

SCOPE

TTRM 302 Transformer Turns Ratio Meter



The most advanced Automatic Transformer Turns Ratio Meter ...TTRM

The Product

TTRM 302 - Transformer Turns Ratio Meter

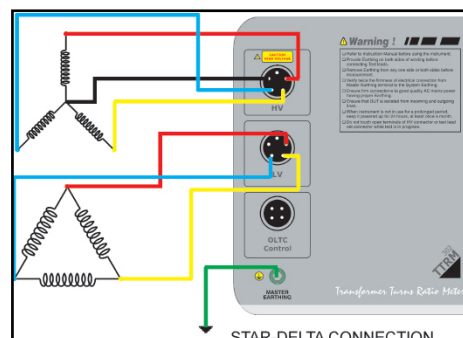
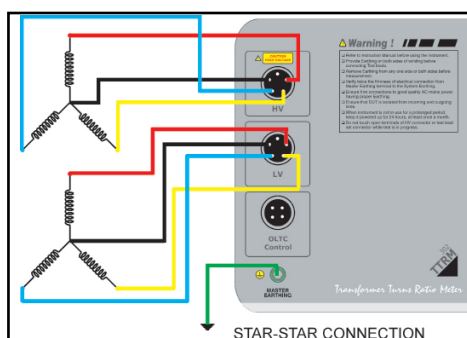
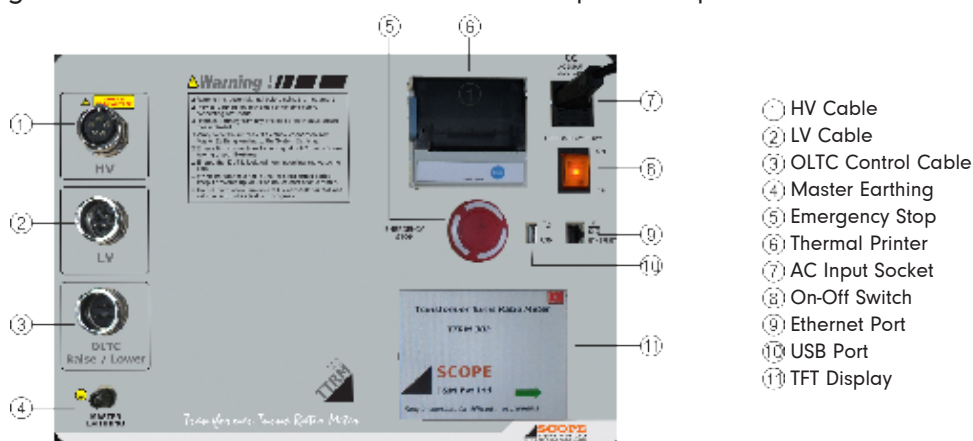
SCOPE's state of the art precision three phase Transformer Turns Ratio Meter (TTRM) designed for field testing as well as factory testing of power transformers, instrument transformers and distribution transformers of all types. TTRM 302 measures ratio deviation, phase angle deviation, magnetizing current and detects tap-position of single as well as three phase transformers in charged switchyard condition along with turns ratio. TTRM 302 has facility of automatically detecting vector group of all majority configurations available. The range of AC voltage selection offers high accuracy in measurement.

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 a 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 the measuring terminal insulation around windings can get damaged or deteriorated over time due to various causes including electrical stress, 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 TTRM 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:** 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 accurate results
- 5.7" TFT display with touch screen and simple menus
- Facility to enter transformer ID and details
- Automatic OLTC operation for tap change
- Date and time stamping of results
- In-built memory to store test results
- In-built Thermal printer to take quick print out for record
- Ethernet port for PC interface to transfer records to CTrans-TTRM Software
- Mass storage device (USB 2.0) interface for copying records in pen drive
- Lightweight, portable instrument house-hold in a 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. The instrument is connected to PC using Ethernet cable. 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, MS Excel, MS Word, HTML, etc. and also can be printed.

3 PHASE TRANSFORMER RESULT

Header

Location	LONIKAND	HV Voltage	400 kV	AUTO Transformer	Yes
ID	PARALI_IN	LV Voltage	220 kV	No Of Taps	17
Sr No	43242	No of Phases	Three Phase	Test Voltage	10 V
Make	AREVA	Vector Group	YNyn0		

Tap Position	Test Date Time	U				V				W			
		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 12:23:03 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 12:24:34 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
3	01-01-1970 12:26:05 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 12:27:35 am	1.8236	-5.600	0.1	-179.66	1.8236	-5.600	0.1	-179.66	1.8236	-5.600	0.1	-179.66
5	01-01-1970 12:29:06 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
7	01-01-1970 12:42:08 am	1.8278	-1.024	0.1	-179.63	1.8278	-1.024	0.1	-179.63	1.8278	-1.024	0.1	-179.63
8	01-01-1970 12:43:38 am	1.8252	-0.851	0.1	-179.62	1.8252	-0.851	0.1	-179.62	1.8252	-0.851	0.1	-179.62
9	01-01-1970 12:45:09 am	1.8237	0.305	0.1	-179.70	1.8237	0.305	0.1	-179.70	1.8237	0.305	0.1	-179.70

