1MAC601476-DB

Motor protection and control REM620

The REM620 is a dedicated motor IED perfectly aligned for the protection, control, measurement and supervision of asynchronous motors in manufacturing and process industry. REM620 is a member of ABB's Relion® product family and a part of its 620 series products. The 620 series IEDs are characterized by flexibility and performance for demanding utility distribution and industrial applications. Engineered from the ground up, the 620 series has been designed to unleash the full potential of the IEC 61850 standard for communication and interoperability between substation automation devices.

Unique REM620 ANSI features

- Six setting groups
- Drawout design
- High-speed (< 1 ms) outputs
- Normally-closed output for motor contactors
- Dedicated machine-run-time timers
- Motor differential protection
- Up to 14 RTD inputs
- Up to 5 mA inputs
- Loss-of-load supervision
- Arc flash detection (AFD)
- Thermal overload protection of motor
- Ring-lug terminals for all inputs and outputs
- Large, easy to read LCD screen
- Programmable push-buttons
- Environmentally friendly design with RoHS compliance

Application

The REM620 constitutes main protection for asynchronous motors and their drives in manufacturing and process industry. Typically, the motor relay is used with circuit breaker or contactor controlled HV motors, and contactor controlled medium sized and large LV motors in a variety of drives, such as pumps and conveyors, crushers and choppers, mixers and agitators, fans, and aerators. Flexible coding allows for choosing from different confi gurations to best fit your motor application needs.

Protection and control

REM620 offers all the functionality needed to manage motor starts and normal drive operations, including protection and fault clearance in abnormal situations. The main features of the motor relay include thermal overload protection, motor start-up time supervision, locked rotor protection, and protection against too frequent motor starts. Additionally, differential protection can also be included. Furthermore, the relay offers negative phase sequence current unbalance protection, motor running stall protection, loss-of-load supervision, phase-reversal protection, and a provision to perform a forced emergency start.

REM620 also incorporates non-directional and directional ground-fault protection, back-up overcurrent protection, three phase undervoltage protection, and negative phase sequence overvoltage, and positive sequence undervoltage protection. Enhanced with an optional plug-in card, REM620 offers a fast three channel arc-fault protection system for arc flash supervision of the switchgear compartments. REM620 also integrates basic control functionality, which facilitates the control of one circuit breaker via the front panel HMI or through remote controls. To protect the relay from unauthorized access and to maintain the integrity of information, the relay has been provided with a four-level, role-based, user authentication system. The access control system applies to the front panel HMI, the embedded web browser based HMI, and the PCM600, Protection and Control IED Manager. front panel HMI, the web browser based HMI and the PCM600 Protection and Control Relay Manager.

Standardized communication

REM620 genuinely supports the new IEC 61850 standard for inter-device communication in substations. It also supports the industry standard Modbus® and DNP3 protocols. For accurate time stamping, REM620 supports synchronization over Ethernet using SNTP or over a separate bus using IRIG-B.

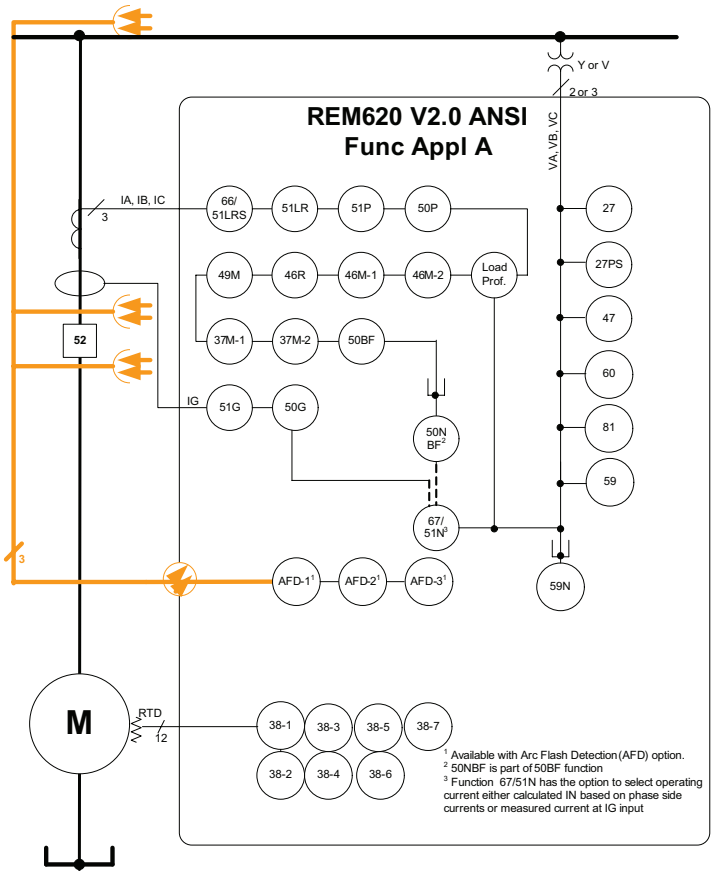
Pre-emptive condition monitoring

For continuous knowledge of the operational availability of the REM620 features, a comprehensive set of monitoring functions to supervise the relay health, the trip circuit, and the circuit breaker health is included. The breaker monitoring can include checking the wear and tear of the circuit breaker, the spring charging time of the breaker operating mechanism, and the gas pressure of the breaker chambers. The relay also monitors the breaker travel time and the number of circuit breaker operations to provide basic information for scheduling breaker maintenance.

