

# Section

# D

**Selection Guide .....D-3**

## **Non-Reversing Contactors**

- YS1N AC Controlled .....D-5
- YS3N DC Controlled .....D-6

## **Reversing Contactors**

- YS1R AC Controlled .....D-7
- YS3R DC Controlled .....D-8

## **Thermal Overload Relay**

- YS1T-RHA.....D-9

**Starters.....D-11**

**Accessories .....D-12**

## **Specifications**

- Contactors and Starters .....D-16
- Overload Relays.....D-24
- Accessories.....D-28

**Dimensions.....D-35**

**Mounting Diagrams.....D-43**

**Wiring Diagrams.....D-47**

**Application Tables.....D-51**

# IEC Contactors

for more information on this product family visit

**[www.idec.com/contactor](http://www.idec.com/contactor)**

### **Additional Web Resources**

- New and updated product information
- Downloadable software demos & upgrades
- Part configuration tool & cross reference
- Online stock check & ordering
- IDEC field sales & distributor search
- Online literature request
- Downloadable manuals & CAD drawings
- Manufacturer's suggested retail price list
- Product training schedule & locations
- Advertising & trade show schedules
- Press releases & FAQs

**[www.idec.com/contactor](http://www.idec.com/contactor)**

## IDEC YS Series Contactors / Starters



D

IEC Contactors

### YS Series: *Superior performance and low maintenance*

#### Key features include:

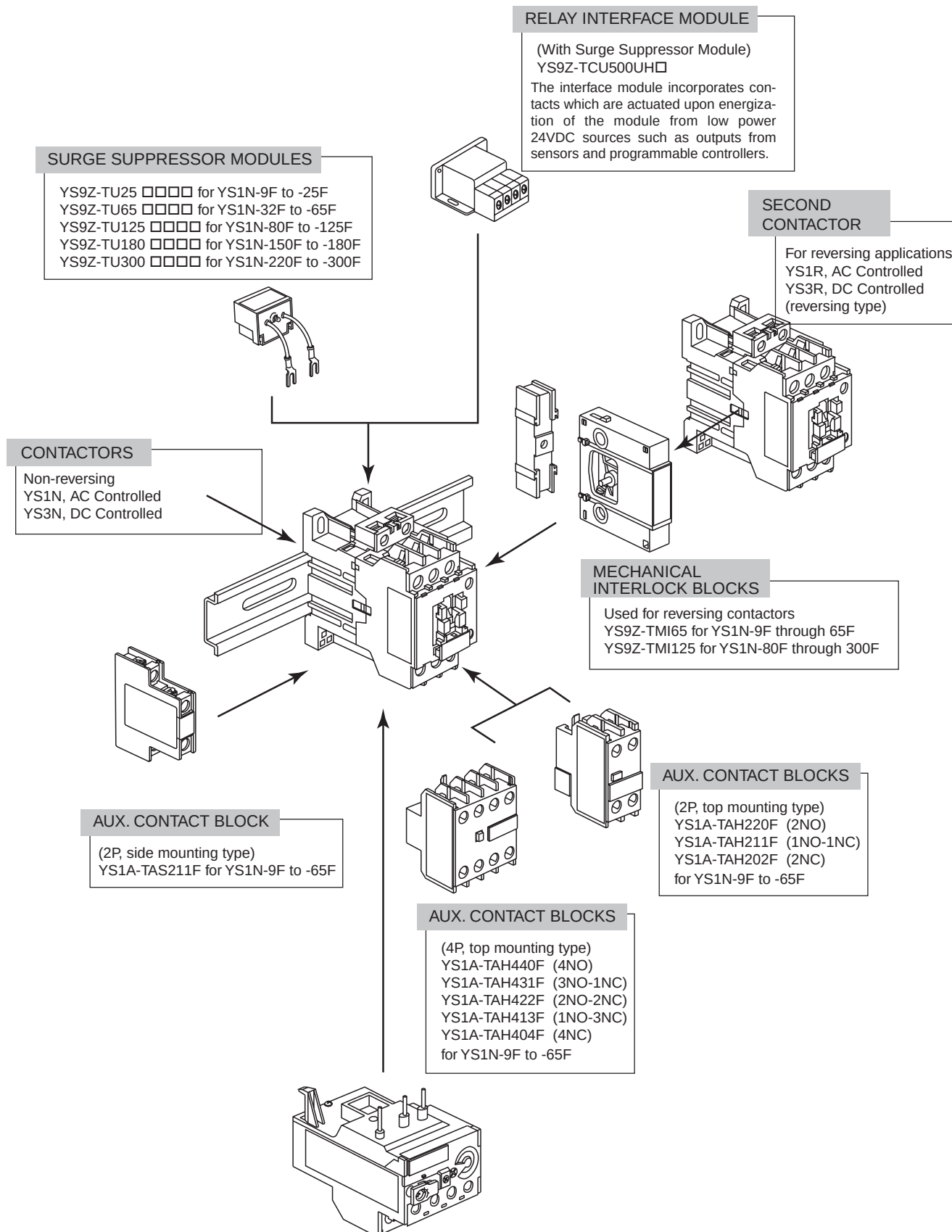
- Simple, compact, rugged electromechanical devices
- Meets IEC, UL, c-UL and other international standards
- All Contactors, Thermal Overload Relays, and Auxiliary Contact Blocks bear the CE mark
- 35mm or 75mm DIN Rail or direct panel mounting
- Bifurcated double bridge auxiliary contacts, the moving contact bridge has an "H" form; suitable for interface with electronic circuit
- Advanced design and materials, special silver-alloy long life contacts
- Cadmium-free contacts for environmental safety
- Bimetallic thermal overload relays
- Easy operation and maintenance; Direct and simple motor control
- Dual frequency 50/60 Hz coils

IEC YS Series Contactors are used in switching motor loads. Like all IDEC products, each model is engineered for long life, minimum maintenance, dependable operation, and superior performance.

Snap on accessories are available for the IDEC YS series, giving each model the flexibility to meet any application requirement.

1. Auxiliary contact blocks
  - Top mounting type (2 or 4 poles type)
  - Side mounting type (2 poles type)
2. Adjustable thermal overloads
3. Surge suppressor modules
4. Mechanical interlock blocks
5. PLC interface modules

## Selection Guide



## YS Series Contactors

## Key features of the YS Series include:

- Compact size
- AC and DC coil, reversing and non-reversing
- Weld-resistant silver alloy contacts
- No cadmium used in contacts
- Highly reliable auxiliary contacts use bifurcated double bridge contact form
- Direct panel mount with screws or 35mm DIN rail (9F to 65F)
- Conforms to IEC standards: EN60947-1, EN60947-4-1, EN-60947-5-1
- Approval standards: UL508 (UL File No. E67770, E184169)



## Ordering Information

## ■ IEC CONTACTORS

- Specify the maximum AC3 current code for the contactor in place of □.
- Specify the coil voltage code for the contactor in place of \*\*\*\*.
- This part number is not indicated on the label of the contactor.

YS1N-□ F11 \*\*\*\*

Completed Part Number of Contactors

## ① Product Series

YS1N: Non-reversing contactor, AC controlled  
 YS1R: Reversing contactor, AC controlled  
 YS3N: Non-reversing contactor, DC controlled  
 YS3R: Reversing contactor, DC controlled

## ② a) Approximate Maximum AC3 Current

## AC or DC Controlled Contactors

9:9A, 12:12A, 20:20A, 25:25A, 32:32A, 38:38A,  
 40:40A, 50:50A, 65:65A, 80:80A, 100:100A, 125:125A

## AC Contactors Only

150:150A, 180:180A, 220:220A, 300:300A

## b) Type of Contactor

F: AC controlled all sizes  
 FG2: DC Controlled, sizes 9-65  
 FG: DC Controlled, sizes 80-125

## ③ Auxiliary Contact Configuration (Built onto contactor)

01: with 1NC, only for contactors sizes 9F-12F  
 10: with 1NO, only for contactors sizes 9F-12F  
 11: with 1NO-1NC, only for contactors sizes 20F-65F  
 22: with 2NO-2NC, only for contactors sizes 80F-300F

## ④ Coil Voltage

(Rated Voltage and Frequency)

|                       |                                 |
|-----------------------|---------------------------------|
| A024 : AC24V 50/60Hz  | AC Contactors<br>(all sizes)    |
| A048 : AC48V 50/60Hz  |                                 |
| A110 : AC110V 50/60Hz |                                 |
| A120 : AC120V 50/60Hz |                                 |
| A230 : AC230V 50/60Hz |                                 |
| A240 : AC240V 50/60Hz |                                 |
| A380 : AC380V 50/60Hz |                                 |
| A415 : AC415V 50/60Hz |                                 |
| A480 : AC480V 50/60Hz |                                 |
| A600 : AC600V 50/60Hz |                                 |
| D024 : DC 24V         | DC Contactors<br>(sizes 9-65)   |
| D048 : DC 48V         |                                 |
| D110 : DC 110V        |                                 |
| D220 : DC 220V        | DC Contactors<br>(sizes 80-125) |
| M100 : DC 110V        |                                 |
| M200 : DC 220V        |                                 |

(Other Voltages Available, Contact IDEC)

## Notes:

1. Use the above ordering information only when interpreting part numbers. Do not use for developing part numbers.
2. Please see tables on following pages for proper selection.
3. For specifications please see page D-16 through page D-34.

## YS1N Non-Reversing AC Contactors



### IEC Contactors, AC Controlled

| I <sup>e</sup><br>(Amps) |      | kW AC3 Rating EN 60974-4-1 |              |      |              | HP Rating per UL508 |      |              |              |              |              | Auxiliary<br>Contacts |      | Part Number     |
|--------------------------|------|----------------------------|--------------|------|--------------|---------------------|------|--------------|--------------|--------------|--------------|-----------------------|------|-----------------|
|                          |      | 3 Phase                    |              |      |              | 1 Phase             |      | 3 Phase      |              |              |              |                       |      |                 |
| AC1                      | AC3  | 220-<br>230V               | 380-<br>400V | 500V | 660-<br>690V | 120V                | 230V | 200-<br>208V | 220-<br>240V | 440-<br>480V | 550-<br>600V | N.O.                  | N.C. |                 |
| 20                       | 8.5  | 2.2                        | 4            | 5.5  | 5.5          | 1/3                 | 1    | 2            | 2            | 5            | 5            | 0                     | 1    | YS1N-9F01****   |
|                          |      |                            |              |      |              |                     |      |              |              |              |              | 1                     | 0    | YS1N-9F10****   |
| 20                       | 11.5 | 3                          | 5.5          | 7.5  | 7.5          | 3/4                 | 2    | 3            | 3            | 7.5          | 5            | 0                     | 1    | YS1N-12F01****  |
|                          |      |                            |              |      |              |                     |      |              |              |              |              | 1                     | 0    | YS1N-12F10****  |
| 30                       | 15.5 | 4                          | 7.5          | 10   | 10           | 1                   | 3    | 5            | 5            | 10           | 13.5         | 1                     | 1    | YS1N-20F11****  |
| 30                       | 22   | 5.5                        | 11           | 15   | 15           | 2                   | 3    | 7.5          | 7.5          | 15           | 15           | 1                     | 1    | YS1N-25F11****  |
| 50                       | 30   | 7.5                        | 15           | 18.5 | 18.5         | 2                   | 5    | 7.5          | 10           | 20           | 20           | 1                     | 1    | YS1N-32F11****  |
| 60                       | 37   | 11                         | 18.5         | 22   | 30           | 3                   | 7.5  | 10           | 15           | 30           | 30           | 1                     | 1    | YS1N-38F11****  |
| 60                       | 37   | 11                         | 18.5         | 22   | 30           | 3                   | 7.5  | 10           | 15           | 30           | 30           | 1                     | 1    | YS1N-40F11****  |
| 80                       | 44   | 15                         | 22           | 30   | 33           | 3                   | 7.5  | 10           | 15           | 40           | 40           | 1                     | 1    | YS1N-50F11****  |
| 80                       | 60   | 18.5                       | 30           | 37   | 37           | 5                   | 10   | 20           | 20           | 50           | 40           | 1                     | 1    | YS1N-65F11****  |
| 135                      | 85   | 22                         | 45           | 55   | 45           | 7.5                 | 15   | 25           | 25           | 60           | 60           | 2                     | 2    | YS1N-80F22****  |
| 150                      | 105  | 30                         | 55           | 65   | 65           | -                   | -    | 30           | 35           | 60           | 75           | 2                     | 2    | YS1N-100F22**** |
| 150                      | 114  | 37                         | 60           | 75   | 75           | -                   | -    | 40           | 50           | 100          | 100          | 2                     | 2    | YS1N-125F22**** |
| 200                      | 138  | 45                         | 75           | 90   | 100          | -                   | -    | 40           | 50           | 100          | 125          | 2                     | 2    | YS1N-150F22**** |
| 240                      | 179  | 55                         | 95           | 110  | 110          | -                   | -    | 50           | 60           | 125          | 125          | 2                     | 2    | YS1N-180F22**** |
| 260                      | 205  | 65                         | 110          | 132  | 132          | -                   | -    | 60           | 75           | 150          | 150          | 2                     | 2    | YS1N-220F22**** |
| 350                      | 300  | 90                         | 160          | 160  | 200          | -                   | -    | 75           | 100          | 200          | 200          | 2                     | 2    | YS1N-300F22**** |

### Codes for Control Circuit AC Voltages 50/60 Hz

| Volts AC 50/60 Hz    | 24   | 48   | 120  | 220  | 240  | 380  | 415  | 480  |
|----------------------|------|------|------|------|------|------|------|------|
| Code to replace **** | A024 | A048 | A120 | A220 | A240 | A380 | A415 | A480 |



Consult an IDEC representative for other coil voltages.  
 For accessories, see page D-12.  
 For specifications, see page D-16 through D-34.  
 For dimensions, see pages D-35.  
 For other application tables, see page D-51.

## YS3N Non-Reversing DC Contactors



D

IEC Contactors

## IEC Contactors, DC Controlled

| I <sup>e</sup><br>(Amps) |      | KW AC3 Rating EN 60974-4-1 |              |      |              | HP Rating per UL508 |      |              |              |              |              | Auxiliary<br>Contacts |      | Part Number      |
|--------------------------|------|----------------------------|--------------|------|--------------|---------------------|------|--------------|--------------|--------------|--------------|-----------------------|------|------------------|
|                          |      | 3 Phase                    |              |      |              | 1 Phase             |      | 3 Phase      |              |              |              |                       |      |                  |
| AC1                      | AC3  | 220-<br>230V               | 380-<br>400V | 500V | 660-<br>690V | 120V                | 230V | 200-<br>208V | 220-<br>240V | 440-<br>480V | 550-<br>600V | N.O.                  | N.C. |                  |
| 20                       | 8.5  | 2.2                        | 4            | 5.5  | 5.5          | 1/3                 | 1    | 2            | 2            | 5            | 5            | 0                     | 1    | YS3N-9FG201****  |
|                          |      |                            |              |      |              |                     |      |              |              |              |              | 1                     | 0    | YS3N-9FG210****  |
| 20                       | 11.5 | 3                          | 5.5          | 7.5  | 7.5          | 3/4                 | 2    | 3            | 3            | 7.5          | 5            | 0                     | 1    | YS3N-12FG201**** |
|                          |      |                            |              |      |              |                     |      |              |              |              |              | 1                     | 0    | YS3N-12FG210**** |
| 30                       | 15.5 | 4                          | 7.5          | 10   | 10           | 1                   | 3    | 5            | 5            | 10           | 13.5         | 1                     | 1    | YS3N-20FG211**** |
| 30                       | 22   | 5.5                        | 11           | 15   | 15           | 2                   | 3    | 7.5          | 7.5          | 15           | 15           | 1                     | 1    | YS3N-25FG211**** |
| 50                       | 30   | 7.5                        | 15           | 18.5 | 18.5         | 2                   | 5    | 7.5          | 10           | 20           | 20           | 1                     | 1    | YS3N-32FG211**** |
| 60                       | 37   | 11                         | 18.5         | 22   | 30           | 3                   | 7.5  | 10           | 15           | 30           | 30           | 1                     | 1    | YS3N-38FG211**** |
| 60                       | 37   | 11                         | 18.5         | 22   | 30           | 3                   | 7.5  | 10           | 15           | 30           | 30           | 1                     | 1    | YS3N-40FG211**** |
| 80                       | 44   | 15                         | 22           | 30   | 33           | 3                   | 7.5  | 10           | 15           | 40           | 40           | 1                     | 1    | YS3N-50FG211**** |
| 80                       | 60   | 18.5                       | 30           | 37   | 37           | 5                   | 10   | 20           | 20           | 50           | 40           | 1                     | 1    | YS3N-65FG211**** |
| 135                      | 85   | 22                         | 45           | 55   | 45           | 7.5                 | 15   | 25           | 25           | 60           | 60           | 2                     | 2    | YS3N-80FG22****  |
| 150                      | 105  | 30                         | 55           | 65   | 65           | -                   | -    | 30           | 35           | 60           | 75           | 2                     | 2    | YS3N-100FG22**** |
| 150                      | 114  | 37                         | 60           | 75   | 75           | -                   | -    | 40           | 50           | 100          | 100          | 2                     | 2    | YS3N-125FG22**** |

| Codes for Control Circuit DC Voltages, 9F through 65F |      |      |      |      | Codes for 80F/100F/125F |      |
|-------------------------------------------------------|------|------|------|------|-------------------------|------|
| Volts DC                                              | 24   | 48   | 110  | 220  | 110                     | 220  |
| Code to replace ****                                  | D024 | D048 | D110 | D220 | M100                    | M200 |



Consult an IDEC representative for other coil voltages.

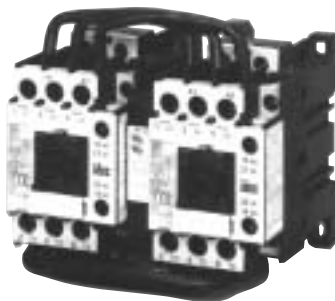
For accessories, see page D-12.

For specifications, see pages D-16 through D-34.

For dimensions, see page D-35.

For other application tables, see page D-51.

## YS1R Reversing AC Contactors



### IEC Contactors, AC Controlled

**D**

IEC Contactors

| I <sup>e</sup><br>(Amps) |      | kW AC3 Rating EN 60974-4-1 |              |      |              | HP Rating per UL508 |      |              |              |              |              | Auxiliary<br>Contacts |      | Part Number     |
|--------------------------|------|----------------------------|--------------|------|--------------|---------------------|------|--------------|--------------|--------------|--------------|-----------------------|------|-----------------|
|                          |      | 3 Phase                    |              |      |              | 1 Phase             |      | 3 Phase      |              |              |              |                       |      |                 |
| AC1                      | AC3  | 220-<br>230V               | 380-<br>400V | 500V | 660-<br>690V | 120V                | 230V | 200-<br>208V | 220-<br>240V | 440-<br>480V | 550-<br>600V | N.O.                  | N.C. |                 |
| 20                       | 8.5  | 2.2                        | 4            | 5.5  | 5.5          | 1/3                 | 1    | 2            | 2            | 5            | 5            | 0                     | 1    | YS1R-9F01****   |
|                          |      |                            |              |      |              |                     |      |              |              |              |              | 1                     | 0    | YS1R-9F10****   |
| 20                       | 11.5 | 3                          | 5.5          | 7.5  | 7.5          | 3/4                 | 2    | 3            | 3            | 7.5          | 5            | 0                     | 1    | YS1R-12F01****  |
|                          |      |                            |              |      |              |                     |      |              |              |              |              | 1                     | 0    | YS1R-12F10****  |
| 30                       | 15.5 | 4                          | 7.5          | 10   | 10           | 1                   | 3    | 5            | 5            | 10           | 13.5         | 1                     | 1    | YS1R-20F11****  |
| 30                       | 22   | 5.5                        | 11           | 15   | 15           | 2                   | 3    | 7.5          | 7.5          | 15           | 15           | 1                     | 1    | YS1R-25F11****  |
| 50                       | 30   | 7.5                        | 15           | 18.5 | 18.5         | 2                   | 5    | 7.5          | 10           | 20           | 20           | 1                     | 1    | YS1R-32F11****  |
| 60                       | 37   | 11                         | 18.5         | 22   | 30           | 3                   | 7.5  | 10           | 15           | 30           | 30           | 1                     | 1    | YS1R-38F11****  |
| 60                       | 37   | 11                         | 18.5         | 22   | 30           | 3                   | 7.5  | 10           | 15           | 30           | 30           | 1                     | 1    | YS1R-40F11****  |
| 80                       | 44   | 15                         | 22           | 30   | 33           | 3                   | 7.5  | 10           | 15           | 40           | 40           | 1                     | 1    | YS1R-50F11****  |
| 80                       | 60   | 18.5                       | 30           | 37   | 37           | 5                   | 10   | 20           | 20           | 50           | 40           | 1                     | 1    | YS1R-65F11****  |
| 135                      | 85   | 22                         | 45           | 55   | 45           | 7.5                 | 15   | 25           | 25           | 60           | 60           | 2                     | 2    | YS1R-80F22****  |
| 150                      | 105  | 30                         | 55           | 65   | 65           | -                   | -    | 30           | 35           | 60           | 75           | 2                     | 2    | YS1R-100F22**** |
| 150                      | 114  | 37                         | 60           | 75   | 75           | -                   | -    | 40           | 50           | 100          | 100          | 2                     | 2    | YS1R-125F22**** |
| 200                      | 138  | 45                         | 75           | 90   | 100          | -                   | -    | 40           | 50           | 100          | 125          | 2                     | 2    | YS1R-150F22**** |
| 240                      | 179  | 55                         | 95           | 110  | 110          | -                   | -    | 50           | 60           | 125          | 125          | 2                     | 2    | YS1R-180F22**** |
| 260                      | 205  | 65                         | 110          | 132  | 132          | -                   | -    | 60           | 75           | 150          | 150          | 2                     | 2    | YS1R-220F22**** |
| 350                      | 300  | 90                         | 160          | 160  | 200          | -                   | -    | 75           | 100          | 200          | 200          | 2                     | 2    | YS1R-300F22**** |

#### Codes for Control Circuit AC Voltages 50/60 Hz

| Volts AC 50/60 Hz    | 24   | 48   | 120  | 220  | 240  | 380  | 415  | 480  |
|----------------------|------|------|------|------|------|------|------|------|
| Code to replace **** | A024 | A048 | A120 | A220 | A240 | A380 | A415 | A480 |



Consult an IDEC representative for other coil voltages.

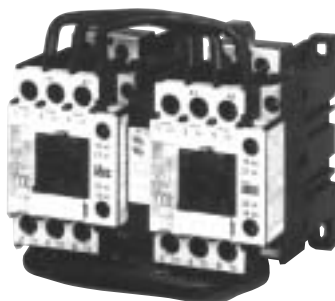
For accessories, see page D-12.

For specifications, see page D-16 through D-34.

For dimensions, see pages D-35.

For other application tables, see page D-51

## YS3R Reversing DC Contactors



D

## IEC Contactors, DC Controlled

IEC Contactors

| I <sup>e</sup><br>(Amps) |      | kW AC3 Rating EN 60974-4-1 |              |      |              | HP Rating per UL508 |      |              |              |              |              | Auxiliary<br>Contacts |      | Part Number      |
|--------------------------|------|----------------------------|--------------|------|--------------|---------------------|------|--------------|--------------|--------------|--------------|-----------------------|------|------------------|
|                          |      | 3 Phase                    |              |      |              | 1 Phase             |      | 3 Phase      |              |              |              |                       |      |                  |
| AC1                      | AC3  | 220-<br>230V               | 380-<br>400V | 500V | 660-<br>690V | 120V                | 230V | 200-<br>208V | 220-<br>240V | 440-<br>480V | 550-<br>600V | N.O.                  | N.C. |                  |
| 20                       | 8.5  | 2.2                        | 4            | 5.5  | 5.5          | 1/3                 | 1    | 2            | 2            | 5            | 5            | 0                     | 1    | YS3R-9FG201****  |
|                          |      |                            |              |      |              |                     |      |              |              |              |              | 1                     | 0    | YS3R-9FG210****  |
| 20                       | 11.5 | 3                          | 5.5          | 7.5  | 7.5          | 3/4                 | 2    | 3            | 3            | 7.5          | 5            | 0                     | 1    | YS3R-12FG201**** |
|                          |      |                            |              |      |              |                     |      |              |              |              |              | 1                     | 0    | YS3R-12FG210**** |
| 30                       | 15.5 | 4                          | 7.5          | 10   | 10           | 1                   | 3    | 5            | 5            | 10           | 13.5         | 1                     | 1    | YS3R-20FG211**** |
| 30                       | 22   | 5.5                        | 11           | 15   | 15           | 2                   | 3    | 7.5          | 7.5          | 15           | 15           | 1                     | 1    | YS3R-25FG211**** |
| 50                       | 30   | 7.5                        | 15           | 18.5 | 18.5         | 2                   | 5    | 7.5          | 10           | 20           | 20           | 1                     | 1    | YS3R-32FG211**** |
| 60                       | 37   | 11                         | 18.5         | 22   | 30           | 3                   | 7.5  | 10           | 15           | 30           | 30           | 1                     | 1    | YS3R-38FG211**** |
| 60                       | 37   | 11                         | 18.5         | 22   | 30           | 3                   | 7.5  | 10           | 15           | 30           | 30           | 1                     | 1    | YS3R-40FG211**** |
| 80                       | 44   | 15                         | 22           | 30   | 33           | 3                   | 7.5  | 10           | 15           | 40           | 40           | 1                     | 1    | YS3R-50FG211**** |
| 80                       | 60   | 18.5                       | 30           | 37   | 37           | 5                   | 10   | 20           | 20           | 50           | 40           | 1                     | 1    | YS3R-65FG211**** |
| 135                      | 85   | 22                         | 45           | 55   | 45           | 7.5                 | 15   | 25           | 25           | 60           | 60           | 2                     | 2    | YS3R-80FG22****  |
| 150                      | 105  | 30                         | 55           | 65   | 65           | -                   | -    | 30           | 35           | 60           | 75           | 2                     | 2    | YS3R-100FG22**** |
| 150                      | 114  | 37                         | 60           | 75   | 75           | -                   | -    | 40           | 50           | 100          | 100          | 2                     | 2    | YS3R-125FG22**** |

| Codes for Control Circuit DC Voltages, 9F through 65F |      |      |      |      | Codes for 80F/100F/125F |      |
|-------------------------------------------------------|------|------|------|------|-------------------------|------|
| Volts DC                                              | 24   | 48   | 110  | 220  | 110                     | 220  |
| Code to replace ****                                  | D024 | D048 | D110 | D220 | M100                    | M200 |



Consult an IDEC representative for other coil voltages.

For accessories, see page D-12.

For specifications, see page D-16 through D-34.

For dimensions, see pages D-35.

For other application tables, see page D-51

## Thermal Overload Relays

YS1T-RHA thermal overload relays are designed to meet the heating characteristics of induction motors with insulation class type E. Various functions can be selected by using the reset button and adjustment button on top of the thermal overload relay.

**Key features of the YS1T Series include:**

- Single-phase protection
- Bi-metallic
- Compact and sturdy
- Ambient temperature compensation mechanism
- Manual/automatic reset operation
- 3 element type with phase failure protection
- Conforms to IEC Standards EN60947-1, EN60947-4-1, EN60947-5-1
- Approval standards UL508, UL File No. E158813



## Ordering Information

## ■ THERMAL OVERLOAD RELAYS

- Part number is indicated on the label of the thermal overload relay.

YS1T-RHA    ☐    ☐☐☐D

Completed Part Number of Thermal Overload Relay

### ① Product Series

② Applicable Maximum Motor Current

**25F:** 25A, contactor sizes 9F, 12F, 20F, 25F

**38F:** 40A, contactor sizes 32F, 38F

**65F:** 65A, contactor sizes 40F, 50F, 65F

**125F:** 125A, contactor sizes 80F, 100F, 125F

**150F:** 150A, contactor sizes 150F or 180F

**180F:** 180A, contactor sizes 150F or 180F

\***300F:** 300A, contactor size 220F or 300F

**\*400F:** 400A, contactor size 220F or 300F

Note: \*With Current Transformer (CT)

#### ④ Function

### D: 3-element Type with Phase Failure Protection

| ③ Current setting<br>range code | Adjustable<br>current range | Current setting<br>range code | Adjustable<br>current range |
|---------------------------------|-----------------------------|-------------------------------|-----------------------------|
| P13 :                           | 0.1 - 0.16                  | 43P :                         | 37 - 50                     |
| P20 :                           | 0.16 - 0.25                 | 56P :                         | 48 - 65                     |
| P30 :                           | 0.25 - 0.4                  | 68P :                         | 55 - 80                     |
| P50 :                           | 0.4 - 0.63                  | 80P :                         | 65 - 95                     |
| P80 :                           | 0.63 - 1                    | 105 :                         | 85 - 125                    |
| 1P3 :                           | 1 - 1.6                     | 120* :                        | 96 - 155                    |
| 1P5 :                           | 1.25 - 2                    | 135 :                         | 110 - 160                   |
| 2P0 :                           | 1.6 - 2.5                   | 155 :                         | 125 - 185                   |
| 3P0 :                           | 2.5 - 4                     | 160* :                        | 128 - 200                   |
| 5P0 :                           | 4 - 6                       | 180* :                        | 150 - 240                   |
| 7P0 :                           | 5.5 - 8                     | 240* :                        | 192 - 300                   |
| 8P5 :                           | 7 - 10                      |                               |                             |
| 11P :                           | 9 - 13                      |                               |                             |
| 15P :                           | 12 - 18                     |                               |                             |
| 21P :                           | 17 - 25                     |                               |                             |
| 27P :                           | 23 - 32                     |                               |                             |
| 32P :                           | 28 - 36                     |                               |                             |
| 35P :                           | 30 - 40                     |                               |                             |
|                                 |                             | Note : *With CT               |                             |

Note : \*With CT

Verify appropriate current setting range code with the correct size overload using the complete part list on the following page.

