

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	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:	4.5...20 A 30,000 operations at 1 x I _N , inductive	
Typical life	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 (-22...+140 °F)		
Insulation co-ordination (IEC 60664 and 60664 A)	rated impulse withstand voltage	pollution degree 2	
	2.5 kV 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 MΩ (DC 500 V)		
Interrupting capacity I _{cn}	0.1...2 A	100 x 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 60068-2-78, test Cab		
Mass	approx. 53 g (2-pole)		
	approx. 50 g (1-pole)		

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	rocker switch/circuit breaker
Mounting	
F snap-in frame	
Size of frame	
3	to fit in cut-out 50.5 x 21.5 mm panel thickness 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
	16 sky blue
	19 green
Rocker markings	
A	
B	
C	
D	
E	
F	
X	
X = without marking	
Rocker illumination (optional)	
12	Y white rocker, yellow LED
12	T white rocker, blue LED
14	R red rocker, red LED
15	Y orange rocker, yellow LED
16	T blue rocker, blue LED
19	G green rocker, green LED
Illumination voltage range (= operating voltage)	
1	10 - 14 V AC/DC
2	20 - 28 V AC/DC
3	90 - 140 V AC
4	185 - 275 V AC
5	42 - 54 V AC/DC
Current ratings	
0.1...16 A	
3120 - F3 2 1 - N7 M1 - W 12 A R 4 - 10 A rdering example	

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/color	
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)	
G	green LED, AC/DC
Y	yellow LED, AC/DC
R	red LED, AC/DC
Illumination voltage range (= operating voltage)	
1	10 - 14 V AC/DC
2	20 - 28 V AC/DC
3	90 - 140 V AC
4	185 - 275 V AC
5	42 - 54 V AC/DC
Current ratings	
0.1...16 A	
3120 - F3 2 F - N7 M1-S GRX G 4 - 10 A ordering example	

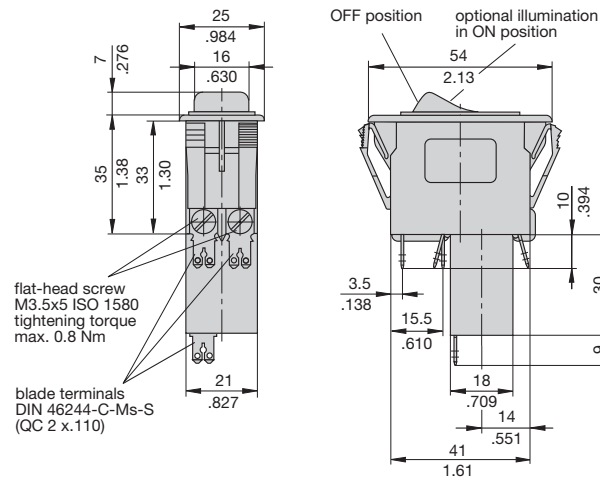
Approvals

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

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.

