

VULCANIC



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USE, START-UP AND MAINTENANCE MANUAL

CONTROL AND REGULATION CABINET

WITH CONTROLLER 30656 AND SOLID STATE RELAYS



***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

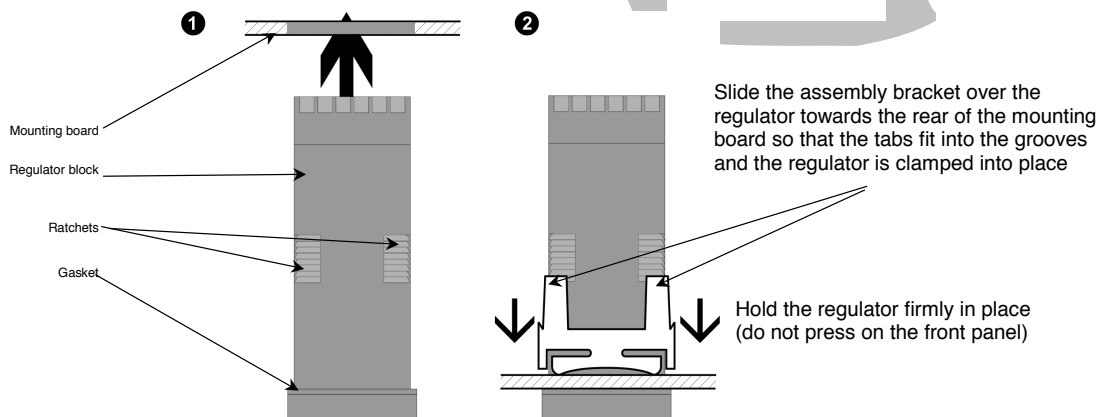


CAUTION: Installation and configurations only to be performed by technically competent personnel authorised to do so. Local regulations concerning electrical installation and safety must be observed.

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.

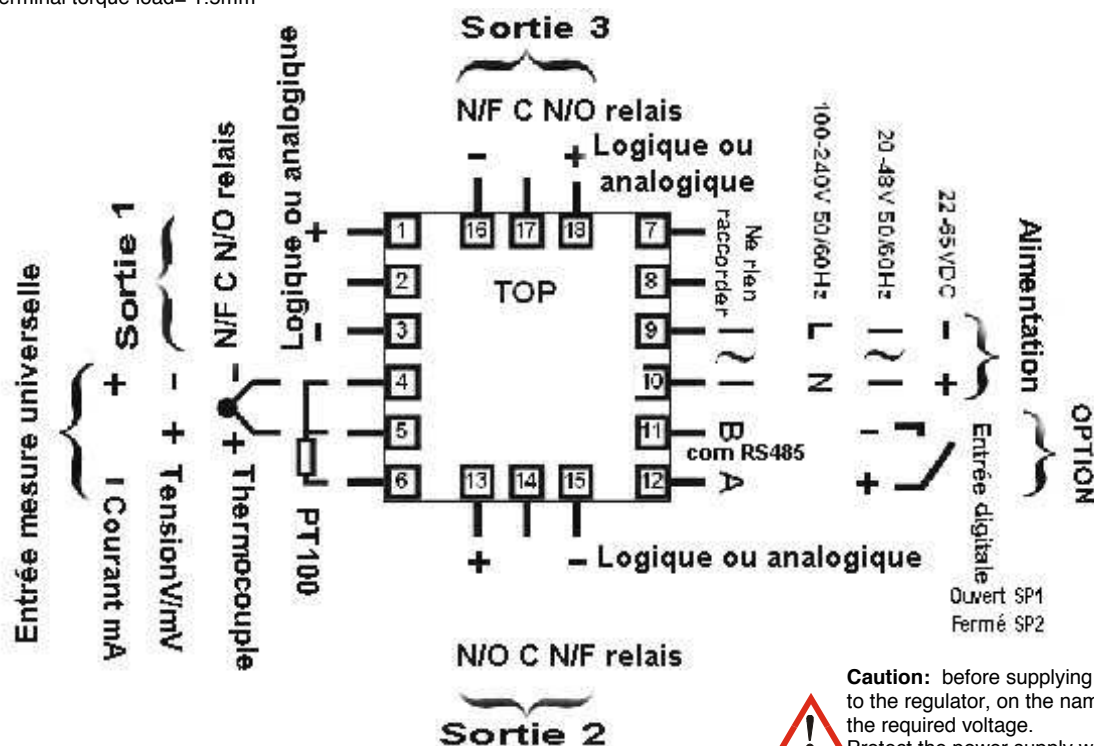
REAR TERMINALS

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.

