

# PNEUMATICS PRODUCTS



- › Logic elements
- › Position / Detectors
- › Electro-pneumatic valves





For over 50 years, Crouzet Control, has established a reputation for providing micro-control products, micro-motors and position sensors. Read on to discover Crouzet Control's complete offer of Pneumatic products for industrial and explosive atmospheres.

Always one step ahead of market trends and customer requirements, Crouzet Control is continually developing its range of both standard and customised automation components and solutions to cover all the latest commercial and industrial applications and meet the needs expressed by manufacturers of automated equipment and machinery.

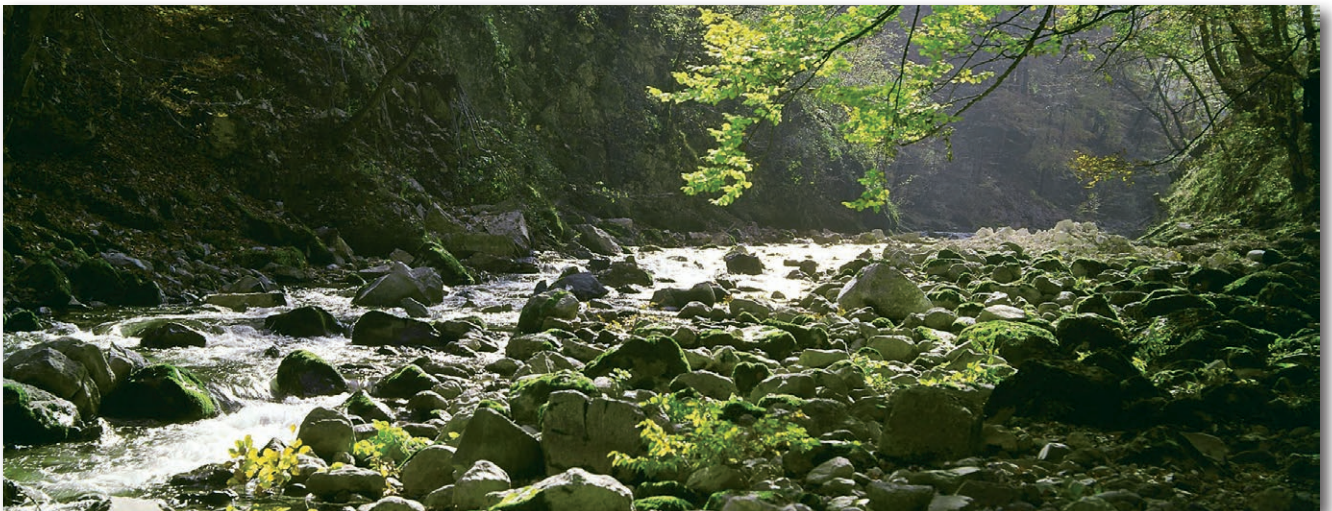
Throughout the world, Crouzet Control the adaptation specialist provides you with technical and industrial expertise to ensure seamless integration, whatever the equipment environment or operating requirements of the machine.

**InnoVista Sensors™**: your trusted partner of choice to face industrial challenges of today and tomorrow.

**InnoVista Sensors™** is a worldwide industrial specialist of sensors, controllers and actuators for automated systems.

Through its brands, Crouzet Aerospace, Crouzet Automation, Crouzet Control, Crouzet Motors, Crouzet Switches and Systron Donner Inertial, **InnoVista Sensors™** offers a wide range of reliable, efficient and customizable components dedicated to the Aerospace & Defence, Transportation and Industrial market and segments.

Thanks to the recognized expertise of its teams and a strong innovation policy, **InnoVista Sensors™** brings performance enhancing solutions to its customers worldwide.



Eco-design is central to the company's "Offer Creation Process", the aim of which is to design products and services that correspond as closely as possible to customers' requirements and reduce their environmental impact throughout their life cycle.

Customer satisfaction will always be our prime objective.

To this end, we rely on standards ISO 9001 and ISO14001 to ensure that our design, industrialisation, manufacturing and commercialisation processes correspond to our customers' requirements.

All Crouzet Control products are fully compliant with the RoHS directive



## ► Expertise - for all your applications

### ● Crouzet Control's Pneumatic expertise

provides you with an offer to meet all your automation system requirements, including systems for explosive atmospheres.

The quality of the Pneumatic components is based on a rigorous organisation which meets all current European and international directives, standards and approvals.

### ● All our products are fully compliant with the RoHS directive and embody an eco-design concept.

The Pneumatic offer is the result of the implementation of Crouzet Control applications and expertise:

- **Listening to and analysing** your requirements
- **Expertise** in the associated applications: mechanical, electronic, sensors, etc.
- **Prototyping and industrialisation**
- **Tests**
- **Standardisation and certification** (IEC, EN, UL-CSA, ATEX, etc.)
- **Equipment** which is responsive and effective
- **International logistics** and after sales support.

### ● Crouzet Control has developed broad expertise in ensuring that your specific needs are taken into account.

Thanks to this expertise, we are continuously developing our standard products to create solutions tailored to your requirements.

### ► Some relevant areas

Water treatment, chemical factories, silos, gas storage, ports, refineries, paper industry, paint factories, vehicles (if used in ATEX conditions), etc.



## ► Pneumatic offer for use in industrial and explosive atmospheres

► This guide has been designed to help you quickly identify the appropriate products for your requirements. Most of our pneumatic components are available in a standard range and a range for use in explosive atmospheres (ATEX): this information is given in the right-hand column on each page.

### Industrial range

The standard range of pneumatic components is designed to meet requirements for industrial applications.

The operating characteristics (pressure, flow rate, service life, etc.) have been optimised to best meet these needs.



### Range for use in explosive atmospheres

The range for use in explosive atmospheres has been developed specifically for applications requiring compliance with European Directive 94/9/EC, the full details of which can be found on pages 30 and 31 of this guide.

The user is responsible for ensuring the compliance of his installations. All new installations must be compliant, and replacements in the event of breakdown or maintenance must comply with this directive.



### Characteristics of our ATEX components

- ATEX products are specifically marked in accordance with the latest versions of harmonised standards
- Every product is supplied with a guide specifying the usage restrictions in explosive atmospheres
- A copy of the approval certificate can be provided if requested at the time of order
- The order entry must state the usage conditions Crouzet Control states the usage restrictions on acknowledgements of receipt of order, delivery notes and invoices



### Crouzet Control has produced a separate catalogue for

Pneumatic products for use in explosive atmospheres. This catalogue gives details of the entire Crouzet Control range of ATEX pneumatic products along with associated standards, certifications, directives, markings and order conditions.



## ATEX Directive 94/9/EC: general information

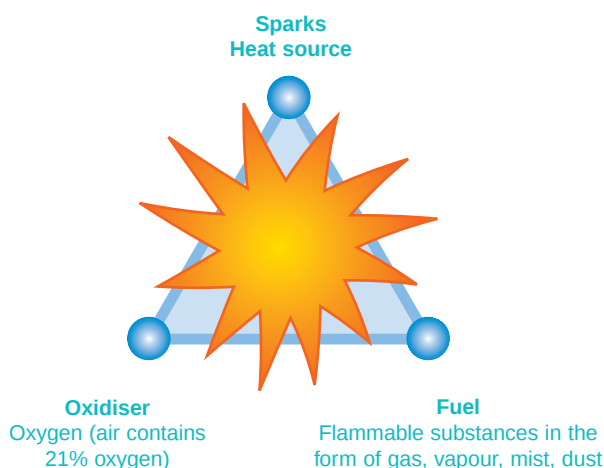


### Principles of Directive 94/9/EC:

- The directive aims to harmonise the legislation of European Union member states in order to ensure free circulation of equipment intended for use in explosive atmospheres (gas and dust).
- Since 1 July 2003, this directive has applied to electrical, mechanical, hydraulic and pneumatic products.
- It concerns the assessment of protective devices and systems (manufacturers) as well as the design (design office), installation (installers, panel-builders) and maintenance (maintenance depts) of installations.

### Definition of an explosive atmosphere:

- An explosive atmosphere is defined as a mixture of flammable substances (in the form of gas, vapour, mist or dust) with air under atmospheric conditions in which, after ignition, combustion spreads throughout the entire unburned mixture.



### Application since 30 June 2003:

- Manufacturers must offer products, which comply with Directive 94/9/EC and must have a Quality Control System that has been approved by a notified body.
- Users are responsible for using equipment correctly according to the zones they have defined within their installations based on the potential risks. Existing installations must be brought into conformity with the ATEX Directive before 30 June 2006. All new products commissioned must comply with Directive 94/9/EC. In the event of breakdown, installed equipment that cannot be repaired must be replaced with equipment complying with Directive 94/9/EC.

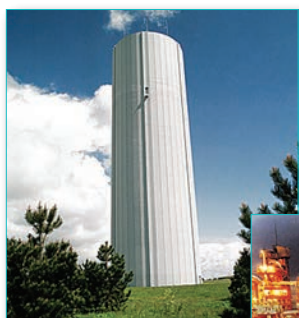
### Classification:

- Potentially explosive environments are classified by zone in compliance with Directive 1999/92/EC. This directive is aimed at users. It details the minimum requirements for increasing protection of the health and safety of workers exposed to explosive atmospheres.
- ATEX Directive 94/9/EC defines categories of equipment and protection systems, which can be used in the corresponding zones.
  - ➔ Categories M1 and M2 relate to mines (group I)
  - ➔ Categories 1, 2 and 3 relate to other locations (group II) often referred to as "Surface industries"

### Documents and recommendations/products:

- ATEX-certified products must be supplied with an EC declaration of conformity and a user manual.
- At the time of sale, the sales representatives must check the zone in which the product is to be used. On the order, the customer must inform the manufacturer of the conditions of use.
- Manufacturers and distributors must ensure that their sales of ATEX products are traceable (so that customers who have been sold an ATEX product can be located in relation to the product's date of manufacture).
- In the case of an assembly, the product with the lowest certification level determines the level of the whole assembly.

### Some relevant areas:



Water treatment

Silos



Chemical factories



Gas storage



Ports

Refineries

Paper industry

Paint factories

Vehicles

(if used in ATEX conditions)

### Equipment definition:

#### Equipment for surface industry - Group II

| Zone                                                                    | 0                                                                                | 20 | 1                                                                        | 21 | 2                                                           | 22 |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------|----|--------------------------------------------------------------------------|----|-------------------------------------------------------------|----|
| Type of atmosphere<br>G = Gas, D = Dust                                 | G                                                                                | D  | G                                                                        | D  | G                                                           | D  |
| Presence of Explosive atmosphere                                        | Continuous presence<br>(or for long periods, i.e. more than 1000 hours per year) |    | Intermittent presence<br>(or occasional, i.e. 10 to 1000 hours per year) |    | Fleeting presence<br>(or rare, i.e. 1 to 10 hours per year) |    |
| Category of equipment that can be used<br>as per 94/9/EC dated 23/03/94 | 1                                                                                |    | 2                                                                        |    | 3                                                           |    |

### Marking example:

Certified products must incorporate marking specific to Directive 94/9/EC, such as:

Crouzet Automatismes SAS

2 rue du Docteur Abel, 26902 Valence, FRANCE

Type: 81513530

Serial no:

Year of construction

**CE 0081**  **II 1 G**

**Ex ia II C T6**

**LCIE 02 ATEX 6121 X**

**Max. amb. T: +50°C**

### Explanation of the marking example:

- ➔ The CE marking along with the identification number of the notified body responsible for monitoring the QCS (0081 = LCIE).

CE 0081  II 1 G

- ➔ The  symbol indicating that this product can be used in an explosive atmosphere followed by the equipment group (II = Surface Industries), the category (1 = continuous presence; 2 = intermittent presence; 3 = fleeting presence), and the type of explosive atmosphere G = Gas, D = Dust.

In affixing this CE marking, the manufacturer declares that the product has been manufactured in complete conformity with the requirements of all the relevant directives.

- ➔ Next line of the marking specified by the harmonised standards:

Ex ia II C T6 X

       
 Reference to the operating instructions for the product  
 Temperature Class corresponding to a max. surface temperature of 85°C  
 Subdivision IIC: including hydrogen acetylene in particular, carbon bisulfur  
 Protection method used: intrinsic safety  
 Symbol indicating that the equipment complies with one or more protection methods

- ➔ The CE-Type Examination Certificate reference (if appropriate).

LCIE 02 ATEX 6121 X  
Max. amb. T: +50°C

- ➔ The ambient operating temperature range.

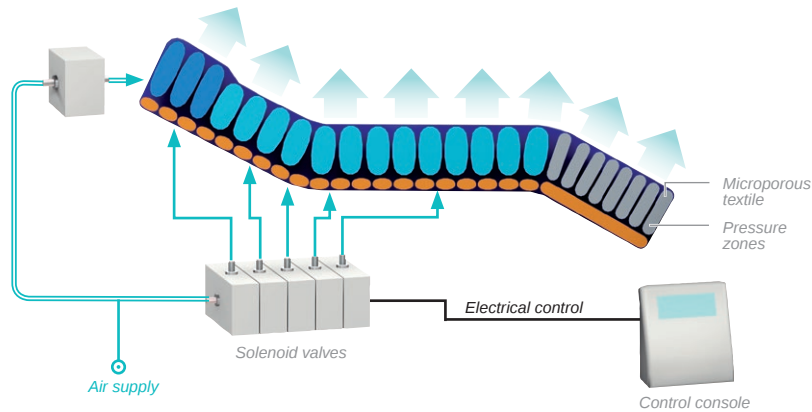
In the event of use in an explosive atmosphere caused by dust, the following items are added to the marking:

- ➔ The surface limit temperature T° C for use in an explosive atmosphere caused by dust.

