

VULCANIC



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USE, START-UP AND MAINTENANCE MANUAL

CONTROL AND REGULATION CABINET

WITH CONTROLLER 30656



**PLEASE READ CAREFULLY AND FULLY THIS MANUAL BEFORE
INSTALLING THE UNIT THIS MANUAL IS AN INTEGRAL PART
OF THE PRODUCT AND SHOULD ACCOMPANY IT UNTIL
ITS POSSIBLE DISASSEMBLY.**

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START-UP

- You are now the owner of a VULCANIC control and regulation cabinet.
Check that the information on the nameplate corresponds to the parameters of your order and the delivery form. Check for the presence of, and refer to the contents of the accompanying technical file:
 - Commercial specifications,
 - Circuit diagrams and parts lists,
 - Manuals for the main regulation and safety equipment.
- Place the cabinet on its base, protected from impact and bad weather (except for the outdoor versions), ensuring that the ventilation orifices are kept clear,
- Carry out electrical connection to the interface terminal blocks in conformity with the state of the art rules and the current standards, using the circuit diagram. Except in special cases, the cables pass through a removable plate located on the inside, that you will provide with the necessary glands. It is mandatory to connect the ground terminal to the ground point.
Check that the connections are tight.
- Check the connection of the wiring, wire by wire, and make sure that the voltage, current, power and external functions conform to those appearing in this file. Also check with the presence of and calibration of the fuses for protection devices (if necessary, pre-adjust the threshold of the latter).
Disconnect the loads from the feeders by opening the fuse holders.
- Ensure the electric supply to the cabinet while preserving the head switch in the open position and checking the power supply voltage.
- Close the head isolating switch and pre-adjust the configurable or programmable (regulator) electric devices. Check the conformity of their operation with the attached manual or specifications. All the functions must be tested in this way, one by one.

**CAUTION:**

During the following live tests, the heating loads (electric resistors) or cooling loads (refrigerating unit) must be set to the normal operating situation: presence of fluids and nominal flow rates.

- Turn off the main electric power supply then connect the loads again (close the fuse holders). Reestablish the electric power supply to perform the first full-scale test. It is preferable to raise the values of the parameters gradually during this test (power and temperature, etc) while monitoring the performance of the various test and safety functions (fans or air conditioning, thermostats, limiters and safety devices, various alarms, etc).
- Check the performance of the installations at full load: all the switching sequences should be tested.

1. FUNCTIONAL ANALYSIS:

- Except in special cases involving particularly complex sequences, this analysis is implicitly contained in the commercial specifications or in the commercial manual of the corresponding product.
- The lighted "ON" selector that is used for switching on (position I) or off (position 0) the equipment. The indicator light comes on when the heating contactor is engaged.
- The green "ON" (option) pushbutton: used for heating the equipment.
- The red "OFF" (option) pushbutton: used for stopping the equipment.

- The lighted "LOCAL/REMOTE" (option) selector switch used as follows:
In the "LOCAL" mode, the operation of the equipment using the front panel controls.
In the "REMOTE" mode, with the orange indicator lights on, the cycle start by closing a potential-free contact.
In the remote mode, the cabinet front panel controls are no longer operational.
- The black "FAULT RESET" pushbutton: fleeting action on this button is a way of acknowledging faults after they have disappeared; this operation is necessary each time the main power supply is cut off and reestablished.
- The white "HEATING" indicator lights come on when the three-phase voltage is present across the terminals of the heating elements. The breakdown of one or several phases results in the partial or permanent lighting, or the total extinguishing, of one or several indicator lights.
- The white "VOLTAGE PRESENCE" indicator light:
The control voltage is present forward of the main isolating switch.
- Red "FAULT, OVERHEATING," indicator light, lighting up when:
 - The respective contact of the thermostat, regulator, external safety loop, opens
 - And after each cut off and re-establishing of the main power supply.
- The "LIMITATION" (option) indicator light comes on when the temperature of the heating elements has exceeded the pressure preset on the thermostat. This interrupts the regulation signal (automatic reset).
- The "EMERGENCY STOP" knob on the cabinet, to stop the operation of the equipment; to reset, turn this knob.
- The SAFETY EXTERNAL LOOP: used for connecting an external normally closed safety contact.
- The "HOUSING SAFETY" thermostat, irreversibly cutting off the heating when the housing temperature has exceeded the safety set point.
- The "HEATING ELEMENTS TEMPERATURE" limiting thermostat interrupts the regulation signal (automatic reset) when the surface temperature of the heating elements has exceeded the limitation set point.
- The temperature regulator:
PID regulator ensuring the regulation of the process temperature by comparison between the measurement made by the regulation probe and the set point chosen by the operator. These displays go out when the voltage is no longer present across the terminals.
- Cascade operation (option):
 - Main temperature regulator (on the front panel of the cabinet):
PID regulator ensuring the regulation of the process temperature by comparison between the measurement made by the regulation probe and the set point chosen by the operator; its displays go out when the voltage is no longer present across the terminals.
 - Auxiliary temperature regulator:
PID regulator ensuring the regulation of the instrumented rod temperature by comparison between the measurement made by the regulation probe and the set point chosen by the operator; its displays go out when the voltage is no longer present across the terminals.
The auxiliary temperature regulator limitation set point is adjusted using the Sphi parameter.
To optimize the main regulator/auxiliary regulator regulation cascade, it is necessary to:
 - Adjust the Sphi limitation set point of the auxiliary regulator,
 - Set the auxiliary regulator to all or nothing regulation (proportional band –0)
 - Set the main regulator to power proportioning (MANUAL) and choosing and power so that the process reaches a temperature for which auxiliary regulator limitation is active.
 - Optimize the PID parameters of the auxiliary regulator limiter using the habitual method as recommended in the specific manual of the regulator (or use the self-adapting PID mode)
 - Put the main regulator in a closed loop (REGULATION).

