



Automatic air-main charging and pressure control system for compressed air supplies Type PCS

A module from the system **bar-vacotrol**®



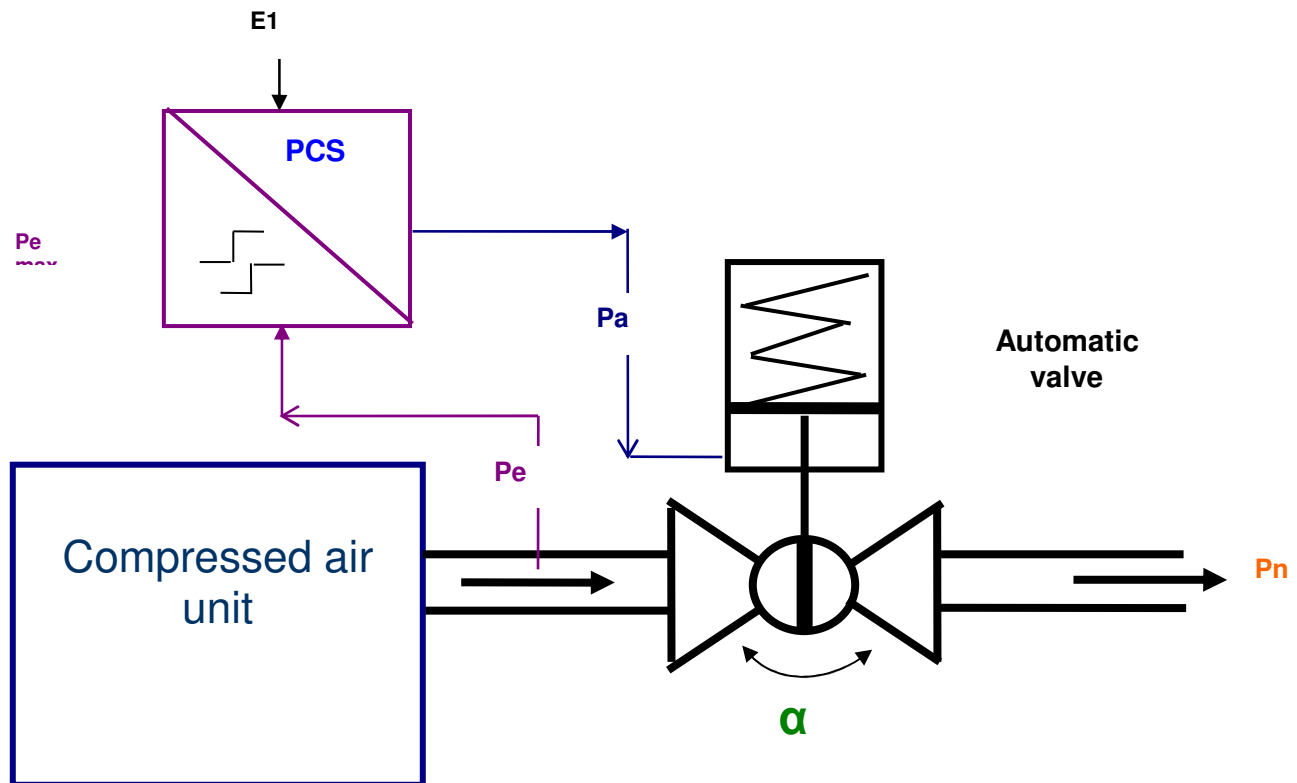
Switching on-off a compressed air unit in a compressed air supply generally takes place with an automatic valve (ball-valve or butterfly valve)

If air is released from the stored large-volume compressed air supply, and when the compressed air unit is activated, there is a considerable reduction of incoming pressure, because the volume flow of the compressed air unit does not correspond to the actual compressed air requirement. This situation can lead to overloading at the compressed air unit.

Air-main charging systems such as PCS ensure

- optimum running-up of compressed air supplies
- protection for the compressed air servicing unit in case of overloading
- on-going operation.

Plant layout



E1 – External switch on
Pe – Supply pressure
Pn – Mains pressure

Pa – in-pressure into actuator
 α – ball-valve or butterfly-valve position

The electro-pneumatic control unit *PCS* coordinates the functional sequence of the OPEN and/or CLOSE movement of the cut-off valve, depending on the supply pressure of the compressed air servicing unit in the compressed air supply.

Automatic running-up and pressure guarantee are differentiated according to their **type of operation**:

Type: **PCS-...-Q** automatic pressure guarantee “**Secure Quality**”

Type: **PCS-...-V** automatic pressure guarantee “**Secure Supply**”.

Types of operation – PCS

The automatic air-main charging system protects the compressed air servicing unit when there is too low pressure in the mains supply (for instance due to leakages in the system, the system can be deflated)

Too low operating pressures can arise when starting the station and/or in the case of too high air consumption.

In this case the valve closes (rotary actuator with ball-valve or butterfly-valve).

