

# INSTRUCTION MANUAL



## **DIGITAL TAP POSITION INDICATOR** **TP-3XX**

**BELLTEK**

**SHAKTI TRANS CONTROL,**

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## 1. INTRODUCTION:

- Shakti Trans Control's Microcontroller based Digital TAP Position Indicator type TP-3XX is a used to indicate the Tap Position of Power Transformer
- Resistors are connected between each Tap on the tap-changer. The connections from the Minimum, Maximum and Wiper Positions coming from the Tap Changer are connected the respective Min, Max and Com Terminals marked on the Rear Panel of the TPI
- When the unit is powered on, the display indicates the current position of the Tap-changer. As the tap is increased, the display increases and decreases as the tap is decreased. Check the TPI by changing the tap from position min to the max. position and confirm reads correctly
- For 4-20mA Output, if required, adjust the output current by changing the count in 4-20mA O/P calibration mode as shown in step 4
- If Max Tap is other than 17, Adjust it in settings parameter mode as shown in Point 3

## 2. TECHNICAL SPECIFICATIONS:

- No of Tap Positions : Up to 35 Taps (Default 17 Taps)
- Type of Sensor : 1 K Ohms / Step Resistance
- Analog Output : 4-20mA Dual Output (Isolated or Non-Isolated)
- Display Format : 3-Digit 7-Segment LED 12.7mm High Red Display
- Power Consumption : < 1W
- Accuracy : +/- 0.5%
- Size : 96mm x 96mm
- Panel Cutout : 90mm x 90mm
- Depth : 75mm
- Operating Temperature : 0 – 50°C
- Auxiliary Supply : 85V - 265V AC and 70 - 430VDC

## 3. TAP PARAMETER PROGRAMING STEPS:

SETTING PARAMETER	DISPLAY	KEY PRESS			DESCRIPTION
		PRG/ ENT	INC	DEC	
Program MAX TAP	"MtP"	<input checked="" type="checkbox"/>	-	-	"Long Press PRG" Key to enter
	"017"		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Default TAPS is set at 17, Press Inc/Dec to increase or decrease to the required TAPS (From 1 to 35 TAPS)
		<input checked="" type="checkbox"/>			Press 'ENT' Key to jump to Time Delay Setting and Store the Parameter into Non-Volatile Memory
Program Time Delay	"tdL"	<input checked="" type="checkbox"/>			"Time Delay" is delay in TAP VALUE updates on display. Press Inc/Dec Key to exit
	"004"		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Default Time Delay is 4 Seconds, can be set from 4 to 99 Seconds
		<input checked="" type="checkbox"/>			Press 'ENT' Key to jump to Modbus ID if RS485 is present or else exit and Store the Parameter into Non-Volatile Memory
EXIT FROM MENU	"dnE"	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Exit from Setting Menu

## 4. TAP OUTPUT CALIBRATION STEPS:

CALIBRATION PARAMETER	DISPLAY	KEY PRESS			DESCRIPTION
		PRG/ ENT	INC	DEC	
	"CAL"		<input checked="" type="checkbox"/>		"Long Press INC" Key to enter Calibration Mode
4-20mA Current OP1_ 4mA Calibration	"4 1"	<input checked="" type="checkbox"/>		-	Put TAP Wiper to Min TAP Value (1) and Press Enter, Press Inc/Dec Key to exit
	"001"		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Increase or decrease the Parameter Value to set 4mA at Current Output -1
		<input checked="" type="checkbox"/>			Press 'ENT' Key to jump to next Parameter
4-20mA Current OP1_ 20mA Calibration	"201"	<input checked="" type="checkbox"/>			Put TAP Wiper to MAX TAP Value and Press Enter, Press Inc/Dec Key to exit
	"017"		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Increase or decrease the Parameter Value to set 20mA at Current Output -1
		<input checked="" type="checkbox"/>			Press 'ENT' Key to jump to next Parameter,
4-20mA Current OP2_ 4mA Calibration	"4 2"	<input checked="" type="checkbox"/>		-	Put TAP Wiper to Min TAP Value (1) and Press Enter, Press Inc/Dec Key to exit
	"001"		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Increase or decrease the Parameter Value to set 4mA at Current Output -2
		<input checked="" type="checkbox"/>			Press 'ENT' Key to jump to next Parameter
4-20mA Current OP2_ 20mA Calibration	"202"	<input checked="" type="checkbox"/>			Put TAP Wiper to MAX TAP Value and Press Enter, Press Inc/Dec Key to exit
	"017"		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Increase or decrease the Parameter Value to set 20mA at Current Output -2
		<input checked="" type="checkbox"/>			Press 'ENT' Key to jump to next Parameter,
EXIT	"dnE"	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Exit from Calibration Menu

