F.A.Q. PCS

GENERAL PCS QUESTIONS

SYSTEM QUESTIONS

THERMAL INSULATION QUESTIONS

VALVE WITH STRAINER QUESTIONS

PICV QUESTIONS

FLEXIBEL HOSES QUESTIONS

27. Do I still need di-electric unions?
28. Are flexible hoses available?

GENERAL PCS QUESTIONS

1. What should I install to connect a FCU?

FCU connection should include several items allowing commissioning, operation and maintenance of the unit. It is required at least a flushing by-pass, a couple of isolation valves, a control and balancing valve (PICV) and a strainer. Additionally, installation of following components is always suggested: additional pressure/temperature port, air vent (if not included on the FCU), a drain valve, a flow rate measuring device. Finally, flexible connections and thermal insulation should be always required.

2. What is a PCS kit?

A PCS kit, Pettinaroli Commissioning Solution, is the Fan Coil Unit connection solution designed and made by Fratelli Pettinaroli. PCS kits include everything needed for fast and safety connection of FCU and small AHU. Most of 2000 variations designed and sold are tailor made and Pettinaroli engineering is always available to support the customer by designing the most suitable configuration for every project. Standard kits are also available, covering most of the common needs (different centre-to-centre distances, different PICVs, different optionals).

3. What are benefits of PCS kits?

Main benefits of PCS kits are:

- Fast and safe installation: pre-assembled and tested kit; see the comparison video, clicking here
- Top-of-the-art of the control and balancing thanks to the Equal Percentage Pettinaroli PICV
- All in 1: a box for every fan coil, including everything the contractor needs (unions, thermal insulation, flexible hoses)
- Compact design
- Liability on 1 manufacturer, Fratelli Pettinaroli
- Easier material handling on site and simpler supplier management
- 100% made and assembled in Italy

4. Where can I find further information about PCS?

A dedicated technical manual about PCS is available: a selection table is available, including all variants (flow rate and centre-to-centre distance). To download the manual, click here. Additional information about standard models can be found on dedicated technical specifications.

5. Are the kits factory tested?

Yes, they are. Actually, every kit is tested twice: all components, manufactured by Pettinaroli, are tested after the assembly. Then, every kit is tested against leakages one by one before boxing. A tag attests the success of the test. In case a union connection is loosened or the kit is tampered, test validity is lost.

6. How can I select a PCS kit?

A PCS kit shall be selected based on FCU design flow rate and centre-to-centre distance of pipes. Then, additional components should be considered. In case the kit should be tailor made, a complete list of requirements (design flow rate, centre-to-centre distance, additional components, insulation and hoses) shall be provided to Fratelli Pettinaroli: Pettinaroli's engineers will design the kit accordingly.

SYSTEM QUESTIONS

7. Why shall I install a flushing by-pass?

The flushing by-pass is a manually operated by-pass which allows system flushing and cleaning before operation. Flushing must be done before system handover to the client. The BSRIA guide BG29/2020 requires flushing operation. It consists in high speed water cleaning of pipes in order to remove all impurities and debris laying into pipes after the installation. The dirty water must be rained out. The flushing must not flow through the PICV. At the end of flushing, the flushing by-pass must be closed. Further information on the Definite Guide of PICV (click here).

8. Shall I prevent reverse flush through the PICV?

Yes, you have to. The reverse flushing across a PICV can bring debris into the valve and get it stuck or damaged. Moreover, the water velocity will be always reduced. Therefore, Fratelli Pettinaroli developed several lines of flushing by-pass with a T-shape ball valve which prevent all times any reverse flushing.

9. Which by-passes are available?

The available by-passes are: 40 mm, 70 mm (DZR) and 80 mm with a single 3-way ball valve. A patented 40 mm by-pass with 3-way ball valves is also available, especially for 4-pipes fan coils. Variable centre-to-centre distance by-pass is also available (made of Pettinaroli ball valves and tee connections.

10. What should I have for FCU maintenance?

A FCU kit shall always have a flushing by-pass with isolation valves and an inspectable strainer. Moreover, a drain valve and test points should be always installed to increase possible actions. Test points on the PICV shall be always installed to check the start-up pressure; an additional test point is crucial to verify the pressure drop across the terminal unit and drain is mandatory in case the flush of the coil is required. If flow rate verification is asked, a Venturi flow measurement device shall be fit on.

