

## Description

Switch/thermal trip free circuit breaker (S-type TO CBE to EN 60934) with standard isolator style two button operation. Single button press-to-reset version also available. Both types can be supplied in single pole configuration only, in double pole with single pole protection, and in double pole with protection on both poles. Designed for snap-in panel mounting. There is a choice of push button colour combinations and illumination is optional. Any one of the following additional function modules can be supplied factory fitted to the rear of the switch/circuit breaker:

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

Approved to CBE standard EN 60934 (IEC 60934).

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

## Typical applications

Motors, transformers, solenoids, extra low voltage wiring systems, office machines, electro-medical equipment, power supplies, communications systems, industrial controls.

## Standard current ratings and typical internal resistance values

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

## Illumination voltage/power consumption

| operating voltage | power consumption |        |
|-------------------|-------------------|--------|
|                   | Y + R             | G      |
| 12 V              | 2 mA              | 3.5 mA |
| 24 V              | 2 mA              | 3.5 mA |
| 48 V              | 2 mA              | 3.5 mA |
| 115 V             | 0.9 mA            | 2.8 mA |
| 230 V             | 0.9 mA            | 2.8 mA |



3120-F...

## Technical data

For further details please see chapter: Technical Information

|                                                                                           |                                                                             |                                                                      |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------|
| Voltage rating                                                                            | AC 240 V; DC 50 V<br>(AC 415 V to special order)<br>(UL: AC 250 V; DC 50 V) |                                                                      |
| Current ratings                                                                           | 0.1...20 A<br>(up to 30 A to special order, single pole only)               |                                                                      |
| Typical life                                                                              | AC 240 V: 0.1...20 A                                                        | <b>1-pole</b><br>30,000 operations at 1 x I <sub>N</sub> , inductive |
|                                                                                           | DC 50 V: 0.1...4 A                                                          | 30,000 operations at 1 x I <sub>N</sub> , inductive                  |
| DC 28 V: 0.1...20 A                                                                       | 4.5...16 A                                                                  | 30,000 operations at 1 x I <sub>N</sub> , resistive                  |
|                                                                                           |                                                                             | 30,000 operations at 1 x I <sub>N</sub> , inductive                  |
| AC 415 V: 0.1...16 A                                                                      |                                                                             | <b>2-pole</b><br>10,000 operations at 1 x I <sub>N</sub> , inductive |
|                                                                                           | AC 240 V: 0.1...16 A                                                        | 50,000 operations at 1 x I <sub>N</sub> , inductive                  |
| DC 50 V: 0.1...16 A                                                                       | 17...20 A                                                                   | 30,000 operations at 1 x I <sub>N</sub> , inductive                  |
|                                                                                           |                                                                             | 50,000 operations at 1 x I <sub>N</sub> , inductive                  |
| 17...20 A                                                                                 |                                                                             | 10,000 operations at 1 x I <sub>N</sub> , inductive                  |
|                                                                                           |                                                                             |                                                                      |
| Ambient temperature                                                                       | -30...+60 °C (-22...+140 °F)                                                |                                                                      |
| Insulation co-ordination<br>(IEC 60664 and 60664 A)                                       | rated impulse withstand voltage                                             | pollution degree                                                     |
|                                                                                           | 2.5 kV                                                                      | 2                                                                    |
|                                                                                           | reinforced insulation in operating area                                     |                                                                      |
| Dielectric strength<br>(IEC 60664 and 60664A)<br>operating area<br>between poles (2-pole) | test voltage                                                                |                                                                      |
|                                                                                           | AC 3,000 V                                                                  |                                                                      |
|                                                                                           | AC 1,500 V                                                                  |                                                                      |
| Insulation resistance                                                                     | > 100 MΩ (DC 500 V)                                                         |                                                                      |
| Interrupting capacity I <sub>cn</sub>                                                     | 0.1...2 A                                                                   | 10 x I <sub>N</sub>                                                  |
|                                                                                           | 2.5...20 A                                                                  | 250 A 2-pole, or 150 A 1-pole                                        |
| Interrupting capacity (UL 1077)                                                           |                                                                             |                                                                      |

|           | I <sub>N</sub> | U <sub>N</sub> | I <sub>nc</sub> |
|-----------|----------------|----------------|-----------------|
| 1, 2-pole | 0.1...20 A     | AC 250 V       | 5000 A          |
| 1, 2-pole | 0.1...20 A     | DC 50 V        | 1000 A          |

