We Measure, We Control, We Record

N1030T Controller

TEMPERATURE CONTROLLER AND TIME – INSTRUCTIONS MANUAL – V1.0x D

SAFETY ALERTS

The symbols below are used on the equipment and throughout this document to draw the user's attention to important operational and safety information.

CAUTION: Read the manual thoroughly before installing and operating the equipment.	**CAUTION OR DANGER:** Electrical shock hazard

All safety related instructions that appear in the manual must be observed to ensure personal safety and to prevent damage to either the instrument or the system. If the instrument is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

INSTALLATION / CONECTIONS

The controller must be fastened on a panel, following the sequence of steps described below:

- Prepare a panel cut-out of 46 x 46 mm;
- Remove the mounting clamps from the controller;
- Insert the controller into the panel cut-out;
- Slide the mounting clamp from the rear to a firm grip at the panel.

RECOMMENDATIONS FOR THE INSTALLATION

- All electrical connections are made to the screw terminals at the rear of the controller.
- To minimize the pick-up of electrical noise, the low voltage DC connections and the sensor input wiring should be routed away from high-current power conductors. If this is impractical, use shielded cables. In general, keep cable lengths to a minimum.
- All electronic instruments must be powered by a clean mains supply, proper for instrumentation.
- It is strongly recommended to apply RC'S FILTERS (noise suppressor) to contactor coils, solenoids, etc. In any application it is essential to consider what can happen when any part of the system fails. The controller features by themselves can not assure total protection.

ELECTRICAL CONNECTIONS

Fig. 01 below shows the electrical terminals of the controller:

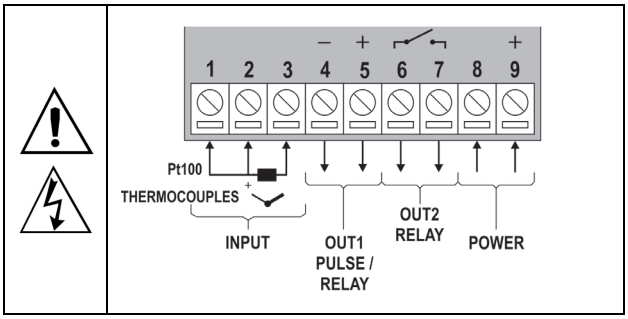


Fig. 01 - Connections of the back panel

FEATURES

INPUT SINGNAL (INPUT)

The type of input to be used by the controller is defined in the equipment configuration. **Table 01** displays the input options available to the user, one of which must be selected during the controller configuration.

TYPE	CODE	RANGE OF MEASUREMENT
Termocouple **J**	tc J	Range: -110.0 a 950.0 °C (-166.0 a 1742 °F)
Termocouple **K**	tc K	Range: -150.0 a 1370 °C (-238.0 a 2498 °F)
Termocouple **T**	tc t	Range: -160.0 a 400.0 °C (-256.0 a 752.0 °F)
Pt100	Pt	Range: -200.0 a 850.0 °C (-328.0 a 1562 °F)

Table 01 – Input types

The temperature sensor used should be the first information passed onto the controller. A change in this parameter may imply automatic changes to many other parameters. The user must check the general condition of the configuration whenever an exchange of the sensor type is held.

OUTPUTS

The controller offers two output channels: OUT1 and OUT2. Their electrical characteristics are:

OUTPUT **OUT1** - Logical pulse, 5 Vdc / 25 mA or
Output Relay SPST-NA / 1.5 A / 240 Vac

OUTPUT **OUT2** - Output Relay SPST-NA / 1.5 A / 240 Vac

The output channels are user configurable as **Control Output**, **Alarm Output** or as **Output Timers T1** or **T2**.

CONTROL OUTPUT (CtrL)

The process control output can operate in **ON/OFF** mode or in **PID** mode.

To operate in **ON/OFF** mode, the value defined in the parameter **Pb** should be **0.0**.

With values other than zero in the **Pb** parameter, the controller operates in the **PID** mode. The PID parameters can be automatically determined enabling the auto-tuning function (**AtUn**).

