CONTROLPRES

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CONTROLPRES

Apart from the performance of the **MASCONTROL**, this new device allows for reducing and adjusting the maximum pressure generated by the pump.

This allows for obtaining the desired pressure in the system without applying a pressure reducer.

In fact, the device accepts an input pressure of a maximum of 12 bar which can be reduced and adjusted from between a minimum of 3 bar and a maximum of 6.5 bar.

The hydraulic part has been enlarged and foresees 1¼” unions which allows for reducing the load loss and offers the advantage of greater flow rate.

The electrical part is structured in such a way as to be able to control monophase pumps with up to 3 HP without the use of remote control switches.

These overall features make **CONTROLPRES** unique and increase its use possibilities.

Applications and Performance

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- **Reduces the maximum pressure generated by the pump.**
- **Adjusts the system pressure within the established field.**
- Replaces the traditional expansion tank system.
- Starts and stops the pump in accordance with the opening and closing of the taps.
- Maintains constant pressure during delivery.
- Stops the pump in the case of water shortage, protecting it from dry running.
- Overcomes the effects of water hammering.
- Maintenance-free.

Technical Features - Electrical parts

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Monophase power supply voltage	230V
Acceptable voltage variations	± 10%
Frequency	50-60 Hz
Maximum current	30 (16) A
Maximum power	2,2 kW (3 HP)

The electronic board accepts minimum voltage variations of 207V and maximum variations of 253V with a frequency of 50/60 Hz.

It supports a rated current for resistive loads up to 30 A, and a rated current for inductive loads up to 16 A.

It is capable of controlling a monophase motor with a maximum power of 2.2 kW equivalent to 3HP.

Electronic Board

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- Varistor on the line protecting against voltage peaks.
- Varistor protecting against relay contacts.
- Relay with two complete 30A contacts in parallel for piloting the monophase motors up to 3HP.

The boards are subjected to burn-in treatment at 50 °C for 24 hours with on/off cycles guaranteeing perfect operation in limit conditions and each individually tested.

Technical Features - Electrical Board Box

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Insulation class II
The electrical part of the device is insulated from the outside due to being housed in a sealed box only accessible via the use of tools.

Type 1C device
A device that works in such a way as to interrupt the electrical circuit by means of a microswitch (the circuit is opened and closed by relays).

Protection degree IP65
The number 6 indicates that the electronic board is completely dust-proof. The number 5 indicates that the electronic board is protected against jets of water arriving from any direction.

Maximum operating temperature 65°C
The device is built to work in an environment in which the temperature may reach 65 °C.

Technical Features - Hydraulic Parts

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Maximum operating pressure 12 bar (1.2 MPa)
Standards establish that the device must:

- Resist for one minute without any visible loss of pressure equal to twice the maximum operating pressure (24 bar).
- Resist for one minute at a pressure equal to four times the maximum operating pressure (48 bar).
- It must also be demonstrated that the device can release a pressure equal to four times the maximum operating pressure (48 bar) without dropping in such a way as to be hazardous for humans.
- Minimum system pressure 3 bar (0,30 MPa).
- Maximum system pressure 6.5 bar (0,65 MPa).

Materials

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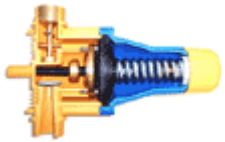

Body, non-return valve, rear part and knob are moulded in 30% fibreglass reinforced polyamide 6 (PA6GF30).
This allows for obtaining a high resistance to wear and pressure.

The diffuser diaphragm and gasket are moulded in EPDM (Ethylene Propylene Diene Monomer).
This guarantees exceptional reliability and durability.

The flow valve, pressure gauge rod and the diffuser are all in brass (OT58).
The dimensional stability of the metal guarantees the operation of the components.

The spring is made in UNI 3823 steel wire.
The stabilisation process guarantees the operation of the pressure switch, essential for the pump start-up precision and the system pressure adjustment. The dimensions and structure of the same allow for considerably reducing the effects of water hammering.

The box containing the electrical part is moulded in shockproof self-extinguishing polystyrene (PSau).

The use of prime materials and top-of-the-range components allows for achieving high levels of dimensional stability, resistance to wear and bursting and duration over time as opposed to other products made with poorer quality materials and components often not admitted by the EEC standards.

