Manual motor starters
Overview and benefits
ABB offers a complete standard motor-protection concept for the world market

Why manual motor starters?
Manual motor starters are protection devices for electrical installations and motor applications. They combine motor control and protection in a single device.

These devices are mainly used to switch motors manually on/off and protect them against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

Customer benefits
- Compact design / space saving
- Various functions in one device
- Quick reaction / fast current limitation
- Motor protection concept for the world market (IEC, UL)
- Safe and cost-saving solution

ABB offers a customer-orientated overall concept for the world market, which delivers experience and expertise in motor protection
- Efficient standard and high performance products
- Worldwide approvals and services
- Solutions for special technical applications

Protection functionalities
- Overload
- Short-circuit
- Phase loss sensitivity

Features
- Manual control
- Disconnect function
- Handle can be locked in the off position
- Remote control via undervoltage release or shunt trip
- Trip indication
- Temperature compensation
- Adjustable current setting

Products for a complete ABB offer
- Short-circuit breaking capacity up to 100 kA
- Magnetic-only devices (only short-circuit protection)
- Manual motor starters in modular DIN rail design
- Special version for transformer protection
- Full range of accessories
- System solutions

Further benefits
- Handle in the middle position after tripping (overload and short-circuit (MS132, MO132, MS4xx, MO4xx, MS132-T)
- Clear and reliable indication of fault in a separate window in the event of short-circuit tripping (MS132, MO132, MS132-T)
- Handle can be locked directly in the off position via standard lock (MS132, MO132, MS4xx, MO4xx, MS132-T) without accessories
- Optimized match to the ABB contactors

Benefits of type MS132

1. Clear trip indication
2. Handle in TRIP position
3. Optical indication for short-circuit
4. Easy locking
ABB manual motor starters can be equipped with many other components. Connection links ensure that the ABB manual motor starter can be connected to ABB contactors and overload relays easily and wiring-free.

**Segments**
- HVAC
- Water and waste water
- Wind power
- General machinery
- Critical power
- Building and infrastructure

**Applications**
- Small machine tools
- Compressors
- Pumps
- Saw mills
- Pitch control
- Conveyor systems
- Ventilation systems
- And many other motor applications

**Motor applications with fuseless protection**
1. Short-circuit protection
   + overload protection
   + switch
   + disconnect
2. Control
3. MO... short-circuit protection
   + switch
   + disconnect
4. Overload protection

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**IEC motor branch protection**

**UL combinations: Type E/F**
## Manual motor starters

### Table for short-circuit ratings for 400 V

<table>
<thead>
<tr>
<th>Type</th>
<th>MS116, MS450, MS495</th>
<th>High performance range MS132, MS497</th>
<th>Modular DIN rail design MS325</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated operational power</strong></td>
<td><strong>Setting range for thermal release</strong></td>
<td><strong>Type</strong></td>
<td><strong>Short-circuit breaking capacity</strong></td>
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<tr>
<td>0.03 kW</td>
<td>0.1 ... 0.16 A</td>
<td>MS116-0.16</td>
<td></td>
</tr>
<tr>
<td>0.06 kW</td>
<td>0.16 ... 0.25 A</td>
<td>MS116-0.25</td>
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<tr>
<td>0.09 kW</td>
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</tr>
<tr>
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<td>0.4 ... 0.63 A</td>
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</tr>
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<td>0.63 ... 1.0 A</td>
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<td>6.3 ... 10 A</td>
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<td>55 kW</td>
<td>80 ... 100 A</td>
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The currents given above concern standard three-phase four-pole cage motors (1500 r.p.m. at 50 Hz 1800 r.p.m. at 60 Hz).
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### Table for short-circuit ratings for 400 V

<table>
<thead>
<tr>
<th>Type</th>
<th>Short-circuit breaking capacity</th>
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<td>(I_{\text{cu}}) (I_{\text{cs}})</td>
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<td>(I_{\text{cu}} / I_{\text{cs}})</td>
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<td>100 kA 50 kA</td>
<td>MS132-T</td>
<td>100 kA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For motor protection, an appropriate thermal or electronic overload relay must be used.
Accessories

Manual motor starters can be equipped with different busbars, auxiliary contacts, signalling contacts, undervoltage releases and shunt trips. Moreover it is possible to order IP65 door mounting kits, IP65 enclosures and shafts for doors.

Description accessories
PS1.. Three-phase busbars
S1.. Three-phase feeder terminals
HKF1.. Auxiliary contacts (mountable on the front)
HK1.. Auxiliary contacts (mountable on the right)
SK1.. Signalling contacts (tripped alarm)
CK1.. Signalling contacts (short-circuit alarm)
AA1.. Shunt trip units
UA1.. Undervoltage releases
MSAH1 Shaft supporter
MSMN Driver
MSMNO Driver
OX6X Shafts
MSH-AR Shaft alignment ring
MSHD IP64 handles (UL: Type 1, 3R, 12)

Accessories for panel applications and enclosures for indoor/outdoor mounting

Rotary handle for MS116, MS/MO132, MS/MO325, MS/MO45x, MS/MO49x
Shalt holder for exact and easy mounting for MS116, MS/MO132
Door mounting kit IP65 (UL: Type 12) for MS116, MS/MO132, MS/MO325
Enclosures with water and dust protection IP65 (UL: Type 12) for MS116, MS/MO132, MS/MO325

For further accessories please check our ABB catalogue motor control and protection
Solutions

Motor starting solutions

ABB offers first-class specialized motor protection components: manual motor starters, contactors, overload relays and soft starters for motor starting solutions.

With the complete range of products and accessories it is possible to create various motor starter types like direct-on-line-, star-delta- and reversing starters.

Coordination tables
The selection of the right components is a real challenge: Because of this ABB provides coordination tables in accordance to IEC and UL standards for a fast and secure selection of the right protection devices. To find the coordination tables for motor protection, please see:

www.abb.com/lowvoltage then go to the right menu: “Support”, select: “Online Product Selection Tools” then select “Coordination Tables for motor protection”.

Recommended protection devices
- Manual motor starters (MMS)
- Overload relays (TOL and EOL)
- Universal motor controller (UMC)
- Moulded-case circuit breakers (MCCB)
- Air circuit breakers (ACB)
- Fuses

Additional planning and design tools
- DOC Win planning tool for electrical installation design
- Cadenas for downloading CAD files
- EPLAN Electric P8 data

System solutions

High short-circuit protection and full selectivity for motor groups with self-resetting S800-SCL-SR limiter.

In industries with high short-circuit ratings, it is necessary to use special backup fuses or limiters in addition to each motor branch. This requires more space and an upstream selective breaker.

ABB now offers a self-resetting limiter, S800-SCL-SR, which can protect the entire motor group with full selectivity for each branch.

Customer benefits
Maximum system availability, maintenance free
- Backup for high short-circuit levels, 100 kA at 440 V, 50 kA at 690 V, 65 kA at 480/600 V
- Full selectivity for any downstream motors, no discrimination tables needed

Cost saving
- Short-circuit calculation is easy, or even not required at all
- Space saving motor group protection. A single device can protect a large number of motor branches, in total up to 100 A.

High safety
- All the advantages of fuseless protection
- Low energy let through values
- Limited current peak
- High personal safety

Segments
- MCC installation
- Shipbuilding
- Mining
- Oil & gas
- Power generation
- Wind power

Motor starter group with S800-SCL-SR limiter

Examples of motor starting combinations
Contact us

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You can find the address of your local sales organization on the ABB home page
http://www.abb.com/contacts -> Low-voltage products

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