

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).



Typical applications

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

Features

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

Approvals



Compliances



Your benefits

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

Further information

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

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

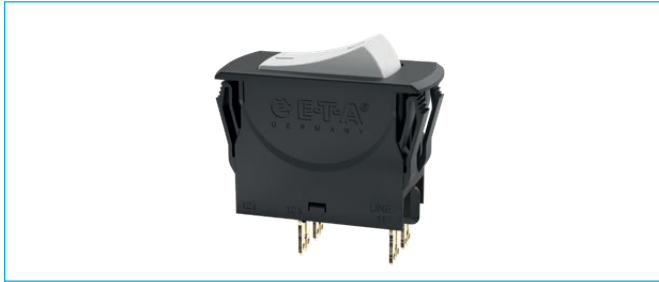
Degree of protection (IEC 60529)

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		

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 (IP65)

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

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

Terminal design

PT push-in terminals

P7 blade terminals

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

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

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

Trip curve

T1 thermal trip

Actuator

W rocker

Rocker colour and illumination

01 . black without illumination

02 . white without illumination

04 . red without illumination

12 . Y white with illumination

14 . R red with illumination

15 . Y orange with illumination

16 . T blue with illumination

19 . G green with illumination

Marking of rocker actuator

rocker style

A (not for style 4)

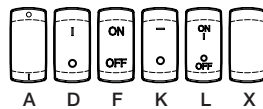
D

F

K

L

X



Illumination voltage range

(= operating voltage)

1 DC 12 V

2 DC 24 V

3 AC 115 V

4 AC 230 V

5 DC 48 V

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

Current ratings

0.1 ... 20 A

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

Order numbering code

Type No.

3120 thermal circuit breaker/switch combination with push button
actuation

Mounting method

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

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

Number of poles

1 1-pole switching, 1-pole thermally protected

2 2-pole switching, 2-pole thermally protected

5 2-pole switching, 1-pole thermally protected

Style

D with actuator guard

E with actuator guard and water splash cover

F with power-on protection

V with power-on protection and water splash cover

Terminal design

PT push-in terminals

P7 blade terminals

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

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

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

Trip curve

T1 thermal trip

Actuator

S two push buttons

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

GRD green/red without illumination

GRDG green with LED illumination/red
without illumination

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

GRX green/red without illumination

GRXG green with LED illumination/red
without illumination

Illumination voltage range

(= operating voltage)

1 DC 12 V

2 DC 24 V

3 AC 115 V

4 AC 230 V

5 DC 48 V

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

Current ratings

0.1 ... 20 A

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

Please observe our minimum ordering quantities.



Order numbering code

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.

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

Approvals

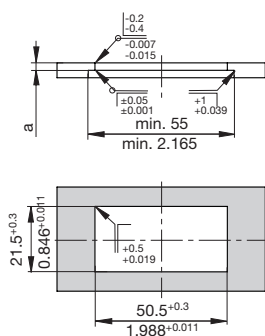
Approval authority	Standard	Voltage ratings	Current rating range	Appr. logos
VDE	IEC/EN 60934	AC 240 V DC 50 V DC 50 V DC 28 V	0.1 A ... 20 A 0.1 ... 20 A (2-pole) 0.1 ... 16 A (1-pole) 0.1 A ... 20 A	
UL	UL 1077	AC 250 V AC 250 V DC 50 V AC 250 V	0.1 A ... 16 A (TC1, OL1) 17 A ... 20 A (TC1, OL0) 0.1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

* 2 poles in parallel

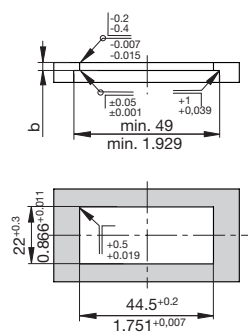
Mounting method

Mounting style

Cut-out for mounting style -N3



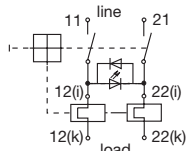
Cut-out for mounting style -N5



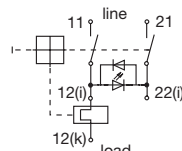
panel thickness	without water splash protection	with water splash protection
a	1 – 6.35 mm	1 – 5.5 mm
b	1 – 4 mm	1 – 3.5 mm

Schematic diagrams

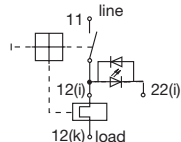
2-pole switching and thermally protected



