


Motor Protection – Selector Guide

| Features | Device | MM200 | MM300 | P253 | 339 | P24NM | P24DM | 369 |
|--|----------|-------|-------|------|-----|-------|-------|-----|
| APPLICATIONS & FUNCTIONALITY | | | | | | | | |
| LV small size induction motor | | • | • | • | | | | |
| MV small or medium size induction motor | | | | | • | • | • | • |
| MV medium or large size induction motor | | | | | • | | | |
| MV induction motor via VFD | | | | | • | | | |
| MV induction motor with cyclic load | | | | | | | | • |
| MV synchronous motor protection | | | | | | | | |
| MV synch. motor protection & excitation ctrl | | | | | | | | |
| Advanced M&D Features | | | | | | | | |
| PROTECTION & CONTROL | | | | | | | | |
| Graphical Display with Bay Control & Monitoring | | | | | | | | |
| Phasor/Harmonic measurement graphical display | | | | | | | | |
| Display of digital/metering status on HMI | | | | | | | | |
| Switchgear Control and Configurable SLD | | | | | | | | |
| Thermal Model (with RTD & unbalance biasing) | 49 | • | • | | • | | | • |
| Thermal Model | 49 | | | • | • | • | • | |
| Under/Over speed | 12/14 | | | | | | | |
| Custom Overload Curves | | | | | • | • | • | • |
| Voltage Dependant Overload Curves | | | | | | | | |
| Logging Start / Starts-Per-Hour | 66 | | • | • | • | • | • | • |
| Acceleration Time | 48 | • | • | • | • | • | • | • |
| Reduced Voltage Starting | 19 | | • | | | | | • |
| Backspin Detection | | | | | | | • | • |
| Two Speed Motor | | • | • | | • | | | • |
| Reversing (DOLR) | | • | • | | | | | |
| Variable frequency drive | | | • | | • | | | |
| Emergency Restart | | | | • | • | • | • | • |
| Mechanical Jam / Stall | 50LR | • | • | • | • | • | • | • |
| Instantaneous Overcurrent - Phase | 50P | | | • | • | • | • | • |
| Instantaneous Overcurrent - Ground | 50G | • | • | • | • | • | • | • |
| Instantaneous Overcurrent - Sensitive Ground/SEF | 50SG | • | • | • | • | • | • | • |
| Instantaneous Overcurrent - Neutral | 50N | | | • | • | • | • | |
| Time Overcurrent - Phase | 51P | | | • | • | • | • | |
| Time Overcurrent - Ground | 51G | • | • | • | • | • | • | |
| Time Overcurrent - Sensitive Ground | 51SG | • | • | • | • | • | • | |
| Time Overcurrent - Neutral | 51N | | | • | • | • | • | |
| Differential | 87S | | | | | | | |
| Current Directional - Phase | 67P | | | | | | • | |
| Current Directional - Neutral | 67N | | | | | | • | |
| Current Unbalance | 46 | • | • | • | • | • | • | • |
| Undercurrent / Underpower | 37 | • | • | • | • | • | • | • |
| Overvoltage - Phase | 59P | | • | | • | | • | • |
| Overvoltage - Neutral | 59N | | | | | | • | |
| Overvoltage - Auxiliary | 59X | | | | | | | |
| Undervoltage - Phase | 27P | | • | | • | | • | • |
| Undervoltage - Auxiliary | 27X | • | • | | • | | | |
| Negative Sequence Overvoltage | 59_2 | | | | • | | • | |
| Voltage Transformer Fuse Failure | VTFE/VTS | | • | | • | | • | |
| Phase Reversal | 47 | | • | | • | • | • | • |
| Current Transformer Supervision | CTS | | • | | • | | • | • |
| Overfrequency | 81O | | | | | | • | • |
| Underfrequency | 81U | | | | | | • | • |
| Reverse Power | 32R | | | | | | • | • |
| Power Factor | 55 | | | | | | | • |
| Field swappable power supply | | | | | | | | |
| Maintenance/Simulation Mode (test/commission facilities) | | | | | | • | • | |
| RTD Overtemperature | 49 | | • | | • | | | • |
| Remote RTD (RRTD) | 49 | | | | • | | | • |
| Breaker Failure | 50BF | | | • | • | • | • | • |
