

## Description

Single or two pole rocker switch/thermal-magnetic circuit breaker with trip-free mechanism (S-type TM CBE to EN 60934). The addition of a magnetic tripping module to the type 3120 range described in catalogue section Thermal Overcurrent Circuit Breakers extends the choices available to include single pole with thermal-magnetic protection; double pole switching with thermal-magnetic protection on one pole, thermal protection on the other; double pole switching with thermal-magnetic protection on one pole only. All are offered with rocker switch or push button control - two buttons for ON/OFF or one button press-to-reset only, in designs to suit one of three different panel cut-out sizes. Illumination is optional. 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, machine tools, office equipment, appliances.

## Standard current ratings and typical internal resistance values

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

## Illumination voltage / Power consumption

Operating voltage	Power consumption		
	Y + R	G	T
12 V	2 mA	3.5 mA	4.9 mA
24 V	2 mA	3.5 mA	4.9 mA
48 V	2 mA	3.5 mA	4.9 mA
115 V	0.9 mA	2.8 mA	2.2 mA
230 V	0.9 mA	2.8 mA	2.2 mA



3120-...-M...

## Technical data

For further details please see chapter: Technical Information

Voltage rating	AC 240 V (50/60 Hz); DC 50 V		
Current ratings	0.1...16 A		
Typical life	<b>1-pole</b>		
	AC 240 V:	0.1...20 A	30,000 operations at 1 x I <sub>N</sub> , inductive
	DC 50 V:	0.1...4 A	30,000 operations at 1 x I <sub>N</sub> , inductive
		4.5...16 A	30,000 operations at 1 x I <sub>N</sub> , resistive
DC 28 V:	<b>2-pole</b>		
	AC 240 V:	0.1...16 A	50,000 operations at 1 x I <sub>N</sub> , inductive
		17...20 A	30,000 operations at 1 x I <sub>N</sub> , inductive
	DC 50 V:	0.1...16 A	50,000 operations at 1 x I <sub>N</sub> , inductive
	17...20 A	10,000 operations at 1 x I <sub>N</sub> , inductive	
Ambient temperature	-30...+60 °C (-22...+140 °F)		
Insulation co-ordination (IEC 60664 and 60664 A)	rated impulse withstand voltage	2.5 kV	pollution degree 2
	reinforced insulation in operating area		
Dielectric strength (IEC 60664 and 60664A)	test voltage	AC 3,000 V	
	operating area	AC 1,500 V	
	current path/current path	AC 1,500 V	
Insulation resistance	> 100 MΩ (DC 500 V)		
Interrupting capacity I <sub>cn</sub>	0.1...2 A	100 x I <sub>N</sub>	
	2.5...16 A	250 A 2-pole	150 A 1-pole
Interrupting capacity (UL 1077)	I <sub>N</sub>	U <sub>N</sub>	
	0.1...4 A	AC 250 V	200 A
	5...10 A	AC 250 V	2,000 A
	12...14 A	AC 125 V	1,000 A
Degree of protection (IEC 60529/DIN 40050)	operating area IP40 (with water splash protection IP54) terminal area IP00		
Vibration	8 g (57-500 Hz) ± 0.61 mm (10-57 Hz) to IEC 60068-2-6, test Fc 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 (2-pole) approx. 50 g (1-pole)		