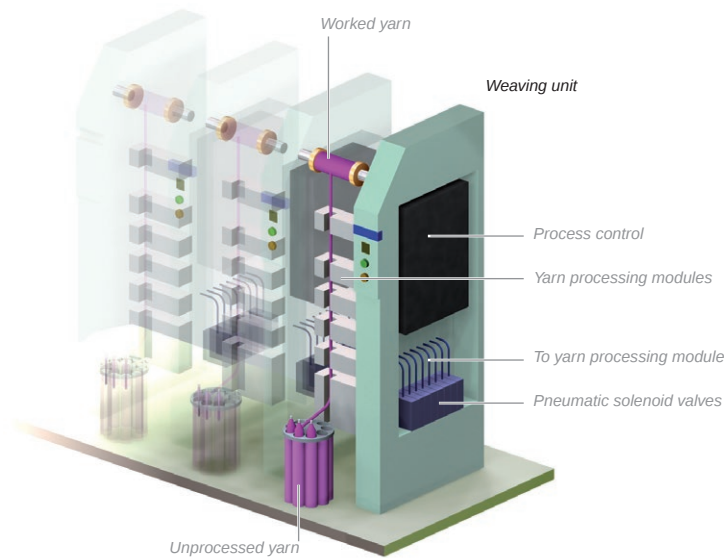
- ➔ The IP rating (only for dust)

## Examples of applications:

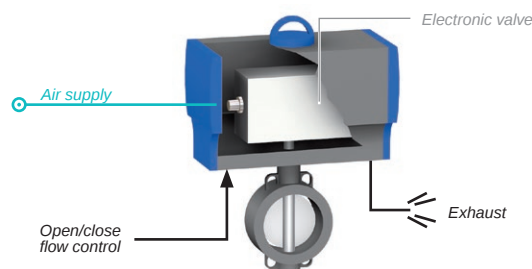
### Medical mattress



### Textile machine

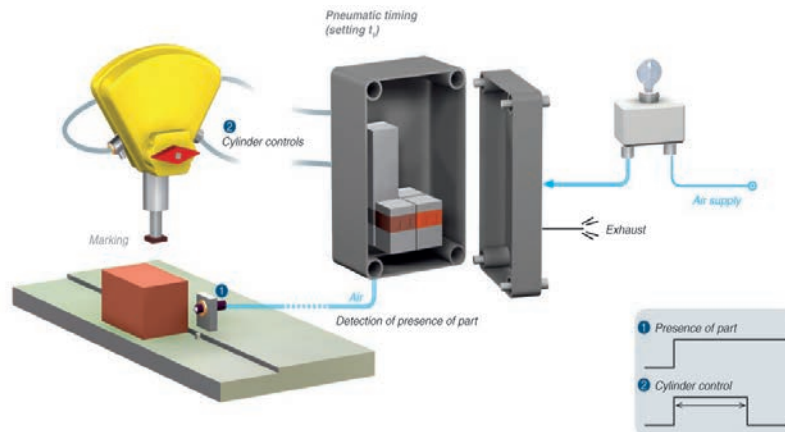


### Industrial valve

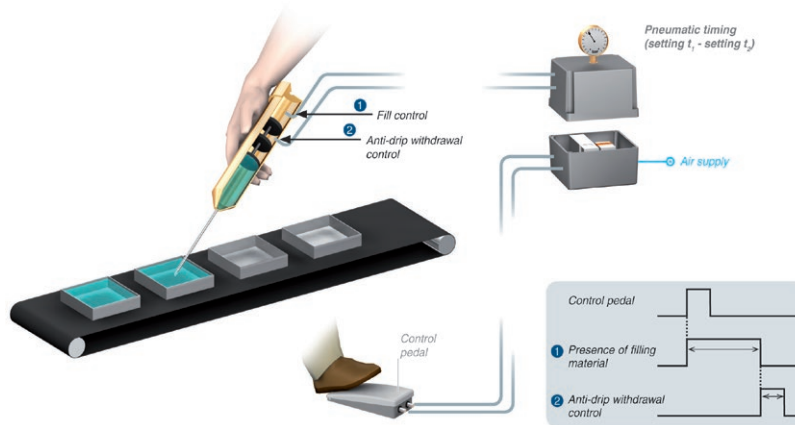


Pneumatic actuators for quarter-turn or proportional taps and valves allow open/close commands and flow rate changes to be automated. The pneumatic actuating cylinder is operated by means of an air distributor valve built into the valve body and controlled by a solenoid valve.

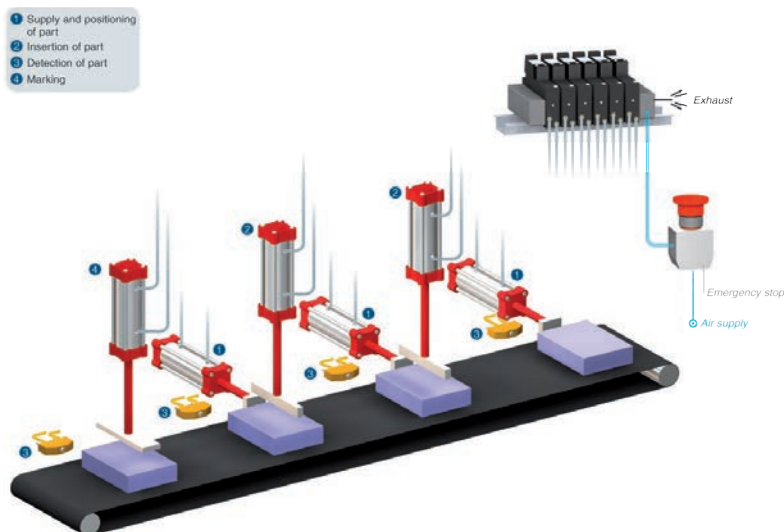
## ▶ Marking control system



## ▶ Semi-automatic resin filling system, with anti-drip control

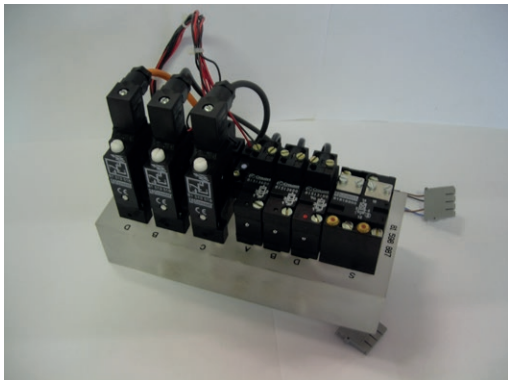


## ▶ Automatic assembly system



## ▶ Particular realizations

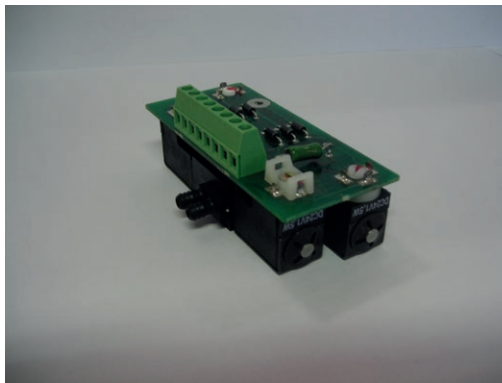
### ▶ Component on manifold mastered



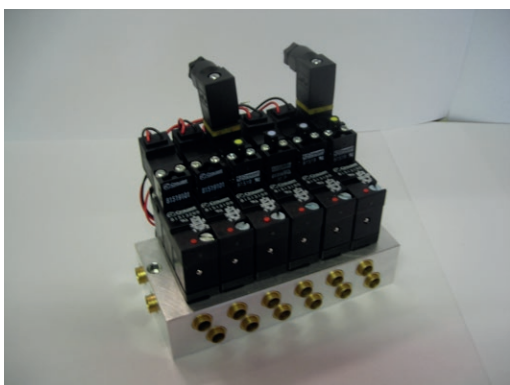
### ▶ Solenoid valves on manifold



### ▶ System for inflating



### ▶ Valves modules on manifold



*For others configurations, consult us*

# General summary

Pages



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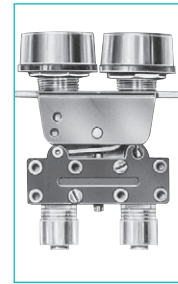
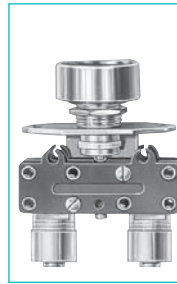


***Teaching materials***

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# MANUAL ACTUATED VALVES

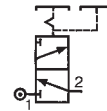
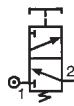
## Push buttons diameter 12 and actuators



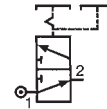
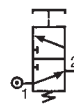
| Features |    | Actuator color | Valve color | Push button round | Push button double round |
|----------|----|----------------|-------------|-------------------|--------------------------|
| Version  | NC | black          | black       | 81 735 511        | —                        |
|          |    | red            | black       | 81 735 512        | —                        |
|          |    | black/red      | black       | —                 | 81 733 511               |
|          | NO | black          | grey        | 81 735 011        | —                        |
|          |    | red            | grey        | —                 | —                        |
|          |    | black/red      | grey        | —                 | —                        |

### Symbol

NC



NO

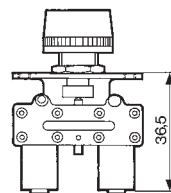


### Characteristics

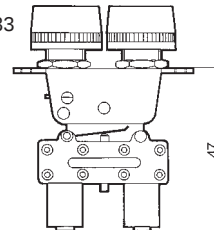
|                                                      |                         |                       |                       |
|------------------------------------------------------|-------------------------|-----------------------|-----------------------|
| Operating pressure                                   | bar                     | 2 → 8                 | 2 → 8                 |
| Orifice diameter                                     | mm                      | 2.7                   | 2.7                   |
| Flow at 6 bars                                       | NI/mn.                  | 200                   | 200                   |
| Valves                                               | NC : black<br>NO : grey | •                     | •                     |
| Operating forces (depending on actuator)             | N                       | 8 → 18                | 8 → 18                |
| Effective travel                                     | mm                      | 1                     | 1                     |
| Fluid: dry or lubricated air                         |                         | •                     | •                     |
| Push-in connectors for semi-rigid tubing (NFE 49100) | mm                      | Ø 4                   | Ø 4                   |
| Operating temperature                                | °C                      | -5 → +50              | -5 → +50              |
| Mechanical life                                      | operations              | 1.5 x 10 <sup>6</sup> | 1.5 x 10 <sup>6</sup> |
| Weight                                               | g                       | 35                    | 40                    |

### Dimensions

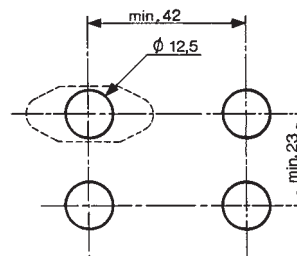
81 735



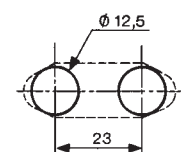
81 733

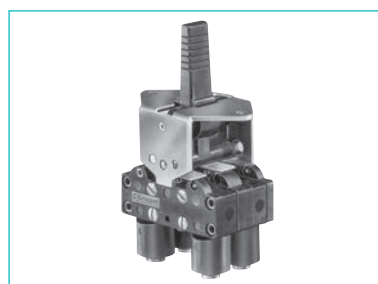


Threaded barrel



2 threaded barrels





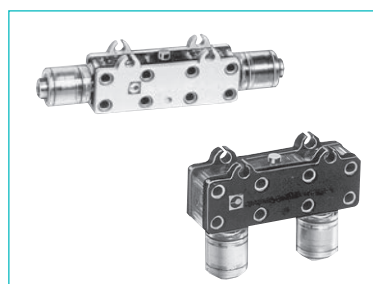
3-position lever  
manual return

81 716 511  
81 716 512



3-position lever  
spring return

81 715 511  
81 715 512

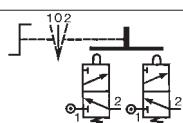
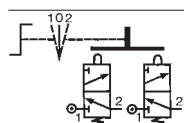


Horizontal outputs

81 280 510  
—  
81 280 010  
—

Vertical outputs

81 281 510  
—  
81 281 010  
—



2 → 8  
2.7  
200

•  
•  
8 → 18  
1  
•

Ø 4  
-5 → +50  
1.5 x 10<sup>6</sup>  
65

2 → 8  
2.7  
200

•  
•  
8 → 18  
1  
•

Ø 4  
-5 → +50  
1.5 x 10<sup>6</sup>  
65

2 → 8  
2.7  
200

—  
—  
1  
—

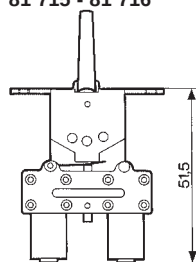
Ø 4  
-5 → +50  
1.5 x 10<sup>6</sup>  
14