- Optimize the main regulator PID parameters using the habitual method as recommended in the regulator specific manual (or use the self-adapting PID mode).
- Red LED "I" on the regulator:
Lights up when the deviation between the measurement and the set point justifies the regulator giving a heating order to the contactors or thyristor power units (option) taking into consideration the settings of the P, I, and D, parameters. Even when OP1 is lighted, heating may be interrupted by the limiter or a safety device.
- Red "ALM" LED on the regulator:
Lights up when the measurement deviates too far from the set point. This value is adjusted by the optional parameter P-AL (full scale), b-AL (band) or A-AL (deviation).
- Red "AT" LED on the regulator:
Lights up when the optimization adjustment of the P.I.D. parameters is automatic (self-adaptive mode). Flashes in the self-regulating mode (and on the startup of the self-adaptive mode). It is unlit when the PID parameter optimization adjustment is carried out manually.
- Red "SET" LED on the regulator.
Lights up in the adjustment mode reserved for qualified personnel; flashes during a change of modes.

2. PARAMETER SETTINGS MODE

See the regulator parameter(s), thermostat(s) in the appendix of the circuit diagram.

The adjustments made in the works for the "safety" functions (temperature, flow rate, pressure, etc) are theoretical and approximate. Their final value is obtained as follows:

- Decalibrate each function to the tripping threshold, in the case of the most unfavorable operation (maximum value or minimum value as applicable), without exceeding this threshold.
- Then increase (for maximum values) or decrease (for minimum values), this tripping threshold to between 3 and 10% of the full-scale.

3. MAINTENANCE

- Check that the interface connections are still tight after 50 hours of operation, then once each year. Clean the heat sinks, fans, filters and ventilation openings using compressed air, and at intervals adapted to the fouling rate
- Annually, check the performance of the safety equipment (thermocouples and various probes, thermostats, indicator lights, alarms, etc), and their calibration if necessary. Replace any defective elements.

4. TROUBLE-SHOOTING:

- Some standardized components may have a procurement time that is incompatible with the availability demands of your installation, including during the warranty period. Be sure to get the information about these times and order the necessary spares from VULCANIC.

5. WARRANTY:

- Unless stipulated otherwise in a contract, the warranty is compliant with the general conditions of sale by VULCANIC. In any case, no action on site under cover of the warranty will be accepted unless VULCANIC has initially received an assistance order on first commissioning, and rushed in the qualified personnel at that time.

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REGULATOR TYPE 30656

EVOLUTIONARY SELF-ADAPTATIVE PID



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**REGULATOR TYPE 30656
SIMPLIFIED MANUAL**

