

TTRM 301 TTRM 302 Transformer Turns Ratio Meter



The Product

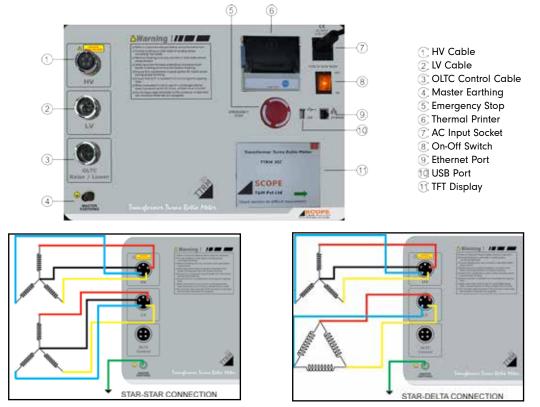
TTRM 301 / 302 Transformer Turns Ratio Meter

SCOPE introduces state of the art precision three phase Transformer Turns Ratio Meter (TTRM) designed for field testing as well as factory testing of power transformers, instrument transformers and distribution transformers of all types. TTRM 301 measures only truns ratio where as TTRM 302 along with turns ratio, measures ratio deviation, phase angle deviation, magnetizing current and detects tap-position of single as well as three phase transformers in charged switchyard condition. TTRM 302 has facility to automatically detect vector group of all majority configurations available. The range of AC voltage selection offers high accuracy in measurement. Both the instrument have in-built TFT display with touch screen and thermal printer. The user friendly, simple instrument makes the testing more easy. With the touch keypad it is possible to enter required DUT information. The ratio results of all the phases are displayed in tabular form with % error. Internal non-volatile memory gives the provision of storing test results. Further data can be downloaded to PC or copied to memory stick through USB port provided.

The CTrans-TTRM software, gives the flexibility to download the stored results to PC and do the further analysis and report generation.

The Measurement

- **Turns Ratio**: The performance of a transformer mainly depends upon accuracy of specific turns or voltage ratio of transformer. So transformer ratio test is an essential test of transformer. The voltage should be applied only in the high voltage winding in order to avoid unsafe voltage. In service, insulation around windings can become damaged or deteriorated from number of causes including spikes, surges, faults, contamination and transport. Insulation damage can short the turns resulting in lower number of turns. Ultimately the voltage will deviate from the voltage mentioned on nameplate of transformer. So turns ratio is maintenance tool which will indicate the condition of insulation between windings of transformer. TTRM measures the Turns ratio and directly displays in tabular form.
- **Phase angle deviation:** The phase difference between high voltage and low voltage windings of single phase is measured. Any deviation in phase indicates the fault in the transformer winding. The instrument has wide range of phase angle deviation measurement with highest accuracy.
- Magnetizing current: Magnetizing current test of transformer is performed to locate defects in the
 magnetic core structure, shifting of windings, failure in turn to turn insulation or problem in tap changers.
 These conditions change the effective reluctance of the magnetic circuit, thus affecting the current required to
 establish flux in the core. If the measured exciting current value is higher than the value measured during
 factory test, there is likelihood of a fault in the winding which needs further analysis.
- Vector Group: In three phase transformer, it is essential to carry out a vector group test of transformer. Proper vector grouping in a transformer is an essential criterion for parallel operation of transformers.





Special Features

- Different voltage ranges provided for more accurate results
- 5.7" TFT display with touch screen and simple menus to operate TTRM.
- Facility to configure transformer ID and details
- Automatic OLTC operation for tap change
- Date and time stamping to results.
- In-build memory to store the test results.
- Thermal printer to take quick print out for record.
- Ethernet port for PC interface to transfer records to PC Software.
- Mass storage device (USB 2.0) interface for copying records in pen drive.
- Lightweight, portable instrument household in rugged moulded case

Software Features

CTrans TTRM

This is windows based software enables uploading of Transformer IDs and its details to instrument & downloading of test results from instrument to PC. Instrument is connected to PC using Ethernet cable. So once the software is installed on PC, instrument can be directly connected without wasting any time. Library of various Transformer IDs is generated in software. Once you create the Transformer ID all result taken in future on that Transformer will be listed down under same ID created in software. The report generation for the tests taken is also possible. This report can be exported to various formats like PDF, Microsoft Excel, Microsoft Word, HTML, etc. and also can be printed.