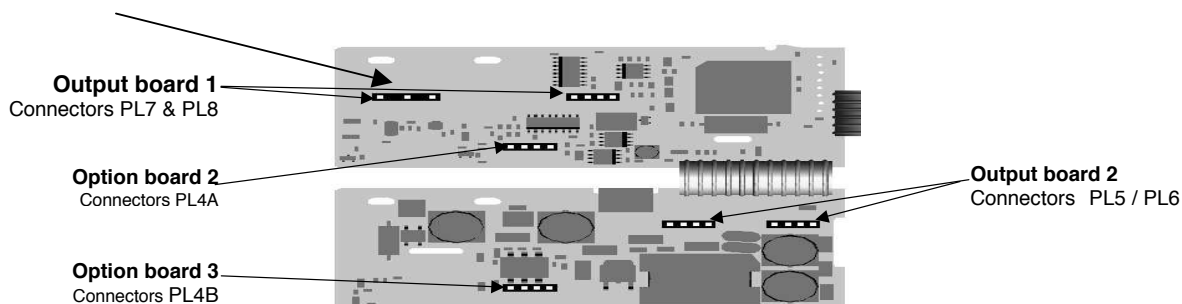


Caution: before supplying electric power to the regulator, on the nameplate, check the required voltage. Protect the power supply with a 1A fuse. Between 100 and 240V, and 315mA between 24 and 48V.

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 \rightarrow 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 \rightarrow 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 centrepont) 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 \rightarrow to scroll through the various parameters then the keys Δ or ∇ to modify their value and finally the key \rightarrow 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 centrepont) 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	ALA 1	P_H I	Full scale high alarm	P_H I
		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)		d iSA
Loop alarm time*	LAEt	From 1 sec to 99 min. 59 sec		99.59




