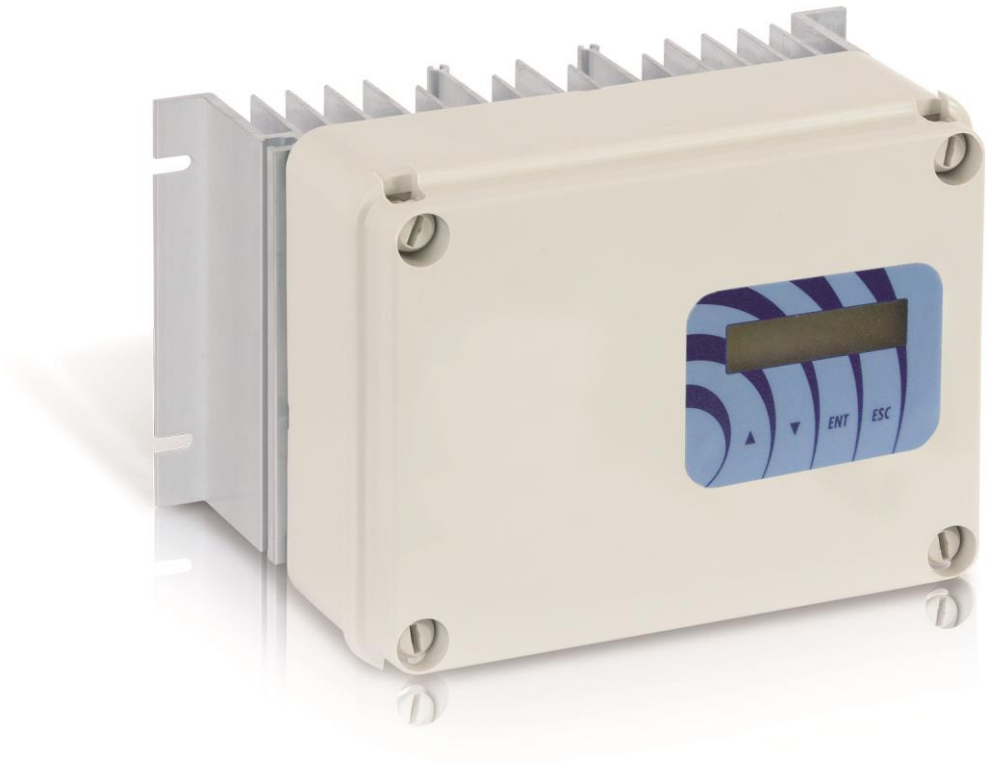


XV300K

MASTER CONTROLLER FOR AC FANS

INDEX

1 READ CAREFULLY

CAUTION! BEFORE INSTALLING THE ***XV300K MASTER*** CONTROLLER READ CAREFULLY THE MANUAL AND FOLLOWS ALL THE INSTRUCTIONS HEREIN. WITH POWERED CONTROLLER DO NOT TOUCH THE INNER ELECTRICAL PARTS IN ANY CASE. IN COMPLIANCE WITH THE EU RULES AND THE EMC DIRECTIVES, PLEASE REMIND THAT THE XV300K CONTROLLER IS DESIGNED TO BE INCORPORATED ON MACHINES OR INTEGRATED ON CONTROL PANELS AND THEREFORE IS TO BE CONSIDERED AS A COMPONENT. THE MACHINE INSTALLATOR SHALL PROVIDE FOR THE GUARANTEE OF COMPLIANCE OF ITS EQUIPMENT TO SUCH RULES. IN THE EVENT THAT THE CONTROLLER FAILS TO OPERATE AND CAUSES DAMAGES TO THINGS OR PERSONS IT SHALL BE THE INSTALLER'S RESPONSIBILITY TO PROVIDE SAFETY DEVICES OR SYSTEMS TO PROTECT OR WARN ABOUT THE FAILED OPERATION. IN ANY MOMENT AND WITHOUT NOTICE FAE FAGAN APPLICAZIONI ELETTRONICHE RESERVES TO CARRY OUT TECHNICAL CHANGES AIMED AT ENHANCING THE QUALITY OR THE PERFORMANCE OF ITS PRODUCTS.

2 PRELIMINARY INSPECTIONS - WARRANTY

Before installing the controller, make sure that it has not been damaged during the carrying and that it corresponds to the model ordered. Check that the technical specifications listed in the label match with those written in the delivery note and in the order form. The controller is covered by a 12-month warranty starting from the delivery. The warranty covers production defects not due to damaging or wrong use, for goods returned to us EX-WORKS. Any damage occurred during the carrying shall be reported to the carrier in with the local legislation.

2.1 DISPOSAL

The sign marked on the equipment indicates that it is not to be considered as a normal domestic waste; therefore it has to be disposed of in a specific electrical and electronic equipment recycling point.

3 XV300K – USE FEATURES

The XV300K electronic controller is normally used to control the speed of AC fans, pumps and centrifugal pumps. It is based on the principle of symmetrical phase partialisation and It is suitable for adjustable voltage motors. XV300K operates on the basis of the inputs received through the measurements, the parameters settings values, the controlling I/O and the control panel. The control panel is used to set the parameters values and read the information about the unit status. XV300K is provided with Modbus connection to dialog with a supervising remote device.

4 CODING

Position	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	XV3	08	K	-6	1	1	2	1

Position	
1	Model Family: XV300K
2	Nominal current in Ampere
3	External case: **K**=boxed
4	Power supply: **-6**=230-400VAC, **-8**=440-460VAC (*)
5	**1**=MASTER
6	IP degree: **1**=IP55
7	**1**=RTC; **2**=no RTC
8	Display type: **1**=normal display; **2**=OLED display

(*) 440-460VAC available only on request

	Power max (kVA)	Current nominal (A)	Current max* (A)	Power dissipation (W)
XV308K	5,5	8	12	30
XV312K	8	12	23	60
XV320K	13	20	30	80
XV328K	19	28	50	120
XV340K	26	40	70	155
XV350K	32	50	70	180
XV360K	41	60	80	250

NOTE:
The data are related to operate at 400V~ 50Hz. For 230V voltage supply or XV3xxK models at 440-460V all current are the same.
(*) Max current refers to an enviroment temperature of 50°C for a maximum time of 10 second every 5 minutes.

5 TECHNICAL CHARACTERISTICS

POWER SUPPLY	230/400V~ +10%/-15%, (440/460V~ on demand)
FREQUENCY	50-60Hz
MAX VOLTAGE POWER OUT	>97% of power supply
OPERATING TEMP.	-25°C/+50°C
STORING TEMP	-40°C/+80°C
MAX TEMP.DISSIPATOR	75°C
PROTECTION GRADE	IP55 self extinguishing plastic box, pollution degree 3
ELECTRIC CLASSIFICATION	Class II at the command imputs (insulation of 4kV between commands block and the device supplied parts). Class I as regards the accessible parts
PROTECTIONS 	Phase lost, inside overheating, sensor missing, external emergency (motor klixon) WARNING: the regulator restores automatically Protection against power surges Class II
ACTION-DISCONNECTION	Type 1(Y). Residual current motor < 15mA
SOFTWARE STRUCTURE	Class A
ELECTRICAL CONNECTION	For XV308-12-20-28-40K Class X, for XV350-60K Class M.