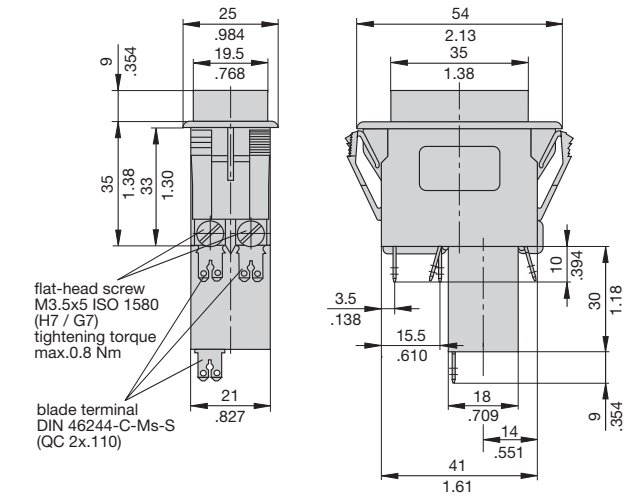
Dimensions

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



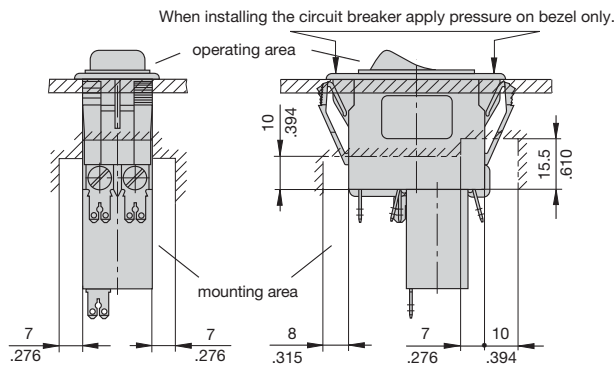
Mounting frame variants

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

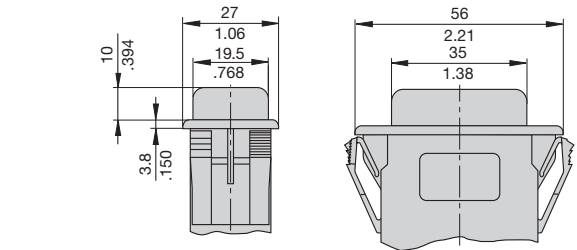


Installation drawing

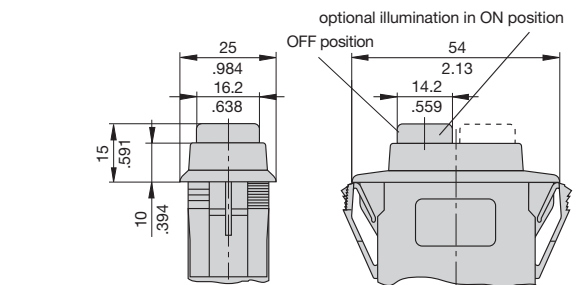
Required safety distances for rocker and push button



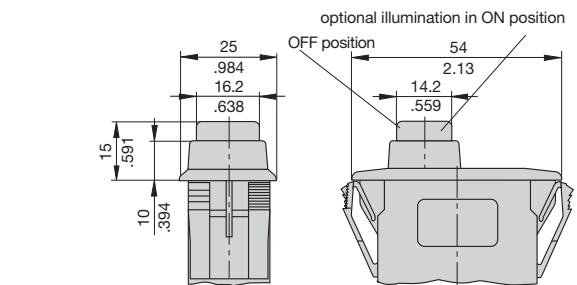
Mounting style F3.4 with rocker collar height 2 mm (.079 in.), with water splash protection



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

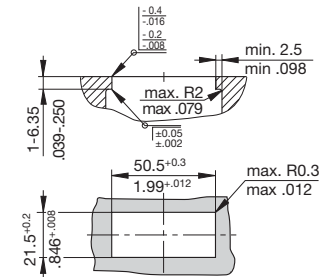


Mounting style F3.G-...-D-... with 1 push button

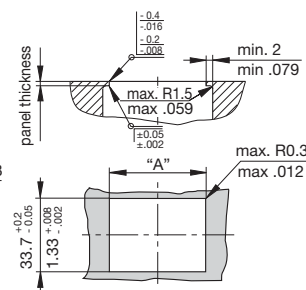


Cut-out dimensions

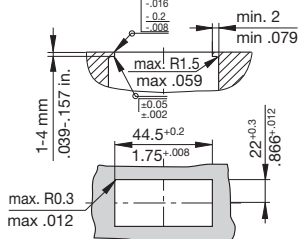
Cut-out for mounting style -F3 with rocker and push button



