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[PKZ2/S-SP,24V 60HZ](#)

[PKZ2/S-SP,120V 60HZ](#)

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# Self-protected Combination Starters System PKZ 2-SP

Type PKZ 2/ZM/S-SP motor starters: a higher level of protection and versatility

## General:

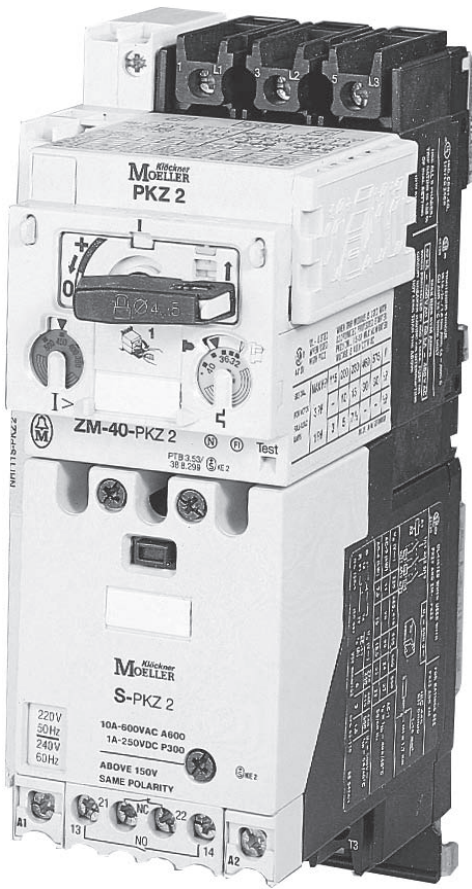
The PKZ 2/ZM/S-SP is a self-protected starter, the first motor controller to be UL listed and CSA certified under Type E, the category for self-protected control devices. In other words, it is a combination motor controller featuring main disconnect, overcurrent, overload and motor switching functions in one compact unit.

In addition, the PKZ 2/ZM/S-SP incorporates the latest technological advances in current limitation to provide a high short-circuit interrupting rating and continuity of service capability.

The PKZ2/ZM/S-SP is a stand-alone device which does not require any backup protection up to its maximum interrupting rating! It is available in both, full voltage non-reversing and full voltage reversing versions.

## Features

- UL listed, CSA certified self-protected combination motor controller UL 508 / CSA 22.2 No. 14, Category E.
- Fuseless, high fault interrupting current-limiting design, with separate main contacts for disconnect and contactor.
- The modular construction integrates both thermal and magnetic trips.
- Controls and protects motors up to 30 HP at 460V, 25 HP at 575V
- One basic device accommodates up to 11 different plug-in modules, simplifying engineering and reducing stocking costs.
- Suitable for PLC controlled, fully automated operation.
- Differentiated overload and short-circuit trip indication.
- A wide range of accessories.



|                                           | Page              |
|-------------------------------------------|-------------------|
| Application notes                         | 03/036            |
| Features and benefits                     | 03/036            |
| Full voltage, non-reversing basic starter | 03/037            |
| Full voltage, reversing basic starter     | 03/037            |
| Trip modules                              | 03/037            |
| Combination starters with trip modules    | 03/038,<br>03/039 |
| Accessories                               | 08/048            |
| Technical data                            | 08/060            |
| Dimensions                                | 08/070            |

## System PKZ 2-SP Self-protected Combination Starters

### All-in-one starter eliminates upstream circuit breaker or fuses

As per the intent of NEC article 430 and CEC Rule 28, the self-protected control device will perform the functions of motor disconnecting means (part IX), motor branch circuit, short circuit and ground fault protection (part IV), motor controller (part VII) and motor overload protection (part III).

Up to the maximum rated short-circuit current available, no upstream circuit breaker or set of fuses is required.

The PKZ 2/ZM-.../S-SP has two sets of main contacts, both current-limiting in design. This provides it with a high interrupting rating and the capability to protect itself against damage under fault conditions. No contact welding can ensue thus providing for continuity of service.

Each unit consists of a basic frame (disconnect switch and contactor) rated to switch a motor load of 30Hp at 460V, 25 Hp at 575V AC. Eleven plug-in trip modules are available to cover motor loads ranging from fractional Hp sizes through 30 Hp at 460V and 25 Hp at 575V AC. As a result, stocking of parts is minimized and use of the starter for other motor loads may be as simple as plugging-in a new trip module and setting the trip module response dials.

### Choose the PKZ2/ZM-.../S-SP starter for maximum protection and flexibility

- UL listed for use on circuits capable of delivering 65kA RMS sym. at 480Y/277V AC and 42kA RMS sym. at 600Y/347V AC.
- No backup short-circuit protection required (replaces fuses or circuit breakers required by other conventional starters).
- Plug-in trip modules can be removed/installed without disturbing power wiring.
- Field-adjustable, coordinated and sealable settings for motor overload and short-circuit trip response.
- Compact design allows installation in hard-to-fit areas.
- Exceeds IEC "Type 2" coordination without the need for additional fuses or circuit breakers.
- Removal of trip block (for maintenance or servicing) provides visible electrical isolation gap between line disconnecting and contactor portions.
- All live parts (including terminals) are shrouded against accidental contact ("finger-proof" per IEC 536), even with the plug-in trip module removed.
- Maximum continuity of service (protects itself against damage from fault currents).