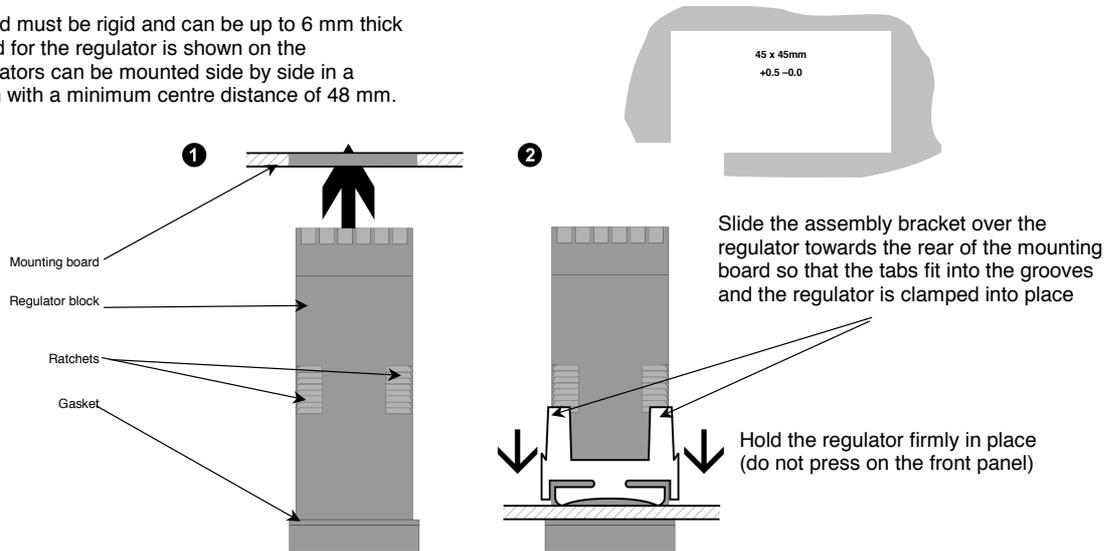


CAUTION: Installation and configurations only to be performed by technically competent personnel authorised to do so. Local regulations concerning electrical installation and safety must be observed.

1. INSTALLATION

Mounting board

The mounting board must be rigid and can be up to 6 mm thick
The cutout required for the regulator is shown on the right. Several regulators can be mounted side by side in a multiple installation with a minimum centre distance of 48 mm.



CAUTION: do not remove the metal gasket, it is designed to ensure tightness against dust and damp.

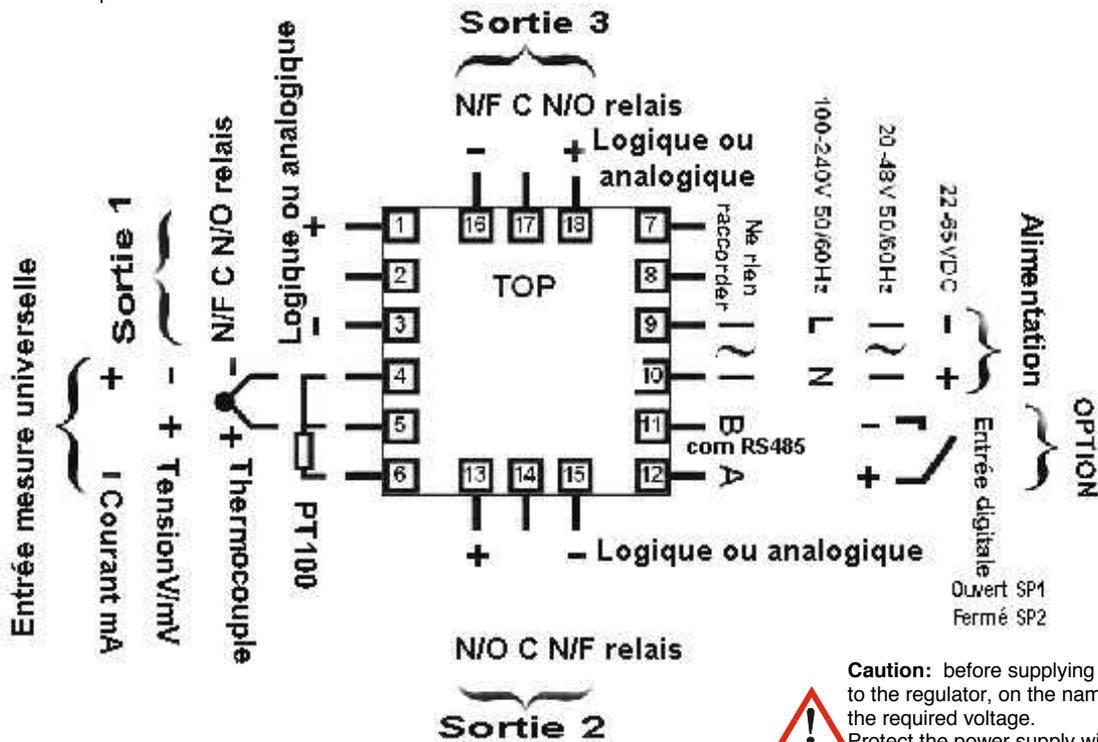
REAR TERMINALS

**USE COPPER CONDUCTORS
(EXCEPT ON THE THERMOCOUPLE INPUT)**

Terminal torque load= 1.5mm²



Caution: the connection diagram below shows all the possibilities of wiring the equipment. Your model may have different inputs and outputs depending on its configuration.

