Module and Application Description

PROCONTROL P
Modules of the Turbine Control System

Test and Indicator Unit for Turbine Protection System

89PA31 – E/R0100

Application
The test and indicator unit is used for operating the test program for internal hardware functions which forms part of the turbine protection system.

Features
The module is mounted in a 19", 6 U DIN—standard withdrawable subrack with a female multi–point connector, type F. The module is wire–connected with the system.

Description
The desired functions are selected by means of key switches or pushbuttons. The individual steps of the test are indicated by two–digit LED displays which can be activated by 24 V binary signals using the BCD code.

For the indication of faults detected by the test program, 20 LEDs are available on the module and can be activated by 24 V binary signals.

Annunciations on the module
On the module front, the following indication and actuation elements are mounted:

- One two–digit digital display indicating the test program steps
- One key switch for test program ‘ON’, ‘OFF/QUIT’
  ‘ON’: Test program active.
  For instance, every 5 sec or 60 min, depending on preselection and settings, the internal test routines are run through. As soon as an error is detected, the program is stopped and an alarm signal is put out. The error can be identified with the help of the step displays and the LEDs. The key can be withdrawn in ‘ON’ position only.
  ‘OFF/QUIT’: Test program OFF.
  All indicators are dark.
  Acknowledgement of stopping and resetting to initial state: step 00.

- One pushbutton
  ‘Test program time switch’
  Normal position: at 60 min
  Long–time: ‘60 min’ = 60 min waiting time
  Short–time: ‘5 sec’ = 5 sec waiting time
  Used for trouble–shooting and service activities.

- 20 LEDs
  Indicating errors (= non-fulfilled control condition of the step–by–step program). For each program step, a different display code is applied.
  For example:
  Step 2, lamps 1, 2 and 5 are illuminated
  = in program step 2: checkback signals 1, 2 and 5 have not arrived.

ABB
Function diagram

Terminal designations

All the inputs and outputs of the module are connected via a printed—circuit board to connector X21 (cf. "Mechanical design").

<table>
<thead>
<tr>
<th>Input</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>D C B</td>
<td>4</td>
</tr>
<tr>
<td>L L L</td>
<td>0</td>
</tr>
<tr>
<td>L L H</td>
<td>1</td>
</tr>
<tr>
<td>L H L</td>
<td>2</td>
</tr>
<tr>
<td>L H H</td>
<td>3</td>
</tr>
<tr>
<td>H L L</td>
<td>4</td>
</tr>
<tr>
<td>H L H</td>
<td>5</td>
</tr>
<tr>
<td>H H L</td>
<td>6</td>
</tr>
<tr>
<td>H H H</td>
<td>7</td>
</tr>
<tr>
<td>H L H</td>
<td>8</td>
</tr>
<tr>
<td>H L L</td>
<td>9</td>
</tr>
</tbody>
</table>

*) US = display ON
Mechanical design

Board size: 6 units, 4.5 divisions, 160 mm deep
Connector: to DIN 41 612
1 x 48–pole edge connector, type F
(connector X21)
Weight: approx. 0.51 kg

Contact assignments of connector X21
Cf. Function diagram.

View of module front and module side
Technical data

In addition to the system data, the following values apply:

**Power supply**

- Operating voltage: +24 V, to be fused with ≤ 2 A
- Power dissipation: 2 W

**Input values**

- Indicator LEDs, '0' signal: 0 ... 3 V
- '1' signal: 11.2 ... 30 V (< 25 mA)
- Seven-segment display, BCD code
  - '0' signal: 0 ... 3 V
  - '1' signal: 15 ... 30 V, input resistance: 22 kΩ, segment illuminated in case of '1' signal

**Output values**

- Contact outputs:
  - Switching voltage: < 60 V
  - Switching current: < 1 A
  - Contact rating: < 60 W

**ORDERING DATA**

- Type designation: 89PA31 – E/R0100
- Order number: GKWD981512R0100
- Spare keys
- Order number: GKWD981512P19

Technical data are subject to change without notice!