THERMAL INSULATION QUESTIONS

11. Is thermal insulation always available for PCS kits?

Yes, it is. Thanks to the material peculiarity and the moulding technology, all PCS can go with a tailor-made insulation shell. The soft cross-linked polyethylene foam can be modelled on the kit shape, ensuring perfect thermal insulation. The external high-density layer gives rigidity while the internal layer provides top-class insulation. Every insulation is made of 2 shells: the number of junctions is limited to 1 (plus pipes and actuator). The shells are linked by Velcro so that the insulation can be opened many times. The material is UL fire rate HF-2 (external) and HF-1 (internal).

12. What shall I do to avoid condensation leakages?

In cooling system, condensation is always an issue. Most of polystyrene insulations are made of many pieces and air can go in on every junction (they are not sealed junctions); at the same time, condensation can drop out. This issue is partially solved by Pettinaroli thermal insulation (minimum junction number). To completely solve it, thermal tape shall be put on every junction (shells junction, pipes and actuator). Tests state complete absence of condensation on the kit.

VALVE WITH STRAINER QUESTIONS

13. What is a Filterball?

The Filterball® valve is an insolation ball valve with integrated strainer. It put together a Y-strainer and 2 ball valves. The valve is corrosion resistant. The standard filter mech is FM028 but thicker meshes are available. For further information, please watch the video (click here) and read the leaflet (click here) and the technical specification on the website.

14. What are Filterball benefits?

Benefits of the Filterball are:

- 2 in 1 valve: space and cost savings
- No FCU drain during maintenance: no lost of treated water (no need to re-fill) and no air into the coil
- No leaking points between valves and strainer
- Top safety ball valve: adjustable gland, triple sealing on the stem
- PN25
- Higher Kv than a Y strainer (with same filter mesh): linear flow path across the Filterball

15. How can I mantain the Filterball?

Maintenance of Filterball is much easier than every other strainer in the market and shall be carried out frequently. The procedure is:

- Close the valve
- Open the side cap and remove the seeger ring
- Remove and clean the strainer or replace it
- Assemble everything back and close the cap
- Open the valve

For further information, watch the video by clicking here.

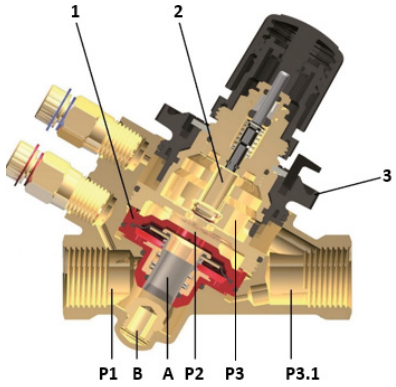
PICV QUESTIONS

16. Which PICVs can they be installed in PCS?

PCS can go with axial and rotary PICV. Among axial valves, both Equal Percentage and Linear valves are available. Axial Equal Percentage valves are 91 and 93, from DN15 150 l/h (0.66 GPM) to DN32 3000 l/h (13.21 GPM); axial linear valves are the Dynasty 92 range, from DN15 150 l/h (0.66 GPM) to DN25 3300 l/h (14.53 GPM). The rotary range shall include the 81 model.

17. What is a PICV?

A Pressure Independent Control Valve is the combination of a differential pressure regulator (1), a 2-way characterized control valve (2) and a settable flow rate adjustment (presetting) (3). It results in a self-balancing control valve. The differential pressure regulator maintains constant the differential pressure across the control valve, resulting in the highest authority (close to 100%). The presetting adjusts the maximum flow rate across the valve. The control valve modulates the flow rate according to system requirements if an actuator is mounted. It is suitable for treated water. In order to provide maximum energy efficiecy and whole system pressure independency, a PICV must be fit on every terminal unit. Further information about Pettinaroli PICV range are available in the technical manual of PICV (click here).

