

CYCLE LOCK SYSTEM SOLUTION



Cycle locks for holding bulk materials and powdered media with an automation unit for venting and bleeding.

MECHANICAL CHARACTERISTICS

Nominal widths:	DN 50 - DN 600
Connection:	PN 6, 10, 16
Volume of chamber:	customer specific
Temperature range:	0°C to +55°C
Permissible operating pressure:	max. 10 bar
Permissible differential pressure:	max. 10 bar
Supply air:	6 bar

ELECTRICAL CHARACTERISTICS

Power supply:	230 V / 50Hz
Operation / visualisation:	via 4" touch panel
Protection class:	IP 65
Temperature range for lock:	-20 - 70°C
Temperature range for control:	0 - 55°C

GENERAL NOTES

- Very variable application because all EBRO valves can be integrated into the system
- Communication using conventional signal technology (binary inputs and outputs)
- Possible to integrate into existing control systems without any problems
- Remote access via Ethernet (optionally via Wlan) using the integrated web visualisation tool
- Self-learning adaptation of the activation times to fluctuations in the process values
- Intelligent service management system for preventative maintenance
- In order to increase the operational availability of the system, changes in the activation times for the valves (e.g. due to blockages or valve wear) are reported
- Stand-alone operation possible
- All standard field bus interfaces available
- Control unit detachable
- ATEX Zone 1/21 applicable

FIELDS OF APPLICATION e.g.:

- Dosing and discharging bulk goods
- Pneumatic conveying technology
- Power plant technology
- Weighing technology
- Bagging plants

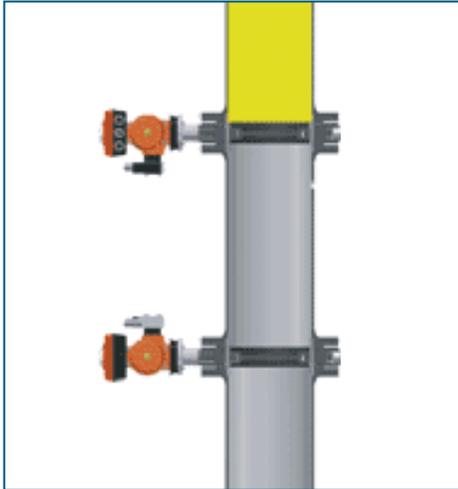


A Phoenix PLC with a touch panel is used to operate and visualise the processes.

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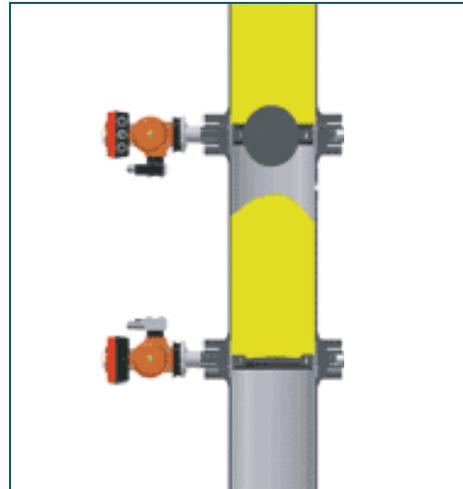
FUNCTIONAL SCHEMATIC

INITIAL STATE



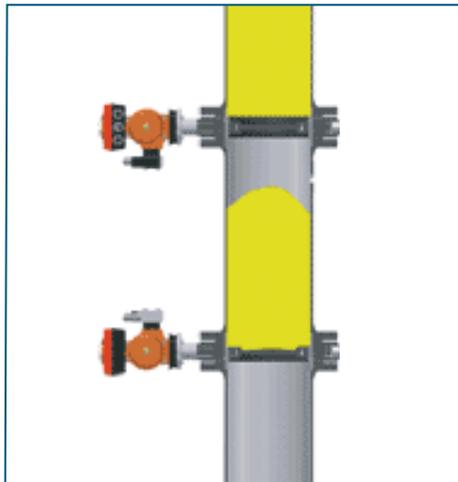
The medium is in the current process and shut off on the inlet side. Before every individual cycle, the output valve is opened for safety reasons to ensure that any possible residual media can fall out of the filling pipe.

