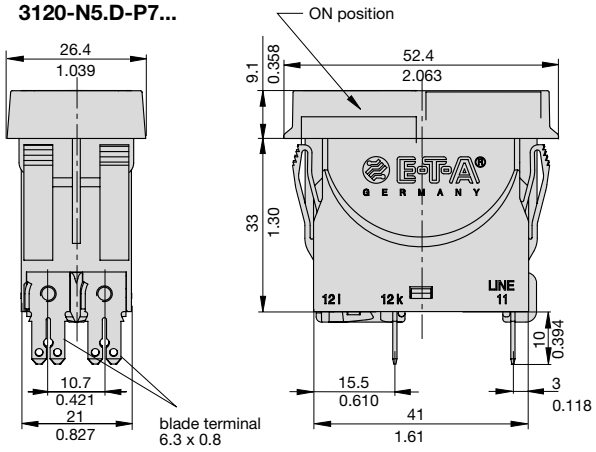
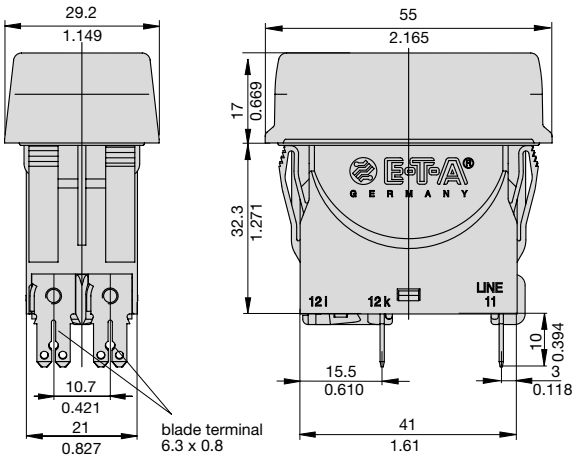
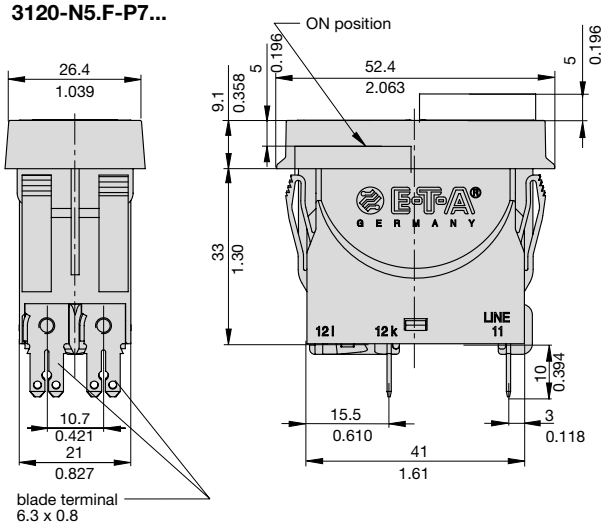


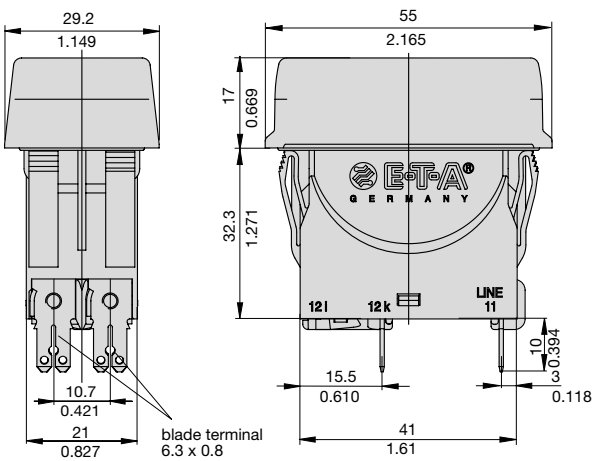
3120-N5.E-P7...



3120-N5.F-P7...

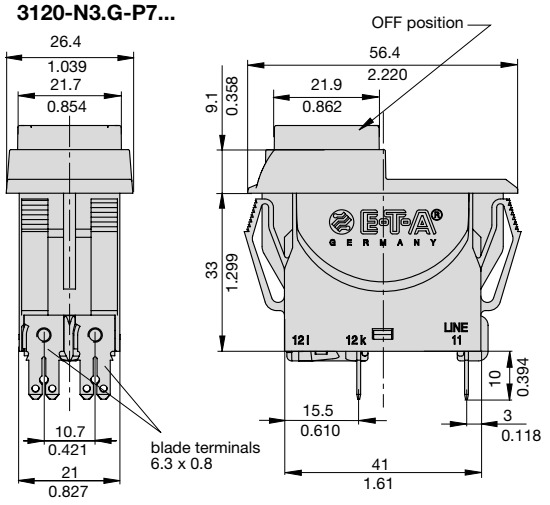


3120-N5.V-P7...

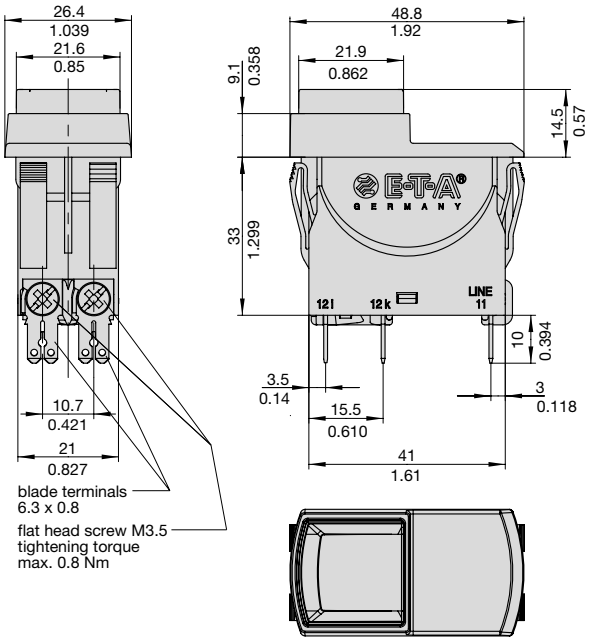


Dimensions

3120-N3.G-P7...



3120-N5.G-P7...