|                                               |                                                                                                |
|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| Degree of protection<br>(IEC 60529/DIN 40050) | operating area IP40<br>terminal area IP00                                                      |
| Vibration                                     | 8 g (57-500 Hz), ± 0.61 mm (10-57 Hz)<br>to IEC 60068-2-6, test Fc<br>10 frequency cycles/axis |
| Shock                                         | 30 g (11 ms)<br>to IEC 60068-2-27, test Ea                                                     |
| Corrosion                                     | 96 hours at 5 % salt mist,<br>to IEC 60068-2-11, test Ka                                       |
| Humidity                                      | 240 hours at 95 % RH,<br>to IEC 60068-2-78, test Cab                                           |
| Mass                                          | approx. 33 g (double pole)<br>approx. 27 g (single pole)                                       |

## Ordering information

### Type No.

3120 push button switch/circuit breaker

### Mounting

F snap in frame

### Size of frame

2 flange mounting, special frame for fitting splash cover

3 to fit mounting cut-out 50.5 x 21.5 mm (1.99 x 8.47 in)  
panel thickness 1 - 6.35 mm (.039 - .250 in)

### Number of poles

1 1-pole, thermally protected

2 2-pole, thermally protected

5 2-pole, 1-pole thermally protected (terminals 11,12k,12i)

### Mounting frame design

F with 2 push buttons

G with 1 push button (switch-on only)

### Terminal configuration

P7 blade terminals, standard for curve T1  
(thermal circuit breaker)

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

### Characteristic curve

T1 thermal 1.01 - 1.4 x I<sub>N</sub>

### Switch style / colour / Illumination

D 01X 1 push button\* black opaque  
without illumination

D 02X 1 push button\* white black opaque  
without illumination

D 04X 1 push button\* red opaque  
without illumination

D 19XG 1 push button\* green translucent  
with LED illumination

SGRX 2 push buttons green/red opaque  
without LED illumination

SGRXG 2 push buttons green/red translucent  
with LED illumination

### Illumination voltage range

1 10 - 14 V DC

2 20 - 28 V DC

3 90 - 140 V AC

4 185 - 275 V AC

### Current ratings

0.1...20 A

3120 - F 3 2 F - P7 T1 - S GRXG 4 - 10 A ordering example

### N.B.

Switch only versions must be specified with -N7 or -G7 terminals.  
Terminals 12(k) and 22 (k) are not fitted.