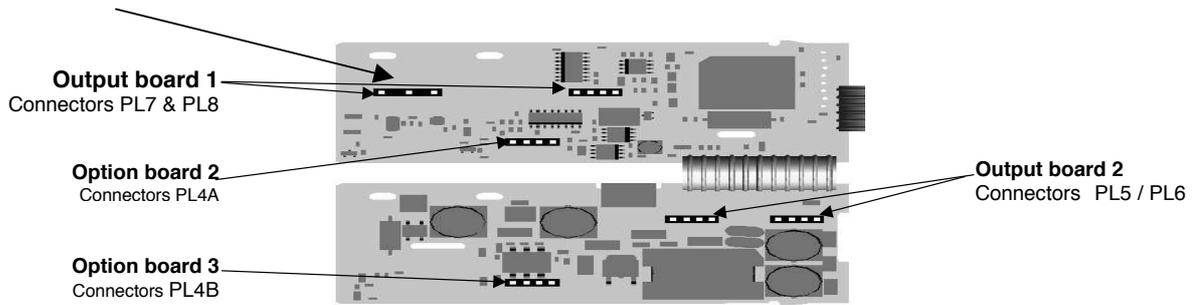


Caution: before supplying electric power to the regulator, on the nameplate, check the required voltage. Protect the power supply with a 1A fuse. Between 100 and 240V, and 315mA between 24 and 48V.

Installation of optional boards

To install additional boards corresponding to various desired outputs and options, pull on the front panel to disconnect the printed circuit boards from the housing. Release the 2 side boards from the front panel by lifting slightly the 2 locking tabs, then the lower ones. Spread these 2 circuits apart gently, without applying excessive stress to the interconnecting harnesses. Insert the additional boards into their respective connectors as indicated below. To reassemble, position the lugs of each additional board in the slot of the opposite circuit then place the 2 side boards in the front panel locking tabs. Push the assembly into the housing with care (the 2 side boards must slide smoothly into the runners of the housing).

Note: The regulator will automatically recognize the optional boards in place.



2. SELECTION MENU

The selection menu is used to gain access to the various modes. It can be opened at any time by simultaneously pressing on Δ then ∇ . The message **SLCt** is displayed, so press Δ or ∇ to select the desired mode then press \odot to validate. An **ULoc** access code is sometimes required to avoid modifications by unauthorised third parties. Press Δ or ∇ to enter the correct code and then press \odot to validate.

Mode	Readout (upper)	Readout (lower)	Description	Locking codes
Operator	OPt	SLCt	Normal operating mode	sans
Parameter settings	SEtP	SLCt	User parameter setup mode	10
Configuration	ConF	SLCt	Regulator configuration mode	20
Product info	inFo	SLCt	Firmware information mode	Sans
Self adjustment	REtun	SLCt	Preadjustment and selfadjustment validation mode	0

To exit from the selection menu, use the same procedure as for the entering it. The regulator will return automatically to the operator mode (display of measurement and centrepoint) if no action is applied to the keys for 2 minutes.

3. CONFIGURATION MODE

It is essential to fully configure the regulator before gaining access to the other modes. Open up the CONFIGURATION mode using the message and the login code indicated in paragraph 2). In this mode which starts with the parameter **nPt**. Press the key \odot to scroll through the various parameters then the keys Δ or ∇ to modify their value and finally the key **AUTO MAN** to validate. To exit from the CONFIGURATION menu, use the same procedure as for the entering it. The regulator will return automatically to the operator mode (display of measurement and centrepoint) if no action is applied to the keys for 2 minutes.

Note: The displayed parameters will vary depending on the configuration of the regulator. *he parameters with an * are also present in the parameter setting mode.*

Parameters	Lower readout	Upper readout	Description	By default
Type of input & scale	inPt		See table of types and scales of input at top of page 7	J C
Type of input & scale	rUL		of low limit at scale top	Top of scale, or 1000 (analog)
Top of input & scale	rLL		of scale bottom to top scale limit	Bottom of scale Or 0 (analog)
Position of Decimal point	dPoS		0, 1, 2 or 3 digits after decimal point, for current or voltage inputs only	1
Type of regulation	CtYP	SnGL	Output 1 (hot) only	SnGL
		duAL	Outputs 1&2 (hot / cold)	
Type of output 1 action (main)	CtRL	rEu	Inverse action (hot regulation)	rEu
		d ir	Direct action (cold regulation)	
Characteristics of alarm 1	AL1	P_H 1	Full scale high alarm	P_H 1
		P_Lo	Full scale low alarm	
		dE	Deviation alarm	
		bAnd	Band alarm (centered on setpoint)	
		nonE	No alarm	
High value AI1 *	PhA 1		Adjustable from min. and max. of measurement scale	Max scale.
Low value AI1 *	PLA 1			Min scale.
High value AI1 *	bAL 1		1 unit at max. range from setpoint	5
Deviation value AI1 *	dAL 1		+ or - from setpoint	5
AI 1 Hysteresis*	AHY 1		1 unit at full scale	1
Alarm 2 Type*	ALA2		SAME AS ALARM 1	P_Lo
High value AI2 *	PhA2			Max scale.
Low value AI2 *	PLA2			Min scale.
Band value AI2 *	bAL2			5
Deviation value AI2*	dAL2			5
AI 2 Hysteresis*	AHY2			1
Loop alarm	LAEn			d iSA (deactivated) or EnAb (activated)
Loop alarm time*	LAEt		From 1 sec to 99 min. 59 sec	99.59