Alarm inhibition VULCANIC SAS	<i>Inh</i>	<i>nonE</i>	No alarm	Simplified Manual
		<i>ALA1</i>	Alarm 1 activated	
		<i>ALA2</i>	Alarm 2 activated	
		<i>both</i>	Alarm 1 and alarm 2 activated	
Output 1 load	<i>USE1</i>	<i>Pr</i>	Main (Hot)	<i>Pr</i>
		<i>SEc</i>	Secondary (Cold)	
		<i>A1_d</i>	Alarm 1 Direct (active above)	
		<i>A1_r</i>	Alarm 1 Reverse (active below)	
		<i>A2_d</i>	Alarm 2 Direct (active above)	
		<i>A2_r</i>	Alarm 2 Reverse (active below)	
		<i>LP_d</i>	Direct alarm loop	
		<i>LP_r</i>	Reverse alarm loop	
		<i>Or_d</i>	Soft alarm 1 OR 2, Direct	
		<i>Or_r</i>	Soft alarm 1 OR 2, Reverse	
		<i>Ad_d</i>	Soft alarm 1 AND 2, Direct	
		<i>Ad_r</i>	Alarm 1 AND 2, Reverse	
		<i>rEtS</i>	Setpoint copy	
		<i>rEtP</i>	Measurement copy	
Scale for linear output In current or voltage	<i>tYP1</i>	<i>0_5</i>	0 – 5 V DC	<i>0_10</i>
		<i>0_10</i>	0 – 10 V DC	
		<i>2_10</i>	2 – 10 V DC	
		<i>0_20</i>	0 – 20 mA DC	
		<i>4_20</i>	4 – 20 mA DC	
Output 1 copy: scale top	<i>ro1H</i>	-1999 to 9999		Max scale
Output 1 copy: scale bottom	<i>ro1L</i>	-1999 to 9999		Min scale
Output 2 load	<i>USE2</i>	SAME AS OUTPUT 1		Sec or AI2
Lin. O/P 2 Range	<i>tYP2</i>			<i>0_10</i>
Output 2 copy: scale top	<i>ro2H</i>	-1999 to 9999		Max scale
Output 2 copy: scale bottom	<i>ro2L</i>	-1999 to 9999		Min scale
Output 3 load	<i>USE3</i>	SAME AS OUTPUT 1		<i>A1_d</i>
Linear Output 3 Range	<i>tYP3</i>			<i>0_10</i>
Output 3 copy: scale top	<i>ro3H</i>	-1999 to 9999		Max scale
Output 3 copy: scale bottom	<i>ro3L</i>	-1999 to 9999		Min scale
Display strategy	<i>d.SP</i>	1, 2, 3, 4, 5 or 6 (see page 8)		1
Communication protocol	<i>Prot</i>	<i>ASC1</i>	Ascii	<i>r7bn</i>
		<i>r7bn</i>	Modbus without parity	
		<i>r7bE</i>	Modbus with even parity	
		<i>r7bo</i>	Modbus with odd parity	
Transmission rate	<i>bAud</i>	<i>1.2</i>	1200	<i>4.8</i>
		<i>2.4</i>	2400	
		<i>4.8</i>	4800	
		<i>9.6</i>	9600	
		<i>19.2</i>	19200	
Address	<i>Addr</i>	1	1 –255 (Modbus), 1-99 (Ascii)	1
Action	<i>CoEn</i>	Read only or read/write		<i>r_w</i>
Use of digital input	<i>d.i.</i>	<i>d.S1</i>	Selection setpoint 1 / setpoint 2	<i>d.S1</i>
		<i>d.A5</i>	Automatic / Manual	
Locking code	<i>CLoc</i>	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
bC	B : 100 to 1824 °C	L.C	L : 0.0 to 537.7 °C	P24F	PtRh20% - 40%: 32 to 3362 °F
bF	B : 211 to 3315 °F	L.F	L : 32.0 to 999.9 °F		
CC	C : 0 to 2320 °C	NC	N : 0 to 1399 °C	PtC	Pt100 : -199 to 800 °C
CF	C : 32 to 4208 °F	NF	N : 32 to 2551 °F	PtF	Pt100 : -328 to 1472 °F
JC	J : -200 to 1200 °C	rc	R : 0 to 1759 °C	Pt.C	Pt100 : -128.8 to 537.7 °C
JF	J : -328 to 2192 °F	rf	R : 32 to 3198 °F	Pt.F	Pt100 : -199.9 to 999.9 °F
J.C	J : -128.8 to 537.7 °C	SC	S : 0 to 1762 °C	0.20	0 / 20 mA DC
J.F	J : -199.9 to 999.9 °F	SF	S : 32 to 3204 °F	4.20	4 / 20 mA DC
KC	K : -240 to 1373 °C	tC	T : -240 to 400 °C	0.50	0 / 50 mV DC
KF	K : -400 to 2503 °F	tF	T : -400 to 752 °F	1050	10 / 50 mV DC
K.C	K : -128.8 to 537.7 °C	t.C	T : -128.8 to 400.0 °C	0.5	0 / 5 V DC
K.F	K : -199.9 to 999.9 °F	t.F	T : -199.9 to 752.0 °F	1.5	1 / 5 V DC
LC	L : 0 to 762 °C	P24C	PtRh20% - 40%: 0 to 1850 °C	0.10	0 / 10 V DC
LF	L : 32 to 1403 °F			2.10	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 **MAN** 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	F .lt	None, 0.5 to 100.0 sec	2.0
Measurement offset	OFFS	+/- of measurement unit	0
Output power (hot) OUT1	PPL	Indicates the value of the power in % (read only)	N/A
Output power (cold) OUT2	SPU		
Proportional output band 1 (PB1)	Pb_P	0% to 999.9% of real input scale (rULBrLL)	10.0
Proportional output band 2 (PB2)	Pb_S		
Integral time (Reset)	ArSt	1 sec to 99 min 59 sec and OFF	5.00
Drift time (Rate)	rAtE	00 secs to 99 min 59 sec	1.15
Overlapping	OL	From -20 (dead band) to +20% (overlapping) of PB1+PB2	0
Proportional band offset (Bias)	b .AS	0% (-100% if outputs 1 and 2) at 100%	25
Output differential 1 in go/nogo	d .fP	0.1% to 10.0% of real input scale (rULBrLL) centered on the setpoint	0.5
Output differential 2 in go/nogo	d .fS		
Output differential 1&2 in go/nogo	d .fF		
Top limit of setpoint (Sphi)	SPuL	Of scale max. setpoint	Value of rUL
Bottom limit of setpoint (Splo)	SPLL	Of scale min. setpoint	Value of rLL
Power limit of output 1 (Ophi)	OPuL	0% to 100%	100
Output cycle time 1	Ct1	0.5, 1, 2, 4, 8, 16, 32, 64, 128, 256 or 512 sec.	32
Output cycle time 2	Ct2		
Output cycle time 3	Ct3		
High alarm 1	PhA1	From min to max. of real input scale (rULBrLL)	R/max
Low alarm 1	PLA1		R/min
Deviation alarm 1	dAL1	+/- from the setpoint	5
Alarm in band 1	bAL1	From 1 unit min to max. of real input scale (rUL)	5
Hysteresis Alarm 1	AHY1	Up to 100%	1
High alarm 2	PhA2	From min to max. of real input scale (rULBrLL)	R/max
Low alarm 2	PLA2		R/min
Deviation alarm 2	dAL2	+/- from the setpoint	5
Alarm in band 2	bAL2	From 1 unit min to max. of real input scale (rLL)	5
Hysteresis Alarm 2	AHY1	Up to 100%	1
Loop alarm temperature:	LAt1	From 1 sec to 99 min. 59 sec	99.59
Auto Pre-tune	APt	d .SA deactivated or EnAb activated	d .SA
Auto/manual regulation	PaEn		
Setpoint gradient (Rpen)	SPr	1 to 9999 units per hour or Off	9999
Setpoint gradient rate	rP		
Setpoint value (SP1 only)	SP	From min to max. of real input scale (rULBrLL)	Value of rLL
Setpoint value 1 (if double setpoint)	_ SP1	From min to max. of real input scale (rUL/rLL) “ _ ” indicates active setpoint.	
Setpoint value 2 (if double setpoint)	SP2		

