

# English

## 1 On this documentation

These instructions apply to poppet valves from the Headline series 27/21, (see **1**). They contain important information for the safe and correct installation and commissioning of the product. They are oriented towards designers, system constructors, installation technicians, service personnel, plant operators and other users of the product.

- Read these instructions all the way through, particularly the chapter 4 "Safety instructions", before working with the product.

**i** These instructions do not apply to poppet valves from the Headline series 27/21, which are approved for use in explosive atmospheres. The RE-05 instructions "Poppet valves, Headline series 27/21, ATEX version, electrically and pneumatically actuated" apply for this.

Additional documentation:

- SISTEMA libraries, see [www.rosseuropa.com](http://www.rosseuropa.com)
- ATEX certificate, TÜV SÜD, see [www.rosseuropa.com](http://www.rosseuropa.com)
- SIL certificate, TÜV Rheinland, see [www.rosseuropa.com](http://www.rosseuropa.com)
- Technical documentation, see [www.rosseuropa.com](http://www.rosseuropa.com)
- In addition, observe the generally applicable statutory and other binding European and national regulations on accident prevention and on environmental protection.

### 1.1 Warning notices in these operating instructions

In these operating instructions, warning notices precede chapters with handling requirements which incur risks of personal injury or material damage.

Warnings are structured as follows:

| <b>SIGNAL WORD</b>                                                             |
|--------------------------------------------------------------------------------|
| <b>Type or source of hazard!</b><br>Consequences<br>► Measures to avert danger |

- **Warning triangle:** Indicates a risk of fatal or severe injuries.
- **Signal word:** Indicates the severity of the danger.
- **Type or source of hazard:** States the type of danger or the source of the hazard.
- **Consequences:** Describes possible consequences of ignoring the warning.
- **Measures to avert danger:** Indicates how to avoid the danger.  
It is essential that the measures to avert danger are complied with.

