

Motor Protection – Selector Guide

Features	Device	MM200	MM300	P253	339	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						
PROTECTION & CONTROL						
Thermal Model (with RTD & unbalance biasing)	49	•	•		•	•
Thermal Model	49			•	•	
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	VTFF/VTS		•		•	
Phase Reversal	47		•		•	•
Overfrequency	81O					•
Underfrequency	81U					•
Reverse Power	32R					•
Power Factor	55					•
RTD Overtemperature	49		•		•	•
Remote RTD (RRTD)	49				•	•
Breaker Failure	50BF			•	•	•
Synchronous motor						
Start Inhibit/Lockout	86	•	•	•	•	•

Features Continued	Device	MM200	MM300	P253	339	369
AUTOMATION						
Contact Inputs (max)		7 DC/6 AC	30	6	10	5
Contact Outputs (max)		3	18	6	7	4
Analog Inputs (max)						
Analog Outputs (max)						4
RTD Inputs (max)			6		3	12
Thermistor Input		•	•			
Programmable Logic			•	Simple logic	•	
Trip / Close Coil Supervision				TCS	•	
Digital Counters		•	•		•	
Timers			•		•	
Undervoltage Auto-restart			•			
Arc Flash Detection						
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	512
Oscillography / Transient Recorder (samples / cycle)			32	16	32	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		•	•	•	•	•
Rear Communications Interface (RS232/RS485)		•	•	•	•	•
802.11 WiFi						
Radius Authentication						
Ethernet					•	
IEC 62439 PRP						
IEEE 1588						
Modbus protocol		•	•	•	•	•
DeviceNet protocol		•	•			•
Profibus protocol		•	•			•
DNP 3.0 protocol					•	
IEC61870-5-103 protocol				•	•	
IEC61850 protocol					•	
IEC61870-5-104 protocol					•	
Peer-to-Peer Communications (GSSE/GOOSE)					•	
Courier						
Simple network Timesync protocol			•		•	
IRIG-B input					•	
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		•				•	
PROTECTION & CONTROL							
Thermal Model (with RTD & unbalance biasing)	49	•	•	•	•	•	•
Thermal Model	49						
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	VTFF/VTS	•	•	•	•	•	•
Phase Reversal	47	•	•	•	•	•	•
Overfrequency	81O	•				•	•
Underfrequency	81U	•	•	•	•	•	•
Reverse Power	32R	•	•	•	•	•	•
Power Factor	55	•	•	•	•	•	•
RTD Overtemperature	49	•	•	•	•	•	•
Remote RTD (RRTD)	49						•
Breaker Failure	50BF	•	•	•	•	•	•
Synchronous motor		•	•	•	•	•	
Start Inhibit/Lockout	86	•	•	•	•	•	•

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Features Continued	Device	469	P241	P242	P243	869	M60
AUTOMATION							
Contact Inputs (max)		7 (9 w/SPM)	12	16	16	14	80
Contact Outputs (max)		6 (9 w/SPM)	11	16	16	10	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			•	•	•	•	•
Trip / Close Coil Supervision		•	TCS	TCS	TCS	•	•
Digital Counters						•	•
Timers			•	•	•	•	•
Undervoltage Auto-restart			•	•	•		
Arc Flash Detection						•	
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		•	•	•	•	•	•
Rear Communications Interface (RS232/RS485)		•	•	•	•	•	•
802.11 WiFi						•	
Radius Authentication						•	•
Ethernet			•	•	•	•	•
IEC 62439 PRP			•	•	•	•	•
IEEEE 1588						•	•
Modbus protocol		•	•	•	•	•	•
DeviceNet protocol		•					
Profibus protocol							
DNP 3.0 protocol						•	•
IEC61870-5-103 protocol			•	•	•	•	•
IEC61850 protocol			•	•	•	•	•
IEC61870-5-104 protocol						•	•
Peer-to-Peer Communications (GSSE/GOOSE)			•	•	•	•	•
Courier			•	•	•		
Simple network Timesync protocol			•	•	•	•	•
IRIG-B input			•	•	•	•	•
Process Bus (IEC 61850-9-2)							•



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