

# Controllers and Instrumentation



**ARCA**  
VALVES  
*quality engineered  
control valves*

# Controllers and Instrumentation

## The Optimal Solution for Every Task

### Local Pneumatic Control Circuits

Inexpensive local control circuits are often used for simple control tasks such as those related to pressure, differential pressure or temperature. They comprise a valve, pneumatic actuator and a pneumatic measuring element that determines the measurement variable, evaluates the control deviation, and integrates an I or D component in addition to the P-response to form the signal used to control the actuator.

ARCA Regler offers a line of pneumatic controllers that meets basic to advanced requirements. Be it P-controllers with a fixed setpoint value and direct actuator control or for ultra-precise control, PID or two-point controllers, available with external setpoint value configuration and support for displaying setpoint/actual values, and actuating pressure, as well as manual-automatic transition with actuator control via pneumatic positioner 824P (see ARCA brochure on the ARCAPRO positioner), ARCA's product offering has the device you're looking for to meet your control needs.

### Instrumentation Accessories

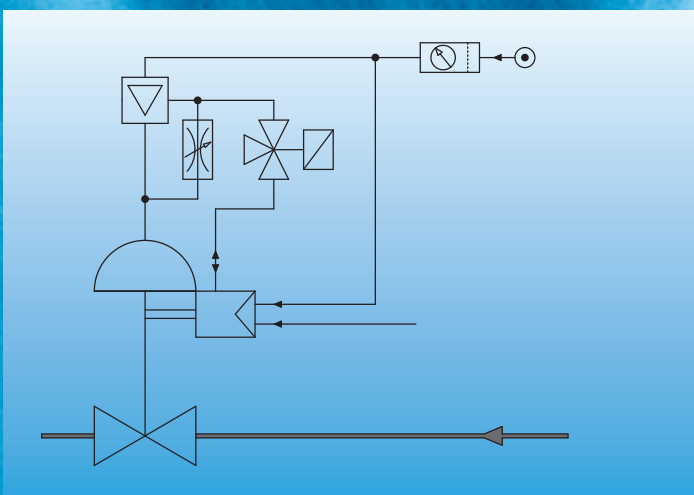
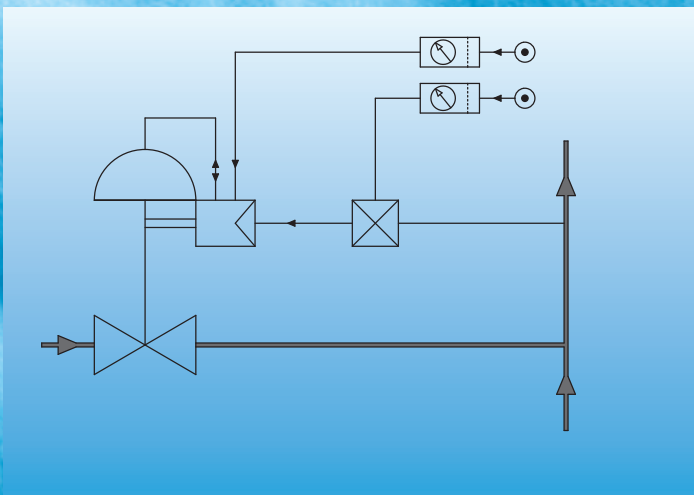
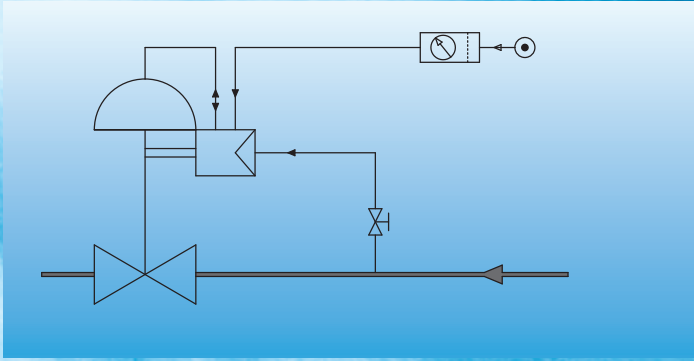
Functions in addition to the ones used for actuating and controlling are often required to ensure that valves are used effectively in plants.

Regardless of whether the application calls for limit position signalling via inductive or mechanical switches, safety-relevant and redundant valve deactivation (if needed) via solenoid and blocking valves, longer actuating times or conditioning of instrument air – ARCA Regler can always provide an appropriate, proven solution.