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

5. AUTOMATIC ADJUSTMENT MODE

Enter SELF-ADJUSTMENT mode (**ALtun**) 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		0 to 9999	0

***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 **OPtcr** 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	No option
		r485	RS485 communication
		d iG_1	Digital input (SP1/SP2)
Type of Firmware	FLUJ	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	- SP2	"-" lighted if digital input = 0,5 I active setpoint SP2	Displays setpoint 2 <i>Adjustable except in strategy 6.</i>
Instant artificial setpoint value	SPrP	SPr activated and rP different from 0	Instant setpoint gradient value <i>Read only</i>
Gradient rate	rP	SPr activated in parameter setting mode	Setpoint gradient rate in unit/hour <i>Adjustable except in strategy 6.</i>
Alarms active	ALSt	if 1 or several alarms are active: The indication ALM Will also flash	AL2 Alarm 2 active AL1 Alarm 1 active AL2 I Loop alarm active
Measurement value	(Empty)	4 (default display on powering up)	Displays measurement only <i>Read only</i>
Setpoint value	(Empty)	5 (default display on powering up)	Displays only selected SP. <i>Read only</i>
Setpoint value	SP-{}-	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	- SP1	"-" 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  or by changing the digital input state if **dIG1** or **dIG2** or has been configured as **dIAS**.

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, (5Ω) AND V (47kΩ).

