

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 1 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).

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
16	< 0.02	< 0.02

Illumination voltage / Power consumption

Operating voltage	Power consumption	
	Filament/Neon	LED
6 V	60 mA	9 mA
12 V	20 mA	9 mA
24 V	20 mA	9 mA
48 V	20 mA	1,5 mA
115 V	< 1.5 mA	< 1 mA*
230 V	< 1.5 mA	< 1 mA*

* single pole only



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	1-pole		
	AC 240 V: 0.1...20 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: 4.5...20 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	
	17...20 A	30,000 operations at $1 \times I_N$, inductive	
	DC 50 V: 0.1...16 A	50,000 operations at $1 \times I_N$, inductive	
17...20 A	10,000 operations at $1 \times I_N$, inductive		
Ambient temperature	-30...+60 °C (-22...+140 °F)		
Insulation co-ordination (IEC 60664 and 60664 A)	rated impulse withstand voltage	pollution degree	
	2.5 kV	2	
	reinforced insulation in operating area		
Dielectric strength (IEC 60664 and 60664A)	test voltage		
	operating area	AC 3,000 V	
	current path/current path	AC 1,500 V	
Insulation resistance	> 100 M Ω (DC 500 V)		
Interrupting capacity I_{cn}	0.1...2 A	100 $\times I_N$	
	2.5...16 A	250 A 2-pole	
		150 A 1-pole	
Interrupting capacity (UL 1077)	I_N	U_N	
	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 60068-2-3, test Ca		
Mass	approx. 53 g (2-pole)		
	approx. 50 g (1-pole)		

Ordering information

Type																																	
3120	rocker switch/circuit breaker																																
Mounting																																	
F snap-in frame																																	
Size of frame																																	
3	to fit in cut-out 50.5 x 21.5 mm 1 - 6.35 mm (.039-.250 in)																																
5	to fit in cut-out 44.5 x 22 mm 1 - 4 mm (.039-.157 in)																																
6	to fit in cut-out 45 x 33.7 mm 1.2 - 2.4 mm (.047-.091 in)																																
Number of poles																																	
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																																
Mounting frame design																																	
1	collar height 1 mm (.039 in)																																
3	collar height 9 mm (.354 in) (with safety frame)																																
4	collar height 2 mm (.079 in) with water splash protection (IP54) (not with -F6 frame)																																
U	with water splash protection and actuator guard																																
Terminal configuration																																	
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)																																
Characteristic curve																																	
M1	standard delay, therm. 1.01-1.4 x I _N ; magn. 4-9 x I _N AC																																
Switch style																																	
W	rocker																																
Switch colour designation																																	
OPAQUE	TRANSLUCENT (for illuminated versions)																																
01 black	12 white																																
02 white	14 red																																
04 red	15 orange																																
	19 green																																
Rocker markings																																	
A	<table border="1" style="margin-left: 20px;"> <tr> <td>0</td><td>ALIS/OFF</td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td>I</td><td>EIN ON</td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td>0</td><td>ALIS/OFF</td><td></td><td></td> </tr> <tr> <td></td><td></td><td>I</td><td>EIN ON</td><td></td><td></td><td></td><td></td> </tr> </table>	0	ALIS/OFF									I	EIN ON									0	ALIS/OFF					I	EIN ON				
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B																																	
C																																	
D																																	
E																																	
F																																	
X																																	
X = without marking																																	
Rocker illumination (optional)																																	
B	filament AC/DC																																
G	green LED, AC/DC																																
Y	yellow LED, AC/DC																																
R	red LED, AC/DC																																
Illumination voltage range (= operating voltage)																																	
0	4 - 7 V (B,G,Y,R)																																
1	10 - 14 V (B,G,Y,R)																																
2	20 - 28 V (B,G,Y,R)																																
3	90 - 140 V (B)																																
4	185 - 275 V (B)																																
5	42 - 54 V (B, Y, R)																																
Current ratings																																	
0.1...16 A																																	

3120 - F3 2 1 - N7 M1 - W 12 A B 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.

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.