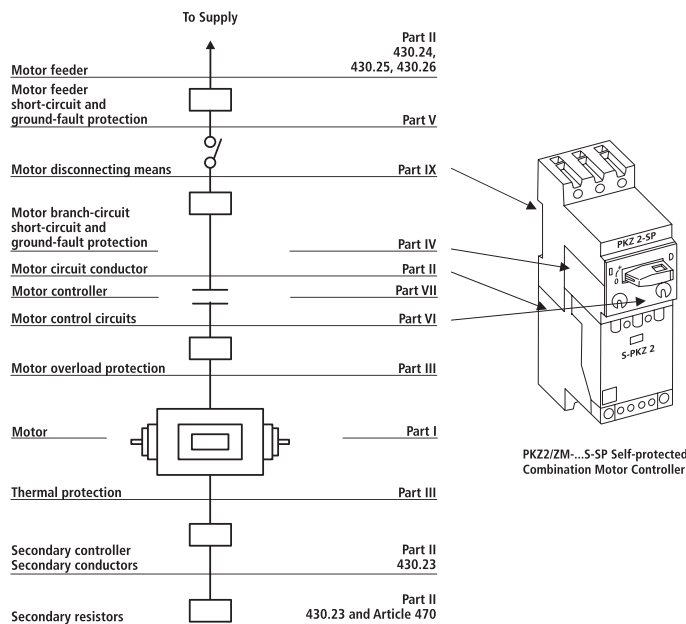
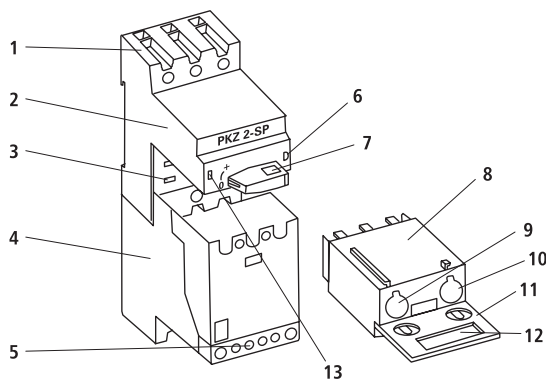


Diagram 430.1 from NEC Article 430

The PKZ2/ZM-.../S-SP self-protected starter comes standard as a one piece construction featuring a main disconnect and a contactor. The unit can be either panel or rail mounted. Integral power takeoffs are provided between the disconnect and contactor for control circuit feed. Adjustable motor protective thermal-magnetic trip modules are set in accordance with the motor full load current and plugged directly into the base of the disconnect.

Trip modules and accessories can be field installed for maximum versatility. The main disconnect and contactor modules can also be separately mounted. This is particularly suitable for full voltage reversing applications which combine the PKZ2-SP disconnect switch and two mechanically interlocked S-PKZ2 contactors. (→ page 08/024)



- Both field wiring terminals on the line side (disconnect) and load side (contactor) have large service entrance spacings typical of molded case circuit breakers.
- The main disconnect isolating contacts are current limiting in design.
- Visible "finger-touch-proof" open circuit power path when trip module is removed.
- The contactor main switching contacts are also current limiting in design and significantly enhance the device's overall interrupting ability.
- The contactor comes standard with 1 N.O. and 1 N.C. auxiliary contacts. 2 N.O. contacts are also available.
- The trip module can be set and then sealed with a wire lock.
- Padlockable handle with ON, OFF and + (tripped) indication.
- Field-interchangeable plug-in motor protective trip modules with coordinated overload and short-circuit protection built in.
- Adjustable magnetic trip dial, range 8.5 - 14 x trip module rating.
- Adjustable thermal trip dial, range 0.6 - 1 x trip module rating (set to motor FLC.)
- Test-to-trip slot.
- Coding feature to differentiate trip modules.
- Short-circuit trip indicator K-AGM-PKZ2 provides visual indication of short circuit trip condition and differentiation between short-circuit and general trip due to overload and/or voltage trips.

## System PKZ 2-SP

### Self-protected Combination Starters - FVNR, FVR, Open Type

| Max. HP rating, 3 phase<br>200 V    230 V    460 V    575 V | Type<br>Specify coil voltage and frequency, → page 03/038 | Price<br>see price list | Notes:                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------|-----------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HP    HP    HP    HP                                        |                                                           |                         |                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Full voltage, non-reversing starter</b>                  |                                                           |                         | Ready to be mounted and wired in its own enclosure. The HP values shown are the maximum allowable and are dependent on the trip module chosen. Trip modules shown below can be selected later according to desired motor HP and FLC and plugged into the disconnect to complete the starter. Trip modules can be field installed for maximum flexibility.                                         |
| without trip module                                         |                                                           |                         |                                                                                                                                                                                                                                                                                                                                                                                                   |
| 10    15    30    25                                        | PKZ2/S-SP (...)                                           |                         |                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Full voltage, reversing starter</b>                      |                                                           |                         | Supplied with factory mounted and wired disconnect and mechanically interlocked contactors. The HP values shown are the maximum allowable and are dependent on the trip module chosen. Trip modules shown below can be selected later according to desired motor HP and FLC and plugged into the disconnect to complete the starter. Trip modules can be field installed for maximum flexibility. |
| without trip module                                         |                                                           |                         |                                                                                                                                                                                                                                                                                                                                                                                                   |
| 10    15    30    25                                        | PKZ2/S-SP-FVR (...)                                       |                         |                                                                                                                                                                                                                                                                                                                                                                                                   |

