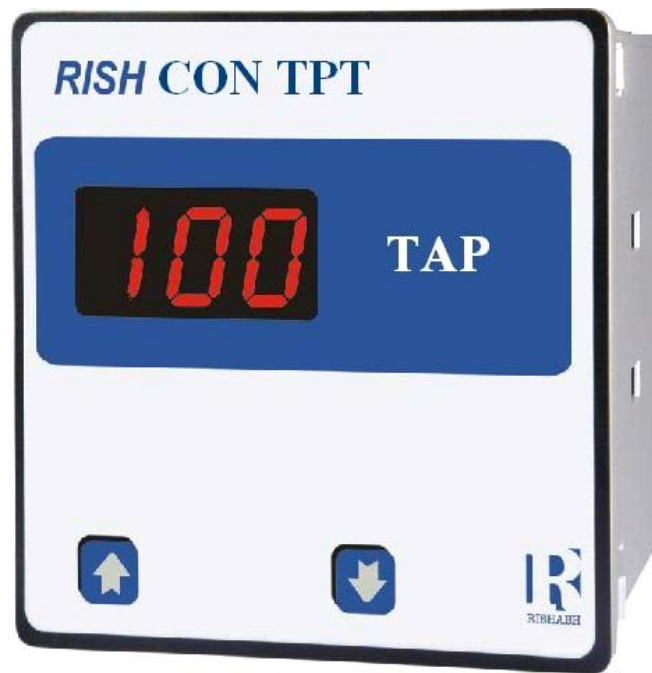


**Data Sheet**

Transducer for measuring  
Tap position Resistance



**RISH CON TPT**

## Application

The purpose of the Tap position transducer is to convert tap position of transformers to equivalent analogue output. Outputs can be given as input to either RTU or indicator or recording instrument.

Input variable and measuring range are programmed with the aid of a PC and the configuration software.

The device has one input channel and two independent outputs and Modbus (RS 485) interface . Input variables and measuring range are also programmable through keys and Modbus .

## Features / Benefits

1. Input measuring range can be programmed using PC (config soft) / Simplifies project planning and engineering (the final range can be determined during commissioning).
2. Input measuring range can be programmed through modbus and keys.
3. Tap number is programmable from 0 to 101 using software.
4. Tap position is displayed on front LED display and on Modbus.
5. Analogue output signal also programmed using the PC (config software) , Modbus and keys.  
(impressed current or superimposed voltage for all ranges between – 20 and + 20 mA DC resp. – 12 and + 15 V DC)
6. Galvanic and optical isolation between Power supply, Input and outputs
7. 3,4 wire measurement to compensate lead resistance automatically.
8. 2 wire measurement with lead resistance compensation through software.
9. Tap counter (number of tap changed) can be viewed on Modbus.

## Function

Tap position transducers receives resistance input, which corresponds to tap position of transformer. Output is proportional to tap position. Tap number is shown on display and modbus. Tap counter increments by one count on tap change (shown on modbus.)

## Electric Isolation

- Electrically isolated analog outputs prevent interference voltage and current. Solves grounding problem in meshed signal networks.
- High electric isolation between input and output – 2.3 kV, and power supply versus all other circuits – 3.7 kV.

## Standards

|   |  |
|---|--|
| Electromagnetic compatibility                 | Acc. to IEC 61326-1<br>IEC 61000-4-3, Level 3<br>IEC 61000-4-4, Level 3  |
| Protection (acc. to IEC 60529 resp EN 60 529) | For Front enclosure : IP50<br>For terminals side: IP20 as per IEC60529.  |
| Electrical standards                          | Acc. to IEC 1010 resp. EN 61010  |
| Over voltage category                         | Acc. to IEC 664:<br>III for power supply.<br>II for measuring input and measuring output.  |
| Double Insulation                             | - Power supply versus all other circuit.<br>- Measuring input versus measuring output.   |
| Test Voltage                                  | Power supply versus:<br>-All 3.7 kV, 50 Hz 1 min<br>Measuring inputs versus :<br>-Measuring output<br>2.3 KV ,50 Hz 1min<br>Measuring output1 versus<br>-Measuring output2<br>500 V,50 Hz 1min |
| Common mode voltage                           | 100V   |
| Pollution degree                              | 2  |

## Technical Data

### Measuring Input

| Measured Variable     | Measuring ranges |           |           |
|-----------------------|------------------|-----------|-----------|
|                       | Limits           | Min. span | Max. span |
| Low Resistance Range  | 0...3700         | 500       | 3700      |
| High Resistance Range | 0...25000        | 500       | 25000     |

Measuring current : = 0.081 mA for measuring range 0...3700 .  
or  
= 0.012 mA for measuring range 0...25000 .