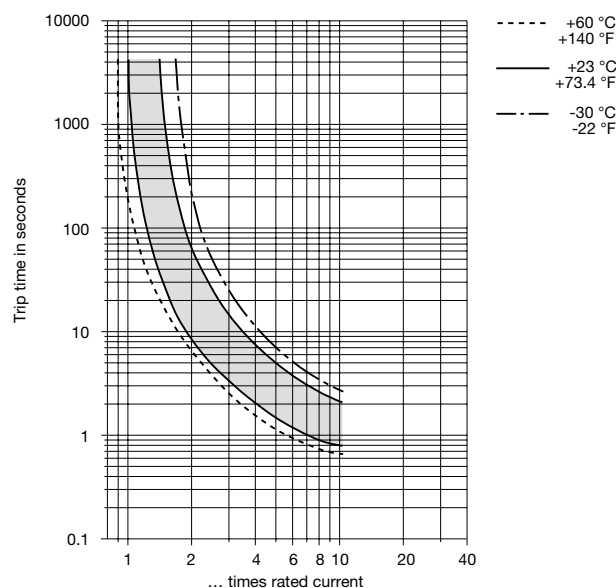
## Approvals

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

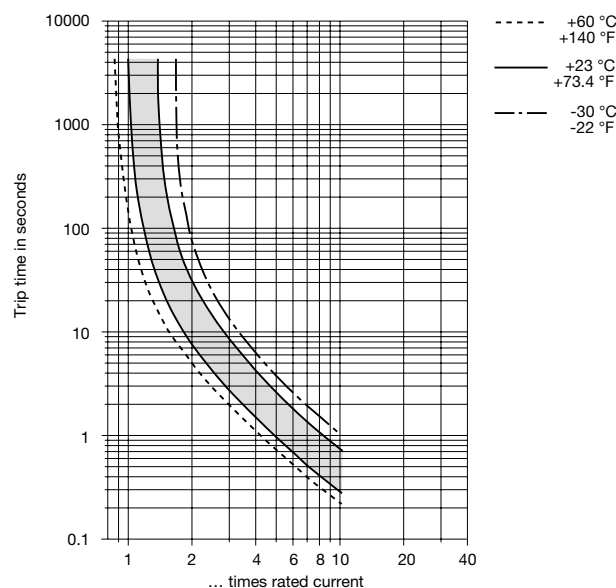
## Typical time/current characteristics

single or double pole load

0.1...2 A



2.5...20 A

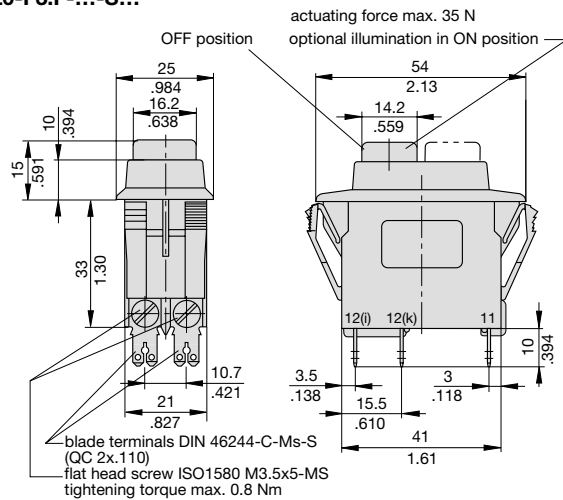


The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section Technical information.

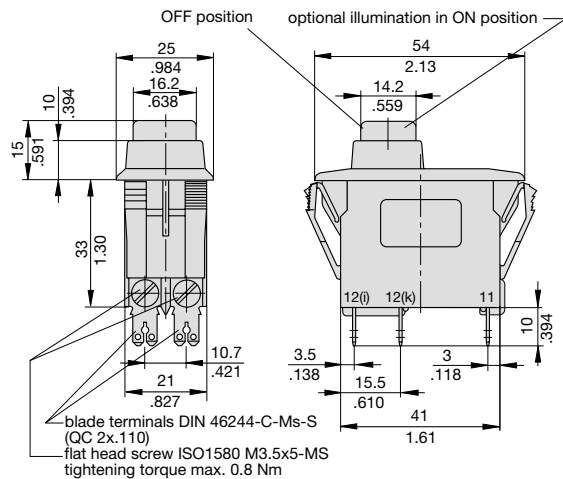
| Ambient temperature | °F  | -22 | -4   | +14  | +32  | +73.4 | +104 | +122 | +140 |
|---------------------|-----|-----|------|------|------|-------|------|------|------|
| °C                  | -30 | -20 | -10  | 0    | +23  | +40   | +50  | +60  |      |
| Derating factor     |     | 0.8 | 0.76 |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

## Dimensions

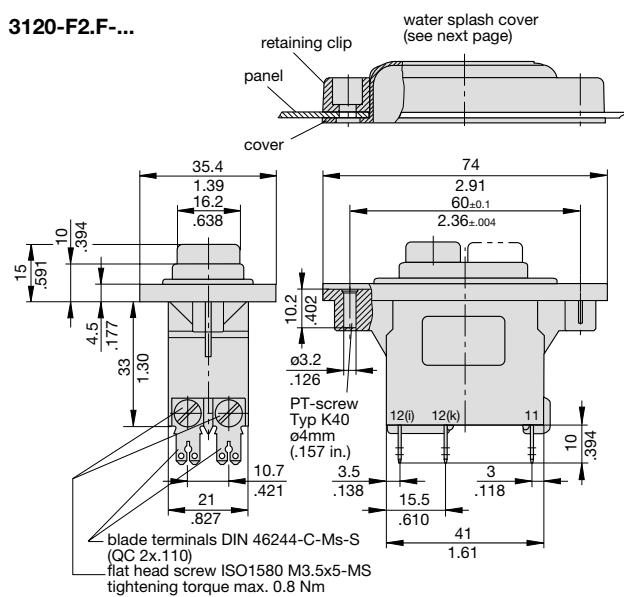
### 3120-F3.F-...-S...