2-pole switching and 1-pole thermally protected

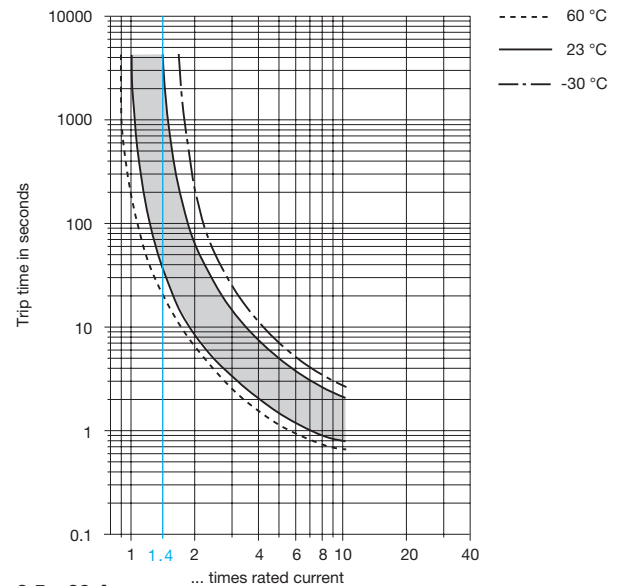


1-pole switching and thermally protected

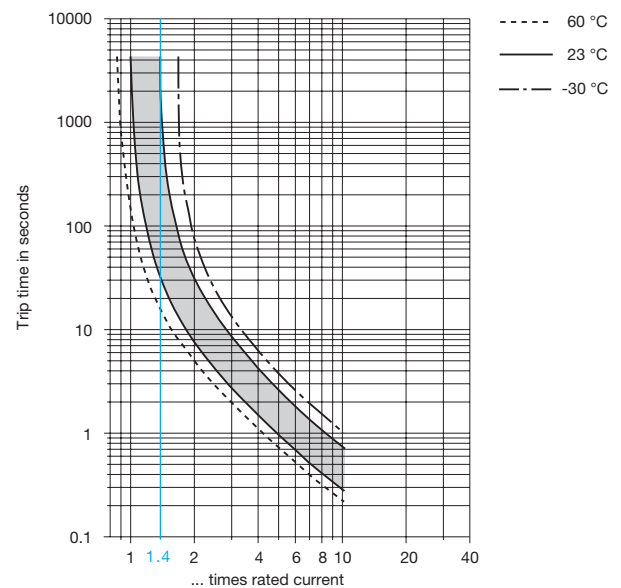


Time/current characteristics

0.1...2 A



2.5...20 A

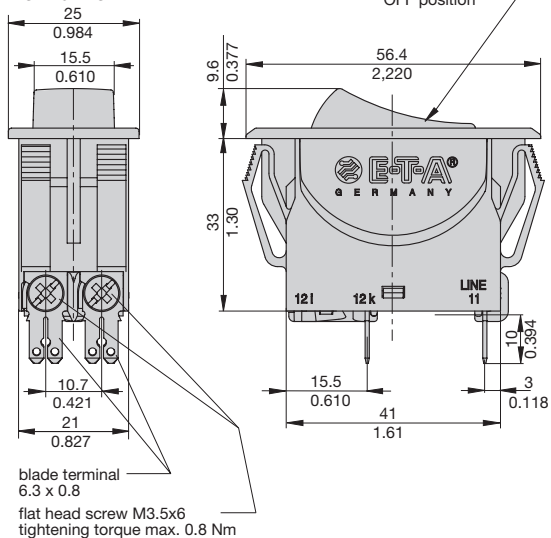


The time/current characteristic depends on the ambient temperature. In order to eliminate nuisance tripping, please multiply the current rating by a derating factor. For detailed technical information please see www.e-t-a.de/ti_d

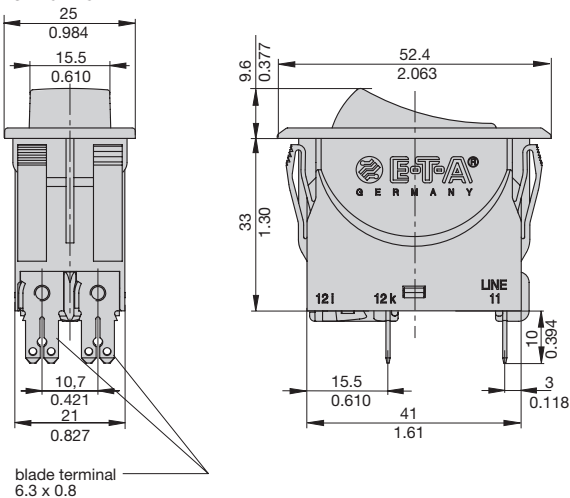
ambient temperature [°C]	-30	-20	-10	0	23	40	50	60
temperature factor	0.8	0.84	0.88	0.92	1	1.08	1.14	1.23

Dimensions

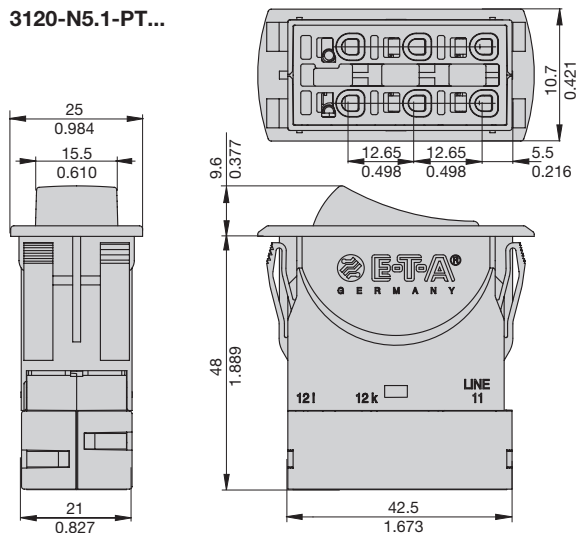
3120-N3.1-H7...



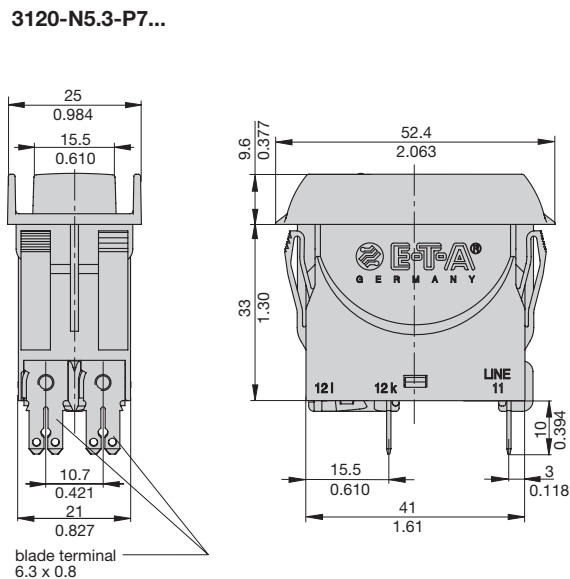
3120-N5.1-P7...



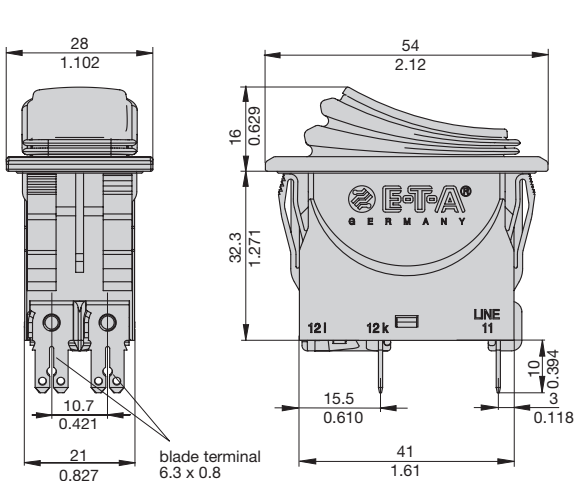
3120-N5.1-PT...