2 → 8  
2.7  
200

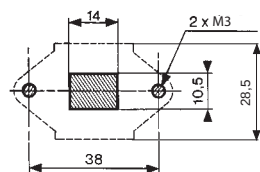
—  
—  
1  
—

Ø 4  
-5 → +50  
1.5 x 10<sup>6</sup>  
14

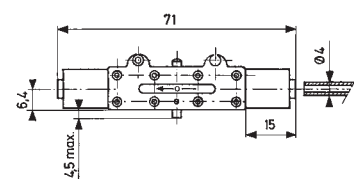
81 715 - 81 716



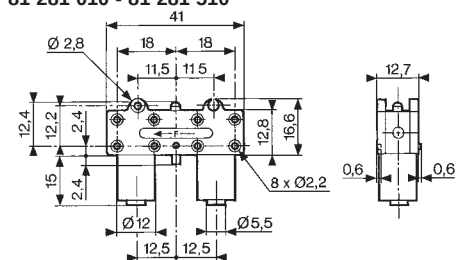
Square lever



81 280 010 - 81 280 510



81 281 010 - 81 281 510

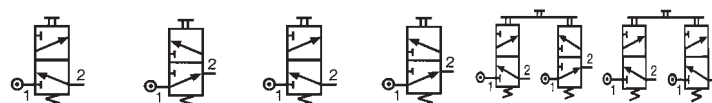


## 3/2 valves for manual actuators Ø 22 mm



|                                                                         |                       |            |            |            |            |            |            |            |
|-------------------------------------------------------------------------|-----------------------|------------|------------|------------|------------|------------|------------|------------|
| 3/2 valve supplied with screws for fixing the adaptator                 | Connection Ø4 Gas 1/8 | 89 543 501 | 89 543 101 | —          | —          | —          | —          | —          |
| Valve(s) 3/2 fixed on adaptator (supplied with adaptator not assembled) | Connection Ø4         | 89 543 701 | 89 543 201 | —          | —          | —          | —          | —          |
| Adaptator for 3/2 valve on actuators Ø 22                               |                       | —          | —          | 89 543 105 | 89 543 005 | 89 543 305 | 89 543 205 | —          |
| Version                                                                 |                       | NC         | NO         | NC         | NO         | NC + NO    | NC + NC    | 24 679 702 |

### Symbol

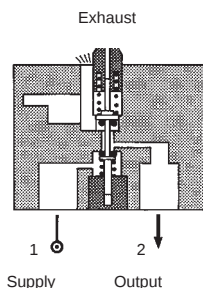


### Characteristics

|                                  |            |                       |                       |                       |                       |                       |                       |    |
|----------------------------------|------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----|
| Operating pressure               | bar        | 0 → 8                 | 0 → 8                 | 0 → 8                 | 0 → 8                 | 0 → 8                 | 0 → 8                 | —  |
| Orifice diameter                 | mm         | 2                     | 2                     | 2                     | 2                     | 2                     | 2                     | —  |
| Flow at 6 bars                   | NI/min     | 112                   | 112                   | 112                   | 112                   | 112                   | 112                   | —  |
| Control force                    | N          | 12.6                  | 12.6                  | 12.6                  | 12.6                  | 12.6                  | 12.6                  | —  |
| Operating temperature in dry air | °C         | -5 → +60              | -5 → +60              | -5 → +60              | -5 → +60              | -5 → +60              | -5 → +60              | —  |
| Life                             | operations | 1.5 x 10 <sup>6</sup> | 1.5 x 10 <sup>6</sup> | 1.5 x 10 <sup>6</sup> | 1.5 x 10 <sup>6</sup> | 1.5 x 10 <sup>6</sup> | 1.5 x 10 <sup>6</sup> | —  |
| Non-connectable exhaust          |            | •                     | •                     | •                     | •                     | •                     | •                     | —  |
| Weight                           | g          | 50                    | 50                    | 60                    | 60                    | 110                   | 110                   | 40 |

### Principle of operation

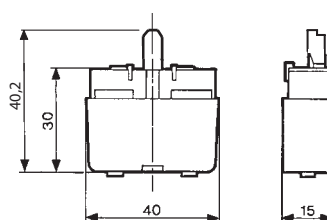
#### NC version



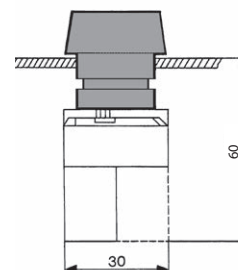
### Dimensions

89 543 001 - 89 543 201

89 543 501 - 89 543 701

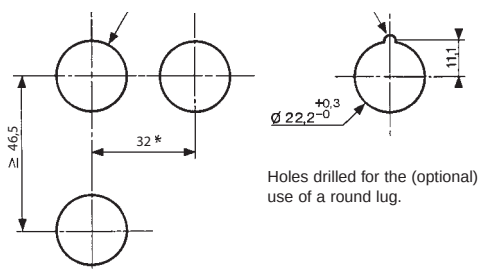


### Ø 22 series

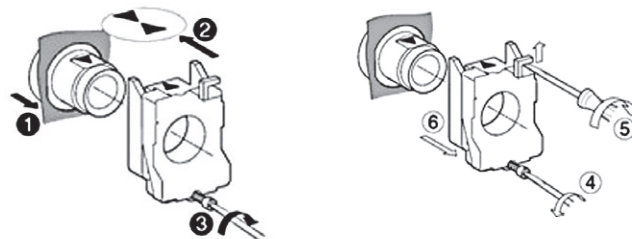


### Holes drilled in panel for actuators Ø 22

#### EN 50007



### Installation



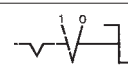
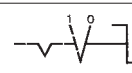
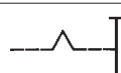
\* > 40 Ø 40 push-buttons

\* > 45 for lever type rotary switches

## Actuators Ø 22 mm for manually operated valves

|                             |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |  |  |  |  |  |
| Push buttons                | Red<br>Green<br>Black                                                             | 24 678 129<br>24 678 128<br>24 678 127                                            | 24 678 173<br>—<br>24 678 172                                                      | 24 678 171<br>—<br>—                                                                | —<br>—<br>—                                                                         |
| 2-positions rotary switches |                                                                                   | —                                                                                 | —                                                                                  | —                                                                                   | —                                                                                   |
| 3-positions rotary switches |                                                                                   | —                                                                                 | —                                                                                  | —                                                                                   | —                                                                                   |
| Function                    |                                                                                   | Flush push contact                                                                | Emergency stop plastic Ø 40                                                        | Emergency stop Ø 40 mm push-turn                                                    | Black symmetrical actuator                                                          |

### Symbol



### Position

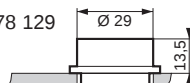


|        |   |    |    |    |    |    |
|--------|---|----|----|----|----|----|
| Weight | g | 30 | 45 | 45 | 45 | 45 |
|--------|---|----|----|----|----|----|

### Dimensions

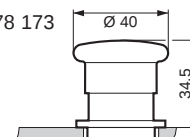
24 678 127 - 24 678 128

24 678 129



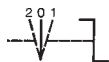
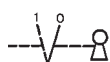
24 678 171 - 24 678 172

24 678 173



|                             |                                       |                            |                                        |                  |                                    |                                                                  |                                                         |  |
|-----------------------------|---------------------------------------|----------------------------|----------------------------------------|------------------|------------------------------------|------------------------------------------------------------------|---------------------------------------------------------|--|
| 2-positions rotary switches | 24 678 180                            | —                          |                                        |                  |                                    |                                                                  |                                                         |  |
| 3-positions rotary switches | —                                     | 24 678 176                 | 24 678 178                             | 24 678 177       | 24 678 179                         | 24 678 182                                                       | 24 678 181                                              |  |
| Function                    | RONIS key 455 removable in position 0 | Black symmetrical actuator | Black symmetrical actuator with return | Long lever Black | Black Long lever, spring to center | RONIS key 455 remov. in pos. 0 3 positions with spring to center | RONIS key 455 removable in position 0 3 fixed positions |  |

### Symbol



### Position

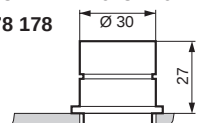


|        |    |    |    |    |    |    |    |
|--------|----|----|----|----|----|----|----|
| Weight | 70 | 45 | 45 | 16 | 45 | 70 | 70 |
|--------|----|----|----|----|----|----|----|

### Dimensions

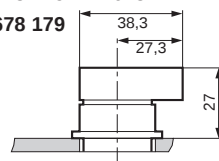
24 678 174 - 24 678 176

24 678 178



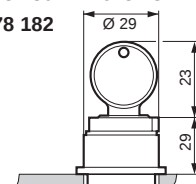
24 678 175 - 24 678 177

24 678 179



24 678 180 - 24 678 181

24 678 182



# Pneumatic 2-hand control

**Conforms to the  
Machinery Directive**



## Definition (conforming to EN 574 +A1)

A pneumatic 2-hand control device is used with dangerous machinery and requires the simultaneous use of both hands to trigger and maintain machine operation. Such a device must be located outside the dangerous zone, so that the operator cannot enter this zone before the machine has come to a complete standstill.

A pneumatic 2-hand control device is composed of 2 parts :

- 2 manual pushbuttons which require the simultaneous use of both hands.
- A pneumatic relay.

## Types of 2-hand control devices

| Requirements                                         | Type |    |     |   |   |
|------------------------------------------------------|------|----|-----|---|---|
|                                                      | I    | II | III |   |   |
|                                                      |      |    | A   | B | C |
| Use of both hands (simultaneous actuation)           | ●    | ●  | ●   | ● | ● |
| Relationship between input signals and output signal | ●    | ●  | ●   | ● | ● |
| Cessation of the output signal                       | ●    | ●  | ●   | ● | ● |
| Prevention of accidental operation                   | ●    | ●  | ●   | ● | ● |
| Prevention of defeat                                 | ●    | ●  | ●   | ● | ● |
| Reinitiation of the output signal                    |      | ●  | ●   | ● | ● |
| Synchronous actuation                                |      |    | ●   | ● | ● |
| Use of category 1 (EN 954-1)                         | ●    |    | ●   |   |   |
| Use of category 3 (EN 954-1)                         |      | ●  |     | ● |   |
| Use of category 4 (EN 954-1)                         |      |    |     |   | ● |

**Category 1 (EN ISO 13849) :** the system should use well tried components and principles.

**Category 3 (EN ISO 13849) :** the system must be designed so that a single fault will not cause the loss of the safety function.

**Category 4 (EN ISO 13849):** the system must be designed so that an accumulation of faults must not lead to a loss of the safety function.

## Synchronous action

An output signal is only generated if both control actuating devices are actuated within 500 ms.

## Resetting the output signal

The release of a single control device interrupts the output signal, but a reset is only possible once both control devices have been released.

## Pneumatic relay for two-hand control

- › 100% pneumatic
- › Complies with Machinery Directive and the standard EN 574 +A1
- › CE Certification type-IIIA and IIIB

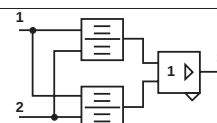


Pneumatic relay for two-hand control  
EN 574 +A1 classification

**81 580 101**  
III A

**81 580 202**  
III B

### Symbol

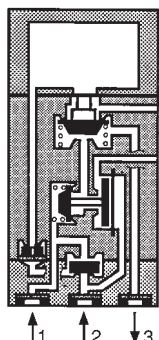


### Characteristics

|                                  |            |                     |                                   |
|----------------------------------|------------|---------------------|-----------------------------------|
| Operating pressure               | bar        | 2 → 8               | 2 → 8                             |
| Orifice diameter                 | mm         | 2.5                 | 2.5                               |
| Max. delay between input signals | s          | 0.2 max.            | 0.2 max.                          |
| Connection                       |            | Sub-base 81 532 001 | Semi-rigid tubing Ø 4 (NFE 49100) |
| Operating temperature            | °C         | -5 → +50            | -5 → +50                          |
| Mechanical life                  | operations | 10 <sup>7</sup>     | 10 <sup>7</sup>                   |
| Weight                           | g          | 90                  | 320                               |

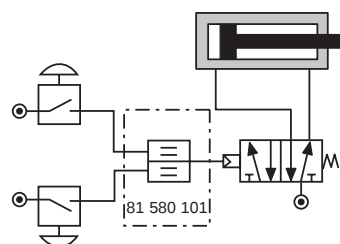
### Principle of operation

**81 580 101**



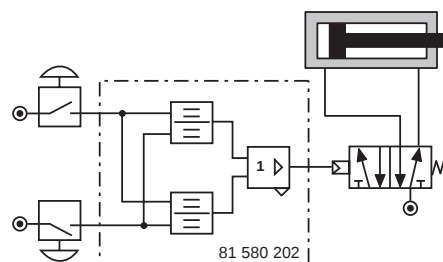
### Connections (Typical application with double-acting cylinder)

**81 580 101**



Components follow current standards

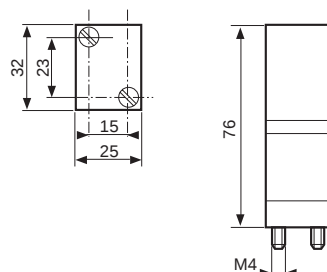
**81 580 202**



To obtain an output signal it is necessary to give simultaneous input signals 'a' and 'b' with a max. delay of 0.45. The output signal 's' is lost if one or both of the inputs are removed.