ALARM OUTPUT (AL)

The controller has an alarm that can be configured to operate on any of the output channels. It can be configured to operate in one of the different functions as detailed in **Table 02**.

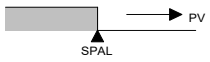
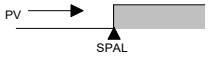
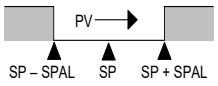
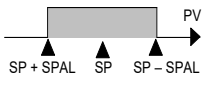
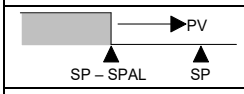
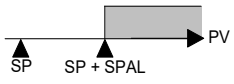
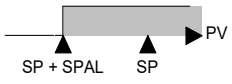
oFF	Output is not used as alarm.	
Lo	Alarm of Absolute Minimum Value. Triggers when the value of measured **PV** is **below** the value defined for alarm *Setpoint (SPAL)*.	
HI	Alarm of Absolute Maximum Value. Triggers when the value of measured **PV** is **above** the value defined for alarm *Setpoint*.	
dIF	Alarm of Differential. In this function the parameters, SPAL represent the deviation of PV in relation to the SP of CONTROL.	
	 Positive SPAL	 Negative SPAL
dIFL	Alarm of Minimum Differential Value. It triggers when the value of PV is **below** the defined point by SP-SPAL.	
	 Positive SPAL	 Negative SPAL
dIFH	Alarm of Maximum Differential. Triggers when the value of PV is **above** the defined point by SP+SPAL.	
	 Positive SPAL	 Negative SPAL
IErr	Alarms of the Sensor Break (Sensor *Break Alarm*). It is activated when the Input presents problems such as interrupted sensor, bad connection, etc.	

Table 02 – Alarm functions

INITIAL BLOCKING OF ALARM

The option to **block initial** alarms inhibits the alarms in the case that there is an alarm condition present on startup. The alarm will be enabled only after the occurrence of a non alarm condition.

Initial blocking is useful, for example, in the initialization of process control operations when the value of the PV is still far from the SP value. Hence the system waits for alarm situations and unwanted alarms are avoided.

The initial blocking is disabled for the sensor break alarm function IErr.

RUN FUNCTION

The **RUN** function, executed by the **RUN** parameter, works as a general key of the controller, enabling or not its operation.

When enabled to work (RUN = YES), the controller is free to perform all its functions. When disabled (RUN = NO), its outputs are switched off and only functions related to temperature measurement and indication continue to operate.

The RUN indicator on the controller front panel, when accessed, indicates that the control is enabled (RUN = YES).

The RUN function can be executed by the F key, which toggles the control condition between enabled and disabled.

The touch on F is long, i.e. > 2 seconds, to disregard quick accidental touches.

OFFSET

This parameter allows fine adjustments to the PV reading for compensation of sensor error. Offset allows measurements errors to be corrected when they occur, for example, after the substitution of a temperature sensor.

TIMERS

The controller has two timers, **T1** e **T2**, which together provide different modes of action. The timing period starts with T1 and, at the end of it, it starts **T2**.

Only **T1** has its time count displayed on the controller display.

With the ZERO value set for any of the timers, the actuation and sequence remains unchanged.

The timers can be associated with any controller output: **OUT1** or **OUT2**. The output associated with **T1**, switches on during the T1 timing period and the output associated with **T2** switches on during the **T2** timing period.

The **A1** and **A2** indicators light up during **T1** and **T2** timing periods, respectively.

At the end of T2, the A2 indicator flashes (*).

If T2 = 0, at the end of T1, the A1 indicator flashes (*).

(*) the controller can be set to disable the control (RUN = OFF) at the end of the timing period and, in this case, the indicators are also cleared.

TIMER START MODES

There are two options to start the timing period:

SP starts counting when the measured temperature value (PV) reaches the SP value set for the process.

F starts the timing period by pressing the **F** key (short press < 1 s).

After starting the timing period, a new short touch on F ONLY stops the timing period (stops it and brings it back to zero).