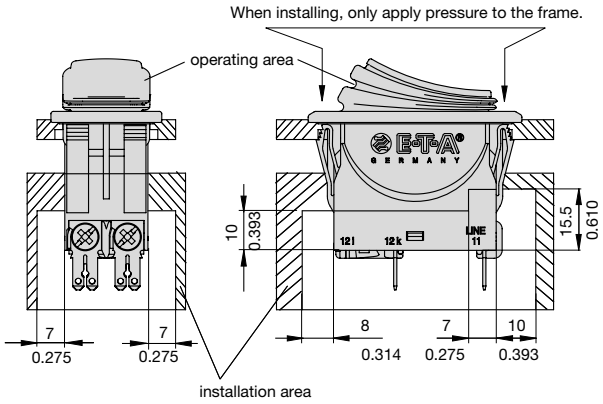


Cable cross sections PT terminals

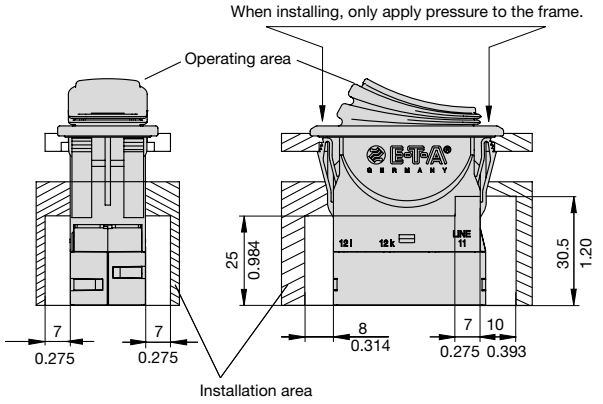
Cable	Cross section with direct push-in wiring
rigid	1...4 mm² (stripping length: 10 mm)
flexible with wire end ferrule (with or without plastic sleeve)	0.5...2.5 mm², length of metal sleeve 8 - 12 mm
Cable	**Cross section when opening the push-in terminals**
rigid	0.5...4 mm² (stripping length: 10 mm)
flexible without wire end ferrule	0.5...2.5 mm²
flexible with wire end ferrule (with or without plastic sleeve)	0.5...2.5 mm², length of metal sleeve 8 - 12 mm

Installation drawing

3120 with blade terminals



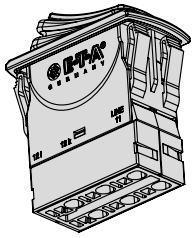
3120 with push-in terminals



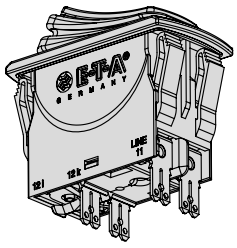
Terminal types

2-pole switching and 2-pole thermally protected

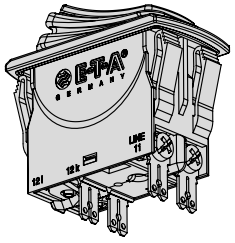
3120-N524-PT



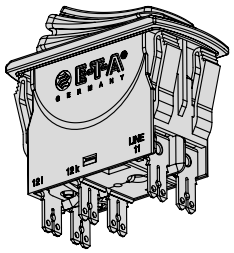
3120-N524-P7



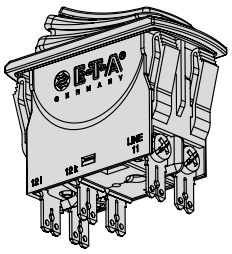
3120-N524-H7



3120-N524-N7

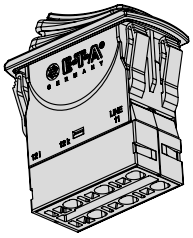


3120-N524-G7

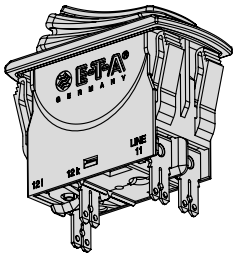


2-pole switching and 1-pole thermally protected

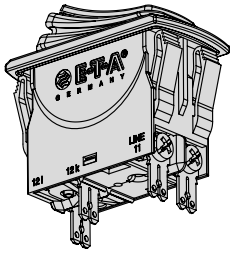
3120-N554-PT



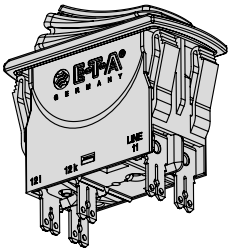
3120-N554-P7



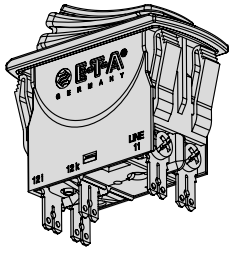
3120-N554-H7



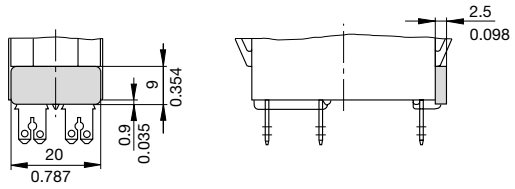
3120-N554-N7



3120-N554-G7



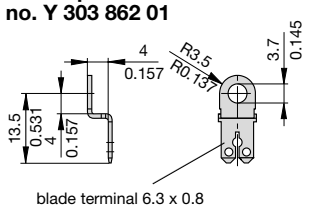
Terminal shroud



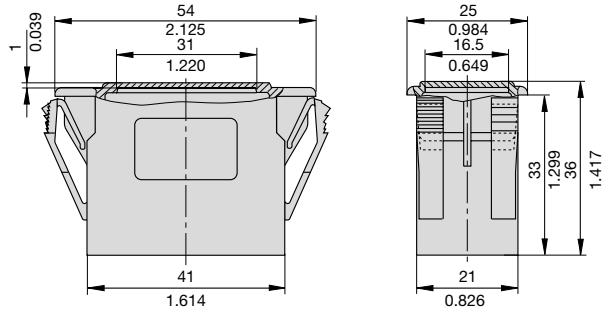
Optionally available in combination with -P7 or -N7 terminal design variants. For details, see ordering information.

Accessories

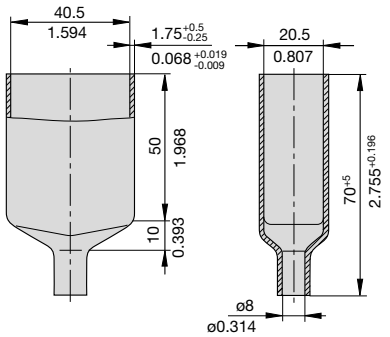
Terminal adapter
order no. Y 303 862 01



Cover for -N3 mounting cut-out
order no. Y 303 885 31



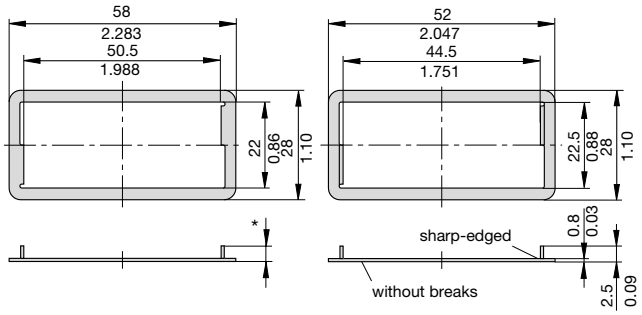
Cover for terminal area (IP20)
order no. Y 304 275 01



