12

IEC style contactors, overload relays and manual motor starters

## Section 12

## IEC style contactors, overload relays and manual motor starters

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## AF Contactors

## Ordering code construction



UL/CSA general use amperage at 600V AC, HP at 480V 3-phase motor rating
Type

|  |
| :---: |
| $C$ |
| $S$ |
| $K$ |
| $R$ |
| $Z$ |
| $Z R$ |
| $N$ |
| $B$ |

Standard
AC control application For safety applications

Push-In Spring
Reversing contactors
Low consumption
Reversing, low consumption
NEMA
Railway

Main contacts

| 30 |
| :--- |
| 40 |
| 22 |
| 04 |

3 NO + ONC (3-pole)
4 NO + 0 NC (4-pole)
2 NO + 2 NC (4-pole)
0 NO + 4 NC (4-pole)***


## AF Contactors

Full voltage non-reversing electronic contactors



Table continues on next page.

## AF Contactors

Full voltage non-reversing electronic contactors



## AF Contactors

Full voltage non-reversing electronic contactors


|  |  | Main contacts |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 3 NO + O NC (30) |  |  |  | 4 NO (40) | $2 \mathrm{NO}+2 \mathrm{NC}$ (22) |
|  |  | Auxiliary contacts |  |  |  |  |  |
|  |  | none | 1 NO | 1 NC | 1 NO + 1 NC | none | none |
| Coil Voltage | Rating | (00) | (10) | (01) | (11) | (00) | (00) |
| 250-500 V AC/ |  |  |  |  |  |  |  |
| DC (14) | $200 \mathrm{~A}, 100 \mathrm{HP}(140)$ | --- | --- | --- | AF140-30-11-14 | --- | --- |
|  | $200 \mathrm{~A}, 100 \mathrm{HP}$ (146) | --- | --- | --- | AF146-30-11-14 | --- | --- |
|  | $250 \mathrm{~A}, 125 \mathrm{HP}$ (190) | --- | --- | --- | AF190-30-11-14 | --- | --- |
|  | $300 \mathrm{~A}, 150 \mathrm{HP}$ (205) | --- | -- | --- | AF205-30-11-14 | - | --- |
|  | $350 \mathrm{~A}, 200 \mathrm{HP}$ (265) | --- | --- | --- | AF265-30-11-14 | - | --- |
|  | $400 \mathrm{~A}, 250 \mathrm{HP}$ (305) | --- | --- | --- | AF305-30-11-14 | --- | --- |
|  | $520 \mathrm{~A}, 300 \mathrm{HP}$ (370) | --- | --- | --- | AF370-30-11-14 | --- | --- |
| $20-60$ V DC (68) | $550 \mathrm{~A}, 350 \mathrm{HP}$ (400) | --- | --- | --- | AF400-30-11-68 | --- | --- |
|  | $650 \mathrm{~A}, 400 \mathrm{HP}$ (460) | --- | --- | --- | AF460-30-11-68 | -- | --- |
|  | $750 \mathrm{~A}, 500 \mathrm{HP}$ (580) | --- | --- | --- | AF580-30-11-68 | --- | --- |
|  | $900 \mathrm{~A}, 600 \mathrm{HP}$ (750) | --- | --- | --- | AF750-30-11-68 | --- | -- |
| 48-130 V AC/ |  |  |  |  |  |  |  |
| DC (69) | $550 \mathrm{~A}, 350 \mathrm{HP}$ (400) | --- | --- | --- | AF400-30-11-69 | --- | --- |
|  | $650 \mathrm{~A}, 400 \mathrm{HP}$ (460) | --- | --- | --- | AF460-30-11-69 | --- | -- |
| $100-250 \text { V AC/ }$ |  |  |  |  |  |  |  |
| DC (70) | $550 \mathrm{~A}, 350 \mathrm{HP}$ (400) | --- | --- | --- | AF400-30-11-70 | --- | --- |
|  | $650 \mathrm{~A}, 400 \mathrm{HP}$ (460) | --- | --- | --- | AF460-30-11-70 | --- | --- |
|  | $750 \mathrm{~A}, 500 \mathrm{HP}$ (580) | --- | --- | --- | AF580-30-11-70 | --- | --- |
|  | $900 \mathrm{~A}, 600 \mathrm{HP}$ (750) | --- | --- | --- | AF750-30-11-70 | --- | --- |
|  | 1210 A (1250) | --- | --- | --- | AF1250-30-11-70 | --- | --- |
|  | 1350 A, 800 HP (1350) | --- | --- | --- | AF1350-30-11-70 | --- | -- |
|  | 1650 A, 900 HP (1650) | --- | --- | --- | AF1650-30-11-70 | --- | --- |
|  | 2100 A (2050) | --- | --- | -- | AF2050-30-11-70 | --- | --- |
|  | 2700 A (2650) | --- | --- | --- | AF2650-30-11-70 | --- | --- |
| 250-500 V |  |  |  |  |  |  |  |
| AC/DC (71) | $550 \mathrm{~A}, 350 \mathrm{HP}$ (400) | --- | --- | --- | AF400-30-11-71 | --- | -- |
|  | $650 \mathrm{~A}, 400 \mathrm{HP}$ (460) | --- | --- | --- | AF460-30-11-71 | --- | --- |

