TNM 96P - Multimeter



- Fast and Easy Installation on panel with self clicking
- True RMS measurement
- 3 Line 4 Digits ultra bright LED Display (up to 9999)
- On site Programmable CT/PT Ratios
- User selectable CT Secondary 1A/5A
- User selectable PT Secondary from 100 VLL to 500 VLL
- User selectable 3ph3wire / 3ph4wire / single phase Network
- Two auxillary Power Supply available 40V 300V AC/DC or 12V 48V DC.
- Storage of MIN / MAX values
- Measurement and Display of RPM, Run hours, On hours, No. of interruption

The TNM96P measures important electrical parameters in 3 phase 4 Wire and 3 phase 3 Wire Network and replaces the multiple analog panel meters. It measures electrical parameters like AC Voltage, AC Current, Frequency, Active, Reactive, Apparent Power and many more.

Product Features

On site programmable PT/CT ratios

It is possible to program primary of external potential Transformer (PT), primary of external Current Transformer (CT) on site via front panel keys by entering into Programming mode.

User selectable CT Secondary 5A/1A

The secondary of external Current Transformer (CT) can be programmed on site to either 5A or 1A using front panel keys.

User selectable PT Secondary

The secondary of external Potential Transformer (PT) can be programmed on site from 100VLL to 500VLL using front panel keys.

Onsite selection of Auto scroll / Fixed Screen

User can set the display in auto scrolling mode or fixed screen mode using front panel keys.

Low back depth

The instrument has very low back depth (behind the panel) of less than 55 mm.

True RMS measurement The instrument measures distorted waveform up to 15th Harmonic.

RPM Measurement

The instrument display rotation per minutes for generator applications. Number of poles can be set on site depending upon application requirement.

3 line 4 digits LED display

Simultaneous display of 3 Parameters.

User selectable 3 phase 3Wire or 4Wire or Single phase Network

User can program on site the network connection as either 3 Phase 3 Wire or 4 Wire or single phase network using front panel keys.

In case of self powered TNM 96P only either 3 Phase 4 wire or single phase network are available.

Storage of parameters possible

The instrument stores minimum and maximum values for System Voltage, System Current, Run Hour, ON Hour and number of Interrupts. Every 60 sec stored values are updated.

Four function keys

Using the four function key, it is possible to go desired parameter screen instantly.

Enclosure Protection for dust and water

Conforms to IP 50 (for front face) and IP 20 (for back) as per IEC60529.



EMC Compatibility

Compliance to International standard IEC 61326.		
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Rated Power Frequency

magnetic Field	IEC 61000-4-8 - 30 A/m
Voltage dip	IEC 61000-4-11 – 0% during 1 cycle.
	– 40% during 10/12 cycles.
	– 70% during 25/30 cycles.
Short interruptions	IEC 61000-4-11 – 0% during 25/30 cycles.
	25 cycles for 50 Hz test.
	30 cycles for 50Hz test.

Input Voltage Nominal input voltage (AC RMS) Phase - Neutral 290V LN , Line-Line 500V L-L Max continuous input voltage 150% of rated value Nominal input voltage burden < 0.3 VA approx. per phase (For external auxiliary meter) System PT secondary values 100VLL to 500VLL programmable on site. System PT primary values 100VLL to 692kVLL programmable on site. Input Current 5A AC RMS System CT secondary values 1A and 5A programmable on site. System CT primary values From 1A up to 9999A (for 1 or 5 Amp)	Technical Specifications			
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	System CT primary values	From 1A up to 9999A (for 1 or 5 Amp)		
Max continuous input current I50% of rated value	Max continuous input current	150% of rated value		
Nominal input current burden < 0.2 VA approx. per phase	Nominal input current burden	< 0.2 VA approx. per phase		
Auxiliary supply	Auxiliary supply			
External Auxiliary 40 V - 300V AC/DC (± 5 %)	External Auxiliary	40 V - 300V AC/DC (± 5 %)		
DC Auxiliary supply 12V - 48V DC	DC Auxiliary supply	12V - 48V DC		
Self powered Input voltage range from 80 to 100% of the rated value	Self powered	Input voltage range from 80 to 100% of the rated value		
(Self powered meter is available only in 3Phase 4 Wire and Single Phase network.		(Self powered meter is available only in 3Phase 4 Wire and Single Phase network.		
Auxiliary input is derived from Phase 1 (R phase)		Auxiliary input is derived from Phase 1 (R phase)		
Frequency range 45 to 65 Hz	Frequency range	45 to 65 Hz		
VA burden Approx. 3 VA	VA burden	Approx. 3 VA		
DC burden 3V	DC burden	3V		
Overload withstand	Overload withstand			
Voltage 2 x rated value for 1 second, repeated 10 times at 10 second intervals	Voltage	2 x rated value for 1 second, repeated 10 times at 10 second intervals		
Current 20x rated value for 1 second, repeated 5 times at 5 min intervals	Current	20x rated value for 1 second, repeated 5 times at 5 min intervals		
Operating Measuring Ranges	Operating Measuring Ranges			
Voltage Range With External Aux 10 120% of rated value	Voltage Range With External Aux	10 120% of rated value		
Voltage Range With Self Power 80 120% of rated value	Voltage Range With Self Power	80 120% of rated value		
Current Range 10 120% of rated value	Current Range	10 120% of rated value		
Frequency 45 65 Hz	Frequency	45 65 Hz		
Power Factor 0.5 Lead 1 0.5 Lead	Power Factor	0.5 Lead 1 0.5 Lead		
Reference conditions for Accuracy	Reference conditions for Accuracy			
Reference temperature 23°C +/- 2°C	Reference temperature	23°C +/- 2°C		
Input waveform Sinusoidal (distortion factor 0.005)	Input waveform	Sinusoidal (distortion factor 0.005)		
Input frequency 50 or 60 Hz ±2%	Input frequency	50 or 60 Hz ±2%		
Auxiliary supply voltage Rated Value ±1%	Auxiliary supply voltage	Rated Value ±1%		
Auxiliary supply frequency Rated Value ±1%	Auxiliary supply frequency	Rated Value ±1%		
Voltage Range 20 100% of nominal value	Voltage Range	20 100% of nominal value		
Current Range 10 100% of nominal value	Current Range	10 100% of nominal value		
Power Cos phi = 1 for active power / Sin phi = 1 for reactive power	Power	Cos phi = 1 for active power / Sin phi = 1 for reactive power		
10 100% of nominal current and 20 100% of nominal voltage		10 100% of nominal current and 20 100% of nominal voltage		
Power Factor / Phase Angle 40 100% of nominal current and 20 100% of nominal voltage	Power Factor / Phase Angle	40 100% of nominal current and 20 100% of nominal voltage		