FILLING



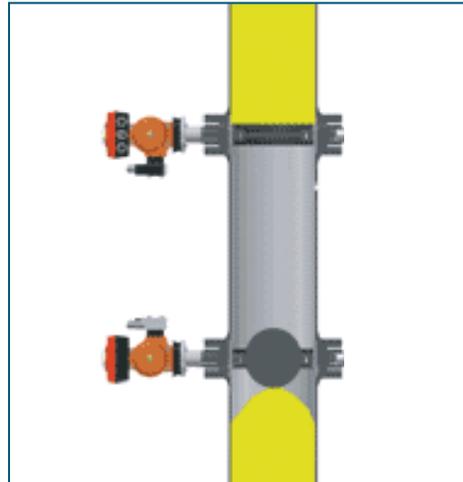
The medium falls into the filling pipe and is held on the output side. The filling time can be freely selected. The filling process can be cancelled based on the volume of material required using a filling level sensor.

INTERMEDIATE STATE



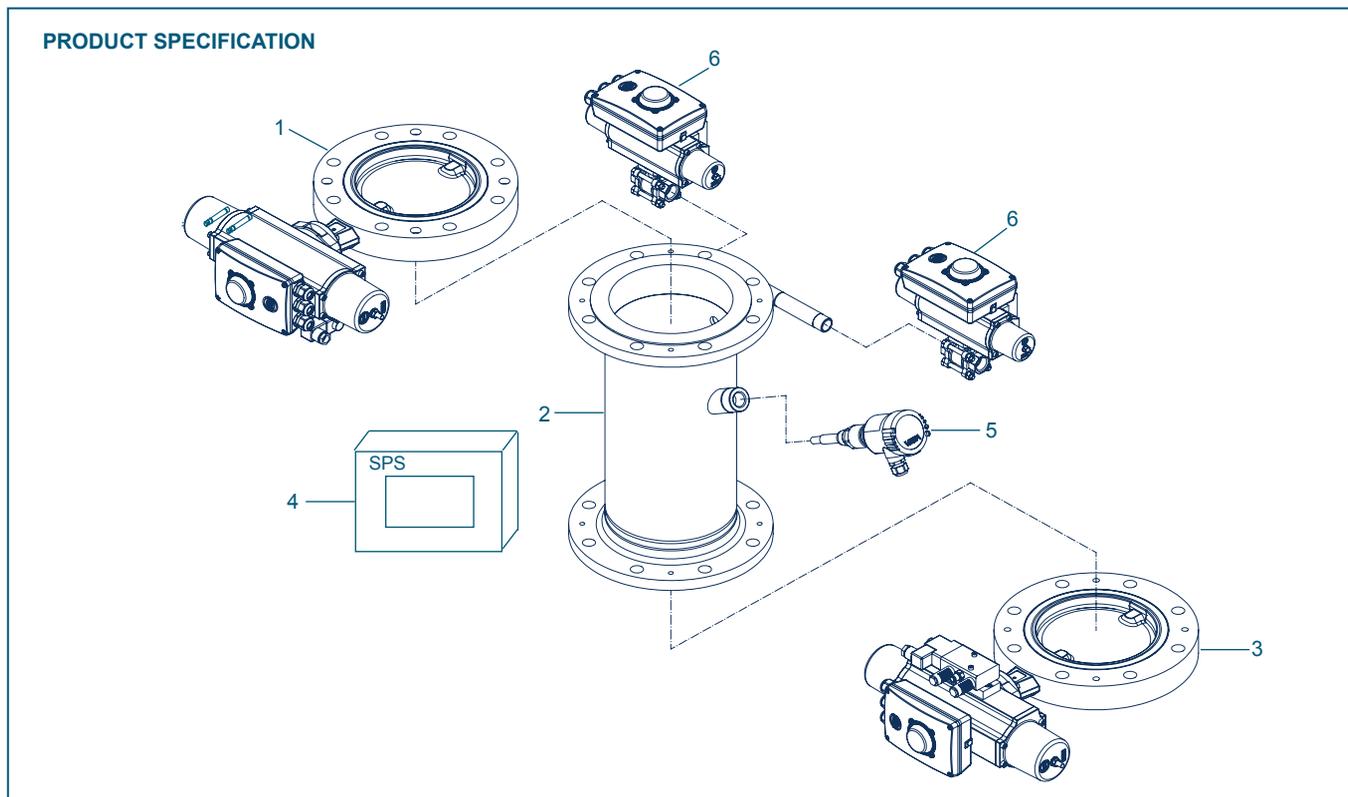
Once the filling level has been reached, the inlet valve closes. The medium is held in the filling pipe until it is discharged. The inlet/discharge volume per cycle depends on the medium, pressure and overall installation height of the unit.

DISCHARGING



The isolation valve on the output side is opened during the discharge process to allow the medium to pass through to the follow-up process.