## AF Contactors

Electromagnetic contactors for AC control applications



## AF Contactors

Push-in (PI) spring and safety application contactors

|  |  |  | Main contacts |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | 3 NO + 0 NC (30) |  |  |  |  |
|  |  |  | Auxiliary contacts |  |  |  |  |
|  |  |  | none | 1 NO | 1 NC | 1 NO + 1 NC | $2 \mathrm{NO}+2 \mathrm{NC}$ |
|  | Coil Voltage | Rating | (00) | (10) | (01) | (11) | (22) |
|  | Push-In (PI) Spring contactors |  |  |  |  |  |  |
|  | 24-60 V AC/ | $25 \mathrm{~A}, 5 \mathrm{HP}$ (09) | --- | AF09-30-10K-11 | AF09-30-01K-11 |  | --- |
|  | 20-60 V DC (11) | $28 \mathrm{~A}, 7.5 \mathrm{HP}$ (12) | --- | AF12-30-10K-11 | AF12-30-01K-11 | --- | --- |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | AF16-30-10K-11 | AF16-30-01K-11 |  | --- |
|  |  | $45 \mathrm{~A}, 15 \mathrm{HP}$ (26) | AF26-30-00K-11 | --- | --- | --- | --- |
|  |  | $50 \mathrm{~A}, 20 \mathrm{HP}$ (30) | AF30-30-00K-11 | --- | --- | --- | --- |
|  |  | $50 \mathrm{~A}, 25 \mathrm{HP}$ (38) | AF38-30-00K-13 | --- | --- | --- | --- |
|  | 100-250 V AC/ |  |  |  |  |  |  |
|  |  | $28 \mathrm{~A}, 7.5 \mathrm{HP}$ (12) | -- | AF12-30-10K-13 | AF12-30-01K-13 |  | --- |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | AF16-30-10K-13 | AF16-30-01K-13 |  | --- |
|  |  | $45 \mathrm{~A}, 15 \mathrm{HP}$ (26) | AF26-30-00K-13 | --- | --- | --- | --- |
|  |  | $50 \mathrm{~A}, 20 \mathrm{HP}$ (30) | AF30-30-00K-11 | --- | --- | --- | --- |
|  |  | $50 \mathrm{~A}, 25 \mathrm{HP}$ (38) | AF38-30-00K-13 | --- | --- | --- | --- |
|  | Contactors for safety applications |  |  |  |  |  |  |
|  | 24-60 V AC/ | $25 \mathrm{~A}, 5 \mathrm{HP}$ (09) | --- | --- | --- | --- | AFS09-30-22-11 |
|  | 20-60 V DC (11) | $28 \mathrm{~A}, 7.5 \mathrm{HP}$ (12) | --- | --- | --- | --- | AFS12-30-22-11 |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | --- | --- - | --- | AFS16-30-22-11 |
|  |  | $45 \mathrm{~A}, 15 \mathrm{HP}$ (26) | --- | --- | - | --- | AFS26-30-22-11 |
|  |  | $50 \mathrm{~A}, 20 \mathrm{HP}$ (30) | --- | --- | --- | --- | AFS30-30-22-11 |
|  |  | $50 \mathrm{~A}, 25 \mathrm{HP}$ (38) | --- | --- | --- | --- | AFS38-30-22-11 |
|  |  | $80 \mathrm{~A}, 40 \mathrm{HP}$ (52) | --- | --- | --- | --- | AFS52-30-22-11 |
|  |  | $90 \mathrm{~A}, 50 \mathrm{HP}$ (65) | --- | -- | --- | --- | AFS65-30-22-11 |
|  |  | $105 \mathrm{~A}, 60 \mathrm{HP}(80)$ | --- | --- | --- | --- | AFS80-30-22-11 |
|  |  | 115 A, 60 HP (96) | --- | --- | --- | --- | AFS96-30-22-11 |
|  | $\begin{aligned} & 100-250 \mathrm{~V} \mathrm{AC/} \\ & \text { DC (13) } \end{aligned}$ | $25 \mathrm{~A}, 5 \mathrm{HP}$ (09) | --- | --- | --- | --- | AFS09-30-22-13 |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | --- | --- | --- | AFS16-30-22-13 |
|  |  | $45 \mathrm{~A}, 15 \mathrm{HP}$ (26) | --- | --- | --- | --- | AFS26-30-22-13 |
|  |  | $50 \mathrm{~A}, 20 \mathrm{HP}$ (30) | --- | --- | --- | -- | AFS30-30-22-13 |
|  |  | $80 \mathrm{~A}, 40 \mathrm{HP}$ (52) | -- | --- | --- | --- | AFS40-30-22-13 |
|  |  | $80 \mathrm{~A}, 40 \mathrm{HP}$ (52) | --- | --- | --- | --- | AFS52-30-22-13 |
|  |  | $90 \mathrm{~A}, 50 \mathrm{HP}$ (65) | --- | --- | -- | -- | AFS65-30-22-13 |
|  |  | 105 A, 60 HP (80) | --- | --- | --- | --- | AFS80-30-22-13 |
|  |  | $115 \mathrm{~A}, 60 \mathrm{HP}$ (96) | --- | --- | --- | --- | AFS96-30-22-13 |
|  | Low consumption for safety applications |  |  |  |  |  |  |
|  | 24 V DC (30) | $25 \mathrm{~A}, 5 \mathrm{HP}$ (09) | -- | --- | --- | AFS09Z-30-22-30 | --- |
|  |  | $28 \mathrm{~A}, 7.5 \mathrm{HP}$ (12) | -- | --- | --- | AFS12Z-30-22-30 | --- |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | -- | -- | AFS16Z-30-22-30 | -- |
|  |  | $45 \mathrm{~A}, 15 \mathrm{HP}$ (26) | --- | --- | --- | AFS26Z-30-22-30 | --- |
|  |  | $50 \mathrm{~A}, 20 \mathrm{HP}$ (30) | --- | --- | --- | AFS30Z-30-22-30 | --- |
|  |  | $50 \mathrm{~A}, 25 \mathrm{HP}$ (38) | --- | --- | --- | AFS38Z-30-22-30 | --- |

