process, temperature, frequency - counter 99 999 counts ITI 6/7/8

- 96 x 48 mm. IP 65
- Configurable by keypad and PC
- 2 thresholds and relay outputs
- Min. and Max. functions
- Analog output
- RS 232/RS 485 MODBUS RTU
- Loop supply

ITI 6, ITI 7 and ITI 8 are DPMs configurable, either by two keys located at the front, or by PC software (except ITI 6) supplied with the serial output option.
The program enables the user to choose the desired function to be measured, the input range, the thresholds as well as the possible computation functions.

functions

Measurement .....
The units from this range are dedicated to various parameters.

ITI 6 measures DC voltage and current, with a 24 VDC/25 mA source to power the sensor.

ITI 7 measures DC voltage and current (with a 24 VDC/25 mA source to power the sensor), resistance, temperature by thermocouples and RTDs.

ITI 8, equipped with two inputs A and B, implements frequency-meter and tachometer functions where quotientmeter, periodmeter, chronometer A/13, rotation direction, event counter, up and down are possible together with measurement of incremental encoder.

The units feature the following functions: process signal scaling, sensor correction after calibration and possible computations, such as square root, square, minimum and maximum.

Scaling and sensor correction.....
Whatever the function programmed, the user may define a scaling or correct a temperature sensor by programming two couples of counts: Display/Measurement.

Minimum and maximum .....
The unit can store the maximum and the minimum of a series of measurements. These values can be displayed and reset to zero.

Square root and square.....
These functions enable the user to correct some sensors, such as flowmeters by applying a relation in the form of $A = \sqrt{M}$ or $A = \sqrt{M} + b$ and by combining it to the scaling.

Thresholds.....
Value, direction and hysteresis can be programmed over two thresholds. Threshold overrun lights up an LED.

Relay outputs.....
The threshold function directly activates 2 alarms over the units, on the ones equipped with this function.

Analog output and relays .....
In addition to the 2 relays above, this version is equipped with two 0-10 V and 4-20 mA analog outputs enabling to recopy the measurement. These outputs are isolated from the measurement.

Serial and relay outputs .....
(except ITI 6)
With this option, the two relays of both ITI 7 and ITI 8 are equipped with a RS 232/RS 485 serial interface, MODBUS protocol. This option includes the PC programming software (LTCTM), and enables downloading additional thermocouple and RTD.

LWTM software.....
(except ITI 6)
This software displays in real time on a PC, the measurements together with their representation in the form of synopsis, real time curve, bargraph, digital table as well as creation of the result files.

general specifications

Configuration saved in permanent memory.
Red LED display, 7 segments, 14-mm high.
ABS casing, weight 160 g.
Measurement rate: 2 per second.
Temperature coefficient: < 10% of accuracy/°C.
Permissible maximum voltage: 20 V in resistance and 100 V in voltage.
Common mode rejection: ≥ 110 dB at 50 and 60 Hz.
Reference range: 23 ± 5°C (RH 45 to 75%).
Operating range: - 10°C to + 50°C.
Connection by unpluggable screw terminal block.
Front panel protection: IP 65.
Conform to the EMC standards (class B).
Power requirements: 230 VAC, 115 VAC, 48 VAC, 24 VAC, 9 to 18 VDC or 18 to 36 VDC.

process measurements - ITI 6

ITI 6 measures DC voltages and currents.
It is equipped with a 24 V/25 mA source allowing power to the sensor or the current loop.
Display capacity: from - 19 999 to + 23 999 counts.
General specifications: see above.

Function	Range	Resolution	Accuracy (1)	Input resistance
DC voltage	1 V	0.1 mV	0.1%+ 0.3 mV	1 000 MΩ
	10 V	1 mV	0.1% + 3 mV	1 MΩ
	100 V	10 mV	0.1% +30 mV	11 MΩ
DC current	20 mA	1 µA	0.1% + 6 µA	50 Ω

(1) In ± (% rdg + number of units) at 23 ± 5°C over one year.

Measurement range: from - 15 to 120% of range.

process and temperature measurements - ITI 7

ITI 7 measures DC voltages and currents, resistances and temperatures with thermocouples or RTDs.
It is equipped with a 24 V/25 mA source allowing power to the sensor.
Display capacity: from - 19 999 to 99 999 counts.
General specifications: see above.

DC voltage .....

Range	Resolution	Accuracy (1)	Input impedance
60 mV	1 µV	0.1% + 10 µV	> 10 MΩ
1 V	100 µV	0.1% + 0,2 mV	> 10 MΩ
10 V	1 mV	0,1% + 2 mV	1,11 MΩ

(1) In ± (% rdg + number of units) at 23 ± 5°C over one year.

Measurement range: from - 15 to 120% of range.

DC current .....

Range	Resolution	Accuracy (1)	Input resistance
20 mA	1 µA	0.1 % + 4 µA	50 Ω

(1) In ± (% rdg + number of units) at 23 ± 5°C over one year.

Measurement range: from - 15 to 120% of range.
Maximum applicable current: 50 mA.

Resistances

Range	Resolution	Accuracy(1)	Measuring current
150 Ω	10 mΩ	0.1% + 20 mΩ	1 mA
400 Ω	10 mΩ	0.1% + 60 mΩ	

(1) In ± (% rdg + number of units) at 23 ± 5°C over one year.

Measurement range:
150 Ω range: from 0 to 160 Ω.
400 Ω range: from 0 to 416 Ω.

3- or 4- wire configuration by means of an internal switch.

RTDs

Range	Resolution	Accuracy (1)	Measuring current
150°C	0.01°C	0. % + 0.05°C	1 mA
850°C	0.1°C	0.1% + 0.2°C	

(1) In ± (% rdg + number of units) at 23 ± 5°C over one year.