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



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OWNER'S MANUAL

SINGLE-PHASE STATIC POWER SUPPLY UNITS

P/N 30330 - 15/25/45

1 - APPLICATION :

The power supply units P/N 30330-15, 30330-25 and 30330-45 are single-phase static contactors designed to control power on single-phase or three-phase set-up resistive loads.

They operate in the "wave train" mode with conduction ignition and shutdown at zero voltage.

2 - TECHNICAL CHARACTERISTICS :

- Load voltage : P/N 30330-15 and 30330-25 : 24 to 440 VAC 50/60 Hz,
: P/N 30330-45 : 40 to 440 VAC 50/60 Hz.
- Loaded only on resistive loads with low temperature coefficient.
- Controllable current levels :

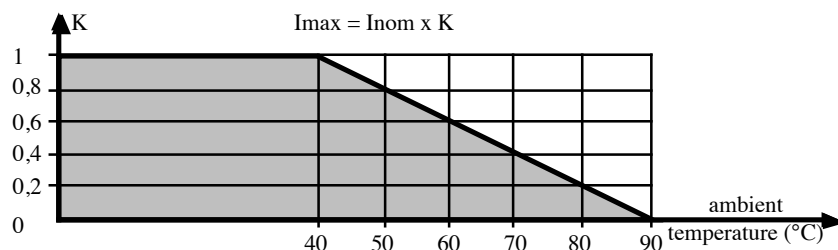
	30330-15	30330-25	30330-45
Minimum controllable rms current (mA)	50	50	100
Maximum controllable rms current (A)	15	25	45
ITSM overload current = 10 ms (A)	100	230	600
I ² t (A ² S) - t = 10ms	610	610	1800

- Input signal :
 - Logic control signal,
 - minimum control voltage : 4 VDC,
 - maximum control voltage : 30 VDC,
 - release voltage : 1 VDC,
 - minimum operating current : 2 mA, maximum : 14 mA,
 - input impedance : 3 kΩ.

These power units with logic control signals are protected against polarity inversions of the signal.

- Leakage current : P/N 30330-15 and 30330-25 : 15 mA, P/N 30330-45 : 20 mA.
- Dissipated power at full load : P/N 30330-15 = 18 W, P/N 30330-25 = 30 W
and P/N 30330-45 = 53 W
- Response time (on opening and closing) : maximum 1/2 cycle.
- Input/output insulation : 4000 VAC.
- Operation indication LED.
- Heat sink isolated from power.
- Built-in RC network protection.
- IP 20 protected case of V2 self-extinguishing polycarbonate.

- Ultra-fast fuse and isolating fuse holder supplied separately.
- Ambient operating temperature range : -30 +40°C.
For higher ambient temperatures : the permissible current per power unit is less than the maximum controllable current : this value is obtained by application of derating factor K to the maximum current controllable on the power unit according to the following current derating curve :



- Ambient storage temperature : -40 + 100°C.
- Mounting on symmetrical DIN rail or by screws on vertical chassis.

3 - **PRECAUTIONS ON USE :**

Check that :

- the power supply unit corresponds exactly to the intended use by reference to the nameplate,
- there is no obstacle preventing the cooling of the power unit which is obtained solely by natural convection,
- the cabinet containing the equipment is provided with sufficient aeration,
- the control connection conductors are sufficiently distant from the power conductors or are placed in an independent cabling channel.

NOTE : Never connect (or disconnect) a power unit without first turning off the power supply and the control.
 : It is essential to connect the ultra-fast fuse (supplied separately) to the power circuit for the protection of the semi-conductor.
 : To ensure that these units operate correctly and therefore that tripping is at zero voltage, it is essential to obtain a satisfactory standard of power supply (sinusoidal form, interference level, peak voltage dispersion, etc.). Private production networks (electric generator sets) may cause the malfunctioning of the thyristor tripping system.