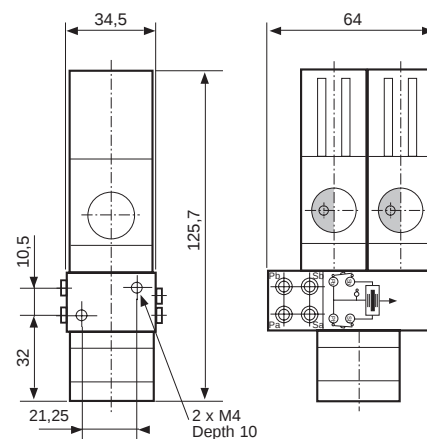
### Dimensions

**81 580 101**



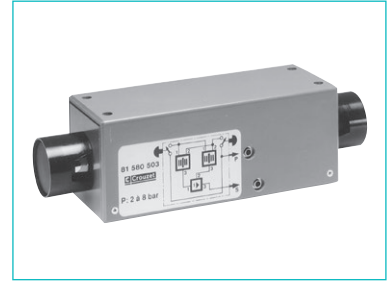
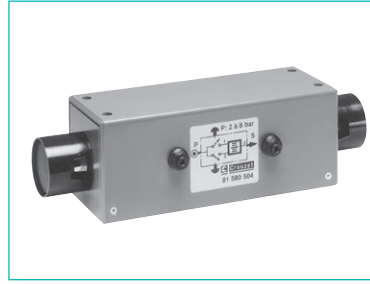
Mounted on sub-base 81 532 001  
(See page 55 of Pneumatic catalogue)

**81 580 202**



## Two-hand pneumatic safety start module

- Conforms to the Machinery Directive and standard EN 574
- Including pneumatic relay to classification IIIA or IIIB depending on version

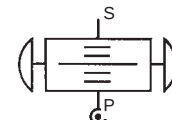
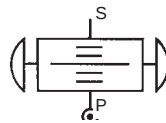


Two-hand pneumatic safety start module  
Pneumatic relay (to EN 574)

**81 580 504**  
Type III A

**81 580 503**  
Type III B

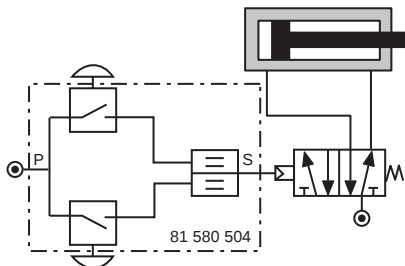
### Symbol



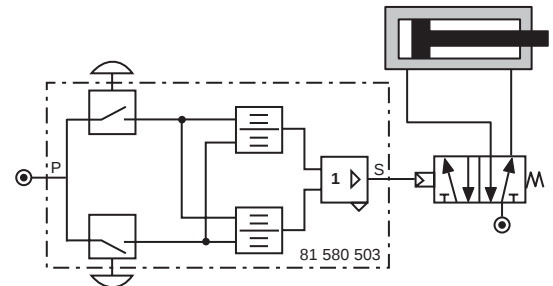
### Characteristics

|                                  |            |                                   |                                   |
|----------------------------------|------------|-----------------------------------|-----------------------------------|
| Operating pressure               | bar        | 2 → 8                             | 2 → 8                             |
| Orifice diameter                 | mm         | 2.5                               | 2.5                               |
| Max. delay between input signals | s          | 0.2 max.                          | 0.2 max.                          |
| Connection                       |            | Semi-rigid tubing Ø 4 (NFE 49100) | Semi-rigid tubing Ø 4 (NFE 49100) |
| Operating temperature            | °C         | -5 → +50                          | -5 → +50                          |
| Mechanical life                  | operations | 1.5 x 10 <sup>6</sup>             | 1.5 x 10 <sup>6</sup>             |
| Weight                           | g          | 1000                              | 1410                              |

**Connections** (Typical application with double-acting cylinder)  
**81 580 504**



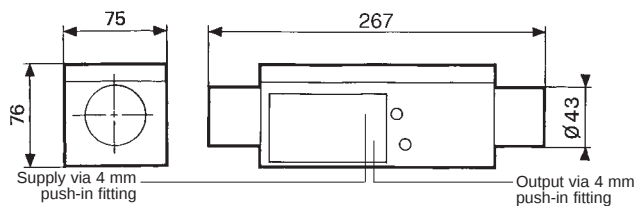
**81 580 503**



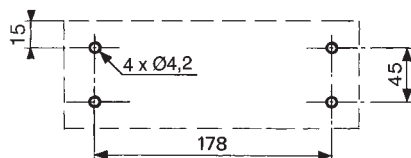
Components follow current standards

### Dimensions

**81 580 503 - 81 580 504**

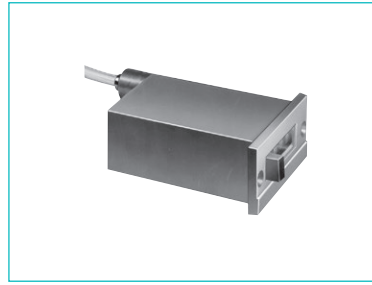


Fixing viewed from below



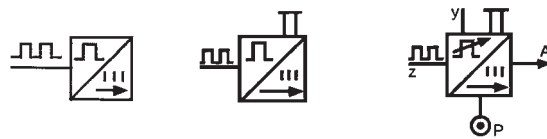
## Pneumatic impulse counters

- › 4, 5, 6 digits with or without reset
- › With or without pre-selection



|                      |                           |                                 |                                              |
|----------------------|---------------------------|---------------------------------|----------------------------------------------|
| Totalizer            | 99 766 001                | 99 766 002                      | 89 538 201                                   |
| Preselection counter | —                         | —                               | —                                            |
| Version              | 6 digits no reset to zero | 4 digits with manual zero reset | 5 digits with manual or pneumatic zero reset |

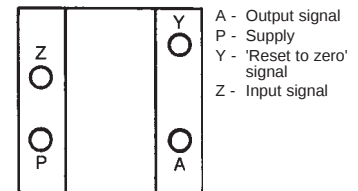
### Symbol



### Characteristics

|                                       |     |         |         |         |
|---------------------------------------|-----|---------|---------|---------|
| Supply pressure                       | bar | 2 → 8   | 2 → 8   | 2 → 8   |
| Pressure to break                     | bar | > 0.3   | > 0.3   | > 0.15  |
| Pressure to make                      | bar | > 1.4   | > 1.4   | > 0.8   |
| Reset :                               |     |         |         |         |
| Minimum pressure                      | bar | —       | —       | 2       |
| Reset time                            | ms  | —       | —       | 150     |
| Circuit pressure                      |     |         |         |         |
| bar                                   |     | —       | —       | 2 → 8   |
| Signal emitted when preset is reached |     |         |         |         |
| Operating temperature                 | °C  | 0 → +60 | 0 → +60 | 0 → +60 |
| Weight                                | g   | 150     | 150     | 136     |

### Connection

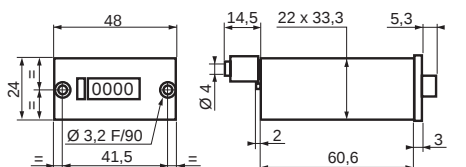


**Note :** the count pulse must be removed before the reset pulse is applied. The preset value can be changed during operation without the counter resetting to zero.

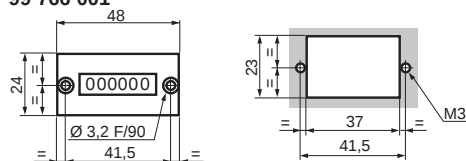
### Dimensions

Connectors for semi-rigid tubing Ø 4 (NFE 49100)

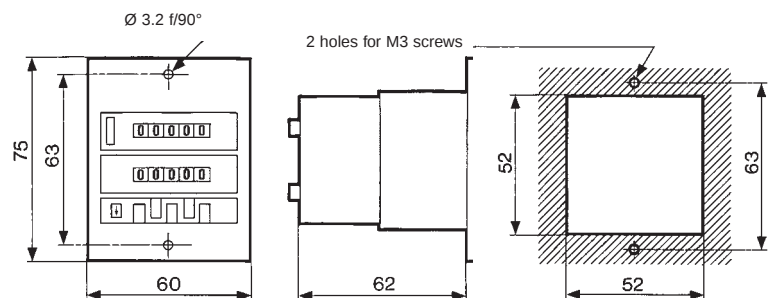
99 766 002



99 766 001



89 538 201



## Indicators and pedal valves

### › Ergonomics



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



Pneumatic indicators Ø 22

Red  
Green  
Yellow  
Blue

84 150 201  
84 150 202  
84 150 203  
84 150 204

—

—

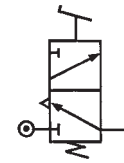
—

—

Pedal valve - Version NC

81 999 501

### Symbol

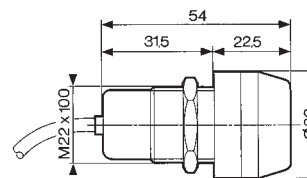


### Characteristics

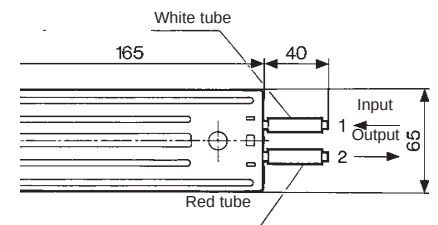
|                                                      |            |                 |                       |
|------------------------------------------------------|------------|-----------------|-----------------------|
| Operating pressure                                   | bar        | 2 → 8           | —                     |
| Push-in connection for semi-rigid tubing (NFE 49100) | mm         | Ø4              | Ø4                    |
| Operating temperature                                | °C         | -5 → +50        | -5 → +50              |
| Mechanical life                                      | operations | 10 <sup>7</sup> | 1.5 x 10 <sup>6</sup> |
| Weight                                               | g          | 34              | 290                   |

### Dimensions

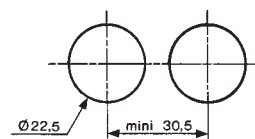
84 150 201 - 84 150 202  
84 150 203 - 84 150 204



81 999 501



### Holes drilled for indicators



# POSITION DETECTORS

# Pressure decay sensor

› 100 % pneumatic



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



Pressure decay sensor

81 504 025

## Symbol

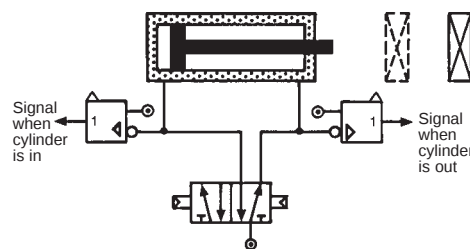


## Characteristics

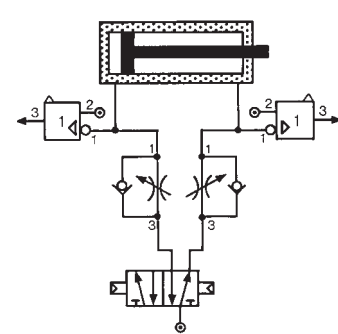
|                                  |            |                     |
|----------------------------------|------------|---------------------|
| Operating pressure               | bar        | 2 → 8               |
| Flow at 6 bars                   | NI/min     | 200                 |
| Tripping point with 6 bar supply | b          | 0.3                 |
| Connection                       |            | Sub-base page 54-55 |
| Operating temperature            | °C         | -5 → +50            |
| Mechanical life                  | operations | ≥10 <sup>7</sup>    |
| Weight                           | g          | 25                  |

## Connections

Without flow restrictor



With flow restrictor

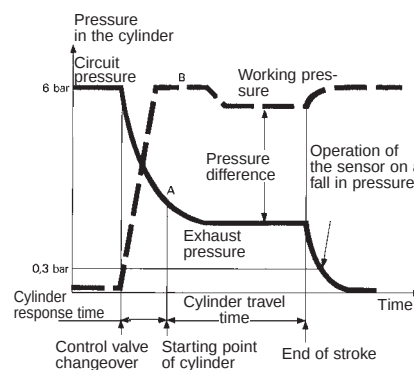


## Principle of operation

Fitted in-line between the cylinder and the control valve, the sensor will give an output when the pressure in this line is exhausted and the cylinder is at end of stroke.

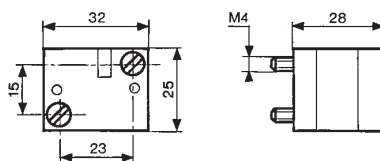
For the correct usage of sensors on a falling pressure, it is recommended that the practical cylinder load is limited to 60% of the theoretical force.

## Evolution of pressure within a double-acting cylinder



## Dimensions

81 504 025



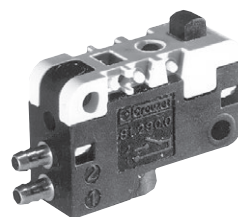
ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-control.com](http://www.crouzet-control.com)

## Low force position detector

- 100 % pneumatic
- Conforme à la norme DIN 41365 Forme A
- Faible effort d'actionnement < 50 g à 6 bars
- Pas de consommation permanente d'air comprimé

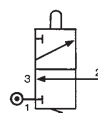
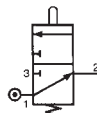


Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



|          |    |            |            |
|----------|----|------------|------------|
| Function | NO | 81 290 501 | —          |
|          | NC | —          | 81 290 001 |

---

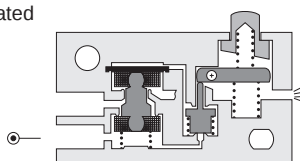
**Symbol**

## Characteristics

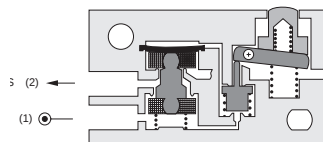
|                                       |           |                 |                 |
|---------------------------------------|-----------|-----------------|-----------------|
| Orifice diameter mm                   |           | 2               | 2               |
| Operating pressure                    | bar       | 3 → 8           | 3 → 8           |
| Flow at 4 bars                        | NI/min    | 100             | 100             |
| Activation force at 6 bars            | N         | < 0,5           | < 0,5           |
| Permissible fluids (air / inert gas)  |           | ●               | ●               |
| Max/min of fluid                      | °C        | -10 → +50       | -10 → +50       |
| temperatures operating                | °C        | -10 → +60       | -10 → +60       |
| storage                               | °C        | -40 → +70       | -40 → +70       |
| Mechanical life at 6 bars             | operation | 10 <sup>7</sup> | 10 <sup>7</sup> |
| Response on activation                | ms        | ≤ 15            | ≤ 15            |
| time on release                       | ms        | ≤ 15            | ≤ 15            |
| Barb connection for semi-rigid tubing |           | 2.7 x 4         | 2.7 x 4         |
| Weight                                | g         | 8.5             | 8.5             |

### Principle of operation NC

Desactivated



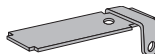
Activated



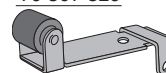
## Operation accessories

Unless otherwise requested, flat and roller-ended levers are supplied loose.