Notes:

1. Use the above ordering information only when interpreting part numbers. Do not use for developing part numbers.
2. For applicable combinations of contactors and thermal overload relays, please consult following page.
3. For specifications and settings please see pages D-16 through D-34.

## Thermal Overload Relays

| Product Series                                                                                                                                         | Current Range | Range Code | Part Number for Overload | Applicable Contactor Size           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------|--------------------------|-------------------------------------|
| <br>YS1T-RHA25F                                                       | 0.1-0.16A     | P13        | YS1T-RHA25FP13D          | YS-9F<br>YS-12F<br>YS-20F<br>YS-25F |
|                                                                                                                                                        | 0.16-0.25A    | P20        | YS1T-RHA25FP20D          |                                     |
|                                                                                                                                                        | 0.25-0.4A     | P30        | YS1T-RHA25FP30D          |                                     |
|                                                                                                                                                        | 0.40-0.63A    | P50        | YS1T-RHA25FP50D          |                                     |
|                                                                                                                                                        | 0.63-1.0A     | P80        | YS1T-RHA25FP80D          |                                     |
|                                                                                                                                                        | 1.0-1.6A      | 1P3        | YS1T-RHA25F1P3D          |                                     |
|                                                                                                                                                        | 1.25-2.0A     | 1P5        | YS1T-RHA25F1P5D          |                                     |
|                                                                                                                                                        | 1.6-2.5A      | 2P0        | YS1T-RHA25F2P0D          |                                     |
|                                                                                                                                                        | 2.5-4.0A      | 3P0        | YS1T-RHA25F3P0D          |                                     |
|                                                                                                                                                        | 4.0-6.0A      | 5P0        | YS1T-RHA25F5P0D          |                                     |
|                                                                                                                                                        | 5.5-8.0A      | 7P0        | YS1T-RHA25F7P0D          |                                     |
|                                                                                                                                                        | 7.0-10.0A     | 8P5        | YS1T-RHA25F8P5D          |                                     |
| <br>YS1T-RHA38F                                                       | 9.0-13.0A     | 11P        | YS1T-RHA25F11PD          | YS-32F<br>YS-38F                    |
|                                                                                                                                                        | 12.0-18.0A    | 15P        | YS1T-RHA25F15PD          |                                     |
|                                                                                                                                                        | 17.0-25.0     | 21P        | YS1T-RHA25F21PD          |                                     |
|                                                                                                                                                        | 9-13A         | 11P        | YS1T-RHA38F11PD          |                                     |
|                                                                                                                                                        | 12-18A        | 15P        | YS1T-RHA38F15PD          |                                     |
|                                                                                                                                                        | 17-25A        | 21P        | YS1T-RHA38F21PD          |                                     |
| <br>YS1T-RHA65F                                                       | 23-32A        | 27P        | YS1T-RHA38F27PD          | YS-40F<br>YS-50F<br>YS-65F          |
|                                                                                                                                                        | 28-36A        | 32P        | YS1T-RHA38F32PD          |                                     |
|                                                                                                                                                        | 30-40A        | 35P        | YS1T-RHA38F35PD          |                                     |
|                                                                                                                                                        | 12-18A        | 15P        | YS1T-RHA65F15PD          |                                     |
|                                                                                                                                                        | 17-25A        | 21P        | YS1T-RHA65F21PD          |                                     |
|                                                                                                                                                        | 23-32A        | 27P        | YS1T-RHA65F27PD          |                                     |
| <br>YS1T-RHA125F                                                     | 28-36A        | 32P        | YS1T-RHA65F32PD          | YS-80F<br>YS-100F<br>YS-125F        |
|                                                                                                                                                        | 30-40A        | 35P        | YS1T-RHA65F35PD          |                                     |
|                                                                                                                                                        | 37-50A        | 43P        | YS1T-RHA65F43PD          |                                     |
|                                                                                                                                                        | 48-65A        | 56P        | YS1T-RHA65F56PD          |                                     |
|                                                                                                                                                        | 37-50A        | 43P        | YS1T-RHA125F43PD         |                                     |
|                                                                                                                                                        | 48-65A        | 56P        | YS1T-RHA125F56PD         |                                     |
| <br>YS1T-RHA150F                                                    | 55-80A        | 68P        | YS1T-RHA125F68PD         | YS-150F<br>YS-180F                  |
|                                                                                                                                                        | 65-95A        | 80P        | YS1T-RHA125F80PD         |                                     |
|                                                                                                                                                        | 85-125A       | 105        | YS1T-RHA125F105D         |                                     |
|                                                                                                                                                        | 65-95A        | 80P        | YS1T-RHA150F80PD         |                                     |
|                                                                                                                                                        | 85-125A       | 105        | YS1T-RHA150F105D         |                                     |
|                                                                                                                                                        | 105-160A      | 135        | YS1T-RHA150F135D         |                                     |
| <br>YS1T-RHA180F                                                    | 85-125A       | 105        | YS1T-RHA180F105D         | YS-220F<br>YS-300F                  |
|                                                                                                                                                        | 105-160A      | 135        | YS1T-RHA180F135D         |                                     |
|                                                                                                                                                        | 125-185A      | 155        | YS1T-RHA180F155D         |                                     |
|                                                                                                                                                        | 96-150A       | 120        | YS1T-RHA300F120D         |                                     |
|                                                                                                                                                        | 150-240A      | 180        | YS1T-RHA300F180D         |                                     |
|                                                                                                                                                        | 128-200A      | 160        | YS1T-RHA400F160D         |                                     |
| <br>*YS1T-RHA300F<br>*YS1T-RHA400F<br><br>*with current transformer | 200-300A      | 240        | YS1T-RHA400F240D         |                                     |

## D

## IEC Contactors

### ■ STARTERS (Contactors with Thermal Overload Relay)

- Select the appropriate contactor (AC or DC, reversing or non-reversing) from pages D-5 through D-8.
- Select the correct size overload from page D-9 through D-10.
- The complete assembled part number is the same as the contactor with the following changes:  
(See examples below)

Completed Part Number of Reversing Starter

### ①Product Series

YS1N contactor ----> **YS2N** AC non-reversing Starter  
 YS1R contactor ----> **YS2R** AC reversing Starter  
 YS3N contactor ----> **YS4N** DC non-reversing Starter  
 YS3R contactor ----> **YS4R** DC reversing Starter

② Maximum AC3 Current (replaced exactly from contactor P/N)

- ☐ F: ☐ is replaced by size, 9-300 for AC controlled
- ☐ FG2: ☐ is replaced by size, 9-65 for DC controlled
- ☐ FG: ☐ is replaced by size, 80-125 for DC controlled

### ③ Thermal Overload Relay

#### D: 3-element Type with Phase Failure Protection

④ Auxiliary Contact Configuration (Replaced exactly from contactor P/N)

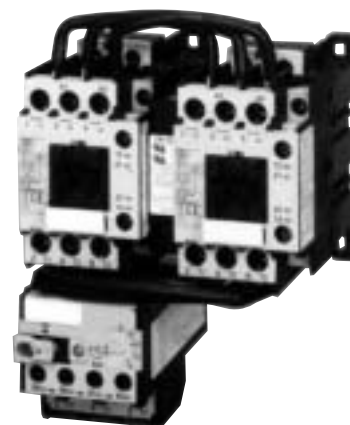
- |                                                |
|------------------------------------------------|
| 01: with 1NC, for contactor sizes 9F-12F       |
| 10: with 1NO, for contactor sizes 9F-12F       |
| 11: with 1NO-1NC, for contactor sizes 20F-65F  |
| 22: with 2NO-2NC, for contactor sizes 80F-300F |

⑤ Coil Voltage (Replaced exactly from contactor P/N)

⑥ Thermal Overload Relay, Type YS1T-RHA

T: Thermal Overload Relay +

###: Three character code designating of Current Setting **Range Code** (See page D-10.)



EXAMPLE #1 :

**Contactor :** YS1R-9F10A120 + **Overload:** YS1T-RHA25F5P0D

①                  ②   ④                  ⑤                                          ⑥

**STARTER: YS2R-9FD10A120T5P0**

①                      ② ③ ④                      ⑤                      ⑥

EXAMPLE #2 :

**Contactor :** YS3N-65FG211D024 + **Overload:** YS1T-RHA65F43PD

①                  ②                  ④                  ⑤                                          ⑥

**STARTER: YS4N-65FG2D11D024T43P**

①                      ②                      ③ ④                      ⑤                      ⑥



## Accessories

| Accessory                                                                                                                                    | Description                          |                |                       |                | Part Number                                                           | Notes                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------|-----------------------|----------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Auxiliary Contact Blocks</b><br>                          | Number of Poles                      | Mounting Style | Contact Configuration |                | Auxiliary contacts only available for contactors from 9F through 65F. |                                                                                                    |
|                                                                                                                                              |                                      |                | NO                    | NC             |                                                                       |                                                                                                    |
|                                                                                                                                              | 2 Poles                              | Side           | 1                     | 1              |                                                                       | YS1A-TAS211F                                                                                       |
|                                                                                                                                              |                                      | Top            | 0                     | 2              |                                                                       | YS1A-TAH202F                                                                                       |
|                                                                                                                                              |                                      |                | 1                     | 1              |                                                                       | YS1A-TAH211F                                                                                       |
|                                                                                                                                              |                                      |                | 2                     | 0              |                                                                       | YS1A-TAH220F                                                                                       |
|                                                                                                                                              | 4 Poles                              |                | 0                     | 4              |                                                                       | YS1A-TAH404F                                                                                       |
|                                                                                                                                              |                                      |                | 1                     | 3              |                                                                       | YS1A-TAH413F                                                                                       |
|                                                                                                                                              |                                      |                | 2                     | 2              |                                                                       | YS1A-TAH422F                                                                                       |
|                                                                                                                                              |                                      |                | 3                     | 1              |                                                                       | YS1A-TAH431F                                                                                       |
|                                                                                                                                              | 4                                    |                | 0                     | YS1A-TAH440F   |                                                                       |                                                                                                    |
| <b>Replacement Auxiliary Contact Block</b>                                                                                                   | 2 Poles                              | Side           | 1                     | 1              | YS1A-TAS211FL                                                         | Replacements for attached auxiliary contact blocks on contactors 80F through 300F                  |
| <b>Power Wire Kits</b><br>                                 | For use with YS-9F through YS-12F    |                |                       |                | YS9Z-KIF411344-A                                                      |                                                                                                    |
|                                                                                                                                              | For use with YS-20F through YS-25F   |                |                       |                | YS9Z-KIF411345-A                                                      |                                                                                                    |
|                                                                                                                                              | For use with YS-32F through YS-38F   |                |                       |                | YS9Z-KIF411346-A                                                      |                                                                                                    |
|                                                                                                                                              | For use with YS-40F through YS-65F   |                |                       |                | YS9Z-KIF411347-A                                                      |                                                                                                    |
|                                                                                                                                              | For use with YS-80F through YS-125F  |                |                       |                | YS9Z-KIF411348-A                                                      |                                                                                                    |
|                                                                                                                                              | For use with YS-150F                 |                |                       |                | YS9Z-KIF411588-A                                                      |                                                                                                    |
|                                                                                                                                              | For use with YS-180F                 |                |                       |                | YS9Z-KIF411588-B                                                      |                                                                                                    |
|                                                                                                                                              | For use with YS-220F through YS-300F |                |                       |                | YS9Z-KIF411590-A                                                      |                                                                                                    |
| <b>Mechanical Interlock</b><br>                           | For use with YS-9F through YS-65F    |                |                       |                | YS9Z-TMI65                                                            |                                                                                                    |
|                                                                                                                                              | For use with YS-80F through YS-300F  |                |                       |                | YS9Z-TMI125                                                           |                                                                                                    |
| <b>Marking Tags</b>                                                                                                                          | For use with YS-9F through YS-65F    |                |                       |                | YS9Z-TIP66                                                            |                                                                                                    |
| <b>Overload DIN Rail Bracket</b><br>                      | For use with YS1T-RHA65F overload    |                |                       |                | YS9Z-TIB65F                                                           |                                                                                                    |
| <b>Pushbutton for Overload Reset w/ Extension Rod</b><br> | <b>Assembled</b>                     |                |                       |                |                                                                       | * Choose cap color<br>B= Black<br>Y= Yellow<br>N= Gray<br>G= Green<br>S= Blue<br>R= Red<br>W=White |
|                                                                                                                                              | Blank Cap / No engraving             |                |                       |                | HW1B-M1RS-*T                                                          |                                                                                                    |
|                                                                                                                                              | Cap engraved with "R"                |                |                       |                | HW1B-M1RS-*T-ENG-R                                                    |                                                                                                    |
|                                                                                                                                              | Cap engraved with "RESET"            |                |                       |                | HW1B-M1RS-*T-ENG-RESET                                                |                                                                                                    |
|                                                                                                                                              | <b>Sub Assembled</b>                 |                |                       |                |                                                                       |                                                                                                    |
|                                                                                                                                              | Operator                             |                |                       |                | HW1B-M0                                                               |                                                                                                    |
|                                                                                                                                              | Blank Cap / No engraving             |                |                       |                | HW1A-B1-*                                                             |                                                                                                    |
| Rod (10 inch length; adjustable)                                                                                                             |                                      |                |                       | HW9Z-RS-TK2141 |                                                                       |                                                                                                    |

## Accessories, continued

| Accessory                                                                           | Description                                                                                                                                                                                              |                                                                          |              | Part Number       | * Applicable Size Codes                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Type                                                                                                                                                                                                     | Rated Voltage                                                            |              |                   | 25 = YS-9F to YS-25F<br>65 = YS-32F to YS-65F<br>125 = YS-80F to YS-125F<br>180 = YS-150F to YS-180F<br>300 = YS-220F to YS-300F                                                        |
|                                                                                     |                                                                                                                                                                                                          | RC Circuit                                                               | 50-127V AC   | YS9Z-TU*C120      |                                                                                                                                                                                         |
|                                                                                     |                                                                                                                                                                                                          |                                                                          | 110-240V AC  | YS9Z-TU*C240      |                                                                                                                                                                                         |
|                                                                                     | Varistor                                                                                                                                                                                                 | 50-127V AC                                                               | YS9Z-TU*V120 |                   |                                                                                                                                                                                         |
|                                                                                     |                                                                                                                                                                                                          | 110-240V AC                                                              | YS9Z-TU*V240 |                   |                                                                                                                                                                                         |
| 380-440V AC                                                                         |                                                                                                                                                                                                          | YS9Z-TU*V440                                                             |              |                   |                                                                                                                                                                                         |
|    | Isolates the coil of contactor from PLC output by providing an easy to mount module that takes 24V DC input and switches up to 380V AC for contactor coils. External source required for contactor coil. |                                                                          |              | YS9Z-TCU500UH*    | 12 = YS-9F to YS-12F<br>25 = YS-20F- to YS-25F<br>38 = YS-32F to YS-38F<br>65 = YS-40F to YS-65F<br>125 = YS-80F to YS-125F<br>180 = YS-150F to YS-180F<br>300 = YS-220F to YS-300F     |
|    | Input Voltage                                                                                                                                                                                            | Contact Style                                                            |              |                   | See Section G for further information                                                                                                                                                   |
|                                                                                     | 100V AC to 240V AC<br>50/60 Hz                                                                                                                                                                           | Star: Delayed SPST-NO<br>Delta: Delayed SPST-NO                          | 8-pin        | GT3S-1AF20        |                                                                                                                                                                                         |
|                                                                                     |                                                                                                                                                                                                          |                                                                          | 11-pin       | GT3S-1EAF20       |                                                                                                                                                                                         |
|                                                                                     |                                                                                                                                                                                                          | Star: Delayed SPST-NO<br>Delta: Delayed SPST-NO<br>Instantaneous SPST-NO | 8-pin        | GT3S-2AF20        |                                                                                                                                                                                         |
|                                                                                     |                                                                                                                                                                                                          |                                                                          | 11-pin       | GT3S-2EAF20       |                                                                                                                                                                                         |
|  | AC Coils for AC Contactors                                                                                                                                                                               |                                                                          |              |                   | A024 = 24V AC 50/60 Hz<br>A048 = 48V AC 50/60 Hz<br>A120 = 120V AC 50/60 Hz<br>A240 = 240V AC 50/60 Hz<br>A380 = 380V AC 50/60 Hz<br>A480 = 480V AC 50/60 Hz<br>A600 = 600V AC 50/60 Hz |
|                                                                                     | For use with YS-9F through YS-12F                                                                                                                                                                        |                                                                          |              | YS9Z-KIL70461-*   |                                                                                                                                                                                         |
|                                                                                     | For use with YS-20F through YS-25F                                                                                                                                                                       |                                                                          |              | YS9Z-KIL70462-*   |                                                                                                                                                                                         |
|                                                                                     | For use with YS-32F to YS-38F                                                                                                                                                                            |                                                                          |              | YS9Z-KIL70463-*   |                                                                                                                                                                                         |
|                                                                                     | For use with YS-40F to YS-65F                                                                                                                                                                            |                                                                          |              | YS9Z-KIL70464-*   |                                                                                                                                                                                         |
|                                                                                     | For use with YS-80F to YS-125F                                                                                                                                                                           |                                                                          |              | YS9Z-KIL70518-*   |                                                                                                                                                                                         |
|                                                                                     | For use with YS-150F to YS-180F                                                                                                                                                                          |                                                                          |              | YS9Z-KIL70466-*   |                                                                                                                                                                                         |
|                                                                                     | For use with YS-220F to YS-300F                                                                                                                                                                          |                                                                          |              | YS9Z-KIL70467-*   |                                                                                                                                                                                         |
|                                                                                     | DC Coils for DC Contactors 9F through 65F                                                                                                                                                                |                                                                          |              |                   | D024 = 24V DC<br>D048 = 48V DC<br>D110 = 110V DC<br>D220 = 220V DC                                                                                                                      |
|                                                                                     | For use with YS-9F through YS-25F                                                                                                                                                                        |                                                                          |              | YS9Z-KIL70562-*   |                                                                                                                                                                                         |
|                                                                                     | For use with YS-32F through YS-38F                                                                                                                                                                       |                                                                          |              | YS9Z-KIL70564-*   |                                                                                                                                                                                         |
|                                                                                     | For use with YS-40F through YS-65F                                                                                                                                                                       |                                                                          |              | YS9Z-KI411880-*   |                                                                                                                                                                                         |
|                                                                                     | DC Coils for DC Contactors 80F through 125F                                                                                                                                                              |                                                                          |              |                   | D110 = 110V DC<br>D220 = 220V DC                                                                                                                                                        |
|                                                                                     | For use with YS-80F through YS-125F #                                                                                                                                                                    |                                                                          |              | YS9Z-KIL70519-*   |                                                                                                                                                                                         |
|                                                                                     | AC/DC Module for 80F through 125F DC coils only                                                                                                                                                          |                                                                          |              |                   | Used in conjunction with YS9Z-KIL-70519-* for DC coils 80F through 125F only.                                                                                                           |
|                                                                                     | 100V AC/DC Module for YS-80F through YS-125F                                                                                                                                                             |                                                                          |              | YS9Z-KIFCA840546A |                                                                                                                                                                                         |
|                                                                                     | 200V AC/DC Module for YS-80F through YS-125F                                                                                                                                                             |                                                                          |              | YS9Z-KIFCA840546B |                                                                                                                                                                                         |



# — YS9Z-KIL70519\* is available ONLY in 110V (D110) or 220V (D220) models.

## Accessories, continued

| Accessory                                                                                                                        | Description                     | Part Number                                  |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------|
|                                                                                                                                  |                                 | each part number is for ONE (1) main contact |
|  <p><b>6 pieces required per contactor</b></p>  | <b>Stationary Main Contacts</b> |                                              |
|                                                                                                                                  | For use with YS-20F             | YS9Z-KIF409056-A                             |
|                                                                                                                                  | For use with YS-25F             | YS9Z-KIF409057-A                             |
|                                                                                                                                  | For use with YS-32F             | YS9Z-KIF410179-A                             |
|                                                                                                                                  | For use with YS-38F             | YS9Z-KIF410180-A                             |
|                                                                                                                                  | For use with YS-40F             | YS9Z-KIF409083-A                             |
|                                                                                                                                  | For use with YS-50F             | YS9Z-KIF409083-B                             |
|                                                                                                                                  | For use with YS-65F             | YS9Z-KIF409083-C                             |
|                                                                                                                                  | For use with YS-80F             | YS9Z-KIF410697-A                             |
|                                                                                                                                  | For use with YS-100F            | YS9Z-KIF410697-B                             |
|                                                                                                                                  | For use with YS-125F            | YS9Z-KIF410697-C                             |
|                                                                                                                                  | For use with YS-150F            | YS9Z-KIF410853-A                             |
|                                                                                                                                  | For use with YS-180F            | YS9Z-KIF410854-A                             |
|                                                                                                                                  | For use with YS-220F            | YS9Z-KIF411841-A                             |
|                                                                                                                                  | For use with YS-300F            | YS9Z-KIF411842-A                             |
|  <p><b>3 pieces required per contactor</b></p> | <b>Moving Main Contacts</b>     |                                              |
|                                                                                                                                  | For use with YS-20F             | YS9Z-KIF409059-A                             |
|                                                                                                                                  | For use with YS-25F             | YS9Z-KIF409060-A                             |
|                                                                                                                                  | For use with YS-32F             | YS9Z-KIF410167-A                             |
|                                                                                                                                  | For use with YS-38F             | YS9Z-KIF410168-A                             |
|                                                                                                                                  | For use with YS-40F             | YS9Z-KIF409155-A                             |
|                                                                                                                                  | For use with YS-50F             | YS9Z-KIF409155-B                             |
|                                                                                                                                  | For use with YS-65F             | YS9Z-KIF409155-C                             |
|                                                                                                                                  | For use with YS-80F             | YS9Z-KIF410698-A                             |
|                                                                                                                                  | For use with YS-100F            | YS9Z-KIF410698-B                             |
|                                                                                                                                  | For use with YS-125F            | YS9Z-KIF410698-C                             |
|                                                                                                                                  | For use with YS-150F            | YS9Z-KIF410856-A                             |
|                                                                                                                                  | For use with YS-180F            | YS9Z-KIF410857-A                             |
|                                                                                                                                  | For use with YS-220F            | YS9Z-KIF411843-A                             |
|                                                                                                                                  | For use with YS-300F            | YS9Z-KIF411844-A                             |



All part numbers refer to one piece quantity (not sets).

**Accessories, continued**

| Part Number                                                                                                    | Description                                                               | For Use With                                                                                           |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>BAA1000</b><br>            | 35mm Aluminum DIN Rail 7.5 mm deep<br>1 meter long                        | YS1N-9F through YS1N-38F Contactors                                                                    |
| <b>BNDN1000</b><br>           | 35mm Aluminum DIN Rail 10.5 mm deep.<br>1 meter long                      | YS1N-9F through YS1N-38F Contactors                                                                    |
| <b>YS9Z-TIP66 Markers</b><br> | Plastic replacement markers<br>sold in 100 piece packs                    | YS-9F through YS-65F series contactors,<br>overloads relays and top mount auxiliary<br>contact blocks. |
| <b>BNL8</b><br>              | DIN Rail End Stop used to prevent<br>contactors from sliding on DIN rails | YS1N-32F/YS1N-38F<br>&<br>YS1R reversing contactors                                                    |
| <b>BNL5</b><br>             | DIN Rail End Stop used to prevent<br>contactors from sliding on DIN rails | YS1N-9F<br>YS1N-12F<br>YS1N-20F<br>YS1N-25F<br>Contactors                                              |
| <b>SR2P-05C</b><br>         | 8-pin DIN mount Finger-safe (IP20)<br>screw terminal socket               | GT3S-1AF20 timer (8 pin)<br>GT3S-2AF20 timer (8 pin)                                                   |
| <b>SR2P-06</b><br>          | 8-pin DIN mount screw terminal socket<br>open terminal construction       | GT3S-1AF20 timer (8 pin)<br>GT3S-2AF20 timer (8 pin)                                                   |
| <b>SR3P-05C</b><br>         | 11-pin DIN mount finger-safe (IP20)<br>screw terminal socket              | GT3S-1EAF20 timer (11pin)<br>GT3S-2EAF20 timer (11pin)                                                 |
| <b>SR3P-06</b><br>          | 11-pin DIN mount screw terminal socket<br>open terminal construction      | GT3S-1EAF20 (11 pin)<br>GT3S-2EAF20 (11 pin)                                                           |

## Specifications

## Contactor Circuit Supply: AC

## Characteristics

| Part Number YS1N–                     |      | 9F                                                                         | 12F | 20F | 25F  | 32F  | 38F  | 40F  | 50F  | 65F  | 80F  | 100F | 125F | 150F | 180F | 220F | 300F |
|---------------------------------------|------|----------------------------------------------------------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Rated Insulation Voltage              | V    | 690                                                                        | 690 | 690 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| Conformity to Standards               |      | NFC 63-110; VDE 0660; BS 5424; JEM 1038; EN60947-1, 60947-4-1; UL508       |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Approvals                             |      | UL, c-UL                                                                   |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Degree of Protection                  |      | Finger-safe (according to VDE 0106)                                        |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Dry Ambient Air Temp. for Storage     | 1/4C | -40 to +80                                                                 |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Dry Ambient Air Temp. for Operation   | 1/4C | -10 to +55 (0.85 to 1.1 Un)                                                |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Operating Altitude                    | m    | 2000                                                                       |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Operating Position (without derating) |      | ±30/4 compared with the normal vertical mounting plane (see table on D-22) |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |

## Main Power Pole Utilization Characteristics:

| Number of Poles: 3        |                         | Part No. | 9F  | 12F | 20F | 25F | 32F | 38F | 40F | 50F | 65F | 80F  | 100F | 125F | 150F | 180F | 220F | 300F |
|---------------------------|-------------------------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| Rated Operational Current | in AC3                  | A        | 9   | 12  | 18  | 25  | 30  | 40  | 40  | 50  | 65  | 80   | 105  | 125  | 150  | 180  | 220  | 300  |
|                           | in AC1                  | A        | 20  | 20  | 30  | 30  | 50  | 60  | 60  | 80  | 80  | 135  | 150  | 150  | 200  | 240  | 260  | 350  |
| Rated Operational Voltage |                         | V        | 660 | 660 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690  | 690  | 690  | 690  | 690  | 690  | 690  |
| Maximum Thermal Current   | I <sub>th</sub> (≥55°C) | A        | 20  | 20  | 35  | 35  | 50  | 60  | 60  | 80  | 80  | 135  | 150  | 150  | 200  | 240  | 260  | 350  |
| Making Capacity           | I <sub>rms</sub>        | A        | 150 | 150 | 280 | 300 | 480 | 480 | 800 | 800 | 800 | 1500 | 1500 | 1500 | 1800 | 2100 | 2500 | 3500 |
| Breaking Capacity         | 220-380-415-440V        | A        | 120 | 150 | 250 | 300 | 380 | 480 | 500 | 600 | 700 | 800  | 1100 | 1300 | 1500 | 1800 | 2100 | 3000 |
| I <sub>rms</sub>          | 500V                    | A        | 100 | 120 | 200 | 250 | 300 | 400 | 400 | 500 | 550 | 800  | 1000 | 1100 | 1200 | 1600 | 1900 | 2200 |
| According to EN 60158-1   | 660-690V                | A        | 90  | 100 | 120 | 180 | 250 | 350 | 350 | 400 | 430 | 500  | 750  | 820  | 1100 | 1200 | 1400 | 1800 |

## Wiring, minimum-maximum wire size:

| Stranded Wire (without ferrule) |                 |       |       |        |        |      |      |      |      |      |      |      |      |       |       |          |          |
|---------------------------------|-----------------|-------|-------|--------|--------|------|------|------|------|------|------|------|------|-------|-------|----------|----------|
| 1 Conductor                     | mm <sup>2</sup> | 1-4   | 1-4   | 1.5-10 | 1.5-10 | 4-16 | 4-16 | 5-25 | 5-25 | 5-25 | 8-60 | 8-60 | 8-60 | 8-100 | 8-100 | 14-150   | 14-150   |
|                                 | AWG             | 18-10 | 18-10 | 16-8   | 16-8   | 12-6 | 12-6 | 10-3 | 10-3 | 10-3 | 8-0  | 8-0  | 8-0  | 8-4/0 | 8-4/0 | 4-300mcm | 4-300mcm |
| 2 Conductors                    | mm <sup>2</sup> | 1-4   | 1-4   | 1.5-6  | 1.5-6  | 4-8  | 4-8  | 5-16 | 5-16 | 5-16 | 8-35 | 8-35 | 8-35 | 8-50  | 8-50  | 14-80    | 14-80    |
|                                 | AWG             | 18-10 | 18-10 | 16-10  | 16-10  | 12-8 | 12-8 | 10-5 | 10-5 | 10-5 | 8-2  | 8-2  | 8-2  | 8-1   | 8-1   | 4-3/0    | 4-3/0    |
| Solid Wire (without ferrule)    |                 |       |       |        |        |      |      |      |      |      |      |      |      |       |       |          |          |
| 1 Conductor                     | mm <sup>2</sup> | 1-4   | 1-4   | 1.5-6  | 1.5-6  | 4-10 | 4-10 | 5-25 | 5-25 | 5-25 |      |      |      |       |       |          |          |
|                                 | AWG             | 18-10 | 18-10 | 16-10  | 16-10  | 12-8 | 12-8 | 10-3 | 10-3 | 10-3 | –    | –    | –    | –     | –     | –        | –        |
| 2 Conductors                    | mm <sup>2</sup> | 1-4   | 1-4   | 1.5-6  | 1.5-6  | 4-10 | 4-10 | 5-16 | 5-16 | 5-16 |      |      |      |       |       |          |          |
|                                 | AWG             | 18-10 | 18-10 | 16-10  | 16-10  | 12-8 | 12-8 | 10-5 | 10-5 | 10-5 | –    | –    | –    | –     | –     | –        | –        |