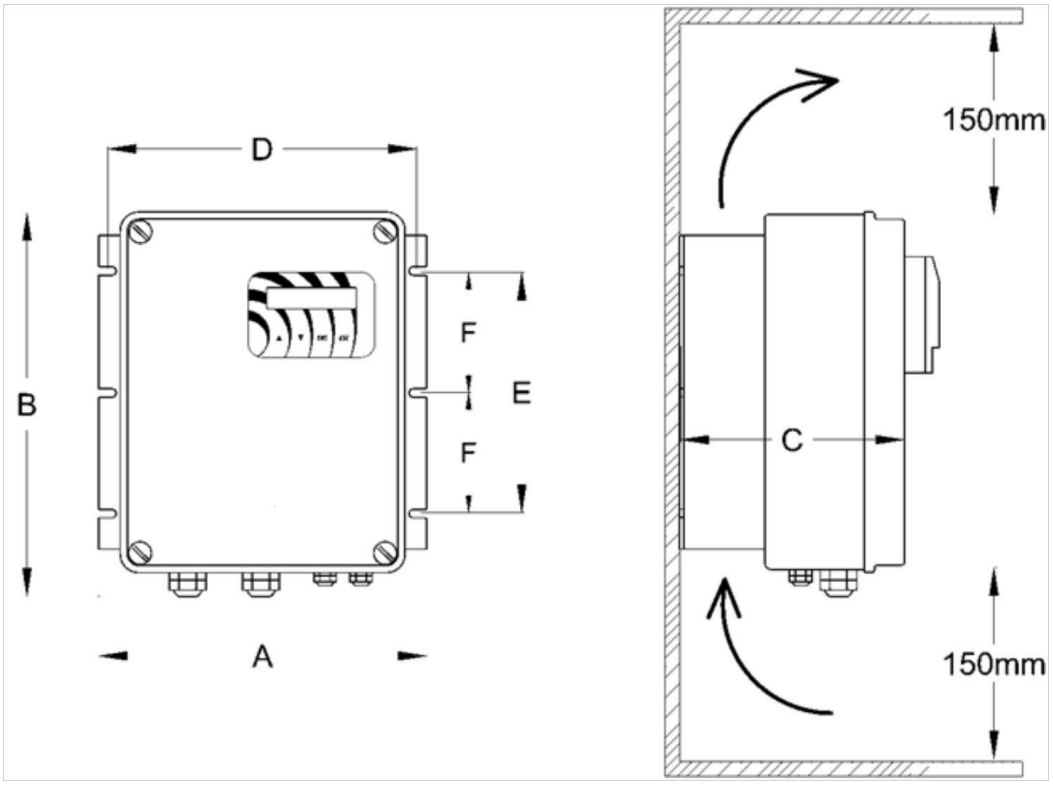
According to safety directive, reference standard EN60730-1. According to electromagnetic directive, reference standard EN 61800-3. With refer to some typical applications, the XV300K8-12-20 regulators are suitable for residential and commercial ambients, while the XV300K 28-40-50-60 regulators are suitable for industrial ambients. XV300K regulators are designed to be installed inside a machine or a standard electrical cabinet and are therefore considered a component. The installer must guarantee that the machine conforms to such regulations.
CAUTION This control does not contain current harmonics filter and for applications on public network power supply the installer must make ref. to EN 61000-2-4 and EN 61000-3-12.

6 MECHANICAL INSTALLATION

The XV300K regulator must be wall-mounted vertically, in order to guarantee adequate dispersion of heat in the area of air circulation and prevent obstructions to air flow in the dissipator zone.
XV300K has IP55 grade protection, anyway protect it from corrosive liquids, gas, heat sources and position it preferably sheltered from the sun's rays. Make sure that it does not undergo vibrations.

Model	Weight (kG)	Dimensions (mm)			Fixed screw (mm)				Cable glands IP68 (Metric)				
		A	B	C*	D	E	F	Ø	M16	M20	M25	M32	M40
XV308K	2,5	230	165	150	215	80	/	M4	1+(1)	-	2	-	-
XV312K	4	230	265	165	215	170	/	M4	1+(1)	1	2	-	-
XV320K	4,8	230	265	230	215	170	/	M4	1+(1)	1	2	-	-
XV328K	7	340	270	235	322	165	/	M5	1+(1)	1	-	2	-
XV340K	9	340	270	235	322	165	/	M5	1+(1)	1	-	-	2
XV350K	17	340	440	235	322	340	170	M5	1+(1)	1	-	-	2
XV360K	18	340	440	235	322	340	170	M5	1+(1)	1	-	-	2

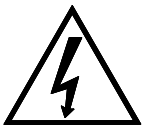
C* = increase C value of 29mm with polycarbonate operable door.
(1) = hole closed with watertight plug.



7 ELECTRICAL INSTALLATION

Connect the power wires and ground to the appropriate regulator terminals. To avoid dispersion currents, the motor earth cable must be connected to the appropriate motor terminal ground. We recommend connecting to the machine's safety circuit any thermal motor protector in order to remove the control power supply and protect the motor with maximum efficiency. The thermal motor protector may be otherwise connected directly to the I4 control card's terminal. If the length of the motor cable exceeds 10 m, we suggest using shielded cable. The control load can consist of

several engines provided the sum of the rated currents of the motors is less than 20% of the rated current of the control. We recommend not introduce any electromechanical device on the motor cable. If the control cable length exceeds 3 m, we suggest using shielded cable, connecting the shield only on the regulator. We suggest don't connect the control 0 Volt to the Earth.
If the length of the power, motor and control cables exceeds 10 m, make sure they are separated by at least 0.3 metres to avoid creating a coupling effect.
If controls are set up in environment subject to electromagnetic disturbance, they should be housed inside a suitable metallic enclosure. In order to prevent the formation of condensation and regular working also cold temperature it is recommended you insure a constant power supply, avoiding turning it off continually.



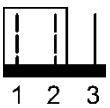
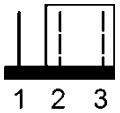
All connections wires must resist to 80°C working temperature.
Avoid routing any electric wires near the copper coils of the filter, use the suitable plastic support! Tighten all wires on control and power terminal boards fully down, avoiding protrusion of the multi-stranded wire.
Do NOT touch the electronic equipment when the power line is on!
During voltage insulation tests disconnect the regulator power lines In/Out.
Use a true RMS tester to measure the current or voltage values

In the event that regulator operation failure could cause damage to objects or physical injury, it is the responsability of the installer to add devises or systems that protect against, or warn of, control failure.

Check the position of the voltage change jumper according to the supply voltage available, to the type of control (see coding paragraph page 3, pos.3) and to the panoramic view of the corresponding card.
To protect the power line and the regulator, the installation technician must install **extra-rapid semiconductor fuses upstream of the power supply adequate for the load and with a value of I^2t less than the value given in the table below**. If a differential circuit breaker is installed, it must be of the delayed action type.

	XV300K8	…12	… 20	… 28	… 40	… 50	… 60
Section power cables (mm^2)	1,5 (Ls = 9)	2,5	2,5/4	6	10	16	16/25
		(Ls =12)		(Ls = 15)			
Section control cables (mm^2)	0,2÷1,5 (Ls = 9)						
Line fuses (A)	10/16	16/20	25	35	50	63	80
Extrarapid fuses (A)	16	25	32	50	63	80	100
I^2t (A^2S) max energy c.c.	610	720	720	8000	15000	15000	80000

Ls = electrical wire peeling length (mm)

Power Supply		
"-6" (230/400V)	**230**	**400**
"-8" (440/460V)	**440**	**460**

To connect wiring to the spring terminals, apply leverage with a screwdriver on the lever or on the rectangular hole to open the terminal (see below the panoramic view cards). The power wires of the XV350K and XV360K regulators must be crimped to form an eyelet (M6 hole) and the nuts (E10) tightened with a wrench.

7.1 LED WARNING SIGNALS

DL1: yellow, starts to flash with input signal at minimum and increases the flashing frequency as the signal rises. It goes on steady with signal = 100%. It follows the priority signal (see Basic Settings [BS] in the Factory Parameters menu).

DL2: green, steady ON = power supply ON.