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Accuracy		
Voltage		+ 10 % of nominal value
Current		$\pm 10\%$ of nominal value
Frequency		0.5% of mid frequency
Active power		± 1.0 % of nominal value
Re-active power		± 1.0 % of nominal value
Apparent power		± 1.0 % of nominal value
Power factor		2.0% of Unity
Phase angle		2.0% of range
Measurment error is normally	much less than error specified	above. Variation due to influence quantity is less tha twice the error allowed for reference
Influence of Variations		
Temperature coefficient		0.025%/°C for Voltage
(for rated value range of use	(050°C)	0.05%/°C for Current
Display update rate	<u>·</u>	
Response time to step input 1 se		l sec approx.
Applicable Standards		
EMC		IEC 61326-1: 2005
Safety		IEC 61010-1-2001 , Permanently connected use
IP for water and dust		IEC60529
Pollution degree		2
Installation category		
High Voltage	Test 3510V AC r.m.s	Enclosure Vs Power supply + All measuring input
(for 1 minute)		Power supply Vs All measuring input
	2210V AC r.m.s,	Input Voltage Vs Input Current
		Input Current Vs Input Current
Environmental		
Operating temperature		0 +50 °C
Storage temperature		-25 to +70°C
Relative humidity		0 90% non condensing
Warm up time		Minimum 3 minute
Shock		15g in 3 planes
Vibration		10 55 Hz, 0.15mm amplitude
Enclosure:		
Front		IP50
Back		IP20
Dimensions and Weights:		
Bezel size		96mm x 96mm DIN 43 718
Panel cut-out		92 +0.8mm x 92 +0.8mm
Overall depth		55mm
Panel thickness		1 - 3mm for self clicking, 1 - 6mm for swivel screws
Weight		320gr. approx.

Installation:







Electrical connections:

	Self Powered Aux	External Powered Aux
3 Phase 4 Wire Unbalanced Load	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
3 Phase 3 Wire Unbalanced Load	Not Applicable	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
1 Phase 2 Wire	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

Dimensions:







Parameter measurement and display:

No.	Parameter	3 Phase 4 Wire	3 Phase 3 Wire	1 Phase 2 Wire
1.	System Voltage	•	•	•
2.	System Current	•	•	•
3.	Voltage L1 - N	•	-	•
4.	Voltage L2 - N	•	-	-
5.	Voltage L3 - N	•	-	-
6.	Voltage L1 - L2	•	٠	-
7.	Voltage L2 - L3	•	•	-
8.	Voltage L3 - L1	•	•	-
9.	Current L1	•	•	•
10.	Current L2	•	•	-
11.	Current L3	•	•	-
12.	Frequency	•	•	•
13.	System Active Power (kW)	•	•	•
14.	Active Power L1	•	-	•
15.	Active Power L2	•	-	-
16.	Active Power L3	•	-	-
17.	System Re-active Power (kVar)	•	•	•
18.	Re-active Power L1	•	-	•
19.	Re-active Power L2	•	-	-
20.	Re-active Power L3	•	-	-
21.	System Apparent Power (kVA)	•	•	•
22.	Apparent Power L1	•	-	•
23.	Apparent Power L2	•	-	-
24.	Apparent Power L3	•	-	-
25.	System Phase Angle	•	•	•
26.	System Power Factor		•	•
27.	Power Factor L1		-	•
28.	Power Factor L2		-	-
29.	Power Factor L3	•	-	-
30.	Phase Angle L1		-	•
31.	Phase Angle L2		-	-
32.	Phase Angle L3	•	-	-
33.	RPM		•	•
34.	Max (System Voltage/ System Current)		•	•
35.	Min (System Voltage/ System Current)	•	•	•
36.	Hour Run		•	•
37.	ON Hour		•	•
38.	Number of auxiliary interrupt			•

•: available

- : Not available

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Rear connection:



Order Information:

Model: TNM96P

Auxiliary supply

	Self Aux*
or	40 V - 300V AC/DC
or	12 V - 48V DC

Order Example:

TNM96P, auxiliary supply 40V - 300V AC/DC)

*NOTE: Self Auxiliary meter is available only in 3Phase 4 Wire and Single Phase network. Auxiliary input is derived from Phase 1 (R phase). In case of external auxiliary meter all three networks are available (3Phase 4Wire / 3Phase 3Wire / Single Phase)