### 3120-F3.G-...-D...

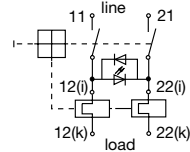


### 3120-F2.F-...

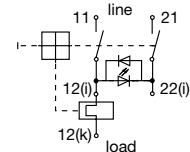


## Internal connection diagrams

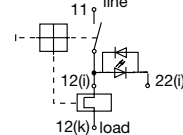
### 2-pole, thermally protected on both poles



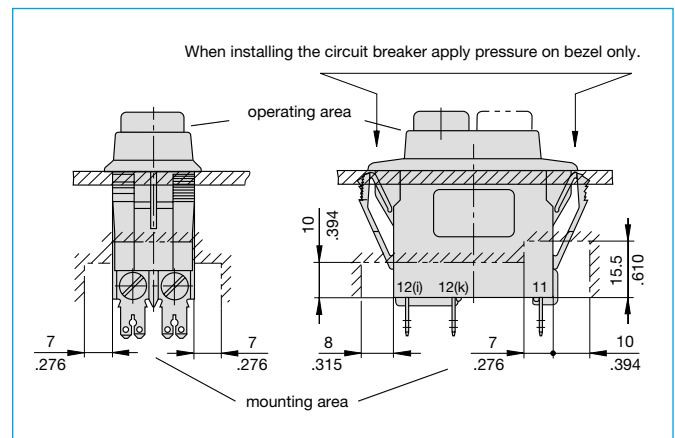
### 2-pole, thermally protected on one pole only



### 1-pole, thermally protected

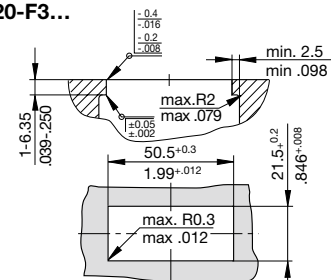


## Installation drawing

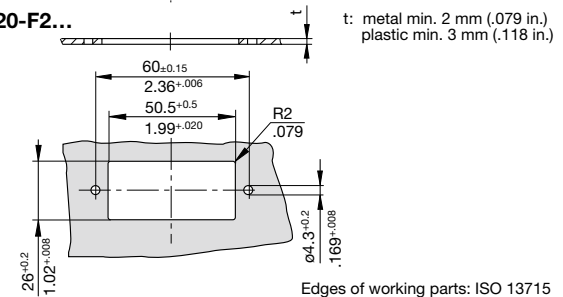


## Panel cut-out

### 3120-F3...



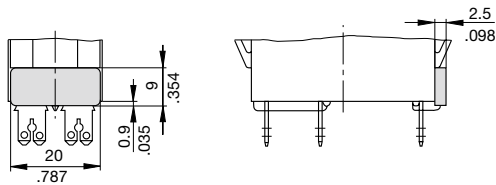
### 3120-F2...



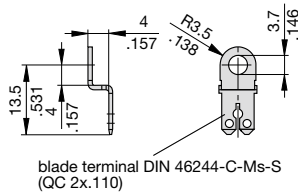
This is a metric design and millimeter dimensions take precedence ( $\frac{\text{mm}}{\text{inch}}$ )