NICH				3	PHASE	TRAN	SFORM	ER RE	SULT						
	Header														
	Location			AV VIITAGE		460/MV		(AU	TO Thereit	100					
	Ð	LV VORIDE				130.8'5'		1	No Of Taxe			10			
	1.55/														
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	1	81-45-3470 12:34/34 ant	1.8200	3,704	8.1	-128.0	1.8030	-1.794	8.1	379.70	14202	3.794	0.1	-176.70	
	1.1	0143 1970 1236-01 pm	1.8273	4.508	81	1298.94	5.8270	4.518	8.1	128.00	\$.8273	4.518	0.1	179.49	
	- A -	10-41-1070 \$2:07.00 are	1.4225	-5.000	81	49.0	5.8026	-5.500	84.	-179.66	1.8229	-3.690	0.1	-179.00	
	- 5	02-02-08/0 12:30-06 am	1.8264	+4.334	- 81	127836	3.8964	-4.334	8.1	-178.66	1.8264	-4,734	6.1	-429.66	
		01-01-1870 12-00-37 am	1.0294	-3.111	84	-119.05	1.0201	-3.512	8.1	-179.06	1.004	-3.512	9.1	-1/9.05	
	7	9242-2919 22-4206 am	1.8219	16.625	8.4	478.63	1.8276	-1.434	+1	1279-03	\$ 8379	18,900	4.8	1279.83	
		VE-EE-1970 EE-R0-20 am	1,6212	-0.621	84	-178.84	1.0251	-6.821	82	-178.02	1.0252	-6.631	4.1	-179.62	
		00-01-1410 12-41(0) am	1.8217	1.301	- 8.2	12/8/20	1.8737	6.391	0.1	428.70	3,8237	10.301	1.0	-174.78	

TTRM Test Report

			TTRM 302 TEST REPORT										SCOI TAM PVI	
HEADER :														
Location LONIKAND			HV Vs	Rage			400 kV	400 kV						
ID PARALI_IN				LV VM	tage			220 kV						
Sr No 432			43242				Phases			Three Pt	tese			
Make AF			AREVA				Group			YNyn0				
AUTO Transformer			Yes				Test Voltage				10 V			
No of Taps 17			17	7 Test Type						AUTO Test				
U			U	v				w						
Tap Position	Test Date Time	Ratio	% Error	Excitation Current (mA)	Phase Deviation (Deg)	Ratio	% Error	Excitation Current (mA)	Phase Deviation (Deg)	Ratio	% Error	Excitation Current (mA)	Phase Deviation (Deg)	
1	01-01-1970 12:33:03 am	1.8364	-8.181	0.1	-178.68	1.8364	-8.181	0.1	-178.68	1.8364	-8.181	0.1	-178.68	
2	01-01-1970 12:34:34 am	1.8232	-7.794	0.1	-179.70	1.8232	-7.794	0.1	-179.70	1.8232	-7.794	0.1	-179.70	
э	01-01-1970 12:36:05 am	1.8273	-6.508	0.1	-179.69	1.8273	-6.508	0.1	-179.69	1.8273	-6.508	0.1	-179.69	
4	01-01-1970 12:37:35 am	1.8206	-5.600	0.1	-179.66	1.8236	-5.600	0.1	-179.66	1.8296	-5.600	0.1	-179.66	
5	01-01-1970 12:39:06 am	1.8264	-4.334	0.1	-179.66	1.8264	-4.334	0.1	-179.66	1.8264	-4.334	0.1	-179.66	
6	01-01-1970 12:40:37 am	1.8194	-3.552	0.1	-179.68	1.8194	-3.552	0.1	-179.68	1.8194	-3.552	0.1	-179.68	