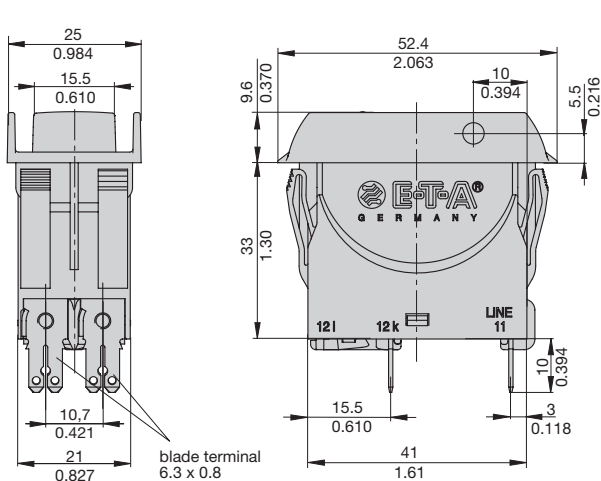
3120-N5.3-P7...



3120-N5.4-P7...

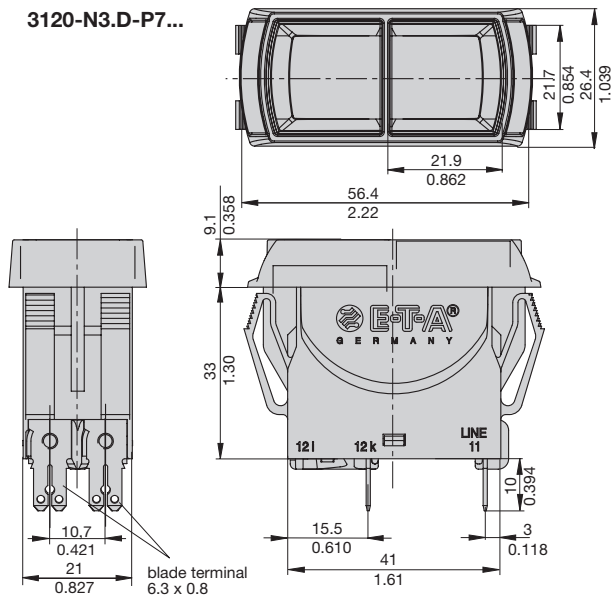


3120-N5.A-P7...

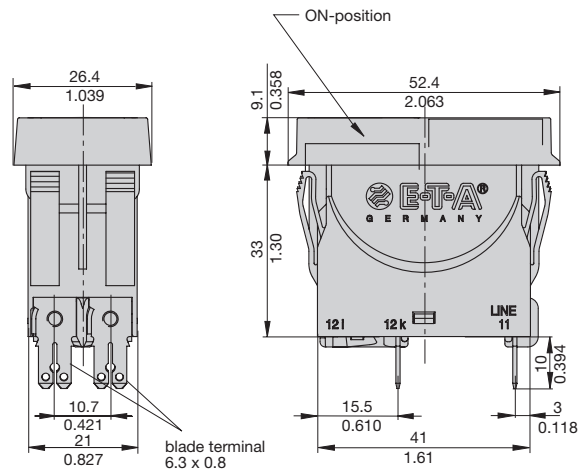


Dimensions

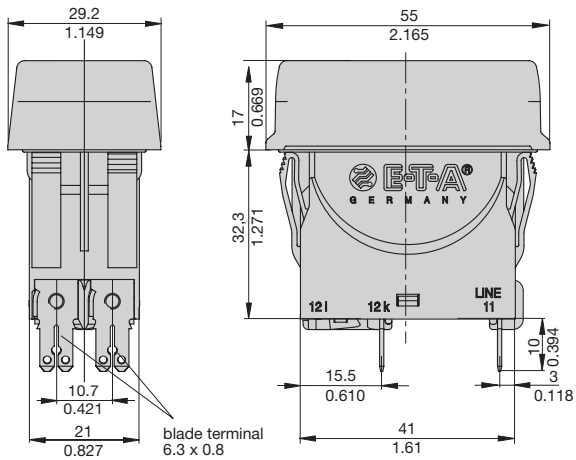
3120-N3.D-P7...



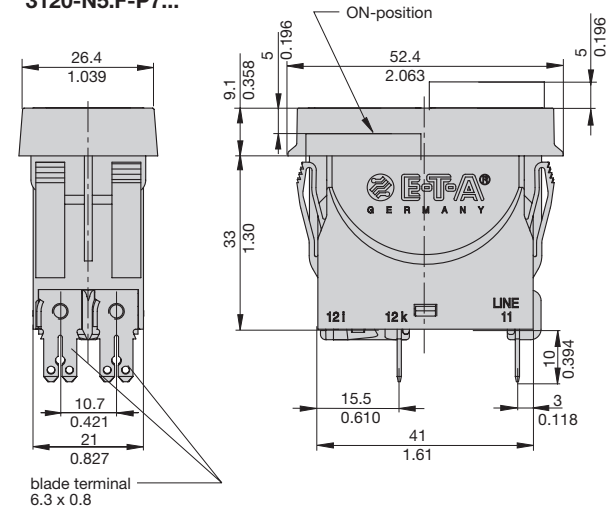
3120-N5.D-P7...



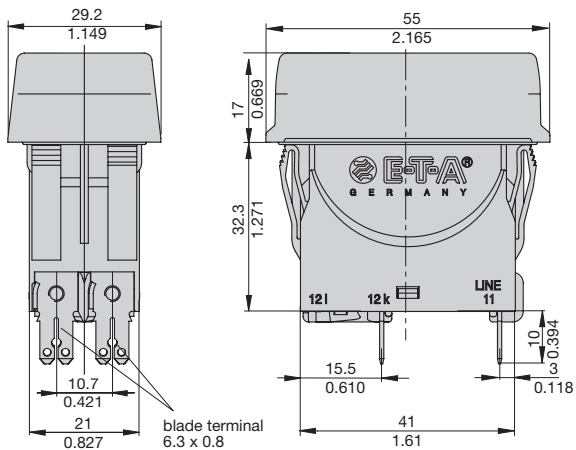
3120-N5.E-P7...



3120-N5.F-P7...

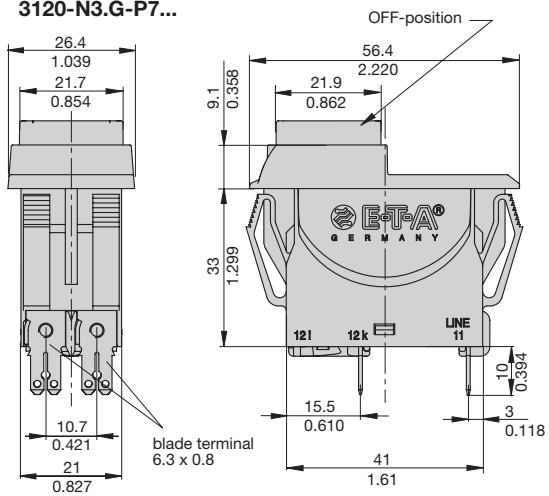


3120-N5.V-P7...