4 - **ASSEMBLY AND ELECTRICAL CONNECTION :**

4 - 1 - **ASSEMBLY :**

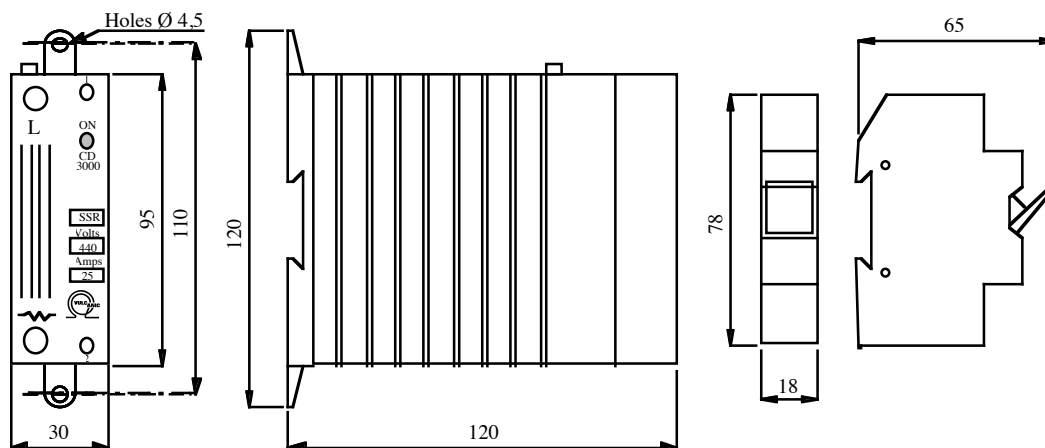
Mounting on symmetrical DIN rail or on vertical chassis using 2 screws Ø 4.

The power units must only be mounted vertically so as to permit optimum cooling by better circulation of the ambient air around the heat sink.

Never install the power supply units near components with high calorific dispersion or that emit electromagnetic interference.

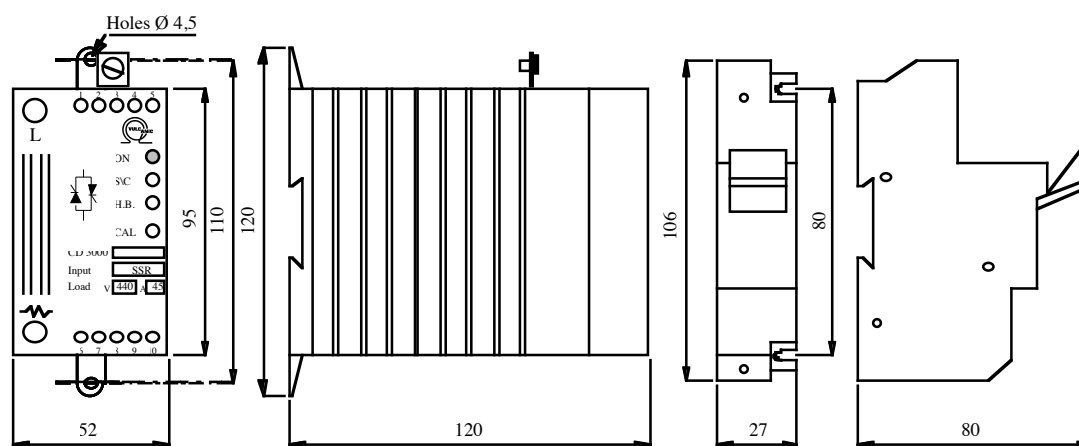
Install the fuse holder (supplied with the equipment) on symmetrical DIN rail.

When several power units are installed in the same box, allow for the minimum distances as indicated in the diagram below and ensure that forced and suitable aeration is supplied (e.g. by means of a fan) or use a cabinet air conditioner if the electrical cabinet is large.