## AF Contactors

Pre-assembled Reversing contactors


## AF Contactors

NEMA contactors and bar connections

|  |  |  | Main contacts |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | 3 NO + 0 NC (30) |  |  |  |  |
|  |  |  | Auxiliary contacts |  |  |  |  |
|  |  |  | none | 1 NO | 1 NC | 1 NO + 1 NC | $2 \mathrm{NO}+2 \mathrm{NC}$ |
|  | Coil Voltage | Rating | (00) | (10) | (01) | (11) | (22) |
|  | NEMA contactors |  |  |  |  |  |  |
|  | $\begin{aligned} & 100-250 \mathrm{~V} \mathrm{AC/} \\ & \mathrm{DC}(13) \end{aligned}$ | $\begin{aligned} & \text { NEMA } 00 \\ & (25 \mathrm{~A}, 5 \mathrm{HP}) \end{aligned}$ | --- | AFO |  | --- | --- |
|  |  | $\begin{aligned} & \text { NEMA O } \\ & \text { (28 A, } 7.5 \mathrm{HP} \text { ) } \end{aligned}$ | --- | AF1 | --- | -- | --- |
|  |  | $\begin{aligned} & \text { NEMA } 1 \\ & (45 \mathrm{~A}, 15 \mathrm{HP}) \end{aligned}$ | AF26N1-30-00-13 --- |  | --- | AF26N1-30-11-13 | --- |
|  |  | $\begin{aligned} & \text { NEMA } 2 \\ & \text { ( } 60 \mathrm{~A}, 30 \mathrm{HP} \text { ) } \end{aligned}$ | --- | --- | --- | AF4ON2-30-11-13 --- |  |
|  |  | $\begin{aligned} & \text { NEMA } 3 \\ & \text { (105 A, } 60 \mathrm{HP} \text { ) } \end{aligned}$ | --- | --- | --- | AF80N3-30-11-13 | --- |
|  |  | $\begin{aligned} & \text { NEMA } 4 \\ & \text { (200 A, } 100 \mathrm{HP} \text { ) } \end{aligned}$ | --- | --- | --- | AF140N4-30-11-13 --- |  |
|  |  | $\begin{aligned} & \text { NEMA } 5 \\ & (350 \mathrm{~A}, 200 \mathrm{HP}) \end{aligned}$ | --- | --- | --- | AF265N5-30-11-13 --- |  |
|  | $\begin{aligned} & 100-250 \mathrm{~V} \mathrm{AC/} \\ & \mathrm{DC}(70) \end{aligned}$ | $\begin{aligned} & \text { NEMA } 6 \text { ( } 50 \text { A, } 400 \\ & \text { HP) } \end{aligned}$ | --- | --- | --- | AF460N6-3011-70 --- |  |
|  |  | $\begin{aligned} & \text { NEMA } 7 \text { ( } 900 \text { A, } 600 \\ & \text { HP) } \end{aligned}$ | --- | --- | --- | AF750N7-3011-70 | --- |
| $3$ | Bar Connections |  |  |  |  |  |  |
|  | $\begin{aligned} & 100-250 \mathrm{~V} \mathrm{AC/} \\ & \mathrm{DC}(13) \end{aligned}$ | 200 A, 100 HP (146) | --- | --- | --- | AF146-30-11B-13 | --- |

## AF Contactors

Low consumption ( $Z$ ) coil

|  |  |  | Main contacts |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | 3 NO + 0 NC (30) |  |  | 4 NO (40) |  |
|  |  |  | Auxiliary contacts |  |  |  |  |
|  | Coil voltage | Rating | n/a (00) | 1 NO (10) | 1 NC (01) | $2 \mathrm{NO}+2 \mathrm{NC}(22)$ | n/a (00) |
|  | Low consumption - standard |  |  |  |  |  |  |
|  | 12-20 V DC (20) | $25 \mathrm{~A}, 5 \mathrm{HP}$ (09) | --- | AF09Z-30-10-20 | --- | --- | --- |
| ( 0 - 010 |  | $28 \mathrm{~A}, 7.5 \mathrm{HP}$ (12) | --- | AF12Z-30-10-20 | --- | --- | --- |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | AF16Z-30-10-20 | --- | --- | --- |
|  |  | $45 \mathrm{~A}, 15 \mathrm{HP}$ (26) | AF26Z-30-00-20 | --- | --- | --- | --- |
|  |  | 50 A 20 HP (30) | --- | --- | --- | --- | --- |
|  |  | $50 \mathrm{~A}, 25 \mathrm{HP}$ (38) | --- | --- | --- | --- | --- |
|  | $20-60 \mathrm{~V} \mathrm{AC/}$ |  |  |  |  |  |  |
|  |  | $28 \mathrm{~A}, 7.5$ HP (12) | --- | AF12Z-30-10-21 | AF12Z-30-01-21 | --- | --- |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | AF16Z-30-10-21 | AF16Z-30-01-21 | --- | AF16Z-40-00-21 |
|  |  | $45 \mathrm{~A}, 15 \mathrm{HP}$ (26) | AF26Z-30-00-21 | --- | --- | --- | AF26Z-40-00-21 |
|  |  | $50 \mathrm{~A}, 20 \mathrm{HP}$ (30) | AF30Z-30-00-21 | --- | --- | --- | --- |
|  |  | $50 \mathrm{~A}, 25 \mathrm{HP}$ (38) | AF38Z-30-00-21 | --- | --- | --- | AF38Z-40-00-21 |
|  | $\begin{aligned} & \hline 48-130 \mathrm{~V} \mathrm{AC/} \\ & \mathrm{DC}(22) \end{aligned}$ | 25 A, 5 HP (09) | --- | AF09Z-30-10-22 | --- | --- | --- |
|  | 100-250 V AC/ |  |  |  |  |  |  |
|  | DC (23) | $25 \mathrm{~A}, 5 \mathrm{HP}$ (09) | --- | AF09Z-30-10-23 | --- | --- | --- |
|  |  | $28 \mathrm{~A}, 7.5$ HP (12) | --- | AF12Z-30-10-23 | -- | -- | --- |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | AF16Z-30-10-23 | --- | --- | --- |
|  | 24 V DC (30) | 25 A, 5 HP (09) | --- | AF09Z-30-10-30 | --- | --- | --- |
|  |  | $28 \mathrm{~A}, 7.5 \mathrm{HP}$ (12) | --- | AF12Z-30-10-30 | --- | --- | --- |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | AF16Z-30-10-30 | --- | --- | --- |
|  |  | $45 \mathrm{~A}, 15 \mathrm{HP}$ (26) | AF26Z-30-00-30 | --- | --- | --- | --- |
|  |  | $50 \mathrm{~A}, 20 \mathrm{HP}$ (30) | AF30Z-30-00-30 | --- | --- | --- | --- |
|  |  | $50 \mathrm{~A}, 25 \mathrm{HP}$ (38) | AF38Z-30-00-30 | --- | --- | --- | --- |
|  | Low consumption - reversing |  |  |  |  |  |  |
|  | $20-60 \mathrm{~V} \mathrm{AC/DC}$ |  |  |  |  |  |  |
|  | (21) | $25 \mathrm{~A}, 5 \mathrm{HP}$ (09) | --- | --- | --- | AF09ZR-30-22-21 | --- |
|  |  | $28 \mathrm{~A}, 7.5 \mathrm{HP}$ (12) | -- | --- | --- | AF12ZR-30-22-21 | --- |
|  |  | $30 \mathrm{~A}, 10 \mathrm{HP}$ (16) | --- | --- | --- | AF16ZR-30-22-21 | --- |

Contact Technical Support for additional low consumption information.

