

(✓ = Standard, ◦ = Option)

Protection functions	ANSI	MCDTV4-2	MRDT4-2
Overexcitation V/Hz	24	✓	
Synchro check	25	✓	
Undervoltage	27	✓	
Power protection: P, Q, Qr, S, Pr	32F, 37F, 32Q, 37Q, 37QR, 32S, 37S, 37R	✓	
QU protection (undervoltage- directional reactive power protection)	27&32Q<	✓	
Negative sequence elements (current/DEFT/INV)	46	✓	✓
Negative/positive sequence elements (voltage)	47	✓	
Overload protection with thermal replica	49	✓	✓
Circuit breaker failure protection	50BF / 62BF	✓	✓
Phase current elements (non-directional)	50/51		✓
Phase current elements (non-directional and directional)	67	✓	
Earth current elements (non-directional)	50N / 51N		✓
Earth current elements (non-directional and directional)	67N	✓	
Inrush detection IH2 (2nd harmonic)		✓	✓
Voltage controlled current protection	51C	✓	
Voltage restraint current protection	51V	✓	
Negative sequence elements (current/IEC/ANSI curves)	51Q	✓	
Power factor cos (φ)	55	✓	
Overvoltage	59	✓	
Residual voltage elements	59N	✓	
Voltage transformer supervision	60FL	✓	
Current transformer supervision	60L	✓	✓
Trip circuit supervision	74TC	✓	✓
Vector surge	78	✓	
Underfrequency / Overfrequency	81 O/U	✓	
Frequency gradient (ROCOF)	81R	✓	
Lockout function	86	✓	✓
Generator differential protection	87G	✓	✓
Transformer differential protection	87T	✓	✓
Restricted earth fault elements	87N (64REF)	✓	✓
Breaker Wear Monitor	BKM	✓	✓
Protection parameter sets		4	4
Reverse interlocking		✓	✓
Event, failure and disturbance recorder		✓	✓
Trend recording		✓	✓
Control			
Control function for 1 / up to 6 switchgear(s)		6	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)		11/11	7/13
Number of digital inputs (depends on type of device)		16/8	8/16
Number of analog inputs and outputs (depends on type of device)		0/2+2	
Communication			
IEC61850 (RJ45 or fiber optic [FO] LC)		◦	◦
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)		✓	✓