Ordering information

Type	
3120	push button switch/circuit breaker
Mounting	
F snap-in frame	
Size of frame	
2	special frame for fitting splash cover
3	to fit in cut-out 50.5 x 21.5 mm panel thickness 1 - 6.35 mm
Number of poles	
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
Mounting frame design	
F	frame with two push buttons
G	frame with one push button
Terminal configuration	
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)
Characteristic curve	
M1	standard delay, therm. 1.01-1.4 x I _N ; magn. 4-9 x I _N AC
Switch style/colour	
D	1 push button (reset only)
01X	black
04X	red
12X	white translucent
19X	green translucent
S	2 push buttons ON/OFF
GRX	green translucent/red
WRX	white translucent/red
WBX	white translucent/black
Push button illumination (optional)	
B	filament bulb AC/DC
L	neon AC
G	green LED, AC/DC
Y	yellow LED, AC/DC
R	red LED, AC/DC
Illumination voltage range (= operating voltage)	
0	4 - 7 V (B,G,Y,R)
1	10 - 14 V (B,G,Y,R)
2	20 - 28 V (B,G,Y,R)
3	90 - 140 V (L)
4	185 - 275 V (L)
5	42 - 54 V (B,Y,R)
Current ratings	
0.1...16 A	

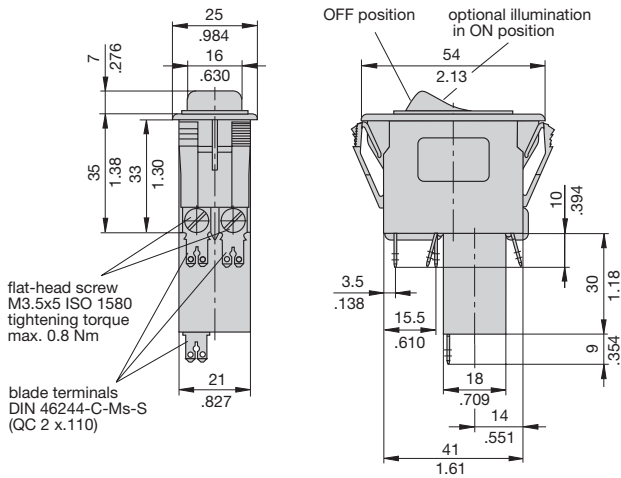
3120 - F3 2 F - N7 M1-S GRX L 4 - 10 A ordering example

