

Motor Protection Features Overview

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(✓ = Standard, ◦ = Option)

	ANSI	MRMV4-2	MRM4-2	MRM3-2-I	MRM3-2-IE	XM1
Protection functions						
Overexcitation V/Hz	24					
Synchro check	25					
Undervoltage	27	✓				
Power protection: P, Q, Qr, S, Pr	32F, 37F, 32Q, 37Q, 37QR, 32S, 37S, 37R	✓				
I< underload protection steps	37	✓	✓	✓	✓	✓
Negative sequence elements (current/DEFT/INV)	46	✓	✓	✓	✓	✓
Negative/positive sequence elements (voltage)	47	✓				
Motor - Start supervision	48	✓	✓	✓	✓	
Overload protection with thermal replica	49	✓	✓	✓	✓	✓
Circuit breaker failure protection	50BF / 62BF	✓	✓	✓	✓	
Phase current elements (non-directional)	50/51			✓	✓	50
Earth current elements (non-directional)	50N / 51N	✓	✓		✓	✓
Negative sequence elements (current/IEC/ANSI curves)	51Q	✓	✓			
Motor - JAM protection	50J	✓	✓			
Motor - Locked rotor protection	51 LRS / 51 LR	✓	✓	✓	✓	✓
Power factor cos (φ)	55	✓				
Overvoltage	59	✓				
Residual voltage elements	59N	✓				
Voltage transformer supervision	60FL	✓				
Current transformer supervision	60L	✓	✓			
Motor - Start supervision	66	✓	✓	✓	✓	
Trip circuit supervision	74TC	✓	✓			
Vector surge	78	✓				
Underfrequency / Overfrequency	81 O/U	✓				
Frequency gradient (ROCOF)	81R	✓				
Lockout function	86	✓	✓			
Breaker Wear Monitor	BKM	✓	✓			
Protection parameter sets		4	4	2	2	
Reverse interlocking		✓	✓			
Event, failure and disturbance recorder		✓	✓	✓	✓	
Trend recording		✓	✓			
Control						
Control function for 1 / up to 6 switchgear(s)		1	1			
Logic (up to 80 equations)		✓	✓			
Measuring functions						
Currents		✓	✓			
Thermal overload θ		✓	✓			
Voltages		✓				
Frequency		✓				
Hardware						
Number of binary output relays (depends on type of device)		7/13	6/4	4	4	2
Number of digital inputs (depends on type of device)		8/8	8/4	7	7	
Number of analog inputs and outputs (depends on type of device)		0+4	0+1			
Communication						
IEC61850 (RJ45 or fiber optic [FO] LC)		◦	◦			
RS485 Open Data				✓	✓	◦
MODBUS RTU (via fiber optic [FO] ST or RS485)		◦	◦	◦	◦	
Modbus TCP (RJ45 or fiber optic [FO] LC)		◦	◦			
IEC60870-5-103 (via fiber optic [FO] ST or RS485)		◦	◦			
Profibus DP (via fiber optic [FO] ST or RS485)		◦	◦			
DNP3.0 RTU (via fiber optic [FO] ST or RS485)		◦	◦			
DNP3.0 TCP (RJ45 or fiber optic [FO] LC)		◦	◦			
IRIG-B interface (time synchronization)		✓	✓			