PCS-...-Q “Secure Quality“

The valve also closes in case of loss of voltage and existing operating pressure.

In the case of loss of voltage supply, there is a "Manual Override" for the air-main charging system.

Secure compressed air quality		
Voltage	Pressure	PCS
0	0	Closed
0	1	Closed
1	0	Closed
1	1	Open

Voltage:	0 = no voltage 1 = voltage present
Pressure:	0 = pending pressure is less

PCS-...-V “Secure supply“

The air-main charging system remains open in case of voltage loss and still existing operating pressure.

Secure compressed air supply		
Voltage	Pressure	DHS
0	0	Closed
0	1	Open
1	0	Closed
1	1	Open

Pressure:	1 = pending pressure is more than
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PCS- the electro-pneumatic control unit

The electro-pneumatic control unit PCS is constructed in a specially developed cast-metal housing for implementing bar-vacotrol® solutions, and is mounted directly onto the actuator actubar®.



all function-related subassemblies are mounted in and around the housing:

- binary end position sensors “Open“ or “Closed“
- valve block for switching the rotary actuator actubar®
- a circuit board with function control and the necessary connecting interface
- an additionally visible mechanical position indicator

connected to the

The compact infeed terminal block is front of the control unit and consists of:

- pressure regulator for supply to the actuator control
- manometer
- electronic pressure switch

Version PCS-...-Q - “Secure Quality“ has an additional mechanical “emergency manual override“.



Actuator control unit and infeed terminal block are completely and mechanically connected to the automatic air-main charging system **PCS**.

This automatic air-main charging system **PCS** is installed free of hoses to the rotary actuator actubar .

The mechanical standard interface at the PCS guarantees connection to all standard rotary actuator with interface 80x30 and 130x30 according to VDI/VDE 3845.

PCS Operating modes

The automatic air-main charging system PCS can be operated in either control or regulating mode.

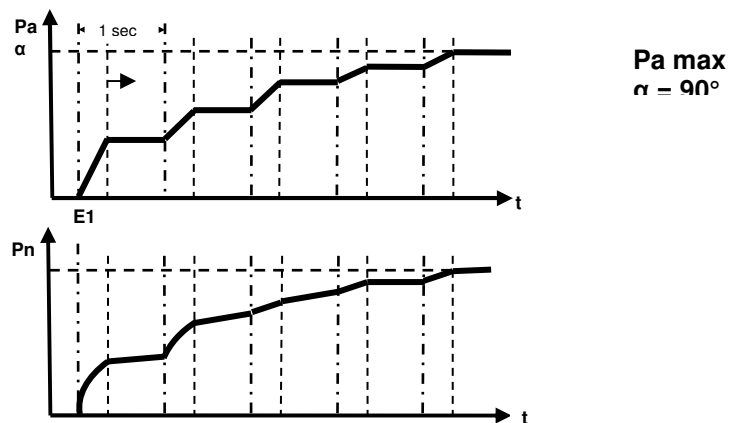
Control mode

In control mode, activating of the actuator or the valve takes place directly dependent on the preset switching point. The activating function can take place with a throttle valve and pulsed additionally. The pulse width can be set at a constant pulse frequency of 1 Hz.

Here we differentiate between 2 **operating modes**:

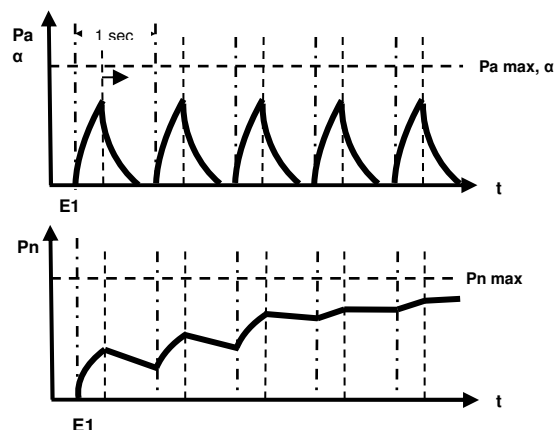
Stepped filling Type S

The actuator and in turn the valve are opened step-by-step with constant frequency and selected pulse width.



Pressure filling Type S

The valve is opened and closed in pulses with constant frequency and selected pulse width.



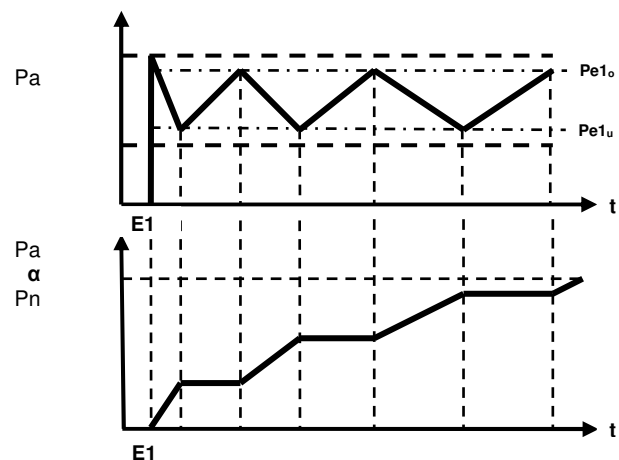
Regulating mode

Operation of the actuator and the valve takes place in regulating mode, and dependent on the preset pressure value at the pressure switch. Here the preset hysteresis determines the quality of control.