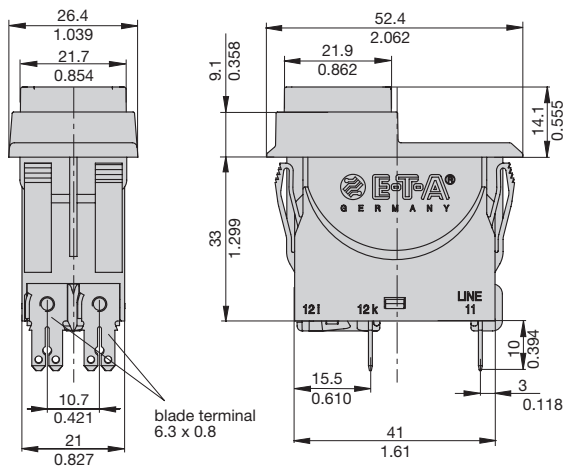


Dimensions

3120-N3.G-P7...



3120-N5.G-P7...

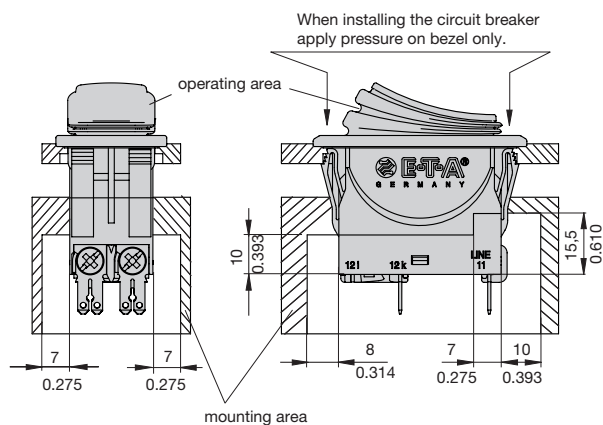


Cable cross sections PT terminals

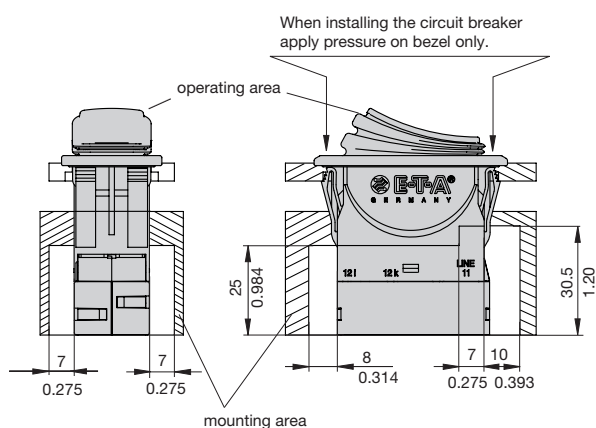
cable	cross section with direct push-in wiring
rigid	1...4 mm ² (stripping length: 10 mm)
flexible with wire end ferrule (with or without plastic sleeve)	0.5...2.5 mm ²
cable	cross section when opening the push-in terminals
rigid	0.5...4 mm ² (stripping length: 10 mm)
flexible without wire end ferrule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