## Control Circuit Characteristics:

| Part Number                                                                           |            |                      | YS1N-           |                  | 9F         | 12F        | 20F        | 25F        | 32F        | 38F        | 40F        | 50F        | 65F        | 80F        | 100F       | 125F      | 150F      | 180F     | 220F     | 300F  |       |
|---------------------------------------------------------------------------------------|------------|----------------------|-----------------|------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|----------|----------|-------|-------|
| Rated AC Control Voltage<br>(50 or 60 Hz) : Un                                        |            |                      | V               | Un: 24 to 600    |            |            |            |            |            |            |            |            |            |            |            |           |           |          |          |       |       |
| Coil Limits<br>(≤ 55°C)                                                               |            |                      |                 |                  |            |            |            |            |            |            |            |            |            |            |            |           |           |          |          |       |       |
| Operating Limits                                                                      |            |                      | Un              | 85% to 110% × Un |            |            |            |            |            |            |            |            |            |            |            |           |           |          |          |       |       |
| Drop-Out Voltage                                                                      |            |                      | Un              | 30% to 70% × Un  |            |            |            |            |            |            |            |            |            |            |            |           |           |          |          |       |       |
| Coil Power Consumption<br>(20°C) in Un                                                |            |                      |                 |                  |            |            |            |            |            |            |            |            |            |            |            |           |           |          |          |       |       |
| AC 50 Hz                                                                              |            | Inrush               | VA              | 55               | 55         | 85         | 85         | 150        | 150        | 170        | 170        | 170        | 276        | 276        | 276        | 819       | 819       | 805      | 805      |       |       |
|                                                                                       |            | Cos Ø (power factor) |                 | 0.8              | 0.8        | 0.8        | 0.8        | 0.7        | 0.7        | 0.6        | 0.6        | 0.6        | 0.5        | 0.5        | 0.5        | 0.5       | 0.5       | 0.2      | 0.2      |       |       |
|                                                                                       |            | Sealed               | VA              | 8                | 8          | 8          | 8          | 15         | 15         | 16         | 16         | 16         | 40         | 40         | 40         | 53        | 53        | 100      | 100      |       |       |
|                                                                                       |            | Cos Ø (power factor) |                 | 0.3              | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3       | 0.3       | 0.37     | 0.37     |       |       |
| AC 60 Hz                                                                              |            | Inrush               | VA              | 50               | 50         | 80         | 80         | 130        | 130        | 150        | 150        | 150        | 231        | 231        | 231        | 714       | 714       | 700      | 700      |       |       |
|                                                                                       |            | Cos Ø (power factor) |                 | 0.7              | 0.7        | 0.7        | 0.7        | 0.6        | 0.6        | 0.5        | 0.5        | 0.5        | 0.5        | 0.5        | 0.5        | 0.5       | 0.5       | 0.21     | 0.21     |       |       |
|                                                                                       |            | Sealed               | VA              | 6                | 6          | 6          | 6          | 12         | 12         | 13         | 13         | 13         | 29         | 29         | 29         | 38        | 38        | 88       | 88       |       |       |
|                                                                                       |            | Cos Ø (power factor) | 0.3             | 0.3              | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3        | 0.3       | 0.3       | 0.37     | 0.37     |       |       |
| Coil Power Consumption                                                                |            | 50 Hz                | W               | 1.5 to 2.5       | 1.5 to 2.5 | 1.5 to 2.5 | 1.5 to 2.5 | 3.5 to 5.0 | 3.5 to 5.0 | 3.7 to 5.2 | 3.7 to 5.2 | 3.7 to 5.2 | 7.5 to 11  | 7.5 to 11  | 7.5 to 11  | 12 to 16  | 12 to 16  | 19 to 27 | 19 to 27 |       |       |
|                                                                                       |            | 60 Hz                | W               | 1.0 to 2.0       | 1.0 to 2.0 | 1.0 to 2.0 | 1.0 to 2.0 | 3.0 to 4.5 | 3.0 to 4.5 | 3.0 to 4.5 | 3.0 to 4.5 | 3.0 to 4.5 | 6.0 to 8.5 | 6.0 to 8.5 | 6.0 to 8.5 | 9.0 to 13 | 9.0 to 13 | 16 to 23 | 16 to 23 |       |       |
| Mechanical Life at Rated Control Voltage (Un)<br>(× 10 <sup>6</sup> operating cycles) |            |                      |                 | 10               | 10         | 10         | 10         | 5          | 5          | 5          | 5          | 5          | 5          | 5          | 5          | 5         | 5         | 5        | 5        | 5     |       |
| Switching Frequency                                                                   | Mechanical |                      | ops/h           | 9000             | 9000       | 9000       | 9000       | 9000       | 9000       | 9000       | 9000       | 9000       | 9000       | 7200       | 7200       | 7200      | 7200      | 7200     | 5000     | 5000  |       |
|                                                                                       | Electrical | AC3                  |                 | 1200             | 1200       | 1200       | 1200       | 1200       | 1200       | 1200       | 1200       | 1200       | 1200       | 1200       | 1200       | 1200      | 1200      | 1200     | 1200     |       |       |
| Minimum-Maximum Wire Size                                                             |            |                      |                 |                  |            |            |            |            |            |            |            |            |            |            |            |           |           |          |          |       |       |
| Stranded Wire<br>(without ferrule)                                                    |            | 1 Conductor          | mm <sup>2</sup> | 1-4              | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4       | 1-4       | 1-4      | 1-4      | 1-4   |       |
|                                                                                       |            |                      | AWG             | 18-10            | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10     | 18-10     | 18-10    | 18-10    | 18-10 |       |
|                                                                                       |            | 2 Conductors         | mm <sup>2</sup> | 1-4              | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4       | 1-4       | 1-4      | 1-4      | 1-4   | 1-4   |
|                                                                                       |            |                      | AWG             | 18-10            | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10     | 18-10     | 18-10    | 18-10    | 18-10 | 18-10 |
| Solid Wire<br>(without ferrule)                                                       |            | 1 Conductor          | mm <sup>2</sup> | 1-4              | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4       | 1-4       | 1-4      | 1-4      | 1-4   |       |
|                                                                                       |            |                      | AWG             | 18-10            | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10     | 18-10     | 18-10    | 18-10    | 18-10 |       |
|                                                                                       |            | 2 Conductors         | mm <sup>2</sup> | 1-4              | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4        | 1-4       | 1-4       | 1-4      | 1-4      | 1-4   | 1-4   |
|                                                                                       |            |                      | AWG             | 18-10            | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10      | 18-10     | 18-10     | 18-10    | 18-10    | 18-10 | 18-10 |

D

IEC Contactors

**Coil Resistance:**

| Coil Voltage | Resistance (Ω) |              |              |                  |                    |                |                |
|--------------|----------------|--------------|--------------|------------------|--------------------|----------------|----------------|
|              | YS1N-9F/12F    | YS1N-20F/25F | YS1N-32F/38F | YS1N-40F/50F/65F | YS1N-80F/100F/125F | YS1N-150F/180F | YS1N-220F/300F |
| 24V 50/60Hz  | 7.90           | 4.8          | 1.68         | 1.7              | 0.39               | 0.298          | 0.107          |
| 48V 50/60Hz  | 33.9           | 19.1         | 7.1          | 6.3              | 1.85               | 1.182          | 0.378          |
| 110V 50/60Hz | 174.4          | 101          | 36.6         | 39.1             | 8.67               | 6.46           | 2.630          |
| 120V 50/60Hz | 196.3          | 122          | 44.2         | 45.2             | 11.6               | 7.1            | 3.186          |
| 208V 50/60Hz | 619.5          | 385          | 134          | 137.4            | 33.3               | 23.2           | 8.310          |
| 220V 50/60Hz | 748.0          | 397          | 153          | 139.0            | 35.6               | 24.8           | 8.840          |
| 230V 50/60Hz | 776.0          | 486          | 153          | 162.0            | 37.2               | 30             | 9.340          |
| 240V 50/60Hz | 841.8          | 513          | 164          | 177.8            | 45.6               | 31.4           | 9.810          |
| 380V 50/60Hz | 2577.0         | 1310         | 458          | 426.0            | 112                | 82             | 22.38          |
| 415V 50/60Hz | 2821.1         | 1480         | 501          | 562.5            | 133                | 96.6           | 28.70          |
| 480V 50/60Hz | 3166.4         | 2050         | 675          | 757.1            | 182                | 129.2          | 62.71          |
| 500V 50/60Hz | 3272.7         | 2170         | 790          | 794.0            | 191                | 135.2          | 66.52          |
| 600V 50/60Hz | 5136.3         | 3100         | 1162         | 1046.7           | 275                | 206            | 100.3          |

**Operating Time:**

| Contactor  |                                    | 50Hz     |           |           |         |           |           | 60Hz     |           |           |         |           |           |
|------------|------------------------------------|----------|-----------|-----------|---------|-----------|-----------|----------|-----------|-----------|---------|-----------|-----------|
| Frame Size | Basic Part Number                  | Closing  |           | (msec)    | Opening |           | (msec)    | Closing  |           | (msec)    | Opening |           | (msec)    |
|            |                                    | Main     | Aux. (NO) | Aux. (NC) | Main    | Aux. (NO) | Aux. (NC) | Main     | Aux. (NO) | Aux. (NC) | Main    | Aux. (NO) | Aux. (NC) |
| 12         | YS1N-9F<br>YS1N-12F                | 11 to 17 | 11 to 17  | 8 to 12   | 5 to 13 | 5 to 13   | 7 to 14   | 10 to 15 | 10 to 15  | 7 to 12   | 5 to 13 | 6 to 14   | 7 to 15   |
| 25         | YS1N-20F<br>YS1N-25F               | 14 to 22 | 15 to 22  | 9 to 16   | 3 to 13 | 6 to 13   | 9 to 17   | 13 to 20 | 13 to 20  | 9 to 13   | 2 to 12 | 7 to 13   | 9 to 17   |
| 38         | YS1N-32F<br>YS1N-38F               | 15 to 23 | 15 to 23  | 8 to 16   | 6 to 15 | 7 to 15   | 12 to 23  | 16 to 24 | 16 to 24  | 9 to 16   | 5 to 14 | 7 to 15   | 11 to 21  |
| 65         | YS1N-40F<br>YS1N-50F<br>YS1N-65F   | 14 to 22 | 16 to 24  | 10 to 16  | 6 to 17 | 5 to 17   | 11 to 23  | 15 to 22 | 15 to 22  | 9 to 16   | 7 to 16 | 7 to 16   | 11 to 20  |
| 125        | YS1N-80F<br>YS1N-100F<br>YS1N-125F | 10 to 27 | 10 to 26  | 6 to 19   | 6 to 20 | 6 to 20   | 10 to 26  | 13 to 31 | 12 to 30  | 8 to 22   | 6 to 18 | 6 to 18   | 10 to 24  |
| 180        | YS1N-150F<br>YS1N-180F             | 17 to 34 | 16 to 31  | 13 to 31  | 8 to 25 | 8 to 28   | 12 to 29  | 21 to 39 | 20 to 36  | 13 to 29  | 5 to 22 | 7 to 22   | 11 to 29  |
| 300        | YS1N-220F<br>YS1N-300F             | 17 to 36 | 16 to 36  | 13 to 33  | 8 to 27 | 8 to 30   | 12 to 31  | 22 to 41 | 21 to 38  | 13 to 31  | 5 to 24 | 7 to 24   | 11 to 31  |

**Notes:**

1. The operating time depends on the type of contactor electromagnet and its control mode.
2. The closing time is measured from the time the coil power supply is switched on to the time the main contacts first make contact.
3. The opening time is measured from the time the coil power supply is switched off to the time the main contacts separate.
4. The duration of the arcing time depends on the type of circuit switched by the poles.
5. For normal three-phase applications the duration of the arcing time is normally less than 10 ms.
6. The load is isolated from the coil power supply after a time equal to: the sum of the opening time and the arcing time.

## Contactor Circuit Supply: DC

### Operating Coil Characteristics

| Part Number                              | Coil Voltage (V) | Exciting Current (mA) | Pick-Up Voltage (V) | Drop-Out Voltage (V) | Coil Resistance ( $\frac{1}{2}$ ) | Power Consumption (W) |
|------------------------------------------|------------------|-----------------------|---------------------|----------------------|-----------------------------------|-----------------------|
| YS3N-9FG2<br>YS3N-12FG2                  | 24V DC           | 214 to 262            | 10 to 15            | 5 to 10              | 102                               | 5.1 to 6.4            |
|                                          | 48V DC           | 108 to 132            | 21 to 30            | 10 to 20             | 404                               | 5.1 to 6.4            |
|                                          | 100V DC          | 51 to 64              | 45 to 63            | 21 to 40             | 1750                              | 5.0 to 6.5            |
|                                          | 200V DC          | 26 to 33              | 90 to 125           | 43 to 80             | 6870                              | 5.1 to 6.8            |
| YS3N-20FG2<br>YS3N-25FG2                 | 24V DC           | 214 to 262            | 10 to 15            | 5 to 10              | 102                               | 5.1 to 6.4            |
|                                          | 48V DC           | 108 to 132            | 21 to 30            | 10 to 20             | 404                               | 5.1 to 6.4            |
|                                          | 100V DC          | 51 to 64              | 45 to 63            | 21 to 40             | 1750                              | 5.0 to 6.5            |
|                                          | 200V DC          | 26 to 33              | 90 to 125           | 43 to 80             | 6870                              | 5.1 to 6.8            |
| YS3N-32FG2<br>YS3N-38FG2                 | 24V DC           | 335 to 410            | 11 to 16            | 4 to 8               | 65.1                              | 8.0 to 9.9            |
|                                          | 48V DC           | 165 to 202            | 23 to 32            | 8 to 16              | 264                               | 7.8 to 9.8            |
|                                          | 100V DC          | 76 to 94              | 48 to 66            | 18 to 32             | 1190                              | 7.5 to 9.5            |
|                                          | 200V DC          | 36 to 45              | 96 to 132           | 36 to 64             | 4970                              | 7.0 to 9.1            |
| YS3N-40FG2<br>YS3N-50FG2<br>YS3N-65FG2   | 24V DC           | 516 to 630            | 13 to 17            | 4 to 7               | 42.3                              | 12.3 to 15.2          |
|                                          | 48V DC           | 215 to 263            | 27 to 33            | 8 to 13              | 203                               | 10.3 to 12.7          |
|                                          | 100V DC          | 103 to 127            | 58 to 69            | 17 to 27             | 880                               | 10.2 to 12.8          |
|                                          | 200V DC          | 53 to 66              | 116 to 137          | 35 to 53             | 3390                              | 10.4 to 13.3          |
| YS3N-80FG2<br>YS3N-100FG2<br>YS3N-125FG2 | 100V DC          | 19 to 24              | 76 to 84            | 43 to 54             | —                                 | —                     |
|                                          | 200V DC          | 11 to 15              | 133 to 144          | 86 to 98             | —                                 | —                     |

### Standard Operating Time

| Part Number                  |     | Coil Applied Voltage 100%Uc |           |           |                   |           |           |
|------------------------------|-----|-----------------------------|-----------|-----------|-------------------|-----------|-----------|
|                              |     | Closing Time (ms)           |           |           | Opening Time (ms) |           |           |
|                              |     | Main                        | Aux. (NO) | Aux. (NC) | Main              | Aux. (NO) | Aux. (NC) |
| YS3N-9F                      | 1NO | 38 to 45                    | 38 to 45  | —         | 5 to 10           | 5 to 10   | —         |
| YS3N-12F                     | 1NC | 38 to 45                    | —         | 38 to 45  | 6 to 12           | —         | 8 to 13   |
| YS3N-20FG2, -25FG2           |     | 45 to 53                    | 45 to 53  | 36 to 46  | 6 to 12           | 6 to 12   | 10 to 16  |
| YS3N-32FG2, -38FG2           |     | 59 to 68                    | 57 to 66  | 46 to 56  | 7 to 19           | 7 to 19   | 14 to 23  |
| YS3N-40FG2, -50FG2, -65FG2   |     | 46 to 56                    | 46 to 56  | 34 to 47  | 23 to 32          | 23 to 32  | 27 to 36  |
| YS3N-80FG2, -100FG2, -125FG2 |     | 32 to 42                    | 32 to 42  | 24 to 36  | 36 to 56          | 36 to 56  | 42 to 62  |

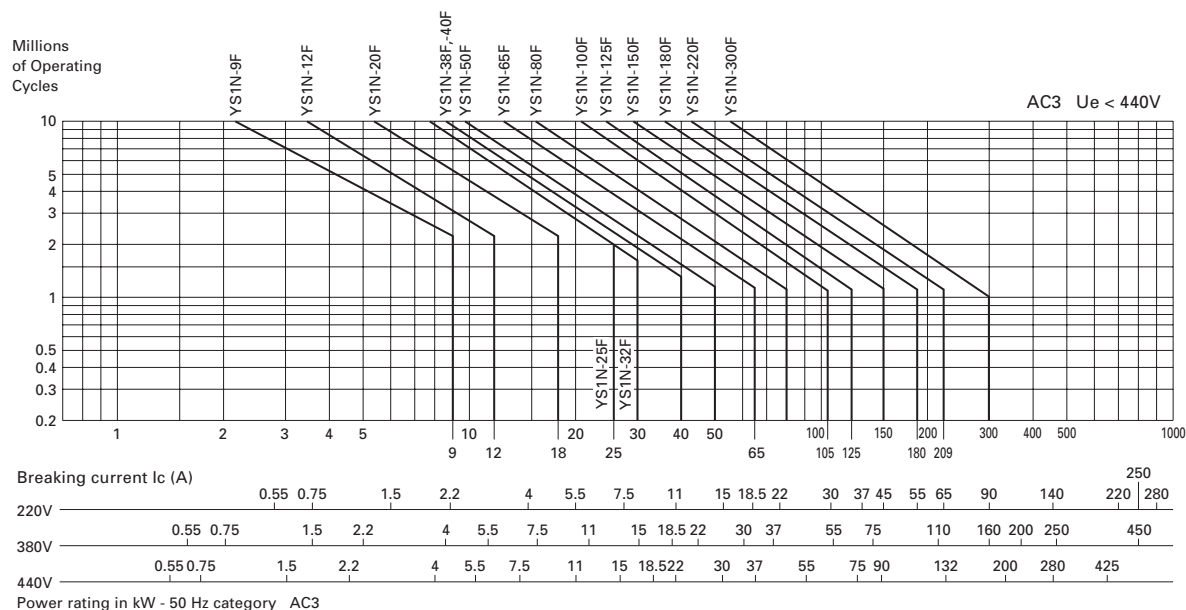
### Operating Limited Distances

| Part Number                  | Rated Operational Voltage 100VDC |                  |                    | Rated Operational Voltage 200VDC |                  |                    |
|------------------------------|----------------------------------|------------------|--------------------|----------------------------------|------------------|--------------------|
|                              | Coil Applied Voltage 100VDC      |                  |                    | Coil Applied Voltage 200VDC      |                  |                    |
|                              | Wire Sectional Area              |                  |                    | Wire Sectional Area              |                  |                    |
|                              | 1.25mm <sup>2</sup>              | 2mm <sup>2</sup> | 3.5mm <sup>2</sup> | 1.25mm <sup>2</sup>              | 2mm <sup>2</sup> | 3.5mm <sup>2</sup> |
| YS3N-9FG2, -12FG2            | 3.2 km                           | 5.0 km           | 9.2 km             | 12.6 km                          | 19.7 km          | 36.4 km            |
| YS3N-20FG2, -25FG2           | 3.2 km                           | 5.0 km           | 9.2 km             | 12.6 km                          | 19.7 km          | 36.4 km            |
| YS3N-32FG2, -38FG2           | 2.1 km                           | 3.4 km           | 6.3 km             | 9.1 km                           | 14.3 km          | 26.3 km            |
| YS3N-40FG2, -50FG2, -65FG2   | 1.6 km                           | 2.5 km           | 4.6 km             | 6.2 km                           | 9.7 km           | 18.0 km            |
| YS3N-80FG2, -100FG2, -125FG2 | 0.136 km                         | 0.213 km         | 0.392 km           | 0.507 km                         | 0.794 km         | 1.46 km            |

## Electrical Life Curves

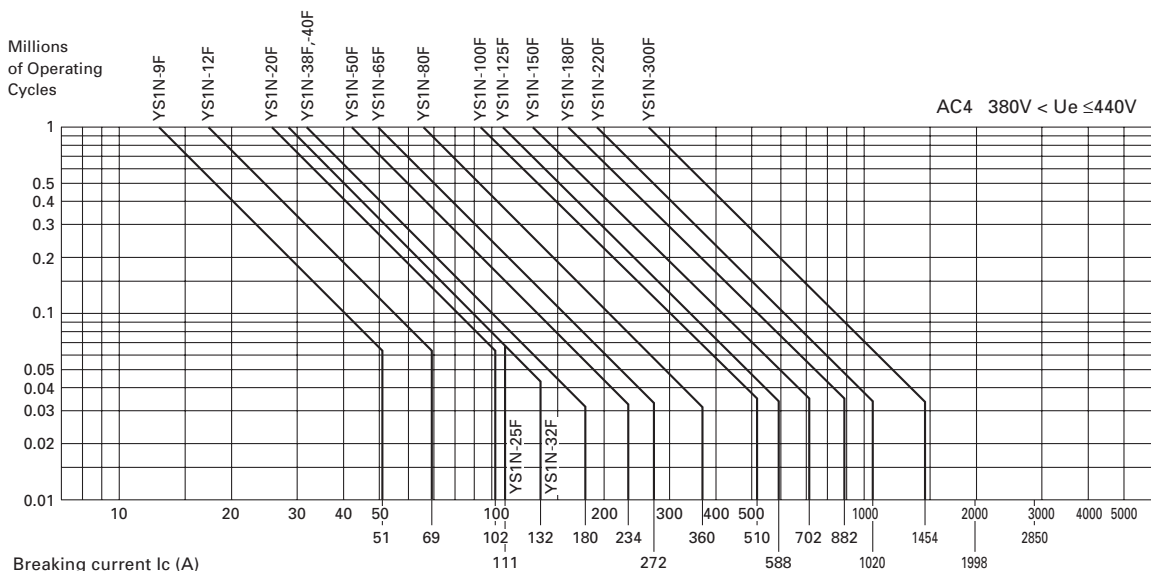
## ■ Electrical Life Curves

Fig.1 Utilization Category AC3



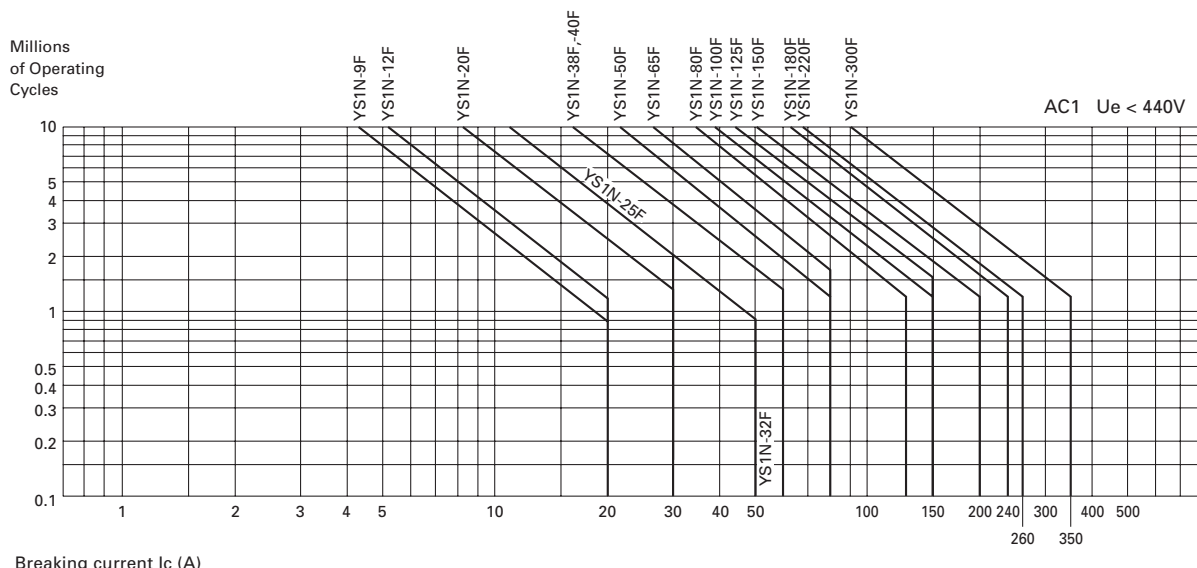
Control of three-phase squirrel cage motors switching off during running  
 The breaking current in AC3,  $I_c$ , is equal to  $I_e$ . ( $I_e$  = rated operational current of the motor)

Fig. 2 Utilization Category AC4



Control of three-phase squirrel cage motors switching off with locked rotor  
 The breaking current in AC4,  $I_c$ , is equal to  $6 \times I_e$ . ( $I_e$  = rated operational current of the motor)

Fig. 3 Utilization Category AC1



Switching a resistive circuit ( $\cos \phi \geq 0.95$ )

The breaking current in AC1,  $I_c$ , is equal to  $I_e$ . ( $I_e$  = rated operational current of the load)

## Electrical Life in Mixed AC3/AC4 Duty Applications

### By calculation:

In a mixed AC3/AC4 application, electrical life can be calculated using the following formula:

$$L = \frac{A3}{1 + \frac{P}{100} \left( \frac{A3}{A4} - 1 \right)}$$

$$1 + \frac{P}{100} \left( \frac{A3}{A4} - 1 \right)$$

L: Electrical life in mixed AC3/AC4 application

A3: Electrical life for breaking current equal to the rated current of the motor. (AC3 from Fig. 1)

A4: Electrical life for a breaking current during starting or plug braking equal to  $I_c = K I_e$ , where:

$$K \leq 6$$

$I_e$  = rated motor current  
(AC4 from fig. 2)

P/100: ratio of switching off during starting or plug braking

D

IEC Contactors

## Operating and Mounting Specifications for Contactors and Starters

### 1. Operating Specifications

|                                             |                                      |
|---------------------------------------------|--------------------------------------|
| <b>Ambient Temperature</b>                  | -5° to +40°C                         |
| <b>Temperature inside the control panel</b> | -5° to +55°C                         |
| <b>Relative humidity</b>                    | 45% to 85% RH                        |
| <b>Altitude</b>                             | No more than 2,000m                  |
| <b>Vibration resistance</b>                 | 10 to 50Hz 19.6m/s <sup>2</sup> (2G) |
| <b>Shock resistance</b>                     | 49.0m/s <sup>2</sup> (5G)            |
| <b>Storage temperature</b>                  | -40°C to +70°C                       |

D

### 2. Mounting

#### Direct Mounting

1. Install the product in a dry area with minimal dust and vibration.
2. Standard mounting is done on a vertical surface in the directions shown in Figure 1. However, a mounting angle up to 30 degrees is allowed in each direction as shown in Figure 2. Operational characteristics of the product, when mounted with these angles are listed on the next page.