Alarm inhibition		Type 30656		Simplified Manual
VULCANIC SAS	Inh 1	nonE	No alarm	
		ALA 1	Alarm 1 activated	
		ALA 2	Alarm 2 activated	
		both	Alarm 1 and alarm 2 activated	
Output 1 load	USE 1	Pr 1	Main (Hot)	Pr 1
		SEc	Secondary (Cold)	
		Al_d	Alarm 1 Direct (active above)	
		Al_r	Alarm 1 Reverse (active below)	
		A2_d	Alarm 2 Direct (active above)	
		A2_r	Alarm 2 Reverse (active below)	
		LP_d	Direct alarm loop	
		LP_r	Reverse alarm loop	
		Or_d	Soft alarm 1 OR 2, Direct	
		Or_r	Soft alarm 1 OR 2, Reverse	
		Ad_d	Soft alarm 1 AND 2, Direct	
		Ad_r	Alarm 1 AND 2, Reverse	
		rEtS	Setpoint copy	
		rEtP	Measurement copy	
Scale for linear output In current or voltage	tYP 1	0_5	0 – 5 V DC	0_10
		0_10	0 – 10 V DC	
		2_10	2 – 10 V DC	
		0_20	0 – 20 mA DC	
		4_20	4 – 20 mA DC	
Output 1 copy: scale top	ro 1H	-1999 to 9999		Max scale
Output 1 copy: scale bottom	ro 1L	-1999 to 9999		Min scale
Output 2 load	USE 2	SAME AS OUTPUT 1		Sec or AI2
Lin. O/P 2 Range	tYP 2			0_10
Output 2 copy: scale top	ro 2H	-1999 to 9999		Max scale
Output 2 copy: scale bottom	ro 2L	-1999 to 9999		Min scale
Output 3 load	USE 3	SAME AS OUTPUT 1		Al_d
Linear Output 3 Range	tYP 3			0_10
Output 3 copy: scale top	ro 3H	-1999 to 9999		Max scale
Output 3 copy: scale bottom	ro 3L	-1999 to 9999		Min scale
Display strategy	d, SP	1, 2, 3, 4, 5 or 6 (see page 8)		1
Communication protocol	Prot	ASC 1	Ascii	r7bn
		r7bn	Modbus without parity	
		r7bE	Modbus with even parity	
		r7bo	Modbus with odd parity	
Transmission rate	bAud	1.2	1200	4.8
		2.4	2400	
		4.8	4800	
		9.6	9600	
		19.2	19200	
Address	Addr	1	1 – 255 (Modbus), 1-99 (Ascii)	1
Action	CoEn	Read only or read/write		r_w
Use of digital input	d, I, 1	d, S 1	Selection setpoint 1 / setpoint 2	d, S 1
		d, AS	Automatic / Manual	
Locking code	CLoc	0 to 9999		20

Note: For more information about the parameters described in this table, refer to the detailed manual, available from your supplier.