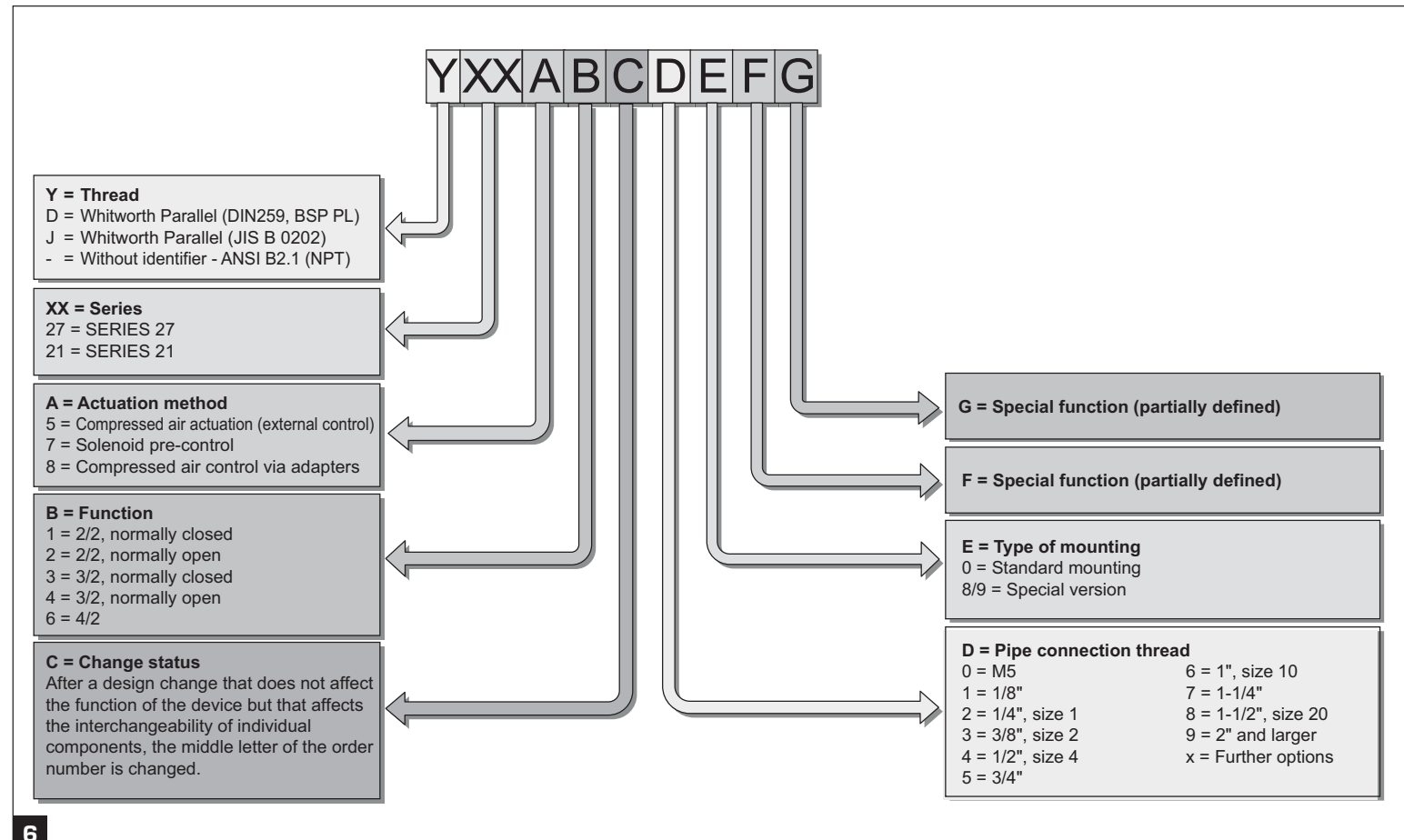
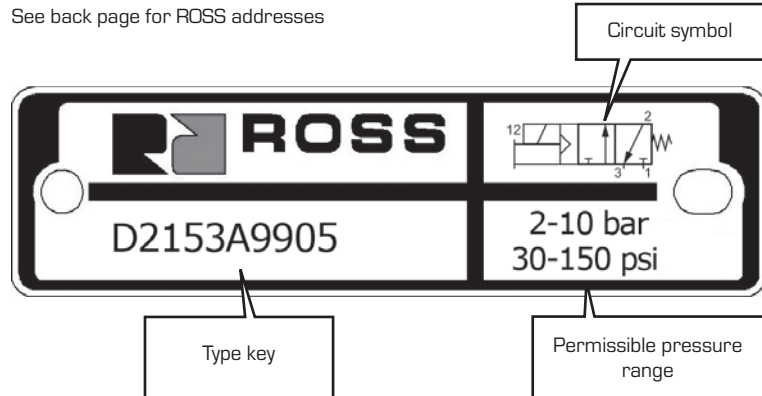
|                  |                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>DANGER</b>    | Indicates an imminent and serious danger that will result in severe or even fatal injury if you fail to avoid it.    |
| <b>WARNING</b>   | Indicates a possible danger that could result in severe or even fatal injury if you fail to avoid it.                |
| <b>CAUTION</b>   | Indicates a danger that may result in minor to moderate injuries if you fail to avoid it.                            |
| <b>ATTENTION</b> | Indicates potential property damage that may be incurred by the product or its surroundings if you fail to avoid it. |

## 2 Product identification

Date of manufacture and site of manufacture are permanently stamped:

| Manufacturing site  | Site abbreviation | Valve printing (example May 2016) |
|---------------------|-------------------|-----------------------------------|
| ROSS CONTROLS USA   | [L]               | [5 16 L]                          |
| ROSS EUROPA         | [G]               | [5 16 G]                          |
| ROSS UK             | [RB]              | [5 16 RB]                         |
| ROSS ASIA           | [J]               | [5 16 J]                          |
| ROSS SOUTH AMERICA  | [B]               | [5 16 B]                          |
| ROSS CONTROLS CHINA | [C]               | [5 16 C]                          |
| ROSS CONTROLS INDIA | [RCI]             | [5 16 RCI]                        |

See back page for ROSS addresses



## 3 Type key

See **6**

## 4 Safety instructions

The product has been manufactured in accordance with generally accepted good engineering practice. Nevertheless there is a danger of personal injury and material damage.