161 A  
flat R 25.4  
70 507 524

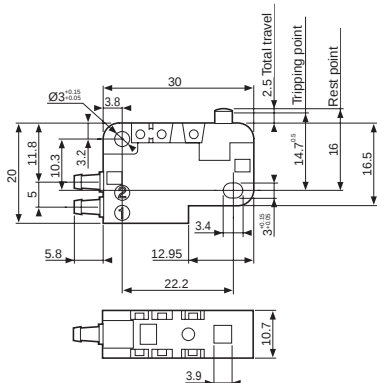


161 E  
with roller R 24.1  
70 507 529

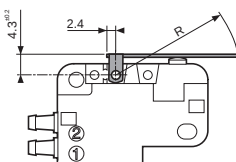


## Dimensions

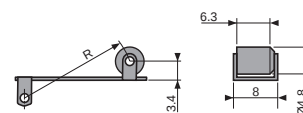
DIN 41635 Form A



161 A  
R 25.4  $\pm 0,2$



161 E  
R 24.1  $\pm 0,2$



ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website **[www.crouzet-control.com](http://www.crouzet-control.com)**

## “Microvalve” series position detectors

› 100 % pneumatic



81 280



81 281

| Version  | NO         | 81 280 010        | 81 281 010      | —                        |
|----------|------------|-------------------|-----------------|--------------------------|
| NC       | 81 280 510 | 81 281 510        | 81 283 510      |                          |
| Features |            | Horizontal output | Vertical output | Rear connection by screw |
| Symbol   |            |                   |                 |                          |

NO



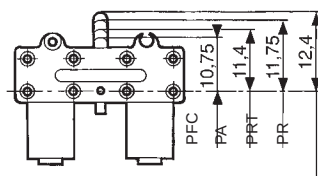
NC



### Characteristics

|                                                      |         |                     |                     |                     |
|------------------------------------------------------|---------|---------------------|---------------------|---------------------|
| Operating pressure                                   | bar     | 2 → 8               | 2 → 8               | 2 → 8               |
| Orifice diameter                                     | mm      | 2.7                 | 2.7                 |                     |
| Flow at 6 bars                                       | NI/min  | 200                 | 200                 | 138                 |
| Operating force at 6 bars                            | N       | 15                  | 15                  | 15                  |
| Effective travel                                     | mm      | 1                   | 1                   | 1                   |
| Push-in connection for semi-rigid tubing (NFE 49100) | mm      | Ø 4                 | Ø 4                 | Ø 4                 |
| Operating temperature                                | °C      | -5 → +50            | -5 → +50            | -5 → +50            |
| Mechanical life                                      | operat. | 5 x 10 <sup>6</sup> | 5 x 10 <sup>6</sup> | 5 x 10 <sup>6</sup> |
| Weight                                               | g       | 14                  | 14                  | 20                  |

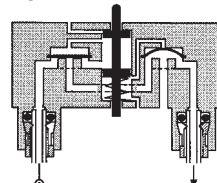
### Principle of operation



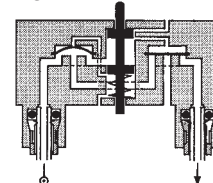
Actuation positions :

PFC : End of travel position  
PA : Operating position (max output kV)  
PRT : Release position (max. exhaust kV)  
PR : Rest position

NC

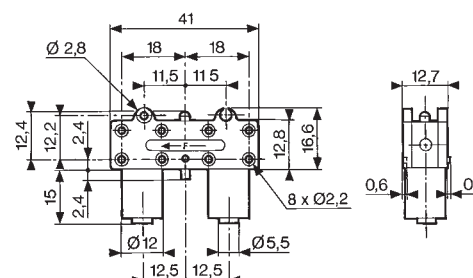


NO

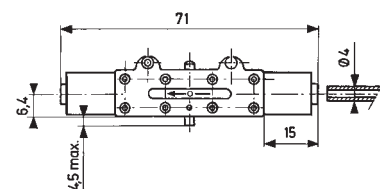


### Dimensions

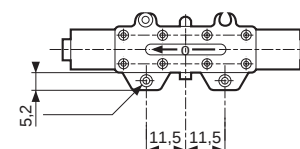
81 281 010 - 81 281 510



81 280 010 - 81 280 510

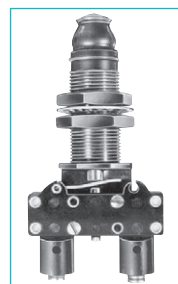
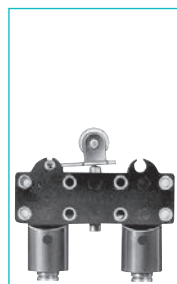
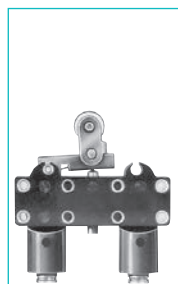
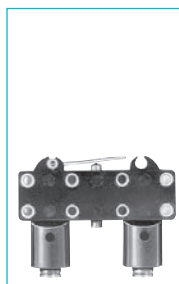


81 283 510



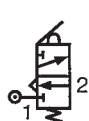
## “Microvalve” series position detectors

› 100 % pneumatic



| Features |    |                 | Short lever | With ball  | Roller trip | With roller | Threaded barrel Ø 16<br>Plunger |
|----------|----|-----------------|-------------|------------|-------------|-------------|---------------------------------|
| Version  | NC | Vertical output | 81 281 502  | 81 281 504 | 81 281 508  | 81 281 509  | 81 737 501                      |

### Symbol

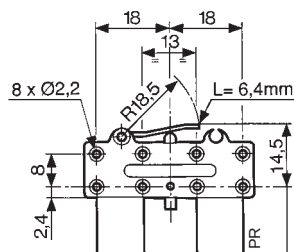


### Characteristics

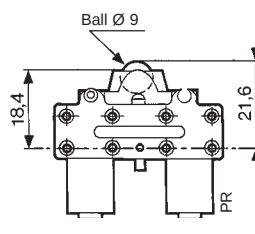
|                                                      |         |                     |                     |                     |                     |                     |
|------------------------------------------------------|---------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Operating pressure                                   | bar     | 2 → 8               | 2 → 8               | 2 → 8               | 2 → 8               | 2 → 8               |
| Orifice diameter                                     | mm      | 2.7                 | 2.7                 | 2.7                 | 2.7                 | 2.7                 |
| Flow at 6 bars                                       | NI/min  | 200                 | 200                 | 200                 | 200                 | 200                 |
| Operating force at 6 bars                            | N       | 15                  | 15                  | 15                  | 15                  | 25                  |
| Effective travel                                     | mm      | 1                   | 1                   | 1                   | 1                   | 1                   |
| Push-in connection for semi-rigid tubing (NFE 49100) | mm      | Ø 4                 | Ø 4                 | Ø 4                 | Ø 4                 | Ø 4                 |
| Operating temperature                                | °C      | -5 → +50            | -5 → +50            | -5 → +50            | -5 → +50            | -5 → +50            |
| Mechanical life                                      | operat. | 5 x 10 <sup>6</sup> | 5 x 10 <sup>6</sup> | 5 x 10 <sup>6</sup> | 5 x 10 <sup>6</sup> | 5 x 10 <sup>6</sup> |
| Weight                                               | g       | 16                  | 18                  | 18                  | 18                  | 90                  |

### Dimensions

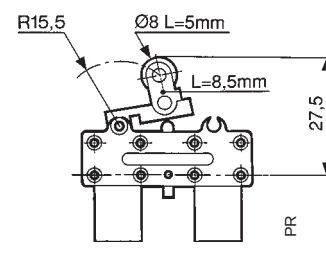
81 281 502



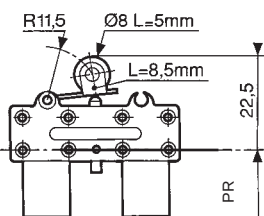
81 281 504



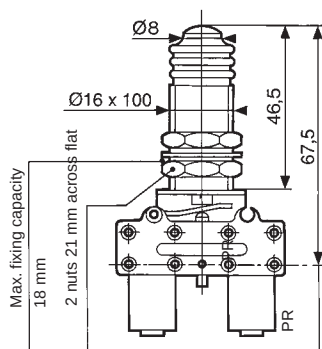
81 281 508



81 281 509



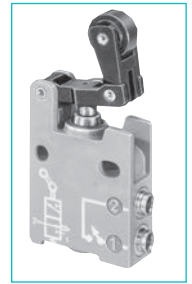
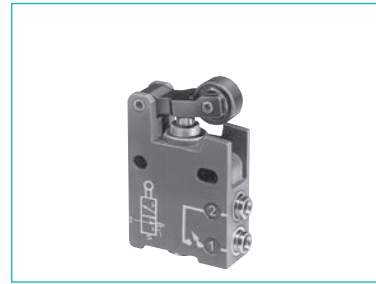
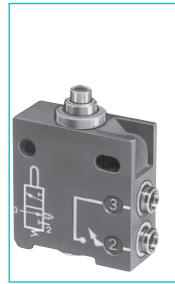
81 737 501



Actuation positions :  
PR : Rest position

## "Miniature" series position detectors

- 100 % pneumatic
- All metal

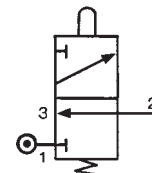


### Part numbers

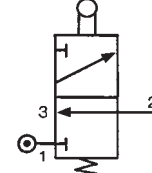
|         |                                                      |                |                                        |                           |
|---------|------------------------------------------------------|----------------|----------------------------------------|---------------------------|
| Version | Push-in connection for semi-rigid tubing (NFE 49100) |                |                                        |                           |
| NC      | Ø 4 silenced exhaust                                 | 81 921 501     | 81 921 701                             | 81 921 702                |
|         | M5 connectable exhaust                               | —              | —                                      | —                         |
|         | Ø 4 connectable exhaust *                            | —              | —                                      | —                         |
| NO      | Ø 6 connectable exhaust *                            | —              | —                                      | —                         |
|         | Ø 4 silenced exhaust                                 | —              | —                                      | —                         |
| NO      | Ø 6 silenced exhaust                                 | —              | —                                      | —                         |
| Control |                                                      | Simple plunger | Lever with plastic roller              | Lever with roller bearing |
|         |                                                      |                | Lever with one-way trip plastic roller |                           |

### Symbol

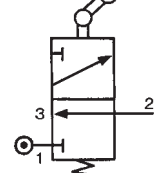
NC



NC



NC

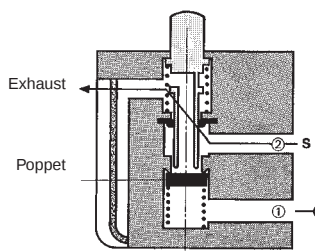


### Characteristics

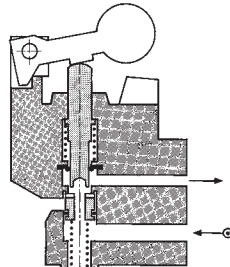
|                           |            |                  |                  |                  |                  |
|---------------------------|------------|------------------|------------------|------------------|------------------|
| Operating pressure        | bar        | 0.1 → 8          | 0.1 → 8          | 0.1 → 8          | 0.1 → 8          |
| Orifice diameter          | mm         | 2.7              | 2.7              | 2.7              | 2.7              |
| Flow at 6 bars            | NI/min     | 200              | 200              | 200              | 200              |
| Actuation force at 6 bars | N          | 18               | 18               | 18               | 18               |
| Circuit function : NC     |            | ●                | ●                | ●                | ●                |
| Circuit function: NO      |            | —                | —                | —                | —                |
| Connectable exhaust       |            |                  |                  |                  |                  |
| Operating temperature     | °C         | -5 → +50         | -5 → +50         | -5 → +50         | -5 → +50         |
| Mechanical life           | operations | ≥10 <sup>7</sup> | ≥10 <sup>7</sup> | ≥10 <sup>7</sup> | ≥10 <sup>7</sup> |
| Weight                    | g          | 62               | 75               | 80               | 77               |

### Principle of operation

NC



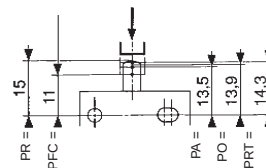
NO



### Actuation travel

Vertical attack

Simple plunger

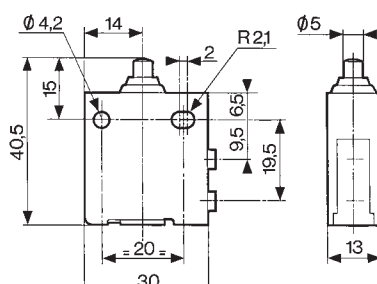


### Actuation positions :

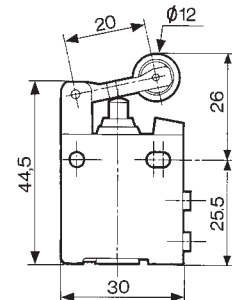
- PA : Operating position (max output kV)
- PFC : End of travel position
- PO : Mid-position closed (no exhaust, no outlet)
- PRT : Release position (max exhaust kV)
- PR : Rest position

