Tap Position Interface
Type REG-F

Operation
The tap position interface REG-F decodes the position of a tap changer transformer to BCD code. A power supply supports the moving side of a dry contact row with a DC voltage, feeds voltage outputs and 6 relay. REG-F gets the information from this switch and the built-in diode matrix decodes the closed contact out of n to BCD (see code table). At one time only one contact should be closed.

Voltage outputs of REG-F should be wired to BCD inputs of REGSys and 6 relay contacts show the BCD code too.

A capacitor on each input and a coil on DC output U+ enhance the noise suppression.

- up to 33 dry contacts of a switch were decoded to BCD
- 6 output signals show BCD 1..39 or -13..19 steps
- up to 100m cable length between switch and REG-F
- contacts with AC 250V 2A, DC 220V 150W
- wide range power supply for AC & DC

Technical Characteristics
Aplied Rules and Standards
IEC1010, IEC801-1 to 6, VDE0110, VDE0160
electrical noise immunity EN50082-2
electrical noise emission EN50081-2, EN55011

Mechanical Construction
case plug-in module 8T 3U 19"rack
size of pc board 100 x 160mm
front Alu, painted grey RAL 7035
module mounting see DIN 41494 part 5
edge connectors 2 pcs, 'F1': DIN 41612 MH 24+7poles
'F2': DIN 41612 F 48poles
conn. mounting 'F1' at position 'n' and *F2' n plus 5T
protection I P00
weight module ≤ 0,5 kg

Input
voltage out of transformer tap switch
switch closed (AC 45...65 Hz.sinusf.)
  voltage Ue 12 ...100 V AC / DC feature E12
  50 ...250 V AC / DC feature E3
  180 ...240 V DC f. E39 (Re 30kΩ)
switch open
  voltage Ue < 2 V AC / DC feature E12
  < 10 V AC / DC feature E3
  < 60 V DC feat. E39 (Re 30kΩ)

Output
BCD 1...BCD 20, connect to REG-D BCD inputs
- voltage limit <55 V DC ->REG-D LV-input feat.E39
- level = voltage Ue (Diodenmatrix) with feat. E12, E3
supply voltage U+ 15V DC; reference GND;
Output resistance < 300Ω (feature E12)
6 relay, one N/O contact each for BCD code 1..20/sgn; contact closed /open (1) / (0)
insulation between relay contacts and to other circuits AC 250 V
contact rating AC 250V 2A, DC 220V 150W
expected life 10⁴ electrical operations

Code Table

<table>
<thead>
<tr>
<th>Code</th>
<th>1 out of n (only one switch closed)</th>
<th>output: BCD - Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 0 0 0 0 0 1</td>
<td>tap 1</td>
<td>20 4 1 2</td>
</tr>
<tr>
<td>0 0 0 0 1 0 1</td>
<td>tap 2</td>
<td>20 4 1 2</td>
</tr>
<tr>
<td>0 1 0 0 0 0</td>
<td>tap 10</td>
<td>20 4 1 2</td>
</tr>
<tr>
<td>0 1 0 0 0 0 1</td>
<td>tap 11</td>
<td>20 4 1 2</td>
</tr>
<tr>
<td>1 0 1 0 0 0</td>
<td>tap 29</td>
<td>20 4 1 2</td>
</tr>
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<td>1 1 0 0 0 0</td>
<td>tap 30</td>
<td>20 4 1 2</td>
</tr>
<tr>
<td>1 1 0 0 0 1</td>
<td>tap 31</td>
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Electrical Safety
protect.class/ overvoltage categorie I / II
pollution degree / test voltage
between DC voltage U+ to power supply volt. (H1, H2),
to relay contacts,
between power sup. volt. to relay contacts

Power Supply
insulated char. H1 AC 85...240 V / DC 100...264 V
char. H2 AC 20... 60 V / DC 18... 72 V
power consumpt. < 6VA / 6W feat.'E12
DC voltage U+ for tap switch connection, to inp. tap1..33
out of REG-F DC 15 V - feature E12 only
external from tap switch row

Temperature
operation 0 ... +65°C
storage, transportation -25 ... +85°C

Contact Position

connector 'F1' "DIN" 24+7p.

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<td>relay BCD 1</td>
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connector 'F2' "F" 48pol.

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Technical Data REG-F_versionB1_a_English 04.2013
### Technical Data

#### REG-F

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<td>H2</td>
</tr>
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<td>DC voltage U+</td>
<td>out of REG-F at tap 1...33 DC 15 V .</td>
<td>E12</td>
</tr>
<tr>
<td>or ext. power supply</td>
<td>voltage U+ at tap1..33 AC/DC 12 ...100 V</td>
<td>E3</td>
</tr>
<tr>
<td>external</td>
<td>power supply voltage U+ AC/ DC 50 ..250 V</td>
<td>E39</td>
</tr>
<tr>
<td>external</td>
<td>voltage U+(output BCD limited to &lt;55V) DC 180 ..240 V</td>
<td></td>
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#### Application REG-F

**characteristics**
- H1: power supply AC 85 to 240 V
- E1: voltage U+ DC 15 V to tap switch out of REG-F

**Application REG-F**

**characteristics**
- H1: power supply AC 85 to 240 V
- E1: voltage U+ DC 15 V to tap switch out of REG-F

**Application REG-Sys**

**characteristics**
- H1: power supply AC 85 to 240 V
- E1: voltage U+ DC 15 V to tap switch out of REG-F

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On longer distance between REG-F and the tap switch the max. cable length will be less determined by its impedance –see following example-. more important is the noise coupling from parallel mounted energy cables.

REG-F input allows a superimposed AC voltage up to 2 V (char. ‘E12’), 10V (char. ‘E3’) or  60V (Char. ‘E39’).

Because every application has its own earth- and voltage relations, lower input noise (by shields and more distance to parallel cables) allows longer cables. (build-in noise surpression by a capacitor >33nF on each input and a coil in output U+).

**example**

- Cable length 1 wire with 20AWG (0,5mm², 4 copper wires with 0,8mm diameter, shielded)
- \( R_L = \text{distance to tap + switch resist.} = 12 + 3 \Omega \)
- \( l = R \times A / \rho = 12 \times 0.5 / 0.02 = 300 \text{ m} \)