| Trip modules                                                                   |                                                     |                                        |                       |                         |  | with overload function |                         |
|--------------------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------|-----------------------|-------------------------|--|------------------------|-------------------------|
| Max. HP rating 3 phase<br>200V    230V    460V    575V<br>HP    HP    HP    HP | Adjustable thermal current range<br>A <sup>1)</sup> | Adjustable magnetic current range<br>A | Type<br>Article No.   | Price<br>see price list |  | Type<br>Article No.    | Price<br>see price list |
| Trip modules are added to above devices to complete starter                    |                                                     |                                        |                       |                         |  |                        |                         |
| In this range select devices in accordance with motor FLC                      | 0.4 - 0.6                                           | 5 - 8                                  | ZM-0.6-PKZ2<br>024232 |                         |  | ZMR-0.6-PKZ2<br>033943 |                         |
| 1/2    1/2    1/2    1/2                                                       | 0.6 - 1.0                                           | 8 - 14                                 | ZM-1-PKZ2<br>028979   |                         |  | ZMR-1-PKZ2<br>033950   |                         |
| 1/3    3/4    1                                                                | 1.0 - 1.6                                           | 14 - 22                                | ZM-1.6-PKZ2<br>031352 |                         |  | ZMR-1.6-PKZ2<br>033952 |                         |
| 1/2    1/2    1    1 1/2                                                       | 1.6 - 2.4                                           | 20 - 35                                | ZM-2.4-PKZ2<br>033725 |                         |  | ZMR-2.4-PKZ2<br>033955 |                         |
| 1    1    2    3                                                               | 2.4 - 4.0                                           | 35 - 55                                | ZM-4-PKZ2<br>036098   |                         |  | ZMR-4-PKZ2<br>033957   |                         |
| 1 1/2    1 1/2    3    5                                                       | 4.0 - 6.0                                           | 50 - 80                                | ZM-6-PKZ2<br>038471   |                         |  | ZMR-6-PKZ2<br>033966   |                         |
| 2    3    5    7 1/2                                                           | 6 - 10                                              | 80 - 140                               | ZM-10-PKZ2<br>040844  |                         |  | ZMR-10-PKZ2<br>033967  |                         |
| 3    5    10    10                                                             | 10 - 16                                             | 130 - 220                              | ZM-16-PKZ2<br>043217  |                         |  | ZMR-16-PKZ2<br>033968  |                         |
| 7 1/2    7 1/2    20    25                                                     | 16 - 27                                             | 200 - 350                              | ZM-25-PKZ2<br>045590  |                         |  | ZMR-25-PKZ2<br>033969  |                         |
| 10    10    20    -                                                            | 24 - 32                                             | 275 - 425                              | ZM-32-PKZ2<br>047963  |                         |  | ZMR-32-PKZ2<br>033973  |                         |
| 10    15    30    -                                                            | 32 - 42                                             | 350 - 500                              | ZM-40-PKZ2<br>050336  |                         |  | ZMR-40-PKZ2<br>033975  |                         |

- Notes:** <sup>1)</sup> Set bimetal trips (yellow dial) to motor FLC
- Tripping current = 125% of setting
  - For motors of service factor 1.0, set dial to 0.9 of motor FLC setting
  - Ambient compensated
  - Phase failure sensitive

#### UL listed / CSA certified Maximum interrupting ratings

|                  |                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------|
| 240 V AC         | 100 kA RMS sym.                                                                                                            |
| 480 Y / 277 V AC | 65 kA RMS sym.                                                                                                             |
| 600 Y / 347 V AC | 42 kA RMS sym.                                                                                                             |
| up to 27 A       | Suitable for maximum 600 V AC power distribution system when the voltage between any phase to ground does not exceed 347 V |
| up to 42 A       | Suitable for maximum 480 V AC power distribution system when the voltage between any phase to ground does not exceed 277 V |

#### Trip module type ZMR

Under overload and short-circuit fault conditions the standard trip module will open the main disconnect portion of the PKZ2 Self-protected Starter, much like the operation of an inverse time molded case breaker. As an option, the trip module type ZMR can be provided. It features a set of auxiliary contacts which are activated under overload conditions. Similar to the operation of an overload relay in a conventional combination controller, the N.C. contact can be used to de-energize the contactor coil circuit in the event of an overload and the N.O. contact can be used to annunciate the condition. A short-circuit fault will trip open the main disconnect instantaneously, just like the standard trip module.

The ZMR module is ideal for applications which need to take full advantage of the self-protected starter's capabilities over conventional combination controllers, but wish to retain the operating features of a conventional overload relay in a starter.

## System PKZ2-SP

### Combination Starters - Self-protected FVNR

| Rating data<br>UL/CSA maximum Horsepower rating (HP)<br>50/60Hz<br>3 phase |             |             |             | Adjustable current<br>range                                 |                  | with ZM trip module<br>Type                        | Price<br>see price list                         |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
|----------------------------------------------------------------------------|-------------|-------------|-------------|-------------------------------------------------------------|------------------|----------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|                                                                            |             |             |             | Thermal<br>setting<br>(set to mo-<br>tor FLC) <sup>1)</sup> | Magnetic<br>trip |                                                    |                                                 | Enclosed<br>General<br>purpose<br>Type 1<br><br>Replace <input type="checkbox"/><br>with suffix<br>/S | Industrial<br>use<br>Type 12<br>dusttight<br>Replace <input type="checkbox"/><br>with suffix<br>/SD<br>Type 3R<br>weather-<br>proof<br>Replace <input type="checkbox"/><br>with suffix<br>/DW | Insulating<br>material<br>Type 12<br>corrosion-<br>resistant<br>dusttight<br><br>Replace <input type="checkbox"/><br>with<br>suffix /I |
| 200 V<br>HP                                                                | 230 V<br>HP | 460 V<br>HP | 575 V<br>HP | A                                                           | A                | Specify coil voltage and<br>frequency, ➡ see below |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
| In this range, select<br>devices in accordance<br>with motor FLC           |             |             |             |                                                             | 0.4 - 0.6        | 5 - 8                                              | PKZ2/ZM-0.6/S-SP <input type="checkbox"/> (...) |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
|                                                                            | 1/2         | 1/2         |             | 0.6 - 1.0                                                   | 8 - 14           | PKZ2/ZM-1/S-SP <input type="checkbox"/> (...)      |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
|                                                                            | 1/3         | 3/4         | 1           | 1.0 - 1.6                                                   | 14 - 22          | PKZ2/ZM-1.6/S-SP <input type="checkbox"/> (...)    |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
| 1/2                                                                        | 1/2         | 1           | 1 1/2       | 1.6 - 2.4                                                   | 20 - 35          | PKZ2/ZM-2.4/S-SP <input type="checkbox"/> (...)    |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
| 1                                                                          | 1           | 2           | 3           | 2.4 - 4.0                                                   | 35 - 55          | PKZ2/ZM-4/S-SP <input type="checkbox"/> (...)      |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
| 1 1/2                                                                      | 1 1/2       | 3           | 5           | 4.0 - 6.0                                                   | 50 - 80          | PKZ2/ZM-6/S-SP <input type="checkbox"/> (...)      |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
| 2                                                                          | 3           | 5           | 7 1/2       | 6 - 10                                                      | 80 - 140         | PKZ2/ZM-10/S-SP <input type="checkbox"/> (...)     |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
| 3                                                                          | 5           | 10          | 10          | 10 - 16                                                     | 130 - 220        | PKZ2/ZM-16/S-SP <input type="checkbox"/> (...)     |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
| 7 1/2                                                                      | 7 1/2       | 20          | 25          | 16 - 27                                                     | 200 - 350        | PKZ2/ZM-25/S-SP <input type="checkbox"/> (...)     |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
| 10                                                                         | 10          | 20          | -           | 24 - 32                                                     | 275 - 425        | PKZ2/ZM-32/S-SP <input type="checkbox"/> (...)     |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |
| 10                                                                         | 15          | 30          | -           | 32 - 42                                                     | 350 - 500        | PKZ2/ZM-40/S-SP <input type="checkbox"/> (...)     |                                                 |                                                                                                       |                                                                                                                                                                                               |                                                                                                                                        |

