V10-PRESS

INSTALLATION AND OPERATION

toscano

4-20 mA PRESSURE TRANSDUCER control

2 pump multifunction controller
for 1/3-phase pumps up to 5,5 kW
(control by 4-20 mA pressure transducer)

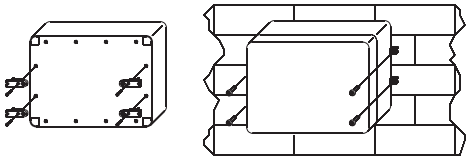
General description

- Control and protection unit for two pumps with automatic alternation by 4-20 mA external pressure sensor.
- Three/single phase. Dual power supply 230/400 Vac.
- Pumps starting & stopping in a cascade sequence.
- Automatic pump alternation in case of failure or deactivation of one of them.
- Overload electronic relay and pahse failure.
- Main switch-disconnector.
- Magnetothermics.
- 24 Vac contactors remote circuit isolated from mains power supply transformer.
- Remote circuit double protection in primary and secundary transformer.
- HAND-OFF-AUTO push buttons for each pump.
- VOLTAGE and LOW LEVEL pilot lights.
- ON/OFF and OVERLOAD for each pump.
- Jammed impeller detection by float or pressure switches.
- REMOTE input (protect up to 400 V)
- Zero flow detection by flow switch.

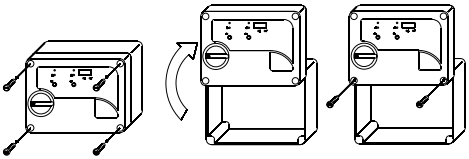
- Jammed impeller protection system.
- General alarm output relay (pumps thermal failure, low level, pressure fault or transducer failure).
- 24 Vdc controls for more security.
- 3 Digits led may display level or aditional information.

Installation

Mounted on a wall.

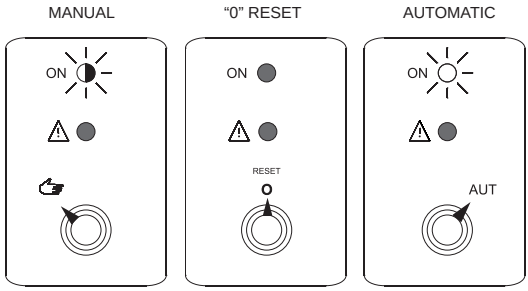


Before opening the unit, the main switch must be in “OFF” position.



Front configuration

Light ON Light FLASHING OFF



A **MANUAL-OFF-AUT** switch.

MANUAL: Pump runs when pressed, remaining only thermal protection. Maximum time hand running is 15 seconds.

OFF "0" (RESET): No starting possible in any circunstance. Pump alarm reset.

AUTOMATIC: The unit works automatically with control and protections.

B Red Pilot: **MOTOR ALARM**. Thermal motor failure.

C Green Pilot: **MOTOR RUNNING.** Light up when pump is running. Flashing pilot led means unit is in "HAND" position.

D Amber Pilot: **HIGH LEVEL**. Light up when over high level.

E Green Pilot: **VOLTAGE**. Light up when there is supply voltage.

F Display **LED**: Shows level height in meters.

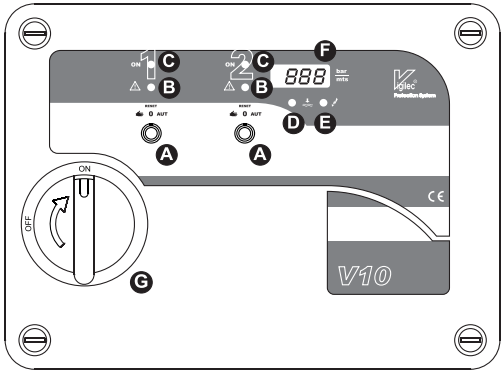
G Main switch. Only runs when the unit is closed. When it's in "ON" position lights up appropriate pilot.

H Selector of low level detection.

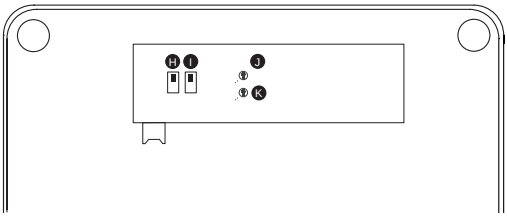
I Selector of external control.

