Controlling cooling circuits when manufacturing solar and flat-panel displays

Highlights

- All necessary components for regulating the cooling process from a single source
- Ready-to-install systems – fully assembled and tested
- Extremely sturdy and reliable components and systems

Project

The manufacturing process for multi-layered solar modules and flat-panel displays generates heat, so a cooling system needs to be integrated at a number of locations in the production process. The challenge is to enable reliably monitoring the flow rate, pressure and temperature of the cooling medium.
Specific application: cooling vacuum pumps, generators and the process chamber in vacuum coating processes.

Requirements

- A reliable, efficient cooling system
- Reliable monitoring of the cooling process
- Less effort during design, commissioning and operation

Solution

Festo components for media distribution with cooling applications:

- Terminal CPX
- Ball valve actuator units VZPR
- Angle seat valve VZXF
- Solenoid valves VMPA
- Pressure regulators LR, LRS

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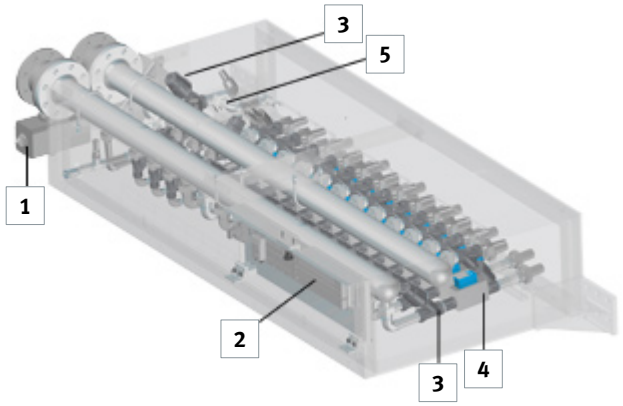
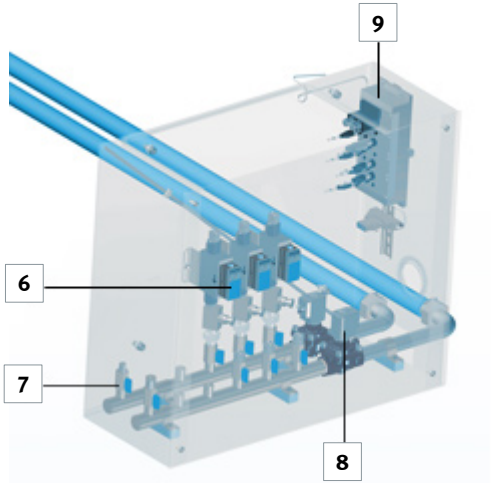
Sample solution: distribution of cooling water





Hauptkomponenten

1 Ball valve actuator unit VZBC

2 Valve terminal CPX/MPA

3 Angle seat valve VZXF

4 Flow sensor SFAW-85U

5 Pressure regulator LR for test gas feed

6 Flow sensor SFAW-32U

7 Ball valves VZBA/VAPB

8 Diaphragm valve VZWF

9 Terminal CPX

Customer requirement with this application:

- Reliable monitoring of flow rate, pressure and temperature of the cooling medium in the system
- Quotation for a system solution

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Products and solutions

Terminal
CPX

- Electrical protection class IP65
- Maximum function integration for complete applications
- Reducing installation costs and increasing productivity
- Decentralised and networked intelligence with embedded CODESYS Controller
- Industry 4.0 via OPC UA and CODESYS control V3

Ball valve actuator units
VZPR

- Combination of a pneumatic swivelling drive and a ball valve
- The flow is fully opened or closed in both directions
- 5/2-way valve with Namur port pattern can be flange-mounted directly on the actuator unit
- Limit switch attachments for end-position sensing can be mounted directly on the drive unit

Angle seat valve
VZXF

- Sturdy: suitable for contaminated or gaseous media with a max. viscosity of 600 mm²/s
- Extremely heat-resistant, stainless steel design
- Closes reliably when pressure drops thanks to N/C function
- Versions:
  - Gas: closes with the media flow
  - Fluids: closes against the media flow

Solenoid valves
VMPA

- Compact high-performance valves in sturdy
- metal housing
- Wide range of valve functions
- Fast troubleshooting thanks to LEDs on the valves
- Safe operation: manual override, nondetenting/
- detenting or covered
- Quick to mount: directly using screws

Pressure regulators
LR, LRS

- 4 sizes: MICRO, MINI, MIDI, MAXI
- All basic functions for compressed air preparation
- Sturdy connection technology
- Two pressure gauge connections for different installation options
- Good control characteristics with minimal pressure hysteresis
- High flow rate