

# Thermal Overload Relays

## TR series

### ■ Features

#### ● Manual trip

These relays can be manually tripped for sequence inspection by pressing manual trip bar (TR-0N/3, TR-5-1N/3). A sequence inspection will be performed when the test button is pulled out. When the test button is pressed in, only the NC contact will turn OFF. The original status will be restored when the test button is then released. (TR-N2/3 to N8/3)

#### ● Trip-free mechanism

Even if the reset button is carelessly pressed, this relay trips without trouble (Trip-free mechanism).

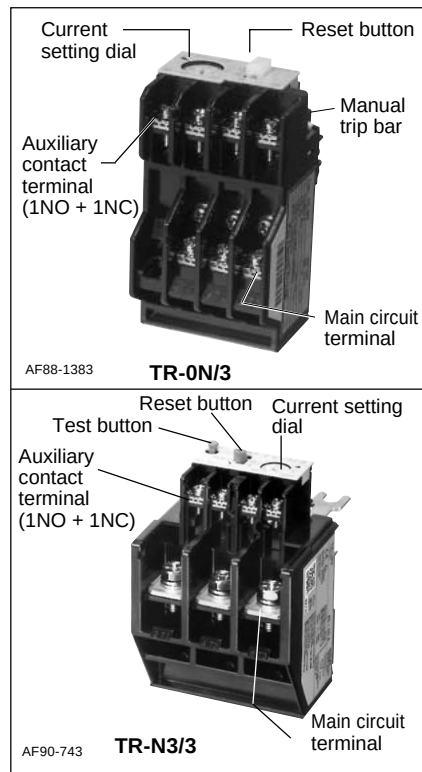
#### ● Easy visual checking of operating status

Trip indicator and manual trip bar permit visual check of tripping status.



#### ● Dial ampere setting

The setting dial uses a RC (Rated Current) marking which is set to the motor full load current.



### ■ Versatile optional accessories

#### Trip indicator



AF00-291

#### Reset release



AF00-585

#### Base unit for separate mounting



AF00-159

### ■ Optional accessories

| Description                                                                     |                                            |        | Type                                 | Ordering code          | Used with thermal overload relay                                     |
|---------------------------------------------------------------------------------|--------------------------------------------|--------|--------------------------------------|------------------------|----------------------------------------------------------------------|
| Reset release                                                                   | Lead length                                | 300 mm | <b>SZ-R1</b>                         | TZ1R1                  | TR-0N/3, TR-5-1N/3, TK-0N, TK-5-1N                                   |
| You can reset these relays remotely on the front panels of switchboards.        |                                            | 500 mm | <b>SZ-R2</b>                         | TZ1R2                  |                                                                      |
|                                                                                 |                                            | 700 mm | <b>SZ-R3</b>                         | TZ1R3                  | TR-N10 to N14, TK-N10 to N14                                         |
|                                                                                 | Lead length                                | 300 mm | <b>SZ-R4</b>                         | TZ2R4                  | TR-N2/3 to N8/3, TK-N2 to N8                                         |
|                                                                                 |                                            | 500 mm | <b>SZ-R5</b>                         | TZ2R5                  |                                                                      |
|                                                                                 |                                            | 700 mm | <b>SZ-R6</b>                         | TZ2R6                  |                                                                      |
| Trip indicator                                                                  | 100–110V AC 50/60Hz<br>200–220V AC 50/60Hz |        | <b>SZ-L100</b>                       | TZ1L100                | TR-0N/3, TR-5-1N/3, TK-0N, TK-5-1N                                   |
|                                                                                 |                                            |        | <b>SZ-L200</b>                       | TZ1L200                | TR-N10 to N14, TK-N10 to N14                                         |
| Easier checking of trip status                                                  | 100–110V AC 50/60Hz<br>200–220V AC 50/60Hz |        | <b>SZ-L100N2</b><br><b>SZ-L200N2</b> | TZ2L100N2<br>TZ2L200N2 | TR-N2/3 to N8/3, TK-N2 to N8                                         |
| Dial cover<br>For protection against the current setting being changed in error |                                            |        | <b>SZ-DA</b>                         | SZ1DA                  | TR-0N/3, TR-5-1N/3, TK-0N, TK-5-1N<br>TR-N2/3 to N14/3, TK-N2 to N14 |
| Base unit for separate mounting                                                 |                                            |        | <b>SZ-HB</b>                         | TZ1HB                  | TR-0N/3, TK-0N                                                       |
| The unit can be screw-mounted and rail-mounted.                                 |                                            |        | <b>SZ-HC</b>                         | TZ1HC                  | TR-5-1N/3, TK-5-1N                                                   |
|                                                                                 |                                            |        | <b>SZ-HD</b>                         | TZ2HD                  | TR-N2/3, TK-N2                                                       |
|                                                                                 |                                            |        | <b>SZ-HE</b>                         | TZ2HE                  | TR-N3/3, TK-N3                                                       |
|                                                                                 |                                            |        | Terminal cover                       |                        |                                                                      |
|                                                                                 |                                            |        | <b>SZ-T11</b>                        | SZ1T11                 | Base unit for separate mounting SZ-HC                                |
|                                                                                 |                                            |        | <b>SZ-T14</b>                        | SZ2T14                 | For separate mounting TR-N2H/3, TK-N2H                               |
|                                                                                 |                                            |        | <b>SZ-T15</b>                        | SZ2T15                 | For separate mounting TR-N3H/3, TK-N3H                               |
|                                                                                 |                                            |        | <b>SZ-RN6T</b>                       | SZ2RN6T                | For separate mounting TR-N6H/3, TK-N6H                               |
|                                                                                 |                                            |        | <b>SZ-T12</b>                        | TZ1T12                 | TR-0N/3, TK-0N                                                       |
|                                                                                 |                                            |        | <b>SZ-T13</b>                        | TZ1T13                 | TR-5-1N/3, TK-5-1N                                                   |
|                                                                                 |                                            |        | <b>SZ-T16</b>                        | SZ2T16                 | TR-N2/3, TK-N2                                                       |
|                                                                                 |                                            |        | <b>SZ-T17</b>                        | SZ2T17                 | TR-N3/3, TK-N2                                                       |