Installation drawing

3120 with blade terminals



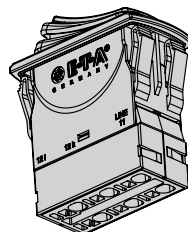
3120 with push-in terminals



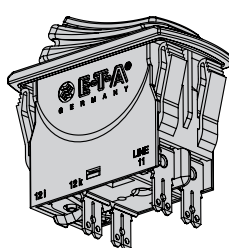
Terminal types

2-pole switching and 2-pole thermally protected

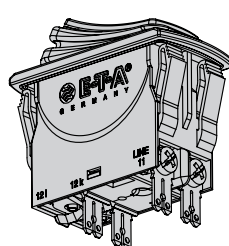
3120-N524-PT



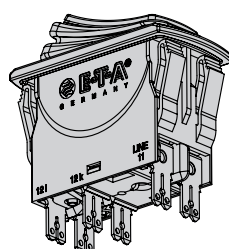
3120-N524-P7



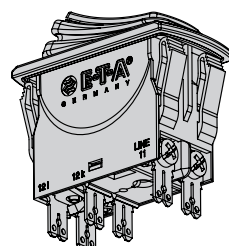
3120-N524-H7



3120-N524-N7

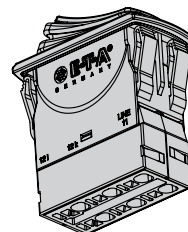


3120-N524-G7

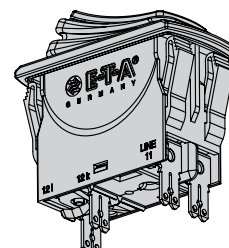


2-pole switching and 1-pole thermally protected

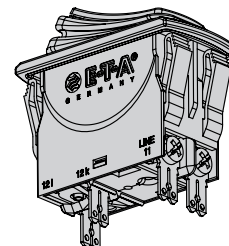
3120-N554-PT



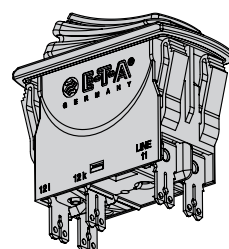
3120-N554-P7



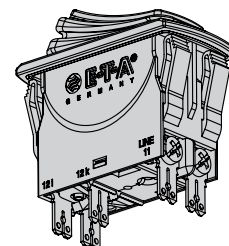
3120-N554-H7



3120-N554-N7



3120-N554-G7

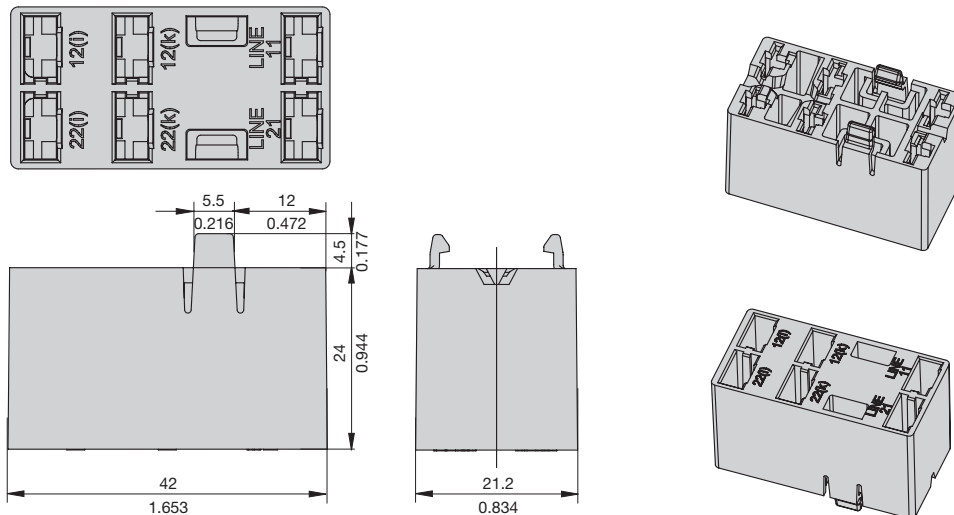


Accessories

Plug-in connector

Y 31214001

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



Benefits:

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

Note:

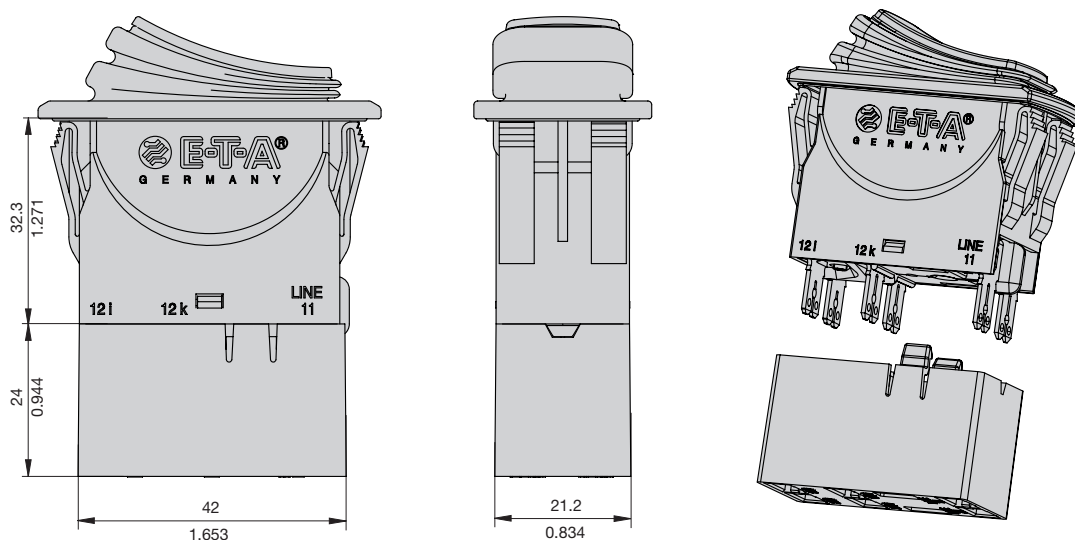
Delivery without receptacles.

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

Examples of suitable receptacles: Stocko RSB 7916 F6,3-1 / Klauke type 2730 / Vogt type 3832d.67 /

TE FASTON Terminals 250 Series / Delphi Packard 58 Series

Plug-in connector mounted on circuit breaker:



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

Description – X3120-A/-B appliance inlet modules

The X3120 appliance inlet module with 3120-N5.6 circuit breaker type combines up to four functions within a single component: C14/C20 inlet plug, an ON/ OFF switch, resettable overcurrent protection and a line filter. Screw-type mounting from the front or from the rear.

Typical applications

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

Approvals

X3120-A – C14 inlet plugs

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

X3120-A - filter

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

X3120-B – C20 inlet plugs

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

Selection of filter rating

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

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

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

Further technical information p 19 ff.



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

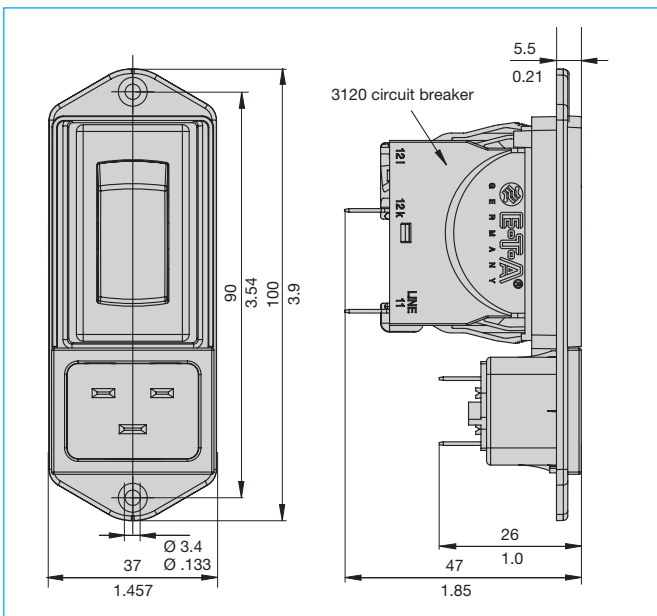
All information and data given on our products are accurate and reliable to the best of our knowledge, but E-T-A does not accept any responsibility for the use in applications which are not in accordance with the present specification. E-T-A reserves the right to change specifications at any time in the interest of improved design, performance and cost effectiveness. Dimensions are subject to change without notice. Please enquire for the latest dimensional drawing with tolerances if required. All dimensions, data, pictures and descriptions are for information only and are not binding. Amendments, errors and omissions excepted. Ordering codes of the products may differ from their marking.