Testing of Hydraulic Parts

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The hydraulic parts of each device are tested individually by means of electronic instruments that detect and memorise the pressure and flow values.

In particular, the tests control the following by means of a PLC:

- Watertight sealing at maximum pressure and therefore the absence of leaks.
- The intervention value of the pressure gauge (restarting).
- The value of the minimum flow below which the flow switch stops the pump.
- Intervention of the stopping function in the event of dry running of the pump.
- Starting and stopping of the pump.

Examples of the components are tested individually to ascertain compliance with the requested technical features.

A percentage of the assembled hydraulic parts are tested on test rigs in limit conditions of continuous operation to ascertain their duration over time.

Installation

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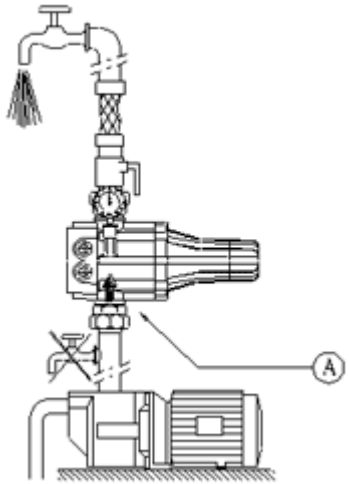
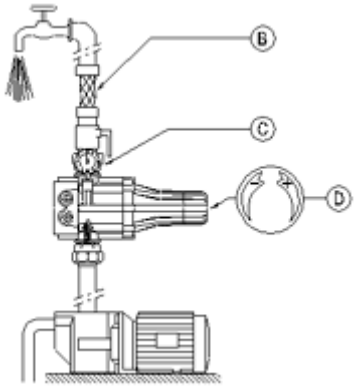
The device can be mounted either directly onto the pump or between the pump and the first tap.



The input pressure of the device must not exceed 12 bar (1.2 MPa).

No tap must be mounted between the pump and the device.

It is essential to mount the device with the flow arrows pointing upwards (fig. A).



It is recommended to connect the output of the device to the system by means of a ball valve and flexible tube (fig. B).

Before starting the device check that the pump is correctly primed.

Adjustment knob (fig. D).

The pressure gauge of the device allows for ascertaining the pressure value of the system (fig. C).

Electrical Wiring

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It is recommended to always foresee the installation of a omnipolar switch with minimum opening of the contacts, equal to three millimetres, upstream from the device.

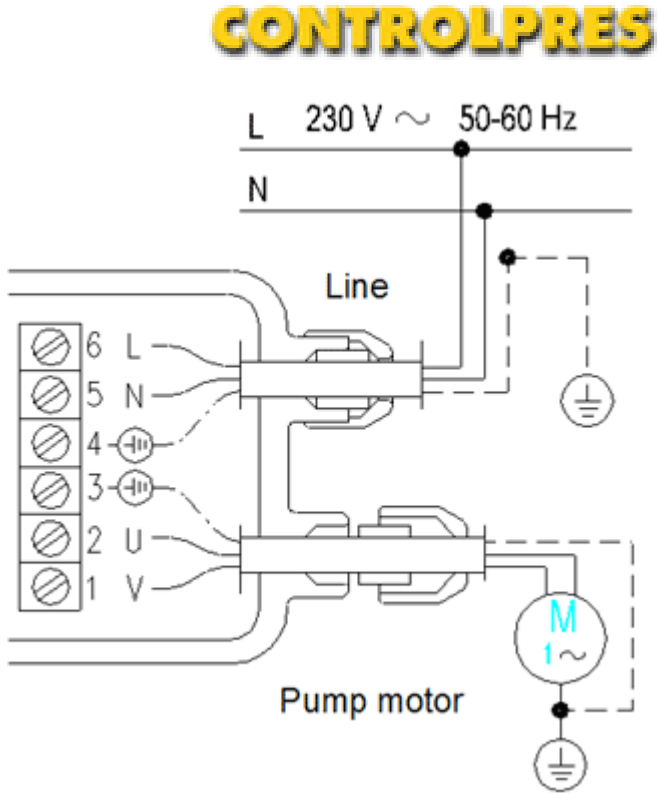
The monophase pumps (230 V) with motor powers of up to 2.2 kW (3 HP) can be connected directly to the device, whereas the same pumps with powers exceeding 2.2 kW (3 HP) and all the three-phase pumps (400 V), must be connected to the device by means of a remote control switch.

