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 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).

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
- 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

REACH RoHS

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	
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_N, inductive
DC 50 V: 0.1...4 A	30,000 operations at 1 x I_N, inductive
4.5...16 A	30,000 operations at 1 x I_N, resistive
DC 28 V: 0.1...20 A	30,000 operations at 1 x I_N, inductive
Typical life 2-pole (EN 60934)	
AC 240 V: 0.1...16 A	50,000 operations at 1 x I_N, inductive
17...20 A	30,000 operations at 1 x I_N, inductive
DC 50 V: 0.1...16 A	50,000 operations at 1 x I_N, inductive
17...20 A	10,000 operations at 1 x I_N, inductive
Ambient temperature	-30 … 60 °C
Insulation coordination (IEC 60664)	2.5 kV /2 reinforced insulation at operating area
Dielectric strength	
Operating area	test voltage AC 3,000 V
pole to pole (2-pole)	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 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		

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

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 (accordion-style seal, 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

opaque

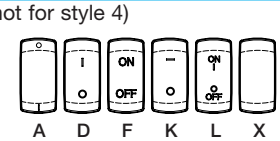
01 .	black	without illumination
02 .	white	without illumination
04 .	red	without illumination

translucent

12 . Y	white	without (with) illumination
14 . R	red	without (with) illumination
15 . Y	orange	without (with) illumination
16 . T	blue	without (with) illumination
19 . G	green	without (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.

1

Order numbering code

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
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

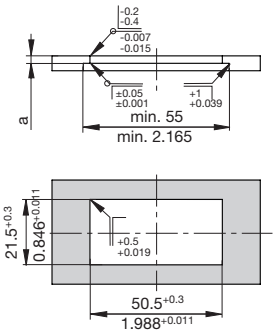
Approval authority	Standard	Voltage ratings	Current rating range	Appr. logos
VDE	IEC/EN 60934	AC 240 V DC 50 V DC 50 V DC 28 V	0.1 A ... 20 A 0.1 ... 20A (2-pole) 0.1 ... 16 A (1-pole) 0.1 A ... 20 A	
UL	UL 1077	AC 250 V AC 250 V DC 50 V AC 250 V	0.1 A ... 16 A (TC1, OL1) 17 A ... 20 A (TC1, OL0) 0.1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

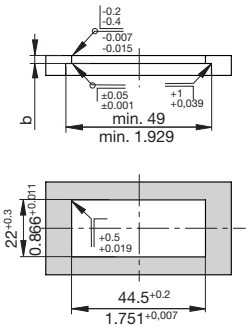
Mounting method

Mounting style

Cut-out for mounting style -N3



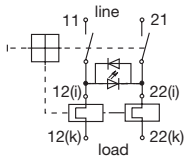
Cut-out for mounting style -N5



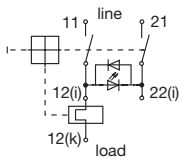
panel thickness	without water splash protection	with water splash protection
a	1 – 6.35 mm	1 – 5.5 mm
b	1 – 4 mm	1 – 3.5 mm

Schematic diagrams

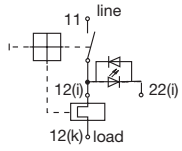
2-pole switching and thermally protected



2-pole switching and 1-pole thermally protected

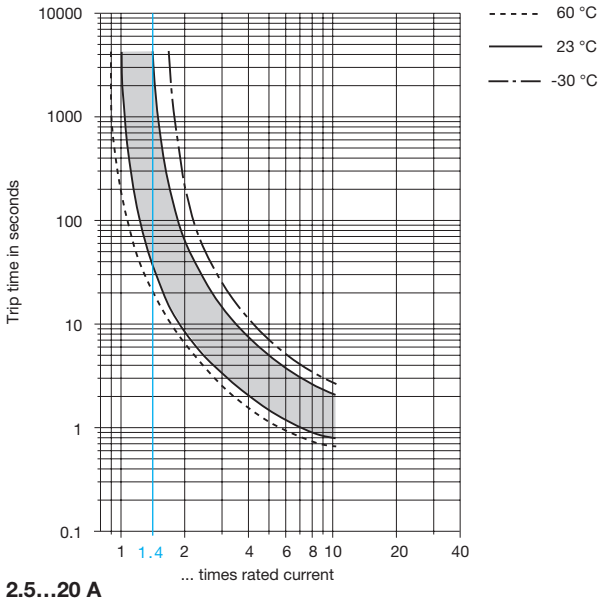


1-pole switching and thermally protected

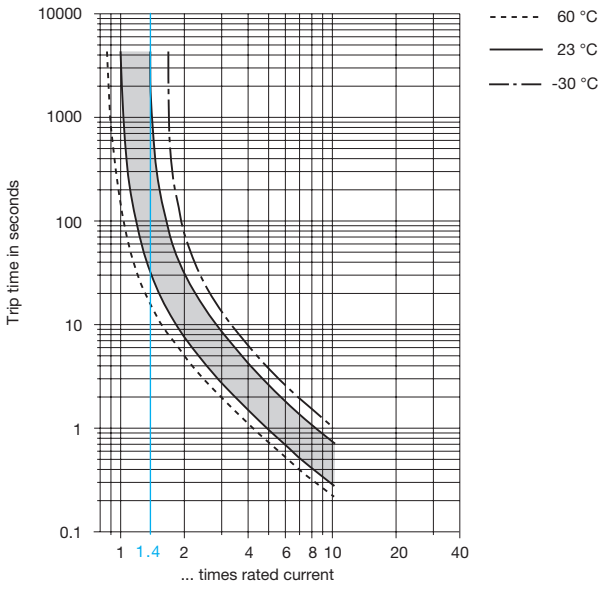


Time/current characteristics

0.1...2 A



2.5...20 A

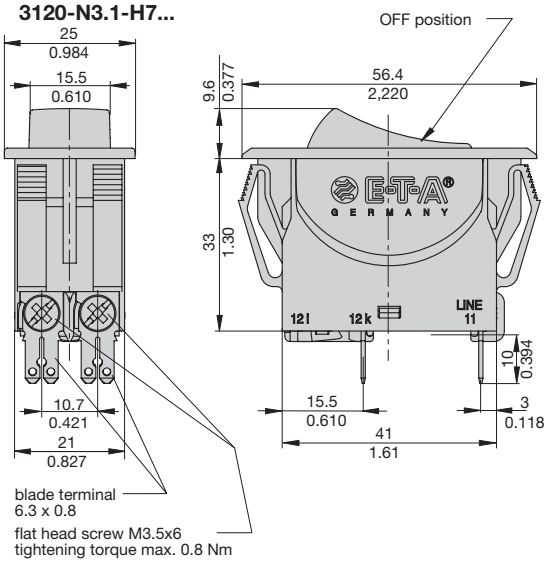


The time/current characteristic depends on the ambient temperature. In order to eliminate nuisance tripping, please multiply the current rating by a derating factor. For detailed technical information please see www.e-t-a.de/ti_d