### Minimized Actuating Time

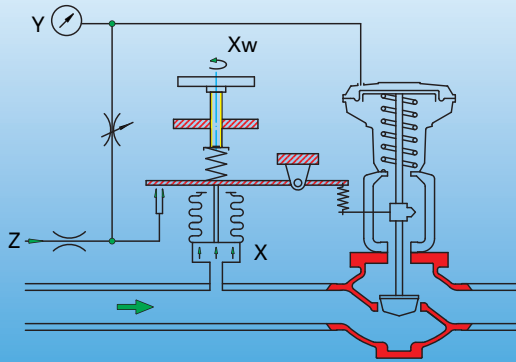
Control valves with large, pneumatic actuators typically have actuating times in excess of 30 seconds. Such responses are too slow for many applications, however. Special applications involving turbine bypass stations or anti-surge control valves on compressors, for example require actuating times of 2 seconds or less to prevent damage to machines and plants.

ARCA Regler has the know-how it takes to master these challenges too. Integration of boosters, throttle and solenoid valves, and filter-reduction stations in the assembly process allows us to offer actuation control circuits that are robust, free of vibrations and extremely fast for demanding situations.



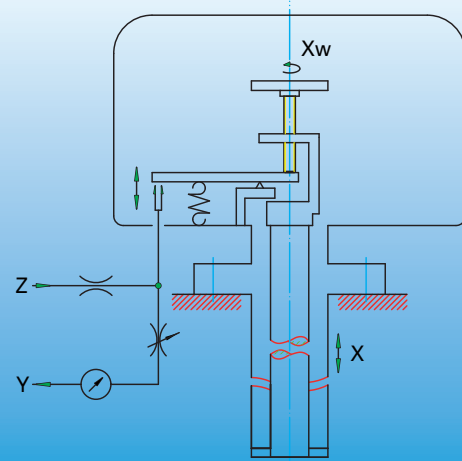


## Pneumatic Controllers



### Type 902 Pressure Controller «Roboter»

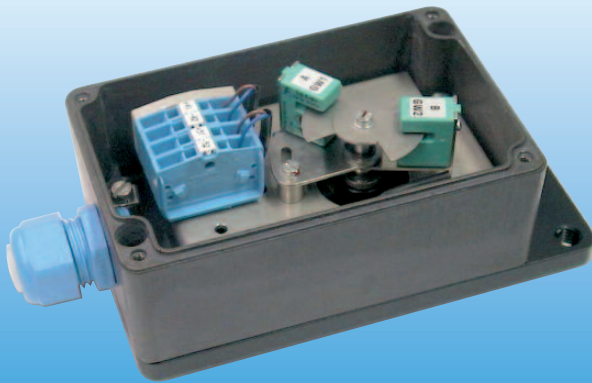
The type 902 pressure controller is a compact measuring element controller that measures pressure and differential pressure and is mounted directly on a pneumatic actuator. The pressure to be controlled generates a force via the measuring system (bellows or diaphragm). This force is then compared to the force of an adjustable spring and used to create the actuating pressure by way of a nozzle/flapper system. A return facility from the drive spindle balances control. The «Roboter» pressure controller can be used to regulate the flow of gas, steam, or fluid pressure in industrial plants.



### Type 910 Temperature Controller

The type 910 temperature controller is an extremely robust measuring element controller for controlling temperature. It is installed directly at the measuring point and generates the actuating pressure required for the actuator via an expansion stick and a nozzle/flapper system. A calibrated scale enables the setpoint value to be configured. The pneumatic actuator with valve can also be located further away from the measuring point. The type 910 temperature controller is used to regulate the temperature of central refrigerant circuits, among other applications.

## Instrumentation Accessories



### Type 827S Signal Box

The type 827S signal box is suitable for signalling intermediate or limit positions. It is mounted at the actuator bracket acc. to NAMUR or ARCA standards and taps the valve stroke using the patented, zero-backlash ARCAPLUG® position feedback. Up to three inductive slot initiators are actuated by adjustable switch discs to indicate the current position of the valve.

### Proximity Switches

Intermediate or limit positions can be detected by external inductive proximity sensors mounted to the NAMUR rib of the actuator bracket. A contact plate on the actuator spindle triggers the sensor signal.



### Mechanical Switches

Mechanical switches with dry contacts can also be attached to ARCA actuators for signalling intermediate or limit positions. The roller-type or plunger switches are mounted to the actuator bracket acc. to NAMUR standards and triggered by a contact plate.