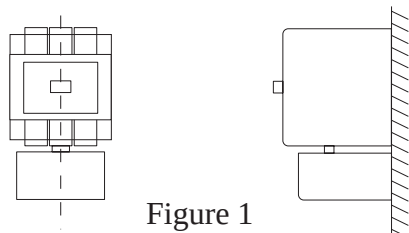


Figure 1

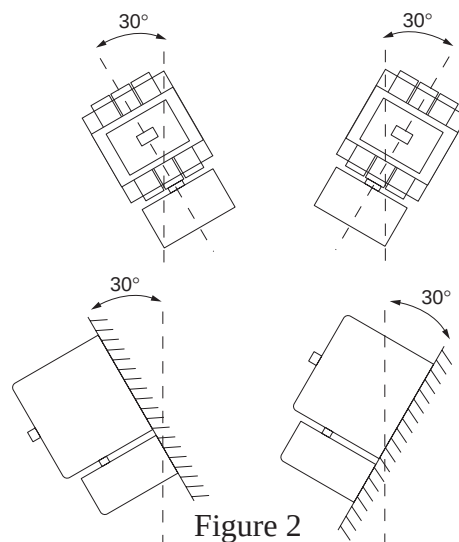


Figure 2

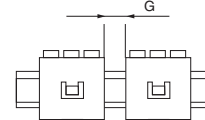
#### DIN Rail Mounting

YS Series electromagnetic contactors/starters YS1N/YS2N-9F through -38F models can be mounted on 35mm wide DIN rail, and YS1N/YS2N-40F through -65F models can be mounted on 75 mm wide DIN rails, as specified in the table below. When mounting the product on DIN rails, keep in mind the following points:

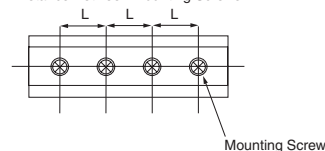
1. Spacing between the products: contributes to a temperature rise and affects the product life. Maintain the minimum spacing as specified in the table below
2. DIN rail mounting holes: To ensure sufficient mechanical strength, the mounting holes should be placed no further apart than those specified in the table below.

| Product Category |          | DIN rail width (mm) | Minimum spacing between contactors (mm) | Distance between mounting screws (mm) |
|------------------|----------|---------------------|-----------------------------------------|---------------------------------------|
| Contactor        | Starter  |                     | (G)                                     | (L)                                   |
| YS1N-9F          | YS2N-9F  | 35                  | 5                                       | 300                                   |
| YS1N-12F         | YS2N-12F | 35                  | 5                                       | 300                                   |
| YS1N-20F         | YS2N-20F | 35                  | 5                                       | 300                                   |
| YS1N-25F         | YS2N-25F | 35                  | 5                                       | 300                                   |
| YS1N-32F         | YS2N-32F | 35                  | 5                                       | 300                                   |
| YS1N-38F         | YS2N-38F | 35                  | 5                                       | 300                                   |
| YS1N-40F         | YS2N-40F | 75                  | 5                                       | 300                                   |
| YS1N-50F         | YS2N-50F | 75                  | 5                                       | 300                                   |
| YS1N-65F         | YS2N-65F | 75                  | 5                                       | 300                                   |

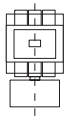
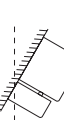
Minimum Space Between Contactors (mm)



Distance Between Mounting Screws



## Mounting Angle and Operational Characteristics of the YS1N, YS2N, YS1R, YS2R

| Contactor /Starter |           | Coil<br>Frequency<br>(Hz) | Maximum turn-on voltage (V)                                                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   | Minimum turn-off voltage (V)                                                        |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|--------------------|-----------|---------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Non-<br>reversing  | Reversing |                           |  |  |  |  |  |  |  |  |  |  |
|                    |           |                           | Standard/<br>normal<br>mounting                                                   | 30° left                                                                          | 30° right                                                                         | 30° tilted<br>forward                                                             | 30° tilted<br>backwards                                                           | Standard/<br>normal<br>mounting                                                     | 30° left                                                                            | 30° right                                                                           | 30° tilted<br>forward                                                               | 30° tilted<br>backwards                                                             |
|                    |           |                           | YS1N/<br>YS2N                                                                     | YS1R/<br>YS2R                                                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| -9F                | -9F       | 50<br>60                  | 114<br>126                                                                        | 111<br>123                                                                        | 110<br>121                                                                        | 118<br>129                                                                        | 104<br>120                                                                        | 84<br>102                                                                           | 82<br>98                                                                            | 80<br>95                                                                            | 82<br>96                                                                            | 78<br>90                                                                            |
| -12F               | -12F      | 50<br>60                  | 114<br>126                                                                        | 111<br>123                                                                        | 110<br>121                                                                        | 118<br>129                                                                        | 104<br>120                                                                        | 84<br>102                                                                           | 82<br>98                                                                            | 80<br>95                                                                            | 82<br>96                                                                            | 78<br>90                                                                            |
| -20F               | -20F      | 50<br>60                  | 122<br>138                                                                        | 120<br>136                                                                        | 121<br>138                                                                        | 124<br>140                                                                        | 115<br>132                                                                        | 105<br>119                                                                          | 102<br>111                                                                          | 99<br>112                                                                           | 103<br>118                                                                          | 101<br>117                                                                          |
| -25F               | -25F      | 50<br>60                  | 122<br>138                                                                        | 120<br>136                                                                        | 121<br>138                                                                        | 124<br>140                                                                        | 115<br>132                                                                        | 105<br>119                                                                          | 102<br>111                                                                          | 99<br>112                                                                           | 103<br>118                                                                          | 101<br>117                                                                          |
| -32F               | -32F      | 50<br>60                  | 114<br>132                                                                        | 114<br>133                                                                        | 112<br>130                                                                        | 124<br>145                                                                        | 99<br>114                                                                         | 78<br>95                                                                            | 77<br>93                                                                            | 83<br>96                                                                            | 81<br>96                                                                            | 78<br>91                                                                            |
| -38F               | -38F      | 50<br>60                  | 114<br>132                                                                        | 114<br>133                                                                        | 112<br>130                                                                        | 124<br>145                                                                        | 99<br>114                                                                         | 78<br>95                                                                            | 77<br>93                                                                            | 83<br>96                                                                            | 81<br>96                                                                            | 78<br>91                                                                            |
| -40F               | -40F      | 50<br>60                  | 114<br>132                                                                        | 114<br>133                                                                        | 112<br>130                                                                        | 124<br>145                                                                        | 99<br>114                                                                         | 78<br>95                                                                            | 77<br>93                                                                            | 83<br>96                                                                            | 81<br>96                                                                            | 78<br>91                                                                            |
| -50F               | -50F      | 50<br>60                  | 116<br>138                                                                        | 117<br>135                                                                        | 116<br>137                                                                        | 131<br>149                                                                        | 107<br>128                                                                        | 91<br>110                                                                           | 88<br>108                                                                           | 87<br>106                                                                           | 86<br>106                                                                           | 84<br>105                                                                           |
| -65F               | -65F      | 50<br>60                  | 116<br>138                                                                        | 117<br>135                                                                        | 116<br>137                                                                        | 131<br>149                                                                        | 107<br>128                                                                        | 91<br>110                                                                           | 88<br>108                                                                           | 87<br>106                                                                           | 86<br>106                                                                           | 84<br>105                                                                           |
| -80F               | -80F      | 50<br>60                  | 132<br>134                                                                        | 132<br>134                                                                        | 132<br>134                                                                        | 137<br>137                                                                        | 132<br>134                                                                        | 83<br>82                                                                            | 83<br>82                                                                            | 83<br>82                                                                            | 83<br>82                                                                            | 83<br>82                                                                            |
| -100F              | -100F     | 50<br>60                  | 132<br>134                                                                        | 132<br>134                                                                        | 132<br>134                                                                        | 137<br>137                                                                        | 132<br>134                                                                        | 83<br>82                                                                            | 83<br>82                                                                            | 83<br>82                                                                            | 83<br>82                                                                            | 83<br>82                                                                            |
| -125F              | -125F     | 50<br>60                  | 132<br>134                                                                        | 132<br>134                                                                        | 132<br>134                                                                        | 137<br>137                                                                        | 132<br>134                                                                        | 83<br>82                                                                            | 83<br>82                                                                            | 83<br>82                                                                            | 83<br>82                                                                            | 83<br>82                                                                            |



Coils with the following rated voltage were used to obtain the above values:

YS1N-9F to-65F: 200V 50Hz, 200-200V 60Hz

YS1N-80F to-125F: 200-220V 50Hz, 200-220V 60Hz

**D**
**IEC Contactors**

## Operating and Mounting Specifications for Thermal Overload Relays

## Ratings and Characteristics:

| Part Number:YS1T-RHA                            |                               |              |                 | 25F-D                                                           | 38F-D | 65F-D | 125F-D | 150F-D | 180F-D | 300F-D | 400F-D  |
|-------------------------------------------------|-------------------------------|--------------|-----------------|-----------------------------------------------------------------|-------|-------|--------|--------|--------|--------|---------|
| Contact Configuration                           |                               |              |                 | 1NO+1NC                                                         |       |       |        |        |        |        |         |
| Number of Elements                              |                               |              |                 | 3                                                               |       |       |        |        |        |        |         |
| Trip Free Reset Operation                       |                               |              |                 | Convertible from manual to automatic                            |       |       |        |        |        |        |         |
| Ambient Temperature Compensation                |                               |              |                 | -25 to +55°C                                                    |       |       |        |        |        |        |         |
| Dial Designation                                |                               |              |                 | Rated current                                                   |       |       |        |        |        |        |         |
| Setting Scale Indication                        |                               |              |                 | Ampere (A)                                                      |       |       |        |        |        |        |         |
| Operation Position                              |                               |              |                 | ± 30 with respect to the normal position (See chart on page 65) |       |       |        |        |        |        |         |
| Tripping Class Conforming to UL 508, EN 60947-4 |                               |              |                 | 10                                                              |       |       |        |        |        |        |         |
| Main Circuit                                    | Rated Insulation Voltage (V)  |              |                 | 750                                                             |       |       |        |        |        |        |         |
|                                                 | Range of Setting Current (A)  |              |                 | 0.1-25                                                          | 7-40  | 9-65  | 37-125 | 65-160 | 85-185 | 96-240 | 128-320 |
|                                                 | Stranded Wire without Ferrule | 1 Conductor  | mm <sup>2</sup> | 0.1-25                                                          | 5-25  | 5-25  | 8-60   | 8-100  | 8-100  | 14-150 | 14-150  |
|                                                 |                               | 2 Conductors | mm <sup>2</sup> | 1.5-10                                                          | 5-16  | 5-16  | 8-22   | 8-50   | 8-50   | 14-80  | 14-80   |
|                                                 | Solid Wire without Ferrule    | 1 Conductor  | mm <sup>2</sup> | 1.5-6                                                           | 5-25  | 5-25  | -      | -      | -      | -      | -       |
|                                                 |                               | 2 Conductors | mm <sup>2</sup> | 1.5-6                                                           | 5-16  | 5-16  | -      | -      | -      | -      | -       |

## Characteristics of Auxiliary Contacts:

| Rated Thermal Current                      |                               |               | 4 A                      |        |         |         |         |         |
|--------------------------------------------|-------------------------------|---------------|--------------------------|--------|---------|---------|---------|---------|
| Rated Operational Current per EN 60947-5-1 | AC (AC-15)                    | Rated Voltage | 24V AC                   | 48V AC | 110V AC | 220V AC | 380V AC | 600V AC |
|                                            |                               | Rated Current | 4A                       | 4A     | 3A      | 2A      | 1.5A    | 0.3A    |
|                                            | DC (DC-13)                    | Rated Voltage | 24V DC                   | 48V DC | 110V DC | 220V DC |         |         |
|                                            |                               | Rated Current | 1A                       | 0.5A   | 0.25A   | 0.1A    |         |         |
| Maximum Cross Section                      | Stranded Wire without Ferrule |               | 4mm <sup>2</sup> (10AWG) |        |         |         |         |         |
|                                            | Solid Wire without Ferrule    |               | 4mm <sup>2</sup> (10AWG) |        |         |         |         |         |
| Minimum Cross Section                      | Stranded Wire without Ferrule |               | 1mm <sup>2</sup> (18AWG) |        |         |         |         |         |
|                                            | Solid Wire without Ferrule    |               | 1mm <sup>2</sup> (18AWG) |        |         |         |         |         |

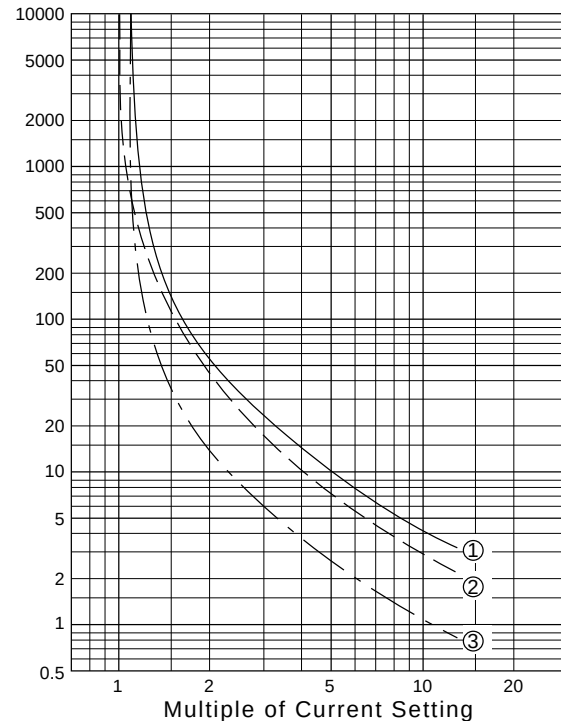
## UL / c-UL Ratings of Auxiliary Contacts:

|                                      |           |               |         |         |         |         |
|--------------------------------------|-----------|---------------|---------|---------|---------|---------|
| Rated Thermal Current                |           |               | 4A      |         |         |         |
| Rated Operational Current per UL 508 | AC (C600) | Rated Voltage | 120V AC | 240V AC | 480V AC | 600V AC |
|                                      |           | Rated Current | 1.5A    | 0.75A   | 0.4A    | 0.3A    |
|                                      | DC (R300) | Rated Voltage | 125V DC | 250V DC |         |         |
|                                      |           | Rated Current | 0.2A    | 0.1A    |         |         |

Fig. 4 Tripping Curves

Average operating times, depending on the multiples of the current

Tripping Time  
(sec.)



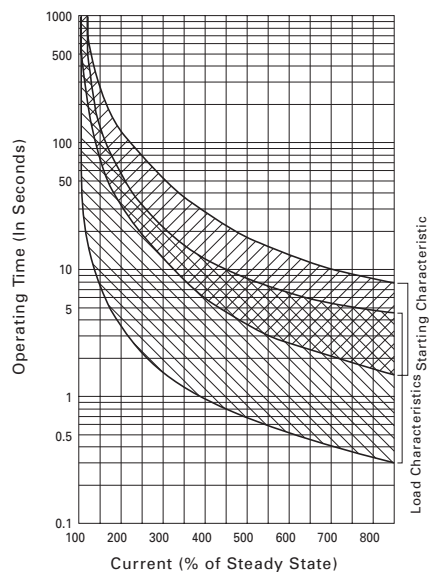
- ① Balanced operation, 3-phase, from cold state.
- ② Balanced operation, 2-phase, from cold state.
- ③ Balanced operation, 3-phase, after a long period of set current flow (hot state).

## Reset Mode Selection and Setting

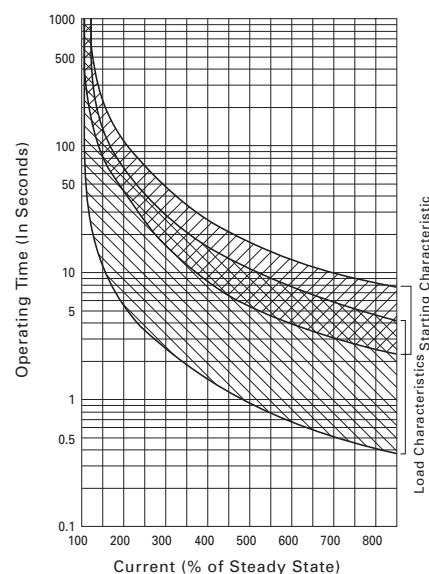
|                   | H                                                                                         | HAND                                                                            | AUTO                                                                                                                                    | A                                                                                              |
|-------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Function Position |                                                                                           |                                                                                 |                                                                                                                                         |                                                                                                |
| Tripping Check    | NO                                                                                        | YES                                                                             | YES                                                                                                                                     | NO                                                                                             |
| Reset             | Hand-Reset                                                                                | Hand-Reset                                                                      | Auto-Reset                                                                                                                              | Auto-Reset                                                                                     |
| Contact Condition | 97    95<br><br>98    96                                                                  | 97    95<br><br>98    96                                                        | Dotted line indicates the condition when the reset button is depressed.                                                                 | 97    95<br><br>98    96                                                                       |
| Setting Method    | Insert screwdriver into the select button, turn it clockwise to the "H" position.<br><br> | The select button is set in "HAND" position, when shipped from factory.<br><br> | Depress the reset button to below ①, insert screwdriver into the select button, turn counter-clockwise to the "AUTO" position ②<br><br> | Insert screwdriver into the select button, turn counter-clockwise to the "A" position.<br><br> |
| Remarks           | Can't check manual trip when in Hand-reset condition                                      | Normal position for Hand-reset                                                  | Normal position for Auto-reset                                                                                                          | Can't check manual trip when in Auto-reset condition                                           |

**Operating Time Characteristics of Thermal Overload Relays**

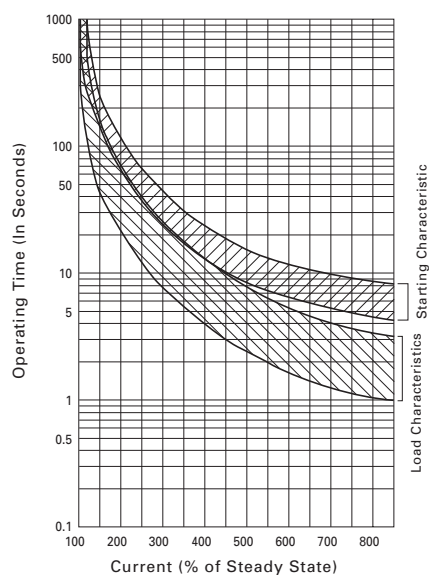
YS1T-RHA38F, YS1T-RHA65F



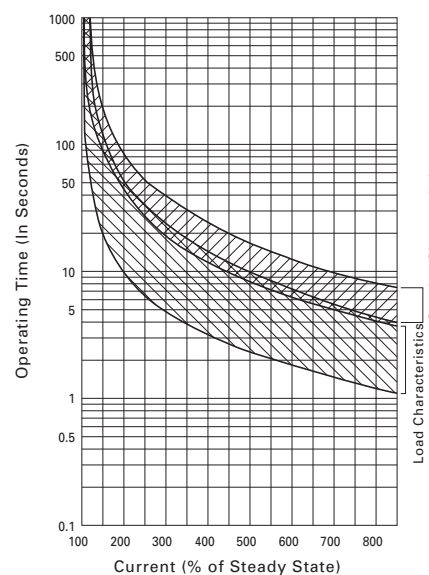
YS1T-RHA25F



YS1T-RHA125F



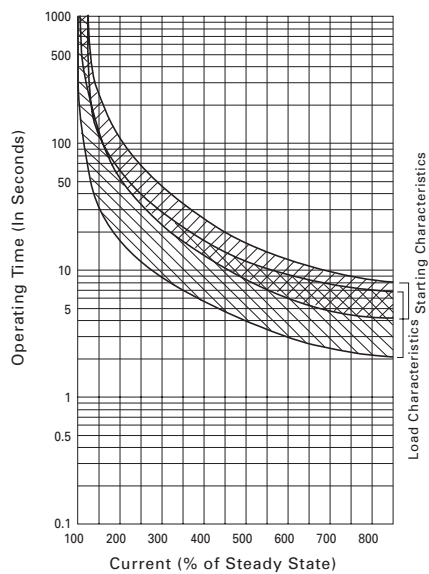
YS1T-RHA150F



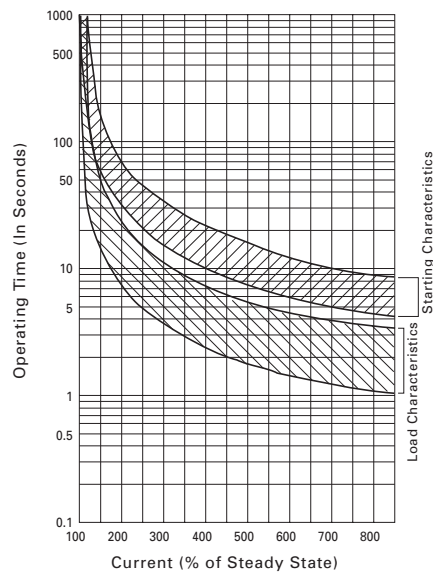
**D**  
**IEC Contactors**

Operating Time Characteristics of Thermal Overload Relays, continued

YS1T-RHA180F



YS1T-RHA300F, YS1T-RHA400F



Specifications for Accessories

AC Ratings of Auxiliary Contacts

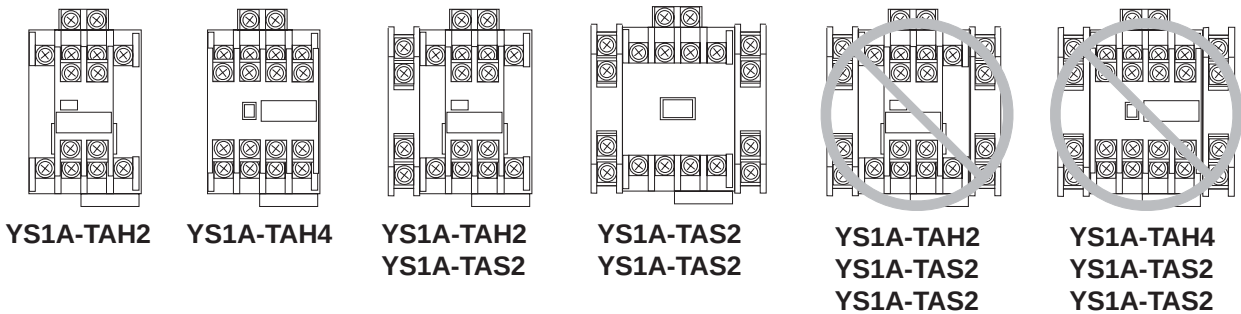
|                                                   |                                           |              | YS1N-9F to -300F |
|---------------------------------------------------|-------------------------------------------|--------------|------------------|
| AC Ratings per<br>EN AC Ratings<br>(EN-60947-5-1) | Rated Insulation Voltage (V)              |              | 660              |
|                                                   | Rated Thermal Current (A)                 |              | 10               |
|                                                   | Rated Operational Current<br>AC-15<br>(A) | AC 200-2240V | 3                |
|                                                   |                                           | AC 380-480V  | 1.5              |
|                                                   |                                           | AC 500-600V  | 1.2              |
| UL / c-UL AC Ratings<br>(UL 508)                  | Rated Insulation Voltage (V)              |              | 600              |
|                                                   | Rated Thermal Current (A)                 |              | 10               |
|                                                   | Rated Operational Current<br>(NEMA A600)  | AC 120V      | 6                |
|                                                   |                                           | AC 240V      | 3                |
|                                                   |                                           | AC 480V      | 1.5              |
|                                                   |                                           | AC 600V      | 1.2              |

Wire Sizes for Auxiliary Contacts

| Minimum-Maximum Wire Size       |              | YS1N-9F to -300F         |                |
|---------------------------------|--------------|--------------------------|----------------|
| Stranded Wire (without ferrule) | 1 Conductor  | mm <sup>2</sup><br>(AWG) | 1-4<br>(18-10) |
|                                 | 2 Conductors | mm <sup>2</sup><br>(AWG) | 1-4<br>(18-10) |
| Solid Wire (ferrule)            | 1 Conductor  | mm <sup>2</sup><br>(AWG) | 1-4<br>(18-10) |
|                                 | 2 Conductors | mm <sup>2</sup><br>(AWG) | 1-4<br>(18-10) |

Instructions for Assembling Auxiliary Contact Blocks:

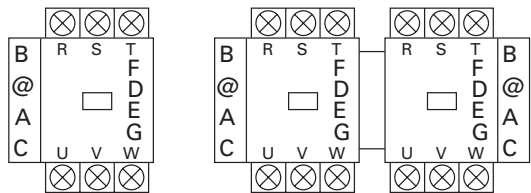
For each magnetic contactor/starter, up to four contacts of the auxiliary contact blocks can be mounted. Two contacts of the top-mount style and two contacts of the side mount style can be combined.



Terminal Numbers and Mounting Examples of Auxiliary Contact Blocks, Side-Mount Style

YS1N-9F to -65F

YS1R-9F to -65F



Note: If you would like to mount two side-mount auxiliary contact blocks (TAS style) to a YS1N non-reversing contactor, mount YS1A-TAS211F.

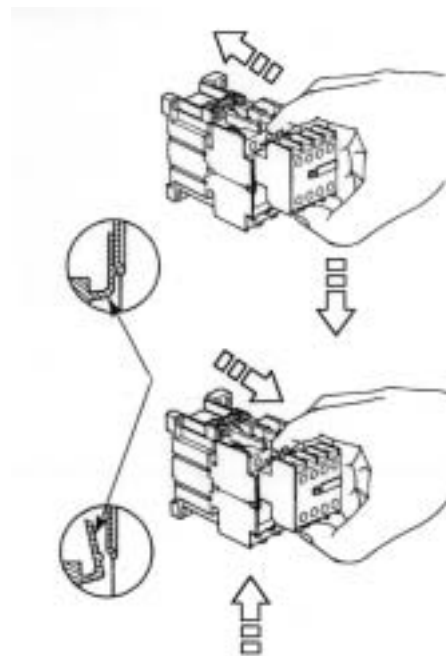
## Mounting and Removing Auxiliary Contact Block on the Contactor

### Top Mount Style

1. Position the contactor and the auxiliary contact block in the same direction.
2. Insert the auxiliary contact block into the area of the top of the contactor. Slide the auxiliary contact until it bottoms (Do not force.) Make sure that the locking hook is locked into position as shown

### Removal Procedure

While lightly lifting the locking hook with your finger, slide the auxiliary contact unit out.



### Side-Mount Style

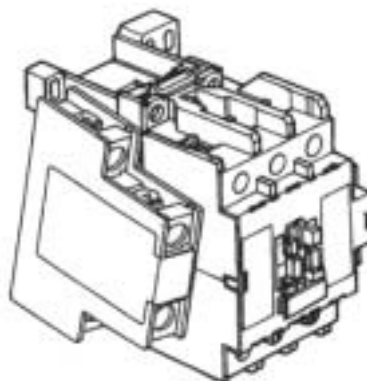
1. Contactor plunger
2. Inside this area, there are locking hooks (upper and lower areas)

### DIN rail Mounting

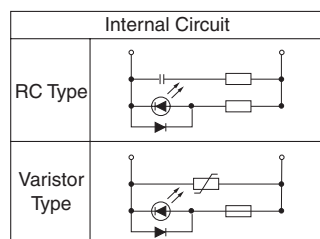
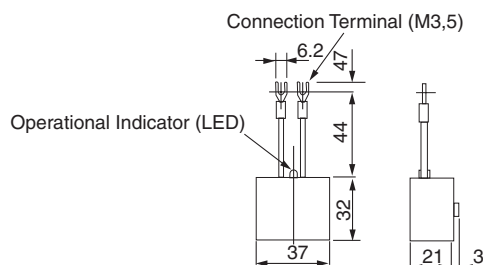
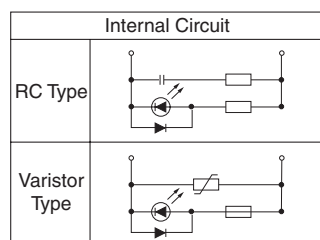
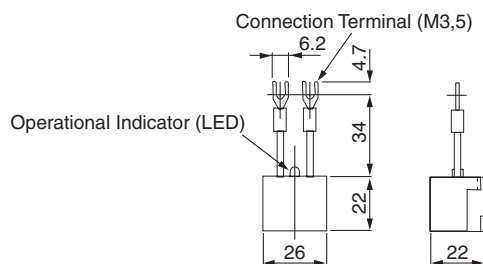
1. Make sure that the auxiliary contact block (right or left side) and the terminal numbers on the contactor are in the same direction.
2. Push the plunger of the contactor downwards approximately 2mm. While holding the plunger in this manner, insert the white protruding portion of the auxiliary contact block into the square groove of the side of the contactor. Make sure that the locking hook is locked into position.

### Removal Procedure

Hold the auxiliary contact block and pull it off.



## Surge Suppressor Module



| Contactor Size | Figure Number | Surge Suppressor Module | Dimensions |     |      |       |     |
|----------------|---------------|-------------------------|------------|-----|------|-------|-----|
|                |               |                         | A          | B   | C    | D     | E   |
| YS1N-9F        | 1             | YS9Z-TU25               | 78.5       | 100 | 12   | 76    | 64  |
| YS1N-12F       | 1             | YS9Z-TU25               | 78.5       | 100 | 12   | 76    | 64  |
| YS1N-20F       | 2             | YS9Z-TU25               | 85         | 103 | 12   | 91    | 75  |
| YS1N-32F       | 2             | YS9Z-TU65               | 92         | 128 | 12   | 111   | 75  |
| YS1N-38F       | 2             | YS9Z-TU65               | 92         | 128 | 12   | 111   | 88  |
| YS1N-50F       | 2             | YS9Z-TU65               | 114        | 162 | 12   | 121   | 88  |
| YS1N-65F       | 2             | YS9Z-TU65               | 114        | 162 | 12   | 121   | 106 |
| YS1N-80F       | 2             | YS9Z-TU65               | 191        | 240 | 12.4 | 143.5 | 106 |

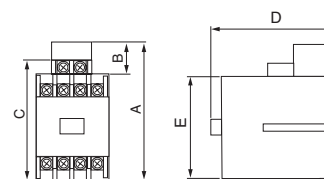


Figure 1

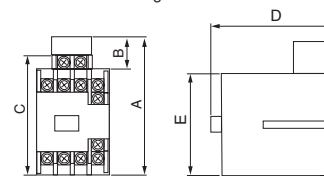


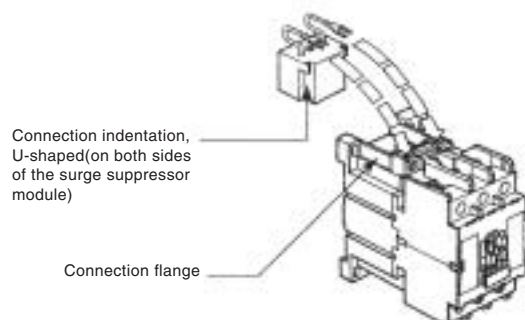
Figure 2

## Mounting Procedure

1. Line up the surge suppressor module and the contactor as shown in the figure on the right. (Make sure the orientation of the surge suppressor module is such that the LED is visible.)
2. Insert the U-shaped indentations of the surge suppressor module into the connection flange of the contactor as shown in the figure on the right.
3. Loosen the contactor screws, insert the fork lugs of the surge suppressor module, and re-tighten the screw terminals.