## Accessories

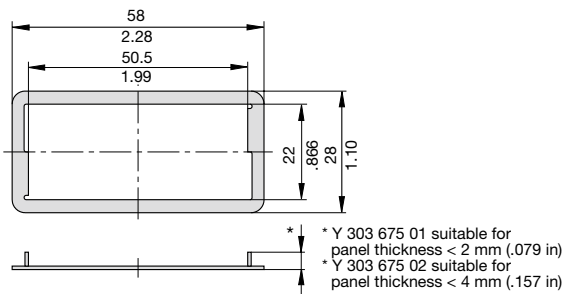
### Insulated cover Y 303 068 01



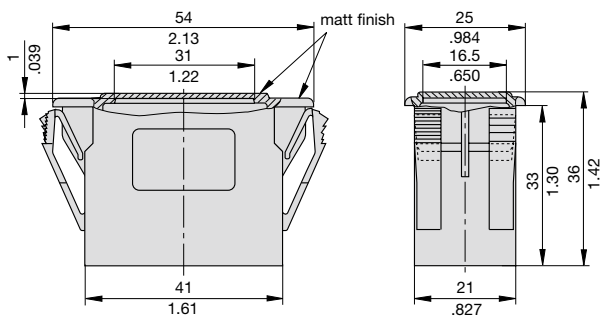
### Terminal adapter Y 303 862 01



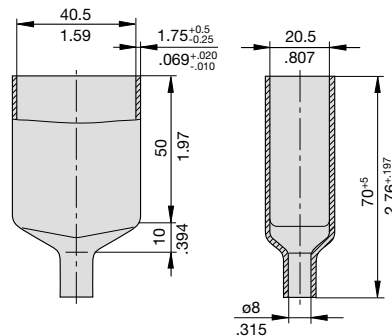
### Spacer for 3120-F3... Y 303 675 01/02



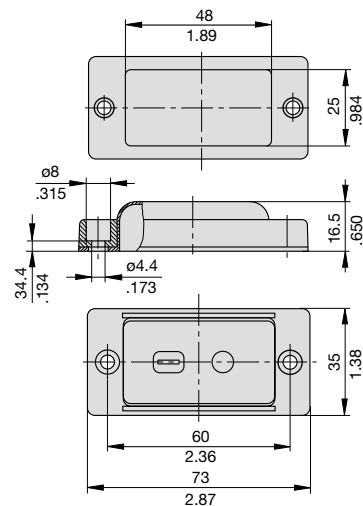
### Blanking piece in -F3 frame Y 303 885 31



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



### Water splash cover, transparent (IP66) for style 3120-F2.F-... X 221 619 01 consisting of - retaining clip Y 306 551 01 - cover Y 306 001 01



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

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

## Description

A module supplied factory fitted to type 3120-F to provide electrically separate changeover contacts which operate as the main contacts open/wclose. Ideally suited to status signalling and sequence switching.

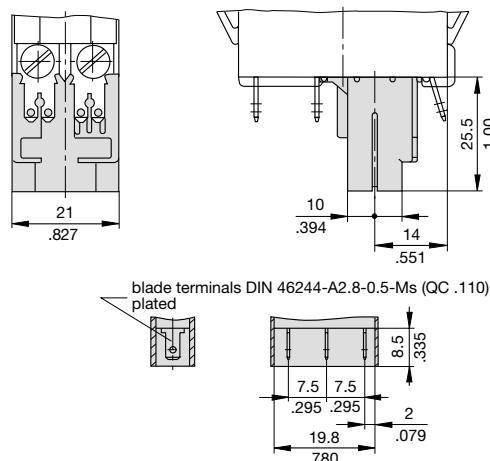
## Typical applications

Monitoring of the switching position of the circuit breaker or any connected load.

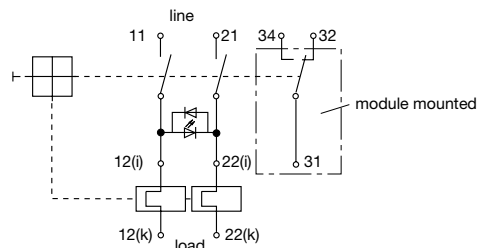
## Ordering information

| Type No.                                  |                                                    |
|-------------------------------------------|----------------------------------------------------|
| <b>X3120</b>                              | Module for type 3120 and type 3140                 |
| Function                                  |                                                    |
| <b>S</b>                                  | auxiliary contact module                           |
| Contact configuration                     |                                                    |
| <b>0</b>                                  | change-over contact                                |
| Terminal design                           |                                                    |
| <b>1</b>                                  | blade terminals 2.8 x 0.5 (QC .110), silver plated |
| Contact rating                            |                                                    |
| AC                                        |                                                    |
| Voltage rating                            | Current rating                                     |
| <b>A</b> 10 V-250 V                       | 0.1...4 A                                          |
|                                           | 12 V 0.1...4 A                                     |
|                                           | 24 V 0.1...1 A                                     |
|                                           | 60 V 0.1...0.5 A                                   |
| <b>B</b> 10 V-250 V                       | 110 V 0.1...25 A                                   |
|                                           | 220 V 5...100mA                                    |
| Supply condition                          |                                                    |
| <b>M</b>                                  | module mounted to circuit breaker 3120-...         |
| <b>X3120 - S 0 1 A M</b> ordering example |                                                    |