3120-N...-...T1-... Thermal Circuit Breaker

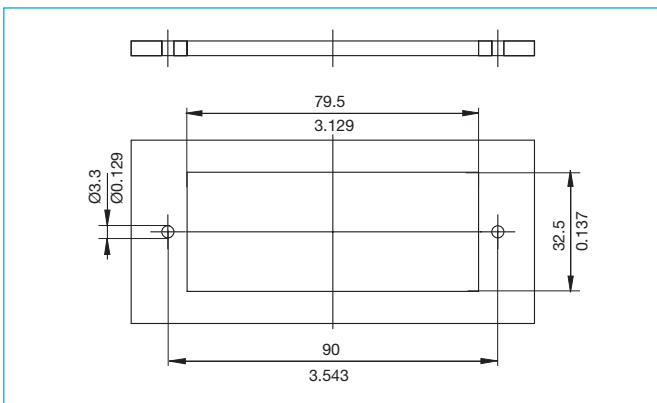
Technical data (X3120-B, without filter)

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

Dimensions (X3120-B)



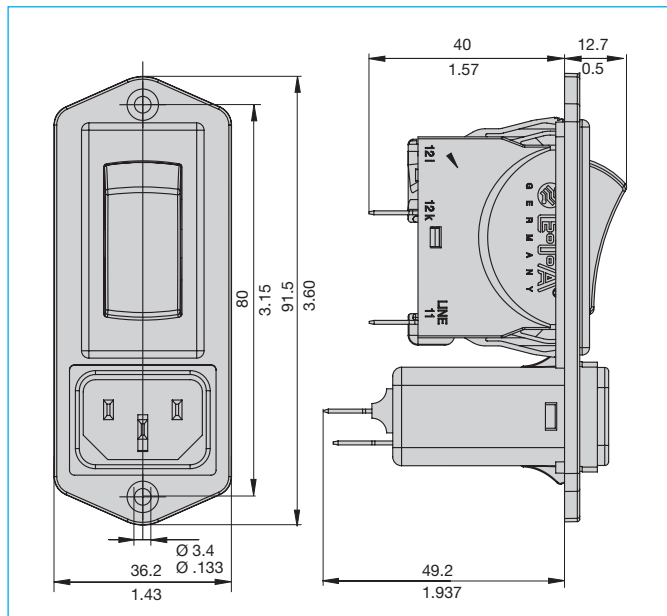
Mounting cut-out (X3120-B)



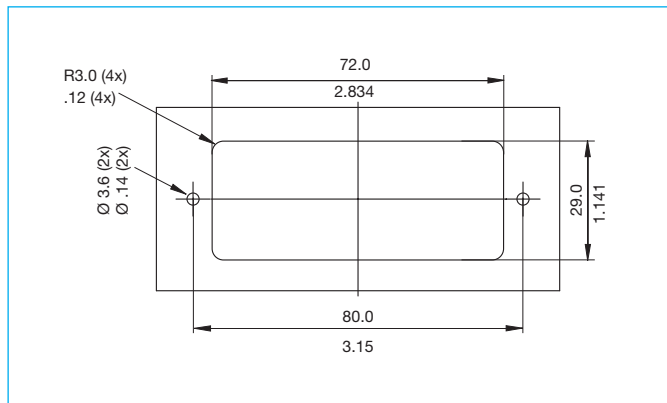
Technical data (X3120-A, with filter)

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

Dimensions (X3120-A)



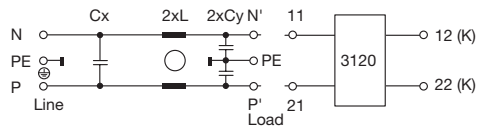
Mounting cut-out (X3120-A)



Schematic diagram X3120-A

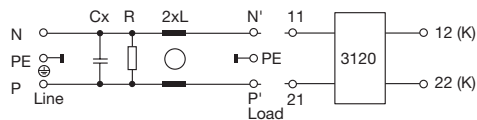
X3120-A0401

General performance filter



X3120-A0403 und X3120-A0406

High-performance filters for medical version

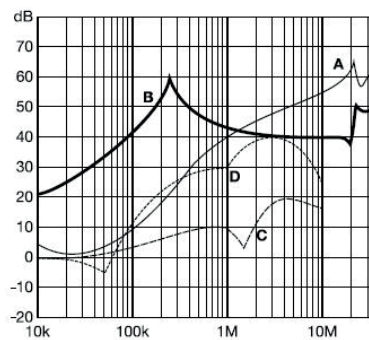


X3120-A0401 and X3120-A0403 – standard filters

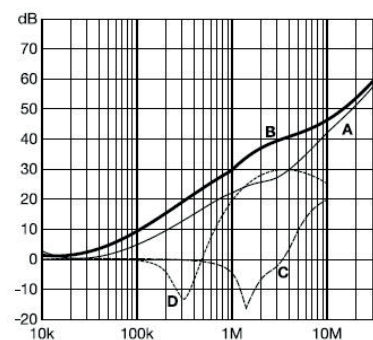
Typical filter attenuation: to CISPR 17

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

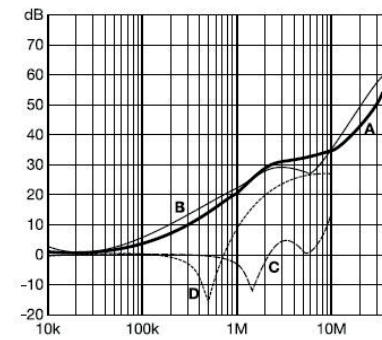
1 and 3 A models



6 – 10 A models



12 and 15 A models

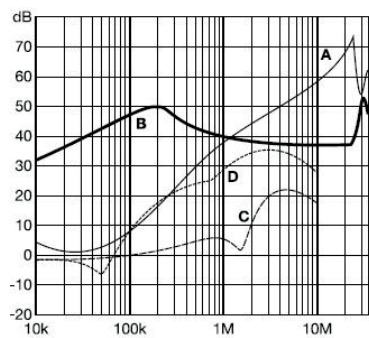


X3120-A0406 – high-power filters

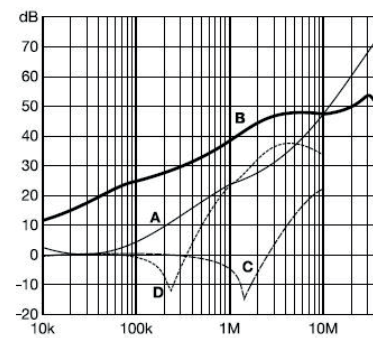
Typical filter attenuation: to CISPR 17

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

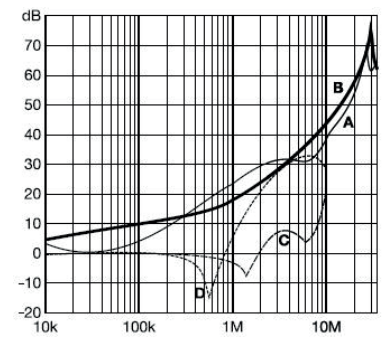
1 and 3 A models



6 – 10 A models



12 and 15 A models



Filter selection table

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

Description X3120-U undervoltage release module

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

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

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

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

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

Not possible with style configurations D and E.

Typical applications

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

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

Order numbering code

Type No.