- It is essential to comply with the following safety and warning notices in these instructions.

### 4.1 Intended use

Headline poppet valves are intended for integration into lines for controlling pneumatic actuators. The valves may be used exclusively in industrial applications. Unauthorised changes to the valves are not permitted.

- Observe the technical data and the limit values cited on the type plate.

### 4.2 Foreseeable misuse

**Warning:** Injury to persons and property damage possible if used incorrectly.

Foreseeable misuse includes:

- Use in non-industrial areas / living areas
- Use outside the limits for the product defined in the technical data
- Unauthorised alterations
- Use in reversible operation (incoming air and outgoing air reversed)
- Vacuum operation

## 5 Prerequisites for use of the product

- Ensure that the designers and installation technicians for the machine or plant where the product will be used, have access to these instructions .
- Keep these operating instructions safely throughout the complete lifecycle of the product.

### 5.1 Personnel qualifications

Integration, installation, commissioning, maintenance and de-commissioning may only be carried out by qualified specialist personnel with knowledge and experience in dealing with electrical and pneumatic control systems.

### 5.2 Safety-related instructions

- Comply with the safety guidelines and regulations of the country in which the product is used.
- Avoid over-voltage. This leads to the solenoids being burnt out.
- Check whether the switch-off time of the valve is extended due to the use of over-voltage protection measures.
- Use a suitable vibration damping mounting for the valve if the machine exhibits heavy vibrations.
- Avoid unnecessary connections and mechanical stresses.
- Protect the device from falling objects.

## 6 Scope of delivery

The following are included in the scope of delivery:

- Headline poppet valve
- Operating instructions for Headline poppet valve (RE-07)

## 7 Mounting and installation



### CAUTION

#### Risk of injury due to installation whilst pressurised or with live parts!

Installation whilst pressurised or with electrical power switched on can result in injuries due to sudden pressure build-up or electric shock.

- De-energise and de-pressurise the relevant system parts before installing the valves.
- Lock out the system to prevent it being switched back on again.

### ATTENTION

#### Destruction of components!

Chemical substances can damage the surface, the markings and the seals of the device.

- Install the valve such that it is protected against the effects of chemicals.
- Damage to the device through storage at incorrect temperatures!
- The storage temperature represents the permissible ambient temperature and depends on the type of valve in question.
- Refer to the temperature information in chapter 11 "Technical data".

### 7.1 Mechanical connection

The valves described in these operating instructions may only be installed by professional and appropriately trained personnel. They must only be used within the scope of "intended use" as described in these operating instructions.

The lines and line connections as well as the electrical control of the valves must comply with the applicable safety regulations.

- See chapter 11.2 "Dimensions of the valve body" for the dimensions of your valve.
- Refer to the type key for the pipe diameter for the connection threads.

### 7.2 Pneumatic and electrical connections

- Connect the compressed air supply with connection 1 and the consumer with connection 2, and also with connection 4 in the case of 4/2-way versions.
- Connection 3 (3/2-way and 4/2-way versions) is the vent connection. Always connect a noise suppressor to connection 3.  
We recommend our type D55 noise suppressor.
- Ensure that connection 3 is not reduced or closed.
- Seal all unused openings.
- Establish the electrical connection in accordance with the operating instructions for the solenoid. Observe the limit values for the magnet specified in chapter 11 "Technical data".
- Ensure that the air supply does not drop below the minimum operating pressure (see chapter 11 "Technical data").