## Ordering information

<b>Type</b>	
3120	rocker switch/circuit breaker
<b>Mounting</b>	
<b>F</b> snap-in frame	
<b>Size of frame</b>	
<b>3</b>	to fit in cut-out 50.5 x 21.5 mm panel thickness 1 - 6.35 mm (.039-.250 in)
<b>5</b>	to fit in cut-out 44.5 x 22 mm panel thickness 1 - 4 mm (.039-.157 in)
<b>6</b>	to fit in cut-out 45 x 33.7 mm panel thickness 1.2 - 2.4 mm (.047-.091 in)
<b>Number of poles</b>	
<b>1</b>	1-pole, thermal-magnetic protection
<b>2</b>	2-pole, thermal-magnetic protection on one pole, thermally protected on the other pole
<b>5</b>	2-pole, thermal-magnetic protection on one pole, unprotected on the other pole
<b>Mounting frame design</b>	
<b>1</b>	collar height 1 mm (.039 in)
<b>3</b>	collar height 9 mm (.354 in) (with safety frame)
<b>4</b>	collar height 2 mm (.079 in) with water splash protection (IP54) (not with -F6 frame)
<b>U</b>	with water splash protection and actuator guard
<b>Terminal configuration</b>	
<b>P7</b>	blade terminals 2x2.8-0.8 mm (QC 2x.110) (terminals 12(k), 22(k), 11, 21)
<b>H7</b>	12(k), 22(k): blade terminals 2x2.8-0.8 (QC 2x.110) 11, 21: terminal screws M3.5, blade terminals 2x2.8-0.8 (QC 2x.110)
<b>N7</b>	as P7, but shunt terminals (12(i) and 22(i)) are blade terminals 2x2.8-0.8 (QC 2x.110)
<b>G7</b>	as H7, but shunt terminals (12(i) and 22(i)) are blade terminals 2x2.8-0.8 (QC 2x.110)
<b>Characteristic curve</b>	
<b>M1</b>	standard delay, therm. 1.01-1.4 x I <sub>N</sub> ; magn. 4-9 x I <sub>N</sub> AC
<b>Switch style</b>	
<b>W</b>	rocker
<b>Switch colour designation</b>	
OPAQUE TRANSLUCENT (for illuminated versions)	
<b>01</b> black	<b>12</b> white
<b>02</b> white	<b>14</b> red
<b>04</b> red	<b>15</b> orange
	<b>16</b> sky blue
	<b>19</b> green
<b>Rocker markings</b>	
A	
B	
C	
D	
E	
F	
X	
X = without marking	
<b>Rocker illumination (optional)</b>	
<b>12</b>	<b>Y</b> white rocker, yellow LED
<b>12</b>	<b>T</b> white rocker, blue LED
<b>14</b>	<b>R</b> red rocker, red LED
<b>15</b>	<b>Y</b> orange rocker, yellow LED
<b>16</b>	<b>T</b> blue rocker, blue LED
<b>19</b>	<b>G</b> green rocker, green LED
<b>Illumination voltage range</b> (= operating voltage)	
<b>1</b>	10 - 14 V AC/DC
<b>2</b>	20 - 28 V AC/DC
<b>3</b>	90 - 140 V AC
<b>4</b>	185 - 275 V AC
<b>5</b>	42 - 54 V AC/DC
<b>Current ratings</b>	
<b>0.1...16 A</b>	
3120 - F3 2 1 - N7 M1 - W 12 A R 4 - 10 A rdering example	

The exact part number required can be built up from the table of choices shown above. Ordering references for optional features should be omitted if not required.

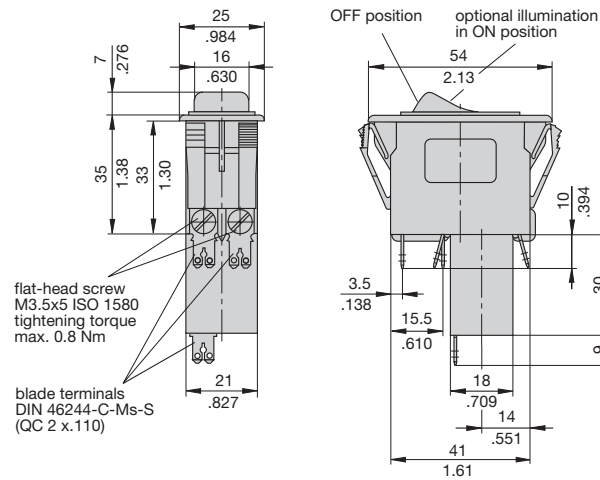
## Ordering information

<b>Type</b>		
3120	push button switch/circuit breaker	
<b>Mounting</b>		
<b>F</b> snap-in frame		
<b>Size of frame</b>		
<b>2</b>	special frame for fitting splash cover	
<b>3</b>	to fit in cut-out 50.5 x 21.5 mm panel thickness 1 - 6.35 mm	
<b>Number of poles</b>		
<b>1</b>	1-pole, thermal-magnetic protection	
<b>2</b>	2-pole, thermal-magnetic protection on one pole, thermally protected on the other pole	
<b>5</b>	2-pole, thermal-magnetic protection on one pole, unprotected on the other pole	
<b>Mounting frame design</b>		
<b>F</b>	frame with two push buttons	
<b>G</b>	frame with one push button	
<b>Terminal configuration</b>		
<b>P7</b>	blade terminals 2x2.8-0.8 mm (QC 2x.110) (terminals 12(k), 22(k), 11, 21)	
<b>H7</b>	12(k), 22(k): blade terminals 2x2.8-0.8 (QC 2x.110) 11, 21: terminal screws M3.5, blade terminals 2x2.8-0.8 (QC 2x.110)	
<b>N7</b>	as P7, but shunt terminals (12(i) and 22(i)) are blade terminals 2x2.8-0.8 (QC 2x.110)	
<b>G7</b>	as H7, but shunt terminals (12(i) and 22(i)) are blade terminals 2x2.8-0.8 (QC 2x.110)	
<b>Characteristic curve</b>		
<b>M1</b>	standard delay, therm. 1.01-1.4 x I <sub>N</sub> ; magn. 4-9 x I <sub>N</sub> AC	
<b>Switch style/color</b>		
<b>D</b>	1 push button (reset only)	
<b>01X</b>	black	
<b>04X</b>	red	
<b>12X</b>	white translucent	
<b>19X</b>	green translucent	
<b>S</b>	2 push buttons ON/OFF	
<b>GRX</b>	green translucent/red	
<b>WRX</b>	white translucent/red	
<b>WBX</b>	white translucent/black	
<b>Push button illumination (optional)</b>		
<b>G</b>	green LED, AC/DC	
<b>Y</b>	yellow LED, AC/DC	
<b>R</b>	red LED, AC/DC	
<b>Illumination voltage range</b> (= operating voltage)		
<b>1</b>	10 - 14 V AC/DC	
<b>2</b>	20 - 28 V AC/DC	
<b>3</b>	90 - 140 V AC	
<b>4</b>	185 - 275 V AC	
<b>5</b>	42 - 54 V AC/DC	
<b>Current ratings</b>		
<b>0.1...16 A</b>		
3120 - F3 2 F - N7 M1-S GRX G 4 - 10 A ordering example		
<b>Approvals</b>		
<b>Authority</b>	<b>Voltage ratings</b>	<b>Current ratings</b>
VDE (EN 60934)	AC 240 V; DC 28 V	0.1...16 A
	DC 50 V	0.1...16 A double pole
	DC 50 V	0.1...10 A single pole
CSA, UL	AC 250 V	0.1...10 A
	AC 125 V	0.1...16 A
CCC	AC 250 V; DC 50 V	0.1...20 A