Measurement range:
150°C range: from - 200°C to + 150°C.
850°C range: from - 200°C to + 850°C.
3- or 4-wire configuration by means of an internal switch.
Linearization according to IEC Publication 751/1995 for 100 Ω at 0°C RTDs, International Temperature Scale ITS 90.

A second type of sensor may be loaded in permanent memory.

Thermocouples

Thermocouple	Measurement range	Resolution	Accuracy (1)
K	- 200 to - 100°C - 100 to + 1 370°C	0.1°C	0.5% 0.1% + 0.3°C
T	- 200 to - 100°C - 100 to + 400°C	0.1°C	0.5% 0.1% + 0.3°C
J	- 200 to - 100°C - 100 to + 1 200°C	0.1°C	0.4% 0.1% + 0.2°C
S	- 50 to + 300°C + 300 to + 1 768°C	1°C	3°C 0.1% + 1°C

(1) In ± (% rdg + number of units) at 23 ± 5°C over one year.

The accuracies are given for a 0°C reference junction.
The uncertainty due to the internal reference junction is ± 1.5°C.

The uncertainty due to the external reference junction (AN 8002) is ± 0.5°C.
Linearization according to IEC Publication 584-1/1995, International Temperature Scale ITS 90.
Another type of sensor may be loaded in permanent memory.

frequency and counter measurements - ITI 8

ITI 8 measures frequency, periods, chronometer, counter up and down and incremental encoder. Thanks to its two A and B inputs, it may be used as quotientmeter for the frequency and counter functions. General specifications: see above.
The uncertainty is expressed in ± (% rdg + number of units).
Display capacity: from 19 999 to + 99 999 counts.

Input specifications
The sensitivity, hysteresis and trigger level of the input circuits are simultaneously programmable over channels A and B (U input from 10 mV to 400 V in AC and AC + DC modes).

Periodmeter

Range	Resolution	Maximum measurement time
999 .99 ms	0.01 ms	2 periods
9.9999 s	0.0001 s	
99.999 s	0.001 s	
999.99 s	0.01 s	

Signal input: channel A.
Minimum pulse duration: 4 µs.
Accuracy: ± (0.002% rdg + 2).

Quotientmeter

fA, fB range	Measurement range
99.999 kHz 9 999.9 Hz 999.99 Hz	0.01 to 999.99

Signal input: channel A and channel B.
Minimum pulse duration: 4 µs.
Accuracy: ± 0.01.
Measurement principle: successive measurements of frequencies fA and fB over the selected range, common to both channels, and computation of fA/fB quotient.

Frequency-meter / Tachometer .....

Range	Resolution	Maximum measurement time
99 999 Hz	1 Hz	0.4 s
9 999.9 Hz	0.1 Hz	2 periods
999.99 Hz	0.01 Hz	
99.999 Hz	0.001 Hz	
9.9999 Hz	0.0001 Hz	

Signal input: channel A.
Minimum pulse duration: 4 µs.
Accuracy: ± (0.002% rdg + 2).

Chronometer "A, B" .....

Range	Resolution
999.99 ms	0.01 ms
9.9999 s	0.0001 s
99.999 s	0.001 s
999.99 s	0.01 s
9 999.9 s	0.1 s

Signal input:
- beginning of measurement, channel A.
- end of measurement, channel B.
Accuracy: ± (0.005% rdg + 2).

Rotation direction .....

Range	Resolution	Maximum meas. time
- 19 999 / + 99 999 Hz	1 Hz	0.8 s
- 1 999.9 / + 9 999.9 Hz	0.1 Hz	4 periods
- 199.99 / + 999.99 Hz	0.01 Hz	4 periods
- 19.999 / + 99.999 Hz	0.001 Hz	4 periods
- 1.9999 / + 9.9999 Hz	0.0001 Hz	4 periods

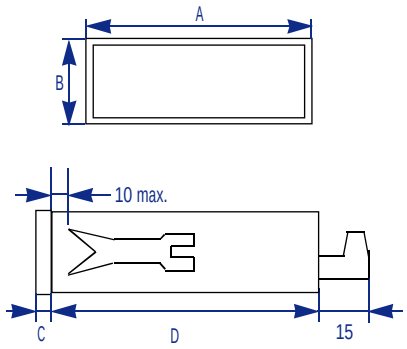
Signal input: channel A and channel B in phase quadrature.
Minimum pulse duration: 4 µs.
Accuracy: ± (0.002% rdg + 2).

Event counter up and down and incremental encoder .....
Counter capacity: - 19 999 to + 99 999.
Maximum counter frequency: 100 kHz.
Minimum pulse width: 4 µs.
A "tarage" may be programmed.
Possible operations:
- counter up over channel A, inhibition over channel B at level one.
- counter up over channel B if A is zero, counter down over channel A.
- incremental encoder, i.e. counter up or down over channel A according to the rotation direction of the sensor given by the input clock over channel B.

The above specifications are subject to modification.

dimensions

Dimensions in mm



Casing	A	B	C	D	Panel cut-out
96 x 48	104.5	57.5	7	101	$92.0^{+0.6}_{0}$ x $45.0^{+0.6}_{0}$

ordering instructions

Process DPM	ITI 6
Process, temperature DPM	ITI 7
Frequency, counter DPM	ITI 8

References to be reported above

Supply	
9 to 18 VDC	3
18 to 36 VDC	4
24 VAC	6
115 VAC	7
230 VAC	8
48 VAC	9

Without option	0
Alarms + analog output	1
Alarms + RS 232 / RS 485 (1)	2
Alarms only	3

(1) Except ITI 6

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