## 8 Commissioning and operation

A careful check of the installation must be carried out by professional, trained personnel prior to commissioning.

- Ensure that the technical data for the valve matches the operational criteria of the machine or the pneumatic system.
- Clean the devices regularly as dust despos on heated surfaces could ignite.

### 8.1 Carrying out a functional test

- Check the valve for leaks at all connections and screw connections.
- When checking for leaks use only aids that neither alter the valve nor leave any residue behind.
- Check whether the desired valve position changeover has occurred after an actuation (see table below). It may be necessary to repeat the leak check.

| Valve type |                 | Solenoid     | Pass-through    |
|------------|-----------------|--------------|-----------------|
| 2/2-way    | Normally closed | Non-actuated | x               |
|            |                 | Actuated     | 1 → 2           |
|            | Normally open   | Non-actuated | 1 → 2           |
|            |                 | Actuated     | x               |
| 3/2-way    | Normally closed | Non-actuated | 2 → 3           |
|            |                 | Actuated     | 1 → 2           |
|            | Normally open   | Non-actuated | 1 → 2           |
|            |                 | Actuated     | 2 → 3           |
| 4/2-way    |                 | Non-actuated | 1 → 2 and 4 → 3 |
|            |                 | Actuated     | 1 → 4 and 2 → 3 |

## 9 Service, repair and maintenance

- In the event of technical problems and in the event of a repair, contact your local ROSS service representative. If the valves are used as intended, there is no maintenance required. Unless otherwise stipulated, ROSS recommends carrying out a functional test (see chapter 8.1 "Carrying out a functional test") at least once per year and at the latest after every 5 million switching operations.

# 10 Dismounting and removal

**CAUTION**

**Risk of injury due to dismantling whilst pressurised or with live parts!**

Dismounting whilst pressurised or with electrical power switched on can result in injuries due to sudden pressure build-up or electric shock.

- ▶ De-energise and de-pressurise the relevant system parts before dismantling the valves.
- ▶ Lock out the system to prevent it being switched back on again.

# 11 Technical data

## 11.1 General data

**Design:** 2/2-way, 3/2-way and 4/2-way poppet valve design with plastic piston (series 27) and metal piston (series 21)

**Actuation:** Pneumatically actuated or solenoid-actuated

**Medium:** Compressed air (neutral gases), filtered per ISO 8573-1 (class 7/40 µm, recommended class 6/5 µm), oiled or unoled (mineral oils per DIN 51519/ISO-VG, viscosity class 32)

**Pressure range:** 1 to 16 bar (depending on design), control pressure ≥ operating pressure

**Temperature range**

• **Pneumatically-actuated valves:**

|                            | Ambient temperature |        | Media temperature |        |
|----------------------------|---------------------|--------|-------------------|--------|
|                            | min.                | max.   | min.              | max.   |
| - <b>Series 27</b>         | 4 °C                | 80 °C  | 4 °C              | 80 °C  |
| - <b>Series 21, type H</b> | -17 °C              | 150 °C | -17 °C            | 150 °C |
| - <b>Series 21, type O</b> | -40 °C              | 80 °C  | -40 °C            | 80 °C  |

• **Electromagnetically-actuated valves:**

|                            | Ambient temperature |        | Media temperature |        |
|----------------------------|---------------------|--------|-------------------|--------|
|                            | min.                | max.   | min.              | max.   |
| - <b>Series 27</b>         | 4 °C                | 50 °C  | 4 °C              | 80 °C  |
| - <b>Series 21, type H</b> | -17 °C              | 122 °C | -17 °C            | 150 °C |
| - <b>Series 21, type O</b> | -40 °C              | 50 °C  | -40 °C            | 80 °C  |

With temperatures below 4 °C, the compressed air must be dried per ISO 8573-3, class 7.