### Output Signals: Output1 and Output 2

DC current: Standard ranges: 0-20 mA or 4 – 20 mA  
Non-standard ranges: -20 to +20 mA  
Min. Span 5 mA  
Max Span 40 mA  
Burden voltage: Negative > -19 V  
Positive < 22 V  
External Resistance -12V / IAN (mA)  
Rext max. [kΩ] = 15V/IAN (mA) OR IAN (mA) =Full scale current  
DC Voltages Standard ranges: 0-5V, 1-5V, 0-10 V, 2–10 V  
External Resistance Rext min. [kΩ] = UA (V)/2 mA  
UA (V)= 15V or -12V  
Residual ripple in Output current < 0.5% p.p.  
Response time < 4 s

Power supply: 60 ... 230...300 VAC/VDC (45...66 Hz)

Power consumption: <3W or <4.7 VA  
Mounting: Panel Mounting.  
Mounting Position: Any

### Accuracy Data (Acc to IEC 60688)

Basic Accuracy: ± 0.2% of range  
Reference Conditions Ambient temperature: 23 °C ± 2K  
Nominal value of Aux supply voltage: 230V 50Hz or 60 Hz AC/DC

Output burden for Curr. OP : 0.5 \* Rext max.  
Output burden for Volt. OP : 2 \* Rext min.

### Influence factors:

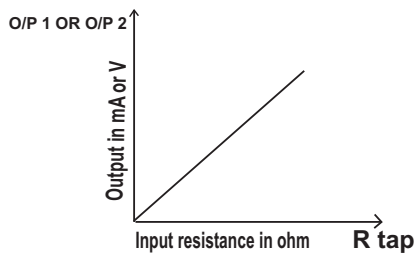
Temperature: ± 0.15% per 10 K  
Burden influence: < ±0.1 % for current output  
< ±0.1 % for voltage output

Magnetic field: < ±0.2 % (400 A/T)

## Regulations

|                               |  |
|-------------------------------|--|
| Electromagnetic Compatibility | Acc. to IEC 61326-1<br>IEC 61000-4-3, Level 3<br>IEC 61000-4-4, Level 3<br>Severity 50 G |
| Shock Resistance              | IEC 60068-2-27, Min.<br>Severity 50 G  |
| Vibration Strength            | IEC 60068-2-6, 10-150-10 Hz,<br>0.15mm, 2G   |
| Electrical standards          | Acc. to IEC 1010 resp. EN<br>61 010  |
| Operating voltages            | <300 V between all<br>Insulated circuits   |
| Climatic rating               | Climate case 3Z acc. to VDI<br>/ VDE 3540  |
| Nominal range of use:         | 0 ...23...45 °C (Usage Group II)   |
| Operating temperature:        | -20 to 65 °C   |
| Storage temperature:          | -40 to 70 °C   |
| Annual mean relative humidity | < 75% standard Climatic<br>rating.   |

## Output characteristics



## Connection Diagram

Fig A shows Input and output connections, Auxiliary power supply and modbus Connections.