## Removal Procedure

1. Loosen coil screw terminals and remove the fork lugs of the surge suppressor module.
2. Insert a screwdriver between the U-shaped indentation of the surge suppressor module and the connection flange of the contactor, and pry the module off the contactor.

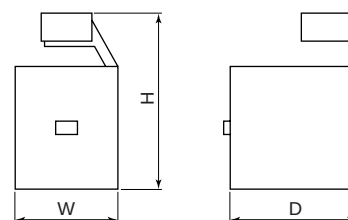


## Specifications of Relay Interface Module

|                         |                                        | YS9Z-TCU500UH                   |
|-------------------------|----------------------------------------|---------------------------------|
| Input (coil)            | Rated Voltage                          | 24V DC                          |
|                         | Maximum Allowable Voltage              | 130% of rated voltage           |
|                         | Power Consumption                      | 0.2W                            |
|                         | Pick-up Voltage (at 20°C)              | 70% of rated voltage            |
|                         | Drop-out Voltage (at 20°C)             | 10% of rated voltage            |
| Output (contact)        | Maximum Operational Voltage            | 380V AC                         |
|                         | Rated Operational Current (at 250V AC) | 2A (cosφ=0.4)                   |
|                         | Thermal Current                        | 5A                              |
|                         | Closing Delay                          | 3 ms                            |
|                         | Opening Delay                          | 1 ms                            |
| Temperature Range       |                                        | -20 to +55°C                    |
| Surge Suppressor Device | Maximum Operational Voltage            | 250V AC                         |
|                         | Function                               | Resistor capacitor circuit (RC) |
|                         | Applicable Control Coil Voltage Range  | Up to 240V AC (50/60 Hz)        |

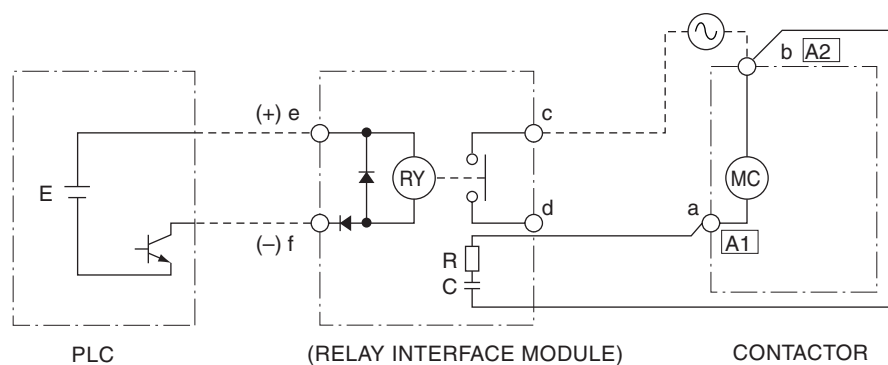
### Relay Interface Completed Part Numbers

| Product Series                     | Applicable Contactor               | Completed Part Number | Dimensions |     |     |
|------------------------------------|------------------------------------|-----------------------|------------|-----|-----|
|                                    |                                    |                       | W          | H   | D   |
| Relay Interface Module<br>YS9Z-TCU | YS1N-9F<br>YS1N-12F                | YS9Z-TCU500UH12       | 49         | 125 | 76  |
|                                    | YS1N-20F<br>YS1N-25F               | YS9Z-TCU500UH25       | 49         | 135 | 91  |
|                                    | YS1N-32F<br>YS1N-38F               | YS9Z-TCU500UH38       | 58         | 140 | 111 |
|                                    | YS1N-40F<br>YS1N-50F<br>YS1N-65F   | YS9Z-TCU500UH65       | 75         | 160 | 121 |
|                                    | YS1N-80F<br>YS1N-100F<br>YS1N-125F | YS9Z-TCU500UH125      | 100        | 187 | 133 |
|                                    | YS1N-150F<br>YS1N-180F             | YS9Z-TCU500UH180      | 130        | 225 | 158 |
|                                    | YS1N-220F<br>YS1N-300F             | YS9Z-TCU500UH300      | 146        | 260 | 184 |



NOTES: Each model is identical in electrical characteristics, mounting plate sizes representing the only difference.

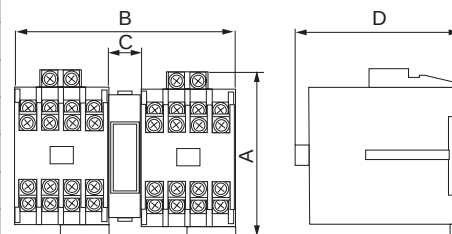
## ■ CONNECTION DIAGRAM AND INTERNAL CIRCUIT OF THE RELAY INTERFACE MODULE



## Mechanical Interlock Blocks

### Reversing Contactors

| Contactor Size | Mechanical Interlock Block | Dimensions |     |      |       |
|----------------|----------------------------|------------|-----|------|-------|
|                |                            | A          | B   | C    | D     |
| YS1R-9F        | YS9Z-TMI65                 | 78.5       | 100 | 12   | 76    |
| YS1R-12F       | YS9Z-TMI65                 | 78.5       | 100 | 12   | 76    |
| YS1R-20F       | YS9Z-TMI65                 | 85         | 103 | 12   | 91    |
| YS1R-25F       | YS9Z-TMI65                 | 85         | 103 | 12   | 91    |
| YS1R-32F       | YS9Z-TMI65                 | 92         | 128 | 12   | 111   |
| YS1R-38F       | YS9Z-TMI65                 | 92         | 128 | 12   | 111   |
| YS1R-40F       | YS9Z-TMI65                 | 92         | 128 | 12   | 111   |
| YS1R-50F       | YS9Z-TMI65                 | 114        | 162 | 12   | 121   |
| YS1R-65F       | YS9Z-TMI65                 | 114        | 162 | 12   | 121   |
| YS1R-80F       | YS9Z-TMI125                | 191        | 240 | 12.4 | 143.5 |
| YS1R-100F      | YS9Z-TMI125                | 191        | 240 | 12.4 | 143.5 |
| YS1R-125F      | YS9Z-TMI125                | 191        | 240 | 12.4 | 143.5 |
| YS1R-150F      | YS9Z-TMI125                | 239        | 300 | 12.4 | 169.5 |
| YS1R-180F      | YS9Z-TMI125                | 239        | 300 | 12.4 | 169.5 |
| YS1R-220F      | YS9Z-TMI125                | 269        | 305 | 12.4 | 195   |
| YS1R-300F      | YS9Z-TMI125                | 269        | 305 | 12.4 | 195   |



Note: 1. The mounting holes are the same as the YS1 Series.

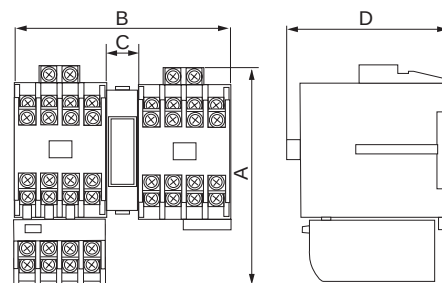
2. The above figures are not drawn to scale. Refer to the chart for actual dimensions.

3. YS1N-80F~-300F size contactors require an additional mounting base.

Refer to the YS1R-80F through -300F in the dimension chart.

### Reversing Starters

| Contactor Size | Mechanical Interlock Block | Dimensions |     |      |       |
|----------------|----------------------------|------------|-----|------|-------|
|                |                            | A          | B   | C    | D     |
| YS2R-9F        | YS9Z-TMI65                 | 78.5       | 100 | 12   | 76    |
| YS2R-12F       | YS9Z-TMI65                 | 78.5       | 100 | 12   | 76    |
| YS2R-20F       | YS9Z-TMI65                 | 85         | 103 | 12   | 91    |
| YS2R-25F       | YS9Z-TMI65                 | 85         | 103 | 12   | 91    |
| YS2R-32F       | YS9Z-TMI65                 | 92         | 128 | 12   | 111   |
| YS2R-38F       | YS9Z-TMI65                 | 92         | 128 | 12   | 111   |
| YS2R-40F       | YS9Z-TMI65                 | 92         | 128 | 12   | 111   |
| YS2R-50F       | YS9Z-TMI65                 | 114        | 162 | 12   | 121   |
| YS2R-65F       | YS9Z-TMI65                 | 114        | 162 | 12   | 121   |
| YS2R-80F       | YS9Z-TMI125                | 191        | 240 | 12.4 | 143.5 |
| YS2R-100F      | YS9Z-TMI125                | 191        | 240 | 12.4 | 143.5 |
| YS2R-125F      | YS9Z-TMI125                | 191        | 240 | 12.4 | 143.5 |
| YS2R-150F      | YS9Z-TMI125                | 239        | 300 | 12.4 | 169.5 |
| YS2R-180F      | YS9Z-TMI125                | 239        | 300 | 12.4 | 169.5 |
| YS2R-220F      | YS9Z-TMI125                | 269        | 305 | 12.4 | 195   |
| YS2R-300F      | YS9Z-TMI125                | 269        | 305 | 12.4 | 195   |



Note: 1. The mounting holes are the same as the YS1 Series.

2. The above figures are not drawn to scale. Refer to the chart for actual dimensions.

3. YS1N-80F through 300F contactors require an additional mounting base.

Refer to the YS2R-80F~-300F in the dimension chart.

## **Mounting and Removing of Mechanical Interlock Block**

### **Mounting Procedure (YS9Z-TMI65)**

1. Position the mechanical interlock block and the contactor in the same direction. (The name plate of the mechanical interlock block should be in the same direction as the name plate of the contactor.)

2. Insert the connection pins of the mechanical interlock block (located on the left and right sides of the mechanical interlock block) into the pin holes of the forward and reverse contactors (the forward contactor in the right and the reverse contactor in the left in the picture). Carefully push the contactors towards the mechanical interlock block to lock the entire assembly together.

3. Insert the mounting base into the bottom of the mechanical interlock block until it bottoms. (Make sure that the arrow-shaped protrusion of the mechanical interlock as far as it will go.)

### **Removal Procedure**

1. To remove the mechanical interlock block, insert a screwdriver into the space between the mechanical interlock block and the mounting base.

2. Remove the mounting base from the assembly.

3. Gently pull the forward and reverse contactors apart.

### **Mounting Procedure (YS9Z-TMI125)**

1. Position the mechanical interlock and the contactor in the same direction. (The name plate of the mechanical interlock should be in the same direction as the name plate of the contactor.)

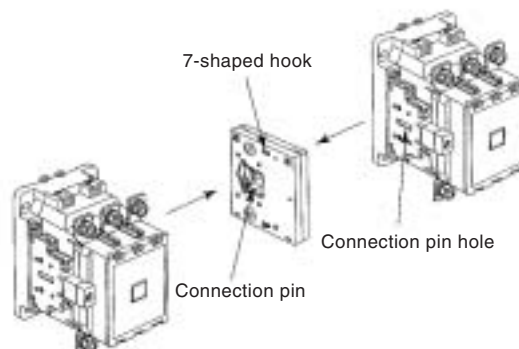
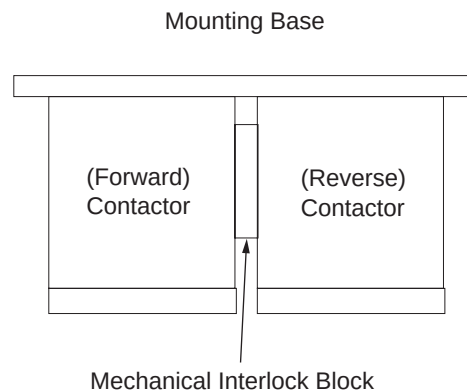
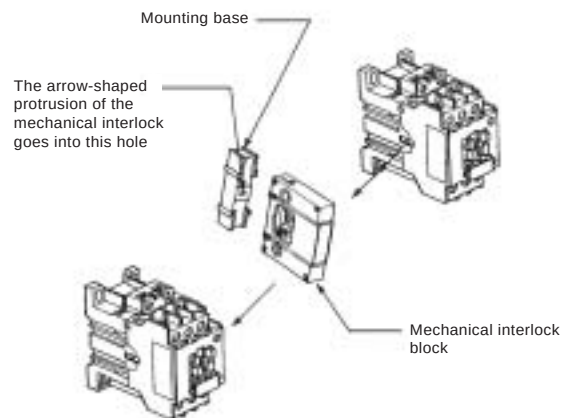
2. Insert the connection pin of the mechanical interlock into the connection pin hole located on the right side of the forward contactor. The 7-shaped hook of the mechanical interlock reaches the contactor. Position the 7-shaped hook of the mechanical interlock to match the ribbed area of the contactor and press the mechanical interlock block towards the forward contactor.

3. For the reverse contactor, follow the same procedure above, but insert the connection pin of the mechanical interlock block into the pin hole located on the left side of the reverse contactor. (Note: The mounting order of the forward or the reverse contactor does not make a difference in the assembly procedure.)

4. After the mechanical interlock block is installed to both contactors, mount the contactors to the mounting base with the screws (4 screws for each contactor, total of 8 screws.) Make sure that the mechanical interlock block is completely locked to the contactors. Please note that there can be operational problems if the mechanical interlock and the contactors are not properly locked into position.

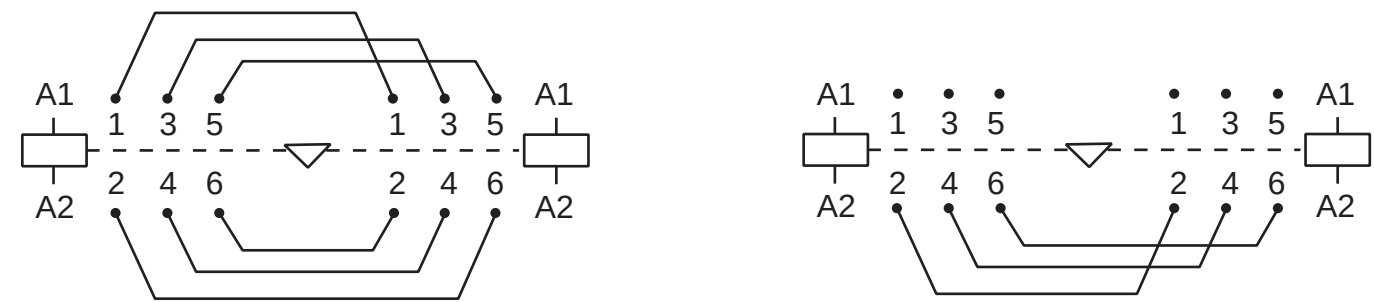
### **Removal Procedure**

1. Insert a screwdriver into the 7-shaped hook area between either contactor and the mechanical interlock and pry out the mechanical interlock.



Connector Kits for Reversing Contactors and Starters

Used as connectors on reversing contactors (YS1R series) and reversing starters (YS2R series).



**D** Power Wiring Kits for Reversing Contactors

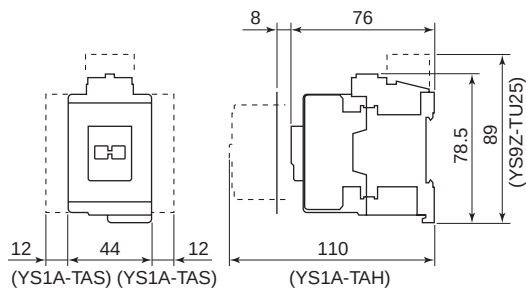
| IEC Contactors | Part Number      | Connections                                                                | Description             | Size    | Applicable Reversing Contactors    |
|----------------|------------------|----------------------------------------------------------------------------|-------------------------|---------|------------------------------------|
|                | YS9Z-KIF411344-A | F:L1-R:L1<br>F:L2-R:L2<br>F:L3-R:L3<br>F:T1-R:T3<br>F:T2-R:T2<br>F:T3-R:T1 | UL1015<br>Solid Wire    | AWG 14  | YS1R-9F<br>YS1R-12F                |
|                | YS9Z-KIF411345-A | F:L1-R:L1<br>F:L2-R:L2<br>F:L3-R:L3<br>F:T1-R:T3<br>F:T2-R:T2<br>F:T3-R:T1 | UL1015<br>Stranded Wire | AWG 10  | YS1R-20F<br>YS1R-25F               |
|                | YS9Z-KIF411346-A | F:L1-R:L1<br>F:L2-R:L2<br>F:L3-R:L3<br>F:T1-R:T3<br>F:T2-R:T2<br>F:T3-R:T1 | UL1283<br>Stranded Wire | AWG 8   | YS1R-32F<br>YS1R-38F               |
|                | YS9Z-KIF411347-A | F:L1-R:L1<br>F:L2-R:L2<br>F:L3-R:L3<br>F:T1-R:T3<br>F:T2-R:T2<br>F:T3-R:T1 | Copper Bar<br>Solid Bar | AWG 6   | YS1R-40F<br>YS1R-50F<br>YS1R-65F   |
|                | YS9Z-KIF411348-A | F:L1-R:L1<br>F:L2-R:L2<br>F:L3-R:L3<br>F:T1-R:T3<br>F:T2-R:T2<br>F:T3-R:T1 | Copper Bar<br>Solid Bar | 1.6 X11 | YS1R-80F<br>YS1R-100F<br>YS1R-125F |
|                | YS9Z-KIF411388-A | F:L1-R:L1<br>F:L2-R:L2<br>F:L3-R:L3<br>F:T1-R:T3<br>F:T2-R:T2<br>F:T3-R:T1 | Copper Bar<br>Solid Bar | 3 X16   | YS1R-150F                          |
|                | YS9Z-KIF411388-B | F:L1-R:L1<br>F:L2-R:L2<br>F:L3-R:L3<br>F:T1-R:T3<br>F:T2-R:T2<br>F:T3-R:T1 | Copper Bar<br>Solid Bar | 3 X20   | YS1R-180F                          |
|                | YS9Z-KIF411590-A | F:L1-R:L1<br>F:L2-R:L2<br>F:L3-R:L3<br>F:T1-R:T3<br>F:T2-R:T2<br>F:T3-R:T1 | Copper Bar<br>Solid Bar | 3.5X25  | YS1R-220F<br>YS1R-300F             |

## Non-Reversing AC Contactors

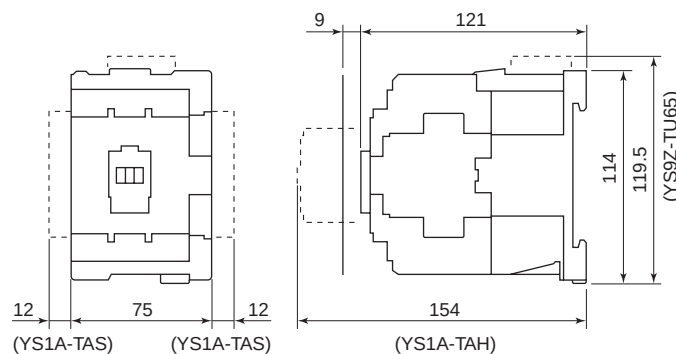
All Dimensions in mm.