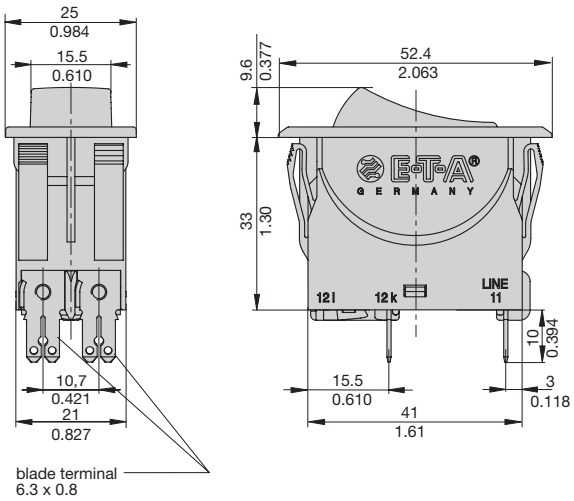
ambient temperature [°C]	-30	-20	-10	0	23	40	50	60
temperature factor	0.8	0.84	0.88	0.92	1	1.08	1.14	1.23

Dimensions

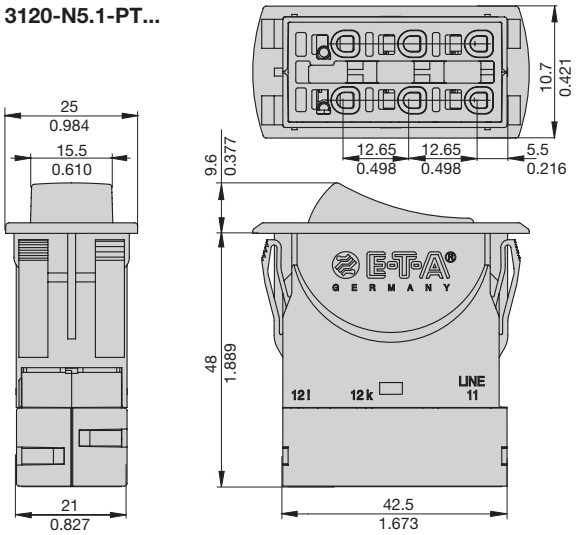
3120-N3.1-H7...



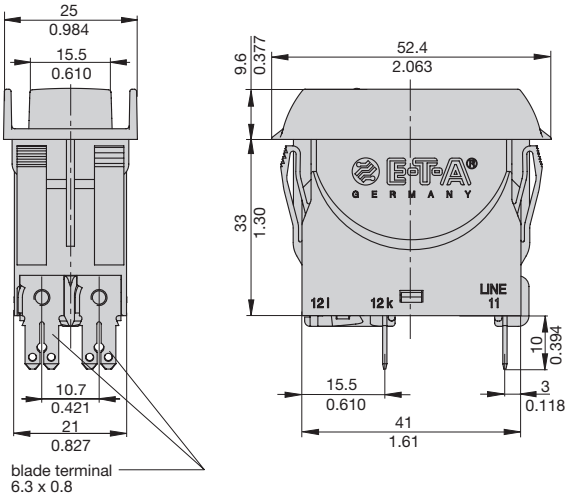
3120-N5.1-P7...



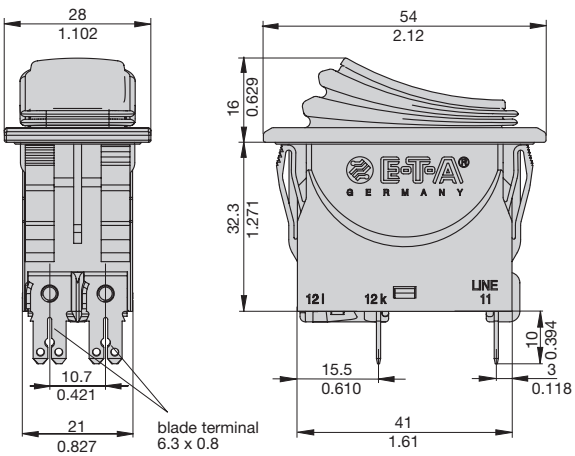
3120-N5.1-PT...



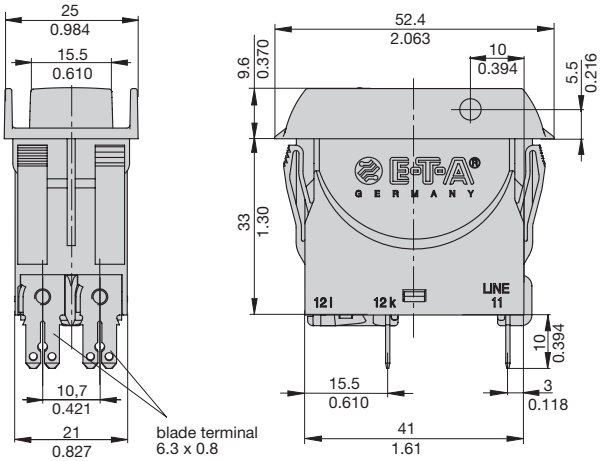
3120-N5.3-P7...



3120-N5.4-P7...

