Pressure Control System PCS

As of 26-07-2013

Control valves T6000 and KPS

The *Pressure Control System*, PCS in brief, allows precise adjustment and measurement of absolute, gauge or differential pressures of air and gases. It is suitable for a manifold of different tasks in laboratory, test facility and manufacturing. The PCS can be used for endurance tests and, equipped with high-precision sensors, as calibration standard.

- Very Fast and Precise Pressure Control
- Customisation to Open and Closed Systems
- Modular Set-Up
- Controller S320 as Measuring and Control System
- Different Sensors and Control Valves/Final Control Elements as (External) Components
- Various Interfaces (Digital, Serial and Ethernet)
- Networking with up to 32 Devices via RS485

Technical Description

The measuring system runs testing schedules autonomously and can transfer the measurement results digitally. The Controller S320 manages the complete testing schedule as well as the data acquisition and evaluation.

Modularity is preserved by both mechanical set-up and sensors of the measuring system and also by the multi-purpose parameterisable software of the device. Modular set-up und parameterisability allow an optimal customisation for various testing and control tasks.
The 10 available programs make it possible to switch quickly and easily between the saved configurations to satisfy different measuring and control states.

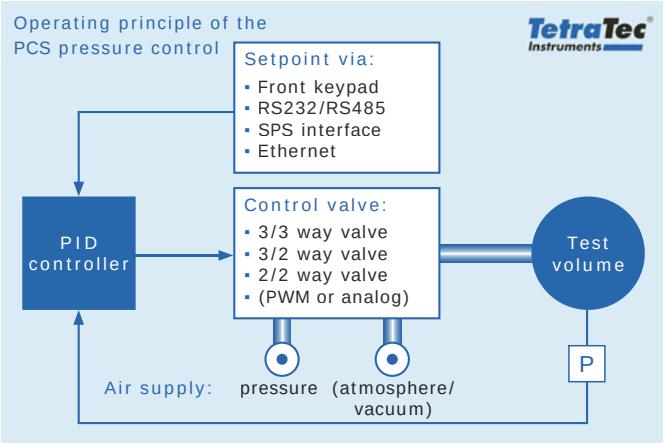
During standard operation the PCS display shows:

- the actual pressure value
- the setpoint pressure value
- the input signal's current value

Alternatively it's possible to display the deviation of actual pressure value from setpoint pressure value in percent instead of the input signal's current value. Special control functions of the digital controller, like programmable pressure ramps, asymptotic control behaviour (approach to the setpoint value without overshooting) or addition of the setpoint value (fast stabilisation by piloting the final control element) allow an optimal customisation for a wide range of control tasks.

The configuration data, like limits, measuring method and testing parameters can be set by interfaces via PC or manually via front keypad. Being saved in Flash-ROM, the entered data are preserved in power-less state.

The control system consists of an analogue final control element designed for the requirements of the task and a digital pressure controller, which postcontrols the pressure value precisely in cooperation with an accurate reference pressure sensor. Having a modular control system both measuring sensors and control valves can be connected as separate components.



Operating principle of the PCS pressure control

The PCS can be controlled by an external computer via different interfaces: digitally (PLC compatible, galvanically isolated), serial (RS232 or RS485) or Ethernet. Quite the same is valid for data acquisition. It can be done by the serial or Ethernet interfaces or by the optional analogue outputs. The two implemented RS485 interfaces allow it furthermore to link and address up to 32 by the RS485 bus structure.

The system works with standard signals and with sensors and control valves of well-known manufacturers. This guarantees a maximum of operational safety, simplifies customer specific solutions, makes the customisation to other measuring and control ranges easier and minimizes storage of spare parts.

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Specifications

Sensor Type and Measuring Ranges

Differential- **and** ±1 / ±10 / ±20 / ±60 / ±100 mbar **and**
Gauge pressure: ±0,5 / ±1 / ±2 / ±4 / ±5 / ±8 bar
Absolute pressure: 0 .. 1 / 1,2 / 2 / 4 / 8 bar
As lower range limit for differential and gauge pressure 0 bar is also possible.

