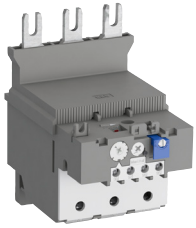


# TF140DU thermal overload relays

## 66 ... 142 A



2DC231012V0012

TF140DU-110

### Description

The TF140DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

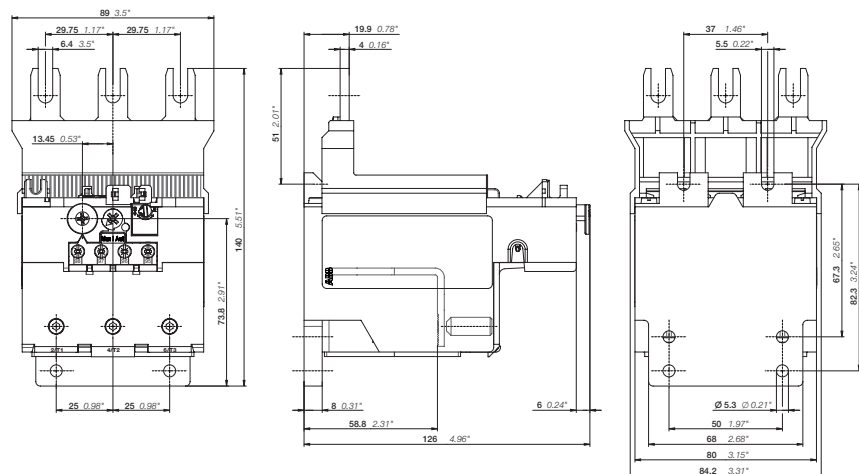
The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- Two electrically isolated auxiliary contacts - 1 N.O. + 1 N.C.
- TEST and STOP function - Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

### Ordering details

| Setting range | Short-circuit protective device | Trip class | Type        | Order code      | Weight (1 pce) kg |
|---------------|---------------------------------|------------|-------------|-----------------|-------------------|
| A             |                                 |            |             |                 |                   |
| 66 ... 90     | 200 A, Fuse type gG             | 10A        | TF140DU-90  | 1SAZ431201R1001 | 0.820             |
| 80 ... 110    | 224 A, Fuse type gG             | 10A        | TF140DU-110 | 1SAZ431201R1002 | 0.820             |
| 100 ... 135   | 224 A, Fuse type gG             | 10A        | TF140DU-135 | 1SAZ431201R1003 | 0.820             |
| 110 ... 142   | 250 A, Fuse type gG             | 10A        | TF140DU-142 | 1SAZ431201R1004 | 0.820             |

### Main dimensions mm, inches



TF140DU

2DC232008F0012

2DC2106054C0201

# TF140DU thermal overload relays

## Technical data

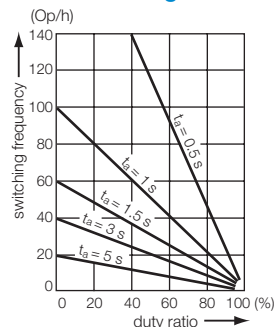
### Main circuit – Utilization characteristics according to IEC/EN

|                                            |                                                                             |
|--------------------------------------------|-----------------------------------------------------------------------------|
| Type                                       | TF140DU                                                                     |
| Standards                                  | IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1                          |
| Rated operational voltage $U_n$            | 690 V AC                                                                    |
| Rated frequency                            | DC, 50/60 Hz                                                                |
| Frequency range                            | 0 ... 400 Hz                                                                |
| Trip class                                 | 10A                                                                         |
| Number of poles                            | 3                                                                           |
| Duty time                                  | 100 %                                                                       |
| Operating frequency without early tripping | Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty" |
| Rated impulse withstand voltage $U_{imp}$  | 8 kV                                                                        |
| Rated insulation voltage $U_i$             | 690 V                                                                       |