**Installation location:** Arbitrary, but ideally vertical

**Magnet/standard voltage:**

Alternating current: 24 V 50 Hz, 110 V 50 Hz and 220 V 50 Hz,

Direct current: 24 V and 110 V

**Operating mode:** Continuous operation (100% ED)

**Protection class according to EN 60529/IEC 60529:** IP65 with mounted connections

**Flow values:** see table

| 2/2-way poppet valve | Nominal diameter | C <sub>v</sub> value |       |               |       |
|----------------------|------------------|----------------------|-------|---------------|-------|
|                      |                  | Normally closed      |       | Normally open |       |
|                      |                  | 1 → 2                | 2 → 3 | 1 → 2         | 2 → 3 |
| 1/4                  | 13               | 2.2                  | -     | 2.2           | -     |
| 3/8                  |                  | 3.8                  | -     | 3.3           | -     |
| 1/2                  |                  | 4.0                  | -     | 3.5           | -     |
| 3/4                  | 21               | 7.7                  | -     | 6.5           | -     |
| 1                    |                  | 9.0                  | -     | 7.3           | -     |
| 1                    |                  | 9.0                  | -     | 7.9           | -     |
| 1 1/4                | 38               | 24.0                 | -     | 21.0          | -     |
| 1 1/4                |                  | 29.0                 | -     | 20.0          | -     |
| 1 1/2                |                  | 29.0                 | -     | 21.0          | -     |
| 2                    | 50               | 49.0                 | -     | 49.0          | -     |
| 2                    |                  | 57.0                 | -     | 57.0          | -     |
| 2 1/2                |                  | 64.0                 | -     | 72.0          | -     |

| 3/2-way poppet valve | Nominal diameter | C <sub>v</sub> value |       |               |       |
|----------------------|------------------|----------------------|-------|---------------|-------|
|                      |                  | Normally closed      |       | Normally open |       |
|                      |                  | 1 → 2                | 2 → 3 | 1 → 2         | 2 → 3 |
| 1/4                  | 13               | 2.8                  | 3.1   | 2.5           | 2.7   |
| 3/8                  |                  | 4.5                  | 5.3   | 3.0           | 3.2   |
| 1/2                  |                  | 4.4                  | 5.3   | 3.0           | 3.2   |
| 3/4                  | 21               | 7.8                  | 9.2   | 7.1           | 8.0   |
| 1                    |                  | 9.4                  | 11.0  | 7.1           | 7.4   |
| 1                    |                  | 10.0                 | 11.5  | 7.1           | 7.5   |
| 1 1/4                | 38               | 28                   | 34.5  | 20.7          | 24    |
| 1 1/4                |                  | 31                   | 32    | 22            | 24    |
| 1 1/2                |                  | 31                   | 31    | 21            | 23    |
| 2                    | 50               | 69                   | 70    | 59            | 59    |
| 2                    |                  | 70                   | 70    | 60            | 61    |
| 2 1/2                |                  | 71                   | 71    | 55            | 55    |

| 4/2-way poppet valve | Nominal diameter | C <sub>v</sub> value |              |
|----------------------|------------------|----------------------|--------------|
|                      |                  | 1 → 2; 1 → 4         | 2 → 3; 4 → 3 |
|                      |                  |                      |              |
| 1/4                  | 13               | 2.1                  | 2.9          |
| 3/8                  |                  | 2.9                  | 4.2          |
| 1/2                  |                  | 3.1                  | 4.2          |
| 3/4                  | 21               | 5.6                  | 8.0          |
| 1                    |                  | 7.0                  | 9.3          |
| 1                    |                  | 7.8                  | 10           |
| 1 1/4                | 38               | 19                   | 26           |
| 1 1/2                |                  | 21                   | 28           |
| 1 1/2                |                  | 22                   | 28           |

## 11.2 Dimensions of the valve body

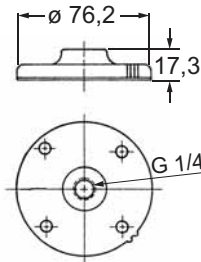
See **2**, **3** and **4**

Further valve dimensions can be found in the technical documents at [www.rosseuropa.com](http://www.rosseuropa.com).