## AF09 ... AF96 3-pole contactors

Contactors and main accessories


## AF116 ... AF370 3-pole contactors

Contactors and main accessories


## AF Contactors

Accessories

|  | Auxiliary contacts |  |  |
| :--- | :--- | :--- | :--- |
|  |  | Fontacts |  |

Additional coil terminal block

| Description | For contactors | Ordering Code |
| :--- | :--- | :--- |
| Additional coil terminal block | AF09-AF96, NF | LDC4 |

## AF Contactors

Accessories


Connection sockets

| For contactors | Type | Ordering Code |
| :--- | :--- | :--- |
| AF116-AF146 | 3-pole | LL146-30 |

## AF Contactors

## Accessories

Terminal lug kits

| For contactors | Wire size | \# lugs per kit | Ordering Code |
| :--- | :--- | :--- | :--- |
| AF190-AF205 | 4 AWG-300 MCM | $\mathbf{3}$ | ATK185 |
| AF265-AF370 | 4 AWG-400 MCM | $\mathbf{3}$ | ATK300 |
| AF265-AF370 | 4 AWG-500 MCM | $\mathbf{3}$ | ATK300/2 |
| AF400-AF580 | 2/0 AWG-500 MCM | $\mathbf{3}$ | ATK580/2 |
| AF580-AF750 | 2/0 AWG-500 MCM | $\mathbf{3}$ | ATK750/3 |
| AF1350 | 4/0 AWG-500 MCM | $\mathbf{3}$ | ATK1350/4 |
| AF1350-AF1650 | 1/0 AWG-750 MCM | $\mathbf{3}$ | ATK1650/4 |
| AF1350-AF1650 | 1/0 AWG-750 MCM | $\mathbf{3}$ | ATK1650/6 |

Spare terminal hardware

| For contactors | Ordering Code |
| :--- | :--- |
| AF190, AF205 | LE185 |
| AF265-AF370 | LE300 |
| AF400-AF580 | LE460 |
| AF580, AF750 | LE750 |

Connecting links - AF contactor to manual motor starter


| Contactors | Manual motor starter | Ordering Code |
| :--- | :--- | :--- |
| AF09- AF16 | MS116-0.16-MS116-25 | BEA16-4 |
| AF26-AF38 | MS132-0.016-MS132-25 |  |
|  | MS116-0.16-MS116-16 | BEA26-4 |
|  | MS132-0.16-MS132-10 |  |
| AF40-AF65 | MS116-20-MS116-32 | BEA38-4 |

Connection bars - AF contactor to MCCB


Vertical assembly

| Contactors | MCCB | Ordering Code |
| :--- | :--- | :--- |
| AF116 - AF146 | XT2 | BEA140/XT2 |
| AF116 - AF146 | XT3 | BEA140/XT3 |
| AF116 - AF146 | XT4 | BEA140/XT4 |
| AF190, AF205 | XT4 | BEA205/XT4 |
| AF265, AF305, AF370 | XT5 | BEA370/XT5 |
| AF400, AF460 | XT5 | BEA460/XT5 |
| AF580, AF750 | XT5 | BEA750/XT5 |

## AF Contactors

Accessories

|  | Connection set for reversing contactors |  |
| :---: | :---: | :---: |
| $\square=\square$ | For contactors | Ordering Code |
| - | AF09-AF16 | BER16-4 |
|  | AF26-AF38 | BER38-4 |
|  | AF40-AF65 | BER65-4 |
|  | AF80-AF96 | BER96-4 |
|  | AF116-AF146 | BER140-4 |
|  | AF190-AF205 | BER205-4 |
|  | AF265-AF370 | BER370-4 |
|  | AF400-AF460 | BEM460-30 |
|  | AF580-AF750 | BEM750-30 |



Mechanical interlock units

| For contactors | Ordering Code |
| :--- | :--- |
| AF09-AF38 | VM4 |
| AF40-AF96 | VM96-4 |
| AF116-AF370 | VM 19 |
| AF116-AF146, AF190, AF205 | $\mathrm{VM} 140 / 190$ |
| AF190, AF205, AF265-AF370 | $\mathrm{VM} 205 / 265$ |
| AF145-AF300 | $\mathrm{VM300H}$ |
| AF400-AF1250 | VM 750 H |
| AF1350-AF2650 | VM 1650 H |



Mechanical and electrical interlock set

| For contactors | Ordering Code |
| :--- | :--- |
| AF09-AF38 | VEM4 |

Phase-to-phase connection sets

| For contactors | Ordering Code |
| :--- | :--- |
| AF116-AF146 | BEP140-30 |
| AF190-AF205 | BEP205-30 |
| AF265-AF370 | BEP370-30 |
| AF400-AF460 | BES460-30 |
| AF580-AF750 | BES750-30 |

Star-delta starting connection sets


| For contactors | Ordering Code |
| :--- | :--- |
| AF09-AF16 | BEY16-4 |
| AF26-AF38 | BEY38-4 |
| AF40-AF65 | BEY65-4 |
| AF80-AF96 | BEY96-4 |
| AF116-AF146 | BEY140-4 |
| AF190-AF205 | BEY190-4 |

## AF Contactors

## Accessories



Electronic timers

| Time delay range | Delay type | Auxiliary contacts | Model | Ordering Code |
| :--- | :--- | :--- | :--- | :--- |
| $0.1-1 \mathrm{~s}$ | ON-delay | $1 \mathrm{NO}+1 \mathrm{NC}$ | AF09-AF96 | TEF4-ON |
| $10-100 \mathrm{~s}$ | OFF-delay | $1 \mathrm{NO}+1 \mathrm{NC}$ | AF09-AF96 | TEF4-OFF |

Interface Relay


| For contactors | Ordering Code |
| :--- | :--- |
| AF $(Z) 09-A F 96$ | AF-RA4 |