TTRM 301 / TTRM 302

Specifications

1 Ratio 0.8000 - 9.9999 0.0001 0.05 9 10 V 10000 - 99.999 0.01 0.05 9 1000.0 - 1500.0 0.1 0.05 9 100.0 - 999.99 0.01 0.05 9 100.0 - 1500.0 0.1 0.05 9 100.0 - 1500.0 0.1 0.05 9 100.0 - 1500.0 0.1 0.05 9 100.0 - 999.99 0.001 0.05 9 100.0 - 999.99 0.001 0.05 9 100.0 - 999.99 0.001 0.05 9 100.00 - 99.99 0.001 0.05 9 100.00 - 99.99 0.01 0.05 9 100.00 - 99.99 0.01 0.05 9 100.00 - 13000 1 0.25 9 100 V 1000 - 13000 1 0.05 9 100 V 1000 - 99.99 0.01 0.05 9 100 V 1000.0 - 99.99 0.01 0.05 9 100 V 1000.0 - 13000 1 0.25 9 100 V 2000 mA 0.1 mA 1 m 100 V			er	Test Voltage	Range	Resolution	Accuracy					
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$\begin{tabular}{ c c c c c }\hline \hline $13001 - 20000 & 1 & 0.20 & 1 \\ \hline $13001 - 20000 & 1 & 0.1 & $$M$ $$A$ & 1 & $$m$ $$1$ & $$						0.1	0.15 %					
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No of channels Three HV channels and three LV channels Test Voltages 10V, 40V and 100V AC selectable voltages Measurements Ratio, Ratio error Ratio, Excitation current, vector		3		10V / 40V / 100 V	± 180 Degree	0.01 Degree ± 0.05 Degre						
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Measurements Ratio, Ratio error deviation, Excitation current, vector	jes	Test		10V, 40V and 100V AC selectable voltages								
OLTC Control Raise and Lower control to operate OLTC	ents	Meo		Ratio, Ratio error Ratio, Ratio error, Phase deviation, Excitation current, vector of								
	rol	OLTC Control		Raise and Lower control to operate OLTC								
Test Results Display (TFT) display, Thermal Printer.	s Display	Test Results Display		(TFT) display, Thermal Printer.								
Test Leads Suitable to test EHV Transformers		Test Leads		Suitable to test EHV Transformers								
Printer Inbuilt Thermal Printer		Prin		Inbuilt Thermal Printer								
Paper Thermal, 58 mm wide roll form	Paper			Thermal, 58 mm wide roll form								
Memory Inbuilt memory, can store 1000 records, with date and time stamping. USB copy record in pen drive		Mer	Inb	Inbuilt memory, can store 1000 records, with date and time stamping. USB port to copy record in pen drive								
Power (110V ± 15%) / (60Hz ± 10%) OR (230V ± 15%) / (50Hz ± 10%), 75VA.	Power											
Communication Port Ethernet port.	ation Port	Communication Port										
Housing Fitted in moulded case		Hou		Fitted in moulded case								
Environment 20°C to 55°C 95%RH (non-condensing) Electrical noise normally found in ch EHV switchyards	nt	Envi	20	20°C to 55°C 95%RH (non-condensing) Electrical noise normally found in charged EHV switchyards								
Dimensions 435 X 315X 175 mm. (Max.)	Dimensions				435 X 315X 17	5 mm. (Max.)						
Weight 10 Kg Approx	S											



Benefits

- Measurement of ratio of all the phases in single test with % error
- Automatic operation of OLTC and ratio calculation at all the taps and tabular result printing
- Complete analysis of transformer with phase angle deviation, magnetising current measurement and tap position detection (Only in TTRM 302).
- Automatic vector group detection of generally available three phase transformers (Only in TTRM 302).
- Simple and easy to use due to TFT display and touch screen.
- Advanced microprocessor offers latest features to user.
- Result storage, downloading to PC ensures proper data maintenance.

Ordering Information

Description	Std Qty
Standard Accessories	
HV Cable, 15m long	1 No
LV Cable, 15m long	1 No
OLTC Command cable, 10m long	1 No
Master Earthing Cable, 7m long	1 No
Ethernet Cable, 2m long	1 No
Thermal Printer Paper roll	1No
Soft carrying bag for instrument and test lead set	1 No each
Mains cable, 3m long	1No
Operation cum instruction manual	1 No
Factory test & Calibration Certificate	1 No
Warranty Certificate	1 No
Communication & Data Downloading Software in CD media	1 No
Optional Accessories	
HV Extension Cable, 10m long	1 No
LV Extension Cable, 10m long	1 No

Generation, Transmission, Distribution, Industry ...



Corporate Office

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