Cut-out for mounting style -F6 with rocker



Cut-out for mounting style -F5 with rocker



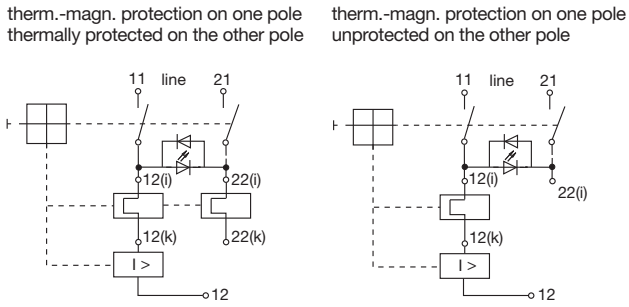
panel thickness	mm	1.2 ^{+0.4}	1.6 ^{+0.8}	2.4 ⁺¹
	inch	.047 ^{+0.016}	.063 ^{+0.031}	.094 ^{+0.039}
dimension "A"	mm	45 ^{+0.2}	45 ^{+0.05}	45 ^{+1.1}
	inch	1.77 ^{+0.008}	1.77 ^{+0.043}	1.77 ^{+0.087}

Edges of working parts: ISO 13715

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)

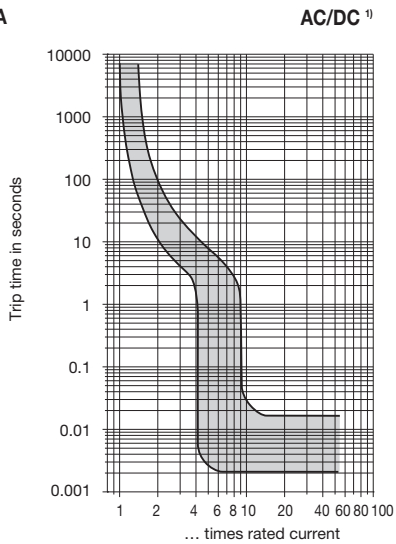
Internal connection diagrams



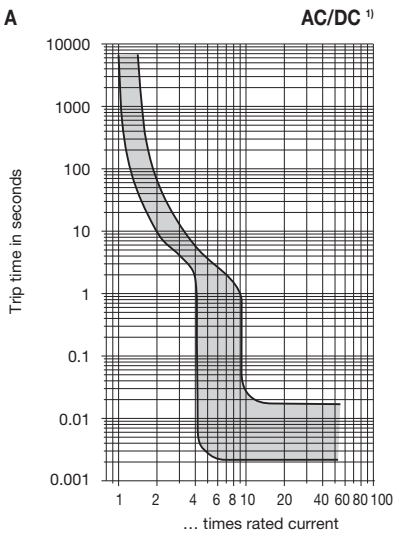
Typical time/current characteristics at +23°C/+73.4°F

Single or double pole load

0.1...2 A



2.5...16 A



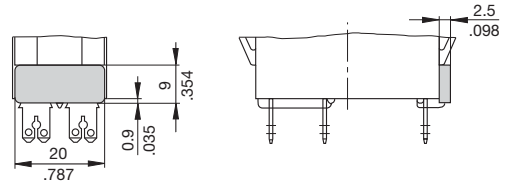
¹⁾ Magnetic tripping currents are increased by 25% on DC supplies.

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 Technical information.

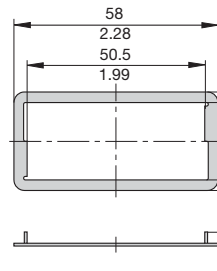
Ambient temperature °F	-22	-4	+14	+32	+73.4	+104	+122	+140
°C	-30	-20	-10	0	+23	+40	+50	+60
Derating factor	0.8	0.76	0.84	0.92	1	1.08	1.16	1.24