J Adjustment of sensor range.

K Adjustment of stop time delay.

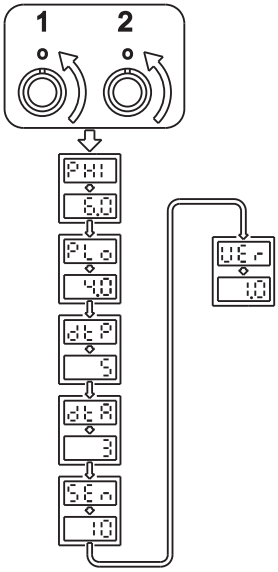


INSIDE COVER



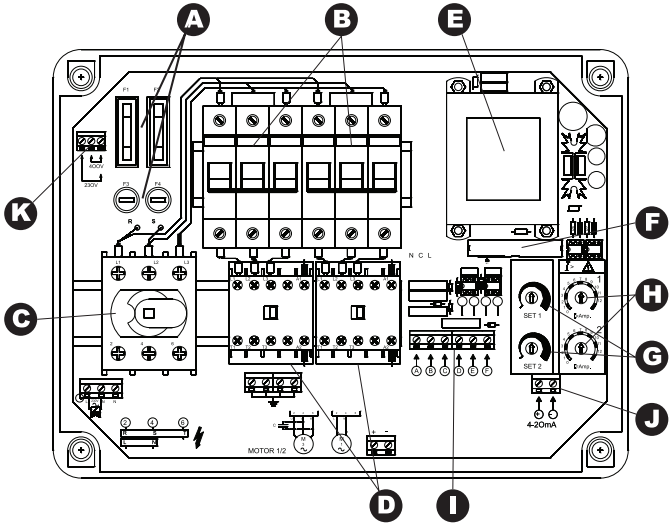
AUTO-CONSULTING: Putting both controls in “0” position, shows unit adjustments sequentially: High pressure (PHI), Low pressure (PLo), Stop delay of duty pump (dtP), Stop delay of standby pump (dtA), Transducer range selected (SEn) and Firmware version (VEr).

This function may us enquiry internal adjustment without open it.



Internal configuration

- A Control fuses (2 Amp 5x20) and (0.1 Amp 6x32).
- B Circuit breakers.
- C Main switch.
- D Contactors.
- E Transformer.
- F Flat cable connector.
- G Alarm level and stop time adjustment.
- H Overload adjustment.
- I Terminal block.
- J Transducer input.
- K Voltage terminal blocks selection 230 o 400 Vac.

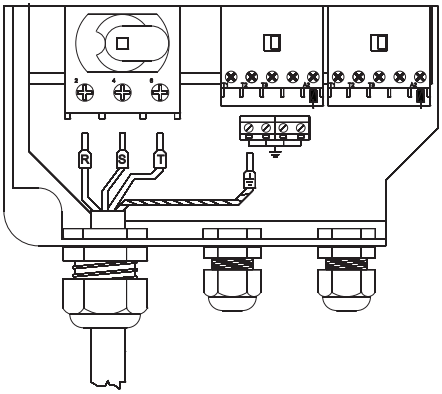


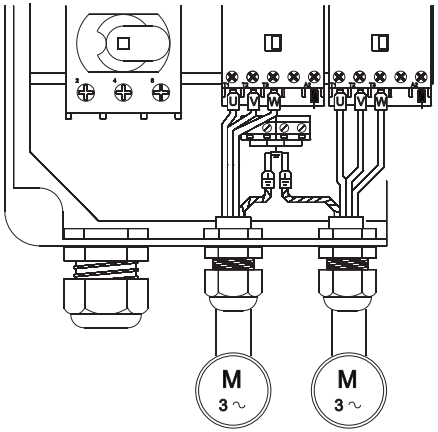
Connection

It's recommended to use suitable terminals in all connection wires.