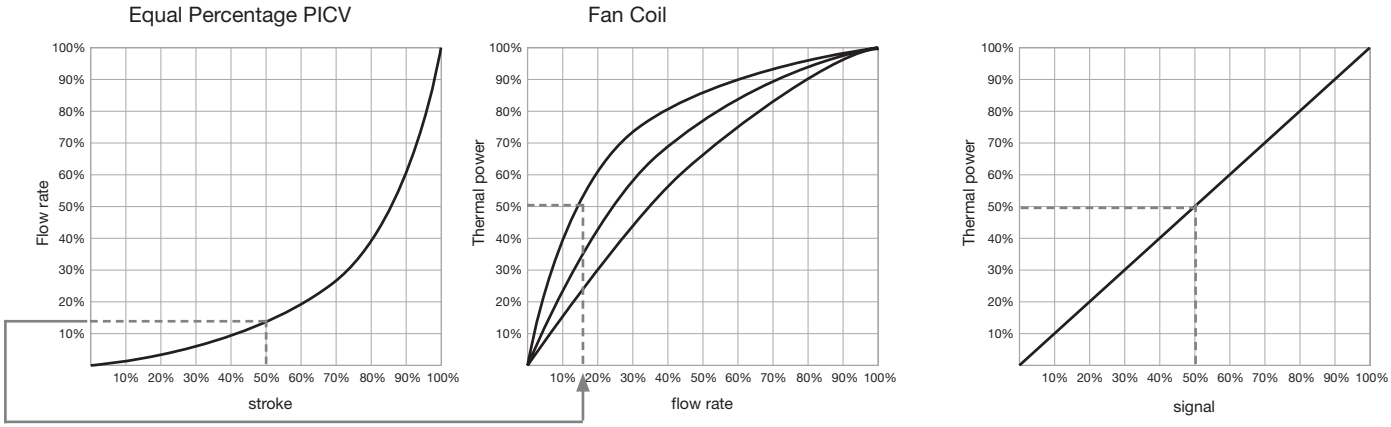


18. What is a PICV used for?

A PICV is a control and balancing valve. When installed on a terminal unit, it ensures every time the right flow rate, when required, irrespective of the pressure fluctuation in the water distributor networks. Balancing is always guaranteed, maximising the energy efficiency. It saves 70% pump energy consumption compared to 4-way control valves.

19. Which kind of control characteristic is advisable for FCU?

Considering that all coils (water-to-air heat exchangers) have a parabolic characteristic (correlation between water flow rate across the coil and thermal power output), the better flow rate control characteristic is the one mirroring the coil characteristic. This characteristic is the EQUAL PERCENTAGE one. Thanks to this, the whole air temperature control system which includes sensors, the controller, the actuator, the PICV and the coil is linear. A linear system is the most general and easiest to control.



Controller asks for 50% thermal power, it sends a 5V control signal to actuator, actuator closes 50% the control valve.

20. Can I install electric actuators on PICV?

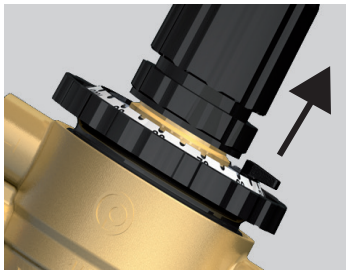
Definitely yes. A PICV is a water flow rate control valve and every valve has a connection for installing an actuator. Axial valves must work with axial actuator (thermoelectrical and electromechanical) while rotary valves must work with rotary actuators. Actuator stroke should always match control valve stroke to enhance modulation accuracy.

21. Can I do maintance on Pettinaroli PICV?

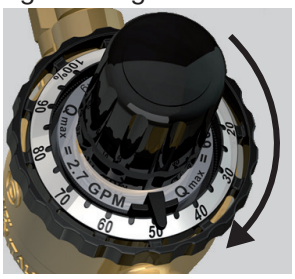
Yes, you can. All Pettinaroli PICV can be maintained. Differential pressure regulator (diaphragm) of 91 and 91X series can be replaced through a tools kit available upon request and the control valve is replaced by using a standard spanner. On 93 series, diaphragm and control valve are replaceable with a standard spanner. The new Dynasty 92 allows complete diaphragm-control valve block replacement and, moreover, the diaphragm itself can be removed, cleaned with fresh water and put back in place. 81 and 83 series (DZR brass) allow diaphragm replacement by using a standard spanner. 83 DN40 and DN50 have an option to open a full bore ball and block the diaphragm to allow flushing through it.

22. How can I do the presetting on 91-93 series?

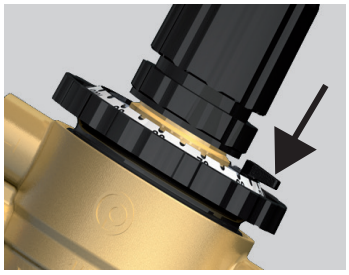
The presetting on 91 and 93 series is externally adjustable and it can be done whenever needed (even if the actuator is on). The presetting is done by unlocking the presetting dial and turning it to the proper percentage; the locking pin is also the indicator. Then it can be fixed by pushing down again the locking pin.