Surge suppressors for AFC only

| For contactors | Rated Coil Voltage | Ordering Code |
| :--- | :--- | :--- |
| AFC09...AFC38 | $24 \ldots .50$ | $\mathrm{RC} 4-1 / 50$ |
|  | $50 \ldots 130$ | $\mathrm{RC} 4-1 / 130$ |
|  | $110 \ldots 260$ | $\mathrm{RC} 4-1 / 260$ |
| AFC40...AFC65 | $50 \ldots 130$ | $\mathrm{RV} 4-1 / 130$ |
|  | $110 \ldots 260$ | $\mathrm{RV} 4-1 / 260$ |
|  | $24 \ldots 50$ | $\mathrm{RC4}$ |
|  | $50 \ldots 130$ | $\mathrm{RC4}-2 / 50$ |

RV4: Surge suppressor fitted with varistor circuit
RC4: Surge suppressor fitted with RC circuit
The use of a surge suppressor will modify the operating time of the contactor or contactor relay

## B-Series mini contactors

Ordering code construction


Auxiliary contacts


## Mini contactors

## B-Series

|  |  |  | Main contacts |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | 3 NO + 0 NC (30) |  |  |  | 4 NO (40) | $2 \mathrm{NO}+2 \mathrm{NC}(22)$ |
|  |  |  | Auxiliary contacts |  |  |  |  |  |
|  |  |  | none | 1 NO | 1 NC | $1 \mathrm{NO}+1 \mathrm{NC}$ | none | none |
|  | AC Control Supply | Rating | (00) | (10) | (01) | (11) | (00) | (00) |
|  | Screw Terminals |  |  |  |  |  |  |  |
|  | 24 V AC (01) | $20 \mathrm{~A}, 3 \mathrm{HP}$ | --- | B6-30-10-01 | --- | --- | --- | --- |
|  |  | $20 \mathrm{~A}, 5 \mathrm{HP}$ | --- | B7-30-10-01 | B7-30-01-01 | --- | --- | B7-22-00-01 |
|  | $\begin{aligned} & 110-127 \text { V AC } \\ & \text { (84) } \end{aligned}$ | $20 \mathrm{~A}, 3 \mathrm{HP}$ | --- | B6-30-10-84 | --- | --- | B6-40-00-84 | --- |
|  |  | $20 \mathrm{~A}, 5 \mathrm{HP}$ | --- | B7-30-10-84 | B7-30-01-84 | --- | --- | --- |
|  | $\begin{aligned} & 220-240 \text { V AC } \\ & \text { (80) } \end{aligned}$ | $20 \mathrm{~A}, 3 \mathrm{HP}$ | --- | B6-30-10-80 | --- | --- | --- | B6-22-00-80 |
|  |  | $20 \mathrm{~A}, 5 \mathrm{HP}$ | --- | B7-30-10-80 | --- | --- | --- | --- |
|  | Flat Pins |  |  |  |  |  |  |  |
|  | 24 V AC (01) | $20 \mathrm{~A}, 5 \mathrm{HP}$ | --- | B7-30-10-F01 | --- | --- | --- | --- |
|  | $\begin{aligned} & 220-240 \text { V AC } \\ & (80) \end{aligned}$ | $20 \mathrm{~A}, 5 \mathrm{HP}$ | --- | --- | --- | --- | B7-40-00-F-80 | --- |


| DC Control Supply |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Screw Terminals |  |  |  |  |  |  |  |
| 12 V DC (07) | $20 \mathrm{~A}, 3 \mathrm{HP}$ | --- | BC6-30-10-07 | --- | --- | --- | --- |
|  | $20 \mathrm{~A}, 5 \mathrm{HP}$ | --- | --- | --- | --- | BC7-40-00-07 | --- |
| 24 V DC (01) | $20 \mathrm{~A}, 3 \mathrm{HP}$ | --- | BC6-30-10-01 | BC6-30-01-01 | --- | BC6-40-00-01 | --- |
|  | $20 \mathrm{~A}, 5 \mathrm{HP}$ | --- | BC7-30-10-01 | BC7-30-01-01 | --- | --- | --- |
| Flat Pins |  |  |  |  |  |  |  |
| 24 V AC (01) | $20 \mathrm{~A}, 5 \mathrm{HP}$ | --- | --- | --- | --- | BC7-40-00-F-0 |  |
| Soldering Pins |  |  |  |  |  |  |  |
| 24 V DC (01) | $20 \mathrm{~A}, 3 \mathrm{HP}$ | --- | BC6-30-10-P01 | --- | --- | --- | --- |


| Reversing DC |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Screw Terminals |  |  |  |  |  |  |  |
| 24 V DC (01) | $20 \mathrm{~A}, 3 \mathrm{HP}$ | --- | --- | VBC6-30-01-01 | --- | --- | --- |
|  | $20 \mathrm{~A}, 5 \mathrm{HP}$ | --- | VBC7-30-10-01 | VBC7-30-01-01 | --- | --- | --- |


| Soldering Pins |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 24 V DC (01) | $20 \mathrm{~A}, 3 \mathrm{HP}$ | --- | --- | VBC6-30-01-P01 | --- | --- | --- |


| Reversing AC |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Screw Terminals |  |  |  |  |  |  |  |
| $110-127$ V AC | 20 A, 3 HP | --- | VB6-30-01-84 | --- | --- | --- |  |
| $(84)$ | 20 A, 5 HP | --- | VB7-30-10-84 | VB7-30-01-84 | --- | --- | --- |

## M-Series mini contactors

Ordering code construction


## Mini contactors

## M-Series



| DC Control <br> Supply |
| :--- |
| Screw Terminals |
| 12 V DC |


| Accessories |  |  |
| :--- | :--- | :--- |
| Description | Variants | Ordering Code |
| Side mounted instant AUX contact block | MC1-MC2 | MACL1-10-AT |
| Front mounted instant AUX contact block | MC1-MC2 (EN 50012) | MACN2-02-AT |
| Front mounted instant AUX contact block | MC1-MC2 (AC) | MARN4-22-AT |
| Surge Suppressor | MC1-MC2 | MPOA-AE2 |
| Electronic Timers |  | MREB-C10-AC2 |