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.

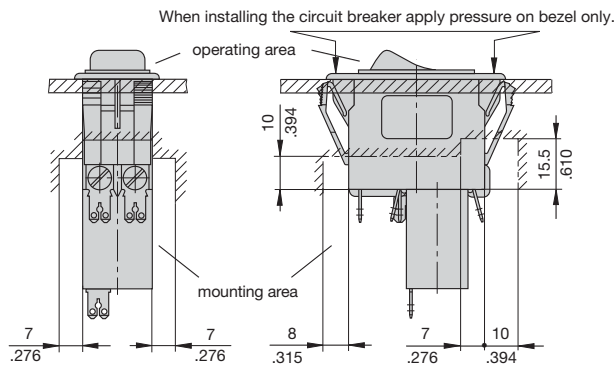
## Dimensions

### Mounting style -F3.1, with rocker – Collar height 1 mm



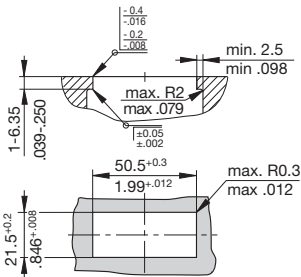
## Installation drawing

### Required safety distances for rocker and push button

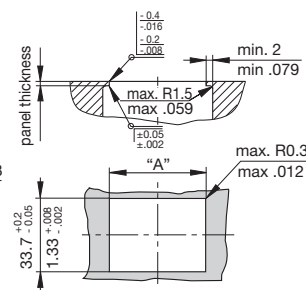


## Cut-out dimensions

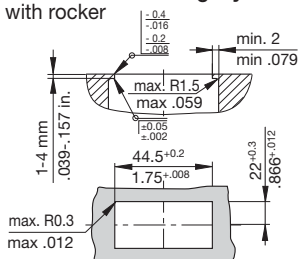
### Cut-out for mounting style -F3 with rocker and push button



### Cut-out for mounting style -F6 with rocker



### Cut-out for mounting style -F5 with rocker

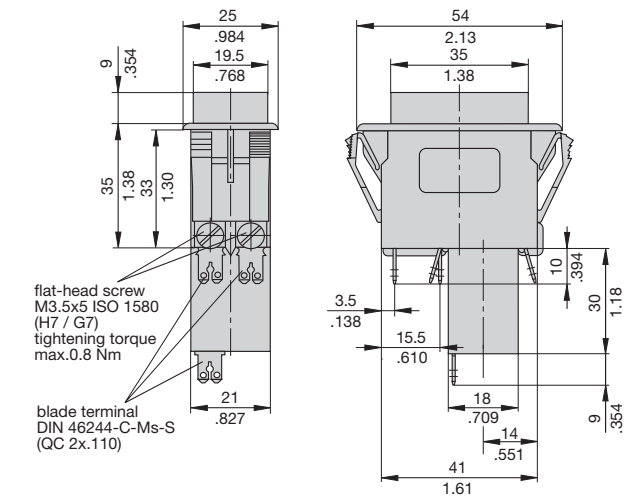


panel thickness	mm	1.2 <sup>+0.4</sup>	1.6 <sup>+0.8</sup>	2.4 <sup>+1</sup>
	inch	.047 <sup>+0.016</sup>	.063 <sup>+0.031</sup>	.094 <sup>+0.039</sup>
dimension "A"	mm	45 <sup>+0.2</sup>	45 <sup>+0.05</sup>	45 <sup>+1.1</sup>
	inch	1.77 <sup>+0.008</sup>	1.77 <sup>+0.043</sup>	1.77 <sup>+0.087</sup>