Accessories

Snap-in frame for 3120-N3...
order no. Y 303 675 01/02

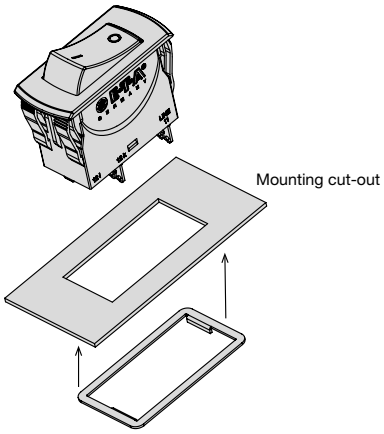
Snap-in frame for 3120-N5...
order no. Y 303 676 01



* Y 303 675 01 can only be used for mounting panel thickness < 2 mm
* Y 303 675 02 can only be used for mounting panel thickness < 4 mm

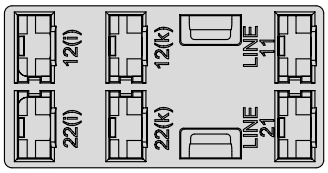
The snap-in frame is used in special cases to ensure a tight fit of the circuit breaker in the mounting cut-out, e.g. in case of dimensional tolerances, soft materials or if the specified edge condition cannot be maintained.

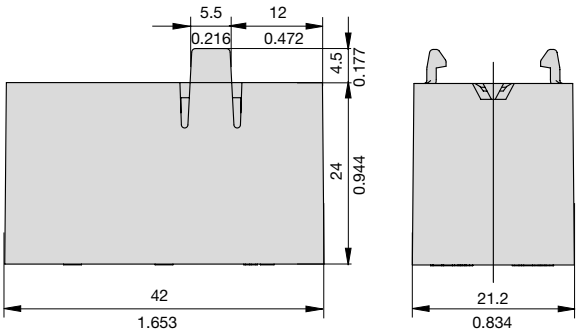
Snap-in frame mounting

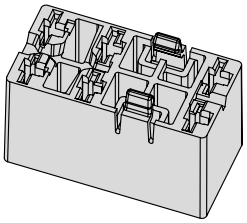


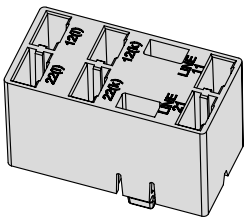
Accessories

Connection adapter
Order number Y 31214001
For pre-assembly of the connection cables. Two snap-in hooks ensure a firm plug-in connection.





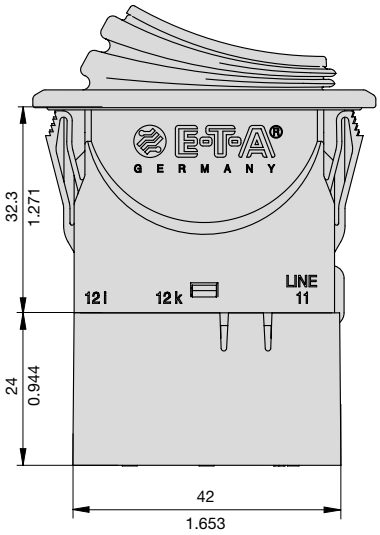


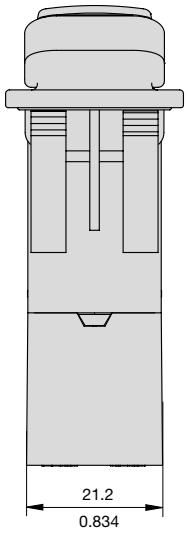


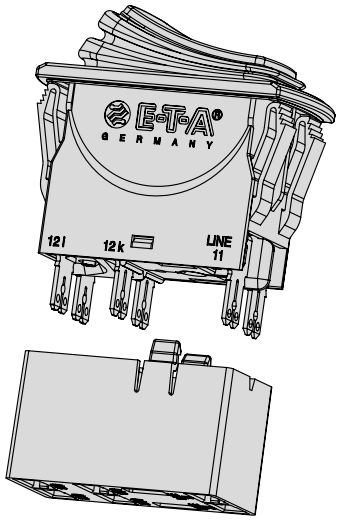
Benefits:
- Time and cost savings during final assembly
- Quick replacement of devices
- Cover for the blade terminals (IP20)

Note:
Supplied without female contacts.
The chamber dimensions for the female contacts (plug width 6.3 mm) are in accordance with DIN 46340 Part 3. Form 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;

Connection adapter plugged onto circuit breaker:







Description – appliance inlet module X3120 A/B

The X3120 appliance inlet module with 3120- N5 circuit breaker combines up to four functions within a single component: A C14/C20 appliance inlet, 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**	**Rated voltage**	**Max. current rating**
ENEC	IEC/EN 60320-1	AC 240 V	10 A
UL/CSA[1)]	UL 60320-1, CSA C22.2 no. 60320-1	AC 250 V	15 A
CQC	CCC	AC 250 V	10 A

1) X3120-A0400 also available with overall approval according to UL 60320-1 at max. 15 A rated current.

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

X3120-B – C20 inlet plugs			
Approval authority	**Standard**	**Rated voltage**	**Max. current rating**
ENEC	IEC/EN 60320-1	AC 240 V	16 A
UL/CSA[2)]	UL 60320-1, CSA C22.2 no. 60320-1	AC 240 V	20 A

2) X3120-B0400 also available with overall approval according to UL 60320-1 at max. 20 A rated current.

Please note: the current rating of the circuit breaker must not exceed the max. current of the filter/inlet plug, depending on the approval.

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 current rating of the circuit breaker must not be higher than the filter current rating. For best attenuation a filter with the smallest possible current rating should be selected. Depending on the IEC/EN or UL/CSA approval, other maximum values are permissible for the inlet plug. The table above serves as orientation.
For protection of the filter in the event of higher overcurrents, we recommend 3120- N circuit breakers with thermal-magnetic trip (3120- N...-M1...).
For further technical information please refer to page 21.

Ordering information

Type no.