### Non-Reversing Contactors

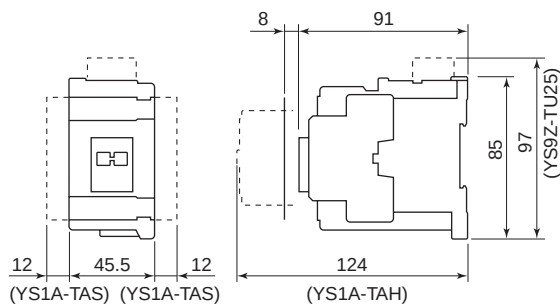
#### ● YS1N-9F, YS1N-12F



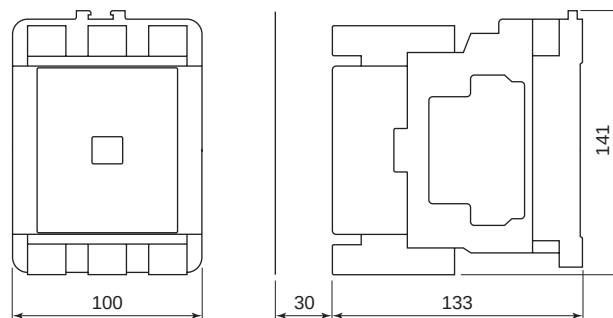
#### ● YS1N-40F, YS1N-50F, YS1N-65F



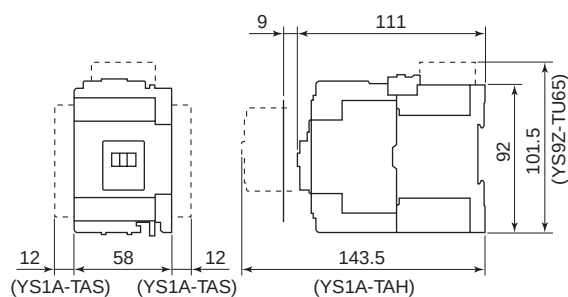
#### ● YS1N-20F, YS1N-25F



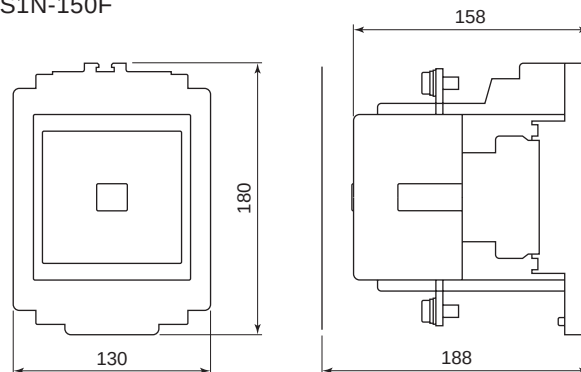
#### ● YS1N-80F, YS1N-100F, YS1N-125F



#### ● YS1N-32F, YS1N-38F

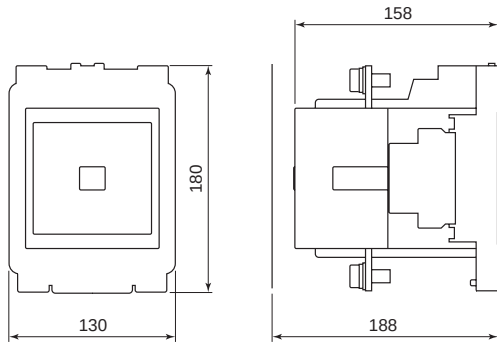


#### ● YS1N-150F

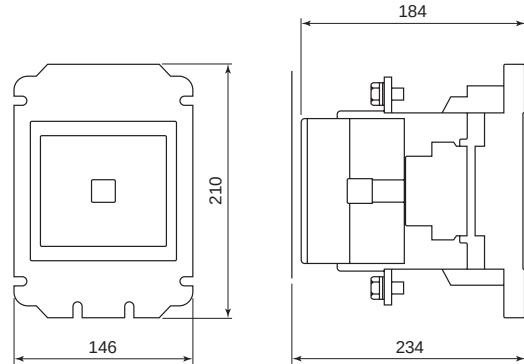


■ Non-Reversing Contactors

● YS1N-180F

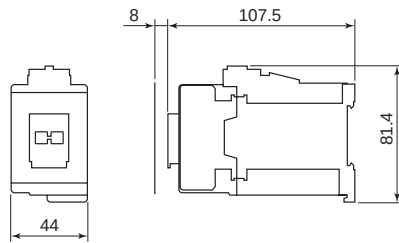


● YS1N-220F, YS1N-300F

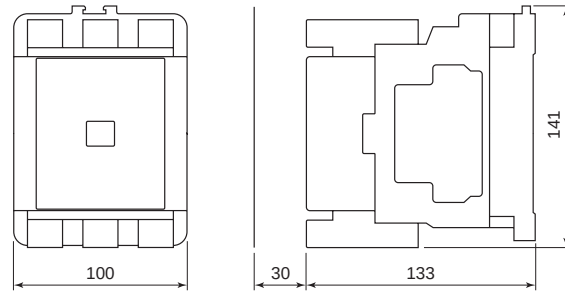


**Non-Reversing DC Contactors**

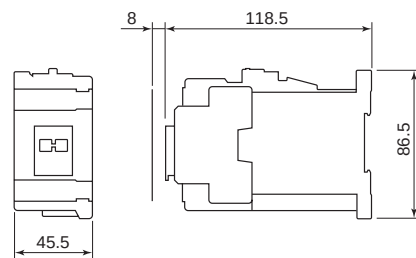
● YS3N-9FG2, YS3N-12FG2



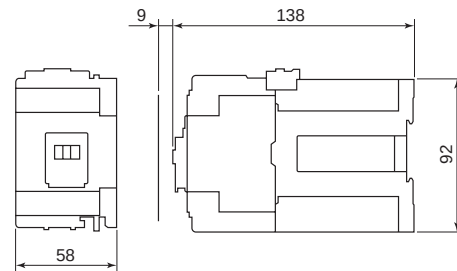
● YS3N-80FG, YS3N-100FG, YS3N-125FG



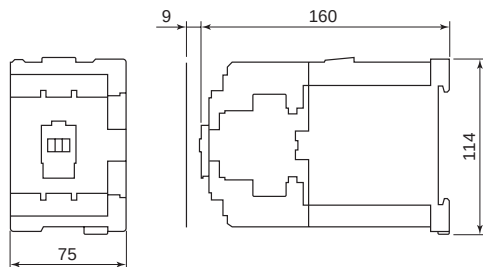
● YS3N-20FG2, YS3N-25FG2



● YS3N-32FG2, YS3N-38FG2



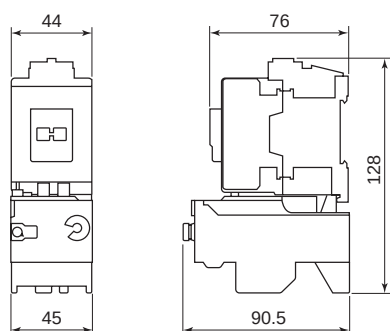
● YS3N-40FG2, YS3N-50FG2, YS3N-65FG2



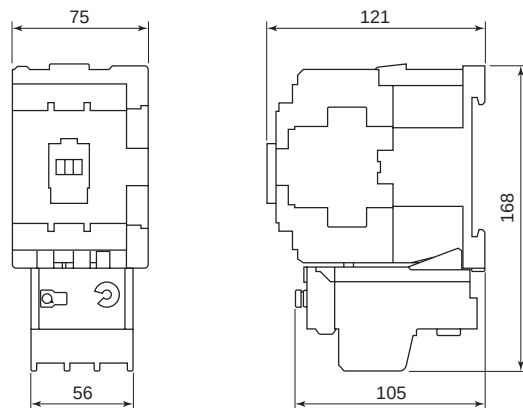
## Non-Reversing AC Starters

### ■ Non-Reversing Starters

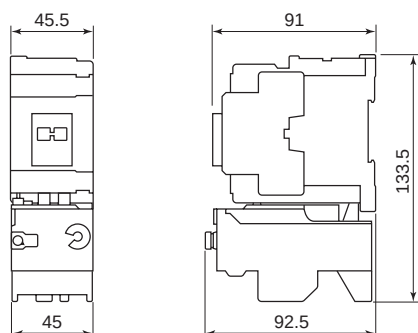
#### ● YS2N-9F, YS2N-12F



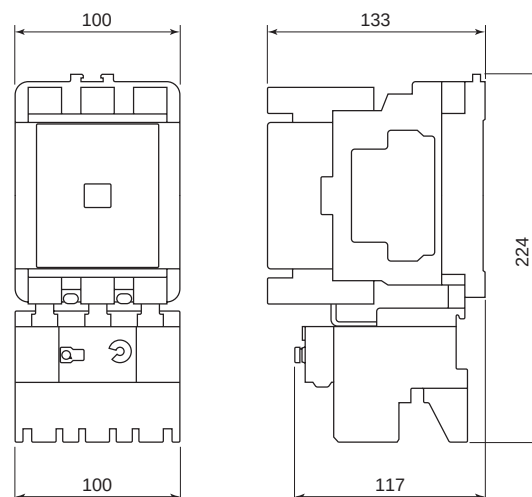
#### ● YS2N-40F, YS2N-50F, YS2N-65F



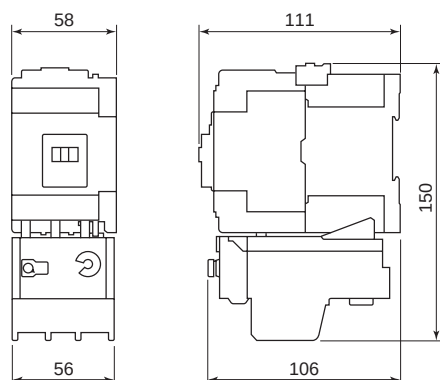
#### ● YS2N-20F, YS2N-25F



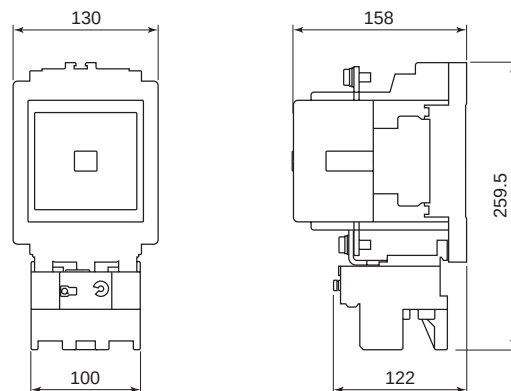
#### ● YS2N-80F, YS2N-100F, YS2N-125F



#### ● YS2N-32F, YS2N-38F

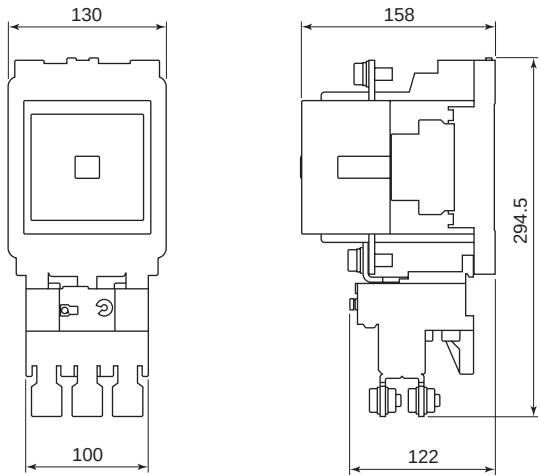


#### ● YS2N-150F

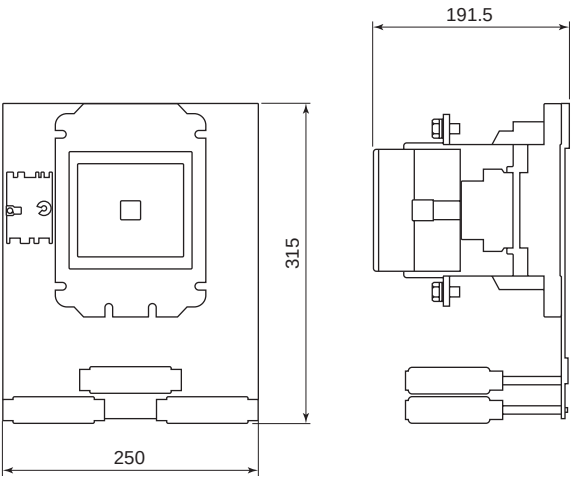

**D**
**IEC Contactors**

■ Non-Reversing Starters

● YS2N-180F



● YS2N-220F, YS2N-300F

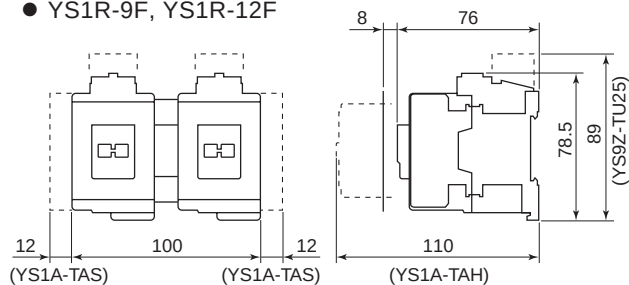


**D**  
**IEC Contactors**

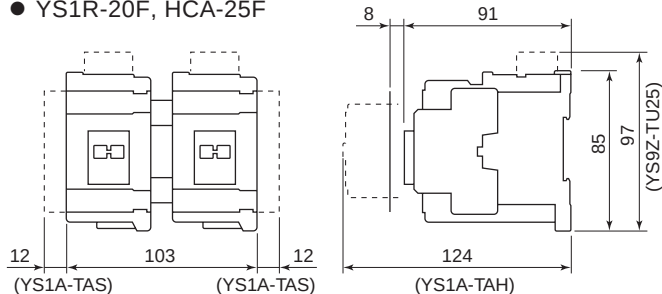
## Reversing AC Contactors

### ■ Reversing Contactors

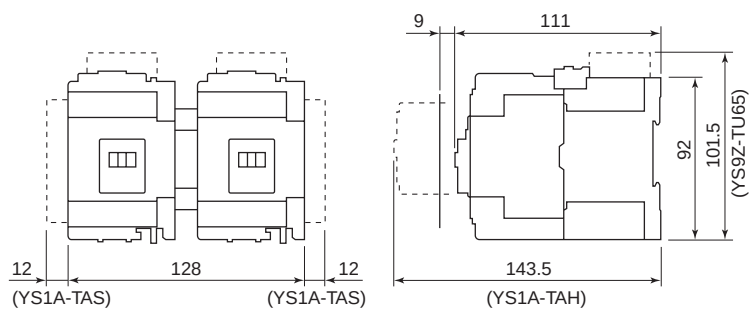
#### ● YS1R-9F, YS1R-12F



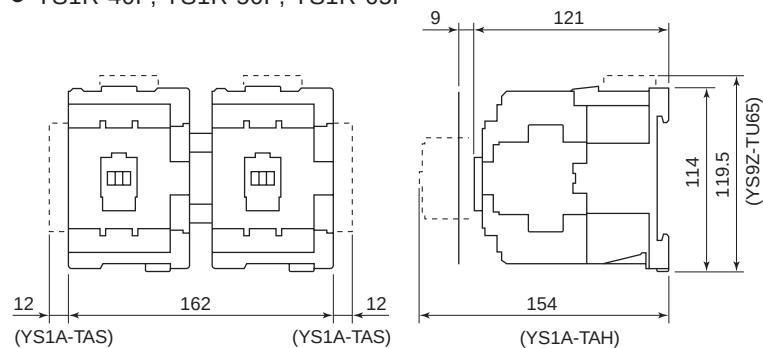
#### ● YS1R-20F, HCA-25F



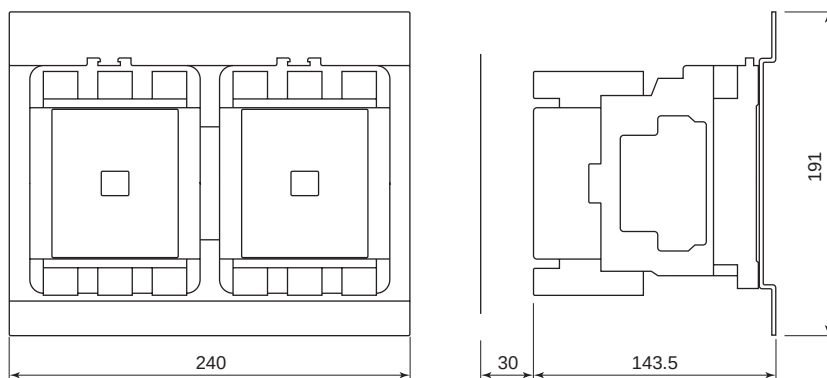
#### ● YS1R-32F, YS1R-38F



#### ● YS1R-40F, YS1R-50F, YS1R-65F



#### ● YS1R-80F, YS1R-100F, YS1R-125F

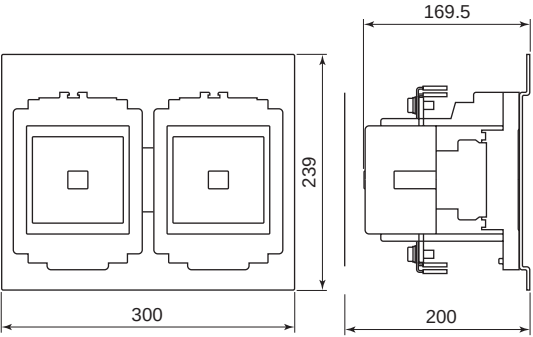

**D**
**IEC Contactors**

D

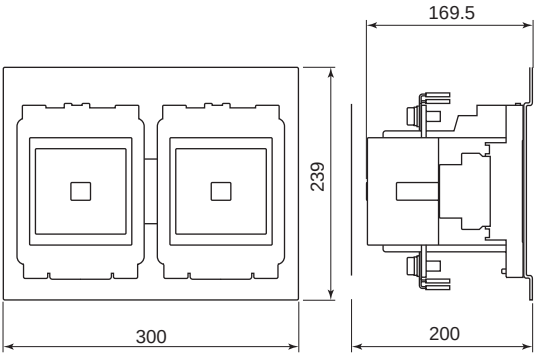
IEC Contactors

■ Reversing Contactors

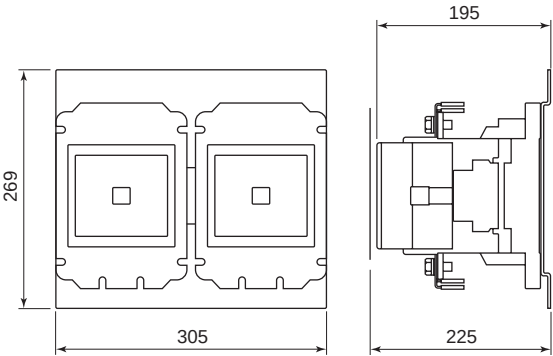
● YS1R-150F



● YS1R-180F



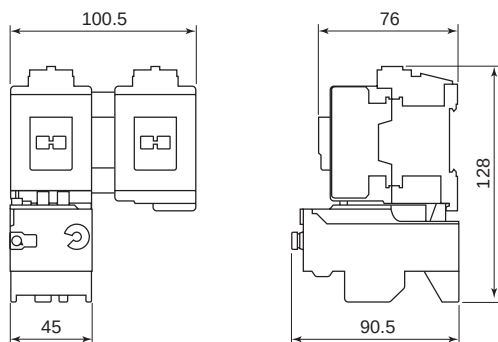
● YS1R-220F, YS1R-300F



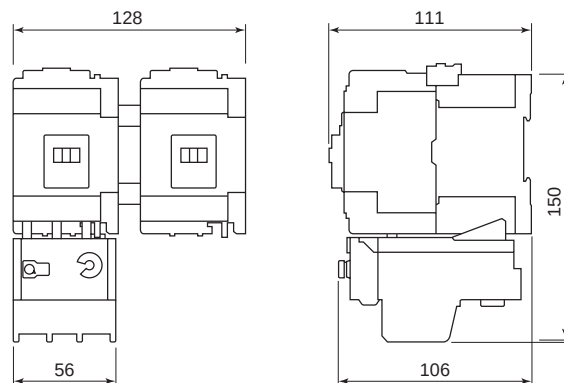
## Reversing AC Starters

### ■ Reversing Starters

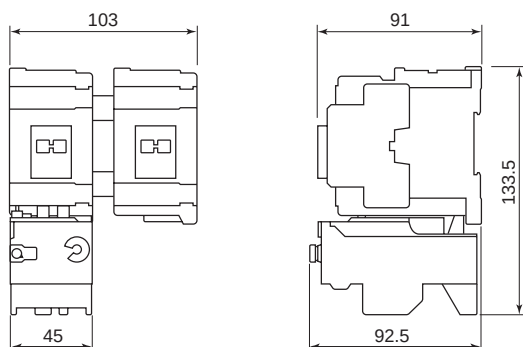
#### ● YS2R-9F, YS2R-12F



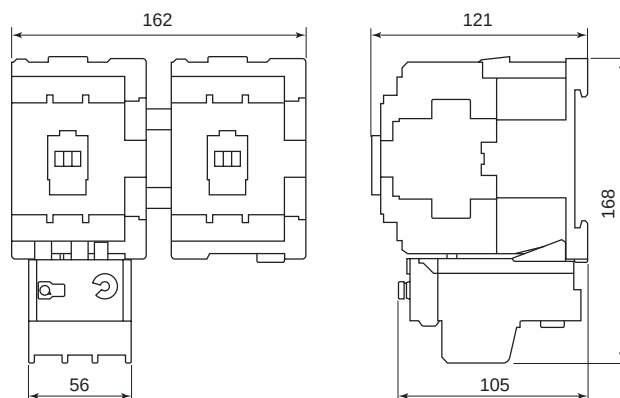
#### ● YS2R-32F, YS2R-38F



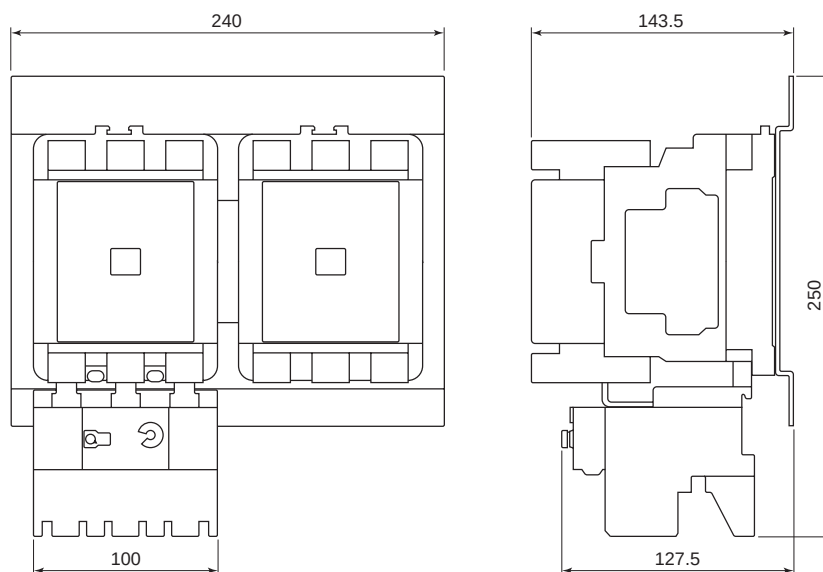
#### ● YS2R-20F, YS2R-25F



#### ● YS2R-40F, YS2R-50F, YS2R-65F



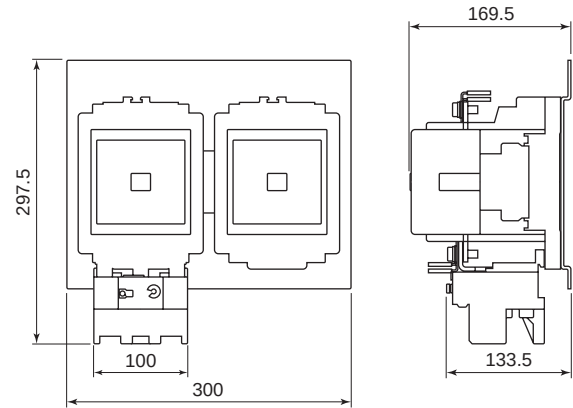
#### ● YS2R-80F, YS2R-100F, YS2R-125F



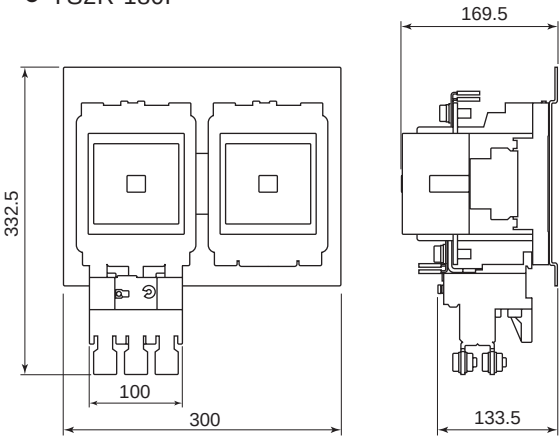
**D**  
**IEC Contactors**

■ Reversing Starters

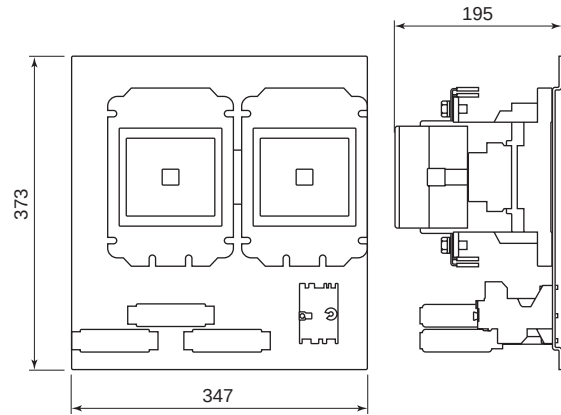
● YS2R-150F



● YS2R-180F



● YS2R-220F, YS2R-300F

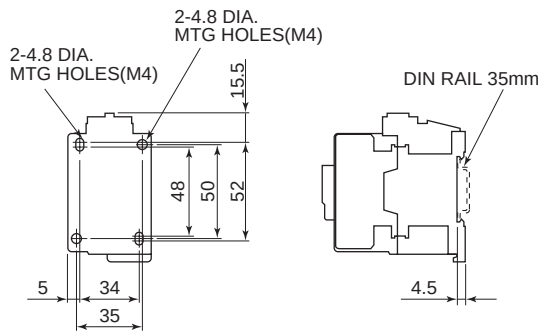


## Non-Reversing AC Contactors

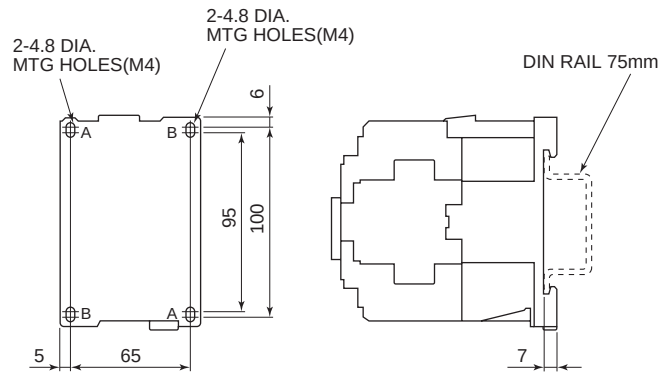
### Mounting, Screw Mounting, and Rail Mounting

#### ■ Non-Reversing Contactors

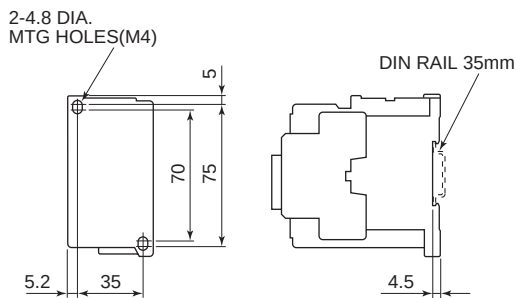
##### ● YS1N, YS1N-12F



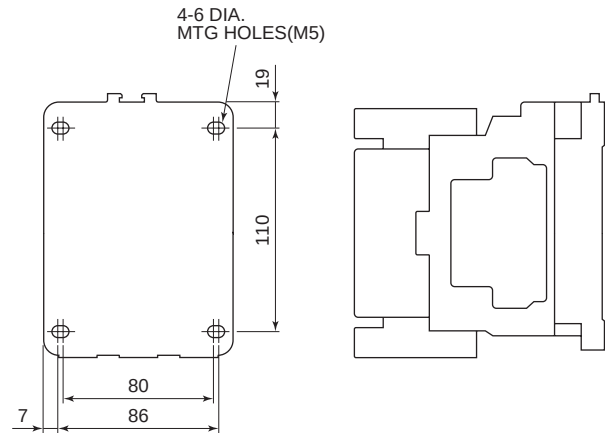
##### ● YS1N-40F, YS1N-50F, YS1N-65F



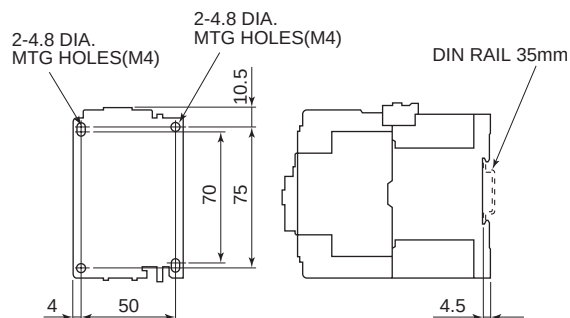
##### ● YS1N-20F, YS1N-25F



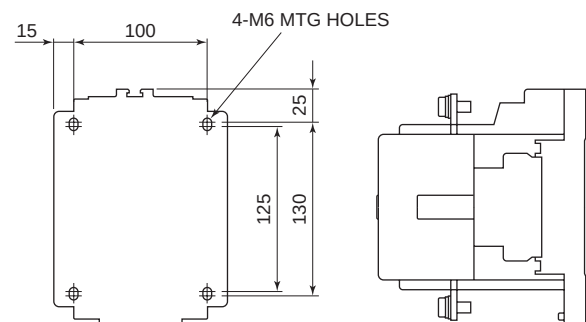
##### ● YS1N-80F, YS1N-100F, YS1N-125F



##### ● YS1N-32F, YS1N-38F



##### ● YS1N-150F



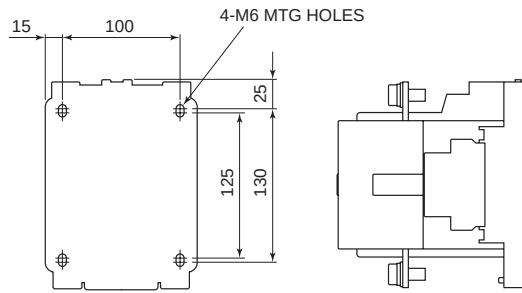
D

IEC Contactors

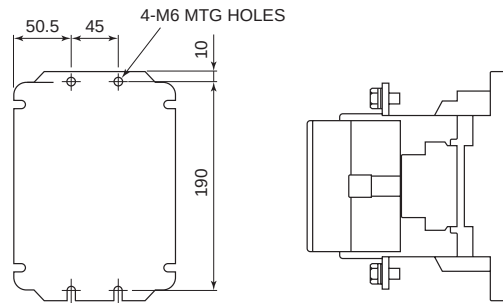
**Mounting, Screw Mounting, and Rail Mounting, continued**

■ Non-Reversing Contactors

● YS1N-180F



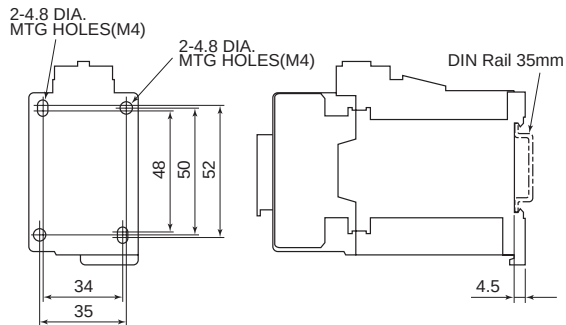
● YS1N-220F, YS1N-300F



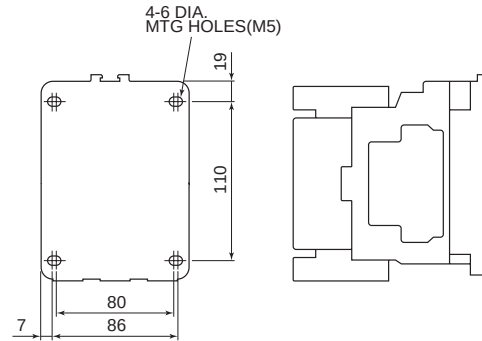
D

**Non-Reversing DC Contactors**

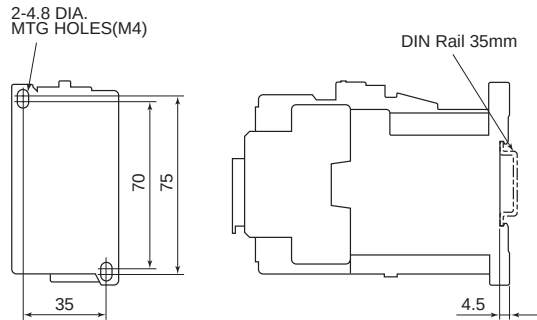
● YS3N-9FG2, -12FG2



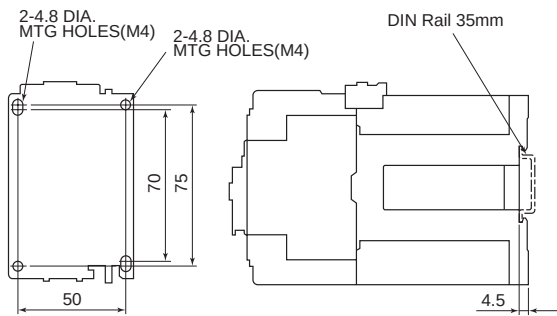
● YS3N-80FG, YS3N-100FG, YS3N-125FG



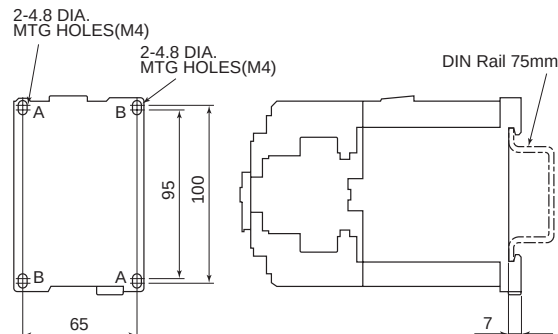
● YS3N-20FG2, YS3N-25FG2



● YS3N-32FG2, YS3N-38FG2



● YS3N-40FG2, YS3N-50FG2, YS3N-65FG2

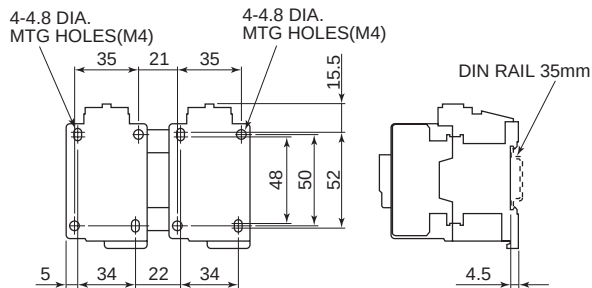


## Reversing AC Contactors

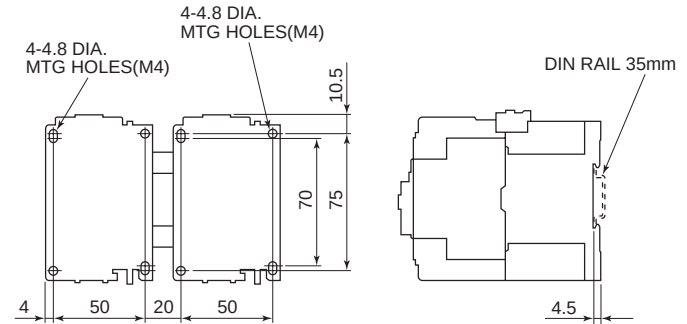
### Mounting, Screw Mounting, and Rail Mounting

#### ■ Reversing Contactors

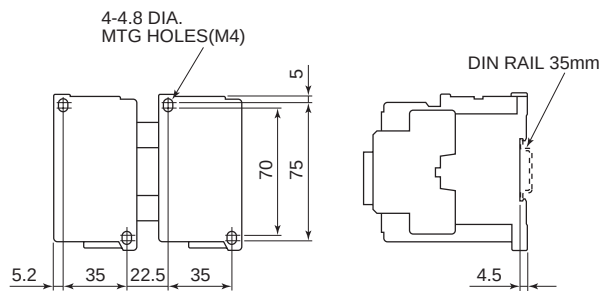
##### ● YS1R-9F, YS1R-12F



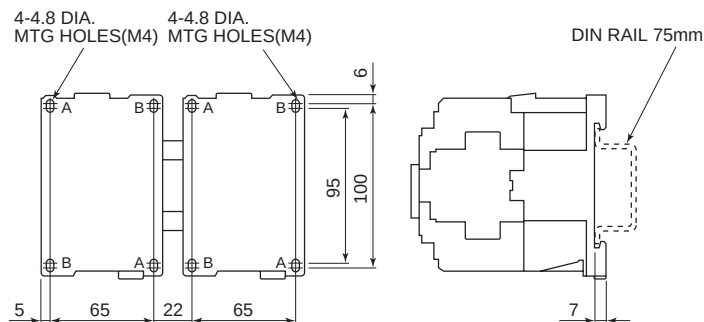
##### ● YS1R-32F, YS1R-38F



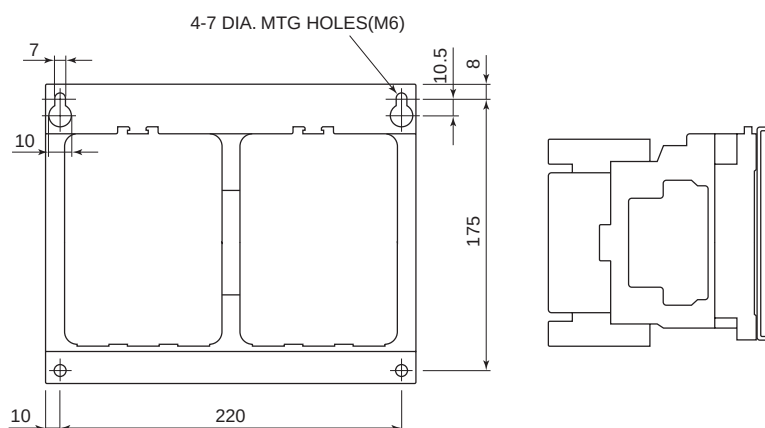
##### ● YS1R-20F, YS1R-25F



##### ● YS1R-40F, YS1R-50F, YS1R-65F



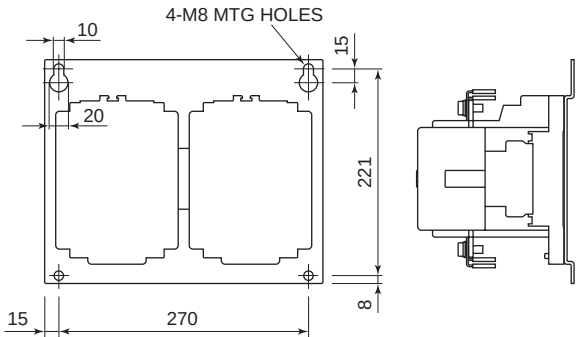
##### ● YS1R-80F, YS1R-100F, YS1R-125F



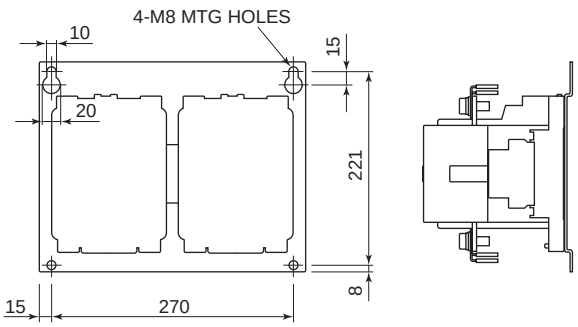
Mounting, Screw Mounting, and Rail Mounting, continued

