

# E-T-A® Thermal Overcurrent Circuit Breaker 1658-...

## Description

Very cost effective design to meet international requirements. No exposed metal parts which are, or could become, current-carrying except for terminals. R-type TO CBE to EN 60934.

- Manual reset, cycling trip free mechanism
- Extremely small and lightweight
- UL, CSA, VDE and EN 60934 (IEC 60934) approved

## Typical applications

Battery chargers, consumer products, power supplies, motors.

## Ordering information

### Type No.

1658 single pole thermal circuit breaker

#### Threadneck design

G21 manual reset type, 3/8"-27 threadneck

G41 manual reset type, 7/16"-28 threadneck

E00 manual reset without threadneck

F01 snap-in type

F02 press to reset, snap-in type

A21 auto reset type, 3/8"-27 threadneck

A41 auto reset type, 7/16"-28 threadneck

A00 auto reset type, without threadneck

A01 auto reset, snap-in type

#### Hardware

| configuration   | bulk    |             | mounted |             |
|-----------------|---------|-------------|---------|-------------|
|                 | hex nut | knurled nut | hex nut | knurled nut |
| 00              | 0       | 0           | 0       | 0           |
| 01              | 1 (PAL) | 0           | 0       | 0           |
| 02              | 1 (PAL) | 1           | 0       | 0           |
| 03              | 0       | 0           | 1 (PAL) | 0           |
| 04              | 0       | 0           | 1 (PAL) | 1           |
| 05              | 0       | 1           | 1 (PAL) | 0           |
| 06              | 0       | 1           | 0       | 0           |
| 07              | 1       | 0           | 0       | 0           |
| 08              | 2       | 0           | 0       | 0           |
| 09              | 1       | 1           | 0       | 0           |
| 10              | 0       | 0           | 0       | 1           |
| 12 (3/8-27 UNS) | 1(PAL)  | 1 (plastic) | 0       | 0           |
| 14 (3/8-27 UNS) | 0       | 0           | 1 (PAL) | 1 (plastic) |
| 15 (3/8-27 UNS) | 0       | 1 (plastic) | 1 (PAL) | 0           |
| 16 (3/8-27 UNS) | 0       | 1 (plastic) | 0       | 0           |
| 19 (3/8-27 UNS) | 1       | 1 (plastic) | 0       | 0           |
| 20 (3/8-27 UNS) | 0       | 0           | 0       | 1 (plastic) |

#### Terminals

P10 blade terminals A6.3-0.8 (QC .250)

P13 blade terminals A6.3-0.8 (QC .250), 90°

S80 straight screw terminals\*

S83 90° bent screw terminals\*

#### Current ratings

5 ... 30 A

1658 - G21 - 02 - P10 - 5 A Ordering example

\* Screws and lock washers bulk shipped

## Standard current ratings and typical voltage drop values

| Current rating (A) | Voltage drop (mV) | Current rating (A) | Voltage drop (mV) |
|--------------------|-------------------|--------------------|-------------------|
| 5                  | ≤ 150             | 12                 | ≤ 140             |
| 6                  | ≤ 150             | 15                 | ≤ 240             |
| 7                  | ≤ 150             | 16                 | ≤ 240             |
| 8                  | ≤ 150             | 20                 | ≤ 240             |
| 9                  | ≤ 150             | 25                 | ≤ 240             |
| 10                 | ≤ 140             | 30                 | ≤ 240             |



1658-...



1658-F

## Technical data

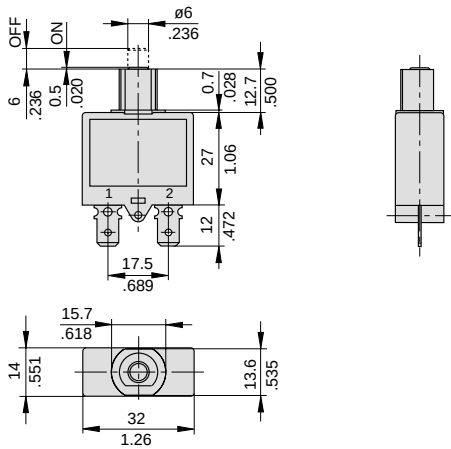
|                                                           |                                                                                          |                  |         |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------|------------------|---------|
| Voltage rating                                            | AC 240 V; DC 28 V                                                                        |                  |         |
| Current ratings                                           | 5...30 A                                                                                 |                  |         |
| Typical life                                              | 1,000 operations at 2 x I <sub>N</sub>                                                   |                  |         |
| Ambient temperature                                       | -20...+60 °C (-4...+140 °F), <8A max. +40 °C (104 °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) operating area | Test voltage                                                                             |                  |         |
|                                                           | AC 3,000 V                                                                               |                  |         |
| Insulation resistance                                     | > 100 MΩ (DC 500 V)                                                                      |                  |         |
| Interrupting capacity I <sub>cn</sub>                     | 200 A                                                                                    |                  |         |
| Interrupting capacity (UL 1077/EN 60934 PC1)              | I <sub>N</sub>                                                                           | U <sub>N</sub>   |         |
|                                                           | 5...16 A                                                                                 | AC 240 V         | 2,000 A |
|                                                           | 18...30 A                                                                                | AC 120 V         | 2,000 A |
|                                                           | 5...30 A                                                                                 | DC 28 V          | 2,000 A |
| Degree of protection (IEC 60529/DIN 40050)                | operating area IP 40                                                                     |                  |         |
|                                                           | terminal area IP 00                                                                      |                  |         |
| 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. 16 g                                                                             |                  |         |