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Notes:

- 1) Set bimetal trips (yellow dial) to motor FLC
  - Tripping current = 125% of setting
  - For motors of service factor 1.0, set dial to 0.9 of motor FLC setting
  - Ambient compensated
  - Phase failure sensitive

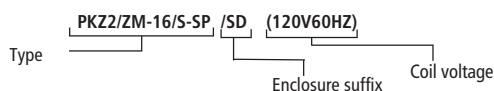
**To order specify:**

Type number

Enclosure suffix

Coil voltage

## Accessories



### Available Coil Voltages

| Standard voltages |          |                         |                         |              | Special voltages<br>(other than the<br>standard coils listed) <sup>1)</sup>                                                           |
|-------------------|----------|-------------------------|-------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 24V 50Hz          | 24V 60Hz | 110V 50Hz,<br>120V 60Hz | 380V 50Hz,<br>440V 60Hz | 24V 50/60Hz  | ...V 50Hz (24 - 600V)                                                                                                                 |
| 48V 50Hz          |          | 190V 50Hz,<br>220V 60Hz | 400V 50Hz,<br>440V 60Hz | 110V 50/60Hz | ...V 60Hz (24 - 600V)                                                                                                                 |
| 240V 50Hz         |          | 220V 50Hz,<br>240V 60Hz | 415V 50Hz,<br>480V 60Hz | 230V 50/60Hz | <sup>1)</sup> when ordering special<br>coils, please state the re-<br>quired actuating voltage<br>from the given range<br>(...-...V). |
|                   |          | 230V 50Hz,<br>240V 60Hz |                         |              |                                                                                                                                       |

## System PKZ2-SP

### Combination Starters - Self-protected FVNR

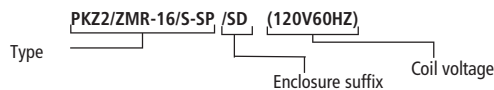
| with ZMR trip module                             |                                                 |                                                                                                                               |                                                           |                                         |
|--------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------|
| Type                                             | Price<br>see price list                         |                                                                                                                               |                                                           |                                         |
| Specify coil voltage and frequency, → see below  | Enclosed                                        |                                                                                                                               | Open                                                      |                                         |
|                                                  | General purpose Type 1                          | Industrial use Type 12 dusttight                                                                                              | Insulating material Type 12 corrosion-resistant dusttight | without enclosure                       |
|                                                  | Replace <input type="checkbox"/> with suffix /S | Replace <input type="checkbox"/> with suffix /SD<br>Type 3R weather-proof<br>Replace <input type="checkbox"/> with suffix /DW | Replace <input type="checkbox"/> with suffix /I           | Delete <input type="checkbox"/> in type |
| PKZ2/ZMR-0.6/S-SP <input type="checkbox"/> (...) |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-1/S-SP <input type="checkbox"/> (...)   |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-1.6/S-SP <input type="checkbox"/> (...) |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-2.4/S-SP <input type="checkbox"/> (...) |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-4/S-SP <input type="checkbox"/> (...)   |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-6/S-SP <input type="checkbox"/> (...)   |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-10/S-SP <input type="checkbox"/> (...)  |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-16/S-SP <input type="checkbox"/> (...)  |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-25/S-SP <input type="checkbox"/> (...)  |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-32/S-SP <input type="checkbox"/> (...)  |                                                 |                                                                                                                               |                                                           |                                         |
| PKZ2/ZMR-40/S-SP <input type="checkbox"/> (...)  |                                                 |                                                                                                                               |                                                           |                                         |

#### Notes:

##### Standard features:

- UL listed, CSA certified, self-protected combination motor controller. UL 508 / CSA 22.2, No. 14 Type E.
- Factory mounted and labeled contactor and disconnect portion rated max. 42A, 30 HP at 460V; max. 27A, 25 Hp at 575V.
- No backup overcurrent protection required up to its full interrupting rating.
- Continuity of service (protects itself against damage under fault conditions).
- Plug-in trip module, which creates an open circuit path to the motor when removed. For additional safety!
- Adjustable thermal and magnetic trips; built-in phase loss differential trip.
- Built-in 1N.O. and 1 N.C. auxiliary contacts in the contactor portion. 2 N.O. are also available.
- Electrical life: 1 million operations, AC-3 (30 HP at 460 V)
- Adapter plate for rail or panel mounting.
- Control circuit transformer tap-off terminals on load side of disconnect.
- Allows mounting of accessories such as voltage trips, standard and trip indicating auxiliary contacts.
- Enclosed starters provided with door interlocking handle.
- In the event of an overload condition, the N.C. contact in the ZMR ...-PKZ2 trip module opens the contactor coil circuit and the N.O. contact may be used to remotely signal an overload condition. On a short circuit, the main disconnect switch opens.