■ Selection guide/Standard type

| On-contactor mounting                               |      | 3-element   | TR-0N/3<br>(TR13DW)<br>TR-0N<br>(TR13NW)   |               | TR-5-1N/3<br>(TR20DW)<br>TR-5-1N<br>(TR20NW)   |                  | TR-N2/3<br>(TR35BDW)<br>TR-N2<br>(TR35BNW)   |           | TR-N3/3<br>(TR65BDW)<br>TR-N3<br>(TR65BNW)   |       |
|-----------------------------------------------------|------|-------------|--------------------------------------------|---------------|------------------------------------------------|------------------|----------------------------------------------|-----------|----------------------------------------------|-------|
| Separate mounting                                   |      | 3-element   | TR-0NH/3<br>(TR13DH)<br>TR-0NH<br>(TR13NH) |               | TR-5-1NH/3<br>(TR20DH)<br>TR-5-1NH<br>(TR20NH) |                  | TR-N2H/3<br>(TR35BDH)<br>TR-N2H<br>(TR35BNH) |           | TR-N3H/3<br>(TR65BDW)<br>TR-N3H<br>(TR65BNW) |       |
| Contactor to be combined                            |      |             | SC-03                                      | SC-0<br>SC-05 | SC-4-0                                         | SC-4-1<br>SC-5-1 | SC-N1                                        | SC-N2     | SC-N2S                                       | SC-N3 |
| Ampere<br>setting range<br>(A)                      | Code | A           | 0.1 – 0.15                                 | 0.1 – 0.15    | 0.1 – 0.15                                     | 0.1 – 0.15       |                                              |           |                                              |       |
|                                                     |      | B           | 0.13 – 0.2                                 | 0.13 – 0.2    | 0.13 – 0.2                                     | 0.13 – 0.2       |                                              |           |                                              |       |
|                                                     |      | C           | 0.15 – 0.24                                | 0.15 – 0.24   | 0.15 – 0.24                                    | 0.15 – 0.24      |                                              |           |                                              |       |
|                                                     |      | D           | 0.2 – 0.3                                  | 0.2 – 0.3     | 0.2 – 0.3                                      | 0.2 – 0.3        |                                              |           |                                              |       |
|                                                     |      | E           | 0.24 – 0.36                                | 0.24 – 0.36   | 0.24 – 0.36                                    | 0.24 – 0.36      |                                              |           |                                              |       |
|                                                     |      | F           | 0.3 – 0.45                                 | 0.3 – 0.45    | 0.3 – 0.45                                     | 0.3 – 0.45       |                                              |           |                                              |       |
|                                                     |      | G           | 0.36 – 0.54                                | 0.36 – 0.54   | 0.36 – 0.54                                    | 0.36 – 0.54      |                                              |           |                                              |       |
|                                                     |      | H           | 0.48 – 0.72                                | 0.48 – 0.72   | 0.48 – 0.72                                    | 0.48 – 0.72      |                                              |           |                                              |       |
|                                                     |      | J           | 0.64 – 0.96                                | 0.64 – 0.96   | 0.64 – 0.96                                    | 0.64 – 0.96      |                                              |           |                                              |       |
| Specify the setting<br>range code when<br>ordering. | K    | 0.8 – 1.2   | 0.8 – 1.2                                  | 0.8 – 1.2     | 0.8 – 1.2                                      |                  |                                              |           |                                              |       |
|                                                     | L    | 0.95 – 1.45 | 0.95 – 1.45                                | 0.95 – 1.45   | 0.95 – 1.45                                    |                  |                                              |           |                                              |       |
|                                                     | M    | 1.4 – 2.2   | 1.4 – 2.2                                  | 1.4 – 2.2     | 1.4 – 2.2                                      |                  |                                              |           |                                              |       |
|                                                     | N    | 1.7 – 2.6   | 1.7 – 2.6                                  | 1.7 – 2.6     | 1.7 – 2.6                                      |                  |                                              |           |                                              |       |
|                                                     | P    | 2.2 – 3.4   | 2.2 – 3.4                                  | 2.2 – 3.4     | 2.2 – 3.4                                      |                  |                                              |           |                                              |       |