Here we differentiate between 2 operating modes:

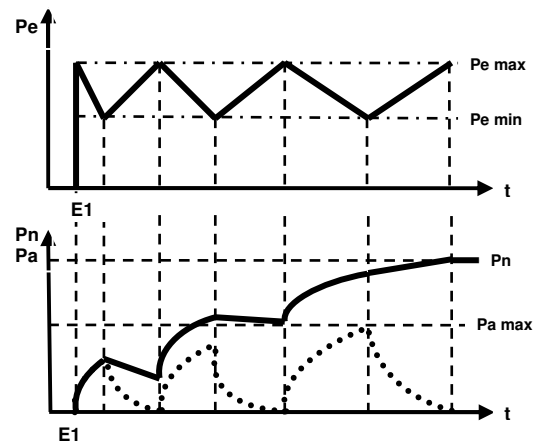
Stepped filling type R

Actuator + valve are opened step-by-step, depending on the preset pressure set value.



Pressure filling type R

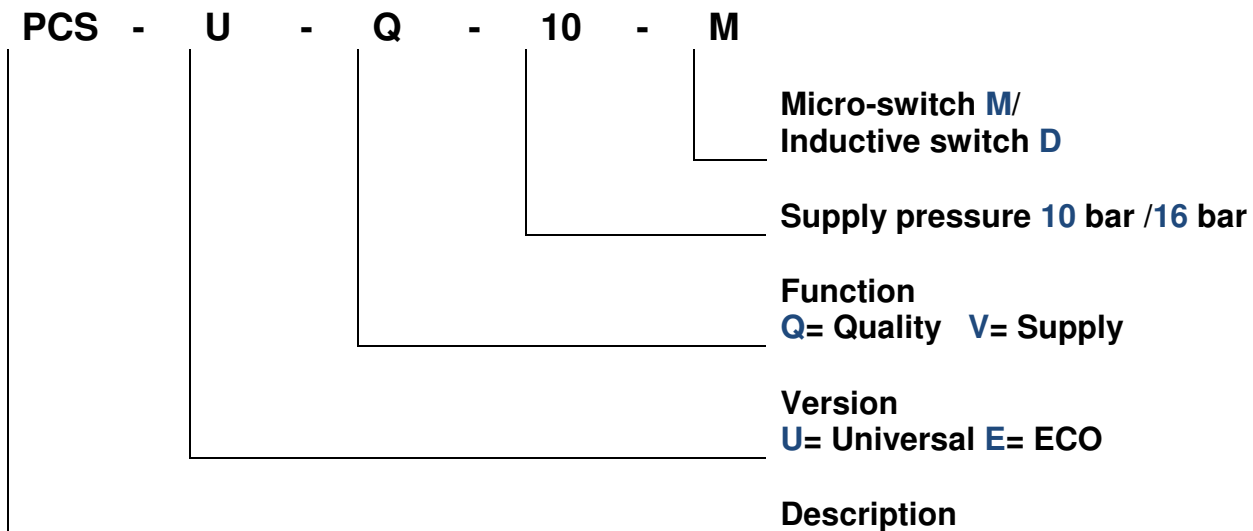
The valve is opened and closed in pulses, depending on the preset pressure set value.



The desired version for both types of PCS is determined at the jumper block on the circuit board. This simple method of being able to switch over operating modes enables optimum adaptation of the system to the actual conditions of the individual air-main.

Advantageous combinations of operating mode are possible through process-specific settings of the digital pressure switch.

Product identification PCS (Pressure Control System)



U= Universal – 4 operating modes

E= ECO – 1 operating mode

Note

- The automatic air-main charging system **PCS-E** is available exclusively with the operating mode **2-point valve regulation**.
- Furthermore, the following installation and setting regulations are valid: **PCS-U/E.MvEv**.

Technical Data

Housing material:	cast-Aluminium
Housing dimensions:	LxWxD [mm] – 180x90x75 mm
Protection grade:	IP54
Supply voltage:	24 VDC
Electrical connection:	terminal strip X2 inside housing
Pneumatic port:	P (ø 6 mm): operating pressure (comp. air)
Operating medium:	filtered and dried air
Supply pressure P_e to P:	3 to 16 bar
Actuating pressure P_a :	2 to 8 bar
Pulse width range	in 16 steps adjustable between >0 to <1000 ms
Ambient temperature:	- 10°C to + 50°C (under + 2°C consideration for condition of air)

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