Code	Type of input & scale	Code	Type of input & scale	Code	Type of input & scale
<i>bC</i>	B : 100 to 1824 °C	<i>L.C</i>	L : 0.0 to 537.7 °C	<i>P24F</i>	PtRh20% - 40%: 32 to 3362 °F
<i>bF</i>	B : 211 to 3315 °F	<i>L.F</i>	L : 32.0 to 999.9 °F		
<i>cC</i>	C : 0 to 2320 °C	<i>nC</i>	N : 0 to 1399 °C	<i>PtC</i>	Pt100 : -199 to 800 °C
<i>cF</i>	C : 32 to 4208 °F	<i>nF</i>	N : 32 to 2551 °F	<i>PtF</i>	Pt100 : -328 to 1472 °F
<i>jC</i>	J : -200 to 1200 °C	<i>rC</i>	R : 0 to 1759 °C	<i>Pt.rC</i>	Pt100 : -128.8 to 537.7 °C
<i>jF</i>	J : -328 to 2192 °F	<i>r.F</i>	R : 32 to 3198 °F	<i>Pt.r.F</i>	Pt100 : -199.9 to 999.9 °F
<i>J.C</i>	J : -128.8 to 537.7 °C	<i>SC</i>	S : 0 to 1762 °C	<i>0.20</i>	0 / 20 mA DC
<i>J.F</i>	J : -199.9 to 999.9 °F	<i>SF</i>	S : 32 to 3204 °F	<i>4.20</i>	4 / 20 mA DC
<i>K.C</i>	K : -240 to 1373 °C	<i>tC</i>	T : -240 to 400 °C	<i>0.50</i>	0 / 50 mV DC
<i>K.F</i>	K : -400 to 2503 °F	<i>tF</i>	T : -400 to 752 °F	<i>1050</i>	10 / 50 mV DC
<i>K.C</i>	K : -128.8 to 537.7 °C	<i>t.C</i>	T : -128.8 to 400.0 °C	<i>0.5</i>	0 / 5 V DC
<i>K.F</i>	K : -199.9 to 999.9 °F	<i>t.F</i>	T : -199.9 to 752.0 °F	<i>1.5</i>	1 / 5 V DC
<i>L.C</i>	L : 0 to 762 °C	<i>P24C</i>	PtRh20% - 40%: 0 to 1850 °C	<i>0.10</i>	0 / 10 V DC
<i>L.F</i>	L : 32 to 1403 °F			<i>2.10</i>	2 / 10 V DC

4. PARAMETER SETTING MODE

Note : The configuration mode must be complete before moving on to the parameter setting mode.

Select the parameter setting up mode (see paragraph 2). The  lights up. To select the parameters, press  then press  or  to change the values.

To get out of the parameter setting mode, press and hold down the  key then press , return to the Optr mode then press .

Note : The displayed parameters will depend on the hardware configuration.

Parameters	Lower readout	Upper readout Adjustment possibility	By default
Display filter time constant	<i>F .ILt</i>	None, 0.5 to 100.0 sec	2.0
Measurement offset	<i>OFFS</i>	+/- of measurement unit	0
Output power (hot) OUT1	<i>PPU</i>	Indicates the value of the power in % (read only)	N/A
Output power (cold) OUT2	<i>SPU</i>		
Proportional output band 1 (PB1)	<i>Pb.P</i>	0% to 999.9% of real input scale (<i>rULBrLL</i>)	10.0
Proportional output band 2 (PB2)	<i>Pb.S</i>		
Integral time (Reset)	<i>ArSt</i>	1 sec to 99 min 59 sec and OFF	5.00
Drift time (Rate)	<i>rAtE</i>	00 secs to 99 min 59 sec	1.15
Overlapping	<i>OL</i>	From -20 (dead band) to +20% (overlapping) of PB1+PB2	0
Proportional band offset (Bias)	<i>b .rS</i>	0% (-100% if outputs 1 and 2) at 100%	25
Output differential 1 in go/nogo	<i>d .fP</i>	0.1% to 10.0% of real input scale (<i>brULBrLL</i>) centered on the setpoint	0.5
Output differential 2 in go/nogo	<i>d .fS</i>		
Output differential 1&2 in go/nogo	<i>d .fF</i>		
Top limit of setpoint (Sphi)	<i>SPuL</i>	Of scale max. setpoint	Value of <i>rUL</i>
Bottom limit of setpoint (Splo)	<i>SPLL</i>	Of scale min. setpoint	Value of <i>rLL</i>
Power limit of output 1 (Ophi)	<i>OPuL</i>	0% to 100%	100
Output cycle time 1	<i>Ct1</i>	0.5, 1, 2, 4, 8, 16, 32, 64, 128, 256 or 512 sec.	32
Output cycle time 2	<i>Ct2</i>		
Output cycle time 3	<i>Ct3</i>		
High alarm 1	<i>PhA1</i>	From min to max. of real input scale (<i>rULBrLL</i>)	R/max
Low alarm 1	<i>PLA1</i>		R/min
Deviation alarm 1	<i>dAL1</i>	+/- from the setpoint	5
Alarm in band 1	<i>bAL1</i>	From 1 unit min to max. of real input scale (<i>rUL</i>)	5
Hysteresis Alarm 1	<i>hY1</i>	Up to 100%	1
High alarm 2	<i>PhA2</i>	From min to max. of real input scale (<i>rULBrLL</i>)	R/max
Low alarm 2	<i>PLA2</i>		R/min
Deviation alarm 2	<i>dAL2</i>	+/- from the setpoint	5
Alarm in band 2	<i>bAL2</i>	From 1 unit min to max. of real input scale (<i>rLL</i>)	5
Hysteresis Alarm 2	<i>hY1</i>	Up to 100%	1
Loop alarm temperature:	<i>LAt .i</i>	From 1 sec to 99 min. 59 sec	99.59
Auto Pre-tune	<i>APt</i>	<i>d .iSA</i> deactivated or <i>EnAb</i> activated	d .iSA
Auto/manual regulation	<i>PaEn</i>		
Setpoint gradient (Rpen)	<i>SPr</i>	1 to 9999 units per hour or Off	9999
Setpoint gradient rate	<i>rP</i>		
Setpoint value (SP1 only)	<i>SP</i>	From min to max. of real input scale (<i>rULBrLL</i>)	Value of <i>rLL</i>
Setpoint value 1 (if double setpoint)	<i>_ SP 1</i>	From min to max. of real input scale (<i>rUL/rLL</i>)	
Setpoint value 2 (if double setpoint)	<i>SP2</i>	"_" indicates active setpoint.	