Accessories

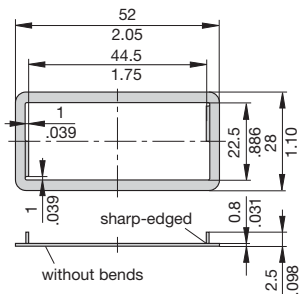
Insulated cover
Y 303 068 01



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

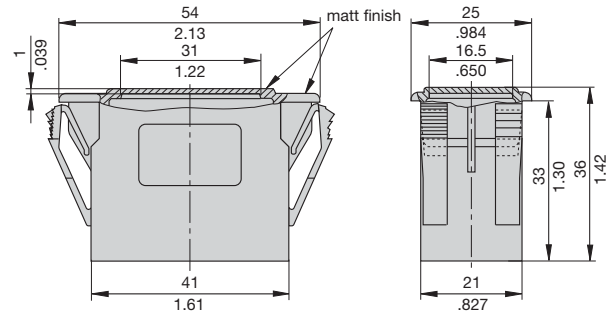


Spacer for 3120-F5...
Y 303 676 01

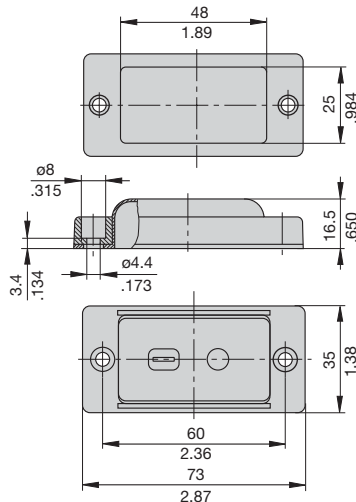


* Y 303 675 01 suitable for panel thickness < 2 mm (.079 in)
* Y 303 675 02 suitable for panel thickness < 4 mm (.157 in)

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



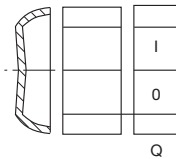
3120-F7..-M1..

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	1-pole	
	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:	30,000 operations at 1 x I _N , inductive	
	4.5...20 A	
AC 240 V:	2-pole	
	0.1...16 A	50,000 operations at 1 x I _N , inductive
DC 50 V:	17...20 A	30,000 operations at 1 x I _N , inductive
	0.1...16 A	50,000 operations at 1 x I _N , inductive
DC 50 V:	10,000 operations at 1 x I _N , inductive	
	17...20 A	
Ambient temperature	-30...+60 °C (-22...+140 °F)	
Insulation co-ordination (IEC 60664 and 60664 A)	rated impulse withstand voltage	pollution degree 2
	2.5 kV	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 MΩ (DC 500 V)	
Interrupting capacity I _{cn}	0.1...2 A	100 x 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 60068-2-78, test Cab	
Mass	approx. 53 g (2-pole)	
	approx. 50 g (1-pole)	

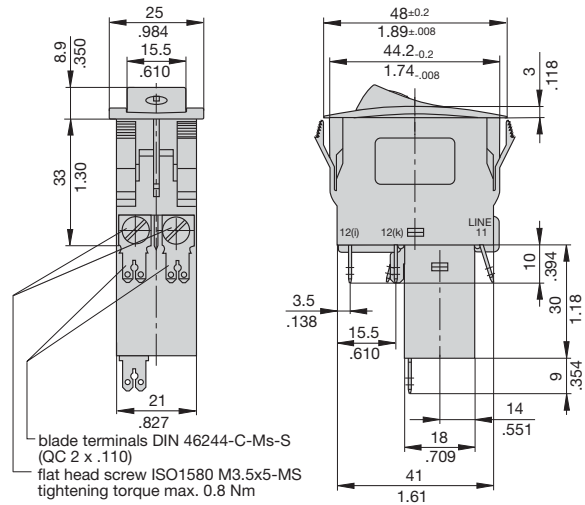
Ordering information

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)
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
Rocker markings	
	
Q „I“ and „0“ moulded in	
Push button illumination (optional)	
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
Illumination voltage range (= operating voltage)	
1	10 - 14 V
2	20 - 28 V
3	90 - 140 V
4	185 - 275 V
5	42 - 54 V AC/DC
Current ratings	
0.1...16 A	

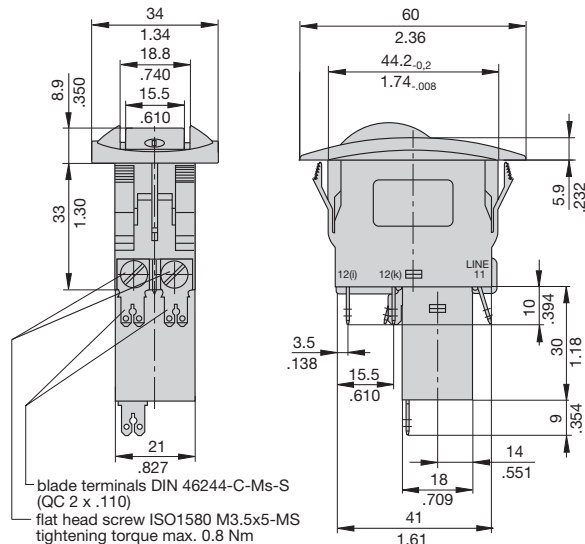
3120 - F7 2 N - N7 M1- A 30 Q T 4 - 10 A ordering example