X3120 Appliance inlet module for circuit breaker type 3120- N

Module

A C14 appliance inlet
(can be combined with 3120-N5.6/-N5.7/-N5.G)

B C20 appliance inlet
(without filter, can be combined with 3120-N5.6/-N5.G)

Mounting method

04 Screw-type mounting

Filters

00 Without filter
01 Standard line filter
03 Standard line filter for medical equipment
06 High-power line filter for medical equipment

Current rating for filter (only with module A)

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 at connector
11 Wired; mounting position 3120: OFF position at connector

Supply status

M Module supplied with mounted 3120 circuit breaker and connector

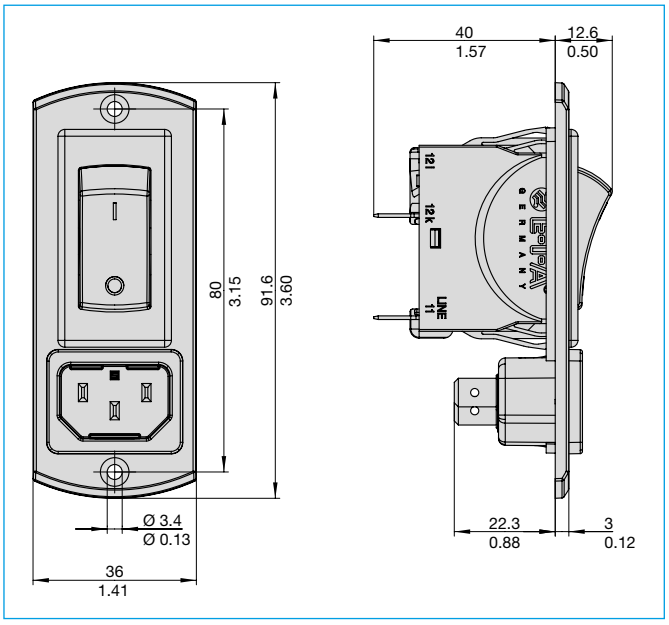
X3120-A	**04**	**01**	**08**	**01**	**M**	Ordering example

Note: the power entry module is only available as a ready-to-use unit including the 3120 circuit breaker, C14/C20 appliance inlet and wiring (if selected).

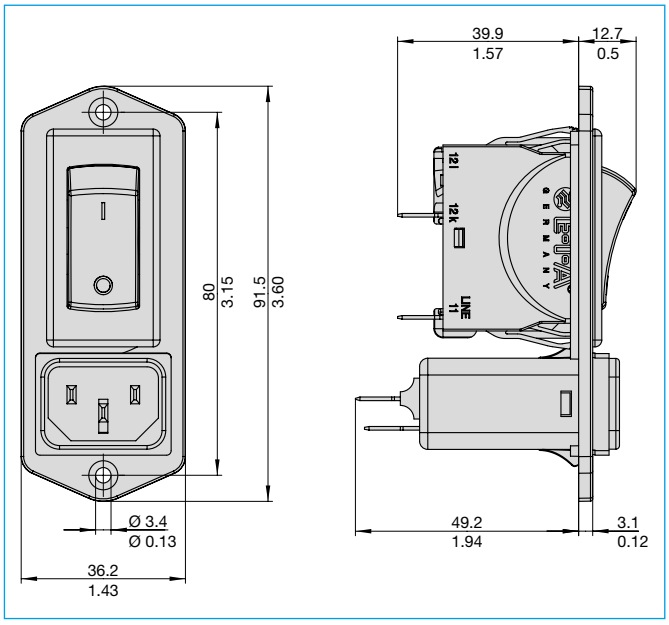
Technical data

	X3120-A0400 (without filter)	X3120-A040x	X3120-B0400
Rated voltage	AC 250 V	AC 250 V	AC 250 V
Current rating (appliance inlet)	10 A (IEC/EN) 15 A (UL/CSA)	10 A (IEC/EN) 15 A (UL/CSA)	16 A (IEC/EN) 20 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	-25°C ... +60°C	-25°C ... +60°C
Number of poles	L, N + mass	L, N + mass	L, N + mass
Degree of protection	I	I	I
Mounting method	Screw-type mounting (from the front or from the rear)	Screw-type mounting (from the front or from the rear)	Screw-type mounting (from the front or from the rear)
Terminals	DIN46244 blade terminal 6.3 mm x 0.8 mm	DIN46244 blade terminal 6.3 mm x 0.8 mm	DIN46244 blade terminal 6.3 mm x 0.8 mm
Housing material	Thermoplastics, black, UL94V-0	Thermoplastics, black, UL94V-0	Thermoplastics, black, UL94V-0
Appliance inlet:	C14 to IEC/EN 60320-1, UL 60320-1, CSA C22.2 no. 60320 - 1	C14 with line filter to IEC/EN 60939, UL 1283, CSA 22.2 no. 8	C20 to IEC/EN 60320-1, UL 60320-1, CSA C22.2 no. 60320-1
Main switch	circuit breaker for equipment protection 3120-N5.6 3120-N5.7 3120-N5.G	circuit breaker for equipment protection 3120-N5.6 3120-N5.7 3120-N5.G	circuit breaker for equipment protection 3120-N5.6 3120-N5.G

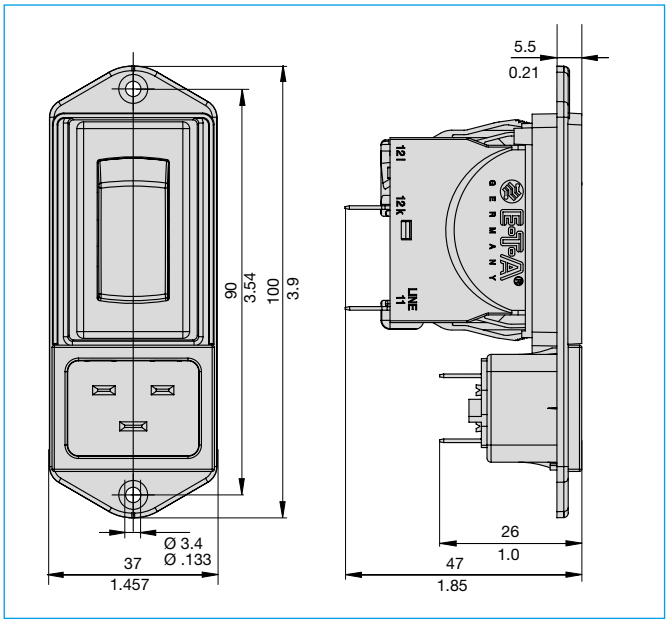
X3120-A0400 dimensional drawing (in fig. with 3120-N5.6)



X3120-A040x dimensional drawing (in fig. with 3120-N5.6)