| Synchronous motor | | | | | | | | |
| Start Inhibit/Lockout | 86 | • | • | • | • | • | • | • |
| Sync Motor Field Overtemperature | 26F | | | | | | | • |
| Sync Motor Field Undervoltage | 27F | | | | | | | • |
| Sync Motor Field Overvoltage | 59F | | | | | | | • |
| Incomplete Sequence | 48 | | | | | | | |

| Features | Device | MM200 | MM300 | P253 | 339 | P24NM | P24DM | 369 |
|--|--------|-----------|-------|--------------|-----|-------|-------|-----|
| Sync Motor Start Equyence Control | 56 | | | | | | | |
| Sync Motor Field Undervoltage | 59F | | | | | | | |
| Sync Motor Field Overcurrent | 76F | | | | | | | |
| Sync Motor Power Factor Regulation | 90F | | | | | | | |
| Reluctance Torque Sync/Resync | 95 | | | | | | | |
| Autoloading | 96 | | | | | | | |
| AUTOMATION | | | | | | | | |
| Contact Inputs (max) | | 7 DC/6 AC | 30 | 6 | 10 | 13 | 13 | 5 |
| Contact Outputs (max) | | 3 | 18 | 6 | 7 | 12 | 12 | 4 |
| GOOSE Remote Inputs | | | | | | 64 | 64 | |
| GOOSE Remote Outputs | | | | | | 64 | 64 | |
| Analog Inputs (max) | | | | | | | | |
| Analog Outputs (max) | | | | | | | | 4 |
| RTD Inputs (max) | | | 6 | | 3 | | | 12 |
| Thermistor Input | | • | • | | | | | |
| Programmable Logic | | | • | Simple logic | • | • | • | |
| Setting mode- Simple/Regular | | | | | | | | |
| Trip / Close Coil Supervision | | | | TCS | • | TCS | TCS | |
| Digital Counters | | • | • | | • | | | |
| Timers | | | • | | • | • | • | |
| Undervoltage Auto-restart | | | • | | | | • | |
| MONITORING & METERING | | | | | | | | |
| Current | | • | • | • | • | • | • | • |
| Voltage | | | • | | • | • | • | • |
| Frequency | | | • | | • | • | • | • |
| Power - Real | | | • | | • | | • | • |
| Power - Apparent / Reactive | | | • | | • | | • | • |
| Power Factor | | | • | | • | | • | • |
| Demand - Current, MW, MVA, Mvar | | | | | | | • | • |
| Energy | | | • | | | | • | • |
| Temperature | | | • | | • | | | • |
| Environmental monitor (T, H, V, S) | | | | | | | | |
| Event Recorder (number of events) | | | 256 | 512 | 512 | 2048 | 2048 | 512 |
| Oscillography / Transient Recorder (samples / cycle) | | | 32 | 16 | 32 | 24 | 24 | 16 |
| Data logger / Trend Recording | | | • | | • | | | • |
| Motor Learned Information | | • | • | | • | | | • |
| Thermal Capacity Used | | • | • | | • | • | • | • |
| Motor Start Data Logger | | | | | • | | | • |
| Motor Start / Stop Health Report | | | | | • | | | • |
| Broken Rotor Bar | | | | | | | | |
| COMMUNICATIONS | | | | | | | | |
| Front Port Local Access | | • | • | • | • | • | • | • |
| USB Front port | | | | • | | • | • | |
| Rear Communications Interface (RS232/RS485) | | • | • | • | • | • | • | • |
| 802.11 WiFi | | | | | | | | |
| Radius Authentication | | | | | | | | |
| Ethernet (copper) | | | • | | • | • | • | |
| Ethernet (fiber) | | | | | 1 | 2 | 2 | |
| Modbus TCP/IP | | • | • | • | • | | | • |
| DeviceNet protocol | | • | • | | | | | • |
| Profibus protocol | | • | • | | | | | • |
| DNP 3.0 protocol | | | | • | • | • | • | |
| IEC61870-5-103 protocol | | | | • | • | • | • | |
| IEC61850 protocol | | | | | • | • | • | |
| IEC61850 Ed2 protocol | | | | | | | | |
| IEC61870-5-104 protocol | | | | | • | | | |
| Peer-to-Peer Communications (GSSE/GOOSE) | | | | | • | • | • | |
| Courier | | | | | | • | • | |
| Simple network Timesync protocol | | | • | | • | • | • | |
| IRIG-B input | | | | | • | • | • | |
| Modbus RTU | | • | • | • | • | • | • | |
| Process Bus (IEC 61850-9-2) | | | | | | | | |