| Additional information   | Page   |
|--------------------------|--------|
| Accessories              | 08/041 |
| Factory modifications    | 03/046 |
| Other operating voltages | 03/038 |
| Technical data           | 08/060 |
| Dimensions               | 08/070 |
| Weights                  | 14/020 |



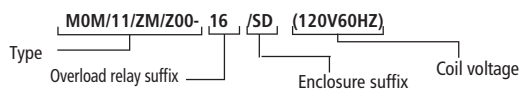
## Combination Starters

### Breaker Type - FVNR

| Rating data<br>UL/CSA maximum Horsepower rating (HP)<br>50/60Hz<br>3 phase |             |             |             | Standard auxiliary contacts |      | Non reversing<br>Type                                                                                            | Price includes 3-phase bimetal overload relay<br>Price<br>see price list                                                                                                                                                                                                                                                                                                                                                     |  |  |
|----------------------------------------------------------------------------|-------------|-------------|-------------|-----------------------------|------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 200 V<br>HP                                                                | 230 V<br>HP | 460 V<br>HP | 575 V<br>HP | N.O.                        | N.C. | Specify coil voltage and frequency,<br>→ page 03/065, 066<br><br>Specify overload relay suffix,<br>→ page 03/023 | Enclosed<br>General purpose<br>Type 1<br>Replace <input type="checkbox"/><br>with suffix /S<br><br>Industrial use<br>Type 12<br>dusttight<br>Replace <input type="checkbox"/><br>with suffix /SD<br>Type 3R<br>weatherproof<br>Replace <input type="checkbox"/><br>with suffix /<br>DW<br><br>Insulating material<br>Type 12<br>corrosion-resis-<br>tant, dusttight<br>Replace <input type="checkbox"/><br>with<br>suffix /I |  |  |
| 3                                                                          | 3           | 5           | -           | 1                           | 0    |                                                                                                                  | M00M-10/ZM/Z00-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                            |  |  |
| -                                                                          | -           | 7 ½         | -           | 1                           | 0    |                                                                                                                  | M00AM-10/ZM/Z00-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                           |  |  |
| 5                                                                          | 7 ½         | 10          | 15          | 1                           | 1    |                                                                                                                  | M0M/11/ZM/Z00-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                             |  |  |
| 7 ½                                                                        | 10          | 15          | 20          | 1                           | 1    |                                                                                                                  | M0AM/11/ZM6/Z1-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                            |  |  |
| 10                                                                         | -           | 20          | 25          | 1                           | 1    |                                                                                                                  | M1M/11/ZM6/Z1-40 <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                              |  |  |
| -                                                                          | 15          | 25          | 30          | 1                           | 1    |                                                                                                                  | M1AM/11/ZM6/Z1-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                            |  |  |
| 15                                                                         | 20          | 40          | 40          | 1                           | 1    |                                                                                                                  | M2M/11/ZM6/Z1-57 <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                              |  |  |
| 20                                                                         | 25          | 50          | 50          | 1                           | 1    |                                                                                                                  | M2AM/11/ZM6/Z1-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                            |  |  |
| 25                                                                         | 30          | 60          | 75          | 1                           | 1    |                                                                                                                  | M3M80/11/ZM6/Z5-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                           |  |  |
| 30                                                                         | -           | 75          | 100         | 1                           | 1    |                                                                                                                  | M4M115/11/ZM6/Z5-100 <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                          |  |  |
| -                                                                          | 40          | -           | -           | 1                           | 1    |                                                                                                                  | M4M115/11/ZM6/Z5-125 <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                          |  |  |
| 40                                                                         | 50          | 100         | 125         | 1                           | 1    |                                                                                                                  | M4M115/11/ZM9/Z5-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                          |  |  |
| 50                                                                         | 60          | 125         | 150         | 2                           | 2    |                                                                                                                  | MM185/22/ZM9/Z5-160 <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                           |  |  |
| 60                                                                         | 75          | 150         | 200         | 2                           | 2    |                                                                                                                  | MM225/22/ZM9/Z5-220 <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                           |  |  |
| 75                                                                         | 100         | 200         | 250         | 2                           | 2    |                                                                                                                  | MM250/22/ZM10/Z5-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                          |  |  |
| 100                                                                        | 125         | 250         | 300         | 2                           | 2    |                                                                                                                  | MM300/22/ZM10/ZW7-... <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                         |  |  |
| 125                                                                        | 150         | 300         | 400         | 2                           | 2    |                                                                                                                  | MM400/22/ZM10/ZW7-400 <input type="checkbox"/> (...)                                                                                                                                                                                                                                                                                                                                                                         |  |  |

#### To order specify:

Type number  
Overload relay suffix  
Enclosure suffix  
Coil voltage  
Accessories