Approvals

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

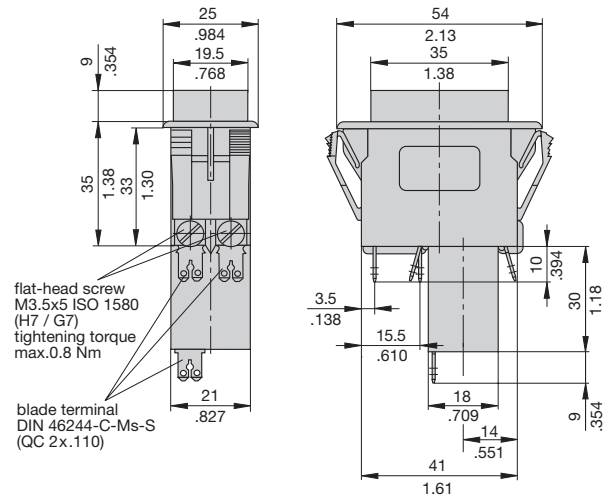
Dimensions

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



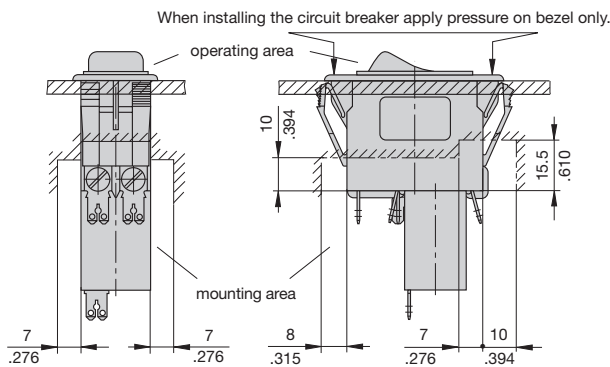
Mounting frame variants

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

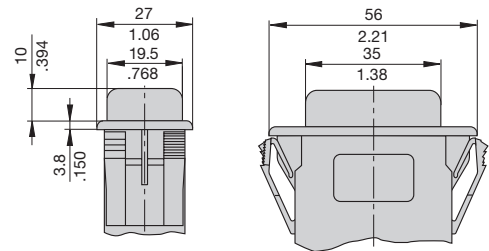


Installation drawing

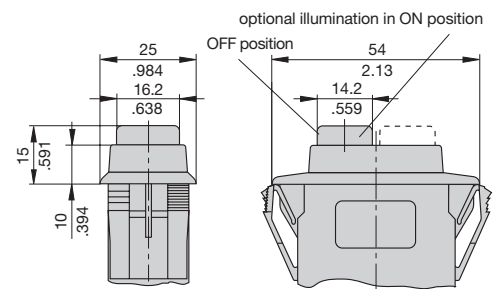
Required safety distances for rocker and push button



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

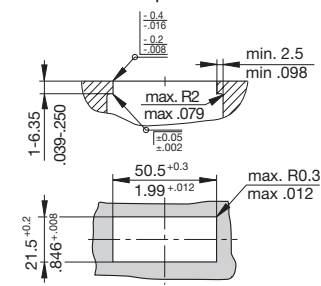


Mounting style F3.F-...-S-... with 2 push buttons

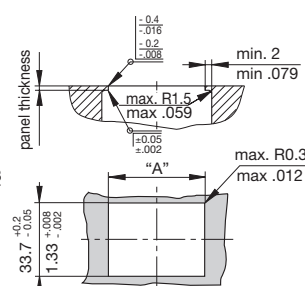


Cut-out dimensions

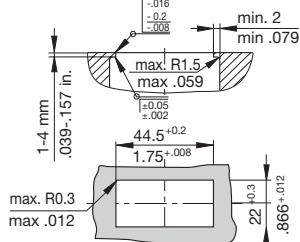
Cut-out for mounting style -F3 with rocker and push button



Cut-out for mounting style -F6 with rocker



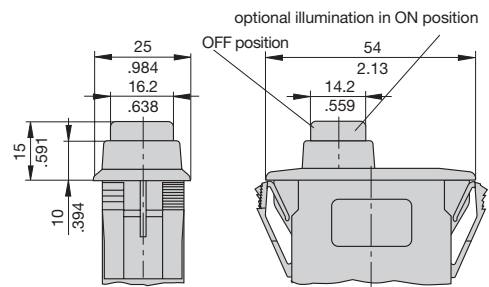
Cut-out for mounting style -F5 with rocker



panel thickness	mm	1.2 ^{+0.4}	1.6 ^{+0.8}	2.4 ⁺¹
	inch	.047 ^{+0.016}	.063 ^{+0.031}	.094 ^{+0.039}
dimension	mm	45 ^{+0.2}	45 ^{+1.1}	45 ^{+2.2}
	inch	1.77 ^{+0.008}	1.77 ^{+0.043}	1.77 ^{+0.087}

Edges of working parts: ISO 13715

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

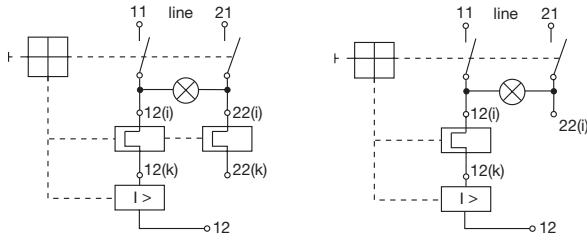


For mounting styles -F2..., -F5..., -F6.. please see section 1.