Motor Protection

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| Features | Device | 469 | P241 | P242 | P243 | 869 | M60 |
|--|----------|-----|------|------|------|-----|-----|
| APPLICATIONS & FUNCTIONALITY | | | | | | | |
| LV small size induction motor | | | • | | | | |
| MV small or medium size induction motor | | • | • | • | • | • | • |
| MV medium or large size induction motor | | • | • | • | • | • | • |
| MV induction motor via VFD | | • | | | | • | |
| MV induction motor with cyclic load | | • | | | | • | |
| MV synchronous motor protection | | • | • | • | • | • | • |
| MV synch. motor protection & excitation ctrl | | • | | | | • | |
| Advanced M&D Features | | | | | | • | |
| PROTECTION & CONTROL | | | | | | | |
| Graphical Display with Bay Control & Monitoring | | | | | | • | • |
| Phasor/Harmonic measurement graphical display | | | | | | • | |
| Display of digital/metering status on HMI | | | | | | 15 | |
| Switchgear Control and Configurable SLD | | | | | | • | • |
| Thermal Model (with RTD & unbalance biasing) | 49 | • | • | • | • | • | • |
| Thermal Model | 49 | | | | | | |
| Under/Over speed | 12/14 | | | | | • | |
| Custom Overload Curves | | • | • | • | • | • | • |
| Voltage Dependant Overload Curves | | • | | | | • | • |
| Logging Start / Starts-Per-Hour | 66 | • | • | • | • | • | • |
| Acceleration Time | 48 | • | • | • | • | • | • |
| Reduced Voltage Starting | 19 | • | • | • | • | • | • |
| Backspin Detection | | | • | • | • | • | • |
| Two Speed Motor | | • | | | | • | • |
| Reversing (DOLR) | | | | | | | |
| Variable frequency drive | | • | | | | • | |
| Emergency Restart | | • | • | • | • | • | • |
| Mechanical Jam / Stall | 50LR | • | • | • | • | • | • |
| Instantaneous Overcurrent - Phase | 50P | • | • | • | • | • | • |
| Instantaneous Overcurrent - Ground | 50G | • | | | | • | • |
| Instantaneous Overcurrent - Sensitive Ground/SEF | 50SG | • | • | • | • | • | • |
| Instantaneous Overcurrent - Neutral | 50N | | • | • | • | • | • |
| Time Overcurrent - Phase | 51P | | • | • | • | • | • |
| Time Overcurrent - Ground | 51G | | | | | • | • |
| Time Overcurrent - Sensitive Ground | 51SG | | • | • | • | | • |
| Time Overcurrent - Neutral | 51N | | • | • | • | • | |
| Differential | 87S | • | | | • | • | • |
| Current Directional - Phase | 67P | | | | | • | • |
| Current Directional - Neutral | 67N | | • | • | • | • | • |
| Current Unbalance | 46 | • | • | • | • | • | • |
| Undercurrent / Underpower | 37 | • | • | • | • | • | • |
| Overvoltage - Phase | 59P | • | • | • | • | • | • |
| Overvoltage - Neutral | 59N | | • | • | • | • | • |
| Overvoltage - Auxiliary | 59X | | | | | • | • |
| Undervoltage - Phase | 27P | • | • | • | • | • | • |
| Undervoltage - Auxiliary | 27X | | | | | • | • |
| Negative Sequence Overvoltage | 59_2 | | • | • | • | • | • |
| Voltage Transformer Fuse Failure | VTF/VTFS | • | • | • | • | • | • |
| Phase Reversal | 47 | • | • | • | • | • | • |
| Current Transformer Supervision | CTS | • | • | • | • | • | • |
| Overfrequency | 81O | • | | | | • | • |
| Underfrequency | 81U | • | • | • | • | • | • |
| Reverse Power | 32R | • | • | • | • | • | • |
| Power Factor | 55 | • | • | • | • | • | • |
| Field swappable power supply | | | | | | • | |
| Maintenance/Simulation Mode (test/commission facilities) | | | | | | • | |
| RTD Overtemperature | 49 | • | • | • | • | • | • |
| Remote RTD (RRTD) | 49 | | | | | | • |
| Breaker Failure | 50BF | • | • | • | • | • | • |