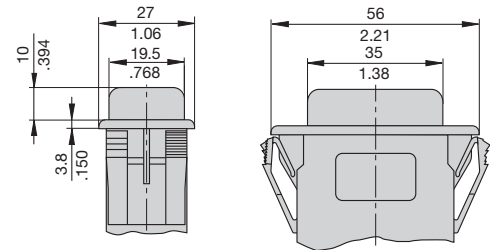
Edges of working parts: ISO 13715

## Mounting frame variants

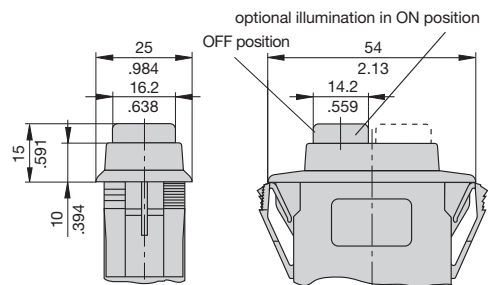
### Mounting style F3.3 with rocker collar height 9 mm (.354 in.)



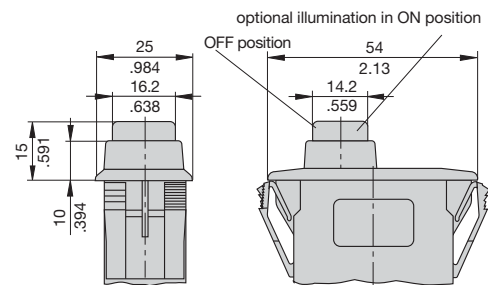
### Mounting style F3.4 with rocker collar height 2 mm (.079 in.), with water splash protection



### Mounting style F3.F-...-S-... with 2 push buttons



### Mounting style F3.G-...-D-... with 1 push button

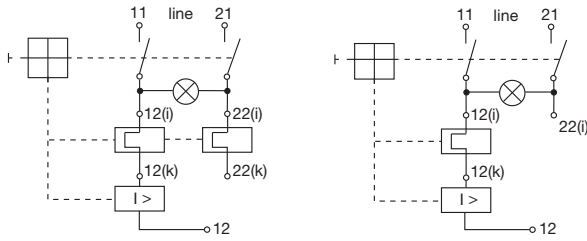


For mounting styles -F2.., -F5.., -F6.. please see section Thermal Overcurrent Circuit Breakers.

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

## Internal connection diagrams

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

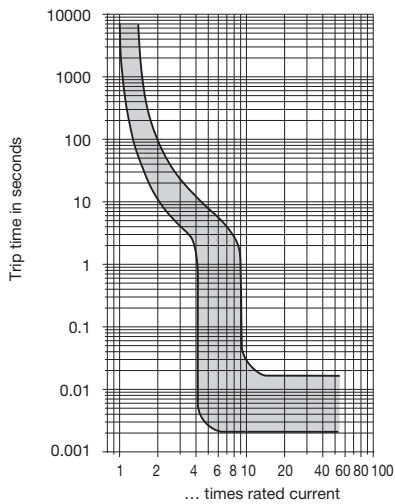


## Typical time/current characteristics at +23°C/+73.4°F

Single or double pole load

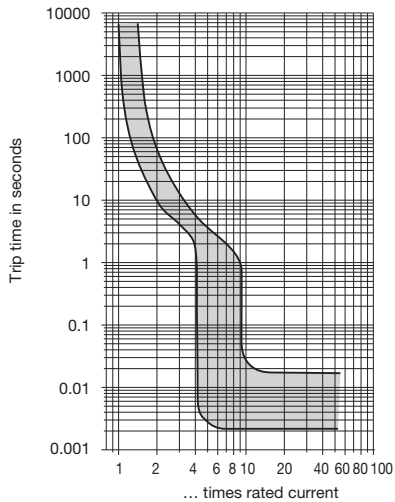
0.1...2 A

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



2.5...16 A

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



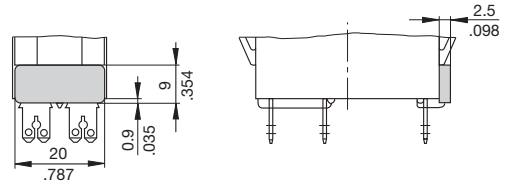
<sup>1)</sup> Magnetic tripping currents are increased by 25% on DC supplies.

