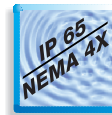


PROGRAMMABLE DIGITAL INDICATOR

Safety and reliability

- Hardware designed with SMT technology.
- IP 65 and NEMA 4X front protection.
- High noise rejection.
- Instrument removable from case by safety screw.
- Self extinguishing plastic case (V-0).
- Software safety key for parameters protection.



AL 1 It is **lit** when the alarm 1 is in ON condition.
It **flashes** when the alarm condition is not present but the alarm is not yet acknowledged (for manual reset only).

AL 2 It is **lit** when the alarm 2 is in ON condition.
It **flashes** when the alarm condition is not present but the alarm is not yet acknowledged (for alarms with manual reset only).

AL 3 It is **lit** when the alarm 3 is in ON condition.
It **flashes** when the alarm condition is not present but the alarm is not yet acknowledged (for alarms with manual reset only).

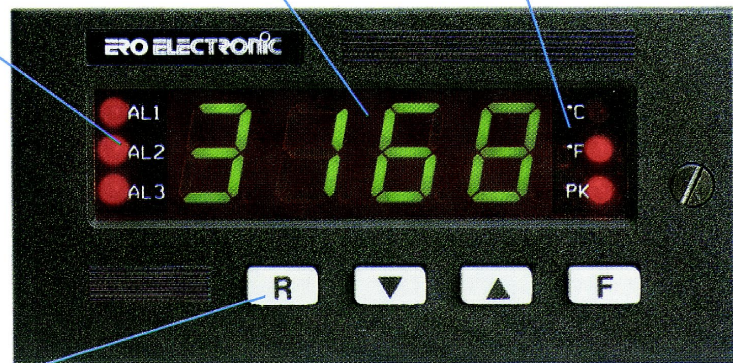
DISPLAY

During run time the display shows the measured value in engineering units.
During the configuration and calibration mode the display shows the parameters code with its value.

°C It is **lit** when the instrument shows the measured value in °C.

°F It is **lit** when the instrument shows the measured value in °F.

PK It is **lit** when the instrument shows the peak high value.
It is **flashes** when the instrument shows the peak low value.



KEYBOARD DESCRIPTION

▲ It is used to increase the value of the selected parameter or to display the peak high value.

▼ It is used to decrease the value of the selected parameter or to display the peak low value.

F It is used to select the parameters.
By pushing the F button the instrument shows the next parameter (scroll with increasing order). It also memorizes the new value of the previous parameter.

R During configuration and calibration procedure, it is used to display the previous parameter (scroll with decreasing order) without memorizing the new value of the parameter.

R + F They are used to reset the peak high and peak low values and start a new peak search sequence.

R + ▼ They are used for manual reset of the alarms.

▼ + ▲ They are used to start the default parameter loading procedure.



TECHNICAL DATA

Case:	PC/ABS, black color; self extinguishing degree: V-0 according to UL - CSA - VDE.
Front protection:	designed and tested for IP 65 (*) and NEMA 4X (*) for indoor location (when panel gasket is installed).
Installation:	panel mounting. Instrument removable from case by safety screw.
Rear terminal board:	with screw terminals, connection diagram and safety rear cover.
Dimensions:	DIN 43700 48 x 96 mm, depth 89 mm.
Cut-out:	45 x 92 mm +0,8 mm -0,0 mm.
Weight:	250 g max.
Displays:	high efficiency LED, 4 digits, 7 segments with decimal point; height 12.7 mm.
Read-out:	from -1999 to 4000.
Front indicators:	AL1 - AL2 - AL3 - PK - °C - °F.
Power supply:	from 100 to 240 V AC 50/60 Hz with max. variations form -15% to +10% of the nominal value. 24 V AC/DC with max. variations form -10% to +10% of the nominal value. 6 VA max.
Consumption:	6 VA max.
Insulation resistance:	> 100 MΩ according to IEC 348.
Insulation voltage:	1500 V r.m.s. according to IEC 348.
Electromagnetic compatibility:	This instrument is CE marked. Therefore, it is conformed to council directive 89/336 and subsequent amendments (reference harmonized standard EN-50081-2 and EN-50082-2).
Safety requirements:	This instrument is marked CE. Therefore, it is conforming to council directives 73/23/EEC and 93/68/EEC (reference harmonized standard EN 61010-1).
Conversion:	dual slope integration.
Resolution:	30000 counts.
Sampling time:	500 ms typical.
Accuracy:	±0.1% vfs ±1 digit @ 25°C ambient temperature.
Common mode rejection ratio:	120 dB @ 50/60 Hz.
Normal mode rejection ratio:	60 dB @ 50/60 Hz.
Temperature drift:	TC inputs: < 200 ppm/°C of the fsv (RJ excluded). RTD inputs: < 400 ppm/°C. Linear inputs: < 300 ppm/°C.
Operative temperature:	0-50 °C.
Storage temperature:	from -20 to +70 °C.
Humidity:	from 20% to 85% RH, not condensing.
Protection:	1) WATCH DOG circuit for automatic restart. 2) DIP SWITCHES for configuration and calibration parameter protection.