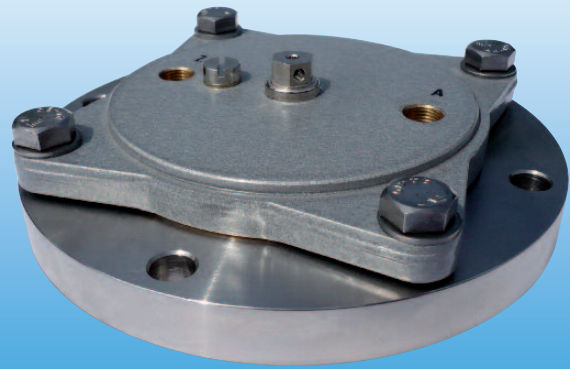
### Solenoid and Blocking Valves

Solenoid valves can be used to actuate on-off valves or implement safety-relevant deactivation for control valves. Pneumatic blocking valves allow the actuating pressure of the actuator to be blocked when the supply air pressure drops below a set threshold value so that the valve remains in its current position.



### Type 920 and 921 Measuring Element Controllers

The measuring element controllers for pressure (type 920) and temperature (type 921) are easy-to-use, highly-precise pneumatic uniform controllers that can be mounted in a cabinet or on a wall. They can function as P, PI, PD, PID, or two-state controllers, with configurable parameters, depending on the type of control needed. The devices indicate setpoint/actual values and the actuating pressure, allow the setpoint value to be changed and provide for a smooth transition from manual to automatic mode.



### Type 931 Pressure Transmitter (1:1)

The type 931 pressure transmitter (1:1) can convert the pressure exerted by liquid, highly viscous, or aggressive media into a pneumatic, air signal and transmit this to a pneumatic measuring element controller, for example. The pressure transmitter has a very simple, robust design and requires no maintenance. It is used in any application that requires the pressure of aggressive, very hot, or highly viscous media as well as media containing solids to be measured.



### Filter-Reducing Stations

For providing supply air with the required pressure and quality filter-reducing stations are used. ARCA Regler offers a wide range of materials, temperature ranges and filter porosities for your specific application.

### Throttle and Throttle Check Valves

Throttle valves are installed in the control-air line to increase the actuating time of pneumatic actuators. Throttle check valves can be used if the actuating time must differ for each direction.



### Accessories for Optimizing Actuating Times

Actuating times of up to 30 seconds are typical for large pneumatic actuators during normal control operation with positioners or open-close operation. Such responses are too slow for many applications, however, because the valves must open and close much more quickly to prevent damage to the plant and high follow-up costs.

The experts at ARCA Regler can provide you with boosters, throttle valves, quick-bleed valves, and appropriately dimensioned filter-reduction stations to ensure consistent, vibration-free closed-loop control or on-off operation actuation times down to 2 seconds, also for large actuators and high levels of valve friction.

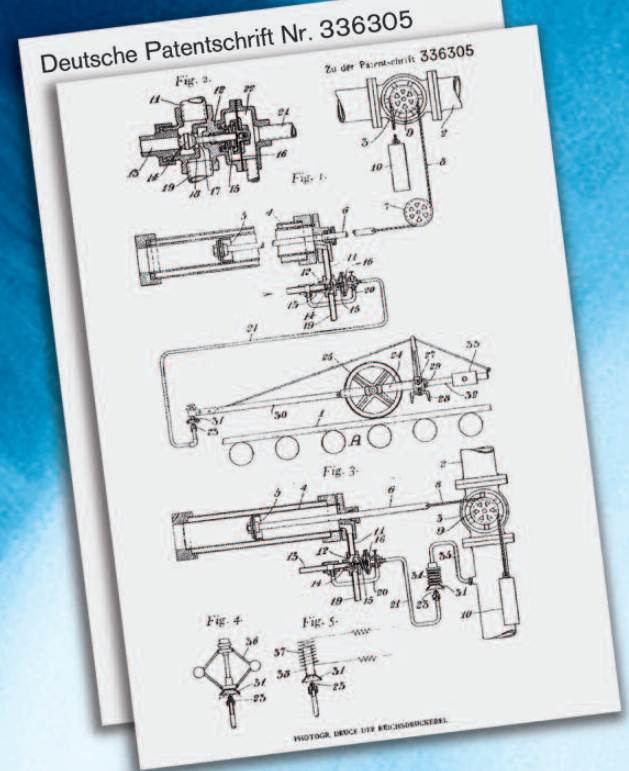
## Proven Nozzle/Flapper System

The nozzle/flapper system was filed for patent protection in 1917 by the founder of ARCA Regler, Ragnar Carlstedt from Sweden. It continues to be the foundation of pneumatic automation technology and gave rise to a world of new possibilities for regulating equipment locally and remotely.