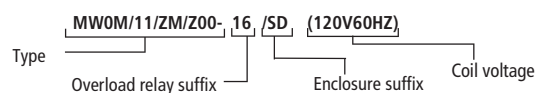
## Combination Reversing Starters

### Breaker Type - FVR

| Rating data<br>UL/CSA maximum Horsepower rating (HP)<br>50/60Hz<br>3 phase |             |             |             | Standard auxiliary contacts |      | Reversing<br>Type                                                                                                   | Price includes 3-phase bimetal overload relay<br>Price<br>see price list | Enclosed | General purpose<br>Type 1<br>Replace <input type="checkbox"/> with<br>suffix /S | Industrial use<br>Type 12<br>dusttight<br>Replace <input type="checkbox"/> with<br>suffix /SD<br>Type 3R<br>weatherproof<br>Replace <input type="checkbox"/> with<br>suffix /DW | Insulating material<br>Type 12<br>corrosion-resis-<br>tant, dusttight<br>Replace <input type="checkbox"/> with<br>suffix /I |
|----------------------------------------------------------------------------|-------------|-------------|-------------|-----------------------------|------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 200 V<br>HP                                                                | 230 V<br>HP | 460 V<br>HP | 575 V<br>HP | N.O.                        | N.C. | Specify coil voltage and frequency,<br>→ page 03/065, 066<br><br>Specify overload<br>relay suffix,<br>→ page 03/023 |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 3                                                                          | 3           | 5           | -           | 0                           | 1    | MW00M-01/ZM/Z00-... <input type="checkbox"/> (...)                                                                  |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| -                                                                          | -           | 7 ½         | -           | 0                           | 1    | MW00AM-01/ZM/Z00-... <input type="checkbox"/> (...)                                                                 |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 5                                                                          | 7 ½         | 10          | 15          | 1                           | 1    | MW0M/11/ZM/Z00-... <input type="checkbox"/> (...)                                                                   |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 7 ½                                                                        | 10          | 15          | 20          | 1                           | 1    | MW0AM/11/ZM6/Z1-... <input type="checkbox"/> (...)                                                                  |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 10                                                                         | -           | 20          | 25          | 1                           | 1    | MW1M/11/ZM6/Z1-40 <input type="checkbox"/> (...)                                                                    |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| -                                                                          | 15          | 25          | 30          | 1                           | 1    | MW1AM/11/ZM6/Z1-... <input type="checkbox"/> (...)                                                                  |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 15                                                                         | 20          | 40          | 40          | 1                           | 1    | MW2M/11/ZM6/Z1-57 <input type="checkbox"/> (...)                                                                    |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 20                                                                         | 25          | 50          | 50          | 1                           | 1    | MW2AM/11/ZM6/Z1-... <input type="checkbox"/> (...)                                                                  |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 25                                                                         | 30          | 60          | 75          | 1                           | 1    | MW3M80/11/ZM6/Z5-... <input type="checkbox"/> (...)                                                                 |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 30                                                                         | -           | 75          | 100         | 1                           | 1    | MW4M115/11/ZM6/Z5-100 <input type="checkbox"/> (...)                                                                |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| -                                                                          | 40          | -           | -           | 1                           | 1    | MW4M115/11/ZM6/Z5-125 <input type="checkbox"/> (...)                                                                |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 40                                                                         | 50          | 100         | 125         | 1                           | 1    | MW4M115/11/ZM9/Z5-... <input type="checkbox"/> (...)                                                                |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 50                                                                         | 60          | 125         | 150         | 2                           | 2    | MWM185/22/ZM9/Z5-160 <input type="checkbox"/> (...)                                                                 |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 60                                                                         | 75          | 150         | 200         | 2                           | 2    | MWM225/22/ZM9/Z5-220 <input type="checkbox"/> (...)                                                                 |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 75                                                                         | 100         | 200         | 250         | 2                           | 2    | MWM250/22/ZM10/Z5-... <input type="checkbox"/> (...)                                                                |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 100                                                                        | 125         | 250         | 300         | 2                           | 2    | MWM300/22/ZM10/ZW7-... <input type="checkbox"/> (...)                                                               |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |
| 125                                                                        | 150         | 300         | 400         | 2                           | 2    | MWM400/22/ZM10/ZW7-400 <input type="checkbox"/> (...)                                                               |                                                                          |          |                                                                                 |                                                                                                                                                                                 |                                                                                                                             |

#### To order specify:

Type number  
Overload relay suffix  
Enclosure suffix  
Coil voltage  
Accessories