## Mini contactor relays

## K-Series, M-Series



K-Mini contactor stocked control relays

| Control voltage type | 2 NO +2 NC | 3 NO + 1 NC | 4 NO + 0 NC |
| :--- | :--- | :--- | :--- |
|  | $(22)$ | $(31)$ | $(40)$ |
| AC Operated |  |  |  |
| 24 V AC (01) | K6-22Z-01 | K6-31Z-01 | --- |
| $110-127$ V AC (84) | K6-22Z-84 | K6-31Z-84 | K6-40E-84 |
|  |  |  |  |
| DC Operated | --- | --- | KC6-40E-07 |
| 12 V DC (07) | KC6-22Z-01 | --- | KC6-40E-01 |
| 24 V DC (01) |  |  |  |

K6/KC6 4-pole mini-contactor relays are space optimized control products mainly used for control functions or for small loads up to AC-15 4 A / 240 V

M-Mini contactor stocked control relays

| Control voltage type | $2 \mathrm{NO}+2 \mathrm{NC}$ | 3 NO + 1 NC | $4 \mathrm{NO}+0 \mathrm{NC}$ |
| :---: | :---: | :---: | :---: |
|  | (22) | (31) | (40) |
| AC Operated |  |  |  |
| 110-115 V AC (J) | MCRA-0-22-AT-J | MCRA-0-31-AT-J | MCRA-0-40-AT-J |
| DC Operated |  |  |  |
| 12 V DC (B) | MCRC-0-22-AT-B | --- | --- |
| 24 V DC (D) | MCRC-0-22-AT-D | MCRC-0-31-AT-D | MCRC-0-40-AT-D |
| 24 V DC (D) - Low Consumption | --- | --- | MCRK-0-40-AT-D |
| 87-162 V DC (WL) | MCRC-0-22-AT-WL | MCRC-0-31-AT-WL | --- |

MC mini-contactor relays are space optimized control products mainly used for control functions or for small loads up to AC-15 4 A / 240 V

## Contactor relays

NF Series


Stocked control relays

| Control voltage type |  |  | Ordering Code |
| :---: | :---: | :---: | :---: |
|  | $2 \mathrm{NO}+2 \mathrm{NC}$ | $3 \mathrm{NO}+1 \mathrm{NC}$ | 4 NO + 0 NC |
|  | -22 | -31 | -40 |
| Standard |  |  | Ordering Code |
| 24-60 V AC/20-60 V DC | NF22E-11 | NF31E-11 | NF40E-11 |
| 48-130 V AC/DC | NF22E-12 | NF31E-12 | NF40E-12 |
| 100-250 V AC/DC | NF22E-13 | NF31E-13 | NF40E-13 |
| Standard - AFC for AC control |  |  | Ordering Code |
| 24 V AC | NFC22E-81 | --- | --- |
| 110-120 V AC | NFC22E-84 | NFC31E-84 | NFC40E-84 |
| 220-240 V AC | NFC22E-80 | --- | --- |
| Standard - Push In (PI) Spring |  |  | Ordering Code |
| 24-60 V AC/20-60 V DC | NF22EK-11 | NF31EK-11 | NF40EK-11 |
| $100-250 \mathrm{~V} \mathrm{AC/DC}$ | NF22EK-13 | NF31EK-13 | NF40EK-13 |
| Low consumption |  |  | Ordering Code |
| 20-60 V AC/DC | NFZ22E-21 | NFZ31E-21 | NFZ40E-21 |
| 24 V DC | NFZ22E-30 | NFZ31E-30 | NFZ40E-30 |
| Low consumption - Push In (PI) Spring |  |  | Ordering Code |
| 20-60 V AC/DC | NFZ22EK-21 | NFZ31EK-21 | NFZ40EK-21 |

NF contactor relays are optimized control products mainly used for control functions up to AC-15 6A / 24-127 V 50/60 Hz

## Overload relays

EF electronic overloads and accessories


Electronic overload ordering codes

| Setting range | Ordering Code |
| :--- | :--- |
| $0.10-0.32 \mathrm{~A}$ | $\mathrm{EF} 19-0.32$ |
| $0.30-1.00 \mathrm{~A}$ | $\mathrm{EF} 19-1.0$ |
| $0.80-2.70 \mathrm{~A}$ | $\mathrm{EF} 19-2.7$ |
| $1.90-6.30 \mathrm{~A}$ | $\mathrm{EF} 19-6.3$ |
| $5.70-18.9 \mathrm{~A}$ | $\mathrm{EF} 19-18.9$ |
| $9.0-30.0 \mathrm{~A}$ | $\mathrm{EF} 45-30$ |
| $15.0-45.0 \mathrm{~A}$ | $\mathrm{EF} 45-45$ |
| $20.0-56.0 \mathrm{~A}$ | $\mathrm{EF} 65-56$ |
| $25.0-70.0 \mathrm{~A}$ | $\mathrm{EF} 65-70$ |
| $36.0-100 \mathrm{~A}$ | $\mathrm{EF96-100}$ |
| $54-150 \mathrm{~A}$ | $\mathrm{EF} 146-150$ |
| $63-210 \mathrm{~A}$ | $\mathrm{EF} 205-210$ |
| $115-380 \mathrm{~A}$ | $\mathrm{EF} 370-380$ |
| $150-500 \mathrm{~A}$ | EF 460 |
| $250-800 \mathrm{~A}$ | EF 750 |

Overload accessories for separate/stand-alone mounting

| For contactors | Description | Ordering Code |
| :--- | :--- | :--- |
| EF19 | Single mounting kit | DB19EF |
| EF45 | Single mounting kit | DB45EF |