## 5. TERMINAL CONNECTION DIAGRAM:



TERMINAL NO.	FUNC	TERMINAL NAME	CONNECTION
1	4-20mA OP-1	1+	4-20mA Output -1
2		1+	
3	4-20mA OP-2	2+	4-20mA Output -2
4		2-	
5	RS-485	A	RS485 - A/D+
6		B	RS485 - B/D-
7		G	RS485 - G (Ground)
8	TAP Connections	MAX	Maximum TAP Wire
9		WTP	Wiper TAP Wire
10		MIN	Minimum TAP Wire
11	AUX SUPPLY	LINE	85-300VAC / 70 - 430VDC Auxiliary Supply
12		NEUTRAL	
13		EARTH	

## 6. ORDERING CODE:

TP-3XX: TP – TAP Indicator, 3 – TAP Code, XX – Input Type and Output Type

MODEL NO	Input Type		OUTPUT Type		
			NON-ISOLATED	ISOLATED	
	Resistance	4-20mA	4-20mA	Isolated 4-20mA	Isolated 485
TP- 310	✓		-		
TP- 311	✓		✓		
TP- 314	✓		-	✓	
TP- 315	✓			✓	✓
TP- 320		✓	-		
TP- 321		✓	✓		
TP- 324		✓	-	✓	
TP- 325		✓		✓	✓

## 7. WARRANTY:

This product from SHAKTI TRANS CONTROL is warranted against defects in materials and workmanship for a period of 12 months from the date of despatch to the first buyer/purchaser of this equipment. This warranty is limited to the warranties provided to SHAKTI TRANS CONTROL on the components used in the equipment.

During the warranty period, SHAKTI TRANS CONTROL will, at its discretion, repair or replace any product that is found to be defective, provided it has been used with reasonable care and in accordance with the manuals and product specifications. This warranty does not apply to defects or damages occurring in transit or resulting from mishandling, misuse, unauthorized modifications or repairs, operation outside the specified environmental or electrical limits, improper or inadequate maintenance, or site conditions that do not meet the recommended requirements, as well as damages arising from accidental or abnormal causes.

The warranty period for repaired or replaced items will not exceed the original warranty period of the equipment. The liability of SHAKTI TRANS CONTROL to the purchaser shall not, under any circumstances, exceed the original purchase price of the equipment.

For warranty service or repair, the equipment must be returned to SHAKTI TRANS CONTROL, securely packed on a freight-paid basis and accompanied by a certificate stating that the equipment is being returned for warranty repair. The purchaser must also include details of the purchase (name and address of purchaser, invoice number, and date of purchase) along with a description of the equipment failure, fault conditions, and any other information that may assist in early diagnosis and repair.

Return of the repaired equipment can be arranged upon payment of packing and forwarding charges and any other applicable taxes, duties, or miscellaneous expenses incurred. Alternatively, the purchaser may collect the equipment directly from SHAKTI TRANS CONTROL. If the repairs are not covered under warranty, all applicable charges must be paid before the equipment is released.

Engineer services are available on-site for instruments both within and outside the warranty period, on a chargeable basis. Details are available upon request.

In the interest of continuous development and improvement, SHAKTI TRANS CONTROL reserves the right to amend the information contained in this publication without prior notice. SHAKTI TRANS CONTROL shall not be held legally liable for any errors, omissions, or amendments.