Feeder Protection Relay REX 521

Implements operational and personnel safety
Supports your target of supplying high-quality power
Enables preventive maintenance and shorter outage times, adding value to your asset management
Large display for comfortable local operations
Selectable IEC and ANSI symbols
Flexible connectivity and IEC 61850 support

The REX 521
is the ultimate feeder protection relay for your distribution network. The relay is also a multifunction motor protection relay, a transformer protection relay and a constituent of your substation’s busbar protection system. The smoothly communicating REX 521 relay integrates smoothly with the control and management system of your distribution network.

Enhanced feeder protection
The REX 521 relay is primarily employed in distribution substations to provide short-circuit, overcurrent and earth-fault protection as well as auto-reclosing of substation feeders. The relay can be used in isolated neutral, resonant earthed, solidly earthed and resistively earthed distribution networks. The sophisticated thermal overload function, the start-up supervision function and the undervoltage function also make the relay an ideal choice for the protection of medium-sized and large circuit-breaker controlled AC motors. Further, the inrush current stabilization function allows the relay to be used for back-up protection of power transformers and for main protection of distribution transformers. The REX 521 relay has also been further developed to provide cost-effective busbar protection.

Complete solution
REX 521 complements ABB’s solution for power system protection, control, measurement and supervision, now ranging from basic protection relays to advanced feeder protection and bay control terminals. The REX 521 relay offers a comprehensive set of feeder protection functions enhanced with supervision functions such as, for instance, power quality supervision. Support for current sensors type Rogowski coils and voltage dividers are also available. Advanced data collection and analysis functions contribute to improving the efficiency of your network control, maintenance and management operations.

Improved system availability and safety
The REX 521 relay features condition monitoring of both primary and secondary systems of the substation as well as of the device itself. The monitoring adds to the operational reliability of the protection, which considerably improves personnel safety. Personnel safety has also been improved by enabling delayed circuit breaker closing when the circuit breaker is controlled locally via the HMI. The CB closing delay is adjustable but can also be set to zero for immediate CB control response.
A step into intelligent substation automation

The REX 521 relays are fully integrated into ABB’s distribution automation and network management systems. The support for all major communication protocols and standards, including the novel IEC 60865 standard, makes the relay a perfect fit for your network control and management system. In addition to protection, REX offers extensive measurements including phase currents, neutral current, line voltages, residual voltage, system frequency, power factor, active and reactive power, total harmonic distortion (THD) and power quality. Any event in the power system can be recorded by the built-in high-sampling-frequency disturbance recorder for subsequent disturbance or fault analysis.

Condition monitoring and self-supervision

The REX 521 relay incorporates a large number of supervision functions for constant monitoring of the relay’s operational preparedness. On the relay input side both voltage and current measuring circuits are continuously supervised. On the relay output side the trip circuits, including the CB trip coils, are constantly supervised for loss of control voltage or trip circuit discontinuity. Furthermore, the condition of the circuit breaker can be monitored for mechanical wear on the main contact. The auxiliary supply of the relay and the internal relay voltages are supervised by the relay’s integrated self-supervision system, which also incorporates watchdog functions supervising the operation of the relay.

Innovative technology

The REX 521 feeder protection relays are part of ABB’s substation automation concept and the RE500 product series. The support for a wide range of communication protocols and standards, including the novel IEC 60865, makes the relay an attractive choice for your power system protection, control and management environment. The flexible connectivity caters for any communication needs you may have and helps cover future demands. The relays’ common configuration, setting and monitoring tools offer you yet another benefit: you just need to learn how to handle one relay, as all RE500 series protection and control devices use the same interface technology.

You can download the connectivity package from www.abb.com/substationautomation

Technical Data

REX 521

Protection functions ANSI number
3-phase non-directional overcurrent protection 50/51
3-phase directional overcurrent protection, 3 stages
3-phase directional overcurrent protection, 2 stages
3-phase undervoltage protection
3-phase transformer inrush and motor start-up current detector
Phase discontinuity protection
3-phase thermal overload protection
+0+1
Auto-reclose function (5 shots)
Underfrequency/overfrequency protection
SYNC 25
Synchron-check/voltage-check function
3-phase thermal overload protection for devices 40/4/66
Three-phase motor start-up supervision
<6 < 50/49/49/49
Phase reversal protection
<6 < 50/49/49/49
Negative phase sequence protection with two stages
<6 < 50/49/49/49
Positive phase sequence protection
FUSEF 60
Fuse failure protection
CBFP 62B
Circuit-breaker failure protection
Included into every protection function

Control Functions:
<6 <> CB1 Circuit breaker control & indication
<6 <> IND 1-3 with adjustable closing delay
<6 <> POS Logic control position selection
AlARM1/8

Monitoring and supervision:
CB wear Circuit-breaker condition monitoring
TC51 Trip-circuit supervision
MCS 3I Energizing current circuit supervision
MCS 3U Energizing current circuit supervision
TIME1 Operation time counter

Measurements:
Primary and unit values
3I 3-phase current measurement
i0 Neutral current measurement
iA Residual voltage measurement
3U 3-phase voltage measurement
f System frequency measurement
E, P, Q, PF Transient disturbance recorder
A/P Analog measuring function

Power Quality:
THD Current and voltage distortion measurements (1-13th harmonics)
PQ3inf Current waveform distortion measurement
PQ3Unf Voltage waveform distortion measurement

GENERAL:
Non-volatile memory
 Nine digital inputs
 Four power outputs
 Two signalling outputs
 User-configurable Alarm LEDs
 Internal relay fault output

Communication and connectivity:
• IEC 68870-5-103, LON®, IEC 61850
• Modbus®, RTU/ASCII, DNP 3.0, Profinet and Pulse
• (with interface adapter)

Dimensions:
Width 148.8 mm (1.9" of a 19" rack),
Height frame 265.9 mm (6U)
Box depth 235 mm