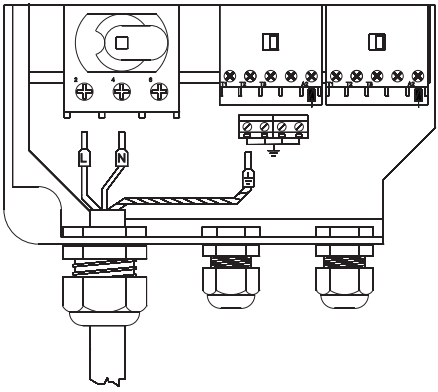
VERY IMPORTANT to select the correct voltage in the voltage selection terminal blocks (see "Internal Configuration" section, point "K").

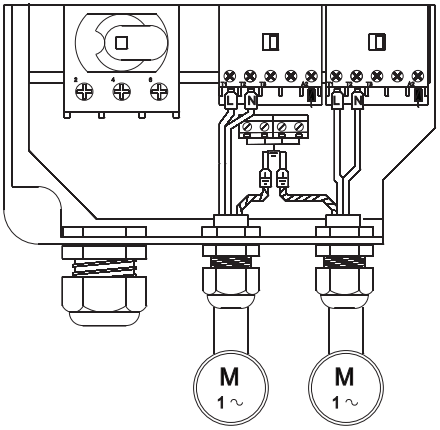
Three phase installation





Single phase installation



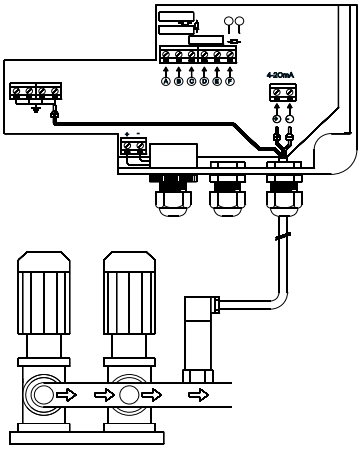


Connect the pressure transducer with 4-20 mA output

Connect a pressure transducer-type two-wire 4-20 mA. This input is protected against short circuit and polarity change.

Transducer cable shield must be connected to protective earth terminal block.

N.B.: In case of sensor failure (signal <2 mA), the display will show the message “Err-SEn”.

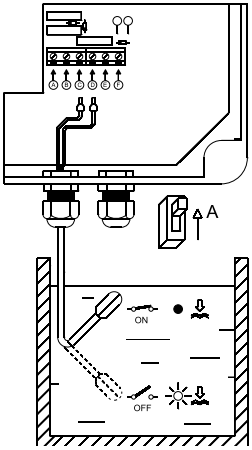


Low level detection (terminal blocks C and D)

Float switch.

Select the position “A” on the switch located at the rear of the front panel.

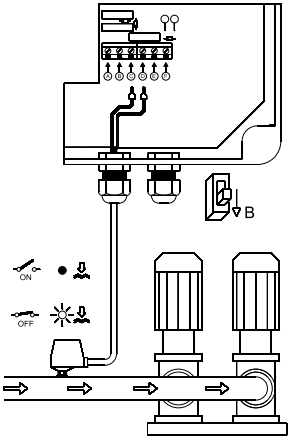
Stop the absence of water pumps on the inlet. Float switch must open the contact in the low position.



Pressure switch.

Select position “B” on the switch located at the rear of the front panel.

It can’t work if inlet pressure is too low. The pressure switch should close contact with low pressure (usual type).



External control (terminal blocks E and F)

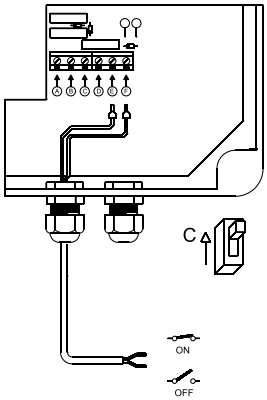
REMOTE to activate / deactivate the system.

Select the “C” position on the switch located at the rear of the front panel.

Contact closed: Normal operation.

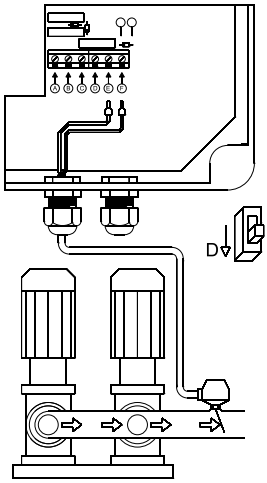
Contact open: system halted.