## Combination Starters - Fusible Disconnect Switch Type

### with fuse holders for Class J fuses - FVNR

| UL/CSA max. Hp rating<br>50/60Hz<br>3 phase |             |             |             | Discon-<br>nect<br>Switch<br>Size | Fuse<br>Clip<br>Size <sup>1)</sup> | Standard<br>auxiliary<br>contacts |      | Type<br>Specify coil voltage and frequency<br>→ pages 03/065, 066<br><br>Specify overload<br>relay suffix code<br>→ page 03/023 | Price includes 3 phase, bimetallic overload relay<br><b>Enclosed</b><br><br>General purpose<br>Type 1<br>Replace <input type="checkbox"/> with suffix<br>/S<br><br>Industrial use<br>Type 12<br>dusttight<br>Replace <input type="checkbox"/> with suffix /SD<br>Type 3R<br>weatherproof<br>Replace <input type="checkbox"/> with suffix /<br>DW |                |
|---------------------------------------------|-------------|-------------|-------------|-----------------------------------|------------------------------------|-----------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 200 V<br>HP                                 | 230 V<br>HP | 460 V<br>HP | 575 V<br>HP | A                                 | A                                  | N.O.                              | N.C. | ... (...)                                                                                                                       | see price list                                                                                                                                                                                                                                                                                                                                   | see price list |
| 3                                           | 3           | 5           | 7 ½         | 30                                | 30                                 | 1                                 | 0    | M00M/10/P2-30FC23/Z00-... <input type="checkbox"/> (...)                                                                        |                                                                                                                                                                                                                                                                                                                                                  |                |
| -                                           | -           | 7 ½         | 10          | 30                                | 30                                 | 1                                 | 0    | M00AM/10/P2-30FC23/Z00-... <input type="checkbox"/> (...)                                                                       |                                                                                                                                                                                                                                                                                                                                                  |                |
| 5                                           | 5           | 10          | 15          | 30                                | 30                                 | 1                                 | 1    | M0M/11/P2-30FC23/Z00-... <input type="checkbox"/> (...)                                                                         |                                                                                                                                                                                                                                                                                                                                                  |                |
| 7 ½                                         | 7 ½         | -           | -           | 30                                | 60                                 | 1                                 | 1    | M0M/11/P2-30FC26/Z00-... <input type="checkbox"/> (...)                                                                         |                                                                                                                                                                                                                                                                                                                                                  |                |
| -                                           | -           | 15          | 20          | 30                                | 30                                 | 1                                 | 1    | M0AM/11/P2-30FC26/Z00-... <input type="checkbox"/> (...)                                                                        |                                                                                                                                                                                                                                                                                                                                                  |                |
| -                                           | 10          | -           | -           | 30                                | 60                                 | 1                                 | 1    | M0AM/11/P2-30FC26/Z1-... <input type="checkbox"/> (...)                                                                         |                                                                                                                                                                                                                                                                                                                                                  |                |
| -                                           | -           | 20          | 25          | 30                                | 60                                 | 1                                 | 1    | M1M/11/P2-30FC26/Z1-... <input type="checkbox"/> (...)                                                                          |                                                                                                                                                                                                                                                                                                                                                  |                |
| 10                                          | -           | -           | -           | 60                                | 60                                 | 1                                 | 1    | M1M/11/P2-60FC26/Z1-... <input type="checkbox"/> (...)                                                                          |                                                                                                                                                                                                                                                                                                                                                  |                |
| -                                           | -           | 25          | 30          | 60                                | 60                                 | 1                                 | 1    | M1AM/11/P2-60FC26/Z1-... <input type="checkbox"/> (...)                                                                         |                                                                                                                                                                                                                                                                                                                                                  |                |
| -                                           | 15          | -           | -           | 60                                | 100                                | 1                                 | 1    | M1AM/11/P2-60FC110/Z1-... <input type="checkbox"/> (...)                                                                        |                                                                                                                                                                                                                                                                                                                                                  |                |
| -                                           | -           | 30          | -           | 60                                | 60                                 | 1                                 | 1    | M2M/11/P2-60FC26/Z1-... <input type="checkbox"/> (...)                                                                          |                                                                                                                                                                                                                                                                                                                                                  |                |
| 15                                          | 20          | 40          | 40          | 60                                | 100                                | 1                                 | 1    | M2M/11/P2-60FC110/Z1-... <input type="checkbox"/> (...)                                                                         |                                                                                                                                                                                                                                                                                                                                                  |                |
| -                                           | -           | -           | 50          | 60                                | 100                                | 1                                 | 1    | M2AM/11/P2-60FC110/Z1-... <input type="checkbox"/> (...)                                                                        |                                                                                                                                                                                                                                                                                                                                                  |                |
| 20                                          | 25          | 50          | -           | 100                               | 100                                | 1                                 | 1    | M2AM/11/P2-100FC110/Z1-... <input type="checkbox"/> (...)                                                                       |                                                                                                                                                                                                                                                                                                                                                  |                |
| -                                           | -           | -           | 60          | 100                               | 100                                | 1                                 | 1    | M3M80/11/P2-100FC110/Z1-100 <input type="checkbox"/> (...)                                                                      |                                                                                                                                                                                                                                                                                                                                                  |                |
| 25                                          | 30          | 60          | 75          | 100                               | 200                                | 1                                 | 1    | M3M80/11/P2-100+62003J/Z5-100 <input type="checkbox"/> (...)                                                                    |                                                                                                                                                                                                                                                                                                                                                  |                |
| 30                                          | -           | 75          | 100         | 100                               | 200                                | 1                                 | 1    | M4M115/11/P2-100+62003J/Z5-100 <input type="checkbox"/> (...)                                                                   |                                                                                                                                                                                                                                                                                                                                                  |                |

Notes:

- <sup>1)</sup> Recommended Class J time-delay fuse ampacity.  
Range: 1.25 - 1.5 x motor full load current  
<sup>2)</sup> Contact Moeller Electric for larger sizes