INPUTS

3 types of input are programmable:

A) Thermocouple

Type:	J - K - N - R - S - T - L keyboard programmable.
Indication:	°C/°F programmable.
Line resistance:	100 Ω max, with max. error equal to 0.1% of the input span.
Cold junction:	automatic compensation from 0 to 50°C.
Burn out:	detection of the open input circuit (wires or sensor) with underrange or overrange selectable indication.
Input impedance:	> 1 MΩ.
Calibration:	Thermocouple type L: according to DIN 42710-1977. All the other thermocouples: according to IEC 584-1.

STANDARD RANGES TABLE:

TC	Ranges	
	°F	°C
J	-150/+1850	-100/+1000
K	-150/+2500	-100/+1370
L	-150/+1650	-100/+900
R	0/+3200	0/+1760
S	0/+3200	0/+1760
T	-150/+750	-100/+400
N	0/+2550	0/+1400

(*) Test were performed in accordance with IEC 529, CEI 70-1 and NEMA 250-1991 STD.

B) Resistive Temperature Detector

Input: RTD Pt 100Ω, 3 wire connection with programmable °C or °F indication.
Input circuit: current injection (160 μA).
Line resistance: automatic compensation up to 20 Ω/wire with no measurable error.
Calibration: according to DIN 43760.
Standard ranges: see table below.
Burn out: the device is capable of detecting a fault on the input signal due to an opening of one or more input wires, displaying it as "overrange". It is capable of detecting also the short circuit of the sensor displaying it as "underrange".

STANDARD RANGES

RTD type	Ranges	
Pt 100 Ω	-320/+1100°F	-200/+600°C
	–	-199.9/+600.0°C

C) Linear inputs

Input type: 0-20 mA, 4-20 mA, 0-60 mV, 12-60 mV, 0-5 V, 1-5 V, 0-10 V, 2-10 V keyboard programmable.
Input impedance: 1) mA input: 5 Ω, 2) mV input: 1 MΩ, 3) 5 V input: 200 kΩ, 4) 10 V input: 400 kΩ.
Read-out: programmable by front push-buttons from -1999 to +4000.
Decimal point: keyboard programmable in any position.

OPTIONS

ALARMS

Number of alarms: up to 3 independent alarms.
Thresholds: from 0 to 100% of the programmed read-out span.
Hysteresis: programmable from 0.1 to 10.0% of the programmed read-out span.
Alarm types: high or low process alarm programmable.
Alarm reset type: selection of Automatic or Manual reset. The manual reset is provided by front push-buttons.
Output of the alarms 1 and 2: two relays: SPDT.
Contacts rating: 3 A - 250 V AC on resistive load. 3 A - 30 V DC on resistive load.
Output of the alarm 3: one relay: SPST with NO contact.
Contact rating: 2 A - 250 V AC on resistive load. 2 A - 30 V DC on resistive load.
Alarm indications: the indicators AL1, AL2 and/or AL3 lit show that the alarms are in the ON condition. The indicator(s) flash(es) to show that the alarm condition(s) is (are) not present but the alarm(s) is (are) not yet resetted (for alarms with manual reset only).