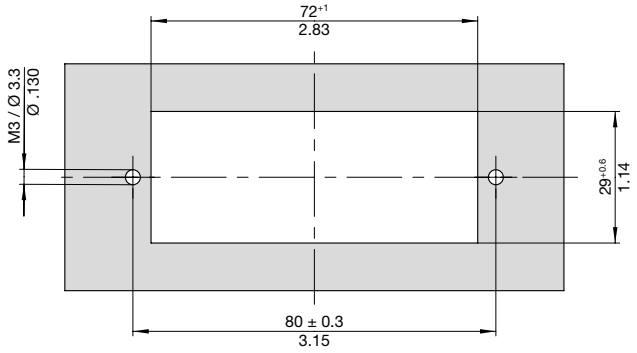


X3120-B0400 dimensional drawing (in fig. with 3120-N5.6)

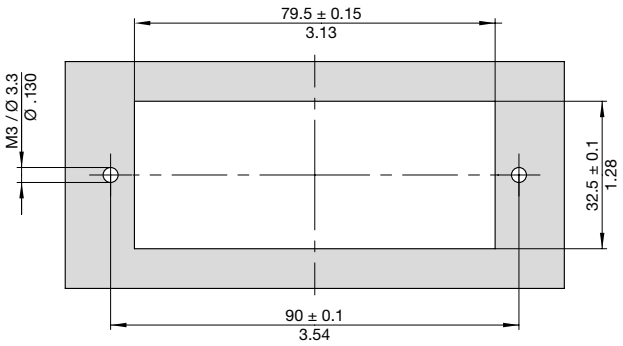


Mounting cut-out

X3120-A0400
X3120-A040x

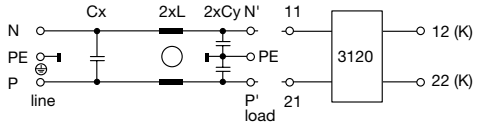


X3120-B0400

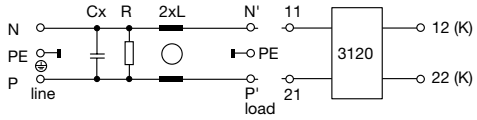


Schematic diagram X3120-A

X3120-A0401
Standard filter

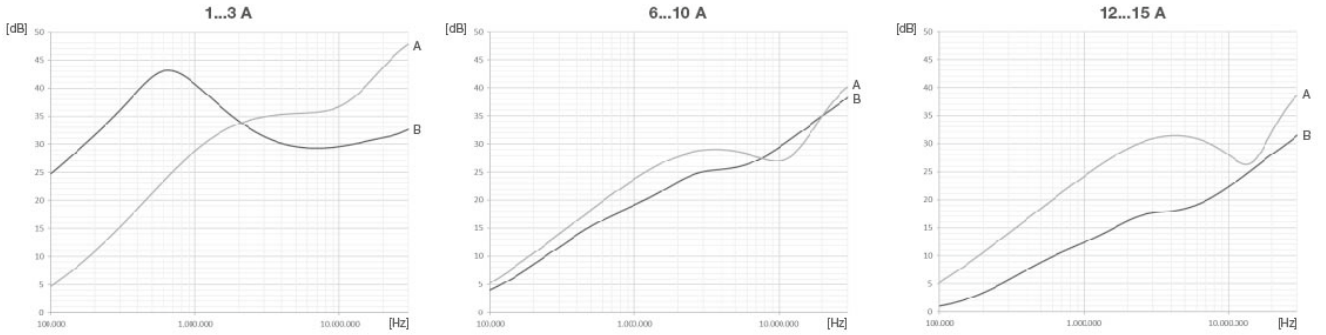


X3120-A0403 and X3120-A0406
Line filter for medical equipment

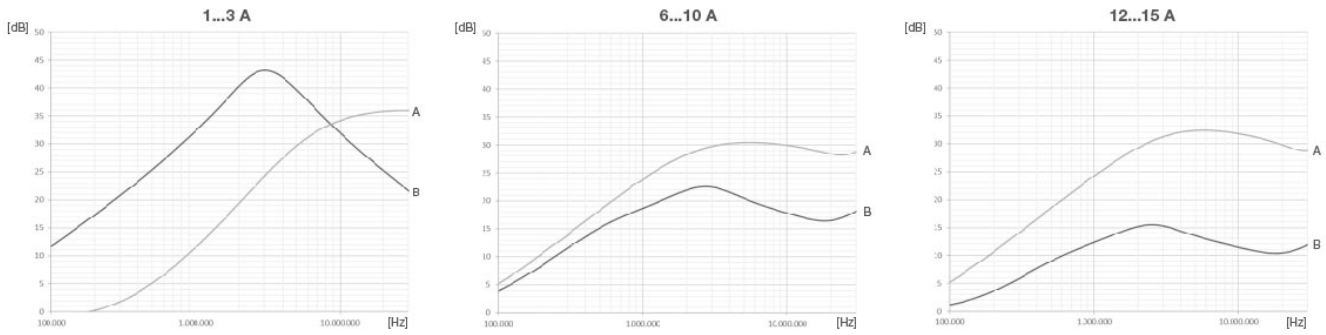


Line filter attenuation curves

X3120-A0401 standard line filter

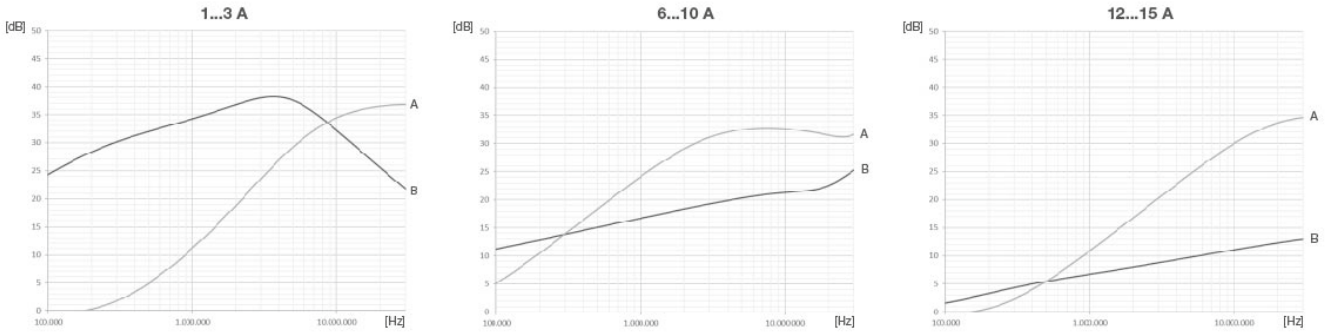


X3120-A0403 standard line filters for medical equipment



Line filter attenuation curves

X3120-A0406 high performance filters for medical equipment



Attenuation curves diagram, information according to CISPR17
curve A (DM, differential mode): 50/50 Ohm sym.
curve B (CM, common mode): 50/50 Ohm asym.