# 12 Accessories

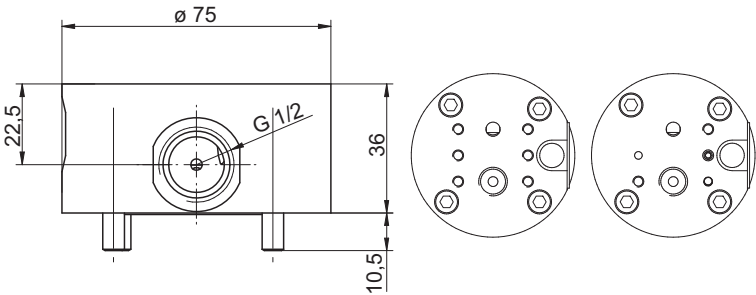
## 12.1 Actuators

### 12.1.1 Pneumatic actuation

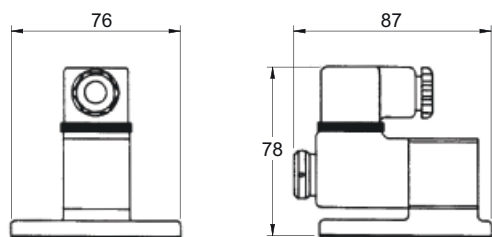


The pneumatic actuation comprises a cap attachment for the valve with an arbitrary connection thread for the control air connection.

The pneumatic actuation is also available as a NAMUR version:

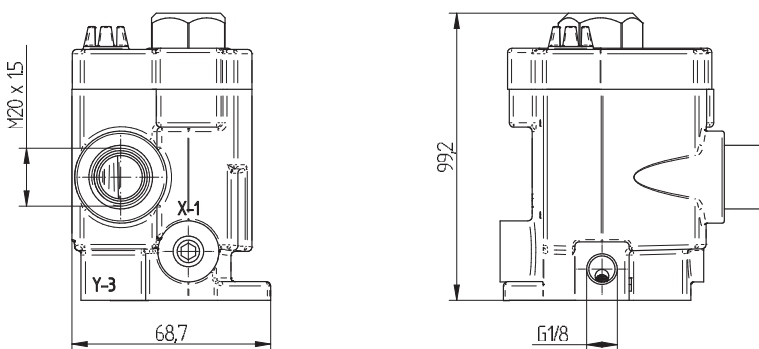


### 12.1.2 Solenoid pilot valve "ALF"



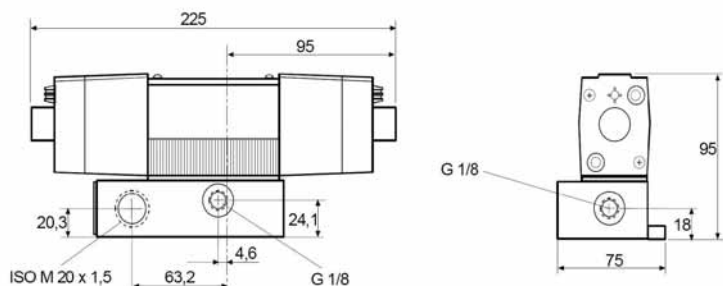
The solenoid pilot valve "ALF" is an electronic pilot valve, which is used in various versions on ROSS poppet valves.

### 12.1.3 Solenoid pilot valve "PACER"



The solenoid pilot valve "PACER" is the most widely used electronic pilot valve for ROSS poppet valves.

### 12.1.4 Pilot valve with double magnet "CV1"

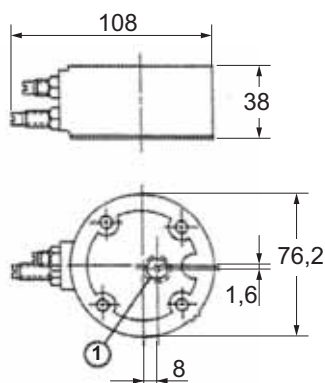


The double magnet solenoid pilot valve "CV1" allows for a controller via electrical impulses.