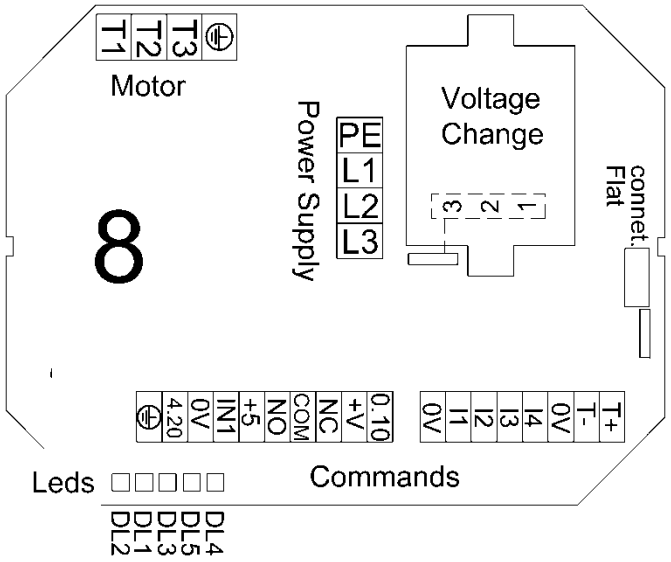
DL3: red, warning alarm ON

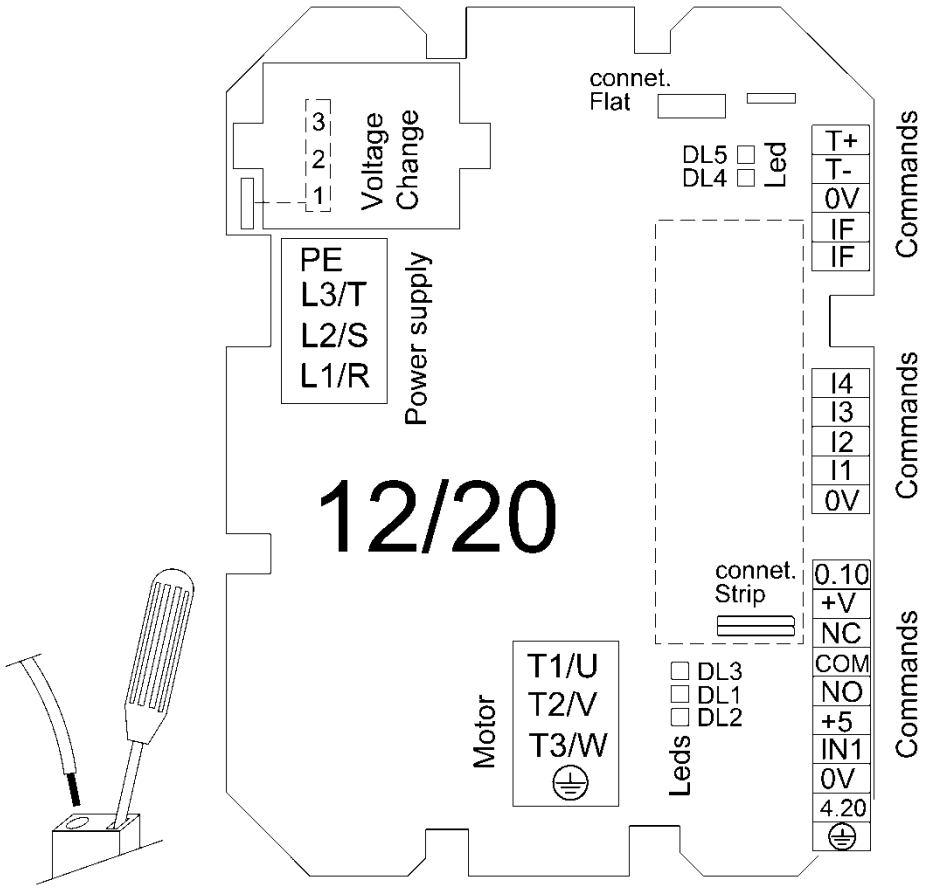
- 1 flash = power phase lost
- 2 flashes = external emergency
- 3 flashes = internal over-temperature
- 4 flashes = probe missing
- 5 flashes = stop for parameters programming or error settings.

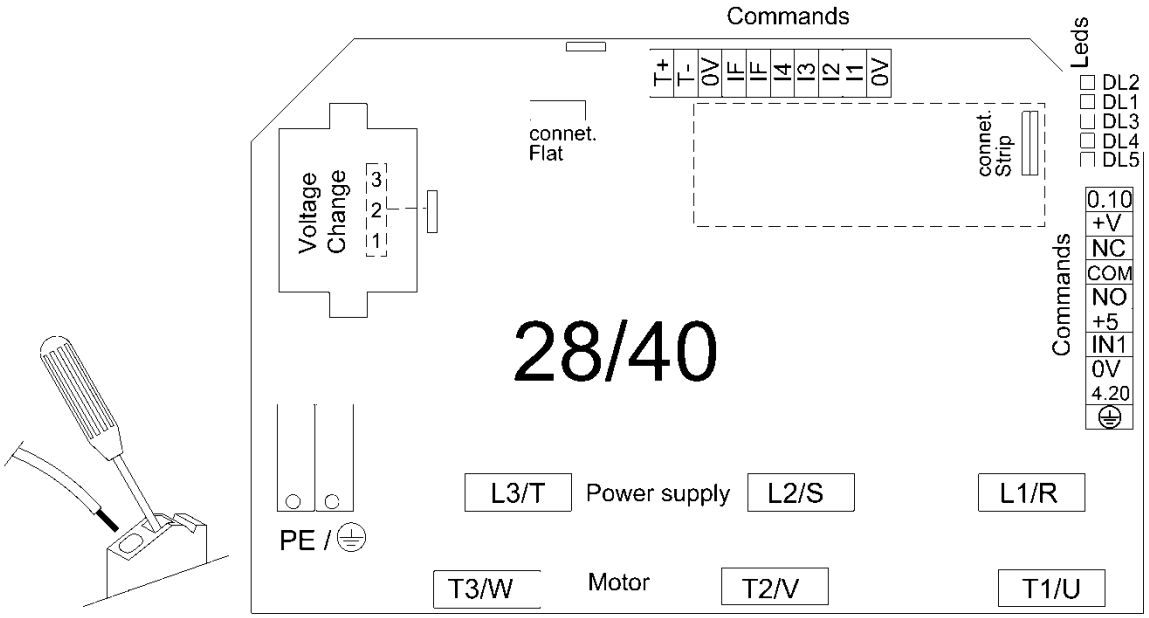
DL4: green, flashing in modbus transmission.

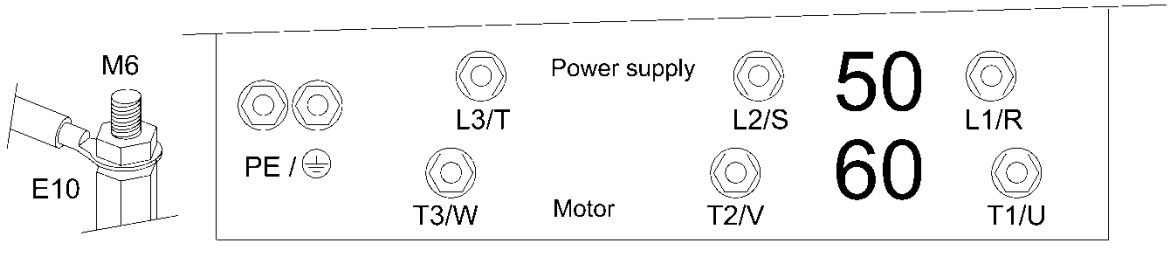
DL5: red, flashing in modbus reception.

7.2 PANORAMIC VIEW CARDS




connet.
Flat
3
2
1
Voltage
Change
DL5
DL4
Led
T+
T-
0V
IF
IF
Commands
PE
L3/T
L2/S
L1/R
Power supply
12/20
I4
I3
I2
I1
0V
Commands
connet.
Strip
0.10
+V
NC
COM
NO
+5
IN1
0V
4.20
Commands
T1/U
T2/V
T3/W
Motor
DL3
DL1
DL2
Leds


Commands
T+
T-
0V
IF
IF
I4
I3
I2
I1
0V
Leds
DL2
DL1
DL3
DL4
DL5
connet.
Flat
connet.
Strip
Voltage
Change
3
2
1
0.10
+V
NC
COM
NO
+5
IN1
0V
4.20
Commands
28/40
PE /
L3/T
Power supply
L2/S
L1/R
T3/W
Motor
T2/V
T1/U

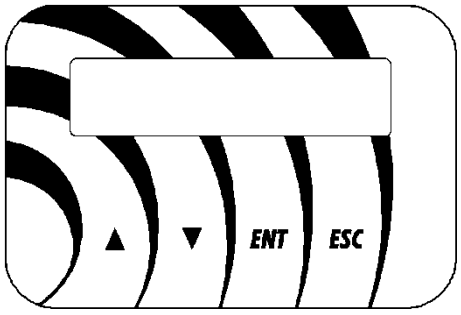

M6
E10
PE /
L3/T
Power supply
L2/S
50
60
L1/R
T3/W
Motor
T2/V
T1/U

8 WIRINGS

Term.	Description	Application
T1+	Serial RS485, Modbus RTU - master	Serial connection line to a Slave controlled inverter/device
T1 -	Serial RS485, Modbus RTU - master	
0V	Ground I/O	Mass I/O
I 4	External emergency input	Open immediately blocks the control. It can be connected to the load temp. protecting device/s
I 3	Start/Stop input	Programmable Start/Stop input
I 2	Limit Speed function input	Closed modifies the adjusting modes. It is often used for the night silenced operating
I 1	Direct/Reverse function input	Open enables the Cool1 cooling mode. Closed enables the Heat or Cool2 heating mode (to be set on basic sett. menu)
s0V	Ground I/O	Mass for the digital inputs
0.10	Analog input , type 0.10V (Ri = 40k Ω)	0..10V command for mode slave running
+V	12V power supply output = (max 30mA)	4..20mA pressure transducer power supply
NC	Relay 1 closed norm. contact output	Programmable output. With standard setting for Defect, the relay is enabled (NO-COM eachother closed) and is disabled by turning to the position represented in the picture in emergency case.
COM	Relay 1 common contact output (1A-250V~/3A-30V=)	
NO	Relay 1 open norm. contact output	
+5V	5V power supply output = (max 15mA)	Ratiometric pressure transducers and NTC power supply
IN 1	Analogical input 1, type 0,5…4,5V / ntc (10 kΩ @25°C, β3435), (Ri = 10 kΩ) / pwm 5..15V	Ratiometric pressure transducers / NTC sensor / PWM 100Hz type with variable average value
0V	Ground I/O	Mass for analogical input
4.20	Analogical input 1, type 4…20mA (Ri = 100 Ω)	4..20mA pressure transducers input,command for mode slave running

