

# MS Series Motor Starter/Protector Specifications



## Shunt release

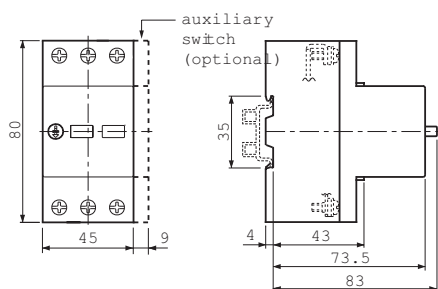
Shunt releases are used for electrically tripping the MSP. These units are easily installed inside the MSP and are offered in 120 and 220/240 volt AC versions.

## Undervoltage release

Undervoltage releases are also installed inside the MSP and trip the device when the monitored voltage drops below a specified level. This is to protect the motor from damage when a low voltage situation occurs. Undervoltage releases may be wired to monitor voltage at point, but are typically wired to two of the incoming lines to the motor circuit. Undervoltage releases are not to be confused with the MSP's internal phase loss protection.

Note: A shunt release and undervoltage release cannot be installed in the same MSP.

## Dimensions (mm)



## Specifications

| General                                   |                                                 |
|-------------------------------------------|-------------------------------------------------|
| <b>Standards</b>                          | IEC 947, EN 60947, VDE 0660, EN 60204, VDE 0113 |
| <b>Approvals</b>                          | UL                                              |
| <b>Impact Resistance at 20ms Duration</b> | 20g                                             |
| <b>Ambient Temperature</b>                | -25 to 50 °C (open) -25 to 40 °C (enclosed)     |
| <b>Climactic Class</b>                    | IEC 68-2-3, IEC 68-2-30                         |
| <b>Weight</b>                             | 0.55 lb (250g)                                  |
| <b>Protection Degree</b>                  | IP 20                                           |
| <b>Mounting</b>                           | Vertical or horizontal                          |
| Main Circuits                             |                                                 |
| <b>Insulation Voltage</b>                 | 690V                                            |
| <b>Insulation Impulse Voltage</b>         | 6kV                                             |
| <b>Thermal Current</b>                    | 25A                                             |
| <b>Utilization Category</b>               | AC3                                             |
| <b>Wire Size Maximum</b>                  | 14-10 AWG                                       |
| <b>Terminal Torque Specification</b>      | 2 N·m                                           |
| Auxiliary Contact                         |                                                 |
| <b>Insulation Voltage</b>                 | 500V                                            |
| <b>Thermal Current</b>                    | 6A                                              |
| <b>Operational Current:</b>               |                                                 |
| 230V                                      | 3.5A                                            |
| 400V                                      | 2A                                              |
| 500V                                      | 1.5A                                            |
| <b>Maximum Fuse Size</b>                  | 6A                                              |
| <b>Wire Size Maximum</b>                  | 18-14 AWG                                       |

Notes: Phase loss protection only works under load.

The phase loss protection is a product of the thermal overload protection circuitry.

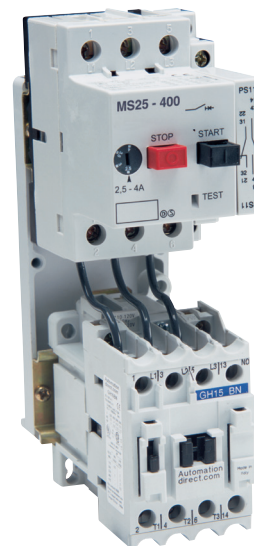
Maximum number of MSP units which can be mounted close together (side by side) is three.

Dimensions and installation data for these products are available on our website, listed under Tech Support/technical and application notes/motor controls/contactors and starters/ Application Data for MS25 manual starter.

## Phase loss protection

Phase loss protection is integral to the MSP overload protection system. Phase loss protection works by detecting unequal current in each of the phases. A mechanical device senses the difference in the position of the bi-metallic overload strips and trips the MSP when this occurs. For proper phase loss detection, the MSP must be sized and adjusted to the motor it is protecting. The phase loss protection works only when the motor is running, and is a product of the thermal overload protection circuitry.

Note: The MSP provides magnetic short circuit protection as well as thermal overload protection under IEC 60947 requirements. NEC 430 may require a short circuit protection device upstream from the MSP. It is the responsibility of the user to comply with applicable codes and requirements.



**Motor starter/protector combination consisting of a contactor, MSP with optional MS25-PS11 auxiliary contact and a UMP45 adapter plate. Components are sold separately.**

# MS Series MSP Selection Guide

Choose your motor starter/protector according to the FLA rating on your motor data plate. Refer to the charts on the following page.

