Magnetic and Hydraulic-Magnetic Circuit Breaker 8340-F... 

**Description**

Single and multipole magnetic circuit breakers with trip-free mechanism and toggle actuation. A choice of fast magnetic only or hydraulically delayed switching characteristics (S-type MO or HM CBE to EN 60934) ensures suitability for a wide range of applications. Industry standard dimensions and panel mounting. Options include auxiliary changeover contacts, or relay trip function. Low temperature sensitivity at rated load. Approved to CBE standard EN 60934 (IEC 60934).

**Typical applications**

Control equipment, communications systems, transportation, power supplies.

**Technical data**

For further details please see chapter: Technical Information

- **Voltage rating**: 3 AC 415 V; AC 240 V, 50/60 Hz; DC 80 V (higher DC ratings to special order)
- **Current ratings**:
  - 1-pole: 0.02...50 A
  - 2-pole: 0.02...30 A
  - Multipole: 0.02...30 A
- **Auxiliary circuit**:
  - 6 A, AC 240 V;
  - 3 A, DC 28 V
  - 1 A, DC 65 V;
  - 0.5 A, DC 80 V
- **Typical life**:
  - 3 AC 415 V, AC 240 V:
    - 0.02...30 A: 6,000 operations at 1 x IN, inductive
    - 10,000 operations at 1 x IN, resistive
  - DC 80 V:
    - 0.02...25 A: 6,000 operations at 1 x IN, inductive
    - 0.02...30 A: 10,000 operations at 1 x IN, resistive
    - 40 + 50 A: 6,000 operations at 1 x IN, resistive
- **Ambient temperature**:
  - -40...+85 °C (−40...+185 °F)
- **Insulation co-ordination**:
  - Rated impulse withstand voltage 2.5 kV reinforced insulation in operating area
  - Test voltage 3,000 V pole to pole (2- and 3-pole)
  - Main to auxiliary circuit 3,000 V
  - Switching to trip circuit 1,500 V (version -X)
- **Insulation resistance**: > 100 MΩ (DC 500 V)
- **Interrupting capacity**:
  - AC (UL 1077): 1.200 A at AC – 2.000 A at DC
  - DC (UL 489A): 2.000 A
- **Degree of protection** (IEC 60609/DIN 40050): operating area IP40, terminal area IP00
- **Vibration** (with toggle down):
  - 10 g (57-2000Hz) ± 0.76 mm (10-57 Hz) at 0.9 x IN
  - 10 g (57-2000 Hz) at 1 x IN
- **Shock** (with curves F1, F2):
  - 100 g (11 ms) at 1 x IN, directions 1,2,3,4,5
  - 100 g (11 ms) at 0.8 x IN, direction 6
- **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. 65 g per pole

**Standard current ratings and typical internal resistance values**

<table>
<thead>
<tr>
<th>Current rating (A)</th>
<th>F1</th>
<th>F2</th>
<th>K1, M1, T1, K2, M2, T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02</td>
<td>1493</td>
<td>953</td>
<td>2669</td>
</tr>
<tr>
<td>0.05</td>
<td>276</td>
<td>152</td>
<td>452</td>
</tr>
<tr>
<td>0.1</td>
<td>58</td>
<td>37</td>
<td>100</td>
</tr>
<tr>
<td>0.25</td>
<td>8.2</td>
<td>6.0</td>
<td>15.5</td>
</tr>
<tr>
<td>0.5</td>
<td>2.3</td>
<td>1.47</td>
<td>3.9</td>
</tr>
<tr>
<td>0.75</td>
<td>0.98</td>
<td>0.63</td>
<td>1.65</td>
</tr>
<tr>
<td>1</td>
<td>0.58</td>
<td>0.35</td>
<td>0.95</td>
</tr>
<tr>
<td>2</td>
<td>0.145</td>
<td>0.096</td>
<td>0.26</td>
</tr>
<tr>
<td>2.5</td>
<td>0.096</td>
<td>0.061</td>
<td>0.15</td>
</tr>
<tr>
<td>3</td>
<td>0.065</td>
<td>0.048</td>
<td>0.10</td>
</tr>
<tr>
<td>5</td>
<td>0.025</td>
<td>&lt; 0.02</td>
<td>0.042</td>
</tr>
<tr>
<td>6</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
<td>0.029</td>
</tr>
<tr>
<td>8</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
</tr>
<tr>
<td>10</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
</tr>
<tr>
<td>12</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
</tr>
<tr>
<td>15</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
</tr>
<tr>
<td>16</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
</tr>
<tr>
<td>20</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
</tr>
<tr>
<td>25</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
</tr>
<tr>
<td>30</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
<td>&lt; 0.02</td>
</tr>
<tr>
<td>40</td>
<td>≤ 0.01</td>
<td>≤ 0.01</td>
<td>≤ 0.01</td>
</tr>
<tr>
<td>50</td>
<td>≤ 0.01</td>
<td>≤ 0.01</td>
<td>≤ 0.01</td>
</tr>
</tbody>
</table>