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 unprotectd on the other pole

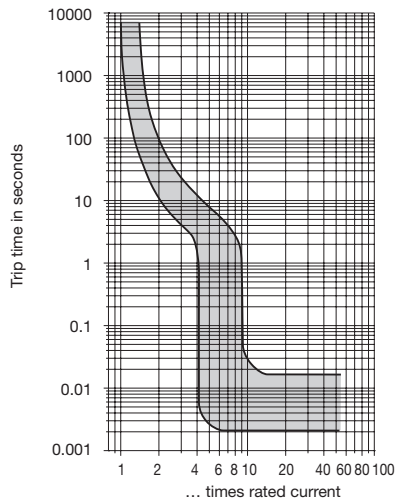


Typical time/current characteristics at +23°C/+73.4°F

Single or double pole load

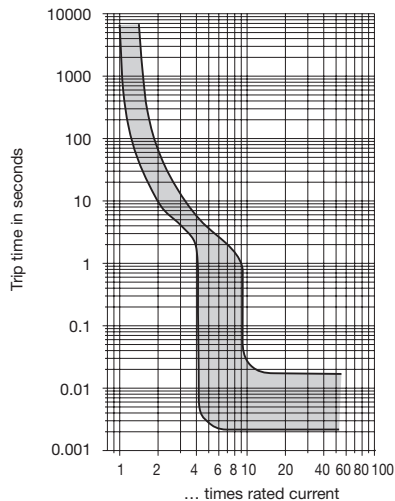
0.1 ... 2 A

AC/DC ¹⁾



2.5 ... 16 A

AC/DC ¹⁾



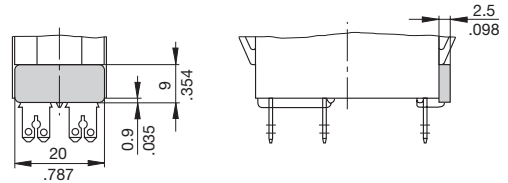
¹⁾ Magnetic tripping currents are increased by 25% on DC supplies.

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 9 – Technical information.

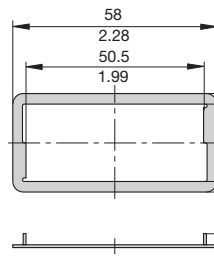
Ambient temperature °F	-22	-4	+14	+32	+73.4	+104	+122	+140
°C	-30	-20	-10	0	+23	+40	+50	+60
Derating factor	0.8	0.76	0.84	0.92	1	1.08	1.16	1.24

Accessories

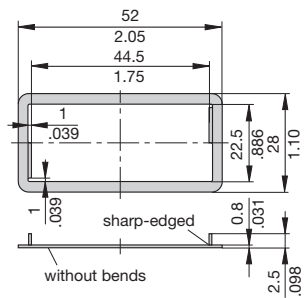
Insulated cover Y 303 068 01



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

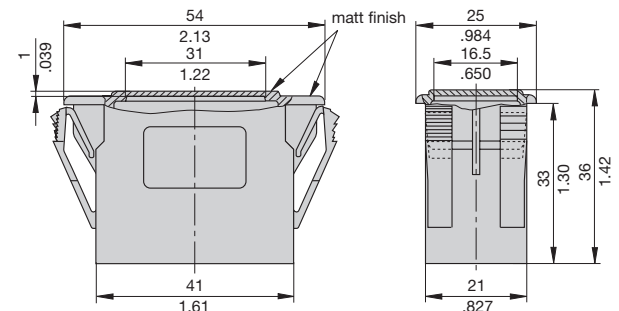


Spacer for 3120-F5... Y 303 676 01

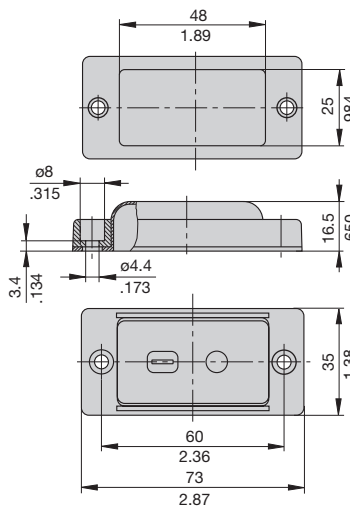


* Y 303 675 01 suitable for panel thickness < 2 mm (.079 in)
* Y 303 675 02 suitable for panel thickness < 4 mm (.157 in)

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 1 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).