Warning: If you use this input, the selector should be placed in position “D” or simply link this one.



Flow switch.

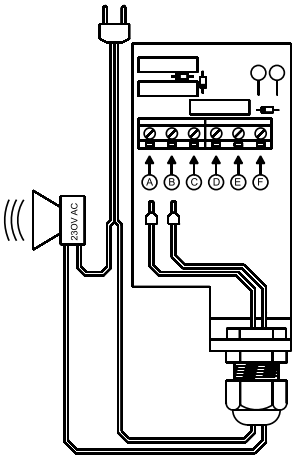
Select the “D” position on the switch located at the rear of the front panel



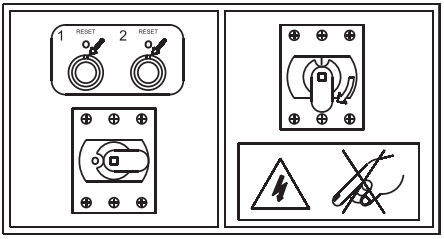
General alarm output (terminal blocks A and B)

The diagram shows an example of connection of an external siren.

One of the connection wires must pass through relay alarm output.



System adjustment



WARNING:

Before opening the control box it is necessary to turn main switch “OFF” position.

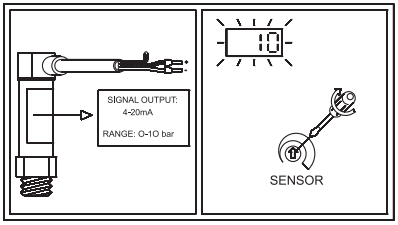
After opened, to do the adjustment it is necessary to manually turn the main switch “ON” position. In that moment, the control box will be electrically energized, all security cautions must be atteded. Do not touch any high voltage electrical parts. When all adjustments are already made you must turn the main switch “OFF” position before closing the control box.

Interactive adjustment

When we move one of the adjustment knobs of “high pressure” or “transducer range”, the display shows flashing their numeric value.

Pressure transducer range selection

It is very important to select the range of the transducer used by the knob behind the inside cover. By turning the knob is on the display will indicate what range we are selecting.

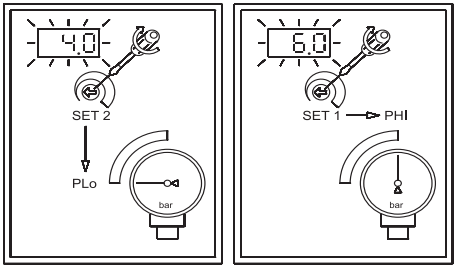


Pressure adjustment (example)

The system always leaves a gap of at least 0.2 Bar between PHI and PLo levels.

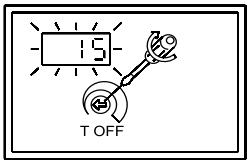
CAUTION: Be careful when setting the high pressure PHI. If you set a pressure much higher than they are able to provide the pumps, the system will never stop.

Low pressure (PLo) High pressure (PHI)



Stop delay adjustment

With this command, located on the back of the lid, you can adjust the timeout to stop the pumps.



The time that appears on the screen to adjust, downtime for the duty pump (dtP).

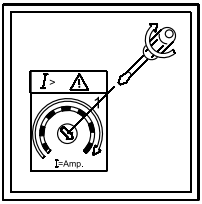
The delay to stop the assist/standby pump (dtA) is proportional to the former.

Position	Duty pump delay dtP	Standby pump delay dtA
Lowest	5 seconds	3 seconds
Highest	180 seconds	30 seconds

Current adjustment

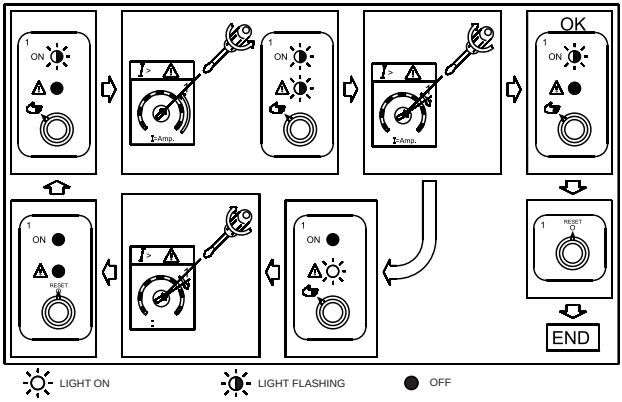
The intensity adjustment be made when the engine is connected to the unit because otherwise it will alarm for lack of cargo. Also, regular pump, keep the other on “0”, because if the alarm off the bomb, another bomb tear to replace it.