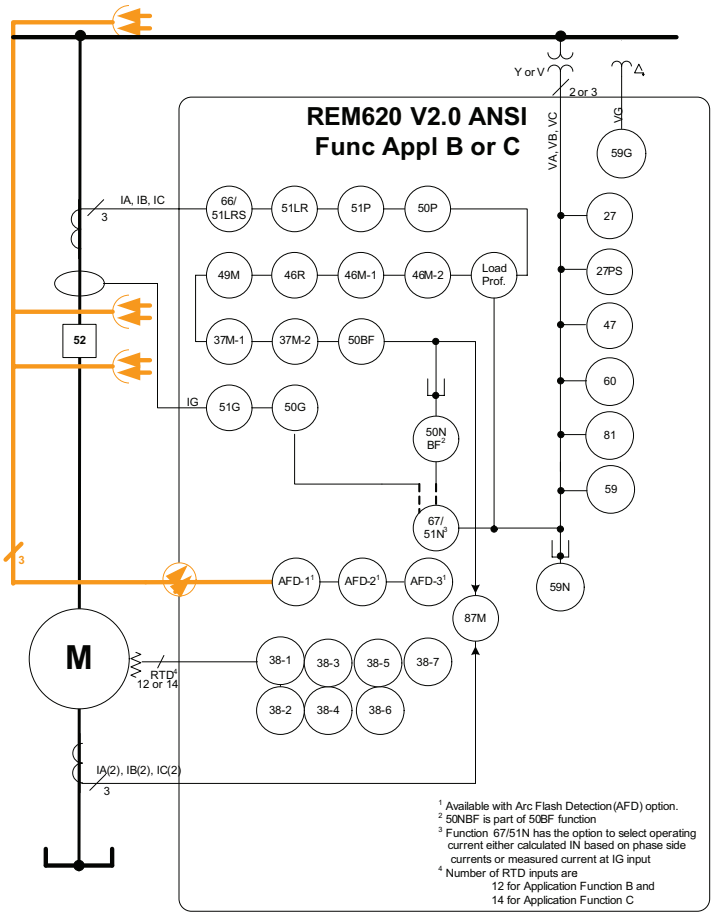
Bus protection via GOOSE

The IEC 61850 implementation in REM620 also includes fast peer-to-peer communication over the substation bus. Use GOOSE communication between the IEDs of the incoming and outgoing feeders of a substation cooperate to form a stable, reliable and high-speed busbar protection system. The cost-effective GOOSE-based busbar protection is obtained just by configuring the IEDs and the operational availability of the protection is assured by continuous supervision of the protection IEDs and their GOOSE messaging over the station bus. No separate hard-wiring is needed for the horizontal communication between the switchgear cubicles.

REM620 V2.0 ANSI Functional Application A



REM620 V2.0 ANSI Functional Application B & C



Functions and Features		Functional Application		
Included = ●, Optional = O		Firmware version 2.0, 2.1		
		A	B	C
Protection	**ANSI Function Name**			
Phase overcurrents	51P, 50P	●	●	●
Ground overcurrents	51G, 50G	●	●	●
Directional neutral overcurrent	67N	●	●	●
Machine differential Multi-Restrained Differential	87M	●	●	●
Machine differential Self-Balancing[1]	87M			●[1]
Thermal overload	49M	●	●	●
Loss-of-load	37M-1, 37M-2	●	●	●
Phase reversal	46R	●	●	●
Locked rotor / start	66/51LRS	●	●	●
Locked rotor / jam	51LR	●	●	●
Negative sequence overcurrents	46M-1, 46M-2	●	●	●
Phase undervoltage	27	●	●	●
Three-phase directional overpower[1]	32O			●[1]
Three-phase directional underpower[1]	32U			●[1]
Volts-per-hertz[1]	24			●[1]
Remanent undervoltage[1]	27R			●[1]
Underexcitation[1]	40			●[1]
Out of Step[1]	78			●[1]
Distance backup[1]	21P			●[1]
Power factor[1]	55			●[1]
Positive sequence undervoltage	27PS	●	●	●
Phase sequence overvoltage	47	●	●	●
Phase overvoltage	59	●	●	●
Neutral overvoltage	59N	●	●	●
Ground overvoltage	59G		●	●
Frequency	81	●	●	●
Resistive thermal devices (RTD)	38	●	●	●
Circuit breaker failure	50BF, 50NBF	●	●	●
Electrically latched/self-resetting trip digital outputs	86/94-1, 86/94-2	●	●	●
Arc flash detection via three lens sensors	AFD-1, AFD-2, AFD-3	O	O	O
Control				
Circuit breaker control	52	●	●	●
Emergency restart	62EST	●	●	●
Number of pages in HMI		2	2	2
Customizable HMI		●	●	●
User programmable LED's		11	11	11
User programmable push buttons		16	16	16
Monitoring and Supervision				
Trip circuit monitoring	TCM	●	●	●
Breaker condition monitoring	52CM	●	●	●
Current circuit supervision	CCM	●	●	●
Machine run timers	OPTM-1, OPTM-2	●	●	●
Measurement				
Three-phase currents	IA, IB, IC	●	●	●
Sequence currents	I1, I2, I0	●	●	●
Ground current	IG	●	●	●
Demand phase currents		●	●	●
Maximum and minimum demand values		●	●	●
Three-phase voltages	VA, VB, VC	●	●	●
Sequence voltages	V1, V2, V0	●	●	●
Ground voltage	VG		●	●
Power and energy (1-phase, 3-phases) and power factor	P, E and PF	●	●	●
Automation & Communications				
Max number of Digital Inputs		14	12	8