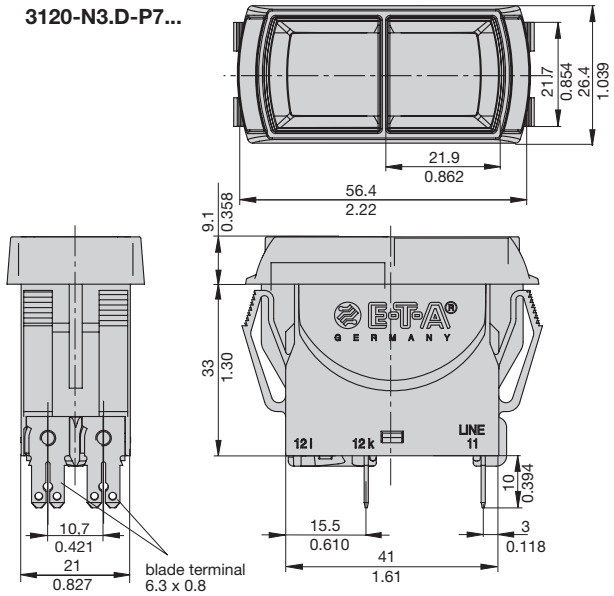


3120-N5.A-P7...



Dimensions

3120-N3.D-P7...



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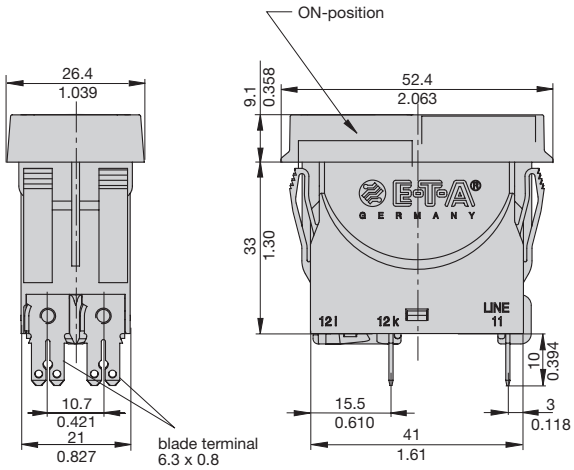

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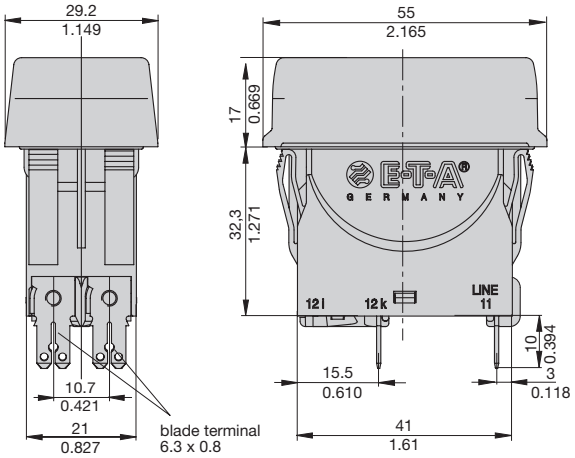
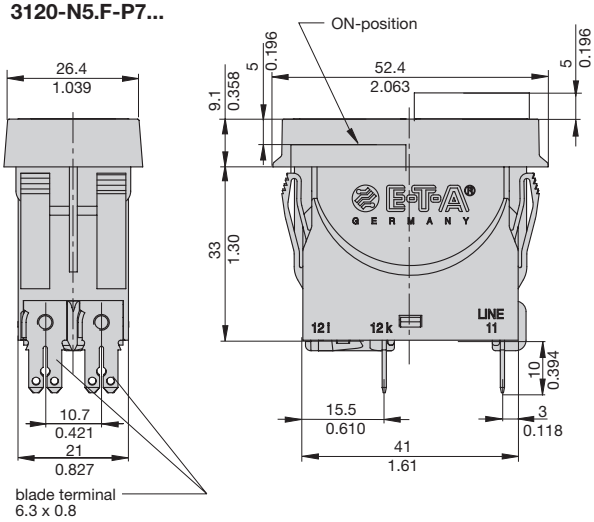
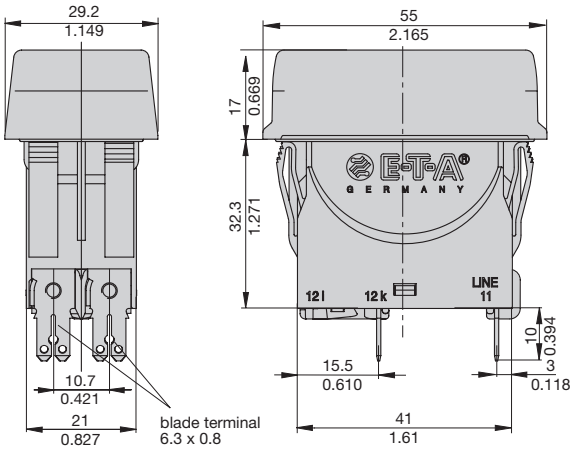


3120-N5.F-P7...

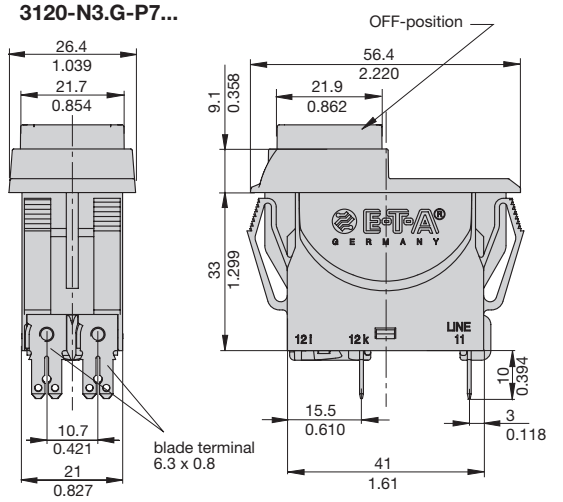


3120-N5.V-P7...