Before we start the adjustment knob to bring the intensity to the maximum.

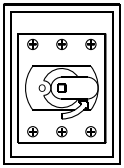


Current adjustment sequence

This sequence we do it for each of the pumps.



Once all the adjustments we can again turn the switch to position “0”. Only then can re-close the unit.



System operation

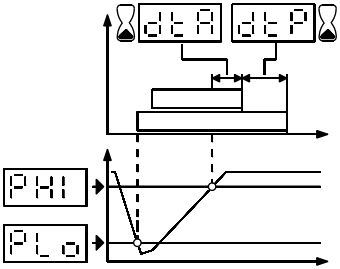
High pressure stop (selector on position “C”)

When the pressure drops below the pressure set on PLo (low pressure) activates the duty pump (maintenance).

If the pressure remains below the setting instance, the assist/standby pump also start after a short lag.

By overcoming the pressure set in the PHI (maximum pressure) the standby pump will stop after stop delay (dtA).

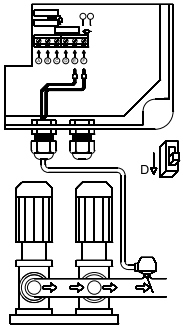
Only if the pressure remains above the value PHI will also stop the duty pump, after staging delay (dtP).



Stop by zero flow detection (selector on position “D”)

In this mode you can install a flow detector (fluxostato) at the collector output of the pumps. This can be detected when there is zero flow and, therefore, stop the bombs.

In the AUTO-CONSULTING menu, the first parameter will appear like flu and is valued at the time of inhibition of the flow detector.

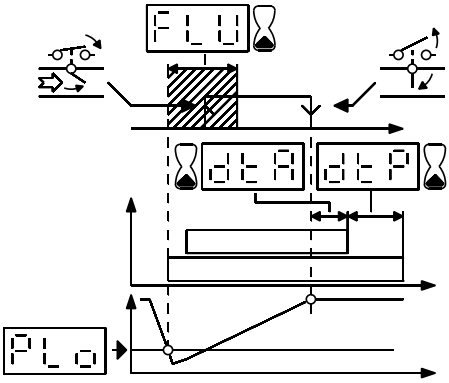


Start

When the pressure falls below the set “PLO”, the duty pump will start. If pressure rises, also will start the standby pump.

Time inhibition “FLU”

As one of the bombs start, begins a time of inhibition, during which the state is not considered a flux detector. During this time of inhibition, we give time for the water pumped is able to activate the flow detector. This time is adjustable, and coincide with the time set in the delay of the duty pump station (5-180 seconds).



Normal stop

As the pressure rises, the flow rate decreases. When the bombs reach their maximum pressure, the flow is zero (no longer being pumped). At that time, the flow detector is disabled and the bombs stop, after stopping their respective delays.

Wrong stop

Once inhibition elapsed after startup, the flow detector must be activated. If this happens and the pressure is still below the set to “PLo”, the system will stop, indicating the message “Err-Prs. This is because the team has detected that the system is unable to pump water.

Caution: To work this way, it is critical the choice of model pumps. The stop pressure coincides with the maximum pressure capable of delivering pumps.

Intake low level detection

If found low level / low pressure, low-level pilot lights on and the pumps will stop. When the water level is restored, the pilot will flashing for 6 seconds and then the pumps will start again.

Broken pipe detection

If one pump is running more than 1 minute and can not raise the pressure above the 20% minimum pressure (PLo) displays the message “Err-Prs” and the system will stop. The system can re-activate after reviewing the facility and spend any of the controls by the RESET position.

Thermal pump protection

In case of overload or phase failure in any pumps there will be a thermal trip of the pump 7 seconds after detection.