The time/current characteristic 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.

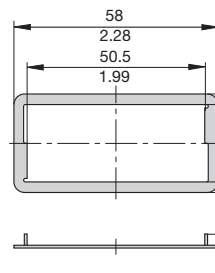
Ambient temperature °F	-22	-4	+14	+32	+73.4	+104	+122	+140
°C	-30	-20	-10	0	+23	+40	+50	+60
Derating factor	0.8	0.76	0.84	0.92	1	1.08	1.16	1.24

## Accessories

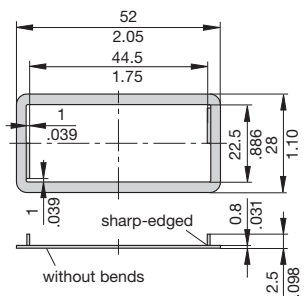
**Insulated cover**  
Y 303 068 01



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

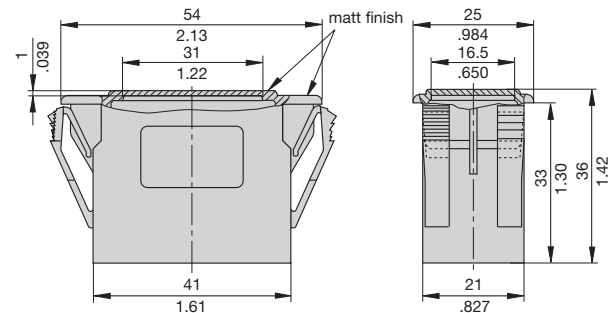


**Spacer for 3120-F5...**  
Y 303 676 01

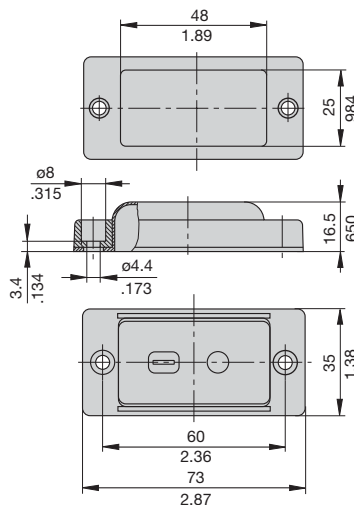


\* Y 303 675 01 suitable for panel thickness < 2 mm (.079 in)  
\* Y 303 675 02 suitable for panel thickness < 4 mm (.157 in)

**Blanking piece in -F3... size mounting frame**  
Y 303 885 31



**Separate water splash cover, transparent (IP66)**  
for use with -F5.. size mounting frames  
X 221 619 01



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

## Description

Single or two pole rocker switch/thermal-magnetic circuit breaker with trip-free mechanism (S-type TM CBE to EN 60934). The addition of a magnetic tripping module to the type 3120 range described in catalogue section Thermal Overcurrent Circuit Breakers extends the choices available to include single pole with thermal-magnetic protection; double pole switching with thermal-magnetic protection on one pole, thermal protection on the other; double pole switching with thermal-magnetic protection on one pole only. All are offered with rocker switch actuation. Illumination is optional.

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, machine tools, office equipment, appliances.

## Standard current ratings and typical internal resistance values

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

## Illumination voltage / Power consumption

Operating voltage	Power consumption		
	Y + R	G	T
12 V	2 mA	3.5 mA	4.9 mA
24 V	2 mA	3.5 mA	4.9 mA
48 V	2 mA	3.5 mA	4.9 mA
115 V	0.9 mA	2.8 mA	2.2 mA
230 V	0.9 mA	2.8 mA	2.2 mA



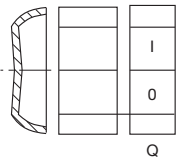
3120-F7..-M1..