Note

The attenuation curves provide an indication of the attenuation behaviour without taking the device /machine environment into account. A measurement is mandatory to verify the EMC conformity of your device/machine.

Filter selection table

Filters	Current 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: 3120- N...-H7 or -G7 basic device requires screw terminals. Not possible in combination with PT terminals.

Applies in combination with design variant 4 (accordion-style):
In the event of voltage dip or power failure, the undervoltage release module switches Circuit breaker off. 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

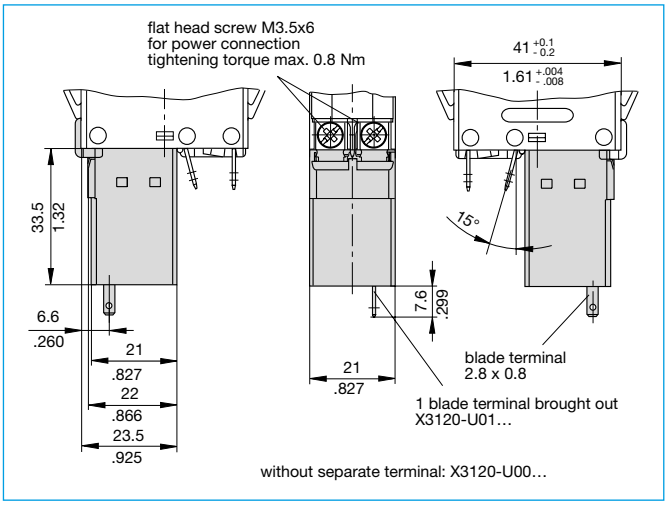
All machines that could cause personal injury upon automatic re-start, e.g. drilling machines, electric saws, meat cutting machines etc.

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.

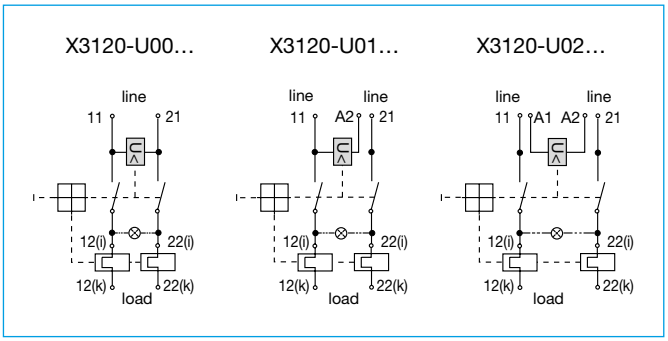
Ordering information

Type no.					
X3120	Module for 3120-N device				
	Module				
	U	Undervoltage release module			
		Design			
		00	Standard (without separate connections)		
		01	1 blade terminals 2.8x0.8		
		02	2 blade terminals 2.8x0.8		
			Rated voltage		
			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
X3120-	U	0000	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 x U_N < U < 0.7 x 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
Latch-in values	≥ 85 % U_N
Ambient temperature	-30 ... 60 °C
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	48 hours at 5 % salt mist, Test to IEC 60068-2-11, Test Ka
Humidity	240 hours in 95 % RH Test to IEC 60068-2-78, Test Cab
Mass	approx. 56 g (including base device)

Description X3120-S auxiliary contact module

Add-on module for circuit breaker type 3120-F. 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 versions N7 and P7.

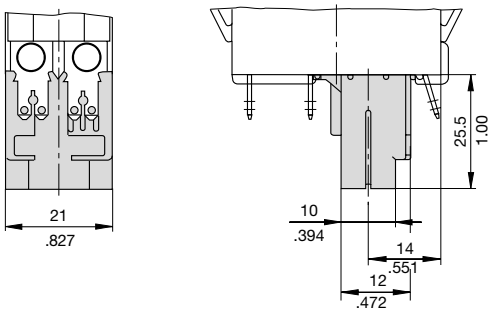
Typical applications

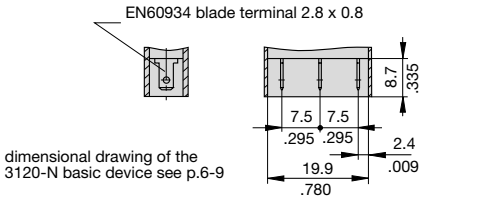
Status monitoring of CBE and/or the connected loads.

Ordering information

Type no.			
X3120	Module for 3120-N device		
	Module		
	S	Auxiliary contact module	
		Design	
		0	Change-over contact
			Terminal design
			1 Blade terminals
			Key for rated power
			A 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 AC 5 V – AC 250 V 5 ... 100 mA
			DC 5 V – DC 250 V 5 ... 100 mA
			Supply status
			M Module mounted to 3120 circuit breaker
X3120-	S	0	1 A M Ordering example

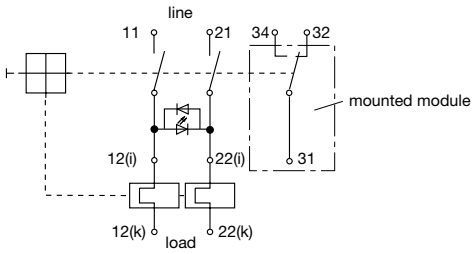
Dimensions – auxiliary contact module





dimensional drawing of the 3120-N basic device see p.6-9

Schematic diagram



Technical data

Rated voltage	AC 250 V, DC 250 V
Current rating	0.1...4 A / 5...100 mA
Typical life	50,000 cycles
Ambient temperature	-30 ... 60 °C
Dielectric strength	
between main and auxiliary circuit	Test voltage AC 3,000 V
Insulation resistance	> 100 MΩ (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 hours in 95 % RH Test to IEC 60068-2-78, Test Cab
Mass	approx. 41 g (including base device)

Description X3120-M remote trip module

By applying voltage (pulse) to the remote trip module the 3120-N circuit breaker can be tripped electrically.

Note: Not possible in combination with PT terminals.

Typical applications

Electrical remote trip of safety systems.