X3120 module for type 3120-N

Module

U undervoltage release module

Design

00 standard (without separate connections)

01 1 blade terminal 2.8x0.8

02 2 blade terminals 2.8x0.8

Voltage ratings

00 AC 230/240 V 50/60 Hz

01 AC 120 V 50/60 Hz

02 AC 100 V 50/60 Hz

03 DC 24 V

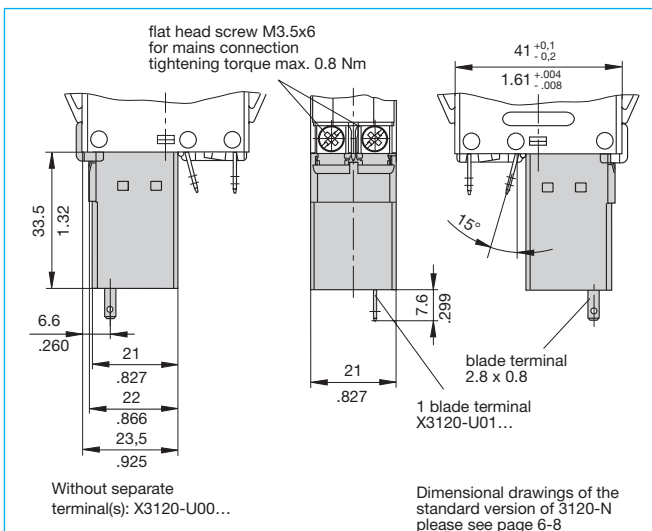
04 AC 400 V 50/60 Hz

Supply status

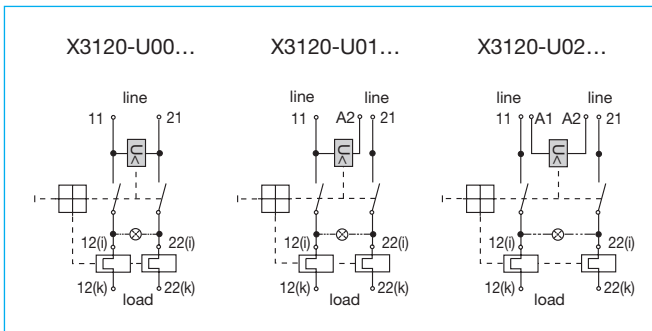
M module mounted to circuit breaker 3120-N

X3120- U 00 00 M ordering example

Dimensions – undervoltage release module



Schematic diagrams



Technical data

Voltage ratings	AC 100 V; AC 120 V; AC 230/240 V; AC 400 V (50/60 Hz) DC 24 V
Voltage tolerances	+ 10 %/- 15 %
Typical life	20,000 cycles
Current consumption	approx. 2.5 mA
Release values	$0.2 \times U_N < U < 0.7 \times U_N$ (at a rated voltage of AC 100 V the device can trip at 70 V and must trip at 20 V)
Trip time	< 20 ms
Reset value	$\geq 85 \% U_N$
Ambient temperature	-30 ... 60 °C
Vibration	8 g (57-500 Hz), ± 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)

All information and data given on our products are accurate and reliable to the best of our knowledge, but E-T-A does not accept any responsibility for the use in applications which are not in accordance with the present specification. E-T-A reserves the right to change specifications at any time in the interest of improved design, performance and cost effectiveness. Dimensions are subject to change without notice. Please enquire for the latest dimensional drawing with tolerances if required. All dimensions, data, pictures and descriptions are for information only and are not binding. Amendments, errors and omissions excepted. Ordering codes of the products may differ from their marking.

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

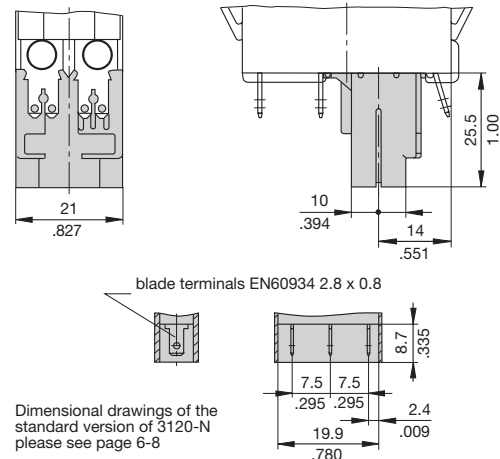
A AC 10 V – AC 250 V	0.1 ... 4 A
DC 12 V	0.1 ... 4 A
DC 24 V	0.1 ... 4 A
DC 60 V	0.1 ... 1 A
DC 110 V	0.1 ... 0.5 A
DC 220 V	0.1 ... 0.25 A
B AC 5 V – AC 250 V	5 ... 100 mA
DC 5 V – DC 250 V	5 ... 100 mA

Supply status

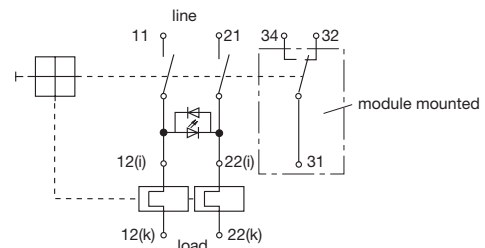
M module mounted to circuit breaker 3120-N

X3120-S 0 1 A M ordering example

Dimensions – auxiliary contact module



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)

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

Description X3120-M remote trip module

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

Note: Not possible in combination with PT terminals.

Typical applications

Electrical remote trip of safety systems.

Order numbering code

Type No.

X3120 module for type 3120-N

Module

M magnetic trip module

Design

2 magnetic remote trip coil

Terminal design

P7 blade terminals DIN 46244-A6.3-0.8

Supply status

M module mounted to circuit breaker 3120-N

Voltage ratings

AC 120, 230 V

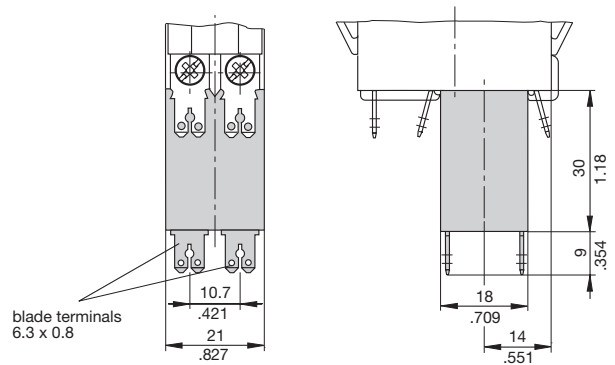
DC 12, 24 V

X3120-M 2 P7 M -12 V ordering example

Standard voltage ratings and typical internal resistance values

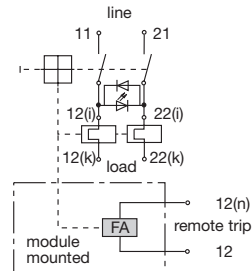
Voltage ratings	Internal internal resistance (Ω)	Voltage ratings	internal internal resistance (Ω)
DC 12 V	0.78	AC 120 V	71.0
DC 24 V	3.3	AC 230 V	312