Pump alternation in case of alarm

If there is a thermal alarm in the pump, the other pump will start automatically.

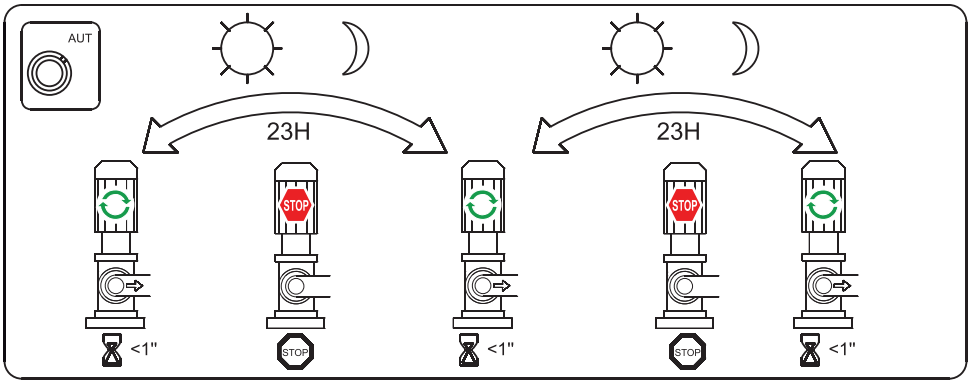
General alarm output (terminal blocks A and B)

If there is any alarm level, transducer fail or thermal alarm in any pump, the alarm will activate.

It is a volt-free contact output N.O. (see “Internal Configuration” section, point “I”).

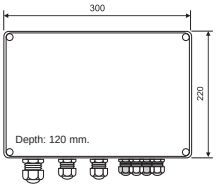
Anti-block system (pump jamming prevention)

If the pump is in “AUTO” the system will start the pump only one second each 23 hours of no running time. This prevents any pump jamming during long non-activity cycles.

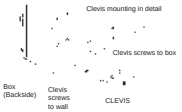


Specifications

Supply voltage	Dual voltage 230/400 V~ selectable
Permissible supply voltage variations	+10% -15%
Maximum current	12 Amp AC3
Overload adjustment	1-13 Amp
Underload adjustment	Fix <0,5 Amp
Pressure transducer	4-20 mA, two wires type
Transducer range	6, 10, 16, 25 and 40 Bar
Accuracy	±0,1 Bar (±0,2 Bar for 40 Bar transducer)
Input connection (power)	Direct to main switch
Output connection (motors)	Direct to contactor 4 mm²
Fixed	Clevis wall mounting
Weight approx.	3,7 Kg



Mounted on a wall



Troubleshooting

Problem	Cause	Solution
• The system doesn't work and the power-on pilot light is off while main power supply voltage is present.	• Blown control fuse. • Wrong input connection. • Phase failure. • Supply over-voltage.	• Replace with appropriate fuse. • Connect correctly. • Check phases. • Verify voltage.
• The system is working but the contactor does not activated.	• Voltage selection error.	• Verify voltage selection.
• Pump alarm trip.	• Low overcurrent adjustment. • Input phase failure. • Anormal excessive motor consumption. • Low current consumption <0,5 A.	• Check motor consumption and adjust the current. • Check three supply phases. • Verify motor.The pump is overloaded. • Check pump.
• Low level control failure.	• Incorrect mode selection.	• Check mode selection.
• Display shows "Err-Prs.	• Unable to upload the pressure.	• Check the hydraulic installation.
• Display shows "Err-SEn"	• Transducer is not connected. • Transducer current <2 mA.	• Connect the transducer 4-20 mA. • Check the transducer.

EC DECLARATION OF COMPLIANCE WITH THE "LOW VOLTAGE" & "ELECTROMAGNETIC COMPATIBILITY" DIRECTIVES.

TOSCANO LINEA ELECTRONICA, S.L. declares that the equipment described in this manual complies with the provisions of the modified "LOW VOLTAGE" directive (Directive DC 2004/108/CE) and with the modified "ELECTROMAGNETIC COMPATIBILITY" directive (Directive DC 2006/95/CE) and with national legislation based upon them. It also complies with the provisions of the following European standards and draft standards:

NF EN 60.439-1 / EN 50.081-1 / EN 50.082-2 .

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