### Auxiliary circuit according to IEC/EN

|                                                                                              |                                                                 |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Type                                                                                         | TF140DU                                                         |
| Rated operational voltage $U_n$                                                              | 500 V AC, 440 V DC                                              |
| Conventional free air thermal current $I_{th}$                                               | N.C., 95-96 10 A<br>N.O., 97-98 6 A                             |
| Rated frequency                                                                              | DC, 50/60 Hz                                                    |
| Number of poles                                                                              | 1 N.O. + 1 N.C.                                                 |
| $I_e$ / Rated operational current AC-15<br>acc. to IEC/EN 60947-5-1 for utilization category |                                                                 |
| 110-120 V                                                                                    | N.C., 95-96 3.00 A<br>N.O., 97-98 1.50 A                        |
| 220-230-240 V                                                                                | N.C., 95-96 1.50 A<br>N.O., 97-98 1.50 A                        |
| 440 V                                                                                        | N.C., 95-96 1.00 A<br>N.O., 97-98 1.00 A                        |
| 480-500 V                                                                                    | N.C., 95-96 1.00 A<br>N.O., 97-98 1.00 A                        |
| $I_e$ / Rated operational current DC-13<br>acc. to IEC/EN 60947-5-1 for utilization category |                                                                 |
| 24 V                                                                                         | N.C., 95-96 1.25 A<br>N.O., 97-98 1.25 A                        |
| 60 V                                                                                         | N.C., 95-96 0.25 A<br>N.O., 97-98 0.25 A                        |
| 110-120-125 V                                                                                | N.C., 95-96 0.25 A<br>N.O., 97-98 0.25 A                        |
| 250 V                                                                                        | N.C., 95-96 0.12 A<br>N.O., 97-98 0.04 A                        |
| Minimum switching capacity                                                                   | 17 V / 3 mA                                                     |
| Short-circuit protective device                                                              | N.C., 95-96 10 A, Fuse type gG<br>N.O., 97-98 6 A, Fuse type gG |
| Rated impulse withstand voltage $U_{imp}$                                                    | 6 kV                                                            |
| Rated insulation voltage $U_i$                                                               | 690 V                                                           |

### Technical diagram – Intermittent periodic duty



$t_s$ : Motor starting time

2CDC32005F0211

2CDC106054C0201

# TF140DU thermal overload relays

## Technical data

### Main circuit – Utilization characteristics according to UL/CSA

|                                      |                                                                |
|--------------------------------------|----------------------------------------------------------------|
| Type                                 | TF140DU                                                        |
| Standards                            | UL 508, CSA 22.2 No. 14, UL 60947-4-1A                         |
| Maximum operational voltage          | 600 V AC                                                       |
| Trip rating                          | 125 % of FLA                                                   |
| Full load amps (FLA)                 | See table "Full load amps and short-circuit protective device" |
| Short-circuit rating RMS symmetrical | See table "Full load amps and short-circuit protective device" |
| Short-circuit protective device      | See table "Full load amps and short-circuit protective device" |

### Auxiliary circuit according to UL/CSA

|                              |             |            |
|------------------------------|-------------|------------|
| Type                         | TF140DU     |            |
| Contact rating               | N.C., 95-96 | B600       |
|                              | N.O., 97-98 | C300       |
| Conventional thermal current | N.C./N.O.   | 10 A / 6 A |

### Full load amps and short-circuit protective device

| Type        | Full load amps (FLA) | Short-circuit protective device         |                 |                                         |                |                                         |                        |
|-------------|----------------------|-----------------------------------------|-----------------|-----------------------------------------|----------------|-----------------------------------------|------------------------|
|             |                      | 480 / 600 V AC                          |                 | 480 / 600 V AC                          |                | 480 / 600 V AC                          |                        |
|             |                      | Short circuit rating<br>RMS symmetrical | Fuse type       | Short circuit rating<br>RMS symmetrical | Fuse type      | Short circuit rating<br>RMS symmetrical | Listed circuit breaker |
| TF140DU-90  | 90 A                 | 10 kA                                   | 250 A, K5 / RK5 | 100 kA                                  | 250 A, Class J | 100 kA                                  | 250 A                  |
| TF140DU-110 | 110 A                | 10 kA                                   | 250 A, K5 / RK5 | 100 kA                                  | 250 A, Class J | 100 kA                                  | 250 A                  |
| TF140DU-135 | 135 A                | 10 kA                                   | 250 A, K5 / RK5 | 100 kA                                  | 250 A, Class J | 100 kA                                  | 250 A                  |
| TF140DU-142 | 142 A                | 10 kA                                   | 250 A, K5 / RK5 | 100 kA                                  | 250 A, Class J | 100 kA                                  | 250 A                  |