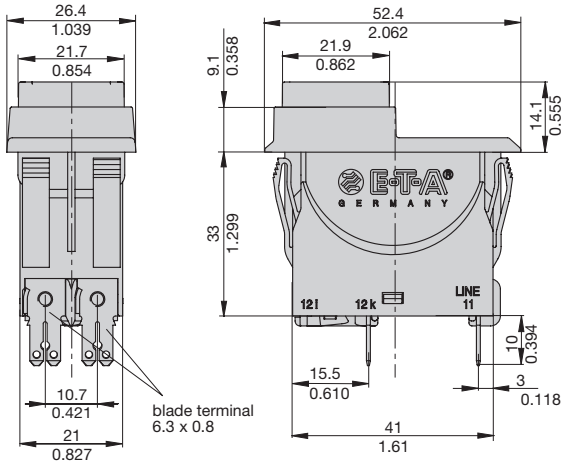


Dimensions

3120-N3.G-P7...



3120-N5.G-P7...

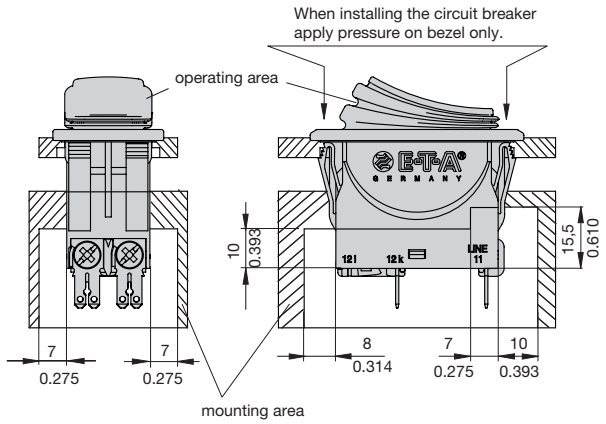


Cable cross sections PT terminals

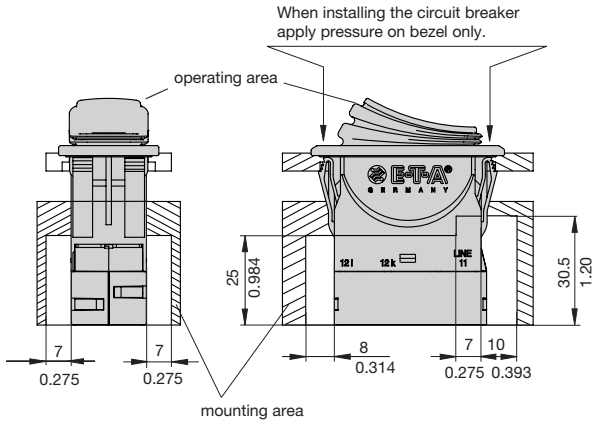
cable	cross section with direct push-in wiring
rigid	1…4 mm² (stripping length: 10 mm)
flexible with wire end ferrule (with or without plastic sleeve)	0.5…2.5 mm²
cable	**cross section when opening the push-in terminals**
rigid	0.5…4 mm² (stripping length: 10 mm)
flexible without wire end ferrule	0.5…2.5 mm²