|                                                     | R    | 2.8 – 4.2   | 2.8 – 4.2                                  | 2.8 – 4.2     | 2.8 – 4.2                                      |                  |                                              |           |                                              |       |
|                                                     | S    | 4 – 6       | 4 – 6                                      | 4 – 6         | 4 – 6                                          |                  |                                              |           |                                              |       |
|                                                     | T    | 5 – 8       | 5 – 8                                      | 5 – 8         | 5 – 8                                          | 4 – 6            | 4 – 6                                        |           |                                              |       |
|                                                     | U    | 6 – 9       | 6 – 9                                      | 6 – 9         | 6 – 9                                          | 5 – 8            | 5 – 8                                        |           |                                              |       |
|                                                     | V    | 7 – 11      | 6 – 9                                      | 6 – 9         | 6 – 9                                          | 6 – 9            | 6 – 9                                        |           |                                              |       |
|                                                     | W    |             | 7 – 11                                     | 7 – 11        | 7 – 11                                         | 7 – 11           | 7 – 11                                       | 7 – 11    | 7 – 11                                       |       |
|                                                     | X    |             | 9 – 13                                     | 9 – 13        | 9 – 13                                         | 9 – 13           | 9 – 13                                       | 9 – 13    | 9 – 13                                       |       |
|                                                     | Q    |             |                                            | 12 – 18       | 12 – 18                                        | 12 – 18          | 12 – 18                                      | 12 – 18   | 12 – 18                                      |       |
|                                                     | B    |             |                                            |               | 16 – 22                                        |                  |                                              |           |                                              |       |
|                                                     | E    |             |                                            |               |                                                | 18 – 26          | 18 – 26                                      | 18 – 26   | 18 – 26                                      |       |
|                                                     | F    |             |                                            |               |                                                | 24 – 36          | 24 – 36                                      | 24 – 36   | 24 – 36                                      |       |
|                                                     | I    |             |                                            |               |                                                |                  | 32 – 42                                      | 28 – 40   | 28 – 40                                      |       |
| G                                                   |      |             |                                            |               |                                                |                  | 34 – 50                                      | 34 – 50   |                                              |       |
| J                                                   |      |             |                                            |               |                                                |                  | 45 – 65                                      | 45 – 65   |                                              |       |
| O                                                   |      |             |                                            |               |                                                |                  |                                              | 48 – 68   |                                              |       |
| L                                                   |      |             |                                            |               |                                                |                  |                                              | 53 – 80*  |                                              |       |
| M                                                   |      |             |                                            |               |                                                |                  |                                              | 65 – 95*  |                                              |       |
| I                                                   |      |             |                                            |               |                                                |                  |                                              | 85 – 105* |                                              |       |