## Technical data

For further details please see chapter: Technical Information

Voltage rating	AC 240 V, 50/60 Hz; DC 50 V		
Current ratings	0.1...16 A		
Typical life	<b>1-pole</b>		
	AC 240 V:	0.1...20 A	30,000 operations at 1 x I <sub>N</sub> , inductive
DC 50 V:	0.1...4 A	30,000 operations at 1 x I <sub>N</sub> , inductive	
	4.5...16 A	30,000 operations at 1 x I <sub>N</sub> , resistive	
DC 28 V:	4.5...20 A	30,000 operations at 1 x I <sub>N</sub> , inductive	
	<b>2-pole</b>		
AC 240 V:	0.1...16 A	50,000 operations at 1 x I <sub>N</sub> , inductive	
	17...20 A	30,000 operations at 1 x I <sub>N</sub> , inductive	
DC 50 V:	0.1...16 A	50,000 operations at 1 x I <sub>N</sub> , inductive	
	17...20 A	10,000 operations at 1 x I <sub>N</sub> , inductive	
Ambient temperature	-30...+60 °C (-22...+140 °F)		
Insulation co-ordination (IEC 60664 and 60664 A)	rated impulse withstand voltage	2.5 kV	pollution degree 2
	reinforced insulation in operating area		
Dielectric strength (IEC 60664 and 60664A)	test voltage	AC 3,000 V	
	operating area	AC 1,500 V	
Insulation resistance	operating area	AC 1,500 V	
	current path/current path	AC 1,500 V	
Interrupting capacity I <sub>cn</sub>	> 100 MΩ (DC 500 V)		
	0.1...2 A	100 x I <sub>N</sub>	
Interrupting capacity (UL 1077)	2.5...16 A	250 A 2-pole	150 A 1-pole
Degree of protection (IEC 60529/DIN 40050)	I <sub>N</sub>	U <sub>N</sub>	
	0.1...4 A	AC 250 V	200 A
	5...10 A	AC 250 V	2,000 A
Degree of protection (IEC 60529/DIN 40050)	12...14 A	AC 125 V	1,000 A
	operating area IP40 (with water splash protection IP54) terminal area IP00		
Vibration	8 g (57-500 Hz) ± 0.61 mm (10-57 Hz) to IEC 60068-2-6, test Fc 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 (2-pole)		
	approx. 50 g (1-pole)		

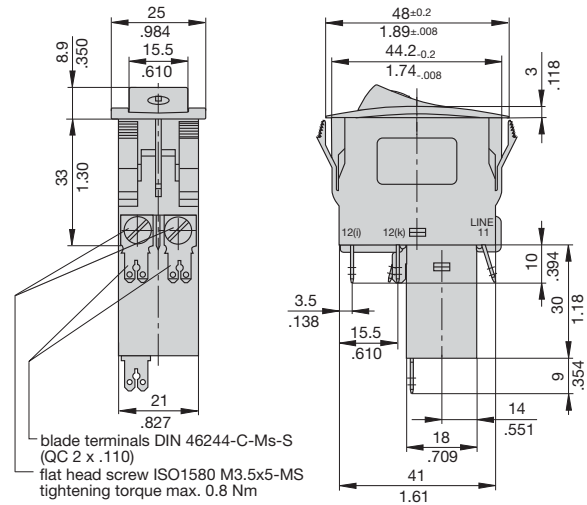
## Ordering information

<b>Type</b>	
3120	rocker switch/circuit breaker
<b>Mounting</b>	
F snap-in frame	
<b>Size of frame</b>	panel thickness
7 to fit in cut-out 44.5 x 22 mm	1 - 4 mm (.039-.157 in)
<b>Number of poles</b>	
1	1-pole, thermal-magnetic protection
2	2-pole, thermal-magnetic protection on one pole, thermally protected on the other pole
5	2-pole, thermal-magnetic protection on one pole, unprotected on the other pole
<b>Mounting frame design</b>	
N	new design, grey
P	snap-on actuator guard grey
Q	snap-on splash cover grey
R	new design, black
S	snap-on actuator guard black
T	snap-on splash cover black
<b>Terminal configuration</b>	
P7	blade terminals 2x2.8-0.8 mm (QC 2x.110) (terminals 12(k), 22(k), 11, 21)
H7	12(k), 22(k): blade terminals 2x2.8-0.8 (QC 2x.110) 11, 21: terminal screws M3.5, blade terminals 2x2.8-0.8 (QC 2x.110)
N7	as P7, but shunt terminals (12(i) and 22(i)) are blade terminals 2x2.8-0.8 (QC 2x.110)
G7	as H7, but shunt terminals (12(i) and 22(i)) are blade terminals 2x2.8-0.8 (QC 2x.110)
<b>Characteristic curve</b>	
M1	standard delay, therm. 1.01-1.4 x I <sub>N</sub> ; magn. 4-9 x I <sub>N</sub> AC
<b>Betätigungselement</b>	
A Switch style	
<b>Switch colour designation</b>	
OPAQUE	TRANSLUCENT (for illuminated versions)
01 black	12 white
02 white	14 red
04 red	15 orange
09 green	19 green
20 blue	30 blue
26 sky blue	36 sky blue
<b>Rocker markings</b>	
	
Q „I“ and „0“ moulded in	
<b>Push button illumination (optional)</b>	
12 Q T	white rocker, blue LED
14 Q R	red rocker, red LED
15 Q Y	orange rocker, yellow LED
19 Q G	green rocker, green LED
30 Q G	blue rocker, green LED
36 Q T	sky blue rocker, blue LED
<b>Illumination voltage range</b> (= operating voltage)	
1	10 - 14 V
2	20 - 28 V
3	90 - 140 V
4	185 - 275 V
5	42 - 54 V AC/DC
<b>Current ratings</b>	
0.1...16 A	