- Check the mains voltage and the nameplate data of the pump motor.
- Use H05 or H07 type cables with a section of 3x1.5 mm 2.
- Ascertain that the device is connected to the earthing system.

Electrical Wiring

Direct connection of the 230V monophase motors with an input not exceeding 2.2 kW (3 HP).

The use of a remote control switch is not necessary.



Electrical Wiring

Connection by means of a remote control switch for 230V monophase motors with an input exceeding 2.2 kW (3 HP).

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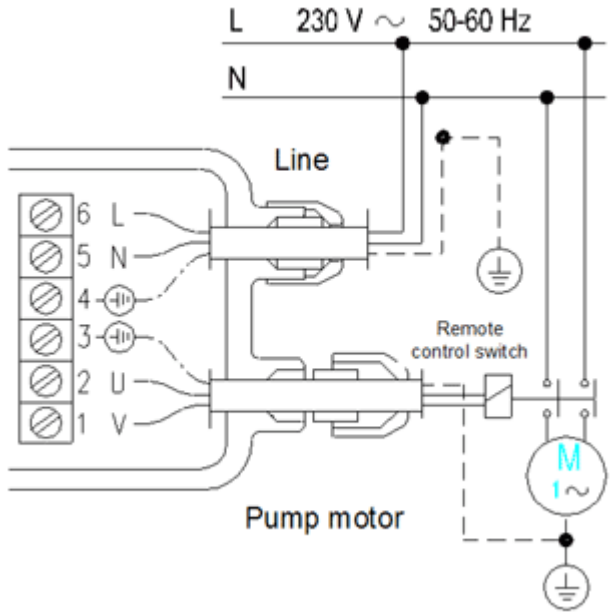
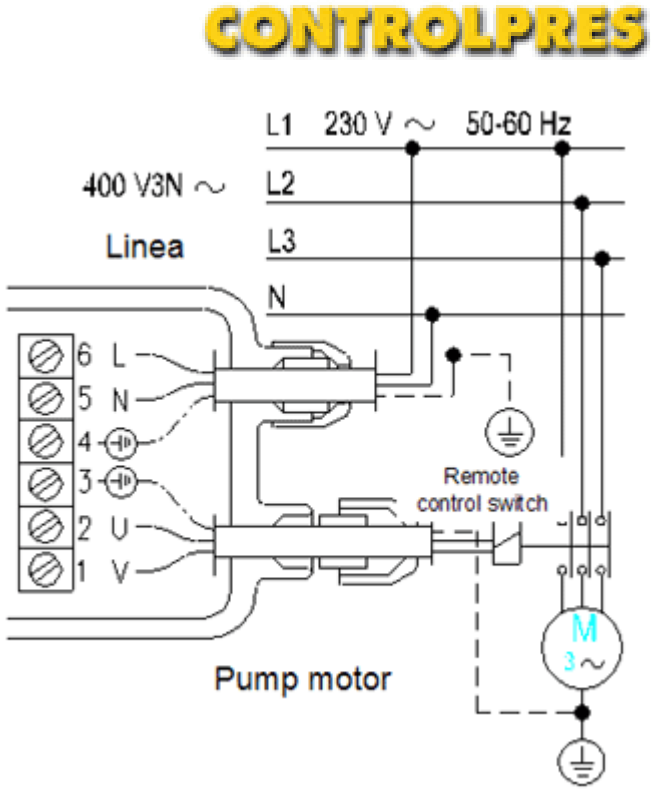