### Dimensions

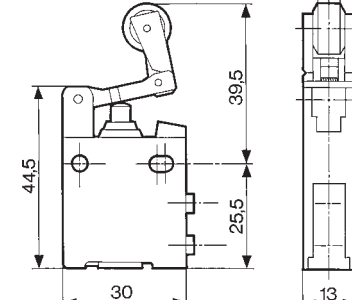
81 921 501



81 921 701 - 81 921 702

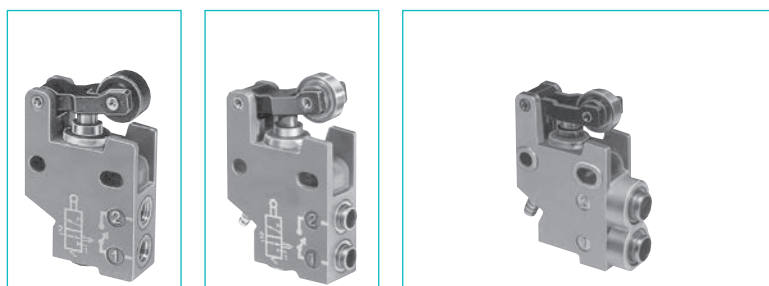


81 921 707

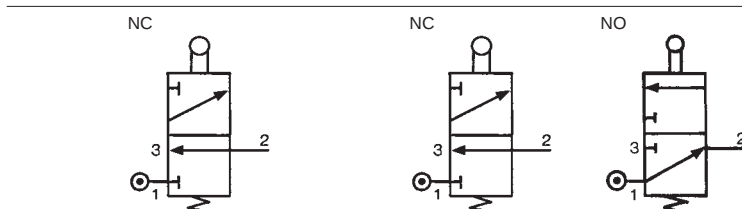


\* with barb for tube Ø 2.7 x 4

Material: body zamak



|                           |                           |                           |                           |
|---------------------------|---------------------------|---------------------------|---------------------------|
| —                         | —                         | —                         | —                         |
| 81 921 806                | —                         | —                         | —                         |
| —                         | 81 921 714                | —                         | —                         |
| —                         | —                         | 81 921 719                | 81 921 717                |
| —                         | —                         | 81 921 911                | 81 921 912                |
| —                         | —                         | 81 921 901                | 81 921 902                |
| Lever with plastic roller | Lever with roller bearing | Lever with plastic roller | Lever with roller bearing |



|                  |                  |                  |                  |
|------------------|------------------|------------------|------------------|
| 0.1 → 8          | 0.1 → 8          | 0.1 → 8          | 0.1 → 8          |
| 2.7              | 2.7              | 2.7              | 2.7              |
| 200              | 200              | 200              | 200              |
| 18               | 18               | 18               | 18               |
| —                | —                | —                | —                |
| —                | —                | —                | —                |
| —5 → +50         | —5 → +50         | —5 → +50         | —5 → +50         |
| ≥10 <sup>7</sup> | ≥10 <sup>7</sup> | ≥10 <sup>7</sup> | ≥10 <sup>7</sup> |
| 75               | 80               | 100              | 100              |

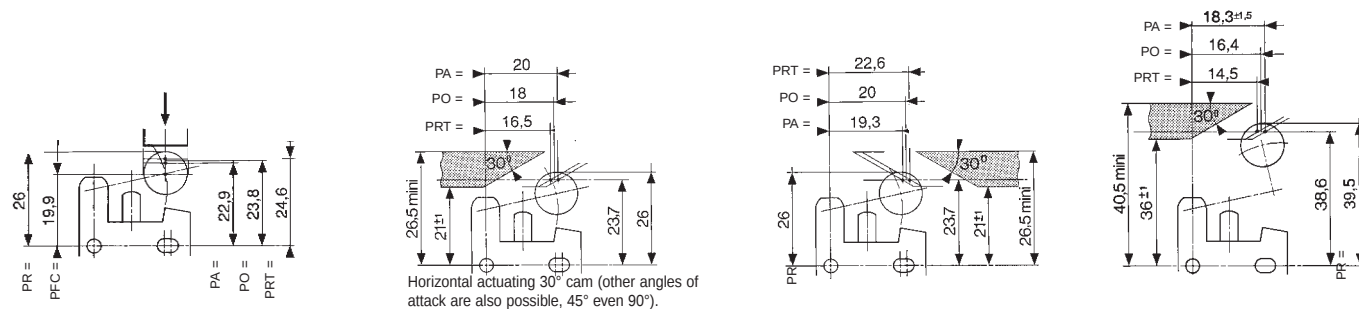
With lever

Horizontal actuating 30° cam (other angles of attack are also possible, 45° even 90°).

With lever

With lever

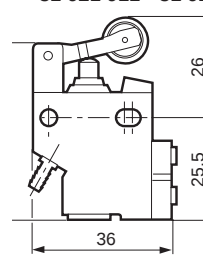
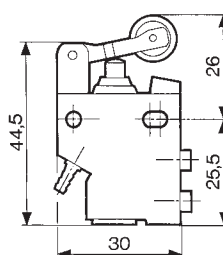
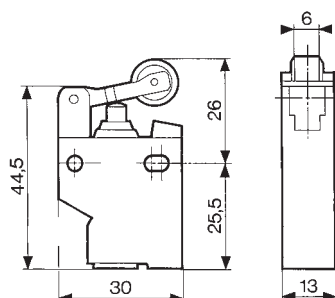
One-way trip lever



81 921 806

81 921 714

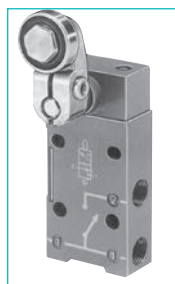
81 921 717 - 81 921 719  
81 921 901 - 81 921 902  
81 921 911 - 81 921 912



Material: body zamak  
Other configuration on demand

## "Compact" series position detectors

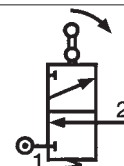
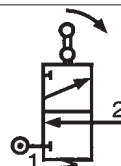
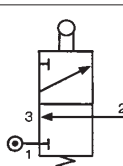
- › 100 % pneumatic
- › All metal



### Part numbers

| Features | Direct acting<br>81 922 401           | Rotary actuator<br>81 922 205                    | Rotary actuator<br>81 922 010          | Rotary actuator<br>81 922 210          |
|----------|---------------------------------------|--------------------------------------------------|----------------------------------------|----------------------------------------|
| Version  | Roller plunger with unthreaded barrel | Right-hand rotary head with roller lever (CNOMO) | Programmable rotary head without lever | Programmable rotary head without lever |

### Symbol



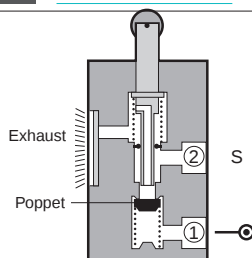
### Characteristics

| Connection                            | BSP<br>push-in for semi-rigid tubing<br>(NFE 49100) | mm                | —                 | 1/8               | —                 | 1/8               |
|---------------------------------------|-----------------------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Operating pressure                    | bar                                                 | 0.1 → 8           | 0.1 → 8           | 0.1 → 8           | 0.1 → 8           | 0.1 → 8           |
| Bore diameter                         | mm                                                  | 3                 | 3                 | 3                 | 3                 | 3                 |
| Flow at 6 bars                        | Nm³/h                                               | 200               | 200               | 200               | 200               | 200               |
| Activation force at 6 bars            | daN                                                 | 2.5               | 2.5               | 2.5               | 2.5               | 2.5               |
| Circuit function: NC                  |                                                     | •                 | •                 | •                 | •                 | •                 |
| Mechanical life                       | operations                                          | > 10 <sup>7</sup> | > 10 <sup>7</sup> | > 10 <sup>7</sup> | > 10 <sup>7</sup> | > 10 <sup>7</sup> |
| Silenced or connectable (1/8) exhaust |                                                     | •                 | •                 | •                 | •                 | •                 |
| Operating temperature                 | °C                                                  | -5 → +50          | -5 → +50          | -5 → +50          | -5 → +50          | -5 → +50          |
| Weight                                | g                                                   | 150               | 193               | 175               | 175               | 175               |

### Accessories

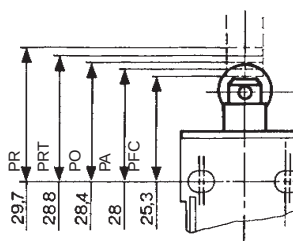
|                              |         |            |   |   |   |   |
|------------------------------|---------|------------|---|---|---|---|
| Lever with roller            | plastic | 79 452 103 | — | • | • | • |
| Lever with roller            | bearing | 79 452 104 | — | • | • | • |
| Lever with adjustable roller | plastic | 79 452 123 | — | • | • | • |
| Lever with adjustable roller | bearing | 79 452 124 | — | • | • | • |
| Adjustable steel rod lever   |         | 79 452 133 | — | • | • | • |

### Principle of operation



### Vertical attack

Detectors with roller plunger with unthreaded barrel.



#### Actuation positions :

- PA : Operating position (max output kV)
- PFC : End of travel position
- PO : Mid-position closed (no exhaust, no outlet)
- PRT : Release position (max exhaust kV)
- PR : Rest position

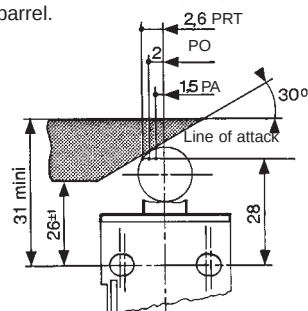
The detectors 81 922 010 and 81 922 210 can operate to both left and right.

**Material: body zamak**

**Other configuration on demand**

### Horizontal attack

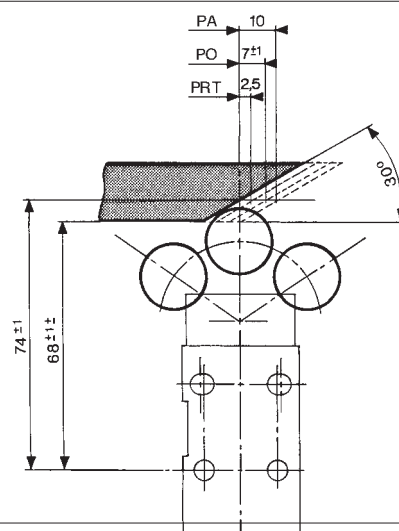
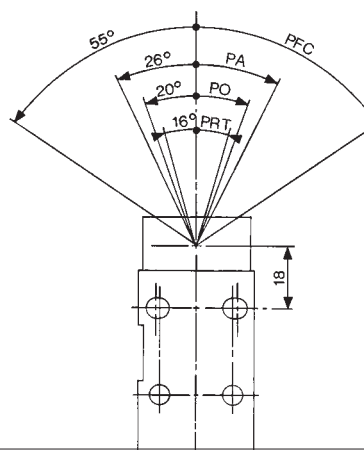
Detectors with roller plunger with unthreaded barrel.



## Rotary actuator

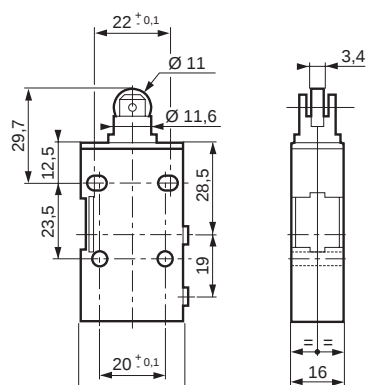
Detectors with levers

81 922 - 81 922 0 - 81 922 2

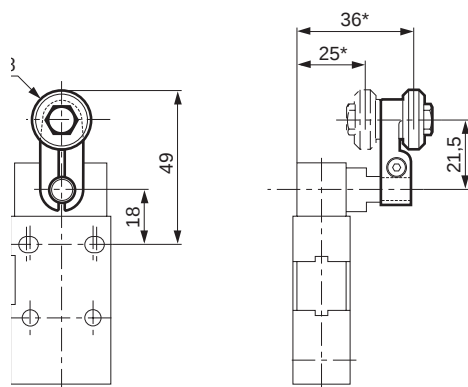


## Dimensions

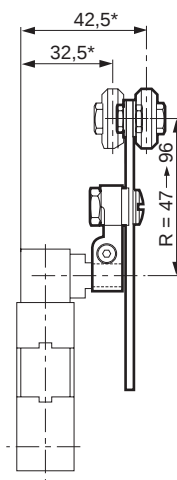
81 922 401



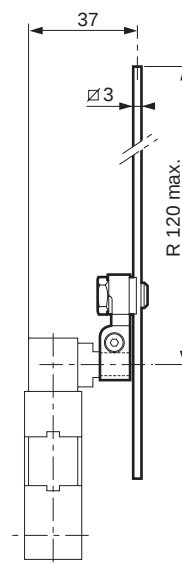
81 922 205 - 81 922 0 - 81 922 2  
79 452 103 - 79 452 104