Parameters	Lower readout	Upper readout Adjustment possibility	By default
Locking code		0 to 9999	10

5. AUTOMATIC ADJUSTMENT MODE

Enter SELF-ADJUSTMENT mode (**Atun**) of SELECTION menu then press KEY  to scroll through the parameters. Press  or  to change the values. To exit from the SELF-ADJUSTMENT mode, hold down  then press  : return to mode then press .

The function of **Pre-Tune** is a function used only on initial starting of the regulator and is inhibited as soon as the approximate adjustments of the PID have been calculated. It only acts if the deviation between the measurement and the setpoint is greater by 5% than the real input scale (**rUL/rLL**). If, in the PARAMETER SETTING mode the parameter **APt = EnAb**, then the Pre-Tune function will be activated on each powering up*.

The function of **Self-Tune** is a function for optimizing the PID parameters that is activated automatically on load or setpoint variations, when the deviation between the measurement and the setpoint is less than 5% of the real input scale (**rUL/rLL**).

For more information about the regulator adjustments, refer to the detailed user manual.

Paramètres	Legend: Readout (lower)	Legend: Readout (higher)	Description / Adjustment values	By default
Pre-tune	Ptun	ON ou OFF	These parameters cannot be changed as long as the regulator is calculating*	OFF
Self-Tune	Stun			
Locking code	tLoc			

***Note: Pre-adjustment will not engage if the setpoint is a gradient. Likewise, automatic adjustment will not engage if the proportional band = 0.**

6. MODE INFORMATIONS USINE

Enter INFO mode (**info**) of SELECTION menu then press the key  to scroll through the parameters. To exit from the INFO mode, hold down  then press  : return to **OPtr** mode then press .

Note : the information is not modifiable

Parameters	Readout (lower)	Readout (upper)	Description
Type of input	In_1	Un_1	Universal input only
Hardware configuration of output 1	OPn1	nonE	Not used
		rLY	Relay
		SSr	PWM static unit control (10Vcc)
		tr_1	PWM Triac control (230 Vca max 1A)
		L in	Linear analog voltage or current
Hardware configuration of output 2	OPn2	Same as output 1	
Hardware configuration of output 3	OPn3		
Hardware configuration of auxiliary I/O	OPnA		nonE
		r485	RS485 communication
		dIG_1	Digital input (SP1/SP2)
Type of Firmware	FbJ		Identified by a number
Version of Firmware	ISS		Identified by a number
Revision level	PrL		Identified by a number
Date of manufacture	dOPn		mm/AA
Serial number (1st group)	Sn_1		First batch of 4 digits in serial number

Parameters	Readout (lower)	Readout (upper)	Description
Serial number (2 nd group)	Sn2		Second batch of 4 digits in serial number
Serial number (3rd group)	Sn3		Last batch of 4 digits in serial number

7. OPERATOR MODE

This mode is activated on power up. It can then be accessed via the SELECTION mode (see paragraph 2).

Note: All the parameters of the CONFIGURATION and PARAMETER SETTING mode need to be set before using the regulator on the process.

Press on  to scroll through the parameters then on  or  to adjust the value.

Note: In display strategy No. 6, the parameters are only accessible during reading. To change them, go through the PARAMETER SETTING mode.