Electrical Wiring

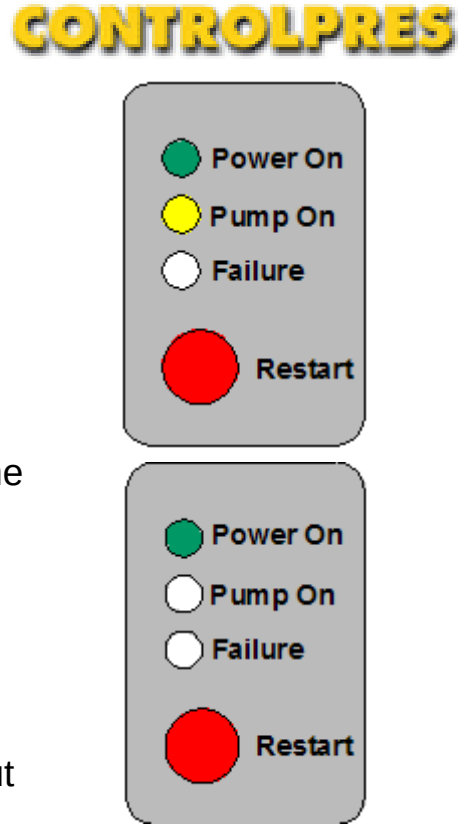
Connection by means of a remote control switch for 400V3N three-phase motors.



Start Up

A panel is located on the front of the device that displays the operating phases of the system via the use of pilot lights. Green light: Power On (voltage), yellow light: Pump On , red light: Failure .

On connecting to the electrical mains the green pilot light turns on and the yellow one signals the start up of the pump.



The pumps keeps operating for several seconds in order to allow the system to gain pressure.
Should this time be insufficient, the red pilot light will turn on. In this case keep the red Restart button pressed in and wait with a tap opened for the red light to turn off.

Once the tap has been closed, the device stops the pump and moves into standby with the green light turned on, ready to carry out all the following command and control operations in full autonomy.

Operation - System Operation

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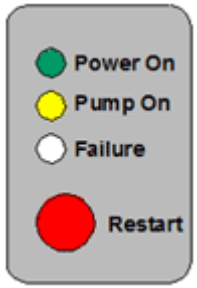
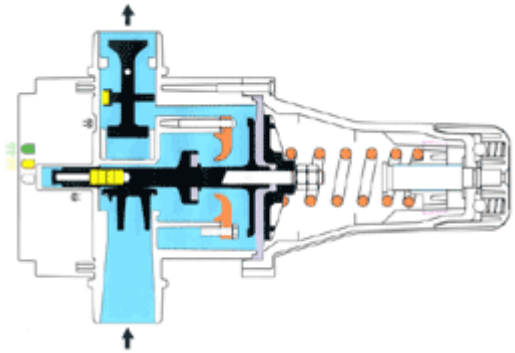
On opening a tap, the device starts the pump which remains in operation for the same time the tap remains open.



- Tap open
- Presence of flow
- Presence of pressure
- Pump running



Operation - System Under Pressure

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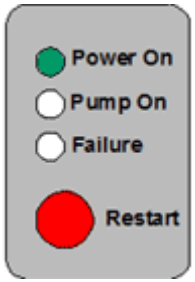
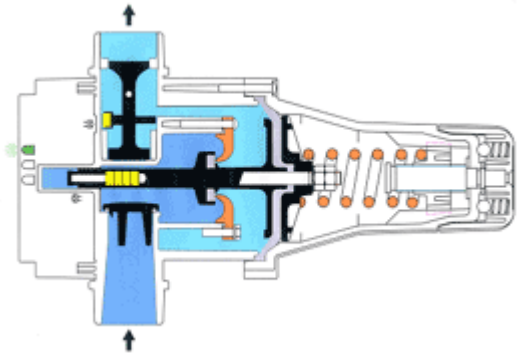
On closing the tap, the device restores the maximum pressure to the system, stops the pump and returns to the standby position.



- System closed
- Absence of flow
- Presence of pressure
- Pump stopped



Operation - System Stopped

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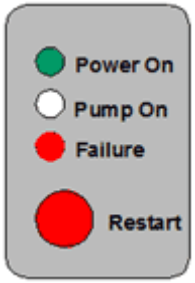
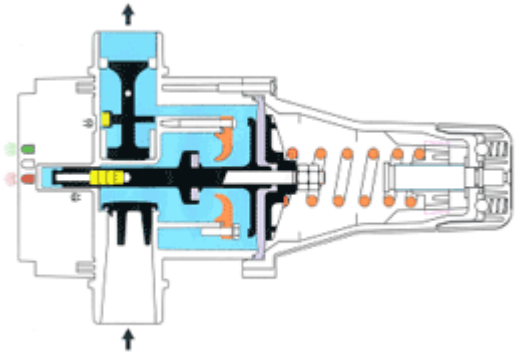
In the event of a water shortage during aspiration, the device will recognise the fault, signalling the same with the red pilot light Failure, and stopping the pump to protect it from dry running.