9 CONTROL PANEL

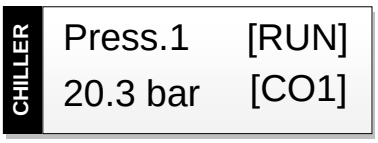
The control panel visualizes in real time the inputs and outputs of the adjuster and allows setting the parameters. It is provided with a back-illuminated LCD/OLED display and with four keys described below.



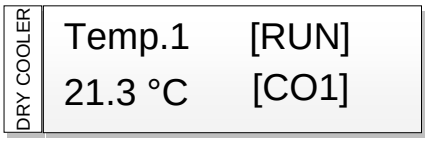
(**UP**) Goes to the previous visualization / increases a
(**DOWN**) Goes to the next visualization / decreases a parameter
(**ENT**) Enters the menu and the parameters / confirms the variation of a parameter
(**ESC**) Escapes from the menu and the parameters / cancels a variation of parameter

10 STATE MENU

After the device is powered on the display visualizes the firmware versions of the device and the keyboard. Then, if no error occurs, the first **status window** will appear, where temperatures or the pressure registered by input 1 are visualised:



RUN in operating state
FLT in block state
RDY if in Stop state

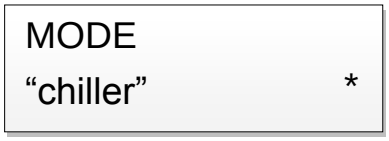


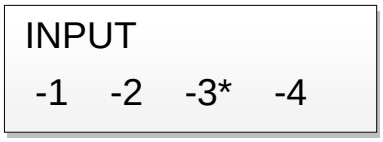
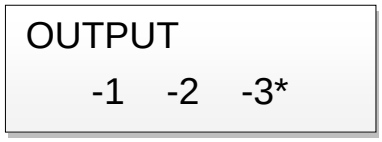
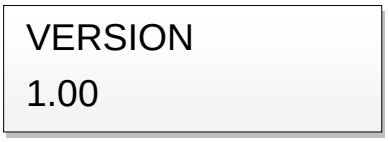
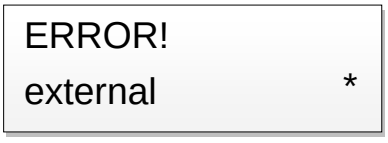
The cycle used for the adjusting is visualized at the right bottom: CO (COOL) or HEA (HEAT) followed by the number 1 or 2 for first or second cycle.

In this mode:

- Press the key ⬇ to slide the state menu downward;
- Press the key ⬆ to slide the state menu upward.

10.1 STATE WINDOW BOXES

	Defines the output voltage/speed. The percentage value refers from 0 to 98% of power voltage
	Defines the operating mode of the adjuster: *Chiller*, *Dry Cooler* or *Slave.* This is a display-only parameter. To edit it go to the basic settings menu inside the “PREIMPO [IB]” menu

	**INPUT 1**: Defines the percentage of the IN1 input among the following possible signals: 0..10V=, 4..20mA, pwm (100Hz type with variable average value). **INPUT PWM**: Defines the percentage of the control value detected in the input dedicated to the PWM input signal with variable frecuency (available only on demand). The percentage value refers to the range defined in the basic settings, in the *PWM min* and *PWM max* parameters. **INPUT MODBUS**: Defines the value transmitted by the modbus RTU from an external MASTER controller. The value is effective if included inside the range limited by the parameters *Min limit* and *Max limit* of the motor settings [IM]
	Defines the state of the digital inputs of the terminals I1, I2, I3 and I4. An asterisk will be displayed next to the digital terminals connected to the terminal "0V"
	Defines the state of the relay 1, relay 2 and of the output 3 (open collector). For the relays 1 and 2 the asterisk means that they are powered and the contacts NO and COM are eachother closed. For the output 3 the asterisk means that the transistor is service. The instructions 2 and 3 are displayed only with *[S1 CARD OPTION]*
	Defines the software version of the adjuster
	*[ONLY IF REAL TIME CLOCK AVAILABLE]* Displays the date and time of the variable weekly clock. This is a display-only window box. To set the clock go to the clock menu inside the "operating parameters"
	**Caution**: in the event of warning alarm the state window box disappears and an alarm box is displayed until the problem is solved. **Alarm warning example**: Warns about an alarm due to the control I4 open. Other warnings refer to the alarms of: *overheating* and *probe missing*

10.2 **LANGUAGE SETTING**

From any screen of the operating menu press the key **ESC** to visualize the language set.

	To change the language press **ENT** and move with the arrows ⬆ ⬇ until it reaches the language to set among the following available languages: *English – Italian – German – French – Spanish – Russian [available only with OLED display]*

LANG. - *	Press again the key **ENT** to save the setting. The asterisk at the right bottom indicates the language set. Press **ESC** to return to the sate menu

11 OPERATING PARAMETERS MENU - CHILLER

The operating parameters menu can be accessed from any visualization of the state menu, by pressing together the keys **ENT** + ↓ (hold the key **ENT** pressed and press the key ↓).

CHILLER COOL 1 SET. [IC] ----------	The menu windows include the menu name and the corresponding [identifying code]. The second line of the display is dotted

- Press the key **ENT** to access the parameters of the visualized menu;
- Press the key **ESC** to return to the state menu;
- Press the key ↓ to go to the next menu;
- Press the key ↑ to return to the previous menu.

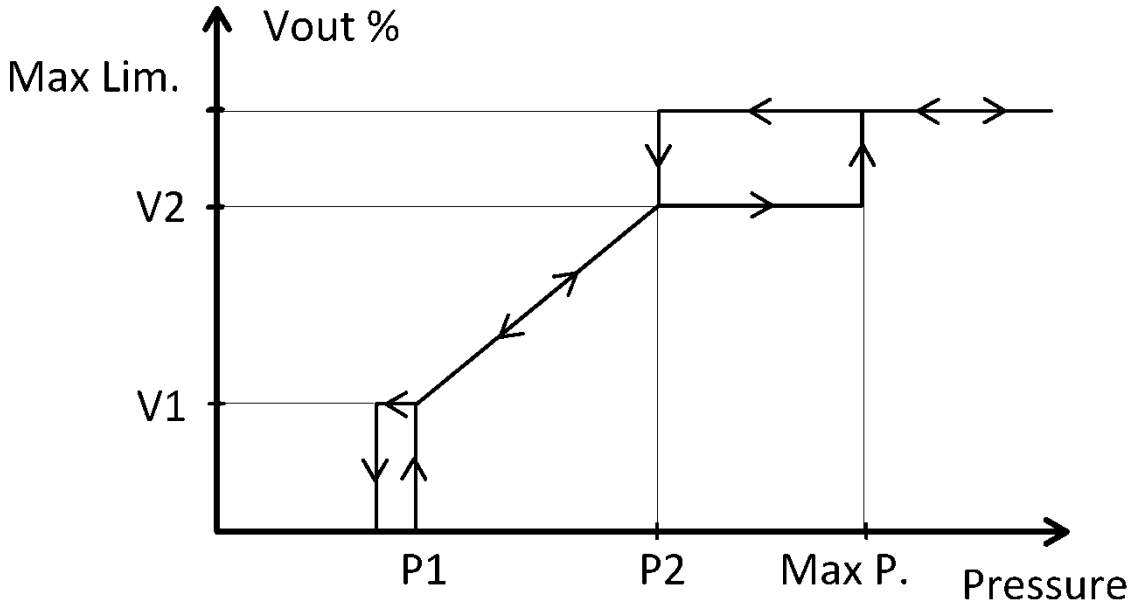
11.1 PARAMETERS READING AND EDITING

CHILLER P1 [IC] 13.0 bar	The parameters windows display the name of the parameter, the [identifying code] of the corresponding menu, the value of the parameter and the unit of measure. ↓ to go to the parameter below; ↑ to go to the parameter above
CHILLER P1 [IC] ->(13.0) bar	To change the value of the parameter press **ENT**, the arrow and the value of the parameter in brackets mean that the system is in the parameter editing mode, edit the value by pressing the following key: ↑ to increase the value ↓ to decrease the value **ENT** to save. **ESC** to return to the parameter