# TF140DU thermal overload relays



## Technical data

### General technical data





|                                            |                                                                             |                |
|--------------------------------------------|-----------------------------------------------------------------------------|----------------|
| Type                                       | TF140DU                                                                     |                |
| Pollution degree                           | 3                                                                           |                |
| Phase loss sensitive                       | Yes                                                                         |                |
| Ambient air temperature                    |                                                                             |                |
| Operation                                  | Open - compensated acc. IEC/EN 60947-4-1                                    | -25 ... +55 °C |
| Open                                       |                                                                             | -25 ... +55 °C |
| Storage                                    |                                                                             | -40 ... +70 °C |
| Ambient air temperature compensation       | Acc. to IEC/EN 60947-4-1                                                    |                |
| Maximum operating altitude permissible     | 2000 m                                                                      |                |
| Resistance to shock acc. to IEC 60068-2-27 | 12 g / 11 ms                                                                |                |
| Mounting position                          | Position 1-5                                                                |                |
| Mounting                                   | Mount on the contactor and tighten the screws of the main circuit terminals |                |
| Degree of protection                       | housing                                                                     | IP20           |
|                                            | main circuit terminals                                                      | IP00           |

### Electrical connection

#### Main circuit

|                                                                                              |                               |                           |
|----------------------------------------------------------------------------------------------|-------------------------------|---------------------------|
| Type                                                                                         | TF140DU                       |                           |
| Connecting capacity                                                                          |                               |                           |
|  Rigid      | 1 x                           | 16 ... 70 mm <sup>2</sup> |
|                                                                                              | 2 x                           | -                         |
|  Flexible | 1 x                           | 16 ... 70 mm <sup>2</sup> |
|                                                                                              | 2 x                           | -                         |
|                                                                                              | Stranded acc. to UL/CSA       | 1 x or 2 x AWG 6-2/0      |
|                                                                                              | Flexible acc. to UL/CSA       | 1 x or 2 x AWG 6-2/0      |
| Stripping length                                                                             | 25 mm                         |                           |
| Tightening torques                                                                           | 8 ... 10 Nm / 77 ... 88 lb.in |                           |
| Connection screw                                                                             | M8 (Hexagon)                  |                           |

#### Auxiliary circuit

|                                                                                                                     |                           |                              |
|---------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------|
| Type                                                                                                                | TF140DU                   |                              |
| Connecting capacity                                                                                                 |                           |                              |
|  Rigid                           | 1 x or 2 x                | 0.75 ... 4 mm <sup>2</sup>   |
|  Flexible with ferrule           | 1 x or 2 x                | 0.75 ... 2.5 mm <sup>2</sup> |
|  Flexible with insulated ferrule | 1 x or 2 x                | 0.75 ... 2.5 mm <sup>2</sup> |
|  Flexible                        | 1 x or 2 x                | 0.75 ... 2.5 mm <sup>2</sup> |
|                                                                                                                     | Stranded acc. to UL/CSA   | 1 x or 2 x AWG 18-14         |
|                                                                                                                     | Flexible acc. to UL/CSA   | 1 x or 2 x AWG 18-14         |
| Stripping length                                                                                                    | 9 mm                      |                              |
| Tightening torques                                                                                                  | 0.8 ... 1.3 Nm / 12 lb.in |                              |
| Connection screw                                                                                                    | M3.5 (Pozidriv 2)         |                              |

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