Dimensions

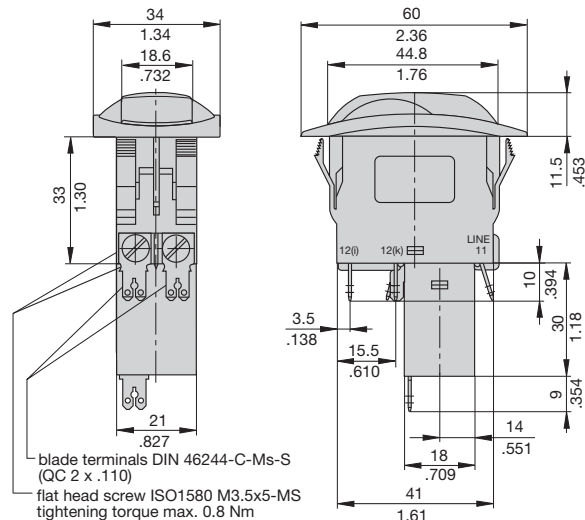
Mounting style -F7.N and -F7.R



Mounting style -F7.P and -F7.S

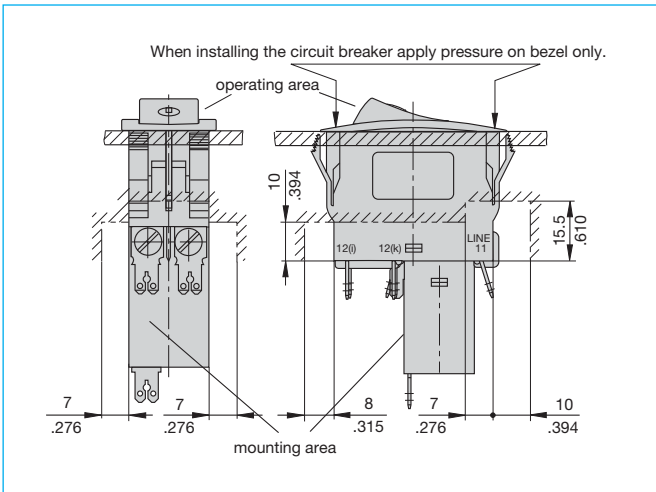


Mounting style -F7.Q and -F7.T

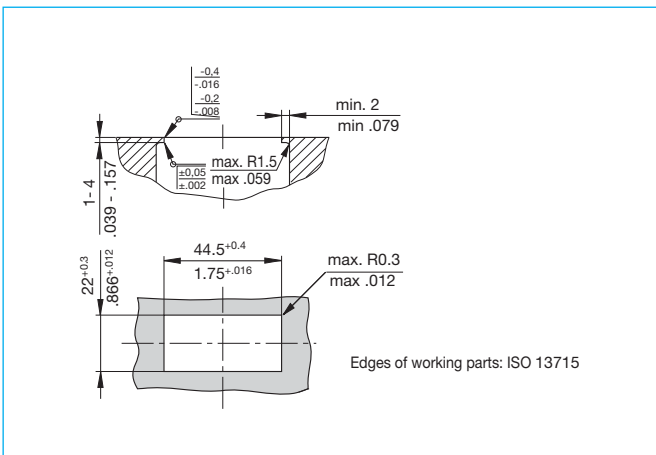


This is a metric design and millimeter dimensions take precedence (mm / inch)