ANALOG RETRANSMISSION

Analog retrans. (TIS MK1 only)

Type: 0-20 mA or 4-20 mA (programmable). The output is galvanically isolated.
Max load: 500 ohm.
Output resolution:
$$= \frac{\text{Display resolution (in E.U.)}}{\text{Retransmission span (in E.U.)}} \cdot 20 \text{ mA}$$

Note: The resolution cannot be better than 0,05% of output span (10 μA for 20 mA output or 5 mV for 10 V output).
Accuracy: ± 0.1% of f.s.v.
Note: The given accuracy is referred only to the retransmission circuit. It does not take into account all the other accuracies (input accuracies, linearization, etc...)
Note: 1) It is possible to change the standard output 0-20 mA in 0-10 V, by means of "CUT/SHORT" on retransmission PCB. The min. load for Volt output is equal to 5 kΩ. The device is supplied with mA output calibration. For Volt output, it is necessary to re-calibrate the instrument.
 2) The analog re-transmission substitutes the relay AL3.
 3) The TIS MK1 model is not UL listed.



SPECIAL FUNCTIONS

Peak high and peak low detection:

the instrument memorizes and displays the maximum and minimum measured value.

Digital filter:

it is possible to insert a software digital filter applied on the displayed value (this function affects the alarm and analog retransmission performance as well). The time constant of this filter is programmable between 1 and 5 seconds.

Safety key:

for protection of the alarm threshold values.

Dip switch:

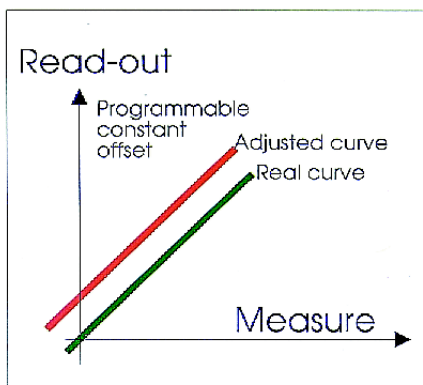
for protection and selection of the operative mode:

a) configuration and calibration mode;

b) operative mode.

Offset on the measured value:

it is possible to program a constant offset on the measured value.



OFFSET on the measured value

In many cases it is quite difficult to locate the sensor in the ideal position.

As a matter of fact, in some cases the sensor will be located far away from the best position.

This incorrect position of the sensor may produce a measured value that is not a true representation of the process value.

The tis offers the possibility to program a constant offset in order to re-align the measured value with the value of the process.

HOW TO ORDER

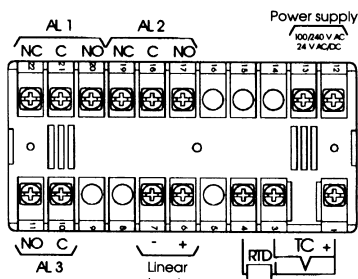
INPUT	POWER SUPPLY = FROM 100 TO 240 V A.C.			
	No option	2 Alarms	2 Alarms + analog retrans.	3 Alarms
TC, RTD TC, RTD, Linear (*)	TIS 400003000 TIS 800003000	TIS 400013000 TIS 800013000	- TIS 800023000 (**)	TIS 400033000 TIS 800033000
INPUT	POWER SUPPLY = 24 V A.C./D.C.			
	No option	2 Alarms	2 Alarms + analog retrans.	3 Alarms
TC, RTD TC, RTD, Linear (*)	- -	- TIS 800015000	- TIS 800025000 (**)	- -

(*) All ranges are factory calibrated.

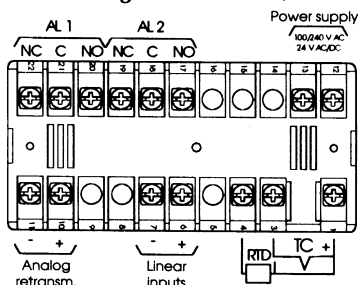
(**) TIS MK1 only (this model is not UL listed).

REAR TERMINAL BOARD

TIS standard



TIS MK1 (with analog retransmission)



DIMENSIONS AND PANEL CUT-OUT