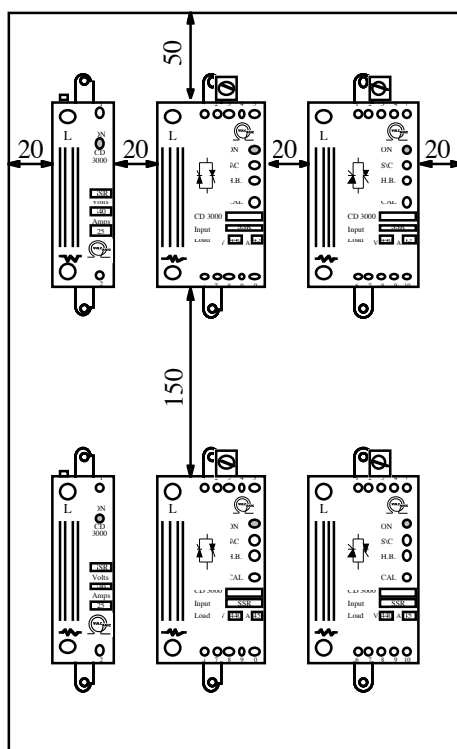
OVERALL DIMENSIONS OF POWER SUPPLY UNITS P/N.: 30330-15 AND 30330-25

FUSE HOLDER 15 AND 25 A



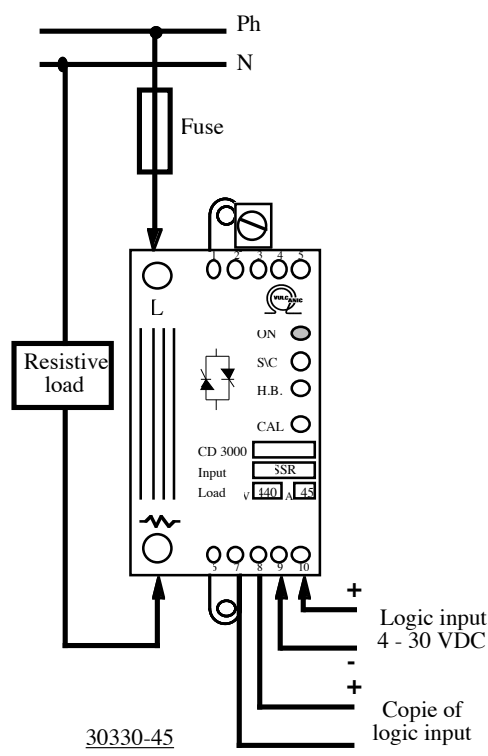
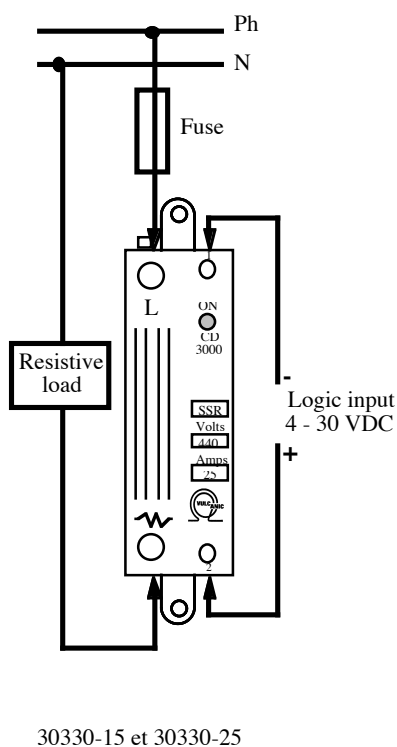
OVERALL DIMENSIONS OF POWER SUPPLY UNITS P/N.: 30330-45

FUSE HOLDER 45 A



4 - 2 - ELECTRICAL CONNECTION :

- Make connections according to either of the two following schemes :



- Connect the conductors bringing in the control signal while ensuring that the indicated polarities are correct.
- Be sure to tighten all the connections.

5 - **SERVICING** :

Regularly check that the connections are tight.

No particular servicing is required on the power units installed in a normally clean atmosphere.

Under more or less dusty environmental conditions, periodic cleaning of the heat sink will be necessary using compressed air, to maintain optimum cooling.

6 - **GUARANTEE** :

Our guarantee is in conformity with the inter-union agreements of the Electrical Construction industry and our general conditions of sale.

Any deterioration caused by :

- use at more than 10% of the rated voltage provided for, or at over-current,
- wear caused by a lack of servicing, impact, clumsiness or inexperienced users,
- failure to comply with this manual, the state-of-the-art rules and legislation,

shall not be binding with respect to our responsibility because of the diversity of the parameters causing them and that are beyond the scope of our control.