## Accessories

To complete your motor starter/ protector, there are several accessories that may be used. The Auxiliary Switch (contact) has one normally open contact and one normally closed contact. The Shunt Release trips when voltage is applied (120V or 220V). With the Undervoltage Release, your motor is protected from a low voltage situation.

| Motor Starter/Protector and Accessories |         |                                                                                         |
|-----------------------------------------|---------|-----------------------------------------------------------------------------------------|
| Part Number                             | Price   | Description                                                                             |
| <a href="#"><u>MS25-16</u></a>          | Retired | Motor starter protector with thermal overload release, setting range from 0.1 to 0.16A  |
| <a href="#"><u>MS25-25</u></a>          | Retired | Motor starter protector with thermal overload release, setting range from 0.16 to 0.25A |
| <a href="#"><u>MS25-40</u></a>          | Retired | Motor starter protector with thermal overload release, setting range from 0.25 to 0.4A  |
| <a href="#"><u>MS25-63</u></a>          | \$63.00 | Motor starter protector with thermal overload release, setting range from 0.4 to 0.63A  |
| <a href="#"><u>MS25-100</u></a>         | \$63.00 | Motor starter protector with thermal overload release, setting range from 0.63 to 1A    |
| <a href="#"><u>MS25-160</u></a>         | \$63.00 | Motor starter protector with thermal overload release, setting range from 1 to 1.6A     |
| <a href="#"><u>MS25-250</u></a>         | Retired | Motor starter protector with thermal overload release, setting range from 1.6 to 2.5A   |
| <a href="#"><u>MS25-400</u></a>         | \$63.00 | Motor starter protector with thermal overload release, setting range from 2.5 to 4A     |
| <a href="#"><u>MS25-630</u></a>         | Retired | Motor starter protector with thermal overload release, setting range from 4 to 6.3A     |
| <a href="#"><u>MS25-1000</u></a>        | Retired | Motor starter protector with thermal overload release, setting range from 6.3 to 10A    |
| <a href="#"><u>MS25-1600</u></a>        | \$73.00 | Motor starter protector with thermal overload release, setting range from 10 to 16A     |
| <a href="#"><u>MS25-2000</u></a>        | Retired | Motor starter protector with thermal overload release, setting range from 16 to 20A     |
| <a href="#"><u>MS25-2500</u></a>        | Retired | Motor starter protector with thermal overload release, setting range from 20 to 25A     |
| <a href="#"><u>MS25-PS11</u></a>        | Retired | Auxiliary switch, 1 N.O. contact, 1 N.C. contact                                        |
| <a href="#"><u>MS25-A120</u></a>        | \$31.50 | 120V/60Hz Shunt Release                                                                 |
| <a href="#"><u>MS25-U220</u></a>        | Retired | 220V/60Hz UnderVoltage Release                                                          |
| <a href="#"><u>MS25-U440</u></a>        | Retired | 440V/60Hz UnderVoltage Release                                                          |
| <a href="#"><u>UMP45</u></a>            | Retired | DIN Rail Adapter Plate                                                                  |

## MS25 Series Motor Starter/Protector Short Circuit Instantaneous Trip Current and Backup Fuse Recommendations

| Manual Starter/<br>Protector Part Number | Short Circuit<br>Trip Current 1 | Short Circuit Breaking Capacity (kA) |            |         |         | Max Back-Up Fuses Class CC or Class J 2 |         |         |         |
|------------------------------------------|---------------------------------|--------------------------------------|------------|---------|---------|-----------------------------------------|---------|---------|---------|
|                                          |                                 | 220/240VAC                           | 460/480VAC | 500 VAC | 690 VAC | 230 VAC                                 | 400 VAC | 500 VAC | 690 VAC |
| <a href="#"><u>MS25-16</u></a>           | 2                               | 50                                   | 50         | 50      | 50      | *                                       | *       | *       | *       |
| <a href="#"><u>MS25-25</u></a>           | 3                               | 50                                   | 50         | 50      | 50      | *                                       | *       | *       | *       |
| <a href="#"><u>MS25-40</u></a>           | 5                               | 50                                   | 50         | 50      | 50      | *                                       | *       | *       | *       |
| <a href="#"><u>MS25-63</u></a>           | 8                               | 50                                   | 50         | 50      | 50      | *                                       | *       | *       | *       |
| <a href="#"><u>MS25-100</u></a>          | 12                              | 50                                   | 50         | 50      | 50      | *                                       | *       | *       | *       |
| <a href="#"><u>MS25-160</u></a>          | 20                              | 50                                   | 50         | 50      | 50      | *                                       | *       | *       | *       |
| <a href="#"><u>MS25-250</u></a>          | 33                              | 50                                   | 50         | 3       | 2.5     | *                                       | *       | 25      | 20      |
| <a href="#"><u>MS25-400</u></a>          | 44                              | 50                                   | 50         | 3       | 2.5     | *                                       | *       | 35      | 25      |
| <a href="#"><u>MS25-630</u></a>          | 75                              | 50                                   | 50         | 3       | 2.5     | *                                       | *       | 50      | 35      |
| <a href="#"><u>MS25-1000</u></a>         | 120                             | 50                                   | 6          | 3       | 2.5     | *                                       | 80      | 50      | 35      |
| <a href="#"><u>MS25-1600</u></a>         | 160                             | 6                                    | 4          | 2.5     | 2       | 63                                      | 80      | 63      | 35      |
| <a href="#"><u>MS25-2000</u></a>         | 230                             | 6                                    | 4          | 2.5     | 2       | 63                                      | 80      | 63      | 50      |
| <a href="#"><u>MS25-2500</u></a>         | 270                             | 6                                    | 4          | 2.5     | 2       | 63                                      | 80      | 63      | 50      |