79 452 123 - 79 452 124

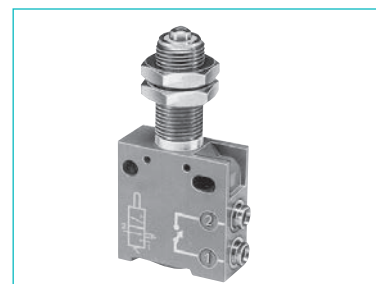


79 452 133



## "Adjustable stop" series position detectors

- › 100 % pneumatic
- › All metal



### Part numbers

Push-in connection for semi-rigid tubing (NFE 49100)

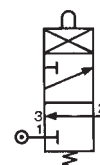
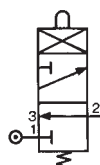
81 923 001

Barb for tube 2.7 x 4

81 921 505

Push-in connector for tube Ø 4

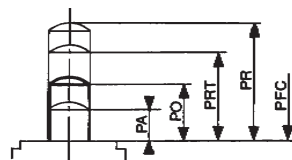
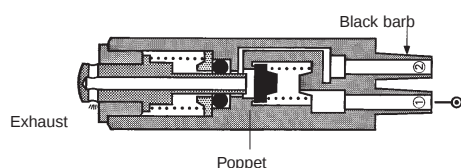
### Symbol



### Characteristics

|                                                  |            |                  |                  |
|--------------------------------------------------|------------|------------------|------------------|
| Operating pressure                               | bar        | 0,1 → 8          | 0,1 → 8          |
| Orifice diameter                                 | mm         | 2                | 2,7              |
| Flow at 6 bars                                   | NI/min     | 130              | 200              |
| Actuation force at 6 bars                        | N          | 16               | 21               |
| Circuit function: NC                             |            | •                | •                |
| Max. load: without shock                         | daN        | 1000             | 1000             |
| Will stop a 63 mm Ø cylinder : 6 bar supply      |            | •                | •                |
| Operating temperature                            | °C         | -5 → +50         | -5 → +50         |
| Mechanical life                                  | operations | ≥10 <sup>7</sup> | ≥10 <sup>7</sup> |
| Weight                                           | g          | 27               | 90               |
| Actuation positions                              |            |                  |                  |
| PA : Operating position (max output kV)          | mm         | 0,4              | 0,7              |
| PFC : End of travel position                     | mm         | 0                | 0                |
| PO : Mid-point closed<br>(no exhaust, no outlet) | mm         | 0,9              | 1                |
| PRT : Release position<br>(max. exhaust kV)      | mm         | 1,5              | 1,5              |
| PR : Rest position                               | mm         | 3                | 3                |

### Principle of operation



| Versions  | PO  | PA  | PFC | PRT | PR |
|-----------|-----|-----|-----|-----|----|
| With barb | 0.9 | 0.4 | 0   | 1.5 | 3  |
| Ø 4       | 1   | 0.7 | 0   | 1.5 | 3  |

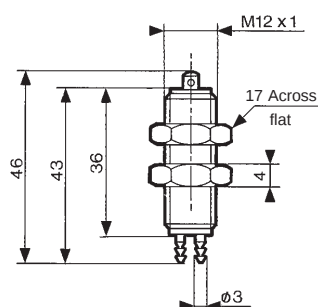
Values in mm

#### Actuation positions :

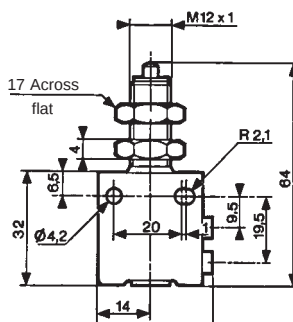
- PA : Operating position (max output kV)
- PFC : End of travel position
- PO : Mid-position closed  
(no exhaust, no outlet)
- PRT : Release position  
(max exhaust kV)
- PR : Rest position

### Dimensions

#### 81 923 001

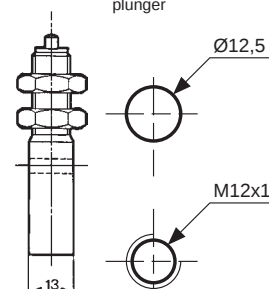


#### 81 921 505



#### Fixing

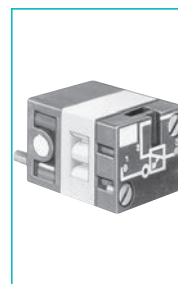
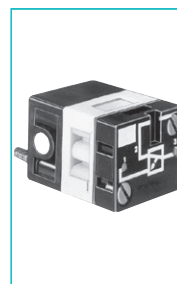
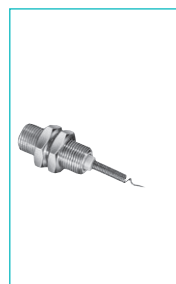
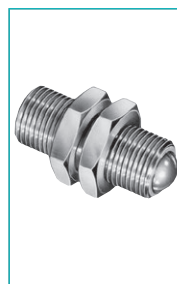
This should be as close as possible to the plunger



Material: body zamak

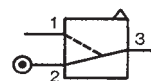
## Position detectors use with relay

- › 100 % pneumatic
- › All metal
- › Low force operation <N 1
- › Very low force Version 30 mN



### References

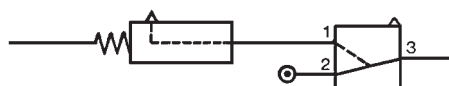
| Version       | 81 512 201<br>with ball | 81 512 401<br>with wire | 81 502 435<br>Positive | 81 505 435<br>Negative |
|---------------|-------------------------|-------------------------|------------------------|------------------------|
| <b>Symbol</b> |                         |                         |                        |                        |



### Characteristics

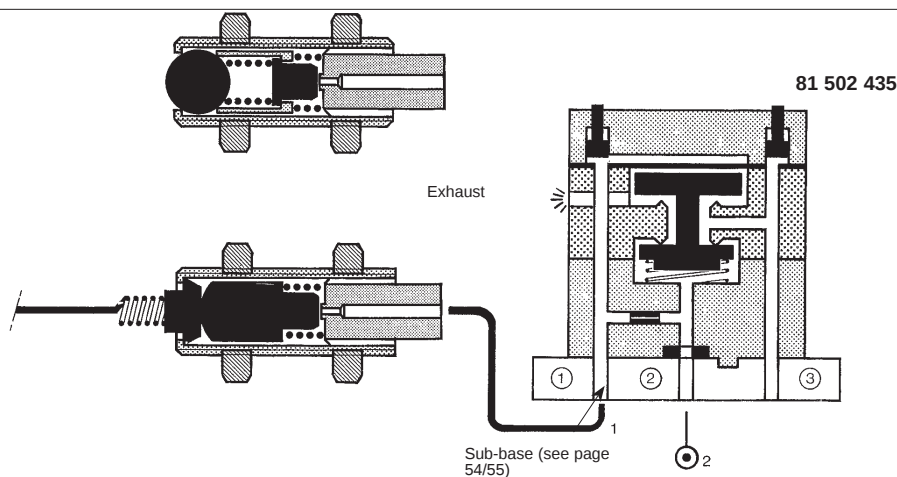
|                                                                                      |            |                 |                 |                  |                  |
|--------------------------------------------------------------------------------------|------------|-----------------|-----------------|------------------|------------------|
| Push-in connection for semi-rigid tubing (NFE 49100)                                 | mm         | Ø 4             | Ø 4             |                  |                  |
| Life at 6 bars                                                                       | operations | 10 <sup>7</sup> | 10 <sup>7</sup> |                  |                  |
| Actuation force at 6 bars                                                            | N          | 0,8             | 0,025           |                  |                  |
| Fluid used: that delivered by the leak sensor relay..                                |            | •               | •               |                  |                  |
| Operating temperature                                                                | °C         | -5 → +50        | -5 → +50        | -5 → +50         | -5 → +50         |
| Weight                                                                               | g          | 24,5            | 23,5            | 35               | 35               |
| Operating pressure                                                                   | bar        |                 |                 | 2 → 8            | 2 → 8            |
| Sensor consumption for relay supply at 6 bar                                         | NI/        |                 |                 | 5                | 5                |
| The distance between relay and sensor must be less than 15 m for a tube Ø 2.7 x 4 mm |            |                 |                 | •                | •                |
| Connection - sub-base see pages 54/55                                                |            |                 |                 | •                | •                |
| Mechanical life                                                                      | operations |                 |                 | ≥10 <sup>7</sup> | ≥10 <sup>7</sup> |

### Connection



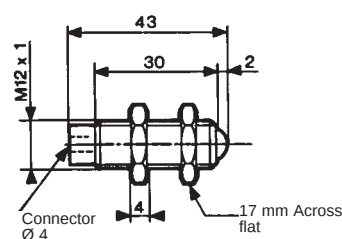
### Principle of operation

Supplied at industrial pressure, the relay produces a permanent bleed at its input port. A sensor shutting off this bleed causes the relay to switch.

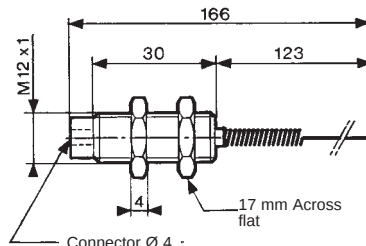


### Dimensions

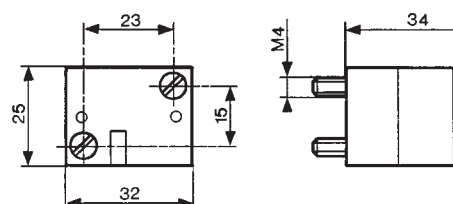
#### 81 512 201



#### 81 512 401



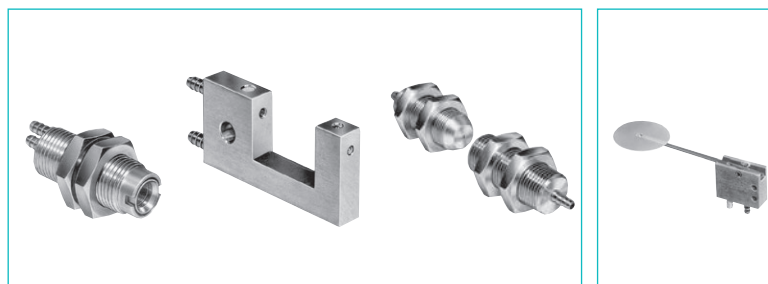
#### 81 502 435 - 81 505 435



Material: brass

## Position detectors

- › 100 % pneumatic
- › All metal
- › Gap, proximity, paddle



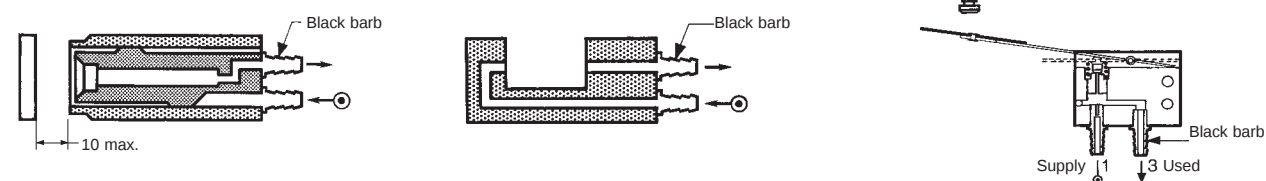
### Part numbers

| Detector | 81 371 401<br>de proximité | 81 372 201<br>gap | 81 372 401<br>gap | 81 372 901<br>with palette |
|----------|----------------------------|-------------------|-------------------|----------------------------|
| Symbol   |                            |                   |                   |                            |

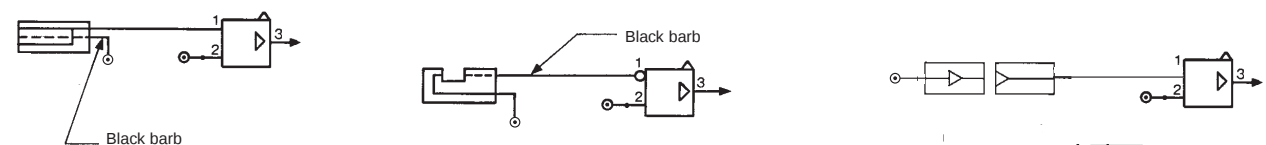
### Characteristics

|                                                   |                     |            |            |            |           |
|---------------------------------------------------|---------------------|------------|------------|------------|-----------|
| Detection distance                                | mm                  | 6 → 10     | 18         | 100        | —         |
| 18 mm gap sensor                                  |                     | —          | —          | —          | —         |
| Supply pressure                                   | bar                 | 0.5 → 2.5  | 0.5 → 2.5  | 0.5 → 2.5  | —         |
| Minimum output pressure                           | mbar                | 1          | 5          | 5          | —         |
| Unlimited life (static component)                 |                     | ●          | ●          | ●          | —         |
| Operating temperature                             | °C                  | - 20 → +70 | - 20 → +70 | - 20 → +70 | —         |
| Consumption at supply pressure of:                | NI/h                | 800        | 70         | 100        | —         |
|                                                   | 2.5 b               | 2500       | 2200       | 700        | —         |
| Barb connection for semi-rigid tubing (NFE 49100) | mm                  | Ø 2.7 x 4  | Ø 2.7 x 4  | Ø 2.7 x 4  | Ø 2.7 x 4 |
| Operating pressure                                | nozzle sensor       | —          | —          | —          | 2 → 8     |
|                                                   | d. detection 200 mm | —          | —          | —          | 2 → 8     |
|                                                   | d. detection 100 mm | —          | —          | —          | 1 → 4     |
| Flow                                              | nozzle at 2 bars    | —          | —          | —          | 320       |
|                                                   | sensor at 2 bars    | —          | —          | —          | 320       |
|                                                   | at 2 bars           | —          | —          | —          | 0.03      |
|                                                   | at 6 bars           | —          | —          | —          | 0.09      |
| Sensor consumption for relay supply at 6 bars     | NI/min              | —          | —          | —          | 5         |
| Weight                                            | g                   | 36         | 9          | 63         | 14        |