Accuracy

Pressure: ≤ 0,1 % F.S.
The available high-precision sensors allow accuracies of up to 0,15 % of Rdg. ± temperature coefficient in a 1:100 span.

Pressure Control Valves

PS11:	Piezo control valve
EWS:	3/3 way servo valve
T6000:	Electro-pneumatic transducer
ZWD:	Idle speed actuator

Pressure measuring range and specific application determine the adequate pressure control valves.

Response Behaviour

Stabilisation period	Accuracy
0,5 to 1 s	±1 % F.S.
2 to 3 s	±0,1 % F.S.

Approx. 5 s after a change of the setpoint value the actual value shows a stable accuracy of ≈ ±0,02 % F.S.

Operating Conditions

Inlet pressure:	0 .. 10 bar abs
Inlet temperature:	0 .. +45 °C
Inlet humidity:	0 .. 100 %, non-condensing

Vacuum operation requires a sufficient low-press. supply.

Ambient Conditions

Pressure:	Atmospheric
Temperature:	-10 .. +50 °C
Humidity:	0 .. 100 %, non-condensing

Media Compatibility

Clean, dry, non-condensing, non-corrosive gases and air. The measuring medium has to correspond with the requirements of ISO 8573-1. Additionally to a 5 µ filter an oil/water separator in the compressed air supply is strongly recommended.

Overrange Limits

The overrange limits depend on the type of sensor and control valve. Usually at least twice the upper range limit is permissible.

Display

Alphanumeric LED (red).
3 displays with 6 characters. Character height: 10 mm.
3 text-displays with 4 characters. Character height: 6 mm.

Enclosure

Type:		DIN 43700 **or** 19“ rack with 3 HU / 42 HP **or** 19“ rack with 3 HU / 84 HP
Dimensions	42 HP:	265 x 165 x 280 mm (WxHxD)
	84 HP:	530 x 165 x 280 mm (WxHxD)
Weight		≈ 5 kg
Ingress Protection		IP 20 to IP 54

Ingress Protection according to set-up, higher levels on request.

Process Connections

G1/8“ to G1“ or according to agreement.

Electrical Connections

Power supply:	VAC power connector
Analogue inputs/outputs:	Round connector (Type Lumberg)

Interfaces

1 x Ethernet, 1 x RS232 und 2 x RS485

Power Supply

90 .. 260 VAC (power supply unit), 50/60 Hz, max. 80 W.

Approvals

The device corresponds to European standard EN 61010-1 (safety regulations for electrical measuring, control and laboratory devices) and the regulations of the EC-Machinery Directive - 89/392.

Delivery Content

- Measuring/control device incl. power cable
- Sensor or controller incl. connection cable
- Operation manual with electrical connection circuit

Special Features

Mounting Options

Measuring/control device: The controller S320 is mounted in a stable 19" rack housing of 3 HU, ready for connection. Control valve and sensors are also available as separate components for external installation.

Control Valves/Final Position Elements

According to pressure range and flow: rotary slide servo and ZWD valves or piezo and collision plate controller or needle valves or PWM controlled seat valves.

Measuring Medium

Useable media: the media property database supports the usage of air and more than 12 gases.

Operation

F1/*F2*/*F3*/</> key: 5 foil keys at the controller for program selection, setting of display and parameterisation.
Zero key: zeroing of diff. and gauge pressure sensors.
START/*STOP* key: begin/end of averaging measurement.

Parameter settings

10 programs: controller settings, display units, decimal places and limits.
System parameters: superior settings and calibration data
Password: protection of the configuration against unauthorised and unintended changes.

Status Displays (optionally)

Coloured lamps: green (O.K.), red (N.O.K.)

Ordering Information

The PCS will be optimallly customised to meet specific requirements. For design and quotation please supply us with the following information:

- Measuring and control range(s)
- Gas(es)
- Testing volume open/closed
- Operating conditions (pressure and temperature)
- Control requirements
- Measuring and control accuracy
- Ambient conditions
- Enclosure requirements
- Electrical supply
- Requirements concerning data acquisition
- Other special requirements

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