After eliminating the causes of the stopping it is sufficient to press the red Restart button to restore normal operation. In case of a temporary electricity cut-off the device will automatically start up when the power returns.



- Tap open
- Absence of flow
- Absence of pressure
- Pump stopped

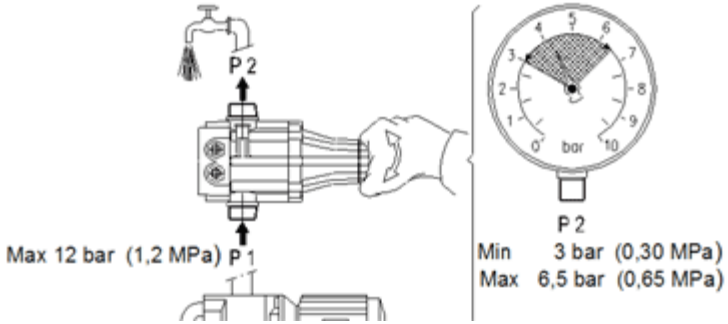


Adjusting the Pressure of the System

CONTROLPRES

Open a tap to start up the pump, close it again and wait for the pump to stop in order to read the system pressure on the pressure gauge, which is normally factory-calibrated at 3 bar.

To adjust the pressure open the tap again, turn the knob in a clockwise direction to increase the pressure, and in an anticlockwise direction to reduce it, close the tap and with the pump stopped read the pressure set on the pressure gauge.



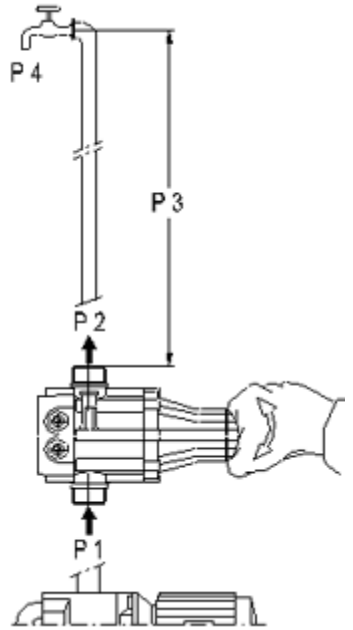
Repeat this operation until the desired pressure value is reached.

The system pressure (P2) must be approximately 1.5 bar lower than the pump pressure (P1), and approximately 1 bar higher than the pressure in the water column feeding the Controlpres (P3).

If the pressure of the pump (P1) fails to reach the values indicated in the pressure adjustment table, the pump will stop working.

In the event of the height of the water column (P3) being higher than the values indicated in the pressure adjustment table, the pump will turn on without starting to operate .

To overcome this shortcoming either position the device higher up in order to recreate the conditions specified above, or set a higher system pressure (P2).



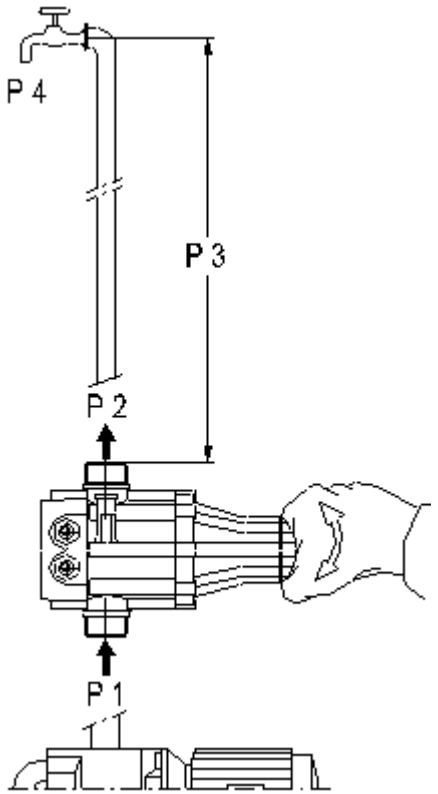
Adjustment Example

P1 - Pressure pump (maximum 12 bar)
P2 - System pressure (maximum 6,5 bar)
P3 - Water column pressure
P4 - Tap pressure