Installation drawing

3120 with blade terminals



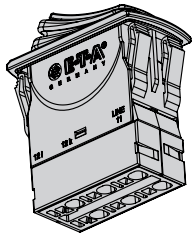
3120 with push-in terminals



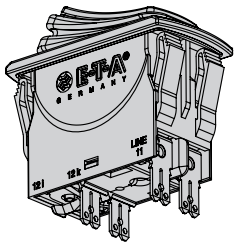
Terminal types

2-pole switching and 2-pole thermally protected

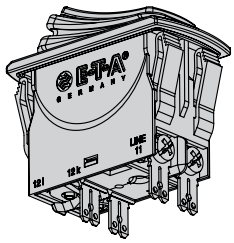
3120-N524-PT



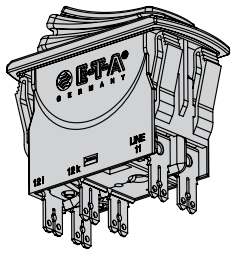
3120-N524-P7



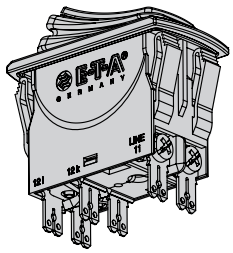
3120-N524-H7



3120-N524-N7

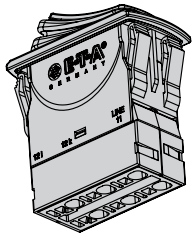


3120-N524-G7

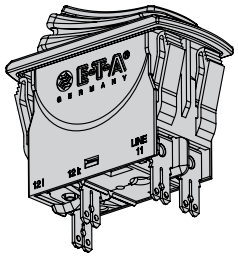


2-pole switching and 1-pole thermally protected

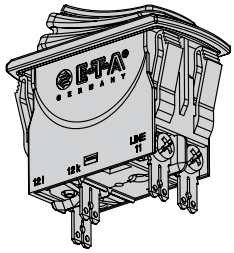
3120-N554-PT



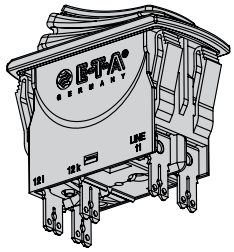
3120-N554-P7



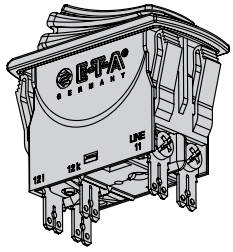
3120-N554-H7



3120-N554-N7



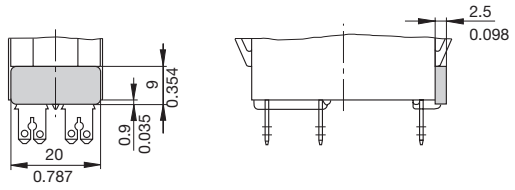
3120-N554-G7



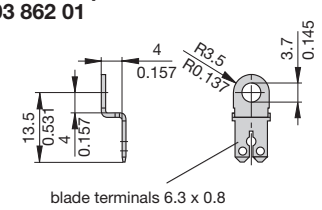
Accessories

1

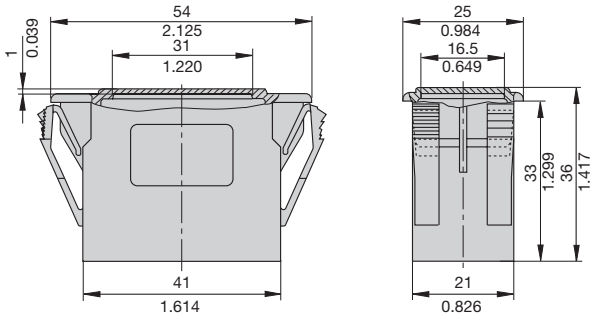
Insulated cover
Y 303 068 01



Terminal adapter
Y 303 862 01

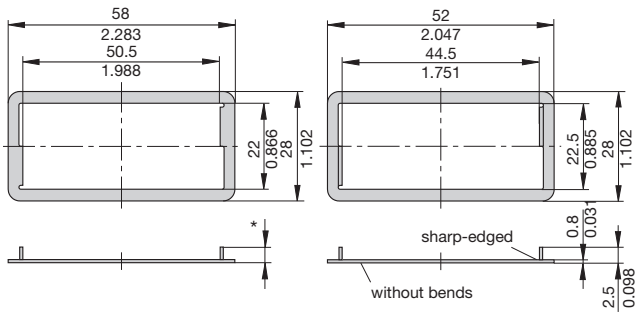


Blanking piece in -N3 frame
Y 303 885 31



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

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

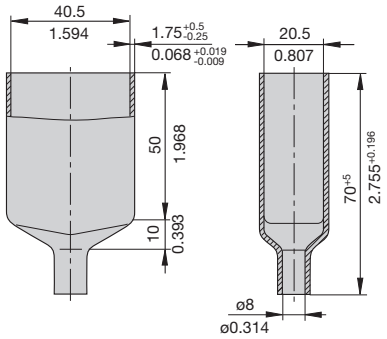


* Y 303 675 01 suitable for panel thickness < 2 mm
* Y 303 675 02 suitable for panel thickness < 4 mm

The spacer is used to ensure a tight fit of the circuit breaker in the mounting hole:

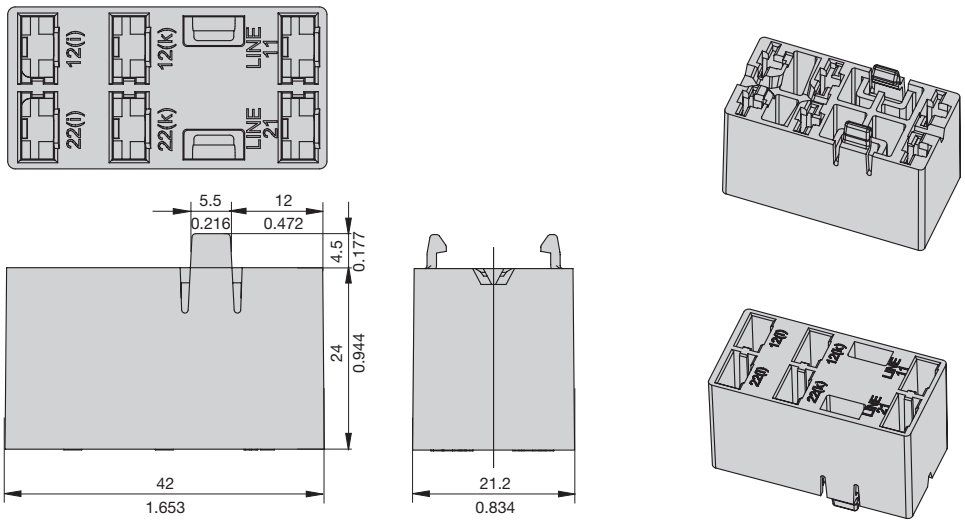
- with soft materials or if the specified edge condition cannot be ensured
- it is mounted together with the circuit breaker with the small lugs pointing down.

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



Accessories

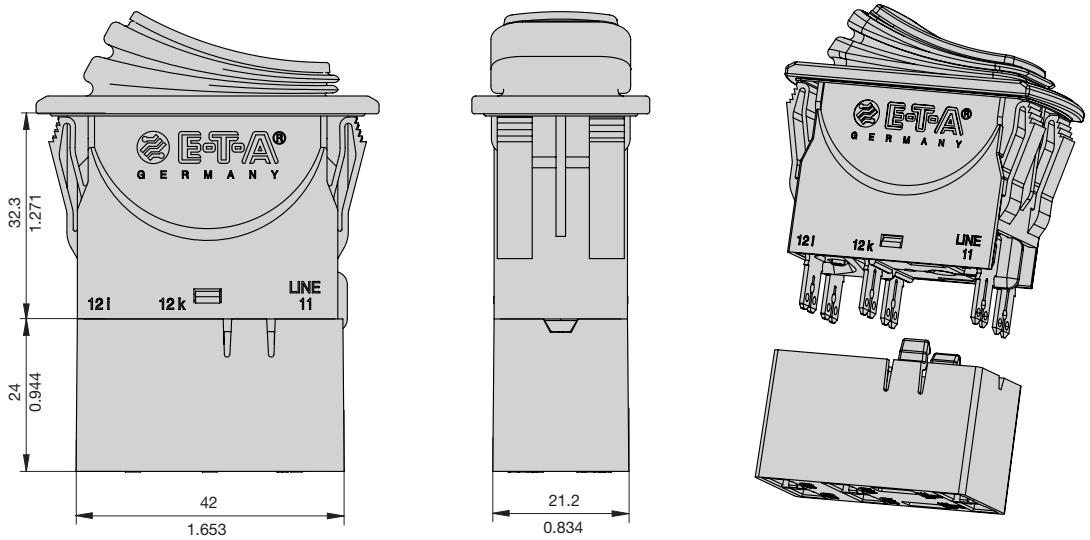
Plug-in connector
Y 31214001
Connecting cables can be pre-wired. Two retaining clips ensure a tight fit.



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 / Klaucke type 2730 / Vogt type 3832d.67 / TE FASTON Terminals 250 Series / Delphi Packard 58 Series

Plug-in connector mounted on 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.