Readout Upper (red)	Readout Lower (green)	strategy SPST	Description
Measurement value	Setpoint value	1 & 2 (default display on powering up)	Display of measurement and setpoint (adjustable in Strategy 2)
Measurement value	Artificial setpoint value	3 & 6 (default display on powering up)	Display of measurement and artificial setpoint (indicating instant value during a gradient) <i>Read only</i>
Setpoint value 2	<i>- SP2</i>	"-" lighted if digital input = 0,5 I active setpoint SP2	Displays setpoint 2 <i>Adjustable except in strategy 6.</i>
Instant artificial setpoint value	<i>SPrP</i>	<i>SPr</i> activated and <i>rP</i> different from 0	Instant setpoint gradient value <i>Read only</i>
Gradient rate	<i>rP</i>	<i>SPr</i> activated in parameter setting mode	Setpoint gradient rate in unit/hour <i>Adjustable except in strategy 6.</i>
Alarms active	<i>ALSt</i>	if 1 or several alarms are active: The indication ALM Will also flash	<i>AL2</i> Alarm 2 active <i>AL1</i> Alarm 1 active <i>AL2 I</i> Loop alarm active
Measurement value	<i>(Empty)</i>	4 (default display on powering up)	Displays measurement only <i>Read only</i>
Setpoint value	<i>(Empty)</i>	5 (default display on powering up)	Displays only selected SP. <i>Read only</i>
Setpoint value	<i>SP-{}-</i>	1, 3, 4, 5 & 6 if digital input is not 0,5 I	Displays setpoint SP <i>Adjustable except in Strategy 6</i>
Setpoint value 1	<i>- SP1</i>	"-" lighted if digital input = 0,5 I active setpoint SP1	Displays setpoint 1 <i>Adjustable except in Strategy 6</i>

Manual operation check for power dispenser

If **POEn** is **EnAb** in the parameter setting mode, manual control can be activated or deactivated by pressing the key  in the operator mode  by changing the digital input state if **d iG1** or **d iG2** or has been configured as **d iAS**.

Indicator will flash as long as it is in Control mode and the bottom readout will indicate xxx (where **Pxxx** represents the output power value). The change to the manual mode is of the smooth type.

Press  or  to adjust the output power. **Caution: the limit generated by the function OPuL is not active in this mode.**

8. ERROR / FAULT INDICATIONS

Parameters	Readout upper (red)	Readout lower (green)	Description
Regulator parameter default		CONF	Configuration & Parameter setting not done. Fault encountered on initial starting or after addition of optional modules: Follow on the instructions of paragraphs 3 and 4
External setpoint input at top of scale	CHH	Normal	Input > 5% from top of scale
External setpoint input at bottom of scale	LLL	Normal	Input < 5% from bottom of scale
Sensor breakdown	OPEN	Normal	Sensor defective or wiring broken
Error in module No. 1	Err	OPn1	Fault in output board No 1
Error in module No. 2		OPn2	Fault in output board No 2
Error in module No. 3		OPn3	Fault in output board No 3
Erreur module Aux.		OPnA	Fault in optional module (I/O)

9. SERIAL COMMUNICATION

For more information about the parameters described in this table, refer to the detailed manual, available from your supplier.

10. CHARACTERISTICS

Universal input

Input impedance: higher than 10M (resistive), except for inputs CC, mA, (5 Ω) AND V (47k Ω).

Insulation: Insulated from all the outputs at 240V CA (except control of SSR).

Digital input (TTL) Open (2 to 24 VDC) = SP1, Auto mode (<0.8 VDC)= SP2,

OUTPUTS

Relays

Type / breaking capacity: Single-pole switch (SPDT); 2A resistive at 120/240V CA

Life duration: Greater than 500,000 operations at nominal voltage / current.

Insulation: Isolated from all other inputs and outputs.

SSR /TTL control

Operating range: SSR > 10V for load of 500 min.

Insulation: Not insulated at input or at the other SSR outputs.

1. TRIAC

Operating range: 20 – 280V RMS (47 – 63 Hz)

Rated current: 0.01 - 1A (complete rms cycle in switched state at 25°C); linear reduction above 40°C reaching 0.5A at 80°C

Insulation: Isolated from all other inputs and outputs.

Linear CC

Definition: 8 bits in 250mS (10 bits in 1s: Typical >10 bits in >1s typical).

Insulation: Isolated from all other inputs and outputs.

OPERATING CONDITIONS: UNDER SHELTER

Duty temperature: 0°C to 55°C (ambient temperature)

Storage temperature : -20°C to 80°C (ambient temperature)

Relative humidity: 20% - 95% RH, condensation-free

Power supply voltage 100 - 240V CA, 50/60Hz 7.5VA (optional)

20 - 48V CA, 50/60Hz 7.5VA (optional)

22 - 65V CC, 5W maximum (low voltage version)

ENVIRONMENT

Approvals: CE, UL, ULC

Sensitivity to IEM: Conforming to EN61326 (immunity and emissions)

Safety approvals: Conforming to EN61010-1 and UL3121

Pollution Degree 2, Installation Category II

Degree of protection: IP66

DIMENSIONAL CHARACTERISTICS

Dimensions Front panel 48 x 48 mm (panel cutout 45x45 mm, +0.5 –0mm)

Depth: 110 mm (behind the front panel)

Weight: 0.21kg maximum

11. NOTES