When RUN= F, a LONG touch on F starts and controls the timing period.

A LONG touch on F (> 2 s), disables the control.

The Timer Start mode is set in the t.Str parameter in the controller Timing Cycle.

TEMPERATURE CONTROL BEHAVIOR AT THE END OF THE TIMING PERIOD (T1+T2)

During the timing period of the T1 and T2 intervals, the temperature control has normal and independent operation. However, at the end of the T1 + T2 interval, it is possible to set the controller to disable the temperature control. The t.EC.o parameter, in the controller Timing Cycle, allows the definition of the desired condition:

on the temperature control continues to work as usual.

oFF the temperature control is disabled, turning the control output off.

UP/DOWN TIMER COUNTING

Both timers can be configured to display the counting in incrementing (UP) or decrementing (DOWN) modes. In UP mode, the counting starts at zero and counts up until the time setting is reached. In DOWN mode, the display starts showing the time setting and counts down to zero.

TIME BASE OF THE TIMERS

The parameter tbAS at the end of the timing cycle defines the time base that will be used. The options are:

SEc MM:SS. The intervals of T1 and T2 are presented in minutes and seconds.

Min HH:MM. The intervals of T1 and T2 are presented in hours and minutes.

OPERATION

The controller's front panel, with its parts, can be seen in the **Fig. 02**:

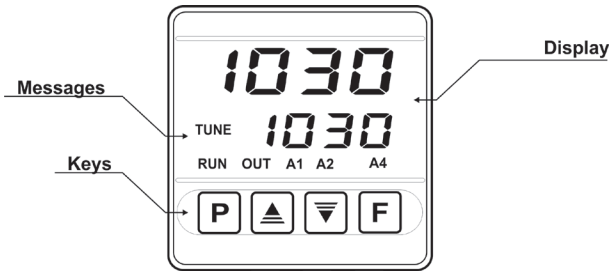


Fig. 02 – Front panel

Display: Shows the measured variable, symbols of the configuration parameters and their values / conditions.

TUNE Indicator: Stays ON while the controller is in tuning process.

RUN Indicator: Indicates that the controller is enabled to operate.

OUT Indicator: Indicates the instantaneous state of the control output.

A1 Indicator: Signalize the output state of T1.

A2 Indicator: Signalize the output state of T2.

A4 Indicator: Signalize the alarm state.

P **Key**: Used to walk through the menu parameters.

▲ **Increment key and** ▼ **- Decrement key**: Allow altering the values of the parameters.

F **Key**: Key used to reverse parameters during setup and perform special functions.

OPERATION

When the controller is powered up, it displays its firmware version for 3 seconds, after which the controller starts normal operation. The value of PV and SP is then displayed and the outputs are enabled. It is in the lower display that the value of SP is displayed. This is the **Indication Screen**.

In order for the controller to operate properly in a process, its parameters need to be configured first, such that it can perform accordingly to the system requirements. The user must be aware of the importance of each parameter and for each one determine a valid condition.

The parameters are grouped in levels according to their functionality and operation easiness. The 5 levels of parameters are:

1 – Operation / 2 - Tuning / 3 - Timer / 4 - Input / 5 - Calibration

The P key is used for accessing the parameters within a level.

Keeping the P key pressed, at every 2 seconds the controller jumps to the next level of parameters, showing the first parameter of each level:

PV >> AtUn >> t1 >> tYPE >> PASS >> PV ...

To enter a particular level, simply release the "**P**" key when the first parameter in that level is displayed. To walk through the parameters in a level, press the P key with short strokes. To go back to the previous parameter in a level, press F Key.

Each parameter is displayed with its prompt in the upper display and value/condition in the lower display.

Depending on the level of parameter protection adopted, the parameter **PASS** precedes the first parameter in the level where the protection becomes active. See section **Configuration Protection**.