#### To order specify:

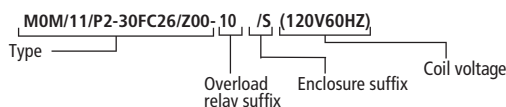
Type number

Overload relay suffix

Enclosure suffix

Coil voltage

Accessories



#### Additional information

Technical data

Dimensions

Overload relays

Accessories

Factory modifications

Weights

#### Page

03/080

03/092

04/004

03/053

03/046

14/020

## Combination Starters - Fusible Disconnect Switch Type

### with fuse holders for Class R fuses - FVNR

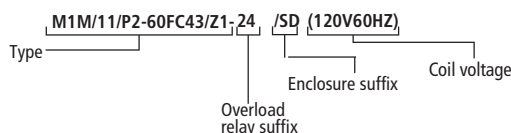
| UL/CSA max. Hp rating<br>50/60Hz<br>3 phase |       |       |       | Discon-<br>nect<br>Switch<br>Size | Fuse<br>Clip<br>Size <sup>1)</sup> | Standard<br>auxiliary<br>contacts |      | Type                                                          | Price includes 3 phase, bimetallic overload relay                                                                                                                                |                |
|---------------------------------------------|-------|-------|-------|-----------------------------------|------------------------------------|-----------------------------------|------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                                             |       |       |       |                                   |                                    |                                   |      | Specify coil voltage and frequency<br>→ pages 03/065, 066     | <b>Enclosed</b>                                                                                                                                                                  |                |
|                                             |       |       |       |                                   |                                    |                                   |      | Specify overload<br>relay suffix code<br>→ page 03/023        | General<br>purpose<br>Type 1<br>Replace <input type="checkbox"/> with suffix /<br>S                                                                                              |                |
|                                             |       |       |       |                                   |                                    |                                   |      |                                                               | Industrial use<br>Type 12<br>dusttight<br>Replace <input type="checkbox"/> with suffix /<br>SD<br>Type 3R<br>weatherproof<br>Replace <input type="checkbox"/> with suffix<br>/DW |                |
| 200 V                                       | 230 V | 460 V | 575 V | A                                 | A                                  | N.O.                              | N.C. | ... (..)                                                      | see price list                                                                                                                                                                   | see price list |
| 3                                           | 3     | -     | -     | 30                                | 30                                 | 1                                 | 0    | M00M-10/P2-30FC33/Z00-... <input type="checkbox"/> (...)      |                                                                                                                                                                                  |                |
| -                                           | -     | 5     | 7 ½   | 30                                | 30                                 | 1                                 | 0    | M00M-10/P2-30FC43/Z00-... <input type="checkbox"/> (...)      |                                                                                                                                                                                  |                |
| -                                           | -     | 7 ½   | 10    | 30                                | 30                                 | 1                                 | 0    | M00AM-10/P2-30FC43/Z00-... <input type="checkbox"/> (...)     |                                                                                                                                                                                  |                |
| 5                                           | 5     | -     | -     | 30                                | 30                                 | 1                                 | 1    | M0M/11/P2-30FC33/Z00-... <input type="checkbox"/> (...)       |                                                                                                                                                                                  |                |
| 7 ½                                         | 7 ½   | 10    | 15    | 30                                | 60                                 | 1                                 | 1    | M0M/11/P2-30FC43/Z00-... <input type="checkbox"/> (...)       |                                                                                                                                                                                  |                |
| -                                           | 10    | -     | -     | 30                                | 60                                 | 1                                 | 1    | M0AM/11/P2-30FC43/Z1-... <input type="checkbox"/> (...)       |                                                                                                                                                                                  |                |
| -                                           | -     | 15    | 20    | 30                                | 60                                 | 1                                 | 1    | M0AM/11/P2-30FC46/Z00-... <input type="checkbox"/> (...)      |                                                                                                                                                                                  |                |
| 10                                          | -     | -     | -     | 60                                | 60                                 | 1                                 | 1    | M1M/11/P2-60FC43/Z1-... <input type="checkbox"/> (...)        |                                                                                                                                                                                  |                |
| -                                           | -     | 20    | 25    | 30                                | 60                                 | 1                                 | 1    | M1M/11/P2-30FC46/Z1-... <input type="checkbox"/> (...)        |                                                                                                                                                                                  |                |
| -                                           | 15    | -     | -     | 60                                | 100                                | 1                                 | 1    | M1AM/11/P2-60FC310/Z1-... <input type="checkbox"/> (...)      |                                                                                                                                                                                  |                |
| -                                           | -     | 25    | 30    | 60                                | 60                                 | 1                                 | 1    | M1AM/11/P2-60FC46/Z1-... <input type="checkbox"/> (...)       |                                                                                                                                                                                  |                |
| -                                           | -     | 30    | -     | 60                                | 60                                 | 1                                 | 1    | M2M/11/P2-60FC46/Z1-... <input type="checkbox"/> (...)        |                                                                                                                                                                                  |                |
| 15                                          | 20    | 40    | 40    | 60                                | 100                                | 1                                 | 1    | M2M/11/P2-60FC310/Z1-... <input type="checkbox"/> (...)       |                                                                                                                                                                                  |                |
| 20                                          | -     | 50    | -     | 100                               | 100                                | 1                                 | 1    | M2AM/11/P2-100FC310/Z1-... <input type="checkbox"/> (...)     |                                                                                                                                                                                  |                |
| -                                           | 25    | -     | -     | 100                               | 200                                | 1                                 | 1    | M2AM/11/P2-100+22003R/Z1-... <input type="checkbox"/> (...)   |                                                                                                                                                                                  |                |
| -                                           | -     | -     | 50    | 60                                | 100                                | 1                                 | 1    | M2AM/11/P2-60FC310/Z1-... <input type="checkbox"/> (...)      |                                                                                                                                                                                  |                |
| 25                                          | 30    | -     | -     | 100                               | 200                                | 1                                 | 1    | M3M80/11/P2-100+22003R/Z5-100 <input type="checkbox"/> (...)  |                                                                                                                                                                                  |                |
| -                                           | -     | 60    | 75    | 100                               | 200                                | 1                                 | 1    | M3M80/11/P2-100-62003R/Z5-100 <input type="checkbox"/> (...)  |                                                                                                                                                                                  |                |
| 30                                          | -     | -     | -     | 100                               | 200                                | 1                                 | 1    | M4M115/11/P2-100+22003R/Z5-100 <input type="checkbox"/> (...) |                                                                                                                                                                                  |                |
| -                                           | -     | 75    | 100   | 100                               | 200                                | 1                                 | 1    | M4M115/11/P2-100+62003R/Z5-100 <input type="checkbox"/> (...) |                                                                                                                                                                                  |                |

Notes:

- <sup>1)</sup> Recommended Class R rejection-time-delay fuse ampacity  
Range: 1.25 - 1.5 x motor full load current
- <sup>2)</sup> Contact Moeller Electric for larger sizes

#### To order specify:

Type number  
Overload relay suffix  
Enclosure suffix  
Coil voltage  
Accessories



| Additional information | Page   |
|------------------------|--------|
| Technical data         | 03/080 |
| Dimensions             | 03/092 |
| Overload relays        | 04/004 |
| Accessories            | 03/053 |
| Factory modifications  | 03/046 |
| Weights                | 14/020 |

**EN** - For pricing and availability in your local country please visit one of the below links:

**DE** - Informationen zu Preisen und Verfügbarkeit in Ihrem Land erhalten Sie über die unten aufgeführten Links:

**FR** - Pour connaître les tarifs et la disponibilité dans votre pays, cliquez sur l'un des liens suivants:

[PKZ2/S-SP,24V 60HZ](#)

[PKZ2/S-SP,120V 60HZ](#)

**EN**

This Datasheet is presented by  
the manufacturer

**DE**

Dieses Datenblatt wird vom  
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