## Dimensions



## Internal connection diagram



## Approvals (complete circuit breaker/module assembly)

| Authority | Standard     | Rated voltage       | Current ratings              |
|-----------|--------------|---------------------|------------------------------|
| VDE       | IEC/EN 60934 | AC 250 V<br>DC 28 V | 0.05 A...4 A<br>0.05 A...4 A |
| UL        | UL 1077      |                     |                              |
| CSA       | C22.2 No 235 | AC 250 V            | 0.1 A...4 A                  |
| CQC       | GB 17701     |                     |                              |

## Technical data

|                                            |                                                                                                                                                |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Voltage rating                             | AC 250 V; DC 220 V                                                                                                                             |
| Current rating                             | 0.1...4 A / 5...100 mA                                                                                                                         |
| Typical life                               | 50,000 operations                                                                                                                              |
| Ambient temperature                        | -30...+60 °C (-22...+140 °F)                                                                                                                   |
| Dielectric strength (IEC 60664 and 60664A) | test voltage                                                                                                                                   |
| between main and auxiliary circuit         | AC 3,000 V                                                                                                                                     |
| Insulation resistance                      | > 100 MΩ (DC 500 V)                                                                                                                            |
| Vibration                                  | 6 g (type X3120-S...A)<br>8 g (type X3120-S...B)<br>(57-500 Hz), ± 0.46 mm (10-57 Hz)<br>to IEC 60068-2-6, test Fc<br>10 frequency cycles/axis |
| Shock                                      | 15 g (11 ms), type X3120-S...A<br>20 g (11 ms), type X3120-S...B<br>to IEC 60068-2-27, test Ea                                                 |
| Corrosion                                  | 96 hours at 5 % salt mist,<br>to IEC 60068-2-11, test Ka                                                                                       |
| Humidity                                   | 240 hours at 95 % RH<br>to IEC 60068-2-78, test Cab                                                                                            |
| Mass                                       | approx. 38 g (complete assembly)                                                                                                               |

This is a metric design and millimeter dimensions take precedence ( $\frac{\text{mm}}{\text{inch}}$ )

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

## Description

A module suitable for all double pole versions of type 3120-F to trip the main switch/circuit breaker mechanism in the event of loss of voltage. When the voltage is restored the rocker switch must be reset to reconnect the load, thereby avoiding the safety hazards associated with automatic re-starting of machinery.

**Note:** Basic unit 3120-...-H7 or -G7: screw terminals necessary.

**US patent number:** US 5,834,996

## Typical applications

Machines such as power tools, industrial equipment and domestic appliances where automatic restart after restoration of power could be dangerous (EC Machinery Directive).

## Ordering information

| Type No.                |                                            |
|-------------------------|--------------------------------------------|
| <b>X3120</b>            | Module for type 3120                       |
| Function                |                                            |
| <b>U</b>                | undervoltage release module                |
| Terminal design         |                                            |
| <b>00</b>               | standard (without separate connections)    |
| <b>01</b>               | 1 blade terminal 2.8x0.8 (QC .110)         |
| Voltage ratings         |                                            |
| <b>00</b>               | AC 230/240 V 50/60 Hz                      |
| <b>01</b>               | AC 120 V 50/60 Hz                          |
| Assembly status         |                                            |
| <b>M</b>                | module mounted to the circuit breaker 3120 |
| <b>X3120 -U 00 00 M</b> | ordering example                           |