DESCRIPTION OF THE PARAMETERS

OPERATION CYCLE

PV + SP	**PV Indication Screen**. On the higher display (red) the value of the measured variable (PV) temperature is shown. On the lower display (green), the control setpoint (SP) is shown.
PV + TM	**Display PV and current timer count.** The upper display (red) shows the measured temperature value (PV). In the lower display (green) the current **T1** timer count is displayed. You cannot set this display.
t1 *Timer 1*	Set the **T1** time interval. From 00:00 to 99:59 (HH:MM or MM: SS). Parameter showed in this cycle when defined in **t.En**.
run Run	Display for enable or disable the controller's action on the process. It acts like a switch, turning the controller on or off. **YES** Enabled control **no** Disabled control **F** Enable/disable command via F key (*) Parameter showed in this cycle when defined in **r.En**. (*) In RUN = F, when the controller is turned on or when it returns from a power failure, the control will be disabled (NO).

TUNING CYCLE

AtUn	**AUTO-TUNE**: Enables the auto-tuning function for the PID parameters (**Pb**, **Ir**, **dt**). Consult the chapter Determination of PID Parameters in this manual. **OFF** - Automatic tuning turned off. **FAST** - Automatic tuning. **FULL** - More accurate automatic tuning.
Pb	Proportional Band - Value of the term **P** of the control mode PID, in percentage of the maximum span of the input type. Adjust between 0 and 500.0 %. **When set to zero (0), control action is ON/OFF.**
Ir	Integral Rate - Value of the term **I** of the PID algorithm, in repetitions per minute (Reset). Adjust between 0.00 and 24.00. Displayed only if proportional band ≠ 0.
dt	Derivative Time - Value of the term **D** of the control mode PID, in seconds. Adjust between 0 and 250 seconds. Displayed only if proportional band ≠ 0.
Ct	Cycle time: Pulse Width Modulation (PWM) period in seconds. Adjustable between 0.5 and 100.0 seconds. Displayed only if proportional band ≠ 0.
HYSt	**Control hysteresis**: Is the hysteresis for ON/OFF control (set in temperature units. Adjustable between **0** and the bandwidth of measurement of the input type selected.

ACt	Action Control: **rE** Control with **Reverse Action**. Appropriate for **heating**. Turns control output on when PV is below SP. **dir** Control with **Direct Action**. Appropriate for **cooling**. Turns control output on when PV is above SP.
Out.1 **Out.2**	Assign functions to the Output channels OUT1 and OUT2: **oFF** Not used **CtrL** Acts as a temperature controller **AL** Acts as Alarm Output **t1** Acts as T1 Timer output **t2** Acts as T2 Timer output

TIMER CYCLE

t1 *Timer 1*	**T1** time interval setting, 00:00 to 99:59 (MM:SS or HH:MM).
t1.En *Timer Enable*	Allows the display of the **T1** parameter in the main (operating) cycle. **YES** Shows T1 in the Operating cycle **no** Hides T1 from the Operating cycle.
t.dir *Timer Direction*	Counting direction of **T1** timer: **uP** Up counting, starting from zero. **dn** Down counting.
t.Str *Timer Start*	Defines starting mode for **T1** timer. **SP** Starts when PV reaches SP **F** The **F** key starts the timing period
t2 *Timer 2*	**T2** time interval setting, 00:00 to 99:59 (MM:SS or HH:MM). This is the time interval where the output **T2** remains **on** after the end of timer **T1**.
t.E.C.o *Timer End Control Off ?*	Control output behavior after the interval **T1 + T2**. **no** Control output remains active. **oFF** Turns the control off at end of the timing period.
tbAS *time base*	Time base for the timers T1 and T2. **SEc** Minutes and Seconds (MM:SS) **Min** Hours and Minutes (HH:MM)