## 12.2 Adapter

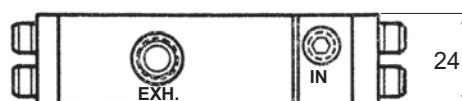
► Request a datasheet for devices or adapters that are not illustrated here:  
info@rosseuropa.com

### 12.2.1 Switch-on / switch-off delay



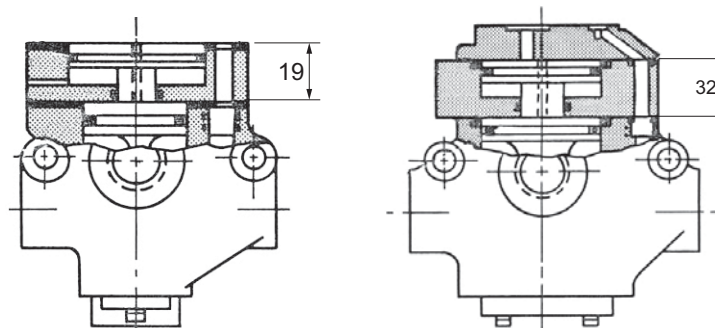
The switch-on / switch-off delay delays the "Switch-on time" (leaving the safe default position) of the ROSS poppet valves by means of mechanical flow restriction and differential pressure link. The adapter is an optional module between a ROSS poppet valve and an arbitrary controller.

### 12.2.2 Adapter "Q"



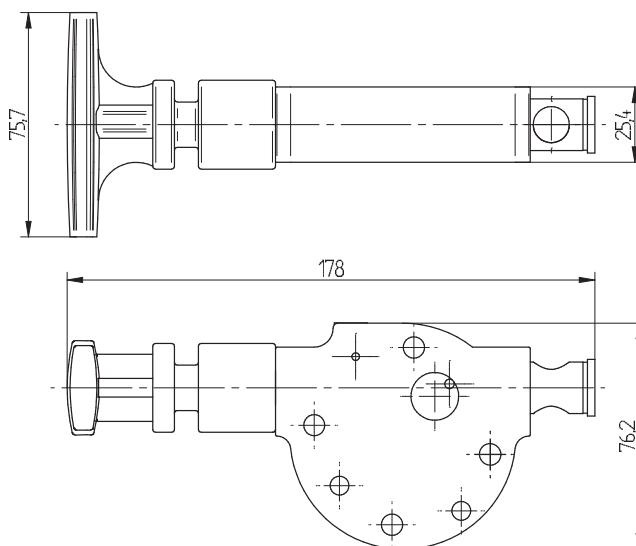
A switch-on delay of up to 60 s can be achieved with the adapter "Q".

### 12.2.3 Adapter "PB"



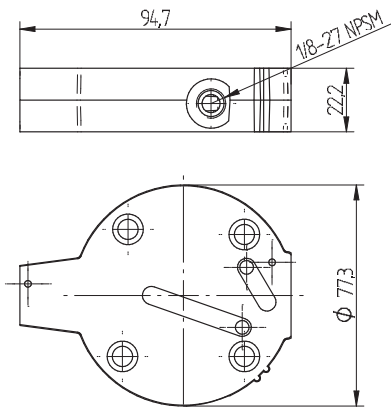
The adapter "PB" is used as an auxiliary piston to increase the actuation force.

### 12.2.4 Adapter "LOX"



The adapter "LOX" ensures a pneumatic isolation of energy sources according to EN1037.

### 12.2.5 Adapter "EEZ-ON"



The adapter "EEZ-ON" implements a controlled process for developing pressure in pneumatic systems.

## 13 Declaration of Incorporation

See **5**