11.2 COOLING CYCLE PARAMETERS [CO1] - CHILLER

CHILLER P1 [IC] 20.0 bar	Pressure of the voltage/speed V1 point. Min. 0 bar Max. **P2** Def. 20 bar
CHILLER P2 [IC] 24.0 bar	Pressure of the voltage/speed V2 point. Min. **P1** Max. **P_MAX** Def. 24 bar

CHILLER P_MAX [IC] 25.0 bar	Maximum production pressure, above this the output is at the voltage **MotorMaxLim**. Min. **P2** Max. **Full Scale** Def. 25 bar
CHILLER V1 [IC] 20 %	Voltage/speed of the pressure point P1. Min. **MotorMinLim** Max. **V2** Def. 20%
CHILLER V2 [IC] 90 %	Voltage/speed of the pressure point P2. Min. **V1** Max. **MotorMaxLim** Def. 90%

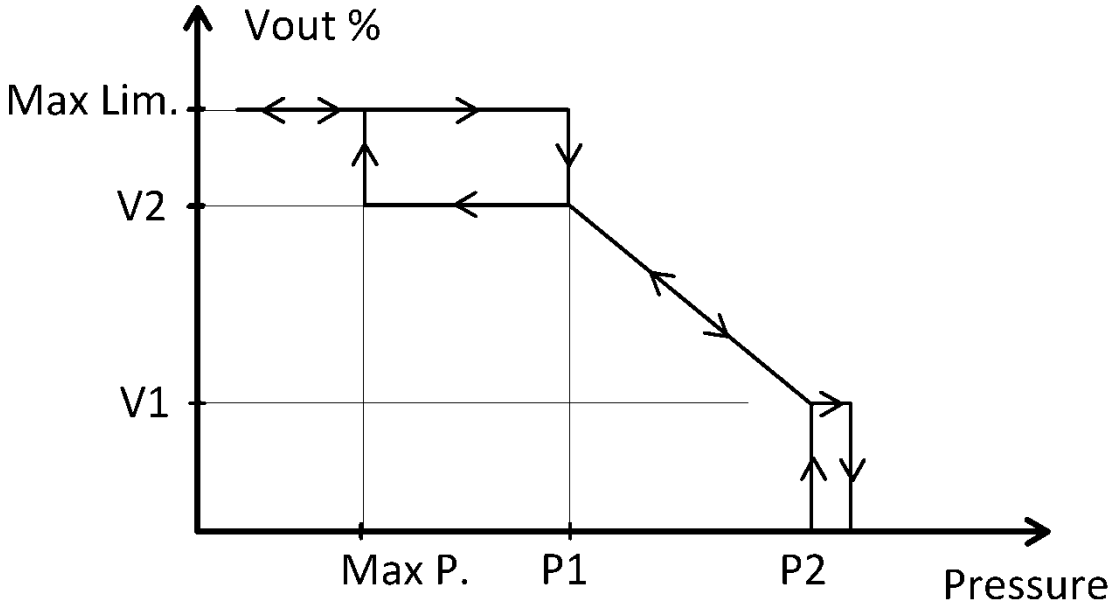


11.3 HEATING CYCLE PARAMETERS [HEA] - CHILLER

Caution: The heating cycle can be replaced by a second cooling cycle [CO2] by changing the setting of the parameter *Second Mode*.

CHILLER P1 [IH] 7.0 bar	Pressure of the voltage/speed V2 point. Min. **P_MAX** Max. **P2** Def. 7 bar
CHILLER P2 [IH] 11.0 bar	Pressure of the voltage/speed V1 point. Min. **P1** Max. **Full Scale** Def. 11 bar

CHILLER P_MAX [IH] 5.0 bar	Maximum production pressure, below this the output is at the voltage **MotorMaxLim**. Min. 0 bar Max. **P1** Def. 5 bar
CHILLER V1 [IH] 20 %	Voltage/speed of the pressure point P2. Min. **MotorMinLim** Max. **V2** Def. 20%
CHILLER V2 [IH] 90 %	Voltage/speed of the pressure point P1. Min. **V1** Max. **MotorMaxLim** Def. 90%



12 OPERATING PARAMETERS MENU - DRY COOLER

The operating parameters menus can be accessed from any visualization of the state menu, by pressing together the keys ENT + ↓ (hold the key ENT pressed and press the key ↓).

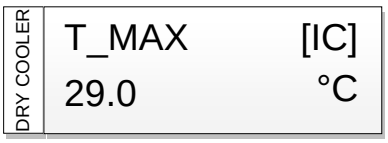
DRY COOLER COOL 1 SET. [C1S] ----------	The menu windows include the menu name and the corresponding [identifying code]. The second line of the display is dotted

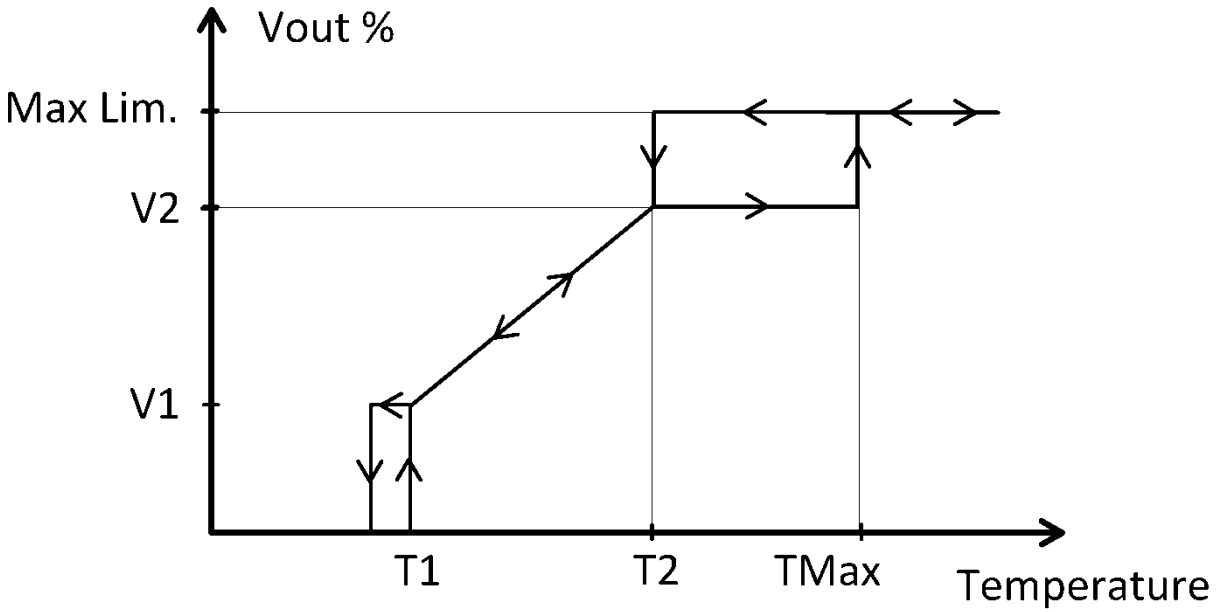
- Press the key ENT to enter the parameters of the visualized menu;
- Press the key ESC to return to the state menu;
- Press the key ↓ to go to the next menu;
- Press the key ↑ to return to the previous menu.