INPUT CYCLE

tYPE	**Input Type:** Selects the input signal type to be connected to the process variable input. J: **tc J** -110 to 950 ºC / -166 to 1742 ºF K: **tc K** -150 to 1370 ºC / -238 to 2498 ºF T: **tc t** -160 to 400 ºC / -256 to 752 ºF Pt100: **Pt** -200 to 850 ºC / -328 to 1562 ºF
dPPo	Selects the decimal point position.
unit	Selects display indication for degrees Celsius or Fahrenheit: **C** - Indication in Celsius. **F** - Indication in Fahrenheit.
oFFS	*Offset*. Parameter that allows the user to make adjustments to the PV value indicated.
SPLL **SPHL**	*SP Low/High Limit*. Defines the lower/upper limit for SP adjustment.
FuAL	*Function Alarm*. Functions of Alarms. Defines the functions for the alarms among the options of the **Table 02**.
SPAL	Alarm SP: Value that defines the point of activation of the alarm outputs. For the alarms programmed with the functions of the type **Differential**, these parameters represent the deviations. For the **lErr** alarm function, this parameter has no meaning.
bLAL	*Blocking Alarm*. Initial Blocking of Alarms. **YES** - Enables initial blocking **no** - Inhibits initial blocking
HYAL	*Hysteresis of Alarm*. Defines the difference between the value of PV at witch the alarm is triggered and the value at witch it is turned off.

CALIBRATION CYCLE

All types of input are calibrated in the factory. In case a recalibration is required; it shall be carried out by a specialized professional. In case this cycle is accidentally accessed, do not perform alteration in its parameters.

PASS	*Password*. Access Password Input. This parameter is presented before the protected cycles. See item Protection of Configuration.
CAL ib	*Calibration.* Enables the possibility for calibration of the indicator. When the calibration is not enabled, the related parameters are hidden.
inLC	*Input Low Calibration.* Enter the value corresponding to the low scale signal applied to the analog input.
inHC	*Input High Calibration.* Enter the value corresponding to the full scale signal applied to the analog input.
rStr	*Restore.* Restores the factory calibration of the input, discarding all alterations made by the user.
PASC	*Password Change*. Allows defining a new access password, always different from zero.
Prot	*Protection*. Sets up the Level of Protection. See **Table 04**.
r.En *RUN Enable*	Shows the parameter RUN (**run**) also in the Operation Cycle. **YES** Releases RUN for the operation cycle **no** Does not release RUN for the operation cycle
run Run	Display for enable or disable the controller's action on the process. It acts like a switch, turning the controller on or off. **YES** Enabled control **no** Disabled control **F** Enable/disable command via F key (*) (*) In RUN = F, when the controller is turned on or when it returns from a power failure, the control will be disabled (NO).

CONFIGURATION PROTECTION

The controller provides means for protecting the parameters configurations, not allowing modifications to the parameters values, avoiding tampering or improper manipulation. The parameter **Protection** (**Prot**), in the Calibration level, determines the protection strategy, limiting the access to particular levels, according to the table below.

PROTECTION LEVEL	PROTECTION LEVELS
1	Only the Calibration level is protected.
2	Calibration and Input levels are protected.
3	Calibration, Input, and Timers levels are protected.
4	Calibration, Input, Timers and Tuning levels are protected.
5	All levels are protected, including SP.

Table 04 – Levels of Protection for the Configuration

ACESS PASSWORD

To access the Calibration cycle, an Access Password is requested. If entered correctly, it gives permission for changes in these cycles parameters configuration, including the Protection parameter (**Prot**).

The Access Password is defined by the user in the parameter *Password Change* (**PASC**), present in the Calibration Level. **The factory default for the password code is 1111.**

PROTECTION ACCESS PASSWORD

The protection system built into the controller blocks for 10 minutes the access to protected parameters after 5 consecutive incorrect attempts of guessing the correct password.

MASTER PASSWORD

The Master Password is intended for allowing the user to define a new password in the event of it being forgotten. The Master Password doesn't grant access to all parameters, only to the *Password Change* parameter (**PASC**). After defining the new password, the protected parameters may be accessed (and modified) using this new password.

The master password is made up by the last three digits of the serial number of the controller **added** to the number 9000.

As an example, for the equipment with serial number 07154321, the master password is 9 3 2 1.

Controller serial number is displayed by pressing F Key for 5 seconds.