## Approvals

| Authority      | Voltage rating    | Current ratings |           |
|----------------|-------------------|-----------------|-----------|
| VDE (EN 60934) | AC 240 V; DC 28 V | 5...25 A        |           |
| UL, CSA        | AC 250 V          | 5...15 A        | 1658-G... |
|                | AC 240 V          | 16 A            | 1658-G... |
|                | AC 120 V          | 30 A            | 1658-G... |
|                | AC 125 V          | 17...25 A       | 1658-G... |
|                | DC 28 V           | 5...30 A        | 1658-G... |

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.

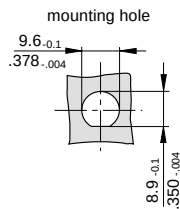
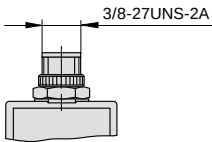
## Dimensions



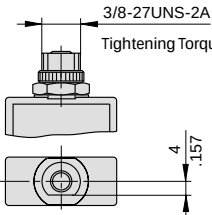
A00



A21



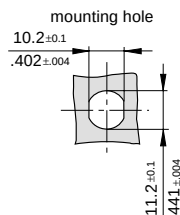
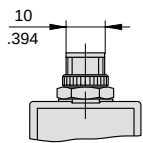
G21



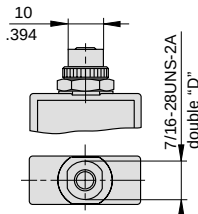
Tightening Torque= 0.8 Nm



A41

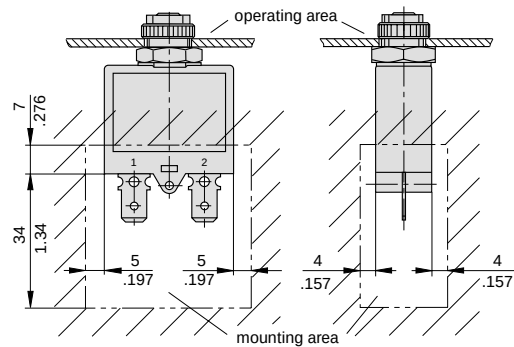


G41



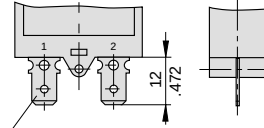
See ordering information for mounting hardware

## Installation drawing



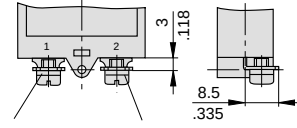
## Terminal design

P10



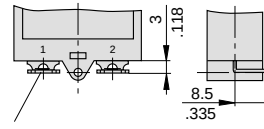
blade terminals DIN 46244-A6.3-0.8 (QC .250)

S83



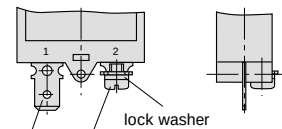
terminal screw 6-32 UNC  
lock washer

P13



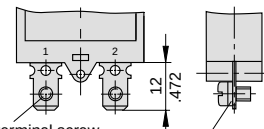
blade terminals DIN 46244-A6.3-0.8 (QC .250) angled 90°