■ Reversing Contactors

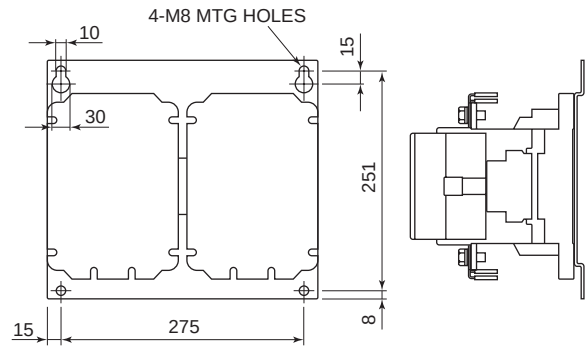
● YS1R-150F



● YS1R-180F



● YS1R-220F, YS1R-300F



D

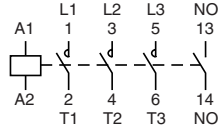
IEC Contactors

## Non-Reversing and Reversing Contactors

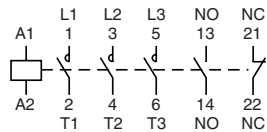
### Wiring Diagrams

#### ■ Non-Reversing Contactors

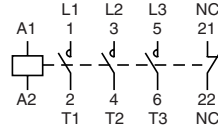
##### ● YS1N-9F, YS1N-12F (1NO)



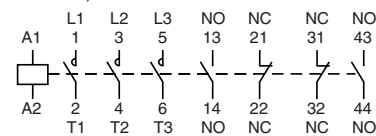
##### ● YS1N-20F, YS1N-25F, YS1N-32F, YS1N-38F YS1N-40F, YS1N-50F, YS1N-65F



##### ● YS1N-9F, YS1N-12F (1NC)

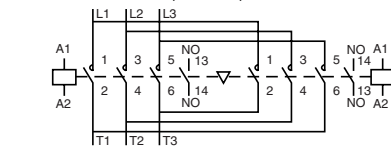


##### ● YS1N-80F, YS1N-100F, YS1N-125F, YS1N-150F, YS1N-180F YS1N-220F, YS1N-300F

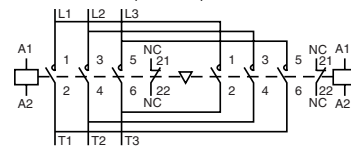


#### ■ Reversing Contactors

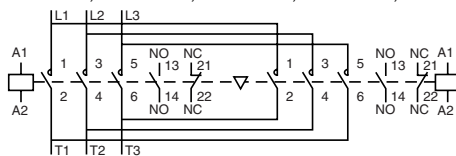
##### ● YS1R-9F, YS1R-12F (1NOX2)



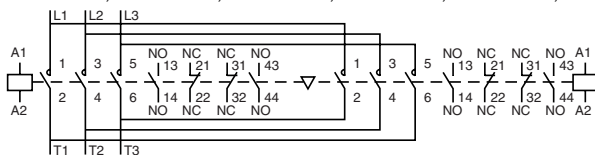
##### ● YS1R-9F, YS1R-12F (1NCX2)



##### ● YS1R-20F, YS1R-25F, YS1R-32F, YS1R-38F, YS1R-40F, YS1R-50F, YS1R-65F

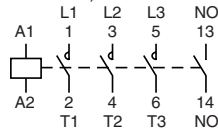


##### ● YS1R-80F, YS1R-100F, YS1R-125F, YS1R-150F, YS1R-180F, YS1R-220F, YS1R-300F

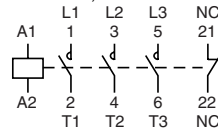


#### ■ Non-Reversing Contactors DC Operated

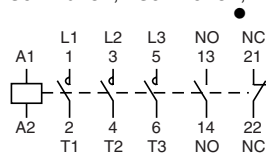
##### ● YS3N-9FG2, YS3N-12FG2 (1NO)



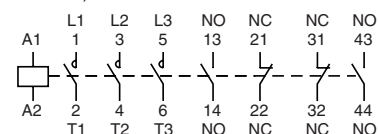
##### ● YS3N-9FG2, YS3N-12FG2 (1NC)



##### ● YS3N-20FG2, YS3N-25FG2, YS3N-32G2F



##### ● YS3N-38FG2, YS3N-40FG2, YS3N-50FG2, YS3N-65FG2

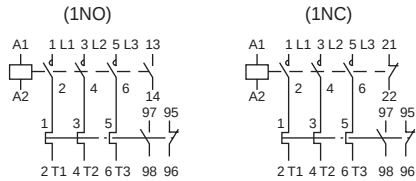


## Non-Reversing and Reversing Starters

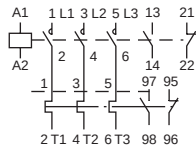
## Wiring Diagrams

## ■ Non-Reversing Starters

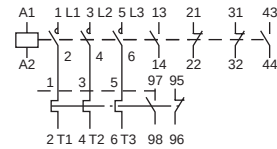
- YS2N-9FD, YS2N-12FD



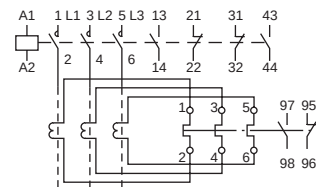
- YS2N-20FD, YS2N-25FD, YS2N-32FD, YS2N-38FD, YS2N-40FD, YS2N-50FD, YS2N-65FD



- YS2N-80FD, YS2N-100FD, YS2N-125FD, YS2N-150FD, YS2N-180FD

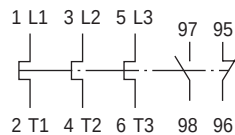


- YS2N-220FD, YS2N-300FD



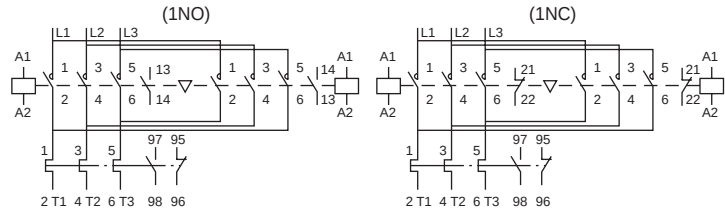
## ■ Thermal Overload Relays

- YS1T-RHA□FD□D

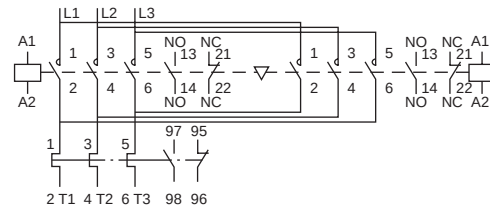


## ■ Reversing Starters

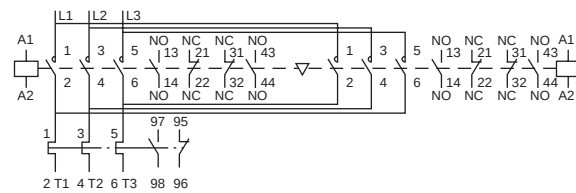
- YS2R-9FD, YS2R-12FD



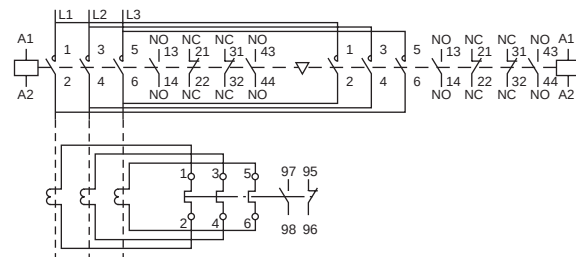
- YS2R-20FD, YS2R-25FD, YS2R-32FD, YS2R-38FD, YS2R-40FD, YS2R-50FD, YS2R-65FD



- YS2R-80FD, YS2R-100FD, YS2R-125FD, YS2R-150FD, YS2R-180FD



- YS2R-220FD, YS2R-300FD

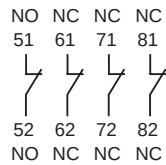


## Auxiliary Contact Blocks

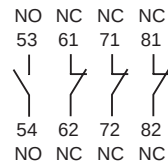
### Wiring Diagrams

#### ■ Auxiliary Contact Blocks

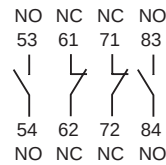
##### ● YS1A-TAH404F 4NC



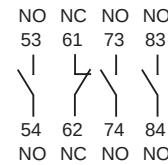
##### ● YS1A-TAH413F 1NO+3NC



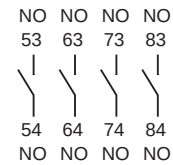
##### ● YS1A-TAH422F 2NO+2NC



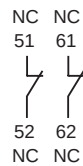
##### ● YS1A-TAH431F 3NO+1NC



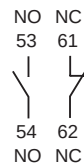
##### ● YS1A-TAH440F 4NO



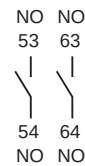
##### ● YS1A-TAH202F 2NC



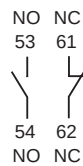
##### ● YS1A-TAH211F 1NO+1NC



##### ● YS1A-TAH220F 2NO



##### ● YS1A-TAS211F 1NO+1NC



D

IEC Contactors

## Appendix

## STANDARDIZED UTILIZATION CATEGORIES [Excerpt from EN60947]

## ■ Class of AC Magnetic Contactors

## Contactors

| Typical applications<br>for AC switching                  | Category | Conditions of making and breaking corresponding to normal operation (dura- |    |            |          |        |            | Conditions of making and breaking corresponding to occasional operation |        |            |          |        |            |
|-----------------------------------------------------------|----------|----------------------------------------------------------------------------|----|------------|----------|--------|------------|-------------------------------------------------------------------------|--------|------------|----------|--------|------------|
|                                                           |          | Making                                                                     |    |            | Breaking |        |            | Making                                                                  |        |            | Breaking |        |            |
|                                                           |          | I                                                                          | U  | cos $\phi$ | I        | U      | cos $\phi$ | I                                                                       | U      | cos $\phi$ | I        | U      | cos $\phi$ |
| Resistive, non-inductive or slightly inductive            | AC1      | le                                                                         | Ue | 0.95       | le       | Ue     | 0.95       | 1.5le                                                                   | 1.05Ue | 0.8        | 1.5le    | 1.05Ue | 0.8        |
| Slip-ring motors Starting, switching                      | AC2      | 2.5le                                                                      | Ue | 0.65       | 2.5le    | Ue     | 0.65       | 4le                                                                     | 1.05Ue | 0.65       | 4le      | 1.05Ue | 0.65       |
| Squirrel cage motors Starting, switching off              | AC3      | 6le                                                                        | Ue | (1)        | le       | 0.17Ue | (1)        | 10le                                                                    | 1.05Ue | (2)        | 8le      | 1.05Ue | (2)        |
| Squirrel cage motors Starting, plugging inching (jogging) | AC4      | 6le                                                                        | Ue | (1)        | 6le      | Ue     | (1)        | 12le                                                                    | 1.05Ue | (2)        | 10le     | 1.05Ue | (2)        |

Notes : (1)  $\cos \phi = 0.65$  for  $le \leq 17A$   $\cos \phi = 0.35$  for  $le > 17A$   
 (2)  $\cos \phi = 0.45$  for  $le \leq 100A$   $\cos \phi = 0.35$  for  $le > 100A$

## ■ Class of Auxiliary Contacts

## Auxiliary Contacts

| Typical applications<br>for AC switching                      | Category | Conditions of making and breaking corresponding to normal operation (dura- |    |            |          |    |            | Conditions of making and breaking corresponding to occasional operation |       |            |          |       |            |
|---------------------------------------------------------------|----------|----------------------------------------------------------------------------|----|------------|----------|----|------------|-------------------------------------------------------------------------|-------|------------|----------|-------|------------|
|                                                               |          | Making                                                                     |    |            | Breaking |    |            | Making                                                                  |       |            | Breaking |       |            |
|                                                               |          | I                                                                          | U  | cos $\phi$ | I        | U  | cos $\phi$ | I                                                                       | U     | cos $\phi$ | I        | U     | cos $\phi$ |
| Control of electromagnets<br>< 72 VA sealed<br>> 72 VA sealed | AC14     | 6le                                                                        | Ue | 0.3        | le       | Ue | 0.3        | 6le                                                                     | 1.1Ue | 0.7        | 6le      | 1.1Ue | 0.7        |
|                                                               | AC15     | 10le                                                                       | Ue | 0.3        | le       | Ue | 0.3        | 10le                                                                    | 1.1Ue | 0.3        | 10le     | 1.1Ue | 0.3        |

**Application Tables**
**AC 1 Ratings:**
**(International Applications)**
**Non-inductive or slightly inductive loads, resistance furnaces:**

| Power Ratings of Three-Phase Motors (50/60Hz) |              |      |      |      |              | Maximum<br>Operational<br>Current<br>AC1 | Instantaneous<br>Auxiliary<br>Contacts |    | Completed Part Number |
|-----------------------------------------------|--------------|------|------|------|--------------|------------------------------------------|----------------------------------------|----|-----------------------|
| Category AC1<br>(Star Connection)             |              |      |      |      |              |                                          |                                        |    |                       |
| 220V<br>230V                                  | 380V<br>400V | 415V | 440V | 500V | 660V<br>690V | θ<55°C                                   | NO                                     | NC |                       |
| kW                                            | kW           | kW   | kW   | kW   | kW           | A                                        |                                        |    |                       |
| 7.5                                           | 13           | 14   | 15   | 17   | 23           | 20                                       | 0                                      | 1  | YS1N-9F01 * * * *     |
| 7.5                                           | 13           | 14   | 15   | 17   | 23           | 20                                       | 1                                      | 0  | YS1N-9F10 * * * *     |
| 7.5                                           | 13           | 14   | 15   | 17   | 23           | 20                                       | 0                                      | 1  | YS1N-12F01 * * * *    |
| 7.5                                           | 13           | 14   | 15   | 17   | 23           | 20                                       | 1                                      | 0  | YS1N-12F10 * * * *    |
| 11                                            | 20           | 21   | 23   | 26   | 34           | 30                                       | 1                                      | 1  | YS1N-20F11 * * * *    |
| 11                                            | 20           | 21   | 23   | 26   | 34           | 30                                       | 1                                      | 1  | YS1N-25F11 * * * *    |
| 19                                            | 32           | 35   | 38   | 43   | 57           | 50                                       | 1                                      | 1  | YS1N-32F11 * * * *    |
| 23                                            | 40           | 43   | 45   | 52   | 68           | 60                                       | 1                                      | 1  | YS1N-38F11 * * * *    |
| 23                                            | 40           | 43   | 45   | 52   | 68           | 60                                       | 1                                      | 1  | YS1N-40F11 * * * *    |
| 30                                            | 52           | 57   | 61   | 69   | 91           | 80                                       | 1                                      | 1  | YS1N-50F11 * * * *    |
| 30                                            | 52           | 57   | 61   | 69   | 91           | 80                                       | 1                                      | 1  | YS1N-65F11 * * * *    |
| 51                                            | 88           | 97   | 102  | 116  | 154          | 135                                      | 2                                      | 2  | YS1N-80F22 * * * *    |
| 57                                            | 98           | 107  | 114  | 129  | 171          | 150                                      | 2                                      | 2  | YS1N-100F22 * * * *   |
| 57                                            | 98           | 107  | 114  | 129  | 171          | 150                                      | 2                                      | 2  | YS1N-125F22 * * * *   |
| 76                                            | 132          | 144  | 152  | 173  | 229          | 200                                      | 2                                      | 2  | YS1N-150F22 * * * *   |
| 91                                            | 158          | 173  | 183  | 208  | 274          | 240                                      | 2                                      | 2  | YS1N-180F22 * * * *   |
| 99                                            | 171          | 187  | 198  | 225  | 297          | 260                                      | 2                                      | 2  | YS1N-220F22 * * * *   |
| 133                                           | 230          | 252  | 267  | 303  | 400          | 350                                      | 2                                      | 2  | YS1N-300F22 * * * *   |

**D**
**IEC Contactors**

**AC2 Ratings: Slip-ring motors; starting, switching off running motors**

**(International Applications)**

**AC4 Ratings: Squirrel-cage motors; starting, plugging, inching**

| Power Ratings of Three-Phase Motors (50/60Hz) |              |      |      |      |              | Instantaneous<br>Auxiliary<br>Contacts |    | Completed Part Number |
|-----------------------------------------------|--------------|------|------|------|--------------|----------------------------------------|----|-----------------------|
| Category AC2 or AC4                           |              |      |      |      |              |                                        |    |                       |
| 220V<br>230V                                  | 380V<br>400V | 415V | 440V | 500V | 660V<br>690V | NO                                     | NC |                       |
| kW                                            | kW           | kW   | kW   | kW   | kW           |                                        |    |                       |
| 2.2                                           | 4            | 4    | 4    | 5.5  | 5.5          | 0                                      | 1  | YS1N-9F01 * * * *     |
| 2.2                                           | 4            | 4    | 4    | 5.5  | 5.5          | 1                                      | 0  | YS1N-9F10 * * * *     |
| 3                                             | 5.5          | 5.5  | 5.5  | 5.5  | 7.5          | 0                                      | 1  | YS1N-12F01 * * * *    |
| 3                                             | 5.5          | 5.5  | 5.5  | 5.5  | 7.5          | 1                                      | 0  | YS1N-12F10 * * * *    |
| 4                                             | 7.5          | 9    | 9    | 9    | 9            | 1                                      | 1  | YS1N-20F11 * * * *    |
| 5.5                                           | 9            | 9    | 9    | 10   | 10           | 1                                      | 1  | YS1N-25F11 * * * *    |
| 7.5                                           | 11           | 11   | 11   | 15   | 15           | 1                                      | 1  | YS1N-32F11 * * * *    |
| 11                                            | 15           | 15   | 15   | 15   | 18.5         | 1                                      | 1  | YS1N-38F11 * * * *    |
| 11                                            | 15           | 15   | 15   | 15   | 18.5         | 1                                      | 1  | YS1N-40F11 * * * *    |
| 15                                            | 18.5         | 18.5 | 22   | 22   | 22           | 1                                      | 1  | YS1N-50F11 * * * *    |
| 18.5                                          | 22           | 22   | 30   | 25   | 25           | 1                                      | 1  | YS1N-65F11 * * * *    |
| 22                                            | 30           | 33   | 33   | 37   | 33           | 2                                      | 2  | YS1N-80F22 * * * *    |
| 30                                            | 45           | 45   | 45   | 45   | 45           | 2                                      | 2  | YS1N-100F22 * * * *   |
| 37                                            | 51           | 51   | 51   | 51   | 51           | 2                                      | 2  | YS1N-125F22 * * * *   |
| 45                                            | 63           | 63   | 63   | 63   | 63           | 2                                      | 2  | YS1N-150F22 * * * *   |
| 55                                            | 80           | 80   | 80   | 80   | 75           | 2                                      | 2  | YS1N-180F22 * * * *   |
| 65                                            | 90           | 90   | 90   | 90   | 90           | 2                                      | 2  | YS1N-220F22 * * * *   |
| 90                                            | 129          | 129  | 129  | 110  | 140          | 2                                      | 2  | YS1N-300F22 * * * *   |

**D**
**IEC Contactors**

## AC3 Ratings:

(International Applications)

Squirrel-cage motors—starting & switching off running motors:

| Power Ratings for Three - Phase Motors 50/60Hz Category AC3<br>—for ambient air temperature around contactor 55° C |              |         |         |         |              | Maximum<br>Operational<br>Current | Instantaneous<br>Auxiliary<br>Contacts |    | Completed Part<br>Number |
|--------------------------------------------------------------------------------------------------------------------|--------------|---------|---------|---------|--------------|-----------------------------------|----------------------------------------|----|--------------------------|
| 220V<br>230V                                                                                                       | 380V<br>400V | 415V    | 440V    | 500V    | 660V<br>690V | AC3 Duty<br>380-440V              | NO                                     | NC |                          |
| kW/HP                                                                                                              | kW/HP        | kW/HP   | kW/HP   | kW/HP   | kW/HP        | A                                 |                                        |    |                          |
| 2.2/3                                                                                                              | 4/5.5        | 4/5.5   | 4/5.5   | 5.5/7.5 | 5.5/7.5      | 8.5                               | 0                                      | 1  | YS1N-9F01 * * * *        |
| 2.2/3                                                                                                              | 4/5.5        | 4/5.5   | 4/5.5   | 5.5/7.5 | 5.5/7.5      | 8.5                               | 1                                      | 0  | YS1N-9F10 * * * *        |
| 3/4                                                                                                                | 5.5/7.5      | 5.5/7.5 | 5.5/7.5 | 7.5/10  | 7.5/10       | 11.5                              | 0                                      | 1  | YS1N-12F01 * * * *       |
| 3/4                                                                                                                | 5.5/7.5      | 5.5/7.5 | 5.5/7.5 | 7.5/10  | 7.5/10       | 11.5                              | 1                                      | 0  | YS1N-12F10 * * * *       |
| 4/5.5                                                                                                              | 7.5/10       | 9/12    | 9/12    | 10/13.5 | 10/13.5      | 15.5                              | 1                                      | 1  | YS1N-20F11 * * * *       |
| 5.5/7.5                                                                                                            | 11/15        | 11/15   | 11/15   | 15/20   | 15/20        | 22                                | 1                                      | 1  | YS1N-25F11 * * * *       |
| 7.5/10                                                                                                             | 15/20        | 15/20   | 15/20   | 18.5/25 | 18.5/25      | 30                                | 1                                      | 1  | YS1N-32F11 * * * *       |
| 11/15                                                                                                              | 18.5/25      | 22/30   | 22/30   | 22/30   | 30/40        | 37                                | 1                                      | 1  | YS1N-38F11 * * * *       |
| 11/15                                                                                                              | 18.5/25      | 22/30   | 22/30   | 22/30   | 30/40        | 37                                | 1                                      | 1  | YS1N-40F11 * * * *       |
| 15/20                                                                                                              | 22/30        | 25/35   | 30/40   | 30/40   | 33/44        | 44                                | 1                                      | 1  | YS1N-50F11 * * * *       |
| 18.5/25                                                                                                            | 30/40        | 37/50   | 37/50   | 37/50   | 37/50        | 60                                | 1                                      | 1  | YS1N-65F11 * * * *       |
| 22/30                                                                                                              | 45/54        | 45/60   | 45/60   | 55/75   | 45/60        | 85                                | 2                                      | 2  | YS1N-80F22 * * * *       |
| 30/40                                                                                                              | 55/75        | 55/75   | 60/80   | 65/87   | 65/87        | 105                               | 2                                      | 2  | YS1N-100F22 * * * *      |
| 37/50                                                                                                              | 60/80        | 63/85   | 63/85   | 75/100  | 75/100       | 114                               | 2                                      | 2  | YS1N-125F22 * * * *      |
| 45/60                                                                                                              | 75/100       | 80/110  | 80/110  | 90/125  | 100/136      | 138                               | 2                                      | 2  | YS1N-150F22 * * * *      |
| 55/75                                                                                                              | 95/130       | 100/136 | 110/150 | 110/150 | 110/150      | 179                               | 2                                      | 2  | YS1N-180F22 * * * *      |
| 65/87                                                                                                              | 110/150      | 110/150 | 110/150 | 132/180 | 132/180      | 205                               | 2                                      | 2  | YS1N-220F22 * * * *      |
| 90/125                                                                                                             | 160/220      | 160/220 | 160/220 | 160/220 | 200/270      | 300                               | 2                                      | 2  | YS1N-300F22 * * * *      |

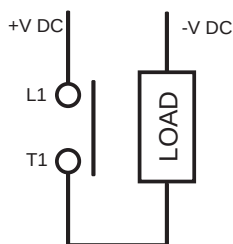
D

IEC Contactors

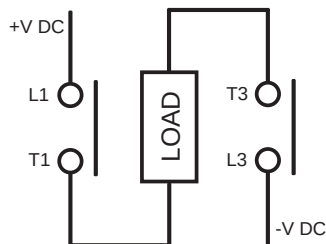
## DC Loads:

| DC1, DC14 L/R=1ms<br>Resistance Load (A) |      |      | DC2, DC4 L/R=15ms<br>DC Motor Load (A) |      |      | DC11 L/R=100ms<br>Inductive Load (A) |      |      | No. of Series<br>Connection | Part No.        |
|------------------------------------------|------|------|----------------------------------------|------|------|--------------------------------------|------|------|-----------------------------|-----------------|
| 48V                                      | 110V | 220V | 48V                                    | 110V | 220V | 48V                                  | 110V | 220V |                             |                 |
| 12                                       | 10   | 1    | 3                                      | 1.5  | 0.25 | 1                                    | 0.7  | 0.8  | 1                           | YS1N-9F##****   |
| 12                                       | 10   | 6    | 6                                      | 4    | 1.2  | 5                                    | 3    | 0.6  | 2                           |                 |
| 12                                       | 12   | 12   | 40                                     | 8    | 4    | 8                                    | 4    | 1.5  | 3                           |                 |
| 13                                       | 10   | 1    | 3                                      | 1.5  | 0.25 | 1                                    | 0.7  | 0.2  | 1                           | YS1N-12F##****  |
| 13                                       | 10   | 6    | 6                                      | 4    | 1.2  | 5                                    | 3    | 0.6  | 2                           |                 |
| 13                                       | 13   | 13   | 13                                     | 8    | 4    | 8                                    | 4    | 1.5  | 3                           |                 |
| 13                                       | 10   | 1    | 3                                      | 2    | 0.25 | 1                                    | 0.7  | 0.25 | 1                           | YS1N-20F11****  |
| 13                                       | 10   | 6    | 6                                      | 4    | 1.2  | 5                                    | 3    | 0.6  | 2                           |                 |
| 13                                       | 13   | 13   | 13                                     | 8    | 4    | 8                                    | 4    | 1.5  | 3                           |                 |
| 15                                       | 12   | 1.5  | 8                                      | 2    | 0.4  | 3                                    | 1.2  | 0.3  | 1                           | YS1N-25F11****  |
| 20                                       | 15   | 10   | 15                                     | 8    | 2    | 12                                   | 5    | 1.2  | 2                           |                 |
| 20                                       | 20   | 15   | 20                                     | 15   | 8    | 15                                   | 10   | 2    | 3                           |                 |
| 26                                       | 15   | 2    | 10                                     | 3    | 0.4  | 3                                    | 1.2  | 0.4  | 1                           | YS1N-32F11****  |
| 26                                       | 26   | 15   | 20                                     | 10   | 3    | 20                                   | 5    | 1.5  | 2                           |                 |
| 26                                       | 26   | 26   | 25                                     | 20   | 10   | 20                                   | 15   | 2    | 3                           |                 |
| 30                                       | 15   | 2    | 10                                     | 3    | 0.4  | 5                                    | 1.5  | 0.4  | 1                           | YS1N-38F11****  |
| 30                                       | 30   | 20   | 30                                     | 15   | 3    | 20                                   | 5    | 1.5  | 2                           |                 |
| 35                                       | 35   | 30   | 35                                     | 20   | 10   | 25                                   | 15   | 2    | 3                           |                 |
| 30                                       | 15   | 2    | 10                                     | 3    | 0.4  | 5                                    | 1.5  | 0.4  | 1                           | YS1N-40F11****  |
| 30                                       | 30   | 20   | 30                                     | 15   | 3    | 20                                   | 5    | 1.5  | 2                           |                 |
| 35                                       | 35   | 30   | 35                                     | 20   | 10   | 25                                   | 15   | 2    | 3                           |                 |
| 30                                       | 15   | 2    | 15                                     | 3    | 0.4  | 5                                    | 1.5  | 0.4  | 1                           | YS1N-50F11****  |
| 50                                       | 35   | 20   | 35                                     | 15   | 3    | 20                                   | 5    | 1.5  | 2                           |                 |
| 50                                       | 50   | 35   | 40                                     | 20   | 10   | 25                                   | 15   | 2    | 3                           |                 |
| 50                                       | 30   | 2    | 20                                     | 4    | 0.4  | 5                                    | 1.5  | 0.4  | 1                           | YS1N-65F11****  |
| 65                                       | 50   | 20   | 40                                     | 25   | 3    | 20                                   | 5    | 1.5  | 2                           |                 |
| 65                                       | 65   | 50   | 50                                     | 30   | 20   | 25                                   | 15   | 2    | 3                           |                 |
| 65                                       | 35   | 3    | 30                                     | 4    | 0.5  | —                                    | —    | —    | 1                           | YS1N-80F11****  |
| 80                                       | 65   | 30   | 65                                     | 40   | 4    | —                                    | —    | —    | 2                           |                 |
| 80                                       | 80   | 65   | 65                                     | 65   | 30   | —                                    | —    | —    | 3                           |                 |
| 80                                       | 35   | 3    | 30                                     | 4    | 0.5  | —                                    | —    | —    | 1                           | YS1N-100F11**** |
| 93                                       | 80   | 40   | 80                                     | 50   | 4    | —                                    | —    | —    | 2                           |                 |
| 93                                       | 93   | 80   | 80                                     | 65   | 40   | —                                    | —    | —    | 3                           |                 |
| 80                                       | 35   | 3    | 30                                     | 4    | 0.5  | —                                    | —    | —    | 1                           | YS1N-125F11**** |
| 100                                      | 100  | 50   | 85                                     | 50   | 4    | —                                    | —    | —    | 2                           |                 |
| 125                                      | 125  | 100  | 100                                    | 65   | 50   | —                                    | —    | —    | 3                           |                 |
| 125                                      | 35   | 4    | 50                                     | 5    | 0.5  | —                                    | —    | —    | 1                           | YS1N-150F11**** |
| 125                                      | 100  | 65   | 125                                    | 80   | 5    | —                                    | —    | —    | 2                           |                 |
| 150                                      | 150  | 125  | 150                                    | 100  | 65   | —                                    | —    | —    | 3                           |                 |
| 125                                      | 35   | 4    | 50                                     | 5    | 0.5  | —                                    | —    | —    | 1                           | YS1N-180F11**** |
| 150                                      | 125  | 80   | 125                                    | 80   | 5    | —                                    | —    | —    | 2                           |                 |
| 180                                      | 180  | 150  | 180                                    | 100  | 80   | —                                    | —    | —    | 3                           |                 |