DETERMINATION OF PID PARAMETERS

During the process of determining automatically the PID parameters, the system is controlled in **ON/OFF** in the programmed Setpoint. The auto-tuning process may take several minutes to be completed, depending on the system. The steps for executing the PID auto-tuning are:

- Adjust the desired SP of the process.
- Enable auto-tuning at the parameter "**Atun**", selecting **FAST** or **FULL**.

The option **FAST** performs the tuning in the minimum possible time, while the option **FULL** gives priority to accuracy.

During automatic tuning the indicator TUNE remains lit on the faceplate of the controller. The user must wait for the tuning to be completed before using the controller.

During the execution of automatic tuning, PV oscillations can be introduced into the process around the *setpoint*.

If the tuning does not result in a satisfactory control, refer to **Table 05** for guidelines on how to correct the behavior of the process.

PARAMETER	VERIFIED PROBLEM	SOLUTION
Band Proportional	Slow answer	Decrease
	Great oscillation	Increase
Rate Integration	Slow answer	Increase
	Great oscillation	Decrease
Derivative Time	Slow answer or instability	Decrease
	Great oscillation	Increase

Table 05 - Guidance for manual adjustment of the PID parameters

CONFIGURATION FACTORY

OPERATION CYCLE

PARAMETER	DESCRIPTION	PARAMETER FACTORY
PV + SP	PV Indication Screen.	0
PV + TM	Display PV and current timer count.	-
t1	Set the **T1** time interval.	0.00
run	Display for enable or disable the controller's action on the process.	no

TUNING CYCLE

Atun	Enables the auto-tuning function for the PID parameters (**Pb**, **Ir**, **dt**).	oFF
Pb	Proportional Band.	0.0
Ir	Integral Rate.	0.00
dt	Derivative Time	0
Ct	Cycle time PWM.	5.0
HYSt	Control hysteresis.	1
ACt	Action Control.	rE
Out.1	Assign functions to the Output channels **OUT1** and **OUT2.**	oFF

TIMER CYCLE

t1	**T1** time interval setting**.**	0.00
t1.En	Allows the display of the **T1** parameter in the main (operating) cycle.	YES
t.dir	Counting direction of **T1** timer**.**	UP
t.Str	Defines starting mode for **T1** timer.	SP
t2	**T2** time interval setting.	0:20
t.E.Co	Control output behavior after the interval **T1 + T2**.	on
tbAS	Time base for the timers **T1** and **T2**.	SEc

INPUT CYCLE

tYPE	Input Type.	J
dPPo	Selects the decimal point position.	0
unit	Selects display indication for degrees Celsius or Fahrenheit.	C
oFFS	Parameter that allows the user to make adjustments to the PV value indicated.	0
SPLL	Defines the lower/upper limit for SP adjustment.	-110 / 950 (limits do sensor J)
SPHL		
FuAL	Functions of Alarms.	oFF
SPAL	Alarm SP.	0
bLAL	Initial Blocking of Alarms.	no
HYAL	Hysteresis of Alarm.	0

CALIBRATION CYCLE

PASS	Access Password Input.	0000
CAL ib	Enables the possibility for calibration of the indicator.	no
inLC	Enter the value corresponding to the low scale signal applied to the analog input.	0000
inHC	Enter the value corresponding to the full scale signal applied to the analog input.	0000
rStr	Restores the factory calibration of the input.	no
PASC	Restores the factory calibration of the input.	0000
Prot	Sets up the Level of Protection.	1
r.En	Shows the parameter RUN (run) also in the Operation Cycle.	YES
run	Display for enable or disable the controller's action on the process.	no

MAINTENANCE

PROBLEMS WITH THE CONTROLLER

Connection errors and inadequate programming are the most common errors found during the controller operation. A final revision may avoid loss of time and damages.

The controller displays some messages to help the user identify problems.

MESSAGE	DESCRIPTION OF THE PROBLEM
----	Open input. No sensor or signal.
Err 1 Err6	Connection and/or configuration problems. Check the wiring and the configuration.

Other error messages may indicate hardware problems requiring maintenance service.