P10-S83



lock washer  
terminal screw 6-32 UNC

S80

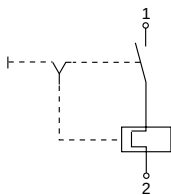


terminal screw 6-32 UNC  
lock washer

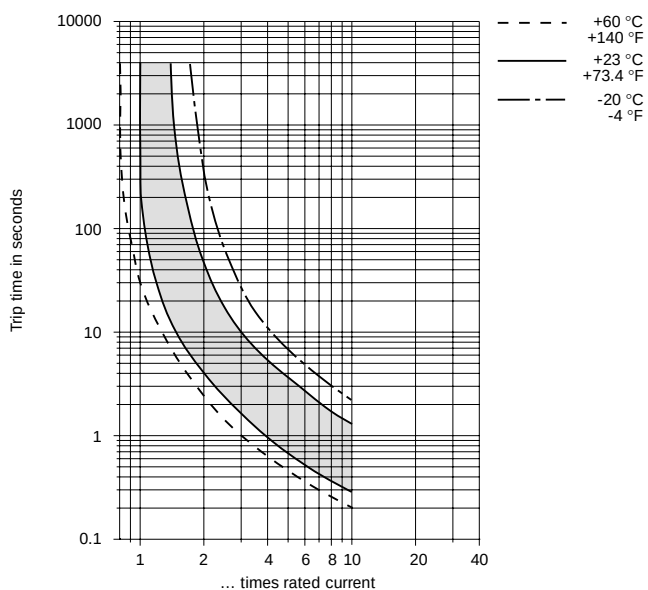
blade terminals DIN 46244-A6.3-0.8 (QC .250)

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

## Internal connection diagram



## Typical time/current characteristics

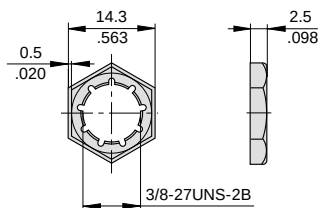


The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section 9 – Technical information.

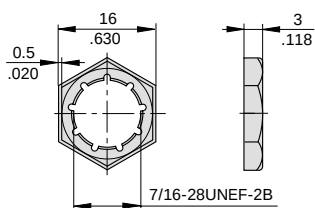
|                       |    |      |      |      |       |      |      |      |
|-----------------------|----|------|------|------|-------|------|------|------|
| Ambient temperature   | °F | -4   | +14  | +32  | +73.4 | +104 | +122 | +140 |
|                       | °C | -20  | -10  | 0    | +23  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

## Accessories

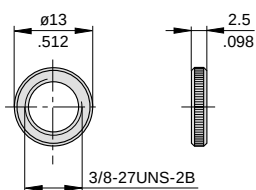
**Mounting nut 3/8", 27-thread**  
Y306 671 01



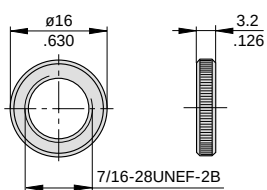
**Mounting nut 7/16", 28-thread**  
Y303 200 01



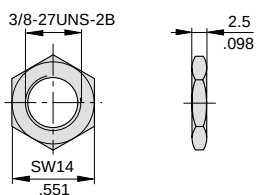
**Knurled nut 3/8", 27-thread  
nickel-plated brass**  
Y300 190 03



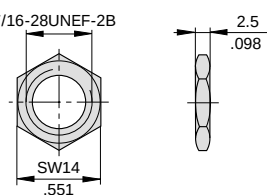
**Knurled nut 7/16", 28-thread  
nickel-plated brass**  
Y302 294 03



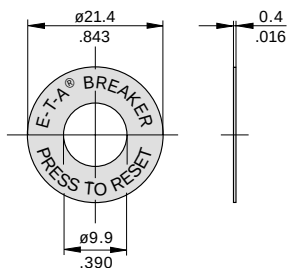
**Hex nut 3/8", 27-thread  
nickel-plated brass**  
Y300 192 01



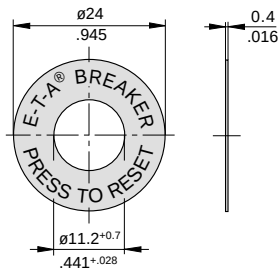
**Hex nut 7/16", 28-thread  
nickel-plated brass**  
Y302 295 01



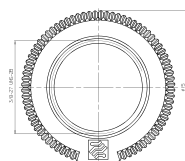
**Press to Reset Plate for 3/8",  
27-thread, aluminium**  
Y301 059 02



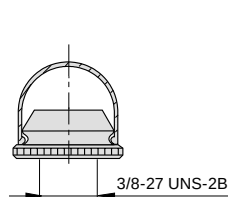
**Press to Reset Plate for 7/16",  
28-thread, aluminium**  
Y302 732 01



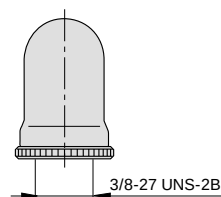
**Plastic knurled nut  
for 3/8", 27-thread**  
Y307 117 02



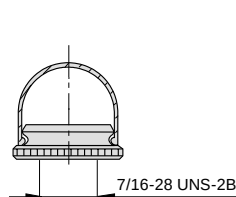
**Reset button seal for 3/8", 27-thread,  
short**  
X201 285 01



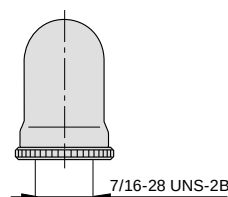
**long**  
X200 799 01



**Reset button seal for 7/16", 28-thread,  
short**  
X222 119 01



**long**  
X222 119 02



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