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
16	< 0.02	< 0.02

Illumination voltage / Power consumption

Operating voltage	Power consumption	
	Filament/Neon	LED
6 V	60 mA	9 mA
12 V	20 mA	9 m
24 V	20 mA	9 mA
48 V	20 mA	1,5 mA
115 V	< 1.5 mA	< 1 mA*
230 V	< 1.5 mA	< 1 mA*

* single pole only



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	1-pole	
AC 240 V:	0.1...20 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:	4.5...20 A	30,000 operations at $1 \times I_N$, inductive
	2-pole	
AC 240 V:	0.1...16 A	50,000 operations at $1 \times I_N$, inductive
	17...20 A	30,000 operations at $1 \times I_N$, inductive
DC 50 V:	0.1...16 A	50,000 operations at $1 \times I_N$, inductive
	17...20 A	10,000 operations at $1 \times I_N$, inductive
Ambient temperature	-30...+60 °C (-22...+140 °F)	
Insulation co-ordination (IEC 60664 and 60664 A)	rated impulse withstand voltage	pollution degree
	2.5 kV	2
	reinforced insulation in operating area	
Dielectric strength (IEC 60664 and 60664A)	test voltage	
	operating area	AC 3,000 V
	current path/current path	AC 1,500 V
Insulation resistance	> 100 M Ω (DC 500 V)	
Interrupting capacity I_{cn}	0.1...2 A	$100 \times I_N$
	2.5...16 A	250 A 2-pole 150 A 1-pole
Interrupting capacity (UL 1077)	I_N	U_N
	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 60068-2-3, test Ca	
Mass	approx. 53 g (2-pole) approx. 50 g (1-pole)	

Ordering information

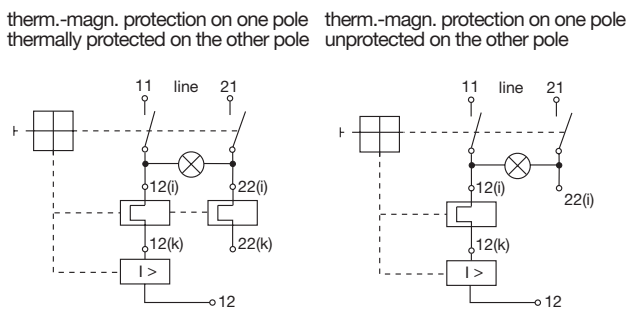
Type	
3120	rocker switch/circuit breaker
Mounting	
F snap-in frame	
Size of frame panel thickness	
7	to fit in cut-out 44.5 x 22 mm 1 - 4 mm (.039-.157 in)
Number of poles	
1	1-pole, thermal-magnetic protection
2	2-pole, thermal-magnetic protection on one pole, thermally protected on the other pole
5	2-pole, thermal-magnetic protection on one pole, unprotected on the other pole
Mounting frame design	
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
Terminal configuration	
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)
Characteristic curve	
M1	standard delay, therm. 1.01-1.4 x I _N ; magn. 4-9 x I _N AC
Betätigungselement	
A Switch style	
Switch colour designation	
OPAQUE	TRANSLUCENT (for illuminated versions)
20 blue	30 blue
Rocker markings	
Q	permanently raised marking
Rocker illumination	
B	filament AC/DC
G	green LED, AC/DC
R	red LED, AC/DC
Illumination voltage range (= operating voltage)	
0	4 - 7 V (B,G,R)
1	10 - 14 V (B,G,R)
2	20 - 28 V (B,G,R)
3	90 - 140 V (B)
4	185 - 275 V (B)
5	42 - 54 V (B,R)
Current ratings	
0.1...16 A	