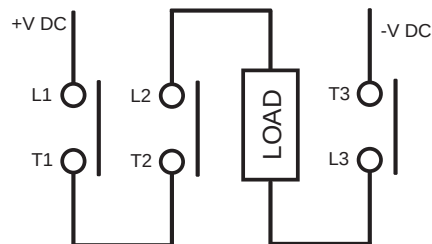
1 Series Connection



2 Series Connection



3 Series Connection



## Application to Star (Wye)-Delta Motor Starters

| 3-Phase Motor Power Rating    |          |      |         | Type of Magnetic Contactors |         |         | Type of Overload Relay  |
|-------------------------------|----------|------|---------|-----------------------------|---------|---------|-------------------------|
| Voltage (V)<br>Frequency (Hz) | Capacity |      | Current | Main                        | Star    | Delta   | Part Number             |
|                               | (kW)     | (HP) | (A)     |                             |         |         |                         |
| 200-240V<br><br>50/60 Hz      | 3.7      | 5    | 17.5    | YS-9F                       | YS-9F   | YS-9F   | RHA-25F/15DP            |
|                               | 5.5      | 7.5  | 26      | YS-9F                       | YS-9F   | YS-9F   | RHA-25F/21DP            |
|                               | 7.5      | 10   | 34      | YS-9F                       | YS-9F   | YS-20F  | RHA-65F/25D + TIB-65F   |
|                               | 11       | 15   | 48      | YS-20F                      | YS-9F   | YS-25F  | RHA-65F/43D + TIB-65F   |
|                               | 15       | 20   | 65      | YS-32F                      | YS-20F  | YS-32F  | RHA-65F/56D + TIB-65F   |
|                               | 18.5     | 25   | 79      | YS-32F                      | YS-20F  | YS-38F  | RHA-125F/68DP           |
|                               | 22       | 30   | 93      | YS-32F                      | YS-32F  | YS-50F  | RHA-125F/80DP           |
|                               | 30       | 40   | 125     | YS-50F                      | YS-32F  | YS-65F  | RHA-125F/105DP          |
|                               | 37       | 50   | 148     | YS-50F                      | YS-32F  | YS-80F  | RHA-150F/135DP          |
|                               | 45       | 60   | 180     | YS-80F                      | YS-50F  | YS-100F | RHA-180F/155DP          |
|                               | 55       | 75   | 220     | YS-125F                     | YS-50   | YS-100F | RHA-300F/180D (with CT) |
|                               | 75       | 100  | 300     | YS-180F                     | YS-80F  | YS-150F | RHA-400F/240D (with CT) |
|                               | 90       | 125  | 360     | YS-220F                     | YS-80F  | YS-180F | RHA-500F/300D (with CT) |
|                               | 110      | 150  | 440     | YS-300F                     | YS-80F  | YS-220F | RHA-500F/300D (with CT) |
|                               | 132      | 175  | 528     | YS-300F                     | YS-80F  | YS-300F | RHA-750F/450D (with CT) |
|                               | 160      | 215  | 640     | YS-400F                     | YS-150F | YS-300F | RHA-750F/450D (with CT) |
| 380-440V<br><br>50/60 Hz      | 3.7      | 5    | 8.7     | YS-9F                       | YS-9F   | YS-9F   | RHA-25F/8.5DP           |
|                               | 5.5      | 7.5  | 13      | YS-9F                       | YS-9F   | YS-9F   | RHA-25F/11DP            |
|                               | 7.5      | 10   | 17      | YS-9F                       | YS-9F   | YS-9F   | RHA-25F/15DP            |
|                               | 11       | 15   | 24      | YS-9F                       | YS-9F   | YS-12F  | RHA-25F/21DP            |
|                               | 15       | 20   | 32.5    | YS-20F                      | YS-9F   | YS-20F  | RHA-65F/32D + TIB-65F   |
|                               | 18.5     | 25   | 39.5    | YS-20F                      | YS-9F   | YS-25F  | RHA-65F/35D + TIB-65F   |
|                               | 22       | 30   | 46.5    | YS-20F                      | YS-20F  | YS-25F  | RHA-65F/43D + TIB-65F   |
|                               | 30       | 40   | 62.5    | YS-32F                      | YS-20F  | YS-38F  | RHA-65F/56D + TIB-65F   |
|                               | 37       | 50   | 74      | YS-32F                      | YS-20F  | YS-38F  | RHA-125F/68DP           |
|                               | 45       | 60   | 90      | YS-32F                      | YS-32F  | YS-50F  | RHA-125F/80DP           |
|                               | 55       | 75   | 110     | YS-50F                      | YS-32F  | YS-50F  | RHA-125F/105DP          |
|                               | 75       | 100  | 150     | YS-80F                      | YS-32F  | YS-80F  | RHA-150F/135DP          |
|                               | 90       | 125  | 180     | YS-80F                      | YS-50F  | YS-100F | RHA-180F/155DP          |
|                               | 110      | 150  | 220     | YS-80F                      | YS-50F  | YS-125F | RHA-300F/180D (with CT) |
|                               | 132      | 175  | 264     | YS-80F                      | YS-50F  | YS-150F | RHA-400F/240D (with CT) |
|                               | 160      | 215  | 320     | YS-150F                     | YS-80F  | YS-180F | RHA-400F/240D (with CT) |
|                               | 200      | 267  | 400     | YS-150F                     | YS-80F  | YS-220F | RHA-500F/300D (with CT) |
|                               | 250      | 333  | 500     | YS-220F                     | YS-80F  | YS-300F | RHA-500F/450D (with CT) |
|                               | 300      | —    | 600     | YS-220F                     | YS-150F | YS-400F | RHA-500F/450D (with CT) |

- Regarding Star operation time is as follows: In case of small inertia (e.g. Non-load, MG set, fan, compressor) is less than 30 seconds. The limit for number of continuity starting is 3 times, more than need off time.
- The term of electrical endurance is more than 0.5 million operations.

## Application to Transformers

| Contactor Type | Single Phase (2-Poles series connection) |     |       |     | Three Phase |     |       |     |
|----------------|------------------------------------------|-----|-------|-----|-------------|-----|-------|-----|
|                | (kVA)                                    | (A) | (kVA) | (A) | (kVA)       | (A) | (kVA) | (A) |
| YS1N-9F        | 1.5                                      | 7.5 | 2     | 5   | 3           | 7.5 | 4     | 5   |
| YS1N-12F       | 2                                        | 9   | 3     | 7   | 3.5         | 9   | 5     | 7   |
| YS1N-20F       | 2.5                                      | 10  | 4     | 9.5 | 5           | 13  | 7.5   | 9.5 |
| YS1N-25F       | 4                                        | 17  | 7.5   | 16  | 6.5         | 17  | 12    | 16  |
| YS1N-32F       | 5                                        | 25  | 10    | 24  | 10          | 25  | 18    | 24  |
| YS1N-38F       | 7                                        | 32  | 10    | 24  | 12          | 32  | 25    | 62  |
| YS1N-40F       | 7                                        | 32  | 10    | 24  | 12          | 32  | 25    | 32  |
| YS1N-50F       | 9                                        | 40  | 18    | 40  | 15          | 40  | 30    | 40  |
| YS1N-65F       | 10                                       | 46  | 20    | 45  | 18          | 46  | 35    | 45  |
| YS1N-80F       | 15                                       | 62  | 35    | 55  | 35          | 62  | 42    | 55  |
| YS1N-100F      | 17                                       | 75  | 33    | 75  | 30          | 75  | 42    | 55  |
| YS1N-125F      | 20                                       | 90  | 33    | 75  | 35          | 90  | 60    | 75  |
| YS1N-150F      | 25                                       | 110 | 40    | 90  | 42          | 110 | 70    | 90  |
| YS1N-180F      | 25                                       | 110 | 50    | 110 | 42          | 110 | 85    | 110 |
| YS1N-220F      | 25                                       | 110 | 57    | 130 | 42          | 110 | 100   | 130 |
| YS1N-300F      | 33                                       | 150 | 57    | 130 | 57          | 150 | 100   | 130 |

1. At the moment when transformer connected with the supply source, large transient inrush current will flow, and its value is much larger than the normal current (about 20 times greater). The duration may be a few cycles.

## Application to Lamp Loads

## Tungsten Lamp

| Contactor | 100V       |              |            |              |            |            |              |              | 200V         |               |            |               |              |              |             |               |
|-----------|------------|--------------|------------|--------------|------------|------------|--------------|--------------|--------------|---------------|------------|---------------|--------------|--------------|-------------|---------------|
|           | 100W<br>1A | 150W<br>1.5A | 200W<br>2A | 250W<br>2.5A | 300W<br>3A | 500W<br>5A | 1000W<br>10A | 1500W<br>15A | 100W<br>0.5A | 150W<br>0.75A | 200W<br>1A | 250W<br>1.25A | 300W<br>1.5A | 500W<br>2.5A | 1000W<br>5A | 1500W<br>7.5A |
| YS1N-9F   | 11         | 7            | 5          | 4            | 3          | 2          | 1            | —            | 22           | 14            | 11         | 8             | 6            | 4            | 2           | 1             |
| YS1N-12F  | 13         | 8            | 6          | 5            | 4          | 2          | 1            | —            | 28           | 18            | 14         | 10            | 8            | 5            | 2           | 1             |
| YS1N-20F  | 13         | 8            | 6          | 5            | 4          | 3          | 1            | 1            | 30           | 20            | 15         | 12            | 10           | 6            | 2           | 2             |
| YS1N-25F  | 19         | 12           | 9          | 7            | 6          | 3          | 1            | 1            | 40           | 26            | 20         | 16            | 13           | 8            | 4           | 2             |
| YS1N-32F  | 26         | 17           | 13         | 10           | 8          | 5          | 2            | 1            | 50           | 33            | 26         | 20            | 16           | 10           | 5           | 3             |
| YS1N-38F  | 35         | 23           | 17         | 14           | 11         | 7          | 3            | 2            | 70           | 46            | 35         | 28            | 23           | 14           | 7           | 4             |
| YS1N-40F  | 35         | 23           | 17         | 14           | 11         | 7          | 3            | 2            | 70           | 46            | 35         | 28            | 23           | 14           | 7           | 4             |
| YS1N-50F  | 50         | 33           | 25         | 20           | 16         | 10         | 5            | 3            | 100          | 66            | 50         | 40            | 33           | 20           | 10          | 6             |
| YS1N-65F  | 65         | 42           | 32         | 26           | 21         | 13         | 6            | 4            | 130          | 86            | 65         | 52            | 43           | 26           | 13          | 8             |

1. When tungsten lamp is lit, its inrush current is about 30 times the normal current and the duration is about 10 milliseconds. In general application to tungsten lamp load, magnetic contactors should be selected so that the rated operational current of the contactor will be no less than two times the normal current of tungsten lamp load, considered its making current capacity.

2. The value of above table shows available quantities as connected in parallel.

## Fluorescent Lamp (rapid start time)

| Contactor | 100V                 |                      |            |            |            |           |           | 200V                 |                       |            |            |            |           |            |           |
|-----------|----------------------|----------------------|------------|------------|------------|-----------|-----------|----------------------|-----------------------|------------|------------|------------|-----------|------------|-----------|
|           | 40W                  |                      | 60W        | 80W        | 100W       |           | 220W      | 40W                  |                       | 60W        | 80W        | 100W       |           | 220W       |           |
|           | 1<br>0.59A<br>(1.2A) | 2<br>0.96A<br>(1.1A) | 1<br>0.92A | 1<br>1.17A | 1<br>1.55A | 2<br>2.5A | 1<br>2.7A | 1<br>0.29A<br>(0.6A) | 2<br>0.48A<br>(0.55A) | 1<br>0.46A | 1<br>0.58A | 1<br>0.78A | 2<br>1.3A | 1<br>1.35A | 2<br>2.5A |
| YS1N-9F   | 18<br>(9)            | 11<br>(10)           | 11         | 9          | 5          | 4         | 4         | 37<br>(18)           | 22<br>(20)            | 23         | 18         | 14         | 8         | 8          | 4         |
| YS1N-12F  | 23<br>(11)           | 14<br>(12)           | 15         | 11         | 9          | 5         | 5         | 48<br>(23)           | 29<br>(25)            | 30         | 24         | 17         | 10        | 10         | 5         |
| YS1N-20F  | 25<br>(12)           | 15<br>(13)           | 16         | 12         | 9          | 6         | 5         | 51<br>(25)           | 31<br>(27)            | 32         | 25         | 19         | 11        | 11         | 6         |
| YS1N-25F  | 33<br>(16)           | 20<br>(18)           | 21         | 17         | 12         | 8         | 7         | 68<br>(33)           | 41<br>(36)            | 43         | 34         | 25         | 15        | 14         | 8         |
| YS1N-32F  | 42<br>(20)           | 26<br>(22)           | 27         | 21         | 16         | 1         | 9         | 86<br>(41)           | 52<br>(45)            | 54         | 43         | 32         | 20        | 18         | 10        |
| YS1N-38F  | 59<br>(29)           | 36<br>(31)           | 38         | 29         | 22         | 14        | 12        | 120<br>(58)          | 72<br>(63)            | 76         | 60         | 44         | 26        | 25         | 14        |
| YS1N-40F  | 59<br>(29)           | 36<br>(31)           | 38         | 29         | 22         | 14        | 12        | 120<br>(58)          | 72<br>(63)            | 76         | 60         | 44         | 26        | 25         | 14        |
| YS1N-50F  | 84<br>(41)           | 52<br>(45)           | 54         | 42         | 32         | 20        | 18        | 172<br>(83)          | 104<br>(90)           | 108        | 86         | 64         | 38        | 37         | 20        |
| YS1N-65F  | 100<br>(54)          | 67<br>(59)           | 70         | 55         | 41         | 26        | 24        | 224<br>(108)         | 135<br>(118)          | 141        | 112        | 83         | 50        | 48         | 26        |

- When fluorescent lamp lights, generally the starting current is a few times the normal current and its duration may be within a few seconds. Magnetic contactors should be selected so the rated operation current will be the same as the total load current of the fluorescent lamp loads.
- The values of above table show available quantities as connected in parallel.
- ( ) values in above table show in the case of the light for Low power factor type.

## Mercury Lamp

| Contactor | 100V (low power factor type/high power factor type) |               |               |               |               |               |                |             | 200V (low power factor type/high power factor type) |                |               |               |               |               |               |               |
|-----------|-----------------------------------------------------|---------------|---------------|---------------|---------------|---------------|----------------|-------------|-----------------------------------------------------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|
|           | 40W                                                 | 100W          | 200W          | 250W          | 300W          | 400W          | 700W           | 1000W       | 40W                                                 | 100W           | 200W          | 250W          | 300W          | 400W          | 700W          | 1000W         |
|           | 1.25A/<br>0.55A                                     | 2.6A/<br>1.4A | 4.6A/<br>2.6A | 5.1A/<br>3.0A | 6.0A/<br>3.7A | 8.0A/<br>4.9A | 14.5A/<br>8.5A | 21A/<br>12A | 0.53A/<br>—                                         | 1.0A/<br>0.65A | 1.9A/<br>1.2A | 2.1A/<br>1.5A | 2.5A/<br>1.8A | 3.3A/<br>2.3A | 5.9A/<br>4.1A | 8.3A/<br>5.8A |
| YS1N-9F   | 8/20                                                | 4/7           | 2/4           | 2/3           | 1/2           | 1/2           | —/1            | —/—         | 20/—                                                | 11/16          | 5/9           | 5/7           | 4/6           | 3/4           | 1/2           | 1/1           |
| YS1N-12F  | 11/25                                               | 5/10          | 3/5           | 2/4           | 2/3           | 1/2           | —/1            | —/1         | 26/—                                                | 14/21          | 7/11          | 6/9           | 5/7           | 4/6           | 2/3           | 1/2           |
| YS1N-20F  | 12/27                                               | 5/10          | 3/5           | 2/3           | 2/4           | 1/3           | 1/1            | —/1         | 28/—                                                | 15/23          | 7/12          | 7/10          | 6/8           | 4/6           | 2/3           | 1/2           |
| YS1N-25F  | 16/36                                               | 7/14          | 4/7           | 3/6           | 3/5           | 2/4           | 1/2            | —/1         | 37/—                                                | 20/30          | 10/16         | 9/13          | 8/11          | 6/8           | 3/4           | 2/3           |
| YS1N-32F  | 20/45                                               | 9/17          | 5/9           | 4/8           | 4/6           | 3/5           | 1/2            | 1/2         | 47/—                                                | 25/38          | 13/20         | 11/16         | 10/13         | 7/10          | 4/6           | 3/4           |
| YS1N-38F  | 28/63                                               | 13/25         | 7/13          | 6/11          | 5/9           | 4/7           | 2/4            | 1/2         | 66/—                                                | 35/53          | 18/29         | 16/23         | 14/19         | 10/15         | 5/8           | 4/6           |
| YS1N-40F  | 28/63                                               | 13/25         | 7/13          | 6/11          | 5/9           | 4/7           | 2/4            | 1/2         | 66/—                                                | 35/53          | 18/29         | 16/23         | 14/19         | 10/15         | 5/8           | 4/6           |
| YS1N-50F  | 40/90                                               | 19/35         | 10/19         | 9/16          | 8/13          | 6/10          | 3/5            | 2/4         | 94/—                                                | 50/76          | 26/41         | 23/33         | 20/27         | 15/21         | 8/12          | 6/8           |
| YS1N-65F  | 52/118                                              | 25/46         | 14/25         | 12/21         | 10/17         | 8/13          | 4/7            | 3/5         | 122/—                                               | 65/100         | 34/54         | 30/43         | 26/36         | 19/28         | 11/15         | 7/11          |

- When mercury lamp lights, the starting current is about 1.5–1.8 times the normal current and its duration may be a few minutes (within 8 times). Magnetic contactors should be selected so the rated operational current will be the same as the total load current of the mercury lamp loads.
- The values of above table show available quantities as connected in parallel.

## Application to Capacitor-Switching

| Contactor Type | Single Phase (2 pole series connection) |     |          |     | Three Phase |     |          |     |
|----------------|-----------------------------------------|-----|----------|-----|-------------|-----|----------|-----|
|                | 200-240V                                |     | 380-440V |     | 200-240V    |     | 380-440V |     |
|                | (kVA)                                   | (A) | (kVA)    | (A) | (kVA)       | (A) | (kVA)    | (A) |
| YS1N-9F        | 1.2                                     | 6   | 1.7      | 4.3 | 2           | 6   | 3        | 4.3 |
| YS1N-12F       | 1.8                                     | 9   | 2.4      | 6   | 3           | 9   | 5        | 8   |
| YS1N-20F       | 1.8                                     | 9   | 3.2      | 8   | 3           | 9   | 6        | 9   |
| YS1N-25F       | 3                                       | 15  | 4.8      | 12  | 5           | 15  | 10       | 15  |
| YS1N-32F       | 4                                       | 20  | 6        | 15  | 7           | 20  | 15       | 23  |
| YS1N-38F       | 5                                       | 25  | 8        | 20  | 8           | 23  | 20       | 30  |
| YS1N-40F       | 5                                       | 25  | 8        | 20  | 8           | 23  | 20       | 30  |
| YS1N-50F       | 7.5                                     | 38  | 12       | 30  | 13          | 38  | 26       | 40  |
| YS1N-65F       | 9                                       | 45  | 16       | 40  | 15          | 45  | 30       | 46  |
| YS1N-80F       | 10                                      | 50  | 20       | 50  | 20          | 58  | 35       | 53  |
| YS1N-100F      | 13                                      | 65  | 20       | 50  | 26          | 75  | 50       | 76  |
| YS1N-125F      | 15                                      | 75  | 26       | 65  | 26          | 75  | 50       | 76  |
| YS1N-150F      | 18                                      | 90  | 30       | 75  | 35          | 105 | 70       | 105 |
| YS1N-180F      | 20                                      | 100 | 36       | 90  | 40          | 115 | 75       | 114 |
| YS1N-220F      | 26                                      | 130 | 40       | 100 | 45          | 130 | 80       | 120 |
| YS1N-300F      | 30                                      | 150 | 60       | 150 | 50          | 150 | 100      | 150 |

1. The making and breaking capacity of the contactor are more than 15 times the rated operational current for capacitor loads in this table.
2. For applications without series reactor: The contactor should be selected to have the making current capacity which is more than 1.5 times the inrush current of the capacitor according to percentage impedance of transformer and impedance of the electric circuit.
3. Large transient inrush current may occur at the moment of switching the capacitors. So when inrush current of capacitor exceeds 15 times the rated operational current of the magnetic contactor, series reactor which has 6% of capacitor reactance shall be connected in the circuit.
4. At single phase application, two poles are used for switching of the capacitor.

# TYPICAL FULL LOAD CURRENT OF INDUCTION MOTORS

| Single-Phase Motors |      |           |           | Three-Phase, 4-Pole Motors 50/60 Hz |      |               |               |           |           |           |               |
|---------------------|------|-----------|-----------|-------------------------------------|------|---------------|---------------|-----------|-----------|-----------|---------------|
| kW                  | hp   | 220V<br>A | 240V<br>A | kW                                  | hp   | 220-230V<br>A | 380-400V<br>A | 415V<br>A | 440V<br>A | 500V<br>A | 660-690V<br>A |
| 0.37                | 0.5  | 3.9       | 3.6       | 0.37                                | 0.5  | 1.8           | 1.03          | -         | 0.99      | 1         | 0.6           |
| 0.55                | 0.75 | 5.2       | 4.8       | 0.55                                | 0.75 | 2.75          | 1.6           | -         | 1.36      | 1.21      | 0.9           |
| 0.75                | 1    | 6.6       | 6.1       | 0.75                                | 1    | 3.5           | 2             | 2         | 1.68      | 1.5       | 1.1           |
| 1.1                 | 1.5  | 9.6       | 8.8       | 1.1                                 | 1.5  | 4.4           | 2.6           | 2.5       | 2.37      | 2         | 1.5           |
| 1.5                 | 2    | 12.7      | 11.7      | 1.5                                 | 2    | 6.1           | 3.5           | 3.5       | 3.06      | 2.6       | 2             |
| 1.8                 | 2.5  | 15.7      | 3.6       | 2.2                                 | 3    | 8.7           | 5             | 5         | 4.42      | 3.8       | 2.8           |
| 2.2                 | 3    | 18.6      | 4.8       | 3                                   | 4    | 11.5          | 6.6           | 6.5       | 5.77      | 5         | 3.8           |
| 3                   | 4    | 24.3      | 6.1       | 3.7                                 | 5    | 13.5          | 7.7           | 7.5       | 7.1       | 5.9       | 4.4           |
| 4                   | 5.5  | 29.6      | 8.8       | 4                                   | 5.5  | 14.5          | 8.5           | 8.4       | 7.9       | 6.5       | 4.9           |
| 4.4                 | 6    | 34.7      | 11.7      | 5.5                                 | 7.5  | 20            | 11.5          | 11        | 10.4      | 9         | 6.6           |
| 5.2                 | 7    | 39.8      | 36.5      | 7.5                                 | 10   | 27            | 15.5          | 14        | 13.7      | 12        | 8.9           |
| 5.5                 | 7.5  | 42.2      | 38.7      | 9                                   | 12   | 32            | 18.5          | 17        | 16.9      | 13.9      | 10.6          |
| 6                   | 8    | 44.5      | 40.8      | 10                                  | 13.5 | 35            | 20            | -         | -         | 15        | 11.5          |
| 7                   | 9    | 49.5      | 45.4      | 11                                  | 15   | 39            | 22            | 21        | 20.1      | 18.4      | 14            |
| 7.5                 | 10   | 54.4      | 50        | 15                                  | 20   | 52            | 30            | 28        | 26.5      | 23        | 17.3          |
|                     |      |           |           | 18.5                                | 25   | 64            | 37            | 35        | 32.8      | 28.5      | 21.3          |
|                     |      |           |           | 22                                  | 30   | 75            | 44            | 40        | 39        | 33        | 25.4          |
|                     |      |           |           | 25                                  | 35   | 85            | 52            | 47        | 45.3      | 39.4      | 30.3          |
|                     |      |           |           | 30                                  | 40   | 103           | 60            | 55        | 51.5      | 45        | 34.6          |
|                     |      |           |           | 33                                  | 45   | 113           | 68            | 60        | 58        | 50        | 39            |
|                     |      |           |           | 37                                  | 50   | 126           | 72            | 66        | 64        | 55        | 42            |
|                     |      |           |           | 40                                  | 54   | 134           | 79            | 71        | 67        | 60        | 44            |
|                     |      |           |           | 45                                  | 60   | 150           | 85            | 80        | 76        | 65        | 49            |
|                     |      |           |           | 51                                  | 70   | 170           | 98            | 90        | 83        | 75        | 57            |
|                     |      |           |           | 55                                  | 75   | 182           | 105           | 100       | 90        | 80        | 61            |
|                     |      |           |           | 59                                  | 80   | 195           | 112           | 105       | 97        | 85        | 66            |
|                     |      |           |           | 63                                  | 85   | 203           | 117           | 115       | 109       | 89        | 69            |
|                     |      |           |           | 75                                  | 100  | 240           | 138           | 135       | 125       | 105       | 82            |
|                     |      |           |           | 80                                  | 110  | 260           | 147           | 138       | 131       | 112       | 86            |
|                     |      |           |           | 90                                  | 125  | 295           | 170           | 165       | 146       | 129       | 98            |
|                     |      |           |           | 100                                 | 136  | 325           | 188           | 182       | 162       | 143       | 107           |
|                     |      |           |           | 110                                 | 150  | 356           | 205           | 200       | 178       | 156       | 118           |
|                     |      |           |           | 129                                 | 175  | 420           | 242           | 230       | 209       | 184       | 135           |
|                     |      |           |           | 132                                 | 180  | 425           | 245           | 240       | 215       | 187       | 140           |
|                     |      |           |           | 140                                 | 190  | 450           | 260           | 250       | 227       | 200       | 145           |
|                     |      |           |           | 147                                 | 200  | 472           | 273           | 260       | 236       | 207       | 152           |
|                     |      |           |           | 150                                 | 205  | 483           | 280           | 270       | 246       | 210       | 159           |
|                     |      |           |           | 160                                 | 220  | 520           | 300           | 280       | 256       | 220       | 170           |
|                     |      |           |           | 180                                 | 245  | 578           | 333           | 320       | 289       | 254       | 190           |
|                     |      |           |           | 185                                 | 250  | 595           | 342           | 325       | 295       | 263       | 200           |
|                     |      |           |           | 200                                 | 270  | 626           | 370           | 340       | 321       | 281       | 215           |
|                     |      |           |           | 220                                 | 300  | 700           | 408           | 385       | 353       | 310       | 235           |
|                     |      |           |           | 250                                 | 340  | 800           | 460           | 425       | 401       | 360       | 274           |
|                     |      |           |           | 257                                 | 350  | 826           | 475           | 450       | 412       | 365       | 280           |
|                     |      |           |           | 280                                 | 380  | 900           | 510           | 475       | 450       | 400       | 305           |
|                     |      |           |           | 295                                 | 400  | 948           | 546           | 500       | 473       | 416       | 320           |
|                     |      |           |           | 300                                 | 410  | 980           | 565           | 510       | 481       | 420       | 325           |
|                     |      |           |           | 315                                 | 430  | 990           | 584           | 535       | 505       | 445       | 337           |
|                     |      |           |           | 335                                 | 450  | 1100          | 620           | 550       | 518       | 472       | 355           |
|                     |      |           |           | 355                                 | 480  | 1150          | 636           | 580       | 549       | 500       | 370           |
|                     |      |           |           | 375                                 | 500  | 1180          | 670           | 610       | 575       | 527       | 395           |
|                     |      |           |           | 400                                 | 545  | 1250          | 710           | 650       | 611       | 540       | 410           |
|                     |      |           |           | 425                                 | 580  | 1330          | 760           | 690       | 650       | 574       | 445           |
|                     |      |           |           | 445                                 | 600  | 1400          | 790           | 730       | 680       | 595       | 455           |
|                     |      |           |           | 450                                 | 610  | 1410          | 800           | 740       | 690       | 608       | 460           |
|                     |      |           |           | 475                                 | 645  | 1490          | 850           | 780       | 730       | 645       | 485           |
|                     |      |           |           | 500                                 | 680  | 1570          | 900           | 820       | 780       | 680       | 515           |

Notes : 1. The full load current of the motor varies with the supply voltage, frequency, number of poles, and number of phases (single- or three-phase).

2. For selection of contactors and thermal overload relays, confirm the actual full load current of the motor.

