



Control unit for valves with inflatable sealing system Type ICS

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



Shut-off valves are used in transport equipment for bulk powder and granulate, whose shut-off mechanism (ball-valve, butterfly or knight-gate valves) is fitted with an inflatable sealing. The OPEN or CLOSED position of the cut-off mechanism is achieved with a pneumatic actuator. In the CLOSED position, an optimum sealing effect is achieved through an inflatable sealing between the valve body and the disc, calotte or knife.

An electro-pneumatic control unit type ICS co-ordinates the functional achievement of the OPENING / CLOSING movement of the shut-off valve and the sealing pressure.

The control unit ICS positively compliments the bar-vacotrol® family series from bar GmbH, and especially when working together with the pneumatic rotary actuator actubar®, automates complex systems operating around the valve.

Construction

The electro-pneumatic control unit ICS is installed in a cast housing, and was specially developed for implementing bar-vacotrol® solutions, and is mounted directly onto the actuator actubar®. The pneumatic connection between control unit and actuator actubar® is achieved without hoses.

The following function-related subassemblies are installed in and on the housing:

- Function block
- Multiple valve block
- Position indication system
- Sequence control unit with connection, operator & display interface

Sequence control unit

The sequence control unit is built around a circuit board.

Connected on the circuit board are:

- Solenoid valve
- Pressure switch
- Position indication system
and
- the external interface to the terminal strip X2.

Important system conditions are signalled with optical messages on the housing cover:

H1 - open

H2 - closed

H3 – pressure on

H4 - malfunction

They are available at terminal strip X2 for external signal processing.

The emergency manual override

Open ↔ Closed

is made with switch (touch-key) on the printed circuit board.

System-related times can be set with the following time elements

T1 – monitoring time

T2 – delay time for opening valve

T3 – delay time for closing valve

on the pcb.

Directional valve & function block

The directional valve & function block links

- the valve for power control of the pneumatic rotary actuator and controlling the pneumatically charged sealing.
- the built-in pressure regulator for sealing pressure
- the adjustable pressure switch for detecting the sealing pressure
- the throttle valve for limiting the volume flow to the seal hose-free via connection & adapter block.

The pneumatic connection interface to the compressed air supply and to the inflatable seal is to be found at the front side of the function block.

Throttle silencers are installed for speed harmonization to the actuator actubar®.

All pneumatic connections have G1/8" screw-connectors.

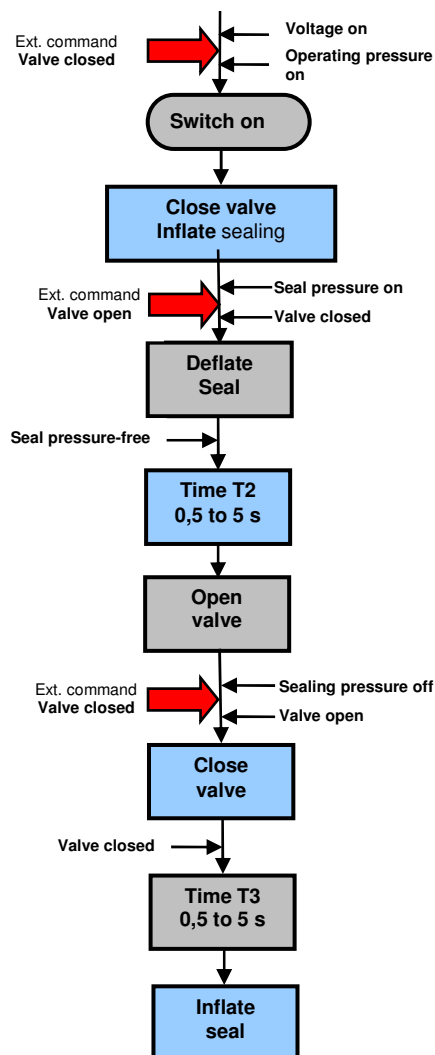
Monitoring

Malfunctions are shown on the LED display as "Malfunction":

- Actuating time exceeded "Valve OPEN"
- Actuating time exceeded "Valve CLOSED"
- Seal pressure reduction (seal is pressure-free in case of closed valve and completion of a monitoring time)

Function – Program Sequence

The control unit ASAD implements the program sequence autonomously for automating the valve with inflatable seal.



Switching on

The program ensures that no switch situation appears when switching on, which could lead to destruction of the inflatable seal.

Opening the valve

- Position message “Closed“ is on, LED display ”closed“ illuminates
- Command “OPEN valve“ is issued
- Inflatable seal is deflated
- When the pressure switch registers that the seal is pressure-free and T2 has finished, the opening movement of the valve is initiated
- Situation “open“ is detected via position message ”open“ and brought to the LED display

Closing the valve

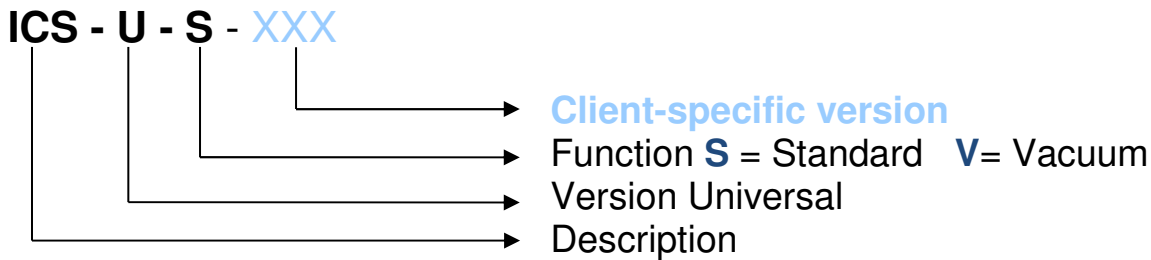
- Position message “open“ is on, LED display ”open“ illuminates
- Command “ OPEN Valve“ is deleted externally
- The closing movement of the valve is initiated
- When the position message “closed“ is on, and after completion of T3, the seal is inflated and shown on the LED display as “Pressure on”

Loss of Current

The valve closes and the seal stays deflated.



Product Identification ICS (Inflate Control System)



Note

- An ejector nozzle is activated for the duration of the deflation time T2 in the case of the control unit for valves with inflatable seal and vacuum deflation.
- Furthermore, the following installation & setting regulations are valid **ICS-U.MvEv**.

Technical Data

Housing material:	cast-Aluminium
Dimensions in full:	L x W x D [mm] – 265x100x90 mm
Protection grade:	IP65
Electrical connection:	to terminal strip X2
Monitoring time:	5 - 20 sec
Operating medium:	filtered & dried air
Operating pressure at P:	3 to 8 bar
Air capacity at A, B:	< 280 NI/min
Air capacity at D:	< 150 NI/min adjustable
Deflation of the seal:	ICS-U-S : un-throttled against the atmosphere ICS-U-V : Vacuum > - 0,5 bar, > 20 l/min
Ambient temperature:	- 10°C to + 50°C (under + 2°C consideration for condition of air)

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