12.1 PARAMETERS READING AND EDITING

	The parameters windows display the name of the parameter, the [identifying code] of the corresponding menu, the value of the parameter and the unit of measure. ↓ to go to the parameter below; ↑ to go to the parameter above
	To change the value of the parameter press **ENT**, the arrow and the value of the parameter in brackets mean that the system is in the parameter editing mode, edit the value by pressing the following key: ↑ to increase the value ↓ to decrease the value **ENT** to save. **ESC** to return to the parameter

12.2 COOLING CYCLE PARAMETERS [CO1] – DRY COOLER

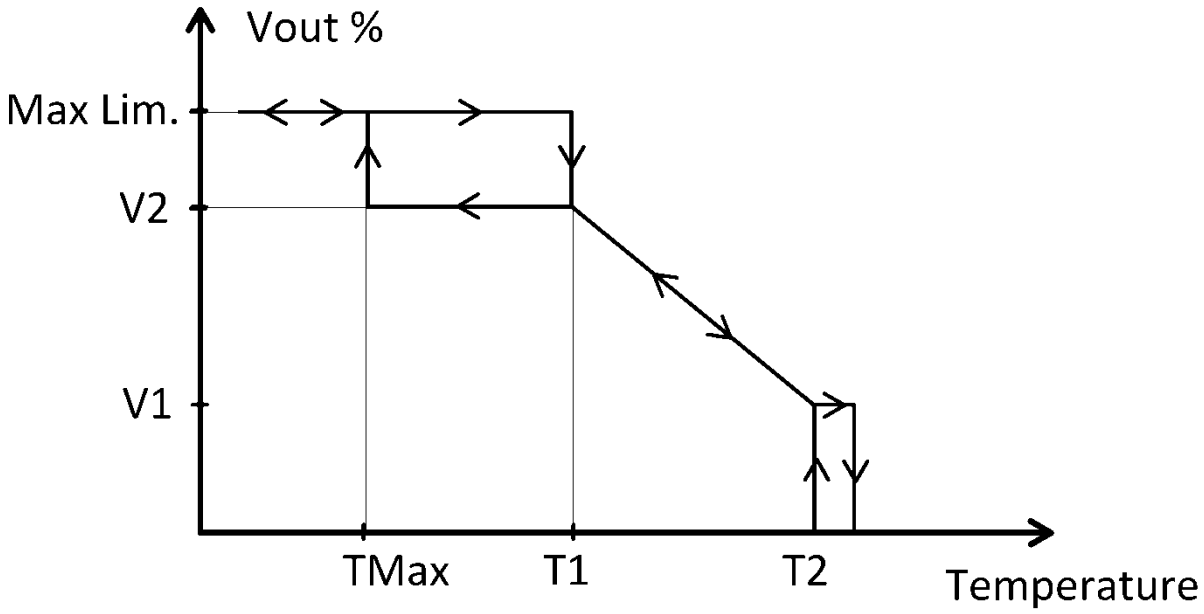
	Temperature of the voltage/V1 speed point. Min. 0 °C Max. **T2** Def. 22,0 °C
	Temperature of the voltage/V2 speed point. Min. **T1** Max. **T_MAX** Def. 28,0 °C
	Maximum production temperature, above this the output is at the voltage **MotorMaxLim**. Min. **T2** Max. 95 °C Def. 29,0 °C
	Voltage/speed of the temperature point T1. Min. **MotorMinLim** Max. **V2** Def. 20%
	Voltage/speed of the temperature point T2. Min. **V1** Max. **MotorMaxLim** Def. 90%



12.3 HEATING CYCLE PARAMETERS [HEA] – DRY COOLER

Caution: The heating cycle can be replaced by a second cooling cycle [CO2] by changing the setting of the parameter *Second Mode*.

DRY COOLER T1 [IH] 22.0 °C	Temperature of the voltage/V2 speed point. Min. **T_MAX** Max. **T2** Def. 22,0 °C
DRY COOLER T2 [IH] 24.0 °C	Temperature of the voltage/V1 speed point. Min. **T1** Max. 95 °C Def. 24,0 °C
DRY COOLER T_MAX [IH] 21.0 °C	Maximum production temperature, over this the output is at the voltage **MotorMaxLim**. Min. 0 °C Max. **T1** Def. 21,0 °C
DRY COOLER V1 [IH] 20 %	Voltage/speed of the temperature point T2. Min. **MotorMinLim** Max. **V2** Def. 20%
DRY COOLER V2 [IH] 90 %	Voltage/speed of the temperature point T1. Min. **V1** Max. **MotorMaxLim** Def. 90%



13 OPERATING PARAMETERS MENU - SLAVE

The operating parameters menus can be accessed from any visualization of the state menu, by pressing together the keys **ENT** + ⬇ (hold the key **ENT** pressed and press the key ⬇).

SLAVE IMPO.SLAVE [IC] ----------	The menu windows include the menu name and the corresponding [identifying code]. The second line of the display is dotted

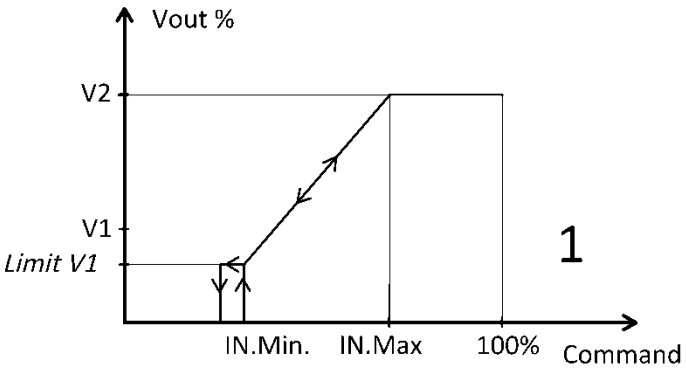
- Press the key **ENT** to enter the parameters of the visualized menu;
- Press the key **ESC** to return to the state menu;
- Press the key ⬇ to go to the next menu;
- Press the key ⬆ to return to the previous menu.

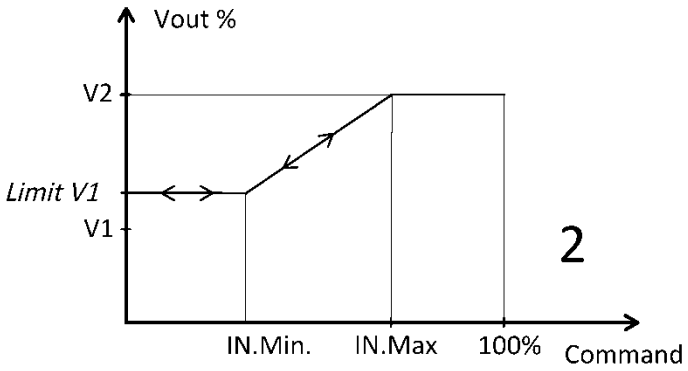
13.1 PARAMETERS READING AND EDITING

SLAVE V1 [IC] 20 %	The parameters windows display the name of the parameter, the [identifying code] of the corresponding menu, the value of the parameter and the unit of measure. ⬇ to go to the parameter below; ⬆ to go to the parameter above
SLAVE V1 [IC] ->20 %	To change the value of the parameter press **ENT**, the arrow and the value of the parameter in brackets mean that the system is in the parameter editing mode, edit the value by pressing the following key : ⬆ to increase the value ⬇ to decrease the value **ENT** to save. **ESC** to return to the parameter

13.2 WORKING PARAMETERS [IC] – SLAVE

SLAVE MIN. INPUT [IC] 10 %	Control signal of the Voltage V1/speed point. Min. 10 % Max. **InMax** Def. 10%
SLAVE MAX INPUT [IC] 95 %	Control signal of the Voltage V2/speed point. Min. **InMin** Max. 100% Def. 95%
SLAVE V1 [IC] 20 %	Voltage/speed of signal command IN.MINIM. Min. **MotorMinLim** Max. **V2** Def. 20%
SLAVE V2 [IC] 100 %	Voltage/speed of signal command IN.MAX Min. **V1** Max. **MotorMaxLim** Def. 100%





14 SPEED LIMITS

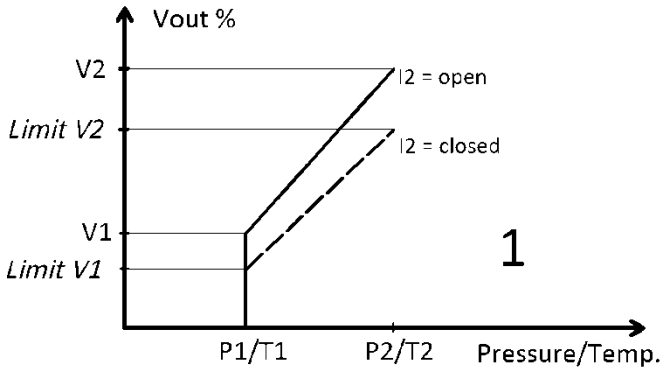
This function is usally used to set a reduced maximum speed in certain operating cycles or a fixed speed detached from the probe signals.
Caution : With the I2 digital input closed (the clock can be used optionally) this function automatically enables the speed limit values (V1 and V2 Limit) on all the Master operating cycles (CHILLER and DRY COOLER) and the dispaly visualizes $^{L}{}^{S}$.