|                             |           |                      |         |                       |                      |                      |                        |                        |           |                        |  |
|-----------------------------|-----------|----------------------|---------|-----------------------|----------------------|----------------------|------------------------|------------------------|-----------|------------------------|--|
| On-contactor mounting       | 3-element | TR-N5/3<br>(TR80BDW) |         | TR-N6/3<br>(TR1CBDW)  | TR-N7/3<br>(TR1FBDW) | TR-N8/3<br>(TR1JBDW) | TR-N10/3<br>(TR2CBDW)  | TR-N12/3<br>(TR4ABDW)  |           | TR-N14/3<br>(TR8ABDW)  |  |
|                             | 2-element | TR-N5<br>(TR80BNW)   |         | TR-N6<br>(TR1CBNW)    | TR-N7<br>(TR1FBNW)   | TR-N8<br>(TR1JBNW)   | TR-N10<br>(TR2CBNW)    | TR-N12<br>(TR4ABNW)    |           | TR-N14<br>(TR8ABNW)    |  |
| Separate mounting           | 3-element | –                    |         | TR-N6H/3<br>(TR1CBDW) | –                    | –                    | TR-N10H/3<br>(TR2CBDH) | TR-N12H/3<br>(TR4ABDH) |           | TR-N14H/3<br>(TR8ABDH) |  |
|                             | 2-element | –                    |         | TR-N6H<br>(TR1CBNW)   | –                    | –                    | TR-N10H<br>(TR2CBNH)   | TR-N12H<br>(TR4ABNH)   |           | TR-N14H<br>(TR8ABNH)   |  |
| Contactor to be combined    |           | SC-N4                | SC-N5A  | SC-N6                 | SC-N7                | SC-N8                | SC-N10                 | SC-N11                 | SC-N12    | SC-N14                 |  |
| Ampere setting range<br>(A) | Code      | B                    | 18 – 26 | 18 – 26               |                      |                      |                        |                        |           |                        |  |
|                             |           | E                    | 24 – 36 | 24 – 36               |                      |                      |                        |                        |           |                        |  |
|                             |           | F                    | 28 – 40 | 28 – 40               |                      |                      |                        |                        |           |                        |  |
|                             |           | G                    | 34 – 50 | 34 – 50               |                      |                      |                        |                        |           |                        |  |
|                             |           | J                    | 45 – 65 | 45 – 65               | 45 – 65              | 45 – 65              |                        |                        |           |                        |  |
|                             |           | L                    | 53 – 80 | 53 – 80               | 53 – 80              | 53 – 80              |                        |                        |           |                        |  |
|                             |           | M                    |         | 65 – 95               | 65 – 95              | 65 – 95              | 65 – 95                |                        |           |                        |  |
|                             |           | I                    |         | 85 – 105              |                      |                      |                        |                        |           |                        |  |
|                             |           | N                    |         |                       | 85 – 125             | 85 – 125             | 85 – 125               | 85 – 125               |           |                        |  |
|                             |           | P                    |         |                       | 110 – 160*           | 110 – 160            | 110 – 160              | 110 – 160              | 110 – 160 | 110 – 160              |  |
|                             |           | R                    |         |                       |                      |                      | 125 – 185              | 125 – 185              | 125 – 185 | 125 – 185              |  |
|                             |           | S                    |         |                       |                      |                      |                        | 160 – 240              | 160 – 240 | 160 – 240              |  |
|                             |           | T                    |         |                       |                      |                      |                        |                        | 200 – 300 | 200 – 300              |  |
| U                           |           |                      |         |                       |                      |                      |                        | 240 – 360              | 240 – 360 |                        |  |
| V                           |           |                      |         |                       |                      |                      |                        | 300 – 450              | 300 – 450 |                        |  |
| W                           |           |                      |         |                       |                      |                      |                        |                        | 400 – 600 |                        |  |

Notes: • TR-N10/3 to N14/3 types are provided with CTs.  
• Max. setting ranges of these starters are as shown in the table on the right.  
• When ordering the thermal overload relays for starter use, select the applicable setting range.  
( ): Basic ordering code (When ordering phase-loss protective type, enter the version code E instead of D)  
\*: Separate mounting only

| Motor starter | Maximum applicable heater range (A)<br>200–240V | 380–440V |
|---------------|-------------------------------------------------|----------|
| SW-03/3H      | 7–11                                            | 6–9      |
| SW-4-0/3H     | 12–18                                           | 12–18    |
| SW-N1/3H      | 24–36                                           | 24–36    |
| SW-N2S/3H     | 34–50                                           | 34–50    |
| SW-N4/3H      | 53–80                                           | 53–80    |
| SW-N6/3H      | 85–125                                          | 85–125   |