Installation drawing



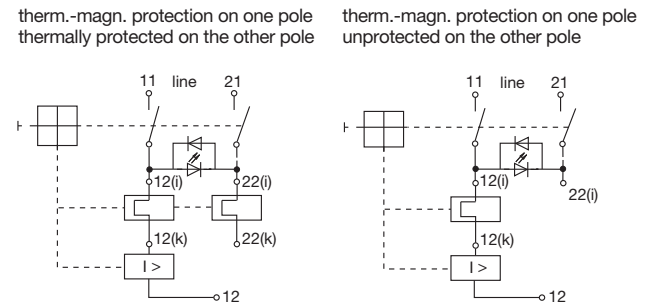
Cut-out dimensions



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

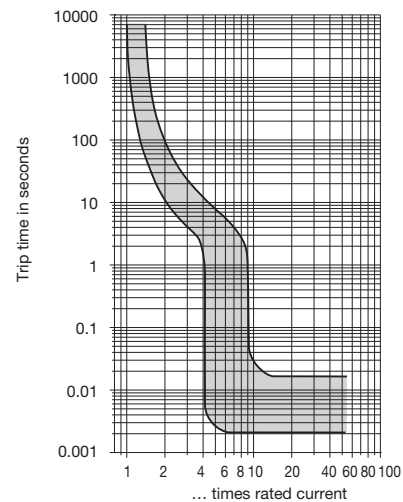


Typical time/current characteristics at +23°C/+73.4°F

Single or double pole load

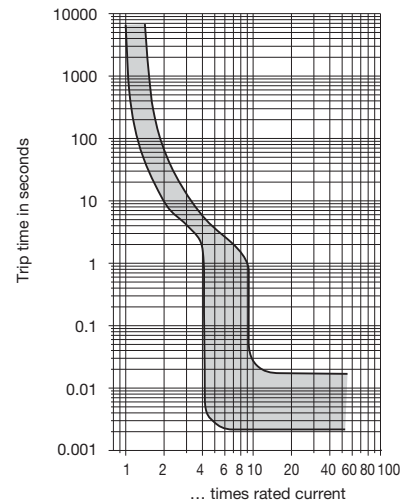
0.1...2 A

AC/DC ¹⁾



2.5...16 A

AC/DC ¹⁾



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

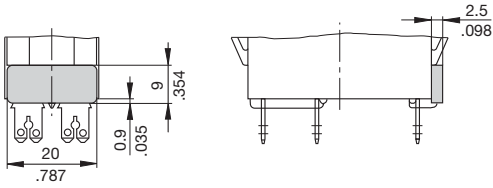
The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section Technical information.

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

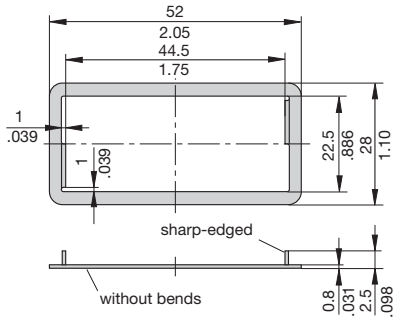
This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

Accessories

Insulated cover Y 303 068 01



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

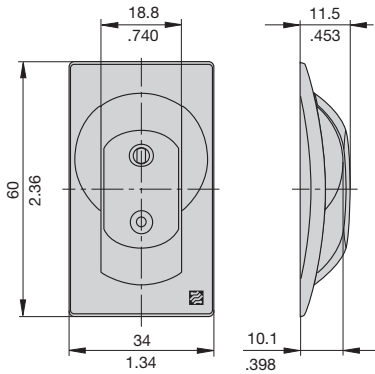


Translucent water splash cover (IP54)

X 222 143 01

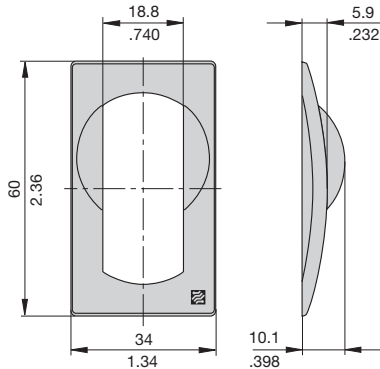
Consisting of

- 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.