Note 1: The short-circuit trip is the current at which the device will instantly trip via the electromagnetic trip circuitry within the MSP. The short circuit breaking capacity is the total branch circuit supply current that the device can safely protect. Fields marked with an asterisk indicate that the device can safely handle any supply current with output fusing.

Note 2: The trip currents and back-up fuses are per IEC 60947. Local codes and regulations may require additional short circuit protection. Consult codes applicable to your application.

# GH Series Contactor/MSP Selection Guide

**Step 1:** Select your motor FLA (full load amperage) from column A.

**Step 3:** After selecting your contactor, go to column C to find your motor starter/protector.

**Step 2:** Go to column B to find your contactor model. Check the maximum amperage rating for that contactor. Ranges overlap and you may have to go to the next larger size.

**Step 4:** Order the motor starter/protector, contactor or any other accessories.

| Motor Contactor and Motor Starter/Protector (MSP) Selection Guide (when motor FLA is known) |                       |                                        |                  |                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------|-----------------------|----------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A                                                                                           | B                     | C                                      | IEC Frame Size   | Special Assembly Note                                                                                                                                                                                                                |
| Current Range<br>Motor FLA                                                                  | Contactor Model       | Motor Starter/Protector<br>Part Number |                  |                                                                                                                                                                                                                                      |
| 0.1 to 0.16 A                                                                               | GH15BN Up to 9A FLA   | <a href="#">MS25-16</a>                | 45 mm frame size | Note: A DIN rail adapter plate is needed for assembly of the contactor and motor starter/protector. This plate allows two DIN rail devices to be mounted together as an assembly to one piece of DIN rail. The part number is UMP45. |
| 0.16 to 0.25 A                                                                              |                       | <a href="#">MS25-25</a>                |                  |                                                                                                                                                                                                                                      |
| 0.25 to 0.4 A                                                                               |                       | <a href="#">MS25-40</a>                |                  |                                                                                                                                                                                                                                      |
| 0.4 to 0.63 A                                                                               |                       | <a href="#">MS25-63</a>                |                  |                                                                                                                                                                                                                                      |
| 0.63 to 1 A                                                                                 |                       | <a href="#">MS25-100</a>               |                  |                                                                                                                                                                                                                                      |
| 0.1 to 1.6 A                                                                                |                       | <a href="#">MS25-160</a>               |                  |                                                                                                                                                                                                                                      |
| 1.6 to 2.5 A                                                                                |                       | <a href="#">MS25-250</a>               |                  |                                                                                                                                                                                                                                      |
| 2.5 to 4 A                                                                                  |                       | <a href="#">MS25-400</a>               |                  |                                                                                                                                                                                                                                      |
| 4 to 6.3 A                                                                                  |                       | <a href="#">MS25-630</a>               |                  |                                                                                                                                                                                                                                      |
| 6.3 to 10 A                                                                                 |                       | <a href="#">MS25-1000</a>              |                  |                                                                                                                                                                                                                                      |
| 10.0 to 16 A                                                                                | GH15CN Up to 12 A FLA | <a href="#">MS25-1600</a>              |                  |                                                                                                                                                                                                                                      |
| 10.0 to 16.0 A                                                                              | GH15DN Up to 16A FLA  | <a href="#">MS25-1600</a>              |                  |                                                                                                                                                                                                                                      |
| 16.0 to 20.0 A                                                                              | GH15ET Up to 25A FLA  | <a href="#">MS25-2000</a>              |                  |                                                                                                                                                                                                                                      |
| 20.0 to 25.0 A                                                                              |                       | <a href="#">MS25-2500</a>              |                  |                                                                                                                                                                                                                                      |

The following charts are to be used as a guideline only. Motor control devices should be sized using the motor FLA (full load amperage) rating. It is the user's responsibility to size the motor starter/protector properly.