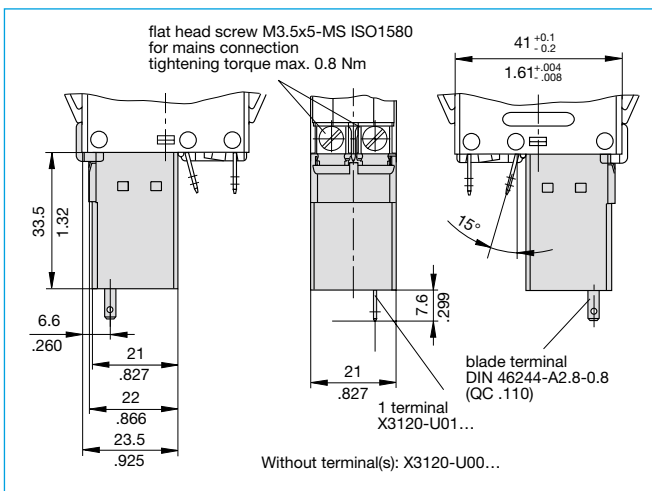
## Preferred types

X3120-U0000M  
X3120-U0100M

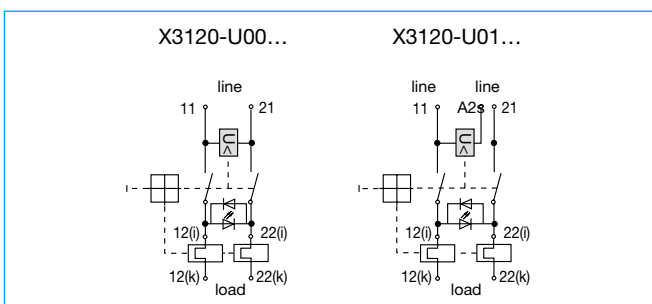
## Approvals (complete circuit breaker/module assembly)

| Authority | Standard     | Rated voltage            | Current ratings |
|-----------|--------------|--------------------------|-----------------|
| VDE       | IEC/EN 60934 | DC 24 V<br>AC 42 – 400 V |                 |
| UL        | 1077         |                          |                 |
| CSA       | C22.2 No 235 |                          |                 |
| CQC       | GB 17701     |                          |                 |

## Dimensions



## Internal connection diagrams



## Technical data

|                     |                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Voltage ratings     | AC 100; 120 V; 230/240 V 50/60 Hz<br>DC 24 V                                                                                      |
| Voltage tolerance   | +10%/-15%                                                                                                                         |
| Current consumption | approx. 2.5 mA                                                                                                                    |
| Typical life        | 20,000 operations                                                                                                                 |
| Release values      | $0.2 \times U_N < U < 0.7 \times U_N$<br>(at a rated voltage of AC 100 V the device may release at 70 V and must release at 20 V) |
| Release delay       | $t < 20$ ms                                                                                                                       |
| Latch-in values     | $\geq 85 \% U_N$                                                                                                                  |
| Ambient temperature | -30...+60 °C (-22...+140 °F)                                                                                                      |
| Vibration           | 8 g (57-500 Hz) $\pm 0.61$ mm (10-57 Hz)<br>to IEC 60068-2-6, test Fc<br>10 frequency cycles/axis                                 |
| Shock               | 30 g (11 ms)<br>to IEC 60068-2-27, test Ea                                                                                        |
| Corrosion           | 48 hours at 5 % salt mist,<br>to IEC 60068-2-11, test Ka                                                                          |
| Humidity            | 240 hours at 95% RH<br>to IEC 60068-2-78, test Cab                                                                                |
| Mass                | approx. 53 g (complete assembly)                                                                                                  |

This is a metric design and millimeter dimensions take precedence ( $\frac{\text{mm}}{\text{inch}}$ )

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

## Description

A module which adds remote trip capability to all versions of type 3120-F. A voltage applied across the coil, by means of an external sensor for example, will cause disconnection of the main switch/circuit breaker mechanism.

## Typical applications

Electrical monitoring of safety systems, remote trip.

## Ordering information

| Type No.                       |                                                  |
|--------------------------------|--------------------------------------------------|
| <b>X3120</b>                   | Module for type 3120                             |
| <b>Function</b>                |                                                  |
| <b>M</b>                       | magnetic relay trip module                       |
| <b>Style</b>                   |                                                  |
| <b>2</b>                       | magnetic remote trip coil                        |
| <b>Terminal design</b>         |                                                  |
| <b>P7</b>                      | blade terminals 2x2.8x0.8 (QC 2x.110) tin plated |
| <b>Supply condition</b>        |                                                  |
| <b>M</b>                       | module mounted to the circuit breaker            |
| <b>Voltage ratings</b>         |                                                  |
| <b>AC 120, 230 V</b>           |                                                  |
| <b>DC 12, 24 V</b>             |                                                  |
| <b>X3120 - M 2 P7 M - 12 V</b> | ordering example                                 |