**Control equipment, communications systems, transportation, power supplies.**
Type No. 8340

Magnetic circuit breaker with toggle actuator

Mounting
F flange mounting

Configuration
1 with mounting nuts 6-32 UNC
4 with mounting nuts M3
9 snap-in frame

Number of poles
0 single pole, switch only
1 single pole protected
2 two pole protected
3 three pole protected
4 four pole protected
5 two pole, protected on one pole only
6 four pole, protected on poles 1, 2 and 3 only
7 two pole, switch only

Panel hardware
0 without panel hardware

Terminal design (main contact)
K3 screw terminals with metric thread, M4 (recommended for \( I_N \geq 20 \) A)
K4 screw terminals with metric thread, M5 \( (I_N = 40 \) A)
P1 blade terminals
X1 blade terminals with separate switching and relay circuit

Characteristic curves

Characteristic curve F, instantaneous trip:
F1 DC trip at 1.01-1.5 \( I_N \)
F2 AC 60/50Hz trip at 1.01-1.5 \( I_N \)

Characteristic curve K, short delay:
K1 DC trip time at 2 \( \times I_N \); 0.16-1.2 s
K2 AC 60/50Hz trip time at 2 \( \times I_N \); 0.13-1.6 s

Characteristic curve M, medium delay:
M1 DC trip time at 2 \( \times I_N \); 0.6-7.5 s
M2 AC 60/50Hz trip time at 2 \( \times I_N \); 2.2-20 s

Without characteristic curve:
Q0 switch only

Characteristic curve T, long delay:
T1 DC trip time at 2 \( \times I_N \); 10-70 s
T2 AC 60/50Hz trip time at 2 \( \times I_N \); 15-150 s

Relay trip X:
X1 voltage trip at DC, instantaneous trip
X2 voltage trip at AC, instantaneous trip

Other curves to special order (e.g. pulse delayed, high inrush currents, capacitive loads)

Actuator colour / design
A black, long toggle
B white, long toggle
C blue, long toggle
K black, short toggle
L white, short toggle
M blue, short toggle
Z black, without toggle, with slot

Marking on actuator
0 without marking
L 1-O; ON-OFF
N 1-O; ON-OFF \( (I_N \) on housing top)

Auxiliary contacts
H0 without auxiliary contacts
H1 with auxiliary contacts, gold-flushed
H2 auxiliary contacts, gold-flushed on one pole only (multipole)
H3 auxiliary contacts, gold-flushed on poles 1 and 3 (3 and 4-pole)

Auxiliary contact function
1 change over contact
2 blade terminal 2.8-0.5 mm

Current ratings
0.02...50 A

Voltage rating
only curves X1, X2
DC 5, 8, 12, 24 V
AC 110, 220, 240 V

Options
H higher flammability rating

Approval (optional)
U UL 489 A

Ordering example
8340 - F 1 1 0 - P1 M1 - A L H1 4 2 - 30 A

Homologations

Authority Voltage ratings Current ratings
VDE (EN 60934) 3 AC 415 V; AC 240 V; DC 80 V 0.02...30 A 1 to 6-pole
DC 80 V 0.02...50 A 1-pole
UL 1077, CSA DC 80 V 0.02...50 A 1 to 6-pole
3 AC 250 V; AC 250 V 0.02...30 A 1 to 6-pole
UL 489 A DC 80 V 0.05...30 A 1, 2-pole
QPL (Sweden) AC 240 V; DC 50 V 1...30 A
CCC 3 AC 415 V; AC 240 V DC 80 V 0.02...30 A