Dimensions – remote trip module



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)

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Description

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

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

Typical applications

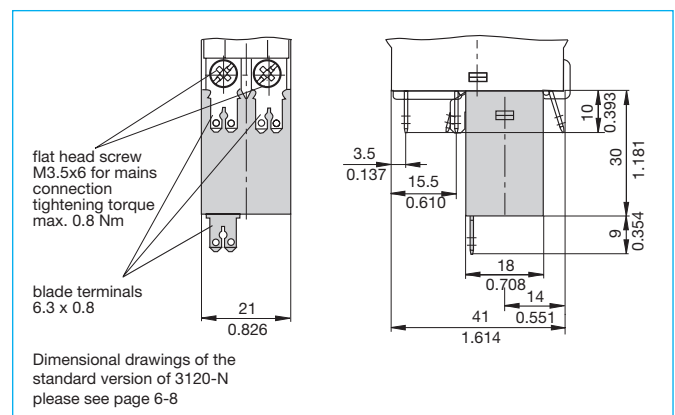
Electric motors, household appliances and office machines, electrical tools, power supplies, charging rectifiers

Current ratings and internal resistance values

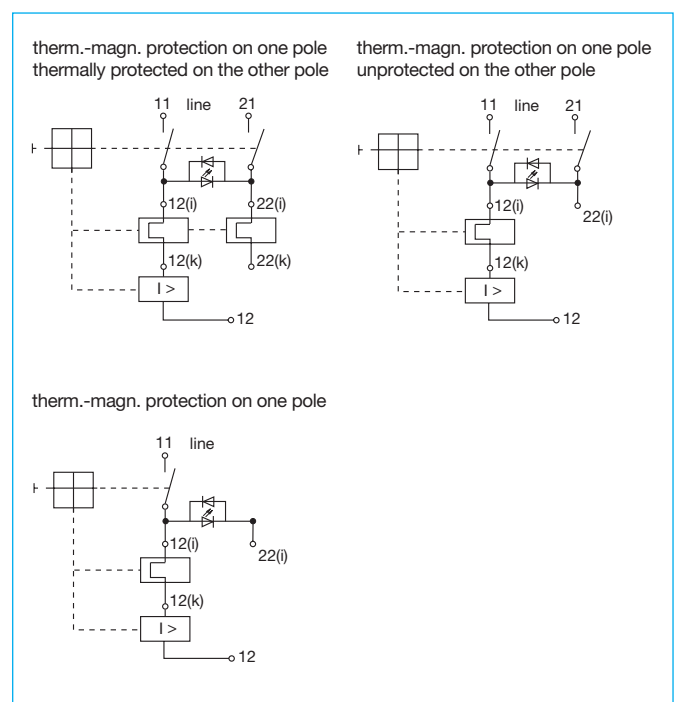
Current rating (A)	Internal resistance per pole (Ω)	
	thermal-magnetic	thermal $1.15 - 1.38 \times I_N$
0.1	165	94
0.2	42.5	24
0.3	20.2	12
0.4	9.7	5.40
0.5	7.17	4.30
0.6	4.9	3
0.8	2.65	1.50
1	1.49	0.9
1.2	1.25	0.7
1.5	0.74	0.45
2	0.49	0.29
2.5	0.20	0.0785
3	0.14	0.0595
3.5	0.114	0.0565
4	0.092	0.0435
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



Schematic diagrams



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

Typical life 2-pole

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

Ambient temperature -30... 60 °C

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

Dielectric strength

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

Insulation resistance > 100 MOhm (DC 500 V)

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

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

Interrupting capacity I_{nc} (UL 1077)

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

Degree of protection (IEC 60529)

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

Approvals

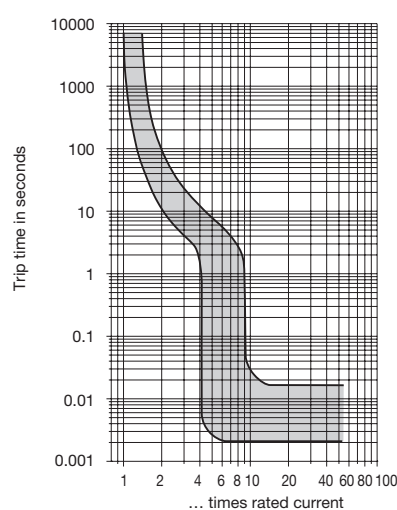
Approval authority	Standard	Voltage ratings	Current rating range
VDE	IEC/EN 60934	AC 240 V DC 50 V	0.1 ... 16 A 0.1 ... 16 A
UL	UL 1077	AC 250 V AC 125 V	0.1 ... 10 A 0.1 ... 16 A
CSA	C22.2 No 235	AC 250 V AC 125 V	0.1...10 A 0.1...16 A
CQC (CCC)	GB 17701	AC 240 V DC 50 V	0.1...16 A 0.1...16 A

Time/current characteristics

Single or double pole load

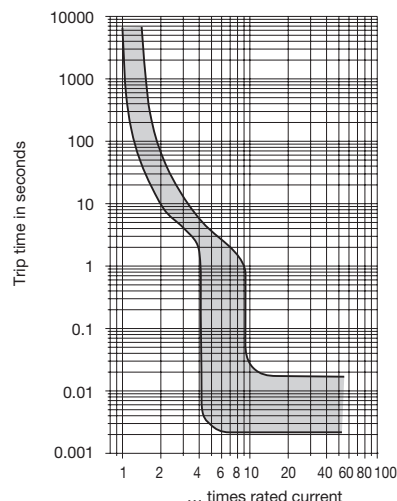
0.1...2 A

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

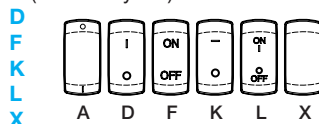
16 . T blue with illumination

19 . G green with illumination

Marking of rocker actuator

rocker style

A (not for style 4)



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.



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

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В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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