The system is rooted in the principle of controlling pressure by opening and closing a nozzle by means of a flapper and using the signal generated by this to control a pneumatic actuator. This allows the movement of the flapper to be regulated by a force, pressure or temperature signal that is converted into a distance or angle. Simple, low-cost pressure and temperature controllers or highly-precise measuring element controllers can be designed on this basis.

ARCA offers a comprehensive range of pneumatic controllers, for pressure and temperature, combining proven technology and quality and tailored to meet your specific requirements.

## Controllers and Instrumentation



### Our Innovations

- 1 Time-tested, classic pressure and temperature controllers with pneumatic output
- 2 Wide range of instrumentation accessories
- 3 Accessories with all common degrees of protection, including SIL classification
- 4 Broad temperature range
- 5 Actuating times of 2 seconds, even for large actuators
- 6 Safety-relevant deactivation via solenoid valve
- 7 Blocking in the event of an auxiliary power failure

### Your Benefits

- ✓ Long service life
- ✓ Simple, robust design
- ✓ No external signal cables required
- ✓ Low life-cycle costs
- ✓ Optimal adaptation to a specific application
- ✓ Can be integrated in any plant concept
- ✓ Also suitable for applications in tropical or arctic environments
- ✓ Special applications possible, e.g. for turbine bypass stations and antisurge control valves on compressors
- ✓ Integration with different safety concepts possible
- ✓ Easy shut-down of plants when damage occurs



# Controllers and Instrumentation

## Pneumatic Controllers

|  |  |
|--|--|
| Supply air pressure  | 1,4 bar  |
| Actuating air pressure                                       | 0,2...1 bar                                      |
| <b>Type 902 pressure controller «Roboter»</b>                | Measuring range -1,0...-0,01 bar to 1,5...80 bar |
| <b>Type 910 temperature controller</b>                       | Measuring range 0...100 °C to 150...250 °C       |
| <b>Type 920 measuring element controller for pressure</b>    | Measuring range -1...1 bar to 0...650 bar        |
| <b>Type 921 measuring element controller for temperature</b> | Measuring range -40...50 °C to 200...600 °C      |
| <b>Type 931 pressure transmitter (1:1)</b>                   | Measuring range 0...4 bar                        |

## Instrumentation Accessories

|  |   |
|--|---|
| <b>Type 827S signal box</b>                            | Up to 3 slot initiators: SC3,5-N0-B-BU / SJ3,5-SN / SB3,5-E2                  |
| Ignition protection                                    | None  |
| <b>External proximity switches</b>                     | Up to 2 inductive proximity sensors: NJ5-18GK-N / NJ5-18GK-SN / NJ5-18GM50-E2 |
| Ignition protection                                    | None / intrinsically safe   |
| <b>External mechanical switches</b>                    | ENM2-SU1Z Ex / GC-UV1Z-AH / 07-2511-3330/04                                   |
| Switching capacity                                     | To 400 V, 10 A AC / 250 V, 0.5 A DC, depending on the type                    |
| Ignition protection                                    | None / flameproof   |
| <b>Solenoid valves</b>                                 | G1/4 / G1/2 / 1/4" NPT / 1/2" NPT   |
| Type   | 2/2-, 3/2-, 5/2- or 5/3-way valves  |
| Rated voltage  | 24 V, 50 Hz / 230 V, 50 Hz / 24 V DC  |
| Ignition protection                                    | None / flameproof / encapsulated / intrinsically safe                         |
| <b>Blocking valves</b>                                 | G1/4  |
| Type   | 2/2-, 3/2- or 4/2-way valves  |
| <b>Filter-reduction stations</b>                       | G1/4 / G1/2 / 1/4" NPT / 1/2" NPT   |
| Supply pressure range                                  | Up to 31 bar, depending on the type   |
| Downstream pressure adjustment range                   | 0...6 bar to 0.3...10 bar, depending on the type                              |
| Filter porosity  | 5...40 µm, depending on the type  |
| <b>Quick-bleed valves / boosters / throttle valves</b> | G1/4 / G1/2 / G 3/4 / G 1 / 1/4" NPT / 1/2" NPT / 3/4" NPT / 1" NPT           |

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ARCA Flow Group worldwide: Competence in valves, pumps & cryogenics



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