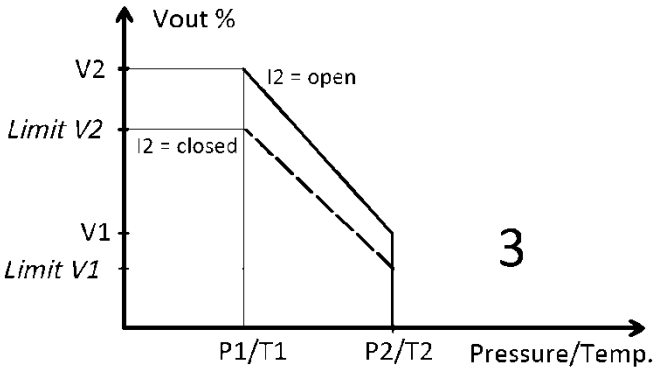
V1 LIMIT [LV] 18 %	Voltage that replaces V1, in the *Master* cycle used, when the I2 max production contact is closed. Voltage that replaces V1, in the *Slave* cycle, when V1 LIMIT>V1. Min. **MotorMinLim** Max. **V2 Limit** Def. 18%

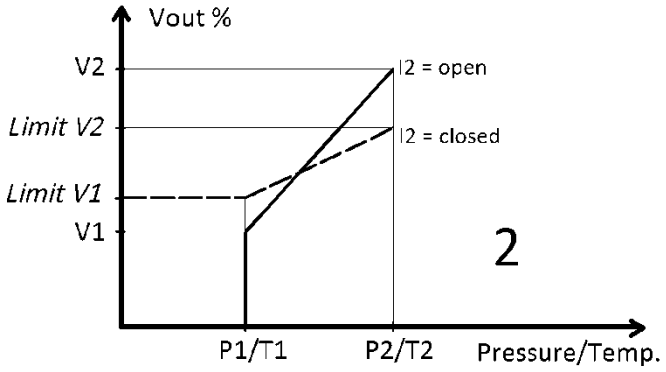
Caution:

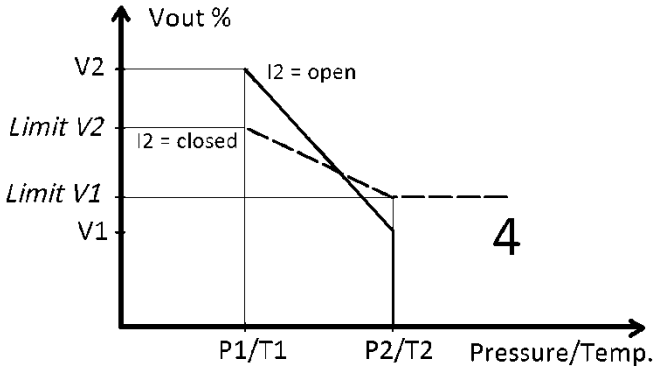
COOL cycle: For V1 Limit > V1 of the active cycle, if the pressure/temperature is lower than P1/T1, the Voltage OUT (Vout%) will be fixed at the value of the V1 Limit (see for example the below chart 2).
HEAT cycle: For V1 Limit > V1 of the active cycle, if the pressure/temperature is higher than P2/T2, the voltage OUT (Vout%) will be fixed at the value of the V1 Limit (see for example the below chart 4).

V2 LIMIT [LV] 65 %	Voltage that replaces V2, in the Master cycle used, when the max productions ***I2 contact*** is closed. Min. **V1 Limit** Max. **MotorMaxLim** Def. 65%
ENAB W/TIME [LV] Off *	*[WITH CLOCK OPTION]* Allows enabling the V1 and V2 limits in the Master operating cycles, not only by closing the I2 contact, but also through the timer calendar set in the Clock menu (page **Error! Bookmark not defined.**). Def. OFF









15 FACTORY PARAMETERS MENU

PIN [PW] 0000	To access the factory parameters menu press **ENT**, enter the number 0023 through the key ⬆, press **ENT** to save

Caution: When entering this menu, all the analogic outputs of the device will be closed and the adjusting operation will be stopped until the menu is closed.

15.1 **BASIC SETTINGS**

PRESET. [IB]	Allows to load one of the settings based on the below tables. Select one setting to speed the programming up.

Caution: previous settings will be overwritten; as for the Master pre-settings the values of SPD1 and SPD2 will be of 20% and 90% respectively.

CHILLER	Input type	Scale	COOL			HEAT		
			P1	P2	MaxP	P1	P2	MaxP
MPRZM_34	0,5..4,5V	0..34,5 bar	13 bar	18 bar	19 bar	4 bar	6 bar	3 bar
MPRZM_45	0,5..4,5V	0..45 bar	20 bar	24 bar	25 bar	7 bar	11 bar	5 bar
MP420_30	4..20 mA	0..30 bar	13 bar	18 bar	19 bar	4 bar	6 bar	3 bar
MP420_50	4..20 mA	0..50 bar	20 bar	24 bar	25 bar	7 bar	11 bar	5 bar

DRY COOLER	Input type	COOL			HEAT		
		T1	T2	MaxT	T1	T2	MaxT
MTNTC_L	10kΩ @ 25°C (β3435)	22°C	28°C	29°C	22°C	24°C	21°C
MTNTC_H	10kΩ @ 25°C (β3435)	38°C	45°C	46°C	22°C	24°C	21°C

SLAVE	Input type	IN. MIN.	IN. MAX	V1	V2
S0_10	0..10V /Pwm	10%	100%	20%	100%
S4_20	4..20mA	10%	100%	20%	100%
S_MDB	Modbus RTU				
S_PWM FV	Pwm FV				

REG. MODE [IB] Q *	Allows selecting the motor adjusting curve. Possible modes: **Q**= optimized for fans (Def.), **L**= linear
USER ACTIV [IB] ON *	Allows forbidding the access to the "Operating parameters" menu. ON (Def.): allows the access OFF: forbids the access
CHILLER INPUT [IB] 4..20 mA *	Defines the type of signal used. **4-20 mA** (Def.): analogical signal 4-20mA; **0,5-4,5 V**: analogical signal 0,5-4,5 V=
SLAVE IN. TYPE [IB] 0..10 *	Defines the type of signal used. **0-10 V** (Def.): analog signal 0..10V= , or **pwm** 100Hz type with variable average value **Range**: 5...15V. **PWM fv**: variable frequency pwm (do not use it). **modbus**: Controlled by Master controller on RTU Modbus transmission

SLAVE PWM min [IB] 2 kHz	(this parameter is displayed only if “IN.TYPE [IB]” is on pwm fv) Minimum input frecuency used for the PWM fv input. Min. 2 kHz Max. **MaxPwm** Def. 2kHz
SLAVE PWM max [IB] 18 kHz	(this parameter is displayed only if “IN.TYPE [IB]” is on pwm fv) Maximum input frecuency used for the PWM fv input. Min. **PWMmin** Max. 20kHz Def. 18kHz
CHILLER FS PROBE [IB] 30,0 bar	Defines the full scale value provided by the probes. Min. 0 bar Max. 1000 bar Def. 50 bar
CHILLER UNIT MEASUR. [IB] bar *	Defines the measurement unit visualized in the state menu and in the operating parameters. **Bar** (Def.) **/ Millibar / Pascal / kiloPascal** **Caution**: numbers won’t be converted
DRY COOLER OFFSET 1 [IB] 0.0 °C	Adjusting value of the temperature probe connected to input 1. Min. -5 °C Max. +5 °C Def. 0 °C
DRY COOLER OFFSET 2 [IB] 0.0 °C	*[WITH S1 CARD]* Adjusting value of the temperature probe connected to input 2. Min. -5 °C Max. +5 °C Def. 0 °C
2° MODE [IB] direct *	Defines the second operating cycle (***it can be activated with I1 contact***). **Direct**: first cycle COOL , second cycle COOL; **Reverse**(Def.): first cycle COOL, second cycle HEAT
PRIORITY IN. [IB] Automat. In. *	*[WITH S1 CARD]* Defines the pressure reference based on the following criteria: **Automatic in.** (Def.): priority to the signal of the higher probe in the cooling cycle, of the lower probe in the heating cycle; **Minimum in.**: priority to the lower signal of the two probes; **Maximum in.**: priority to the higher signal of the two probes; **In.2**: probe 2 (disables input 1); **In.1**: probe 1 (disables input 2);
START CON. [IB] closed *	Defines the operating logic of the ***start (I3)*** contact. **Closed** (Def.): enables the adjuster (start) with the contact closed; **Open**: enables the adjuster (start) with the contact open