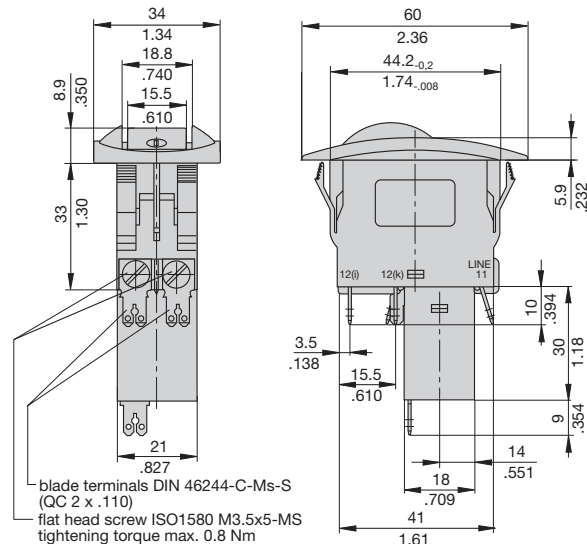
3120 - F7 2 N - N7 M1 - A 30 Q T 4 - 10 A ordering example

## Dimensions

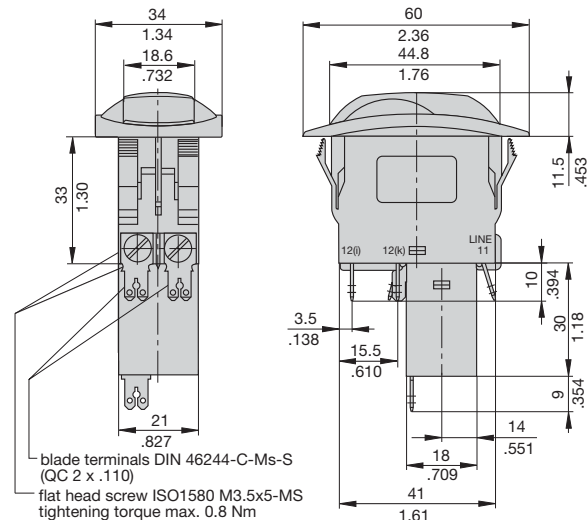
### Mounting style -F7.N and -F7.R



### Mounting style -F7.P and -F7.S



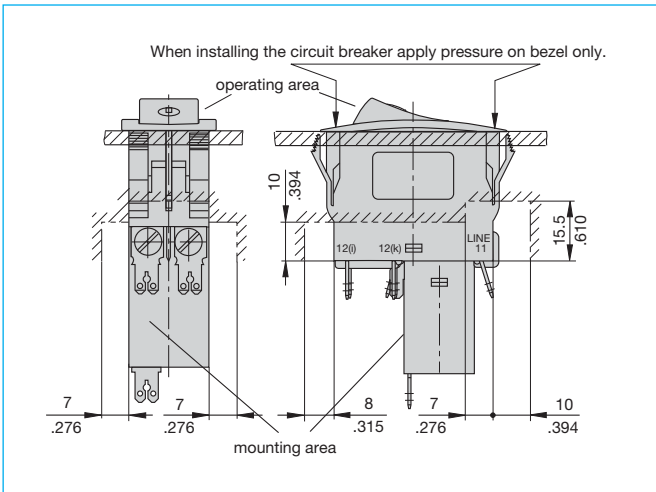
### Mounting style -F7.Q and -F7.T



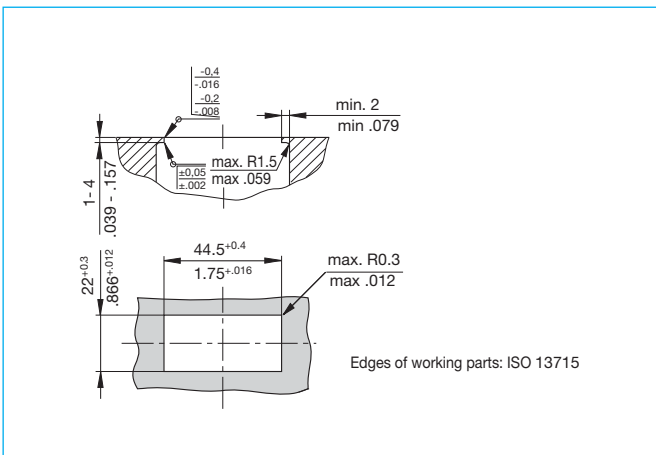
This is a metric design and millimeter dimensions take precedence (mm / inch)