Order numbering code

Type No.
X3120 appliance inlet module for circuit breaker type 3120-N

Module
- **A** inlet plug C14 (with filter)
- **B** inlet plug C20 (without filter)

Mounting method
- **04** screw-type mounting

Filter
- **00** without
- **01** standard line filter
- **03** standard line filter for medical equipment
- **06** high-power line filter for medical equipment

Filter rating (for module A only)
- **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-N: OFF position at connector
- **11** wired; mounting position 3120-N: OFF position at connector

Supply status
- **M** module supplied with mounted 3120-N circuit breaker and filter (module A)

X3120- A 04 01 08 01 M ordering example

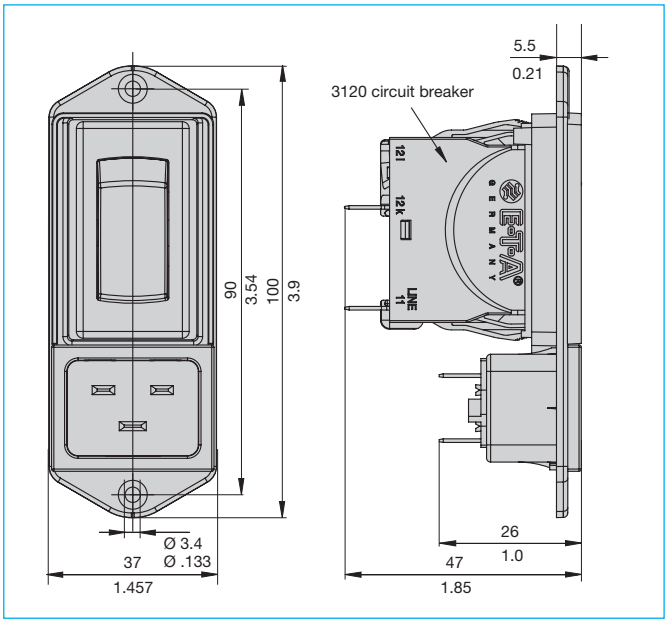
Technical data (X3120-B, without filter)

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

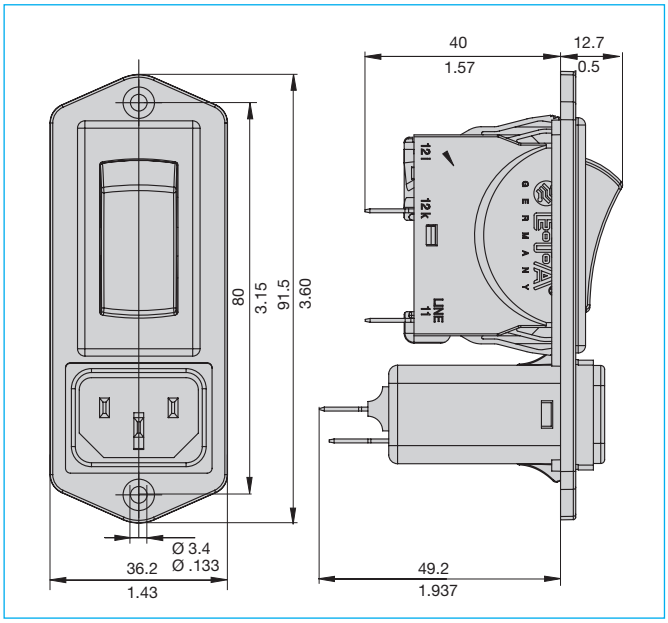
Technical data (X3120-A, with filter)

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

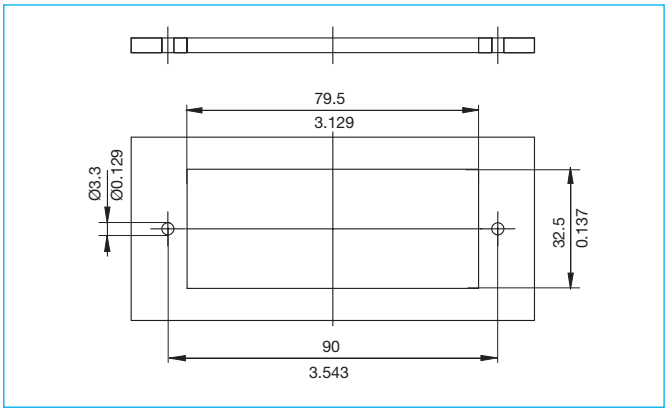
Dimensions (X3120-B)



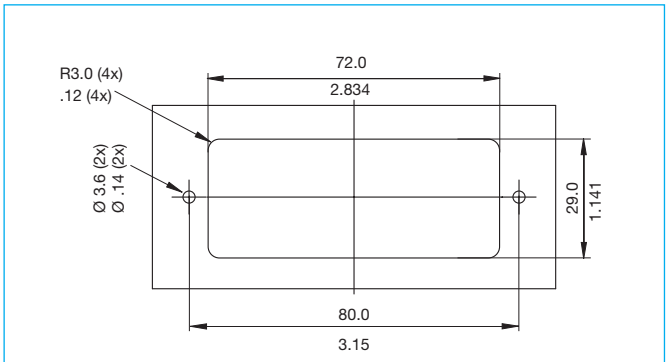
Dimensions (X3120-A)



Mounting cut-out (X3120-B)

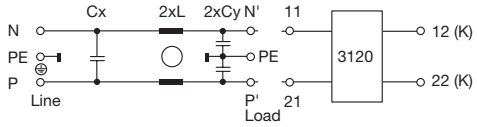


Mounting cut-out (X3120-A)

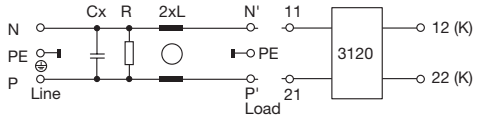


Schematic diagram X3120-A

X3120-A0401
General performance filter



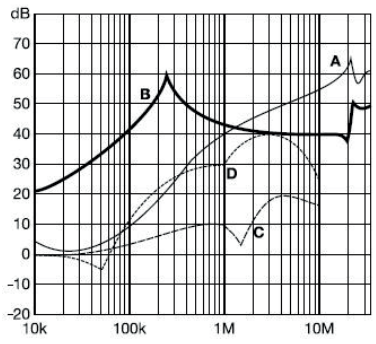
X3120-A0403 und X3120-A0406
High-performance filters for medical version