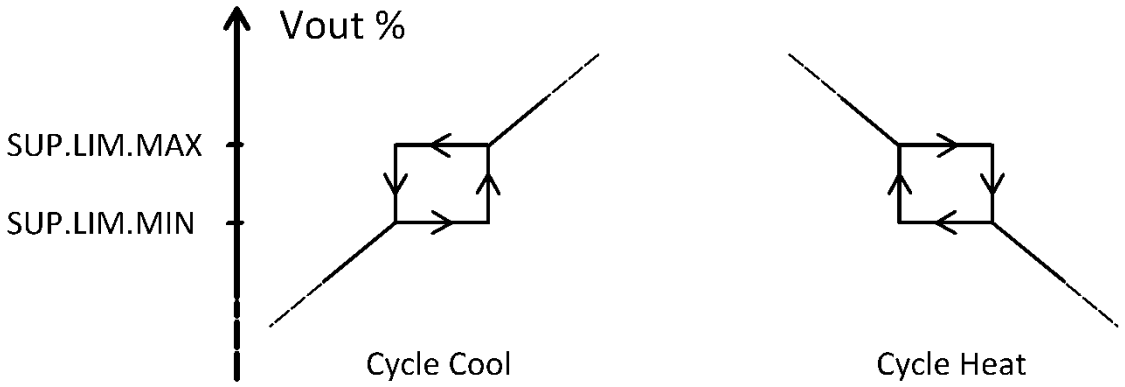
KICK START [BS] OFF *	Enabling of the kick start. This parameter is set for loads that need a torque start to move at low speeds. ON (Def.): function enabled OFF: function disabled
RESET ? [IB] Press ENT *	Factory settings reset: reset to standard parameters (except for the operating time of the adjuster). **Caution**: once entered the reset control through the key **ENT**, the old settings will be lost and the controller will be reset accoriding to the pre-setting MP420_50

15.2 **MOTOR SETTINGS**

COS-PHI [ES] 0.8	Allows setting manually the cos-phi of the load to enhance its adjusting. Min. 0.1 Max. 1 Def. 0.8
CosPhi auto? [ES] OFF *	Allows enabling a function that automatically detects the value of the cos-phi of the motor and save it in the parameter *COS-PHI (available only on demand).* **Caution:** the controller will be restart and the output voltage will be increased gradually up to the 100% to return to the basic setting value. The whole process will be automatic and last few seconds
MIN. LIMIT [IM] 15 %	Minimum adjustable voltage, used to limit the load minimum speed. Min. 15 % Max. **Max.Lim.** Def. 15%
MAX. LIMIT [IM] 100 %	Maximum adjustable voltage, used to limit the load maximum speed. Min. **Min.Lim.** Max. 100% Def. 100%
RAMP [IM] 5 sec	Time employed by the adjuster to go from 0% to 100% of the output signal 0-10V. Min. 0 sec Max. 60sec Def. 5 sec
SUPPRESS.1 [IM] off *	Defines the enabling of the jump window specified in the parameters "**Sup.Min.Lim.1**" and "**Sup.Max.Lim.1**" of the adjuster. It is enabled to prevent events of mechanical resonance. Def. OFF **Caution**: this is a prioritary function on any operating cycle
SUP.MIN.LIM.1 [IM] 20 %	Lower voltage of the jump window. Min. 0% Max. **Sup.Max.Lim.1** Def. 20% (this parameter is visualized only if "Suppress.1" is ON)

SUP.MAX.LIM.1 [IM] 30 %	Higher voltage of the jump window. Min. **Sup.Min.Lim.1** Max. **Sup.Min.Lim.2** Def. 30% (this parameter is visualized only if "Suppress.1" is ON)

The functions "***Suppress.2***" and "***Suppress.3***" with corresponding limits operate alike the "*Suppress 1*" and are prioritary functions on any operating cycle.



15.3 **RELAY SETTINGS**

RELAY 1 [IR] default *	Enables the internal relay based on the following settings: **Default (Def.)** : enabled relay in a condition of regular operating, disabled relay in emergency case (see Diagnosis on page 24). **Manual**: enabled relay above the value *Max.Lim.Rel.1* and disable under the value *Min.lim.rel.1*. **Clock** *[OPTIONAL]:* Enabled relay between the intervals of the clock timer
MIN.LIM.REL. 1 [IR] 20 bar	Value of pressure/temperature under which the relay is disabled. This parameter is visualized only when "*Relay1*" is set on "*Manual*".
MAX.LIM.REL. 1 [IR] 25 bar	Value of pressure/temperature above which the relay is enabled. This parameter is visualized only when "*Relay1*" is set on "*Manual*"

[WITH S1 CARD]
The functions "*Relay 2*" and "*Relay 3*" with the corresponding limits operate alike the "*Relay 1*". With manual operation ON the relays exchange with reference to the signal of the priority probe except when the setting "PRIORITY IN. [BS] = independent" is ON. In this case the Relay 1 makes reference to the analogical input 1and the Relays 2 and 3 to the analogical input 2.

15.4 **MODBUS SETTINGS**

MB ADDRESS [MB] 1	Defines the ModbusRTU address of the adjuster. It can go from 1 to 247. Def. 1

BAUDRATE [MB] 19200 bps *	Defines the transmission speed on channel RS-485 Possible modes: **9600**bps, **19200**bps (Def.), **38400**bps
PARITY [MB] none *	Defines the type of parity on the serial transmission. Possibles modes: **None** (Def.), **even**, **odd**
BIT STOP [MB] *	Defines the parity bit in the serial transmission. Possible modes: **1**=one bit (Def.), **2**=two bits
SLAVE TIME OUT MDB [IB] 30 S	Adjuster's maximum time to receive the setting value on Modbus transmission. Over this time the adjuster locks the outputs and starts the emergency state. Min. 1 Max. 240s Def. 30s

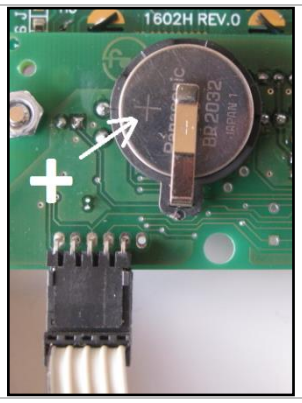
15.5 **DIAGNOSIS**

TOTAL HOURS [DI] 02:23 g:h	Days and hours of operation of the adjuster **Caution**: in case of reset this value won't be reset
INT. TEMP. [DI] 33.2 °C	Internal temperature of the adjuster represented in Centigrades
PHASE MISS. [DI] 4 err	Quantity of stops due to the missing of a power supply phase or high disturbances in the power supply line
OVERHEATING [DI] 2 err	Quantity of stops due to the internal overheating
EXTERNAL [DI] 4 err	Quantity of stops due to an external emergency received on the terminal I4
PROBE MISS. [DI] 4 err	Quantity of stops due to a breakdown/fault of the possible power supply probe 4…20 mA

[IF REAL TIME CLOCK AVAILABLE]
With clock option ON the display visualizes the date and time of the last stop next to the number of stops.

16 REAL TIME CLOCK

The following functions are available only in the controllers provided with the related option and only with a backup battery type CR2032-3V (not provided) as represented in the image. The battery duration highly depends on the temperature of the environment and lasts 3 years in average. With low battery the display visualizes β



WED 05.09.2012 13:27:13	Displays the date and time of the internal clock. To change press **ENT**.
MON OFF - - : - - → - - : - -	In this menu a weekly calendar can be enabled to edit the setting mode by activating the speed limits SPD1, SPD2 ant control the relays
MON ON 19 : 00 → 06:00	Press the key **ENT** to enter the editing mode. Then press ↑ and ↓ to enable (ON) or disable (OFF) the clock option of each day of the week and increase or decrease the hours and the minutes when the enabling starts and finishes. Once changed the time, the system asks to copy the setting on the next day of the week. To save press the key **ENT**, to cancel press **ESC**. **Caution:** As represented in the image, if the operation start is set on the day before the day of the operation end, this will be set on the next day. Only one time can be set per day

Dixell

EMERSON
Climate Technologies

Dixell S.r.l. - Z.I. Via dell'Industria, 27 - 32010 Pieve d'Alpago (BL) ITALY
Tel. +39.0437.9833 r.a. - Fax +39.0437.989313 - EmersonClimate.com/Dixell - dixell@emerson.com