Functions and Features (continued)		Functional Application		
Included = ●, Optional = O		Firmware version 2.0, 2.1		
Automation & Communications		**A**	**B**	**C**
Max number of Digital Outputs		13	10	10
Max number of High-Speed Outputs (Optional and take the place of some digital outputs)		3	3	3
100Base-TX Ethernet (RJ45)[3]		O	O	O
Rear 100Base-FX Ethernet (LC)		O	O	O
Rear 100Base-TX Ethernet(RJ45) + RS-485(1x4-wire or 2x2-wire) + IRIG-B		O	O	O
Rear [2 * Ethernet 100FX (LC) + Ethernet 10/100BaseT (RJ45) + serial glass fiber (ST)] w HSR/PRP[1]				O[1]
Rear 100Base-FX Ethernet(LC) + RS-485(1x4-wire or 2x2-wire) + IRIG-B		O	O	O
Rear 100Base-TX and -FX Ethernet (1 * LC, 2 * RJ45) + serial glass fiber (ST)		O	O	O
Rear 100Base-TX Ethernet (3 * RJ45) + serial glass fiber (ST)		O	O	O
Ethernet 100Base-TX (RJ45) + configurable RS232/RS485 + [RS485 or serial glass fiber (ST) + IRIG-B] ports[2]		O	O	O
All three DNP3.0, Modbus, and IEC61850		●	●	●
Records				
Sequence of events recorder	SER	●	●	●
Fault recorder	FLR	●	●	●
Digital fault (waveform) recorder	DFR	●	●	●
Load profile	LoadProf	●	●	●
Digital Fault Recorder signal channels (Analog/Digital)		12/64	12/64	12/64
Events recorder (FIFO), 1ms resolution		1024	1024	1024
Fault records		128	128	128

1 REM620 Firmware version 2.1 must be selected
2 May not be combined with Arc Flash Detection (AFD) option
3 Front port included, rear port optional

Analog inputs

- Three phase currents: 5/1 A programmable
- Ground current: 5/1 A programmable
- Rated frequency: 60/50 Hz programmable
- Three-phase and ground voltages: programmable nominal secondary voltage
- Twelve RTD inputs standard
- Additional RTD inputs available as an option
- Four mA inputs standard

Binary inputs and outputs

- Eight binary inputs standard
- Ten binary outputs available as standard
- One Form C self-check alarm output as standard
- Optional high speed outputs (HSO) available
- Additional binary inputs and outputs available as options

Communication

- IEC 61850-8-1 with GOOSE messaging
- DNP3 Level 2+ over TCP/IP
- Modbus over TCP/IP
- Time synchronization via SNTP (primary and backup servers)
- Optional serial RS-485 port programmable for DNP3 Level 2+ or Modbus RTU
- Optional IRIG-B time synchronization
- Optional HSR/PRP communication

Tools

- PCM600 V2.4.1 or later for setting configuration data retrieval
- COM600 Station Automation series products V3.5 or later
- Web browser based user interface (IE 7.0 or later)

Product dimensions and weights

- Frame: 10.32” (262.6 mm) W x 6.97” (177 mm) H
- Case: 9.69” (246 mm) W x 6.30” (160 mm) H x 7.91” (201 mm) D
- Weight: Complete IED – 10.5 lbs. (4.8 kg); Plug-in unit only - 6.0 lbs.(2.8 kg)

Control voltage

- Option 1: 48 ... 250 V dc, 100 ... 240 V ac
- Option 2: 24 ... 60 V dc

Certificates

- UL Listed product, File E103204

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