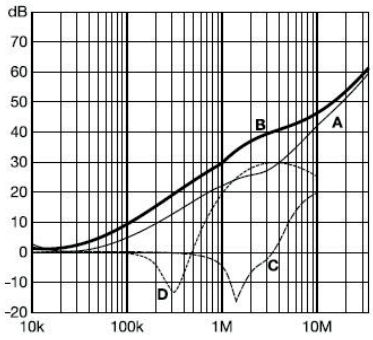
X3120-A0401 and X3120-A0403 – standard filters

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

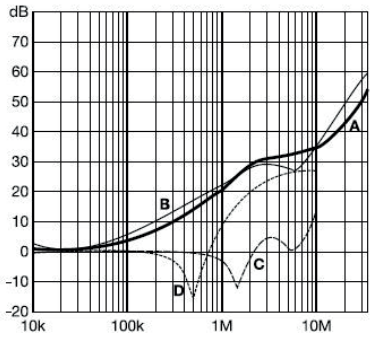
1 and 3 A models



6 – 10 A models



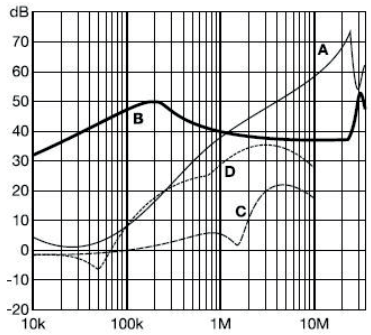
12 and 15 A models



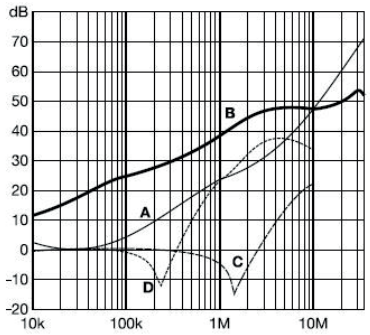
X3120-A0406 – high-power filters

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

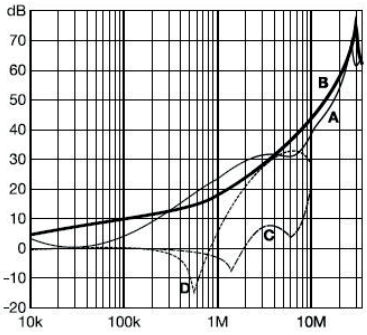
1 and 3 A models



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

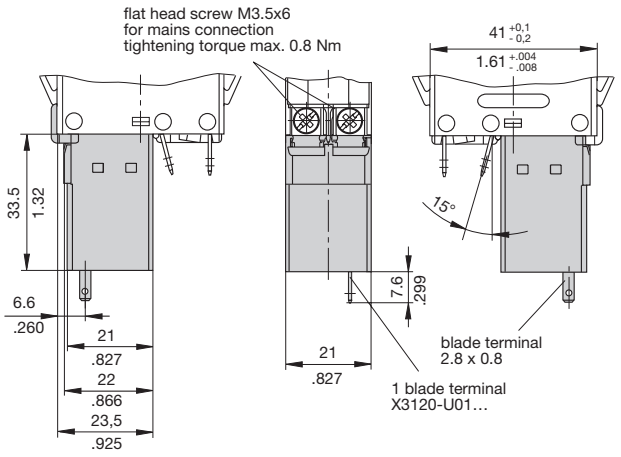
All machines that could cause personal injury upon automatic re-start, e.g. drilling machines, electric saws, meat cutting machines etc.

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

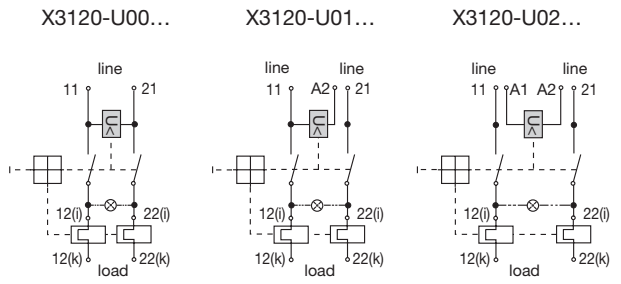
Type No.						
X3120	module for type 3120-N					
	Module					
	U undervoltage release module					
		Design				
		00 standard (without separate connections)				
		01 1 blade terminal 2.8x0.8				
		02 2 blade terminals 2.8x0.8				
			Voltage ratings			
			00 AC 230/240 V 50/60 Hz			
			01 AC 120 V 50/60 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



Dimensional drawings of the standard version of 3120-N please see page 6-8

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
Reset value	≥ 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 hrs in 95 % RH test to IEC 60068-2-78, test Cab
Mass	approx. 56 g (including base unit)

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

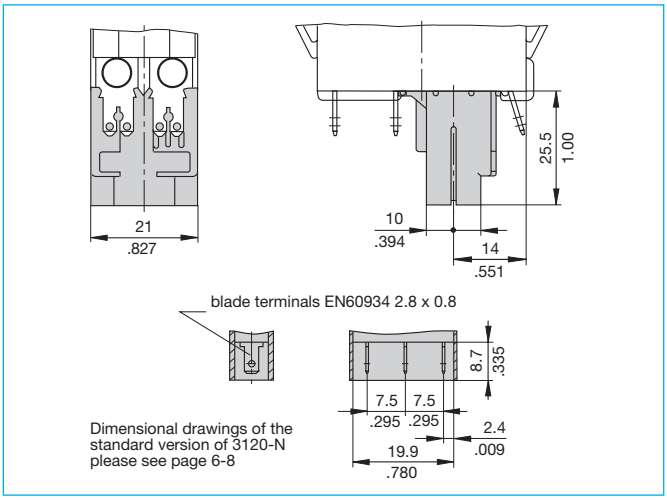
Status monitoring of CBE and/or the connected loads.