Internal connection diagrams

1-pole protected magnetically with separate switching and relay circuit

Auxiliary contacts
H0 without auxiliary contacts
H1 with auxiliary contacts, gold-flushed
H2 auxiliary contacts, gold-flushed on one pole only (multipole)
H3 auxiliary contacts, gold-flushed on poles 1 and 3 (3 and 4-pole)

Current ratings
0.02...50 A
**Dimensions**

**Flange mounting**
Configuration: F1/F4
Actuator: long toggle

![Diagram of Flange mounting Configuration: F1/F4 with long toggle actuator]

Actuator: short toggle

![Diagram of Flange mounting Configuration: F1/F4 with short toggle actuator]

Actuator: without toggle, with slot

![Diagram of Flange mounting Configuration: F1/F4 with slot]

**Configuration: F9**
Actuator: long toggle

![Diagram of Configuration: F9 with long toggle actuator]

Actuator: short toggle

![Diagram of Configuration: F9 with short toggle actuator]

Actuator: without toggle, with slot

![Diagram of Configuration: F9 with slot]

number of poles: 1-4

![Diagram of number of poles: 1-4]

Cut-out dimensions max. panel thickness: 3 mm

Applicable for nominal dimensions without direct tolerance indication:
DIN ISO 286 ± IT13

**Mounting thread**

- M3
- 6-32 UNC-2B

Mounting depth:

- max. 4.5 mm
- 0.177 in.

Tightening torque:

- max. 0.33 Nm

**This is a metric design and millimeter dimensions take precedence.**

**Issue C**

www.e-t-a.com

3 - 21
Terminal design / Dimensions

K3/4 screw terminals
tightening torque max. 1.2 Nm

K3 screw terminals M4
K4 screw terminals M5

P1 blade terminals

X1 blade terminals
with separate switching and relay circuit

Auxiliary contacts
version H (standard, asymmetrical gold-flushed terminals, silver contacts)

Actuator configuration

Actuator design
number of poles: 1 - 4
Configuration: F1 / F4

Actuator long

Actuator short

number of poles: 1 - 4
Configuration: F9

Actuator long

number of poles: 1
Configuration: F1 / F4 / F9
Actuator: Z (black, without toggle, with slot)

Installation drawing

Terminal design K
Terminal design P

Trip time values indicated for front mounting on a vertical even surface

This is a metric design and millimeter dimensions take precedence (mm)
Typical time/current characteristics at 23 °C / +73.4 °F

**Curve F1 (instantaneous) for DC**

**Curve M0 (medium delay) for AC/DC**

**Curve F2 (instantaneous) for AC 50/60 Hz**

**Curve M1 (medium delay) for DC**

**Curve K1 (short delay) for DC**

**Curve M2 (medium delay) for AC 50/60 Hz**

**Curve K2 (short delay) for AC 50/60 Hz**

N.B. All curves will only be maintained if the escutcheon is mounted on a vertical surface.

Other characteristic curves to special order (e.g., with impulse delay for inrush peaks).
### Typical time/current characteristics at 23 °C / +73.4 °F

**Curve T1 (long delay) for DC**

![Graph](image1)

**Curve T2 (long delay) for AC 50/60 Hz**

![Graph](image2)

**N.B.** All curves will only be maintained if the escutcheon is mounted on a vertical surface.

Other characteristic curves to special order (e.g. with impulse delay for inrush peaks).

### Accessories

**Splash cover with mounting plate and screws**

1 pole

Y 303 565 01

- 16.7
- 42.4
- 42.4
- 10.7
- 708
- mounting holes

2 pole

X 211 118 01

- 37.9
- 40.15
- 40.15
- 19.2
- 15.7
- mounting holes

3 pole

X 211 119 01

- 57.8
- 59.15
- 59.15
- 37.8
- 15.7
- mounting holes

**Toggle guard**

Y 307 250 01

N.B. All curves will only be maintained if the escutcheon is mounted on a vertical surface.

Other characteristic curves to special order (e.g. with impulse delay for inrush peaks).

### Shock directions / Mounting attitudes

![Diagram](image3)

This is a metric design and millimeter dimensions take precedence (\text{mm} over \text{in}.

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.