1

Ordering information

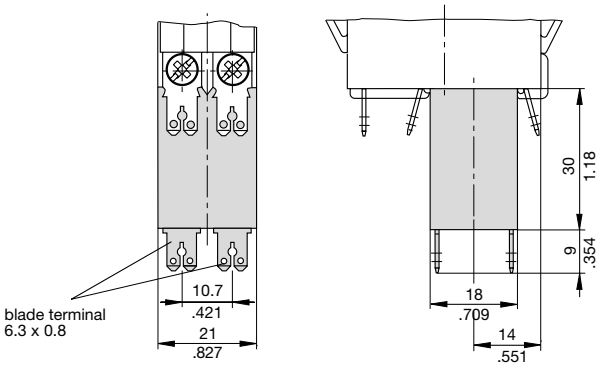
Type no.	
X3120	Module for 3120-N device
	Module
	M Magnetic relay trip module
	Design
	2 Magnetic coil physically isolated from device
	Terminal design
	P7 Blade terminals
	Supply status
	M Module is only supplied mounted to base device
	Rated voltage
	AC 120, 230 V
	DC 12, 24 V

X3120- M 2 P7 M -12 V Ordering example

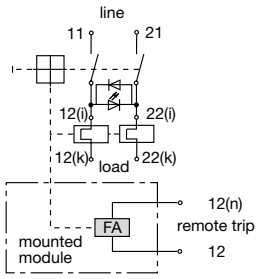
Standard voltage ratings and typical internal resistance values

Rated voltage	Internal resistance (Ω)	Rated voltage	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_{on} < 100 ms t_{off} > 10 sec
Trip time	< 20 ms
Typical life	50,000 operations at U_N
Ambient temperature	-30 ... 60 °C
Dielectric strength	
between main and trip current circuit	Test voltage AC 3,000 V
Insulation resistance	> 100 MΩ (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 hours in 95 % RH Test to IEC 60068-2-78, Test Cab
Mass	approx. 56 g (including base device)

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 Safety of household and similar electrical appliances.

3120-N...-... M1-...

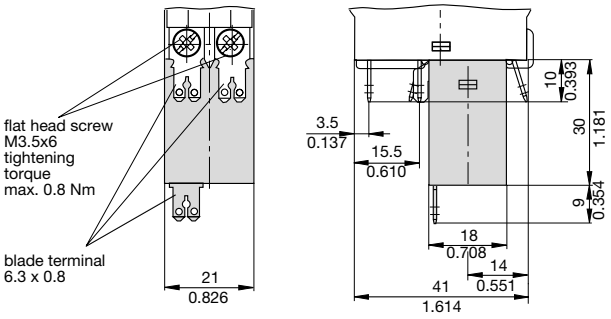
Typical applications

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
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

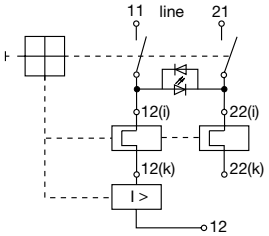
Dimensions – magnetic trip module



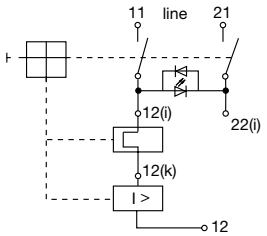
dimensional drawing of the 3120-N basic device see p. 6-9

Schematic diagrams

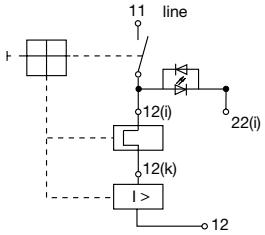
1-pole thermal-magnetically protected
1-pole thermally protected



1-pole thermal-magnetically protected
1-pole thermally unprotected



1-pole thermal-magnetically protected



Technical data

For detailed technical information please see 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 cycles at 1 x I_N, inductive
DC 50 V:	0.1 ... 4 A	30,000 cycles at 1 x I_N, inductive
	4.5 ... 16 A	30,000 cycles at 1 x I_N, resistive
DC 28 V:	0.1 ... 16 A	30,000 cycles at 1 x I_N, inductive

Typical life 2-pole

AC 240 V:	0.1 ... 16 A	50,000 cycles at 1 x I_N, inductive
DC 50 V:	0.1 ... 16 A	50,000 cycles at 1 x 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 Current path/current path	 Test voltage AC 3000 V Test voltage AC 1500 V
Insulation resistance	> 100 MΩ (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 x 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 x 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) ± 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 hours in 5 % salt mist Test to IEC 60068-2-11, Test Ka
Humidity	240 hours in 95 % RH Test to IEC 60068-2-78, Test Cab
Mass	approx. 53 g (2-pole) approx. 50 g (1-pole)

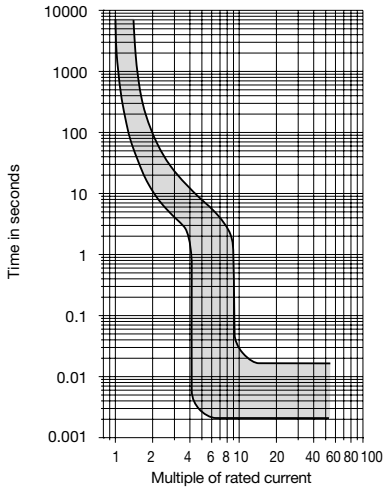
Approvals

Approval authority	Standard	Rated voltage	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 AC 125 V	0.1 ... 10 A 0.1 ... 16 A
CQC (CCC)	GB 17701	AC 240 V DC 50 V	0.1 ... 16 A 0.1 ... 16 A

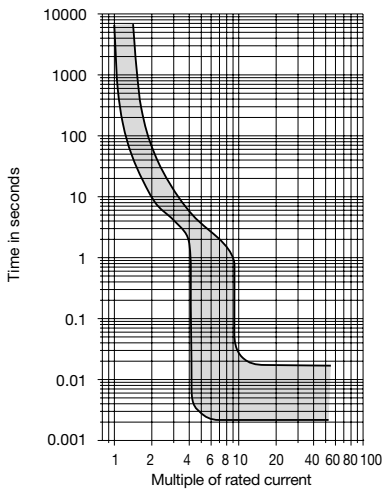
Time/current characteristics

Total switch-off time at rated voltage and 1- or 2-pole load
Ambient temperature 23 °C

0.1...2 A **AC/DC** [1]



2.5...16 A **AC/DC** [1]



[1] With DC, the magnetic response values are higher by a factor of approx. 1.25.

The time/current characteristics depend on the ambient temperature. In order to eliminate nuisance or late tripping, please multiply the current rating of the circuit breaker by a temperature factor (also refer to chapter Technical Information).