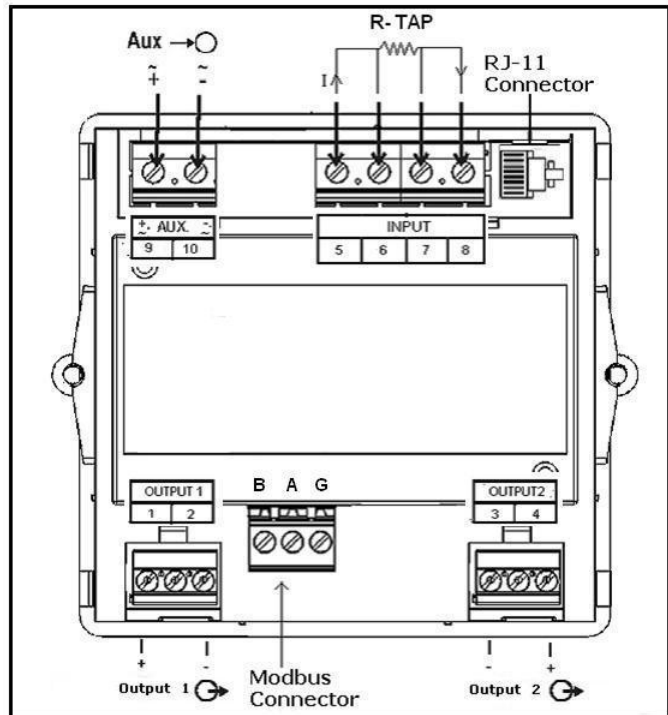


Fig A

Table: Alternative connection types

| Measurement                                     | Measuring range limit     | Measuring span                  | No. | Wiring diagram |
|---|---------------------------|---------------------------------|-----|----------------|
| Resistance measurement<br>Two-wire connection   | 0...3700Ω /<br>0...25000Ω | 100 ...3700Ω /<br>500 ...25000Ω | 1   |                |
| Resistance measurement<br>Three-wire connection | 0...3700Ω /<br>0...25000Ω | 100 ...3700Ω /<br>500 ...25000Ω | 2   |                |
| Resistance measurement<br>Four-wire connection  | 0...3700Ω /<br>0...25000Ω | 100 ...3700Ω /<br>500 ...25000Ω | 3   |                |
| Resistance<br>Transmitter WF                    | 0...3700Ω /<br>0...25000Ω | 100 ...3700Ω /<br>500 ...25000Ω | 4   |                |
| Resistance<br>Transmitter WF DIN                | 0...3700Ω /<br>0...25000Ω | 100 ...3700Ω /<br>500 ...25000Ω | 5   |                |

## Ordering Information

PRODUCT NAME- INPUT RANGE CODE-MODBUS-OUTPUT1 RANGE CODE- OUTPUT2 RANGE CODE AUXILLARY SUPPLY

1) Product Name :- TPT 96X96

2) Standard input range codes:-

| Input resistance<br>(K $\Omega$ ) | Ordering<br>Code |
|-----------------------------------|------------------|
| 0.....25                          | 1                |
| 0....20                           | 2                |
| 0.....18                          | 3                |
| 0.....17                          | 4                |

3) Tap Position Indicator

| Modbus Ordering | Code |
|-----------------|------|
| With Modbus     | 1    |
| Without Modbus  | 2    |

4) Standard output1 range codes:-

| Current<br>(mA) | Ordering<br>Code | Voltage<br>(V) | Ordering<br>Code |
|-----------------|------------------|----------------|------------------|
| 0.....20        | 1                | 0.....10       | 3                |
| 4.....20        | 2                | 2.....10       | 4                |

5) Standard output2 range codes :-

| Current<br>(mA) | Ordering<br>Code | Voltage<br>(V) | Ordering<br>Code |
|-----------------|------------------|----------------|------------------|
| 0.....20        | 1                | 0.....10       | 3                |
| 4.....20        | 2                | 2.....10       | 4                |

6) Auxiliary supply voltage

| Auxiliary supply | Ordering Code |
|------------------|---------------|
| 60 ...300V AC/DC | H             |
|                  |               |

Example:-

To order model of 0 to 25 K $\Omega$  input , with Modbus, output1 0 to 10V , output2 4 to 20 mA and auxiliary supply 60 to 300 V AC DC, ordering information will be as follow :-  
TPT 96X96-1-1 -3-2-H



**RISHABH**  
INSTRUMENTS  
Measure, Control & Record with a Difference

**RISHABH INSTRUMENTS PVT.LTD.**  
F-31, MIDC, Satpur, Nashik-422 007, India.  
Tel.: +91 253 2202160, 2202202 Fax : +91 253 2351064  
E-mail : India :- marketing@rishabh.co.in  
International :- exp.marketing@rishabh.co.in  
Web-site : www.rishabh.co.in