## Installation drawing



## Cut-out dimensions

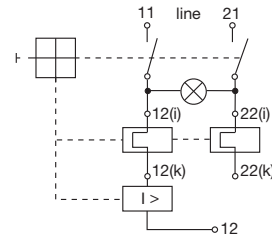


## Approvals

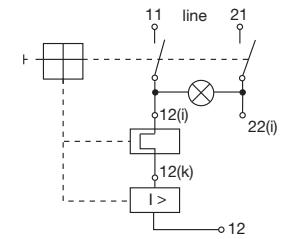
Authority	Voltage ratings	Current ratings
VDE (EN 60934)	AC 240 V; DC 28 V	0.1...16 A
	DC 50 V	0.1...16 A double pole
	DC 50 V	0.1...10 A single pole
CSA, UL	AC 250 V	0.1...10 A
	AC 125 V	0.1...16 A
CCC	AC 250 V; DC 50 V	0.1...20 A

## Internal connection diagrams

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



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

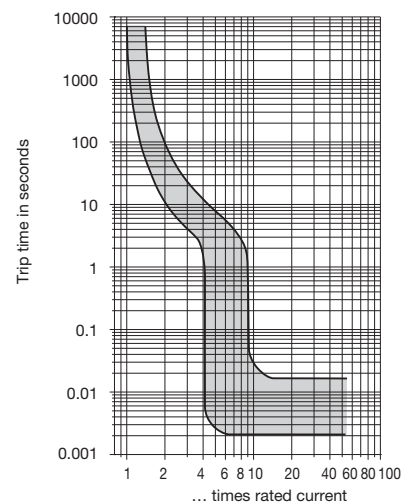


## Typical time/current characteristics at +23°C/+73.4°F

Single or double pole load

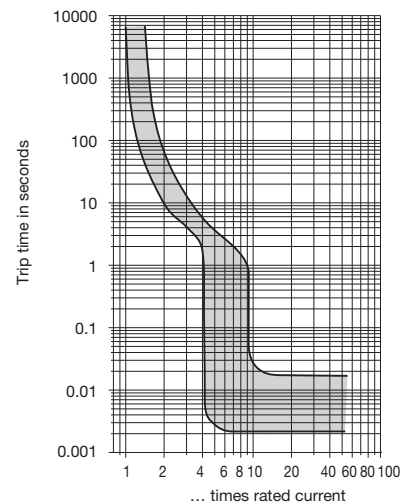
0.1...2 A

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



2.5...16 A

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



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

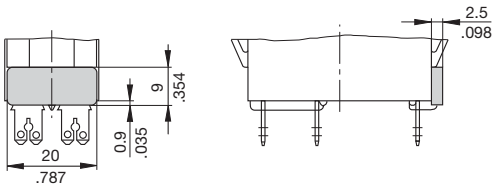
The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section Technical information.

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

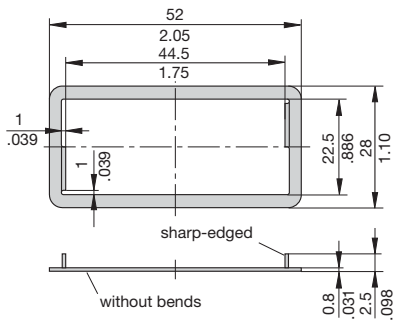
This is a metric design and millimeter dimensions take precedence ( $\frac{\text{mm}}{\text{inch}}$ )

## Accessories

### Insulated cover Y 303 068 01



### Spacer for 3120-F7... Y 303 676 01

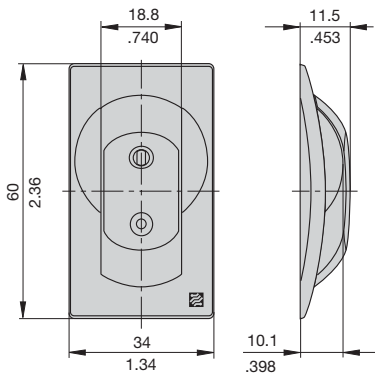


### Translucent water splash cover (IP54)

X 222 143 01

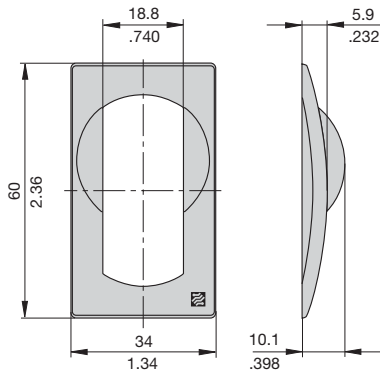
Consisting of

- Y 307 097 01 snap-on frame with actuator guard
- Y 307 096 01 soft plastic cover



### Snap-on frame with actuator guard (can be snapped on as switch-on protection or switch-off protection)

Y 307 097 01



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.