- **Step 1:** Select your motor horsepower rating in column A based on the rating from the motor data plate or spec. sheet.
- **Step 2:** Go to column B to find your contactor model. Check the maximum amperage rating for that contactor. Ranges overlap and you may need to go to the next larger size.
- **Step 3:** After selecting your contactor, go to column C to find your motor starter/protector.

| Motor Contactor and MSP Selection Guide for 440-480 Volt Three-Phase Motor Control |                      |                                        |                 |                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------|----------------------|----------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A                                                                                  | B                    | C                                      | IEC Frame Size  | Special Assembly Note                                                                                                                                                                                                                |
| Motor<br>Horsepower                                                                | Contactor Model      | Motor Starter/Protector<br>Part Number |                 |                                                                                                                                                                                                                                      |
| 1/2                                                                                | GH15BN Up to 9A FLA  | <a href="#">MS25-160</a>               | 45mm frame size | Note: A DIN rail adapter plate is needed for assembly of the contactor and motor starter/protector. This plate allows two DIN rail devices to be mounted together as an assembly to one piece of DIN rail. The part number is UMP45. |
| 3/4                                                                                |                      | <a href="#">MS25-160</a>               |                 |                                                                                                                                                                                                                                      |
| 1                                                                                  |                      | <a href="#">MS25-250</a>               |                 |                                                                                                                                                                                                                                      |
| 1 1/2                                                                              |                      | <a href="#">MS25-400</a>               |                 |                                                                                                                                                                                                                                      |
| 2                                                                                  |                      | <a href="#">MS25-400</a>               |                 |                                                                                                                                                                                                                                      |
| 3                                                                                  |                      | <a href="#">MS25-630</a>               |                 |                                                                                                                                                                                                                                      |
| 5                                                                                  |                      | <a href="#">MS25-1000</a>              |                 |                                                                                                                                                                                                                                      |
| 7 1/2                                                                              | GH15CN Up to 12A FLA | <a href="#">MS25-1600</a>              |                 |                                                                                                                                                                                                                                      |
| 10                                                                                 | GH15DN Up to 16A FLA | <a href="#">MS25-1600</a>              |                 |                                                                                                                                                                                                                                      |
| 15                                                                                 | GH15ET Up to 25A FLA | <a href="#">MS25-2500</a>              |                 |                                                                                                                                                                                                                                      |

| Motor Contactor and MSP Selection Guide for 230-240 Volt Three-Phase Motor Control |                      |                                        |                  |                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------|----------------------|----------------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A                                                                                  | B                    | C                                      | IEC Frame Size   | Special Assembly Note                                                                                                                                                                                                               |
| Motor<br>Horsepower                                                                | Contactor Model      | Motor Starter/Protector<br>Part Number |                  |                                                                                                                                                                                                                                     |
| 1/2                                                                                | GH15BN Up to 9A FLA  | <a href="#">MS25-250</a>               | 45 mm frame size | Note: A DIN rail adapter plate is needed for assembly of the contactor and motor starter/protector. This plate allows two DIN rail devices to be mounted together as an assembly to one piece of DIN rail. The part number is UMP45 |
| 3/4                                                                                |                      | <a href="#">MS25-400</a>               |                  |                                                                                                                                                                                                                                     |
| 1                                                                                  |                      | <a href="#">MS25-400</a>               |                  |                                                                                                                                                                                                                                     |
| 1 1/2                                                                              |                      | <a href="#">MS25-630</a>               |                  |                                                                                                                                                                                                                                     |
| 2                                                                                  |                      | <a href="#">MS25-1000</a>              |                  |                                                                                                                                                                                                                                     |
| 3                                                                                  | GH15CN Up to 12A FLA | <a href="#">MS25-1000</a>              |                  |                                                                                                                                                                                                                                     |
| 5                                                                                  | GH15DN Up to 16A FLA | <a href="#">MS25-1600</a>              |                  |                                                                                                                                                                                                                                     |
| 7 1/2                                                                              | GH15ET Up to 25A FLA | <a href="#">MS25-2500</a>              |                  |                                                                                                                                                                                                                                     |

# MS25 Series Tripping Characteristics