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

Ordering information

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 1: thermal-magnetically protected, pole 2: thermally protected)
- **5** 2-pole switching, 1-pole thermal-magnetically protected

Style
- **1** Standard
- **3** With actuator guard
- **4** With accordion-style seal, IP65
- **6** Version with shorter flange (only for mounting method N5)
- **A** 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_N; magnetic 4-9 x I_N AC

Actuator
- **W** Rocker

Rocker colour and illumination

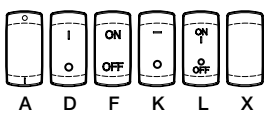
Opaque

01 .	Black	without illumination
02 .	White	without illumination
04 .	Red	without illumination

Translucent (when named with Y/R/T/G the rocker is illuminated)

12 . (Y)	White	(illuminated)
14 . (R)	Red	(illuminated)
15 . (Y)	Orange	(illuminated)
16 . (T)	Blue	(illuminated)
19 . (G)	Green	(illuminated)

Marking of rocker
- **A** (not for mounting method 4)
- **D**
- **F**
- **K**
- **L**
- **X**



3120-N5 2 4 - P7 M1-W 19 D G ... Ordering example

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 rating
- **0.1 ... 16 A**

3120-N5 2 4 - P7 M1-W 19 D G 4 - 16 A Ordering example

Ordering information

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 1: thermal-magnetically protected, pole 2: thermally protected)
- **5** 2-pole switching, 1-pole thermal-magnetically protected

Style
- **D** With actuator guard
- **E** With actuator guard and water splash cover IP54
- **F** With power-on protection
- **V** With power-on protection and water splash cover IP54

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_N; magnetic 4-9 x I_N AC

Actuator
- **S** Two push buttons

Colour of push button/illumination (Style D and F without water splash protection)
- **GRD** Green/red without illumination
- **GRDXG** 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
- **GRDXG** 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 rating
- **0.1...16 A**

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

Please observe our minimum ordering quantities.

Ordering information

Type no.
3120 Thermal magnetic 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 thermal-magnetically protected
- **2** 2-pole protected (1 1: thermal-magnetically protected, pole 2: thermally protected)
- **5** 2-pole, 1-pole thermal-magnetically protected

Style
- **G** Resettable circuit breaker

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_N; magnetic 4-9 x I_N AC

Actuator
- **D** One push button

Colour of push button
- **01** Black
- **02** White opaque
- **04** Red opaque (UL/CSA approval only)
- **09** Green opaque

Marking of the push button
- **X** Without marking

Current rating
- **0.1...16 A**

3120-N3 2 G - P7 M1 - D 01 - X 16 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.

Mouser Electronics

Authorized Distributor

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E-T-A Circuit Breakers:

3120-N311-P7T1-W01D-15A 3120-U00620-14A 3120-N3PF-H7T1-SGRX-30A 3120-N35F-P7T1-SGRXG4-20A 3120-N35F-P7T1-SGRXG4-6A 3120-N35F-H7T1-SGRX-16A 3120-N35F-H7T1-SGRX-8A 3120-N35F-P7T1-SGRXG3-10A 3120-N35F-P7T1-SGRXG3-12A 3120-N35F-P7T1-SGRXG3-14A 3120-N32F-P7T1-SGRXG4-8A 3120-N32F-H7T1-SGRXG4-5A 3120-N32F-N7T1-SGRXG4-1A 3120-N32F-P7T1-SGRX-15A 3120-N32F-P7T1-SGRXG3-14A 3120-N32F-P7T1-SGRXG3-7A 3120-N32F-P7T1-SGRXG4-7A 3120-N32F-H7T1-SGRX-15A 3120-N32F-H7T1-SGRX-5A 3120-N31F-P7T1-SGRX-6A 3120-N31F-P7T1-SGRX-10A 3120-N31F-P7T1-SGRX-15A 3120-N35F-H7T1-SGRX-X3120-U0000M-8A 3120-N321-P7T1-W19DG3-X3120-M2 3120-N321-P7T1-W12DY3-5A 3120-N35V-H7T1-SGRX-15A 3120-N35V-H7T1-SGRXG4-15A 3120-N521-P7T1-W01K-20A 3120-N511-P7T1-W16DT3-3A 3120-N511-P7T1-W16DT3-7A 3120-N32F-P7T1-SGRD-20A 3120-N311-P7T1-W01K-0.5A 3120-N323-P7T1-W19LG4-16A 3120-N523-P7T1-W16DT3-20A 3120-N553-P7T1-W02D-20A 3120-N526-P7T1-W01D-8A 3120-N526-P7T1-W19DG4-X3120-B040011M-15A 3120-N513-P7T1-W14DR3-15A 3120-N321-P7T1-W01H-2.5A 3120-N323-P7T1-W19LG4-9A 3120-N553-P7T1-W12DY2-10A 3120-N31E-P7T1-SGRX-15A 3120-N321-P7T1-W19LG3-4A 3120-N32V-H7T1-SGRX-20A 3120-N511-P7T1-W01F-2A 3120-N323-P7T1-W19LG4-10A 3120-N526-P7T1-W19LG4-3A 3120-N526-P7T1-W19DG4-15A 3120-N526-P7T1-W01D-10A 3120-N526-P7T1-W01D-15A 3120-N526-P7T1-W01D-20A 3120-N32E-H7T1-SGRX-20A 3120-N524-H7T1-W14XR4-X3120-U0000M-10A 3120-N514-P7T1-W19DG4-4A 3120-N31A-H7T1-W12LY3-6A 3120-N31D-P7T1-SGRD-20A 3120-N32D-H7T1-SGRD-20A 3120-N523-P7T1-W16DT4-3A 3120-N314-P7T1-W04X-10A 3120-N524-P7T1-W16DT4-20A 3120-N314-P7T1-W16FT3-16A 3120-N52E-P7T1-SGRX-10A 3120-N521-P7T1-W12DY3-6A 3120-N524-H7T1-W14XR3-X3120-U0002M-18A 3120-N521-P7T1-W15DY4-X3120-S01BM-15A 3120-N324-P7T1-W19DG3-30A 3120-N521-P7T1-W02L-5A 3120-N323-P7T1-W16DT4-15A 3120-N521-P7T1-W02L-6A 3120-N553-P7T1-W12DY2-2A 3120-N511-P7T1-W19DG4-4A 3120-N514-P7T1-W19DG3-5A 3120-N314-H7T1-W19FG3-12A 3120-N323-P7T1-W19FG4-13A 3120-N524-P7T1-W04D-20A 3120-N52D-P7T1-SGRD-15A 3120-N521-P7T1-W16DT3-6A 3120-N526-P7T1-W19DG3-15A 3120-N311-P7T1-W01F-0.5A 3120-N324-P7T1-W02L-4A 3120-N311-P7T1-W19FG4-4A 3120-N32A-P7T1-W12LY4-2.5A 3120-N526-P7T1-W19DG3-10A 3120-N52D-P7T1-SGRD-5A 3120-N323-P7T1-W02L-1.5A 3120-N314-PTT1-W04X-16A 3120-N526-P7T1-W19DG3-X3120-B040011M-15A 3120-N314-P7T1-W19FG3-20A 3120-N511-P7T1-W19DG3-5A 3120-N323-P7T1-W19D-x3120-M2P7M-120V-20A 3120-N521-P7T1-W15LY4-X3120-S01AM-12A 3120-N521-P7T1-W16DT3-16A 3120-N311-P7T1-

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