## Preferred types

X3120-M2P7M-120 V  
X3120-M2P7M-230 V  
X3120-M2P7M-24 V

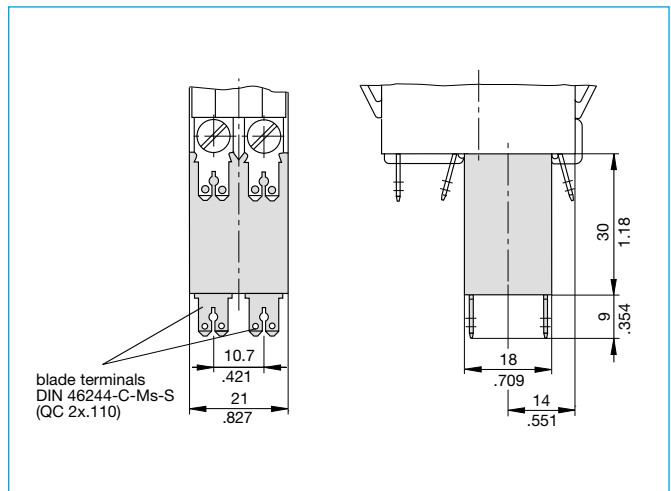
## Standard voltage ratings and typical internal resistance values

| Voltage rating (A) | Internal resistance per pole (Ω) | Voltage rating (A) | Internal resistance per pole (Ω) |
|--------------------|----------------------------------|--------------------|----------------------------------|
| 12 V DC            | 0.78                             | 120 V AC           | 71.0                             |
| 24 V DC            | 3.3                              | 230 V AC           | 312                              |

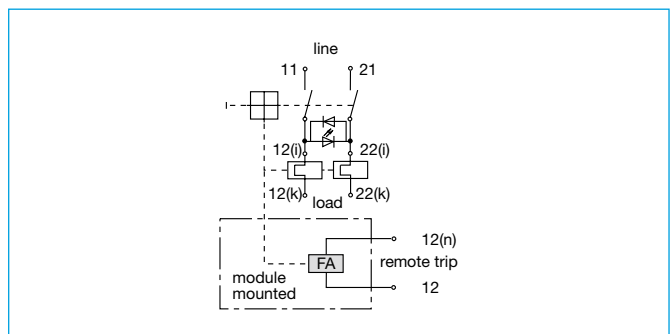
## Approvals (complete circuit breaker/module assembly)

| Authority | Standard     | Rated voltage                 | Current ratings |
|-----------|--------------|-------------------------------|-----------------|
| VDE       | IEC/EN 60934 | DC 12 – 24 V<br>AC 12 – 240 V |                 |
| UL        | UL 1077      |                               |                 |
| CSA       | C22.2 No 235 | DC 12 – 28 V<br>AC 12 – 240 V |                 |
| CQC       | GB 17701     |                               |                 |

## Dimensions



## Internal connection diagram



## Technical data

|                                                                                       |                                                                                            |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Voltage ratings                                                                       | AC 120...230 V; DC 12...24 V                                                               |
| Power consumption                                                                     | approx. 200 W                                                                              |
| Pulse operation                                                                       | 20 ms < t <sub>ON</sub> < 100 ms/t <sub>OFF</sub> > 10 sec                                 |
| Release delay                                                                         | t < 20 ms                                                                                  |
| Typical life                                                                          | 50,000 operations at U <sub>N</sub>                                                        |
| Ambient temperature                                                                   | -30...+60 °C (-22...+140 °F)                                                               |
| Dielectric strength (IEC 60664 and 60664A) between main circuit and trip coil circuit | test voltage<br>AC 3,000 V                                                                 |
| Insulation resistance                                                                 | > 100 MΩ (DC 500 V)                                                                        |
| Vibration                                                                             | 8 g (57-500 Hz) ± 0.61 mm (10-57 Hz) to IEC 60068-2-6, test Fc<br>10 frequency cycles/axis |
| Shock                                                                                 | 30 g (11 ms) to IEC 60068-2-27, test Ea                                                    |
| Corrosion                                                                             | 96 hours at 5 % salt mist, to IEC 60068-2-11, test Ka                                      |
| Humidity                                                                              | 240 hours at 95 % RH to IEC 60068-2-78, test Cab                                           |
| Mass                                                                                  | approx. 53 g (complete assembly)                                                           |

This is a metric design and millimeter dimensions take precedence ( $\frac{\text{mm}}{\text{inch}}$ )

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