TTRM Test Report

TTRM 302 TEST REPORT

HEADER :

Location	LONIKAND	HV Voltage	400 kV
ID	PARALI_IN	LV Voltage	220 kV
Sr No	43242	No of Phases	Three Phase
Make	AREVA	Vector Group	YNyn0
AUTO Transformer	Yes	Test Voltage	10 V
No of Taps	17	Test Type	AUTO Test

RESULT :

Tap Position	Test Date Time	U				V				W			
		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 12:23:03 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 12:24:34 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
3	01-01-1970 12:26:05 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 12:27:35 am	1.8236	-5.600	0.1	-179.66	1.8236	-5.600	0.1	-179.66	1.8236	-5.600	0.1	-179.66
5	01-01-1970 12:29:06 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

Specifications

Sr no.	Parameter	Test Voltage	Range	Resolution	Accuracy
1	Ratio	10 V	0.8000 - 9.9999	0.0001	0.05 %
			10.000 - 99.999	0.001	0.05 %
			100.00 - 999.99	0.01	0.05 %
			1000.0 - 1500.0	0.1	0.05 %
			1500.1 - 2000.0	0.1	0.1 %
			2000.1 - 4000.0	0.1	0.2%
		40 V	0.8000 - 9.9999	0.0001	0.05 %
			10.000 - 99.999	0.001	0.05 %
			100.00 - 999.99	0.01	0.05 %
			1000.0 - 4000.0	0.1	0.05 %
			4000.1 - 9999.9	0.1	0.25 %
			10000 - 13000	1	0.25 %
		100 V	0.8000 - 9.9999	0.0001	0.03 %
			10.000 - 99.999	0.001	0.03 %
			100.00 - 999.99	0.01	0.05 %
			1000.0 - 4000.0	0.1	0.05 %
			4000.1 - 9999.9	0.1	0.15 %
			10000 - 13000	1	0.15 %
13001 - 20000	1		0.20 %		
2	Excitation Current	10 V	2000 mA	0.1 mA	± 1 mA
		40 V	500 mA	0.1 mA	± 1 mA
		100 V	200 mA	0.1 mA	± 1 mA
3	Phase Deviation	10V / 40V / 100 V	± 180 Degree	0.01 Degree	± 0.05 Degree

Parameters	TTRM 302
No of channels	Three HV channels and Three LV channels
Test Voltages	10V, 40V and 100V AC selectable voltages
Measurements	Ratio, Ratio error, Phase Angle Deviation, Excitation current, Vector group
OLTC Control	Raise and Lower control to operate OLTC
Test Results Display	(TFT) display, Thermal Printer
Test Leads	Suitable to test EHV Transformers
Printer	Inbuilt Thermal Printer
Paper	Thermal, 58 mm wide roll form
Memory	Inbuilt memory, can store 1000 records, with date and time stamping. USB port to copy record to pen drive
Power	(110V ± 15%) / (60Hz ± 10%) or, (230V ± 15%) / (50Hz ± 10%), 75VA.
Communication Port	Ethernet port, USB
Housing	IP 65 rated moulded case
Operating Environment	-20°C to +55°C, 95%RH (non-condensing)
Storage Environment	-40°C to +60°C, 95%RH (non-condensing)
Dimensions	435 X 315X 175 mm. (Max.)
Weight	10 Kg Approx

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
- Automatic vector group detection of generally available three phase transformers.
- 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

Standard Accessories

Description	Std Qty
HV Cable, 10/15/20 m long	1 No
LV Cable, 10/15/20 m long	1 No
OLTC Command cable, 10m long	1 No
Master Earthing Cable, 7m long	1 No
Mains cable, 3m long	1No
Ethernet Cable, 2m long	1 No
Thermal Printer Paper roll	1No
Soft carrying bag for instrument and test lead set	1 No each
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

Ordering Code

Example: TTRM 302

N F F F F N F F M R I N

TTRM 302

F F F F F F F

N	None											None	N
1	Magnetic Balance Test											Customised	Z
F	Reserved											Indian Plug	I
F	Reserved											Universal Plug	U
F	Reserved											230V ± 15%, 50/60Hz AC Input	R
F	Reserved											110V ± 15%, 50/60Hz AC Input	Q
N	None											10m Test Lead Set	S
Z	Customised											15m Test Lead Set	M
F	Reserved											20m Test Lead Set	L
F	Reserved											Customized Test Lead Set	Z

Generation, Transmission,
Distribution, Industry ...

... there is **SCOPE**
always!

Corporate Office

402, Aurus Chambers, Annex-A,
S.S.Amrutwar Marg, Worli,
Mumbai 400013, INDIA
Phone : +91 22 4344 4244
Fax : +91 22 4344 4242
Email : marketing@scopetnm.com

Works & After Seles

EL 31/11, 'J' BLOCK,
MIDC Bhosari,
Pune 411026, INDIA
Phone : +91 20 6733 3999
Fax : +91 20 6733 3900
Email : works@scopetnm.com

Simple solutions for difficult measurements®

SCOPE
T & M Pvt Ltd