## Overload relays

## TF thermal overloads



Thermal overload ordering codes


| 3 phase hp rating at 480V | 0.5-10hp | 0.5-25hp | 15.50hp | 30-75hp | 50-100hp | 50-150hp |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Setting range ( A ) |  |  |  |  |  |  |
| 0.10-0.13 | --- | TF42-0.13 | --- | --- | --- | -- |
| 0.13-0.17 | --- | TF42-0.17 | --- | --- | --- | --- |
| 0.17-0.23 | --- | TF42-0.23 | --- | --- | --- | --- |
| 0.23-0.31 | --- | TF42-0.31 | --- | --- | --- | --- |
| 0.31-0.41 | --- | TF42-0.41 | --- | --- | --- | --- |
| 0.41-0.55 | --- | TF42-0.55 | --- | --- | --- | --- |
| 0.55-0.74 | --- | TF42-0.74 | --- | --- | --- | --- |
| 0.74-1.00 | T16-1.0 | TF42-1.0 | --- | --- | --- | --- |
| 1.00-1.30 | T16-1.3 | TF42-1.3 | --- | --- | --- | --- |
| 1.30-1.70 | T16-1.7 | TF42-1.7 | --- | --- | --- | --- |
| 1.70-2.30 | T16-2.3 | TF42-2.3 | --- | --- | --- | --- |
| 2.30-3.10 | T16-3.1 | TF42-3.1 | --- | --- | --- | --- |
| 3.10-4.20 | T16-4.2 | TF42-4.2 | --- | --- | --- | --- |
| 4.20-5.70 | T16-5.7 | TF42-5.7 | --- | --- | --- | --- |
| 5.70-7.60 | T16-7.6 | TF42-7.6 | --- | --- | --- | --- |
| 7.60-10.0 | T16-10 | TF42-10 | --- | --- | --- | --- |
| 10.0-13.0 | T16-13 | TF42-13 | --- | --- | --- | --- |
| 13.0-16.0 | T16-16 | TF42-16 | --- | --- | --- | -- |
| 16.0-20.0 | --- | TF42-20 | --- | --- | --- | --- |
| 20.0-24.0 | --- | TF42-24 | --- | --- | --- | -- |
| 22.0-28.0 | --- | --- | TF65-28 | --- | --- | --- |
| 24.0-29.0 | --- | TF42-29 | --- | --- | --- | --- |
| 25.0-33.0 | --- | --- | TF65-33 | --- | --- | -- |
| 29.0-35.0 | --- | TF42-35 | --- | --- | --- | --- |
| 35.0-40.0 | --- | TF42-38 | --- | --- | --- | --- |
| 30-40 | --- | --- | TF65-40 | --- | --- | --- |
| 36-47 | --- | --- | TF65-47 | --- | --- | --- |
| 40-51 | --- | --- | --- | TF96-51 | --- | -- |
| 44-53 | --- | --- | TF65-53 | --- | --- | --- |
| 50-60 | --- | --- | TF65-60 | TF96-60 | --- | --- |
| 57-67 | --- | --- | TF65-67 | --- | --- | --- |
| 57-68 | --- | --- | --- | TF96-68 | --- | --- |
| 65-78 | --- | --- | --- | TF96-78 | --- | --- |
| 75-87 | --- | --- | --- | TF96-87 | --- | --- |

## Overload relays

TF thermal overloads

Thermal overload ordering codes continued

| 3 phase hp rating at 480V | 0.5-10hp | 0.5-25hp | 15.50hp | 30-75hp | 50-100hp | 50-150hp |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Setting range (A) |  |  |  |  |  |  |
| 66-90 | --- | --- | --- | --- | TF140DU-90 | TA200DU90 |
| 84-96 | --- | --- | --- | TF96-96 | --- | --- |
| 80-110 | --- | --- | --- | --- | TF140DU-110 | TA200DU110 |
| 100-135 | --- | --- | --- | --- | TF140DU-135 | TA200DU135 |
| 110-142 | --- | --- | --- | --- | TF140DU-142 | --- |
| 110-150 | --- | --- | --- | --- | -- | TA200DU150 |
| 130-175 | --- | --- | --- | --- | --- | TA200DU175 |
| 150-200 | --- | --- | --- | --- | --- | TA200DU200 |

Overload accessories for separate/stand-alone mounting

| For contactors | Description | Ordering Code |
| :--- | :--- | :--- |
| T16 | Single mounting kit | DB16-ABB |
| TF42 | Single mounting kit | DB42 |
| TF65 | Single mounting kit | DB65 |
| TF96, EF96 | Single mounting kit | DB96 |
| TA200DU | Single mounting kit | DB200 |

## Starters

## Manual motor starters



|  | Electronic overload ordering codes |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Screw termination | Push-In Spring |
| $\stackrel{*}{*}$ + | Setting range in Amps | HP @ 480 V | MS116 | MS132 | MS165 | MS132K |
|  | 0.10-0.16 | --- | MS116-0.16 | MS132-0.16 | --- | MS132-0.16K |
|  | 0.16-0.25 | --- | MS116-0.25 | MS132-0.25 | --- | MS132-0.25K |
|  | 0.25-0.40 | --- | MS116-0.4 | MS132-0.4 | --- | MS132-0.4K |
|  | 0.40-0.63 | --- | MS116-0.63 | MS132-0.63 | --- | MS132-0.63K |
|  | 0.63-1.0 | --- | MS116-1.0 | MS132-1.0 | --- | MS132-1.0K |
|  | 1.0-1.6 | 3/4 | MS116-1.6 | MS132-1.6 | --- | MS132-1.6K |
|  | 1.6-2.5 | 1 | MS116-2.5 | MS132-2.5 | --- | MS132-2.5K |
|  | 2.5-4 | 2 | MS116-4.0 | MS132-4.0 | --- | MS132-4.0K |
|  | 4-6.3 | 3 | MS116-6.3 | MS132-6.3 | --- | MS132-6.3K |
|  | 6.3-10 | 5 | MS116-10 | MS132-10 | --- | MS132-10K |
|  | 8-12 | 7.5 | MS116-12 | MS132-12 | --- | --- |
|  | 10-16 | 10 | MS116-16 | MS132-16 | MS165-16 | MS132-16K |
|  | 16-20 | 10 | MS116-20 | MS132-20 | MS165-20 | MS132-20K |
|  | 20-25 | 15 | MS116-25 | MS132-25 | MS165-25 | MS132-25K |
|  | 25-32 | 20 | MS116-32 | MS132-32 | MS165-32 | MS132-32K |
|  | 30-42 | 30 | --- | --- | MS165-42 | --- |
|  | 40-54 | 40 | --- | --- | MS165-54 | --- |
|  | 52-65 | 50 | --- | --- | MS165-65 | --- |
|  | 62-73 | 60 | --- | --- | MS165-73 | --- |
|  | 70-80 | 75 | --- | --- | MS165-80 | --- |