How to deliver a 3 bar pressure to the tap located at a height of 30 m:
pressure requested by the tap = 3 bar = **P4**
tap height 30 m = 3 bar = **P3**

The system pressure (P2) must be adjusted to 6 bar, seeing that P2 = P4 + P3.
T he pump pressure (P1) must be a minimum of 7.5 bar, seeing that P1 = P2 + 1,5 bar.

CONTROLPRES



Adjustament Table

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To help the installer adjust the device, the manual illustrates the pressure values generated by the pump and the height of the water column in relation to the pressure that it is necessary to obtain in the system (for the sake of simplicity these are listed in 0.5 bar steps without taking intermediate values into account).

Pressure of the system adjusted to 3.0 bar (0.30 MPa)
The pressure of the pump must be a minimum of 4.5 bar (0.45 MPa), and a maximum of 12 bar (1.2 MPa).
The water column between the device and the highest tap must not exceed 12 metres.

Pressure of the system adjusted to 3.5 bar (0.35 MPa)
The pressure of the pump must be a minimum of 5.0 bar (0.50 MPa), and a maximum of 12 bar (1.2 MPa).
The water column between the device and the highest tap must not exceed 16 metres.

Pressure of the system adjusted to 4.0 bar (0.40 MPa)
The pressure of the pump must be a minimum of 5,5 bar (0.55 MPa), and a maximum of 12 bar (1.2 MPa).
The water column between the device and the highest tap must not exceed 20 metres.

Pressure of the system adjusted to 4.5 bar (0.45 MPa)
The pressure of the pump must be a minimum of 6.0 bar (0.60 MPa), and a maximum of 12 bar (1.2 MPa).
The water column between the device and the highest tap must not exceed 25 metres.

Pressure of the system adjusted to 5.0 bar (0.50 MPa)

The pressure of the pump must be a minimum of 6.5 bar (0.65 MPa), and a maximum of 12 bar (1.2 MPa).
The water column between the device and the highest tap must not exceed 30 metres.

Pressure of the system adjusted to 5.5 bar (0.55 MPa)
The pressure of the pump must be a minimum of 7.0 bar (0.70 MPa), and a maximum of 12 bar (1.2 MPa).
The water column between the device and the highest tap must not exceed 35 metres.

Pressure of the system adjusted to 6.0 bar (0.60 MPa)
The pressure of the pump must be a minimum of 7.5 bar (0.75 MPa), and a maximum of 12 bar (1.2 MPa).
The water column between the device and the highest tap must not exceed 40 metres.

Pressure of the system adjusted to 6.5 bar (0.65 MPa)
The pressure of the pump must be a minimum of 8.0 bar (0.80 MPa), and a maximum of 12 bar (1.2 MPa).
The water column between the device and the highest tap must not exceed 45 metres.

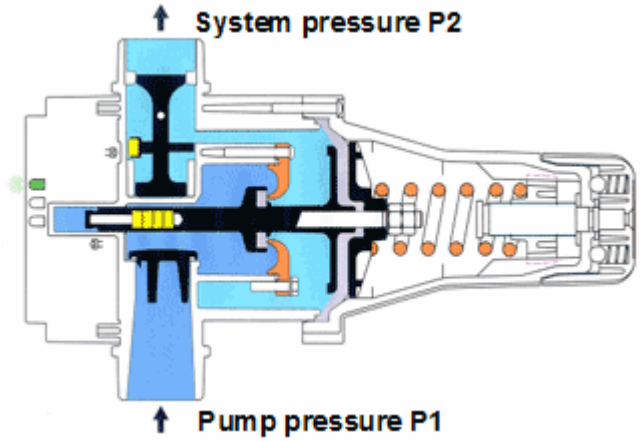
How Controlpres Reduces and Adjusts the Pressure

