Feeder Protection
Relay REX 521
REX 521 Medium Range Products

- Wide selection of single busbar applications
- Proven and reliable technology
- Part of versatile product range covering vast number of protection applications

The enhanced REX 521 now offers a number of new protection functions, and supervision functions such as motor protection and power quality supervision.
Four different variants of HW:
Basic, Medium, High and High with sensors

All variants contain:
- 9 Digital inputs
  - DI 9 can be used for time sync.
- 6 Digital outputs
  - 4 power outputs
  - 2 signal outputs
Hardware

- Basic
- 4 CTs
Hardware

- **Medium**
- **5 CTs**
- **1 VT**
Hardware

- High
- 5 CTs
- 4 VTs
Hardware

- High sensor
  - 6 sensors
  - 2 CTs
  - 1 VT
Application Example: B01/B02

- Outgoing feeder of a single busbar:
  - All network types (Solidly earthed, etc.)
  - Overheadlines (AR in B02)
  - Supervision and condition monitoring of primary equipment for preventive maintenance
  - Current measurements for network supervision and operations
  - Non-directional protections
Application Example: M02

- Outgoing feeder of a single busbar:
  - All network types (Solidly earthed, etc.)
  - Cables (Dir E/F) and overheadlines (AR in M02)
  - Supervision and condition monitoring of primary equipment for preventive maintenance
  - Current measurements for network supervision and operations
  - Thermal overload protection for cable/line
Application Example: H04

- Outgoing feeder of a single busbar:
  - All network types (Solidly earthed, etc.)
  - Cables and overheadlines
  - Extensive supervision and condition monitoring of primary equipment for preventive maintenance
  - Wide range of measurements for network supervision and operations
  - Directional and non-directional earth-fault protection
  - Thermal overload protection for cable or line
**Application Example: H07**

- **Outgoing motor feeder:**
  - For large and medium size synchronous and asynchronous AC motors
  - Thermal overload protection for devices
  - Motor start-up supervision (stall protection)
  - Extensive supervision and condition monitoring for preventive maintenance
  - Wide range of measurements for supervision and operation
# Protection Functions

<table>
<thead>
<tr>
<th>HW versions</th>
<th>Protection functions</th>
<th>FB Name</th>
<th>ANSI Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard configuration</td>
<td>Basic</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>B01</td>
<td>B02</td>
<td>M01</td>
</tr>
<tr>
<td>Basic B01 &amp; B02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium M01 &amp; M02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High H01 – H06 &amp; H08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor protection H07</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Basic B01 & B02
- Medium M01 & M02
- High H01 – H06 & H08
- Motor protection H07
Control Functions

Included control functionality decreases the amount of external components

No extra auxiliary relays are needed for interlockings or control

- Control of one breaker
- Pre-programmed interlocking conditions
- Operation by external push buttons, through communication or via menus
Measurements

Enhanced measuring functions improve the supervision of the process!

- **REX 521 measures:**
  - 3-phase current*
  - Neutral current
  - 3 phase voltage
  - Residual voltage
  - Active / reactive power*
  - Energy
  - Cos fi
  - Frequency
  - Harmonics for currents and voltages
  - Disturbance recorder

* Also mean values
Coming errors/problems in auxiliary equipment can be foreseen with condition monitoring.

- The monitored units are:
  - Current transformers
  - Voltage transformers
  - Trip circuit
  - Circuit breaker
    - Breaker wear
    - Counter
    - Inactive time
    - Travel time
  - Running time (motor protection)
  - Relay
REX 521 combined with sensors:

- Less engineering time as you have two universal versions to choose from
- Human safety improved, through low voltage levels
- Accuracy at high current
- Compact design, enabling easy installation
Communication Benefits

Information available through communication:

- Set values
- Measured values
- Registered values / events
- Uploading of disturbance recorder data
- Control
- Setting banks
Communication and System Integration

**INBUILT PROTOCOLS IN REX 521**

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Rear port optical</th>
<th>Rear port opto isolated RS-485</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPA</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>LON</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>IEC 60870-5-103</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ModBus (RTU &amp; ASCII)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DNP 3.0</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**WITH ADAPTER**

<table>
<thead>
<tr>
<th>Protocol</th>
<th>ADAPTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProfiBus DPV1</td>
<td>SPA-ZC 302</td>
</tr>
<tr>
<td>IEC 61850-8-1</td>
<td>SPA-ZC 402</td>
</tr>
</tbody>
</table>

**Note!** Only one communication port and protocol can be active at a time (optical front connector can be used simultaneously, naturally).
The REX 521 is suitable for all kinds of switchgear
Saving Engineering Time

Before

After

Switchgear installation space
is reduced
Easy to Set with Graphical Setting Tool

New graphical setting tool in CAP 501 & CAP 505
User Friendliness

Pre-tested in the factory providing ready made test plans
When ordering REX 521 protection relays, specify the following:

- Order number
- Quantity
- Additional language

<table>
<thead>
<tr>
<th>Code</th>
<th>Language combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>FI</td>
<td>English-Finnish</td>
</tr>
<tr>
<td>SE</td>
<td>English-Swedish</td>
</tr>
<tr>
<td>DE</td>
<td>English-German</td>
</tr>
<tr>
<td>ES</td>
<td>English-Spanish</td>
</tr>
<tr>
<td>FR</td>
<td>English-French</td>
</tr>
<tr>
<td>PT</td>
<td>English-Portuguese</td>
</tr>
<tr>
<td>PL</td>
<td>English-Polish</td>
</tr>
</tbody>
</table>

Display language (see the table about display language codes)

- Configuration revision
- Configuration name: B01, B02, M01, M02, H01, H02, H03, H04, H05, H06, H07, H08
- Rear communication: S=SPA/IEC/Modbus/DNP 3.0  L=SPA/IEC/Modbus/DNP 3.0/LON
- Optical connectors for rear communication: P = plastic-fibre, G = glass-fibre
- Power supply: H = PS_87H, L = PS_87L
- Type of hardware: B = Basic, M = Medium, H = High, S = High sensor
- Revision
What It All Comes Down to Is…

- Reduce the need for local adaptations
- Improve efficiency through data information and prevent accidents from happening
- Engineering time is reduced thanks to easy implementation
- Reduce the need for advanced training

We are there for you!