## Accessories

MS116, MS132, MS165, MO132, MO165, MS132-T

Manual motor starters with accessories (MS116, MO132, MO165)


Manual motor starters (MS132, MS165) and circuit breakers for transformer protection (MS132-T) with accessories


## Starters

Manual motor starter accessories


Auxiliary contacts


Shunt trips - left mount


| Control voltage $\mathbf{6 0 ~ H z}$ | Models | Ordering Code |
| :--- | :--- | :--- |
| Shunt trips - left mount |  |  |
| 24 V AC | MS116, MS132, MS165 | AA1-24 |
| 110 V AC | MS116, MS132, MS165 | AA1-110 |
| $200-240$ V AC | MS116, MS132, MS165 | AA1-230 |
| Undervoltage releases - left mount |  |  |
| 120 V AC | MS116, MS132, MS165 | UA1-120 |
| 240 V AC | MS116, MS132, MS165 | UA1-230 |
| 480 V AC | MS116, MS132, MS165 | UA1-415 |

Table continues on next page.

## Accessories

MS116, MS132, MS165, MO132, MO165

Manual motor starters with three-phase busbar systems (MS116, MS132, M0132)


Three-phase busbar up to 65 A


Three-phase busbar up to 100 A

Note: busbars and feeder blocks are only suitable for screw versions.
Manual motor starters with three-phase busbar systems (MS165, MO165)


## Starters

## Manual motor starter accessories

|  | Three-phase busbar |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Operational current (A) | No. of MMS | No. of lateral aux. | Models | Ordering Code |
|  | 65 | 2 | 0 | MS116, MS132 | PS1-2-0-65 |
| 01 | 65 | 3 | 0 | MS116, MS132 | PS1-3-0-65 |
|  | 65 | 4 | 0 | MS116, MS132 | PS1-4-0-65 |
|  | 65 | 5 | 0 | MS116, MS132 | PS1-5-0-65 |
|  | 65 | 2 | 1 | MS116, MS132 | PS1-2-1-65 |
|  | 65 | 3 | 1 | MS116, MS132 | PS1-3-1-65 |
|  | 65 | 4 | 1 | MS116, MS132 | PS1-4-1-65 |
|  | 65 | 5 | 1 | MS116, MS132 | PS1-5-1-65 |
|  | 65 | 2 | 2 | MS116, MS132 | PS1-2-2-65 |
|  | 65 | 3 | 2 | MS116, MS132 | PS1-3-2-65 |
|  | 65 | 4 | 2 | MS116, MS132 | PS1-4-2-65 |
|  | 65 | 5 | 2 | MS116, MS132 | PS1-5-2-65 |
|  | 92 | 3 | 0 | MS116, MS132 | PS1-3-0-100 |
|  | 92 | 4 | 0 | MS116, MS132 | PS1-4-0-100 |
|  | 92 | 5 | 0 | MS116, MS132 | PS1-5-0-100 |
|  | 92 | 3 | 1 | MS116, MS132 | PS1-3-1-100 |
|  | 92 | 4 | 1 | MS116, MS132 | PS1-4-1-100 |
|  | 92 | 5 | 1 | MS116, MS132 | PS1-5-1-100 |
|  | 125 | 3 | 0 | MS165 | PS2-2-0-125 |
|  | 125 | 2 | 2 | MS165 | PS2-2-2-125 |
|  | 125 | 2 | 0 | MS165 | PS2-3-0-125 |
|  | 125 | 3 | 2 | MS165 | PS2-3-2-125 |
|  | 125 | 3 | 0 | MS165 | PS2-4-0-125 |
|  | 125 | 4 | 2 | MS165 | PS2-4-2-125 |



Three-phase feeder terminals

| Operational current (A) | Mounting form | Models | Ordering Code |
| :--- | :--- | :--- | :--- |
| 63 | Flat | MS116, MS132 | S1-M1-25 |
| 63 | High | MS116, MS132 | S1-M2-25 |
| 63 | UL/CSA Type E/F | MS116, MS132 | S1-M3-25 |
| 92 | UL/CSA Type E/F | MS116, MS132 | S1-M3-35 |

## Starters

## Manual motor starter accessories

General accessories


| Description | Models | Ordering Code |
| :--- | :--- | :--- |
| Protection cover for busbars | MS116, MS132 | BS1-3 |
| Protection cover for busbars | MS165 | BS2-3 |
| Padlock + two keys | MS116, MS132 | SA2 |
| Lock handle | MS116 | SA1 |
| Terminal shroud | MS165 | KA165 |
| NEMA Type 12 yellow enclosure with red handle | MS116, MS132 | IB132-Y |
| NEMA Type 12 grey enclosure with black handle | MS116, MS132 | IB132-G |
| Door mount and handle for NEMA Type 12 yellow/red | MS116, MS132 | DMS132-Y |
| Door mount and handle for NEMA Type 12 grey/black | MS116, MS132 | DMS132-G |
| NEMA type 1, 3R, 12 black handle, IO/On-Off | MS116, MS132, MS165, MS49x | MSHD-LB |
| NEMA type 1, 3R, 12 yellow handle, IO/On-Off | MS116, MS132, MS165, MS49x | MSHD-LY |
| NEMA type 1, 3R, 12 black handle, IO/On-Off+trip | MS116, MS132, MS165, MS49x | MSHD-LTB |
| NEMA type 1, 3R, 12 yellow handle, IO/On-Off+trip | MS116, MS132, MS165, MS49x | MSHD-LTY |
| Shaft supporter | MS116, MS132, MS165, MS49x | MSAH1 |



## Starters

Enclosed direct-on-line starters

|  | DRAF UL enclosed direct-on-line starters |  |  |
| :---: | :---: | :---: | :---: |
|  | HP 3 phase |  |  |
| AHB | 440 V-480 V | Control voltage | Ordering Code |
|  | 5 | 24-60 | DRAF09-11U |
|  | 7.5 | 24-60 | DRAF12-11U |
|  | 7.5 | 100-250 | DRAF12-13U |
|  | 10 | 24-60 | DRAF16-11U |
|  | 10 | 100-250 | DRAF16-13U |