CONTROLPRES

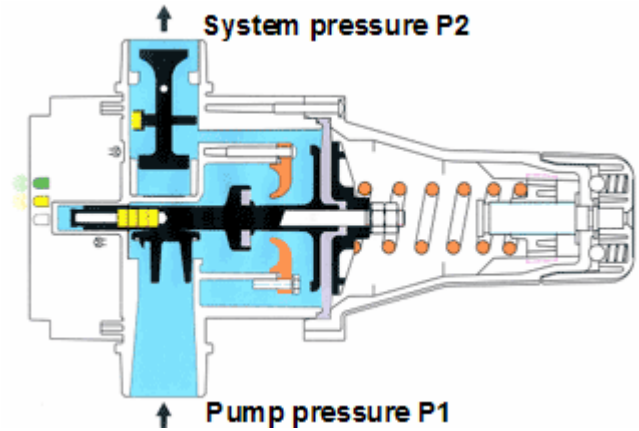
The reduction and adjustment of the pressure are obtained by exploiting the pressure reducer system.

The CONTROLPRES body is subdivided into two chambers (separated or communicating with a diffuser fitted with a shutter):

- a primary chamber (C1) which contains the maximum pressure generated by the pump (P1);
- a secondary chamber (C2) where the pressure (P2) is reduced and adjusted to the value necessary in the system.

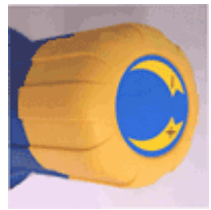


When the pump has stopped, the chambers do not communicate as the diffuser is closed due to the pressure in the primary chamber being higher than that of the secondary chamber.



When the pump is operating, the chambers communicate as the diffuser is more or less open due to the fact that a pressure differential is created between the primary chamber and the secondary chamber depending on the adjustment.

The pressure differential is determined by the force of the spring that can be reduced or increased by turning the adjustment knob of the device. In this way the desired pressure is obtained in the system, which is in any case lower than the pressure generated by the pump and can be adjusted between a minimum of 3 bar and a maximum of 6.5 bar.



IMPORTANT: The CONTROLPRES does not have a fixed restart pressure calibration.
The restart pressure value increases with the increasing of the pressure value set on the system and decreases with a reduction of the same.

Operating Faults

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Operating Faults	Main Causes
The pump fails to turn on	Check the electrical connections
The pump turns on but fails to restart	Excessive height of the water column
The pump functions intermittently	Loss in system lower than minimum flow
The pump fails to stop	Loss in system higher than minimum flow
The pump stops	Water shortage on aspiration

In the case of a fault in the electrical box, this can be replaced without removing the device as it is interchangeable and supplied on request.

Further malfunctioning can be avoided by checking the features of the device, pump and system with the warnings indicated in the installation manual.

Checking the Operation

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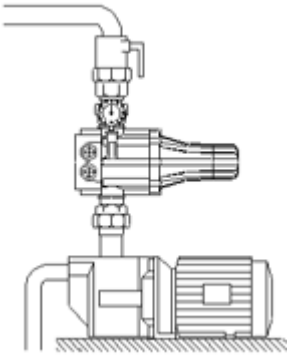
In the case of faults it is recommended to apply a ball valve to the output of the CONTROLPRES.



This allows for testing the operation of the pump and the device and excluding the system by means of the valve for the purpose of troubleshooting and removing the cause of the malfunctioning.

By closing the ball valve it is also possible to read the effective pressure obtained with the adjustment on the pressure gauge.

Advantages of the Controlpres

CONTROLPRES

The **CONTROLPRES** is the only product on the market that apart from controlling the pump also reduces and adjusts its pressure.

It manages monophase pumps with powers of up to 3 HP, avoiding the use of remote control switches, offering **savings for the tap and tap-friendly installation for the plumber** (who need not resort to intervention by electricians).

Its special technical feature of reducing and adjusting the pressure ensures an **additional economic advantage** as it overcomes the need to install a pressure reducer and eliminates subsequent costs.

Flow Rate and Pressure Loss

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Flow Rate	litres per minute	50	75	100	125
CONTROLPRESS	losses in bar	0,2	0,5	0,8	1,2

Application with an Expansion Tank

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For minimum delivery requirements, the application of a small expansion tank downstream from the CONTROLPRES allows for reducing the pump start-ups.

(Example: a glass of water, ice-making machines, old inverse osmosis systems with small losses)