INPUT CALLIBRATION

All inputs are factory calibrated and recalibration should only be done by qualified personnel. If you are not familiar with these procedures do not attempt to calibrate this instrument. In the case that it is necessary to recalibrate an input proceed as described in the following steps:

a) Set the type parameter according to the input **tYPE**.

b) Configure the lower and upper limits of indication for the maximum span of the selected input type.

c) Access the calibration level.

d) Enter the password.

e) Enable the calibration setting YES in the parameter **CAL ib**.

f) Using a function generator, apply to the input terminals a signal level close to the lower limit of the configured input range.

With the aid of an electrical signals simulator, apply a signal level close the lower limit of the measuring range of the input, on the corresponding terminals.

g) Access the parameter " **inLc**". With the keys ▲ and ▼ adjust the display reading such as to match the applied signal. Then press the **P** key.

h) Inject a signal that corresponds to a value a little lower than the upper limit of indication.

i) Access the parameter " **inHC**". With the keys ▲ and ▼, adjust the display reading such as to match the applied signal. Then press the **P** key until return to the Display PV screen.

j) Validate the calibration performed.

Note: When checking the controller calibration with a Pt100 simulator, pay attention to the simulator minimum excitation current requirement, which may not be compatible with the 0.170 mA excitation current provided by the controller.

SPECIFICATIONS

DIMENSION: .....48 x 48 x 35 mm

Approximate weight: ..... 60 g

POWER SUPPLY:

Standard Model .....100 to 240 Vac (±10 %), 50/60 Hz

.....48 to 240 Vdc (±10 %)

24 V Model: ..... 12 to 24 Vdc / 24 Vac (-10 % / +20 %)

Maximum Consumption: ..... 5 VA

ENVIRONMENTAL CONDITIONS:

Operation Temperature: ..... 0 to 50 °C

Relative Humidity:.....80 % @ 30 °C

For temperatures above 30 °C, reduce 3 % % for each °C

Internal use; Category of installation II, Degree of pollution 2; altitude < 2000 meters

INPUT:..... Thermocouples **J**; **K**; **T** and **Pt100** (according of **Table 01**)

Internal Resolution:.....32767 levels (15 bits)

Resolution of Display:..... 12000 levels (from -1999 up 9999)

Rate of input reading: .....up 5 per second

Accuracy: ..Thermocouples **J**, **K**, **T**: 0.25 % of the *span* ±1 °C (*)

.....Pt100: 0.2 % of the *span*

Input impedance: .....Pt100 and thermocouples: > 10 MΩ

Measurement of Pt100: .....3-wire type, (α= 0.00385)

With compensation for cable length. Excitation current of 0.170 mA.

OUTPUTS: OUT1: .....Voltage pulse, 5 Vdc / 25 mA

.....Relay SPST; 1.5 A / 240 Vac / 30 Vdc

OUT2: .....Relay SPST; 1.5 A / 240 Vac / 30 Vdc

FRONT PANEL: ..... IP65, Polycarbonate (PC) UL94 V-2

ENCLOSURE:..... IP30, ABS+PC UL94 V-0

ELECTROMAGNETIC COMPATIBILITY: ..... EN 61326-1:1997 and EN 61326-1/A1:1998

EMISSION:..... CISPR11/EN55011

IMMUNITY:.....EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8 and EN61000-4-11

SAFETY: ..... EN61010-1:1993 and EN61010-1/A2:1995

SPECIFIC CONNECTIONS FOR TYPE FORK TERMINALS;

PROGRAMABLE CYCLE OF PWM: from 0.5 up 100 seconds;

STARTS UP OPERATION: after 3 seconds connected to the power supply.

CERTIFICATION: CE and cULus

IDENTIFICATION

N1030T -	A -	B

A: Outputs Features

PR: OUT1= Pulse / OUT2= Relay

RR: OUT1= Relay / OUT2= Relay

B: Power Supply electric

(Blank): .....Model standard

.....100~240 Vac / 48~240 Vdc; 50~60 Hz

24V: .....Model 24V

.....12~24 Vdc / 24 Vac

WARRANTY

The warranty conditions are on our website www.novusautomation.com/warranty.