3120 - F7 2 N - N7 M1- A 20 Q B 4 - 10 A ordering example

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

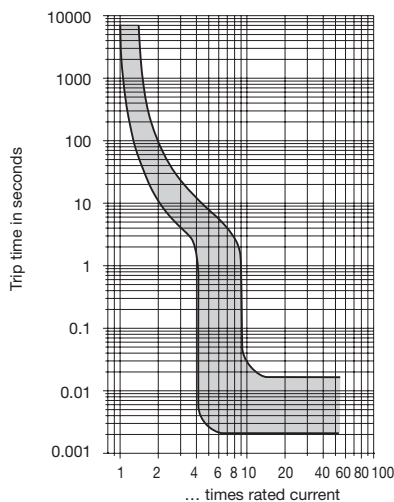


Typical time/current characteristics at +23°C/+73.4°F

Single or double pole load

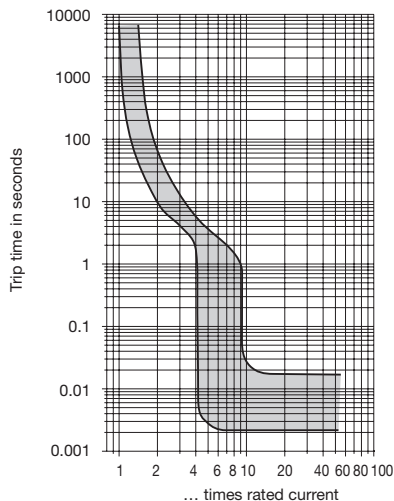
0.1 ... 2 A

AC/DC ¹⁾



2.5 ... 16 A

AC/DC ¹⁾



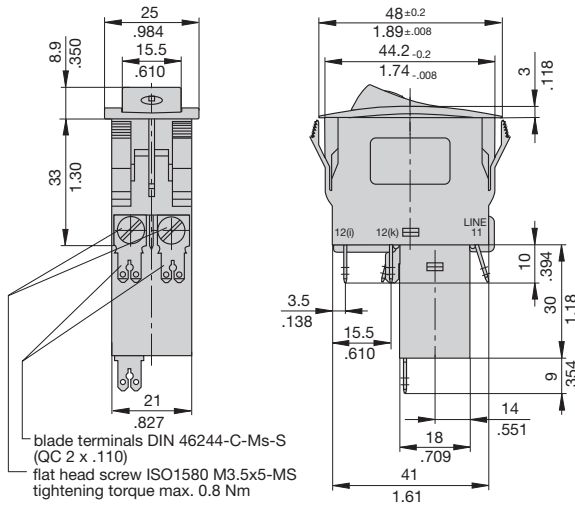
¹⁾ Magnetic tripping currents are increased by 25% on DC supplies.

The time/current characteristic 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 9 – Technical information.

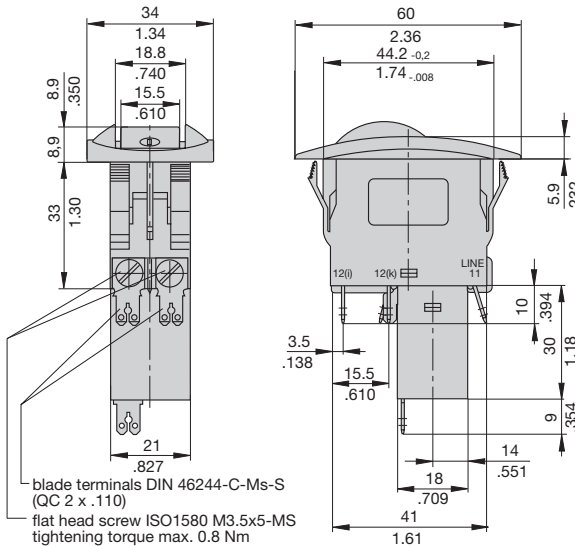
Ambient temperature °F	-22	-4	+14	+32	+73.4	+104	+122	+140
°C	-30	-20	-10	0	+23	+40	+50	+60
Derating factor	0.8	0.76	0.84	0.92	1	1.08	1.16	1.24