| Synchronous motor | | • | • | • | • | • | • |
| Start Inhibit/Lockout | 86 | • | • | • | • | • | • |
| Sync Motor Field Overtemperature | | | | | | • | |
| Sync Motor Field Undervoltage | | | | | | • | |
| Sync Motor Field Overvoltage | | | | | | • | |
| Incomplete Sequence | | | | | | • | |

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| Features | Device | 469 | P241 | P242 | P243 | 869 | M60 |
|--|--------|-------------|------|------|------|--------------|------|
| Sync Motor Start Equyence Control | | | | | | • | |
| Sync Motor Field Undervoltage | | | | | | • | |
| Sync Motor Field Overcurrent | | | | | | • | |
| Sync Motor Power Factor Regulation | | | | | | • | |
| Reluctance Torque Sync/Resync | | | | | | • | |
| Autoloading | | | | | | • | |
| AUTOMATION | | | | | | | |
| Contact Inputs (max) | | 7 (9 w/SPM) | 12 | 16 | 16 | 24 | 150 |
| Contact Outputs (max) | | 6 (9 w/SPM) | 11 | 16 | 16 | 10 | 90 |
| GOOSE Remote Inputs | | | | | | 8 sets of 64 | |
| GOOSE Remote Outputs | | | | | | 3 sets of 64 | |
| Analog Inputs (max) | | 4 | 4 | 4 | 4 | 4 | 24 |
| Analog Outputs (max) | | 4 | 4 | 4 | 4 | 7 | 4 |
| RTD Inputs (max) | | 12 | 10 | 10 | 10 | 12 | 24 |
| Thermistor Input | | | | | | | |
| Programmable Logic | | | • | • | • | • | • |
| Setting mode- Simple/Regular | | | | | | • | |
| Trip / Close Coil Supervision | | • | TCS | TCS | TCS | • | • |
| Digital Counters | | | | | | • | • |
| Timers | | | • | • | • | • | • |
| Undervoltage Auto-restart | | | • | • | • | | |
| MONITORING & METERING | | | | | | | |
| Current | | • | • | • | • | • | • |
| Voltage | | • | • | • | • | • | • |
| Frequency | | • | • | • | • | • | • |
| Power - Real | | • | • | • | • | • | • |
| Power - Apparent / Reactive | | • | • | • | • | • | • |
| Power Factor | | • | • | • | • | • | • |
| Demand - Current, MW, MVA, Mvar | | • | • | • | • | • | • |
| Energy | | • | • | • | • | • | • |
| Temperature | | • | • | • | • | • | • |
| Environmental monitor (T, H, V, S) | | | | | | • | |
| Event Recorder (number of events) | | 256 | 250 | 250 | 250 | 1024 | 1024 |
| Oscillography / Transient Recorder (samples / cycle) | | 12 | 24 | 24 | 24 | 128 | 16 |
| Data logger / Trend Recording | | • | | | | • | • |
| Motor Learned Information | | • | | | | • | • |
| Thermal Capacity Used | | • | • | • | • | • | • |
| Motor Start Data Logger | | | | | | • | |
| Motor Start / Stop Health Report | | | | | | • | |
| Broken Rotor Bar | | • | | | | • | • |
| COMMUNICATIONS | | | | | | | |
| Front Port Local Access | | • | • | • | • | • | • |
| USB Front port | | | | | | • | |
| Rear Communications Interface (RS232/RS485) | | • | • | • | • | • | • |
| 802.11 WiFi | | | | | | • | |
| Radius Authentication | | | | | | • | • |
| Ethernet (copper) | | | • | • | • | • | • |
| Ethernet (fiber) | | | 2 | 2 | 2 | 2 | 3 |
| Modbus TCP/IP | | • | | | | • | • |
| DeviceNet protocol | | • | | | | | |
| Profibus protocol | | | | | | | |
| DNP 3.0 protocol | | | | | | • | • |
| IEC61870-5-103 protocol | | | • | • | • | • | • |
| IEC61850 protocol | | | • | • | • | • | • |
| IEC61850 Ed2 protocol | | | | | | • | • |
| IEC61870-5-104 protocol | | | | | | • | • |
| Peer-to-Peer Communications (GSSE/GOOSE) | | | • | • | • | • | • |
| Courier | | | • | • | • | • | • |
| Simple network Timesync protocol | | | • | • | • | • | • |
| IRIG-B input | | | • | • | • | • | • |
| Modbus RTU | | | • | • | • | | |
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