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1. Isolation valve at input side with a pneumatic rotary actuator and stop position monitoring:

In principle, any valve – butterfly valve, gate, pinch valve or ball valve – can be used for the cycle lock. Both components (in this case butterfly valves) are screwed together with the filling pipe in the factory. It is preferable to use single-acting (spring-reset) pneumatic actuators of type EB-SYS for operating the valves. Stop position monitoring takes place using limit switch boxes of type SBU with mechanical or inductive limit switches.

2. Filling pipe:

The filling pipe is used for the interim storage of the medium. Depending on the specific properties of the products to be passed through the valve, cylindrical filling pipes are available, which can also be given different coatings. The geometry can be adapted to meet the customer's specifications – for example in conical form. The chamber volume can be adapted individually.

3. Isolation valve at output side with a pneumatic rotary actuator and stop position monitoring:

The valve is screwed together with the filling pipe in the factory and automated using actuators from across the entire production program.

4. Control unit with visualisation via the touch panel:

In this example, an efficient Phönix PLC with a touch panel is used to operate and visualise the processes. It is suitable for the special challenges faced in high-performance, automated processes and reliably controls dynamic applications and control-specific processes.

5. Optional filling level sensor:

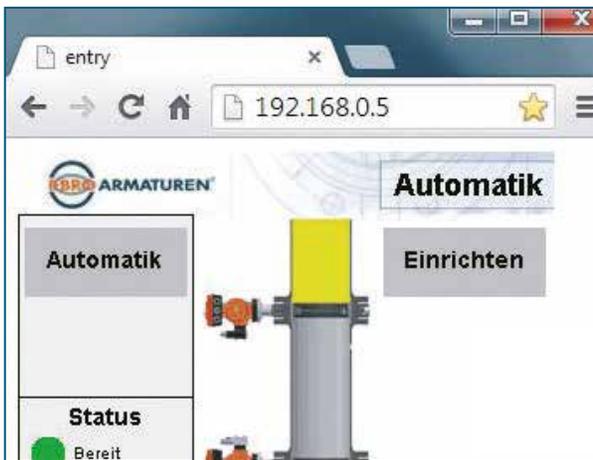
Instead of using preset filling times, material can be passed through the valve in the volume required using a filling level sensor. The partly insulated measuring probe has been optimised for measuring bulk material.

6. Optimal bypass valves:

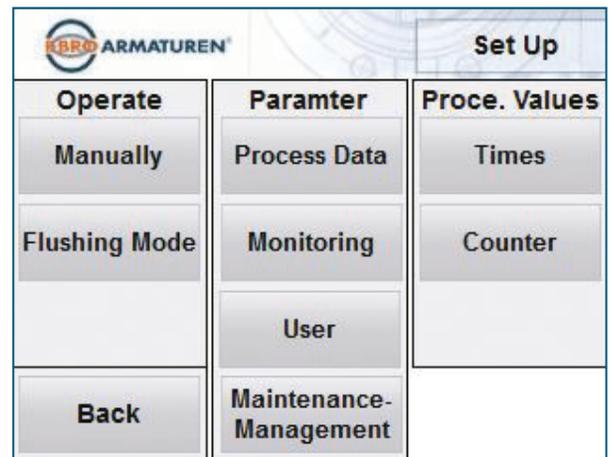
Different pressure levels can be bridged with bypass valves. To prevent the sudden blowing out of the material in the case of a difference in pressure between the inlet and discharge sides, pressure compensation is carried out before filling. This pressure compensation also significantly decreases wear of the sleeve because the medium is not blown across the sleeve at a great flow velocity when opening the valve.

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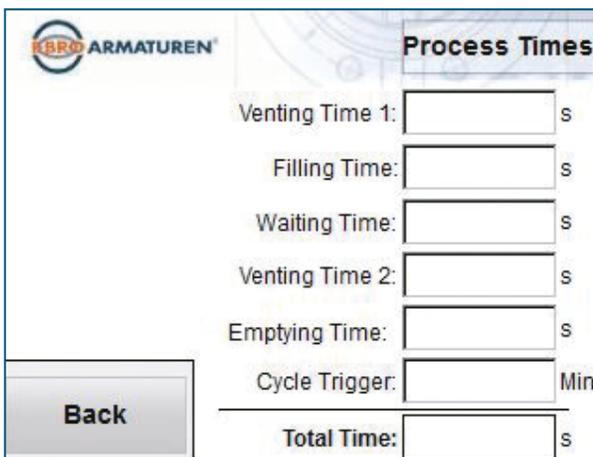
OPERATION AND VISUALISATION



The main screen makes it possible to easily monitor the ongoing process and select the operating modes.



In the main menu, there is a manual operation option, all parameter settings are adjustable and the current process values can be observed.



The cycle can be flexibly adapted to the relevant process in the menu section "Process times".