Lift the lock pin to unlock the selector



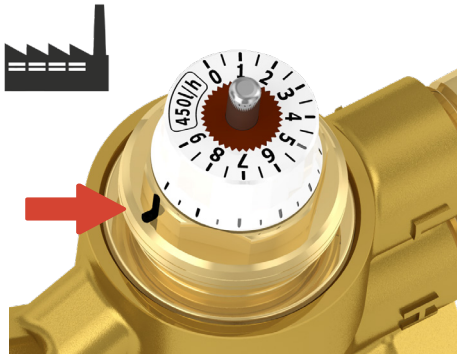
Turn the selector to the target position



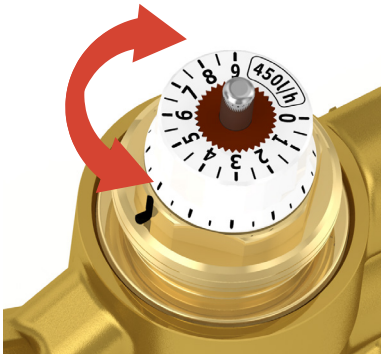
Press the lock pin to lock the selector in the final position

23. How can I do the presetting on 92 series?

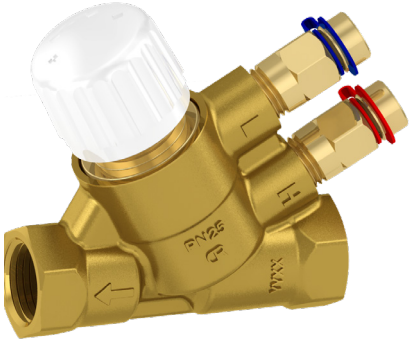
The presetting on Dynasty 92 series is internally adjustable. The presetting is done by removing the actuator or the cap. The default position is full open, which means position 9. Turn the presetting dial to the proper position; then, re-assembly the cap or the actuator.



Remove the handwheel or the actuator. default setting: pos. **9**



Turn the selector to the target position to set the flow rate



Re-assembly the handwheel or the actuator

24. How can I select the right PICV?

All PICV must be selected based on terminal unit design flow rate firstly. The right PICV should have the closest higher flow rate with respect to the terminal unit design flow rate. The PICV should work with the highest presetting position possible. In order to reduce the minimum differential pressure, a small safety margin (5-10%) can be taken into consideration while selecting the PICV.

25. How can I check whether the PICV is working?

Through the pressure ports. By using a differential pressure manometer, the differential pressure across the entire PICV can be checked: in case the DeltaP is higher than the start-up pressure at the given presetting, the PICV is working and keeping constant the flow rate.

26. Can I measure the flow rate across a PICV?

Usually not. Few PICV in the market allow flow rate measurement through the pressure ports but the stated accuracy is very low. It is not possible on Pettinaroli PICV. Pettinaroli suggests the installation of a Venturi flow measurement device with a calibrated orifice: the overall pressure drop is extremely limited and the measurement accuracy extremely high (±3%). Every PCS can be equipped with the Venturi flow measurement device CV90 or MV90. The calibrated orifice is selected according to the design flow rate in order to have a differential pressure signal between 2 and 10 kPa.

FLEXIBLE HOSES QUESTIONS

27. Do I still need di-electric unions?

No, you do not. All PCS kits can be supplied with flexible hoses. Hoses are made of EPDM rubber wrapped by a stainless steel tress: thus, di-electric connection is granted by the rubber.

28. Are flexible hoses available?

Yes, they are. Fratelli Pettinaroli makes available a full range of flexible hoses: the length, the connection type and the internal diameter can be selected according to the every installation needs. The hoses are boxed together with the PCS. All hoses are made of EPDM pipe and the external tress is made of stainless steel. The nominal pressure is 16 bar. Further information are available on the dedicated technical manual.

Fratelli Pettinaroli Spa
Via Pianelli, 38 - 28017 San Maurizio d'Opaglio (NO) - Italy
Tel. +39 0322 96217 - +39 0322 96545 - Fax +39 0322 96546
info@pettinaroli.com - www.pettinaroli.com