Dimensions

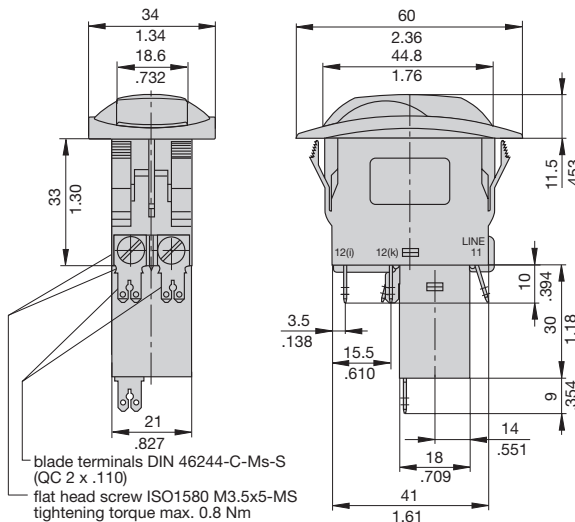
Mounting style -F7.N and -F7.R



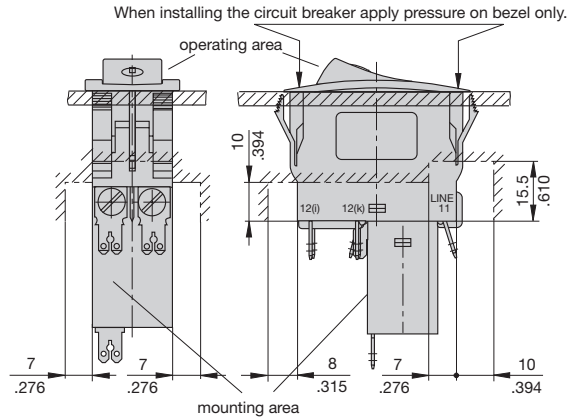
Mounting style -F7.P and -F7.S



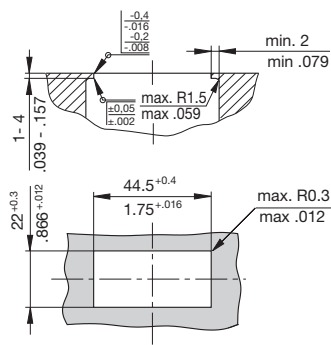
Mounting style -F7.Q and -F7.T



Installation drawing



Cut-out dimensions

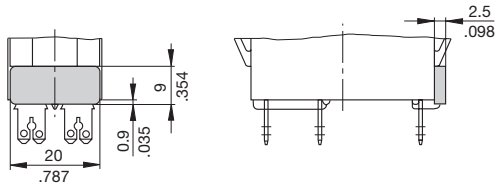


Edges of working parts: ISO 13715

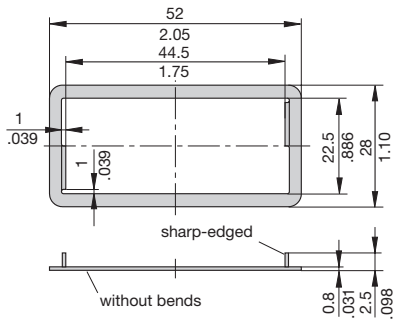
This is a metric design and millimeter dimensions take precedence (mm)
inch

Accessories

Insulated cover Y 303 068 01



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



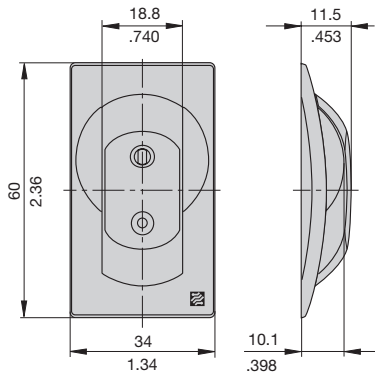
Translucent water splash cover (IP54)

X 222 143 01

Consisting of

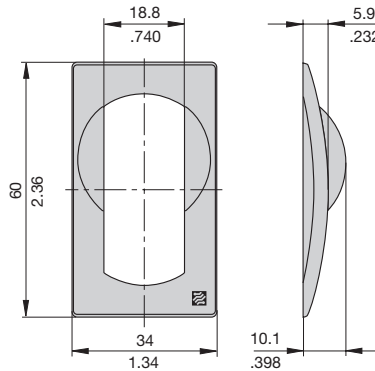
- Y 307 097 01 snap-on frame with actuator guard

- 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.