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		
				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 circuit breaker 3120-N

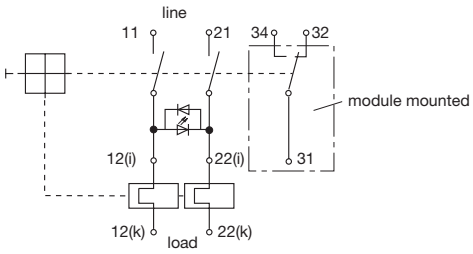
X3120- S 0 1 A M ordering example

Dimensions – auxiliary contact module



Dimensional drawings of the standard version of 3120-N please see page 6-8

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
Dielectric strength	
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)

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.

1

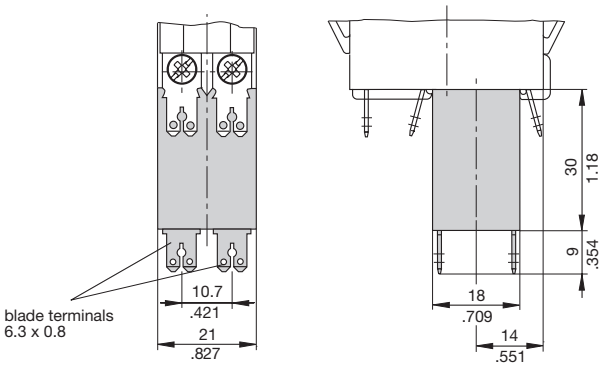
Order numbering code

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

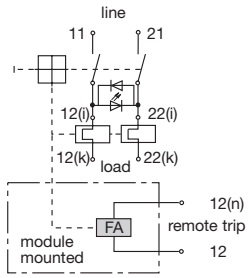
Voltage ratings	Internal internal resistance (Ω)	Voltage ratings	internal internal resistance (Ω)
DC 12 V	0.78	AC 120 V	71.0
DC 24 V	3.3	AC 230 V	312

Dimensions – remote trip module



Dimensional drawings of the standard version of 3120-N please see page 6-8

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 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)

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.

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

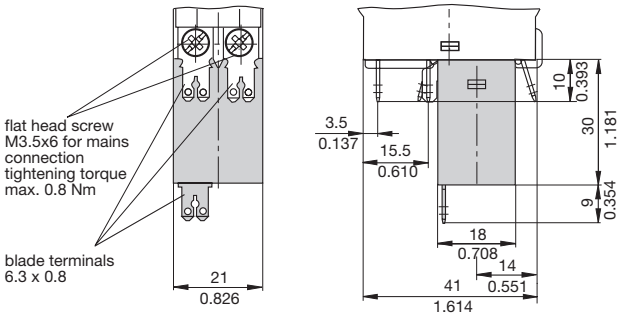
Typical applications

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 1.15 -1.38 x I_N
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

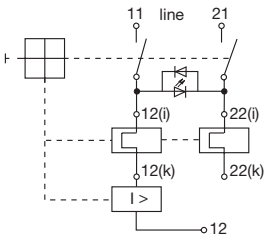
Dimensions – magnetic trip module



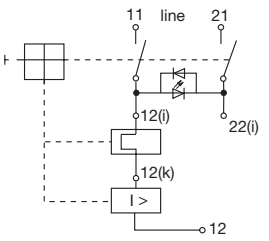
Dimensional drawings of the standard version of 3120-N please see page 6-8

Schematic diagrams

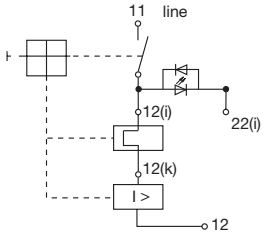
therm.-magn. protection on one pole thermally protected on the other pole



therm.-magn. protection on one pole unprotected on the other pole



therm.-magn. protection on one pole



1

Technical data

For further details 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 operations at 1 x I_N, inductive
DC 50 V:	0.1...4 A	30,000 operations at 1 x I_N, inductive
	4.5...16 A	30,000 operations at 1 x I_N, resistive
DC 28 V:	0.1...16 A	30,000 operations at 1 x I_N, inductive

Typical life 2-pole

AC 240 V:	0.1...16 A	50,000 operations at 1 x I_N, inductive
DC 50 V:	0.1...16 A	50,000 operations 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	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 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 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)

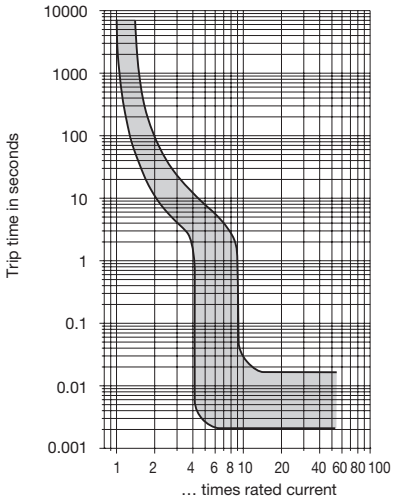
Approvals

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 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

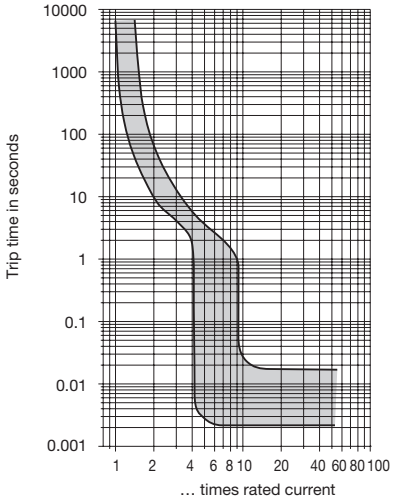
Time/current characteristics

Single or double pole load

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



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



[1] 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

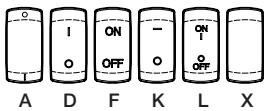
Trip curve
- **M1** medium delay, thermal- 1.01-1.4 x I_N; magnetic 4-9 x I_N AC

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)
- **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)

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_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
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

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 (pole one: thermal-magnetically protected, pole two: 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				
								Marking of push button			
								X without marking			
									Current ratings		
									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.