### Principle of operation

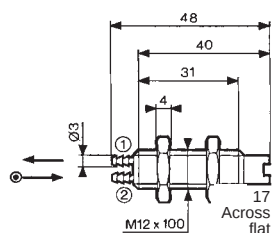


### Connection

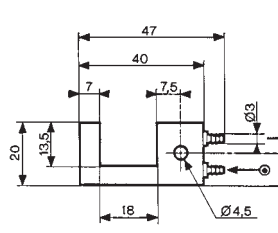


### Encombrements

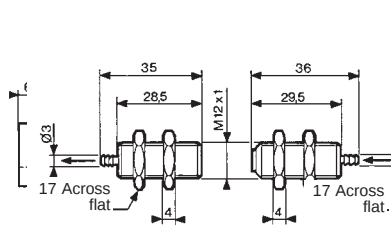
#### 81 371 401



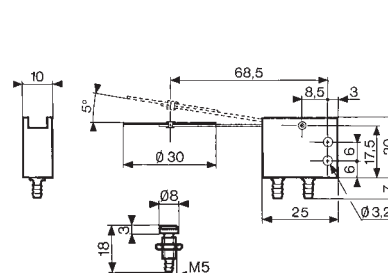
#### 81 371 201



#### 81 372 401



#### 81 372 901



# Amplifiers for mounting on installation plan

## Gap sensor



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



## Part numbers

Simple amplifiers (for 81 372 201/401)

Sensitive amplifiers (for 81 371 401)

Version

81 502 230

81 505 230

81 502 320

81 505 320

positive

negative

positive

negative

## Symbol



## Characteristics

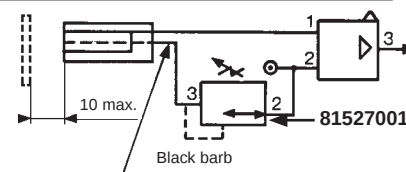
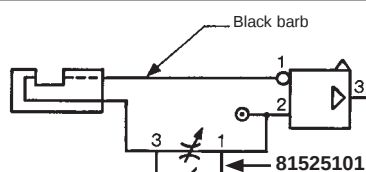
|                                         |            |                     |                     |                     |                     |
|-----------------------------------------|------------|---------------------|---------------------|---------------------|---------------------|
| Pressure to make                        | mb         | 10 → 20             | 10 → 20             | 1 → 4               | 1 → 4               |
| Operating pressure (non-lubricated air) | bar        | 2 → 8               | 2 → 8               | 2 → 6               | 2 → 6               |
| Orifice diameter                        | mm         | 2.5                 | 2.5                 | 2.5                 | 2.5                 |
| Average consumption at 4 bars           | Nl/min     | 5                   | 5                   | 5                   | 5                   |
| Permissible overload for 1 hour         | mb         | 800                 | 800                 | 800                 | 800                 |
| Operating temperature                   | °C         | -5 → +50            | -5 → +50            | -5 → +50            | -5 → +50            |
| Mechanical life                         | operations | 3 x 10 <sup>6</sup> | 3 x 10 <sup>6</sup> | 3 x 10 <sup>6</sup> | 3 x 10 <sup>6</sup> |
| Weight                                  | g          | 150                 | 150                 | 185                 | 185                 |

## Connections

Used for gaps up to 25 mm.

The supply to the sensor should be made via a pressure regulator or one-way flow restrictor (see page 52)

Connection - sub-base

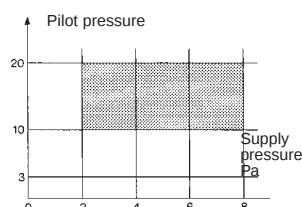


## Principle of operation

### Simple amplifiers

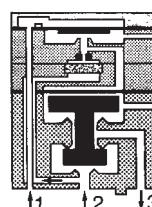
An output at normal industrial pressure is delivered on a low pressure input.

NB: Hysteresis is 20% of the pilot pressure.



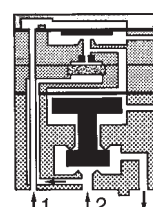
81 502 230

Positive output



81 505 230

Negative output

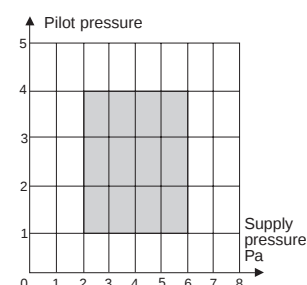


1- pilot  
2- supply  
3- output

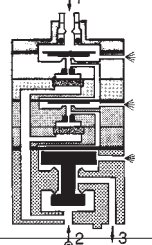
### Sensitive amplifiers

An output at normal industrial pressure is delivered on a very low pressure input.

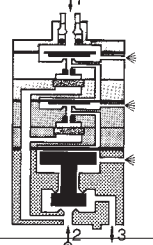
Note: The specifications are given for a supply pressure of 6 bars, and for detection at the mid-point of the gap.



81 502 320

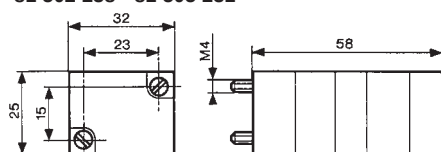


81 505 320

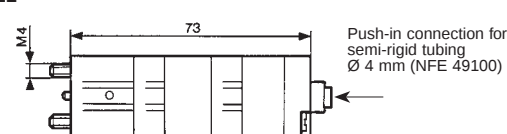
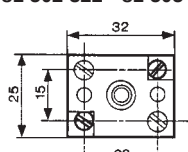


## Dimensions

81 502 238 - 81 505 231



81 502 322 - 81 505 321



Push-in connection for semi-rigid tubing Ø 4 mm (NFE 49100)

## Other information

With gap sensors, use an amplifier with negative output if you require a signal on interruption of the jet.

ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-control.com](http://www.crouzet-control.com)

# Amplifier with intégral régulator, positive output

- › Setting Flow
- › Fixing rail 35mm wide



## Part numbers

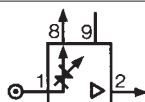
Amplifiers with integral regulator

81 510 001

Version

Positive output

## Symbol



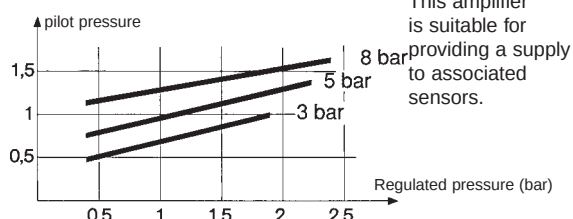
## Characteristics

|                                                                              |            |                     |                     |                     |
|------------------------------------------------------------------------------|------------|---------------------|---------------------|---------------------|
| Pressure to make                                                             | mb         | 0.5 → 1.5           | —                   | —                   |
| Reduced pressure supplied at port 8                                          | bar        | 0.5 → 2.5           | —                   | —                   |
| Flow through port 8                                                          | Nm³/h      | 0.1 → 2.5           | —                   | —                   |
| Consumption of amplifier only                                                | NI/h       | 100 → 200           | —                   | —                   |
| Permissible overload for 1 hour                                              | mb         | 300                 | —                   | —                   |
| Operating temperature                                                        | °C         | -5 → +50            | -5 → +50            | -5 → +50            |
| Mechanical life                                                              | operations | 3 x 10 <sup>6</sup> | 3 x 10 <sup>6</sup> | 3 x 10 <sup>6</sup> |
| Weight                                                                       | g          | 380                 | —                   | —                   |
| Detectors (see page 28)                                                      |            | Proximity<br>Ø 12   | Gap<br>Ø 18         | Proximity<br>Ø 12   |
| Nominal range                                                                | mm         | 81 371 401          | 81 372 201          | 81 372 401          |
| Min. total consumption for detection<br>(0.5 b regulated pressure)           |            | 8                   | 18                  | 100                 |
| Max. total consumption for short response<br>time (2.5 b regulated pressure) | NI/h       | 880                 | 140                 | —                   |
| Min. detectable<br>dimensions                                                | mm         | 2750                | 400                 | 920                 |
| nominal sensing distance                                                     | mm         | Ø 3                 | Ø 2 - Ø 1.5         | Ø 7 - Ø 6.5         |
| Max. frequency of use                                                        | 2          | 2                   | —                   | —                   |
| Force exerted by the jet on the parts<br>to be detected                      | Hz         | 5                   | 5                   | 5                   |
|                                                                              | N          | 0.02 → 0.7          | 0.01 → 0.03         | 0.1                 |

## Connection

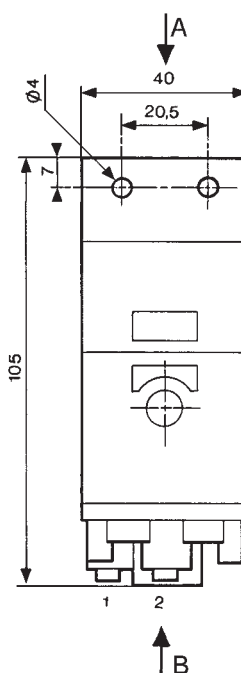
To use with detectors page 32

## Principle of operation

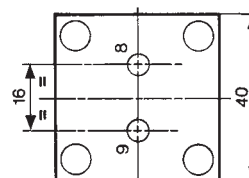


## Dimensions

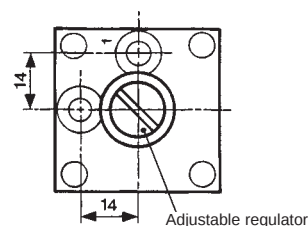
Push-in connection for semi-rigid tubing Ø 4 mm (NFE 49100)



Viewed from B



Viewed from A

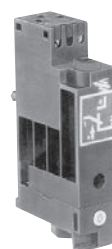


# PRESSURE SWITCHES

## VACUUM

## Pressure switches - vacuum (electrical output)

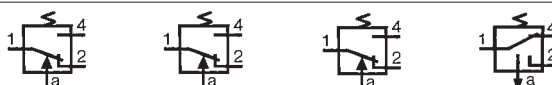
- Conform to the Low Voltage Directive
- Can be used without enclosure according to IEC 664-1 pollution group III



### Part numbers

|                              |            |            |              |            |
|------------------------------|------------|------------|--------------|------------|
| Pressure and vacuum switches | 81 513 552 | 81 513 502 | 81 513 501   | 81 513 522 |
| Mounting                     | DIN rail   | DIN rail   | DIN rail     | DIN rail   |
| Actuators                    | Pressure   | Pressure   | Low pressure | Vacuum     |
| Manual override              | with       | without    | without      | without    |

### Symbol



### Characteristics

|                                                      |                                                                                     |                  |                  |                  |                  |
|------------------------------------------------------|-------------------------------------------------------------------------------------|------------------|------------------|------------------|------------------|
| Pneumatic connection                                 | Push-in connection for semi-rigid tubing (NFE 49100) mm<br>Tapped BSP via connector | Ø 4 ext.         | Ø 4 ext.         | Ø 4 ext.         | Ø 4 ext.         |
| Protection                                           | IEC 529                                                                             | IP 20            | IP 20            | IP 20            | IP 20            |
| Permissible fluid: air, inert gases and liquids      |                                                                                     | •                | •                | •                | •                |
| Adjustment of switching pressure (* adjusted to 0.3) | bar                                                                                 | 2 → 8            | 2 → 8            | 0.3 → 1.2 *      | -0.3 → -0.8      |
| Hysteresis                                           | at 1 bar bar                                                                        | 0.5              | 0.5              | —                | —                |
|                                                      | at 2 bars bar                                                                       | 0.6              | 0.6              | —                | —                |
|                                                      | at 4 bars bar                                                                       | 0.8              | 0.8              | —                | —                |
|                                                      | at 6 bars bar                                                                       | 1                | 1                | —                | —                |
|                                                      | max. 200 mb                                                                         | —                | —                | •                | —                |
|                                                      | max. 250 mb                                                                         | —                | —                | —                | •                |
| Pressure to break                                    |                                                                                     | —                | —                | —                | —                |
| Mechanical life (operations)                         |                                                                                     | 10 <sup>6</sup>  | 10 <sup>6</sup>  | 10 <sup>6</sup>  | 10 <sup>6</sup>  |
| Contact rating (V resistive)                         |                                                                                     | 5A - 220-230 V   | 5A - 220-230 V   | 5A - 220-230 V   | 5A - 220-230 V   |
| Wire cross-section                                   | mm <sup>2</sup>                                                                     | 0.75             | 0.75             | 0.75             | 0.75             |
| Operating temperature                                | °C                                                                                  | -10 → +70        | -10 → +70        | -10 → +70        | -10 → +70        |
| Weight                                               | g                                                                                   | 48               | 46               | 46               | 46               |
| Standard electrical contact                          |                                                                                     | V4 83 170 4 I W2 | V4 83 170 4 I W2 | V4 83 170 4 I W2 | V4 83 170 4 I W2 |
| UL and cUL approval                                  |                                                                                     | MH15213 (R)      | MH15213 (R)      | MH15213 (R)      | MH15213 (R)      |

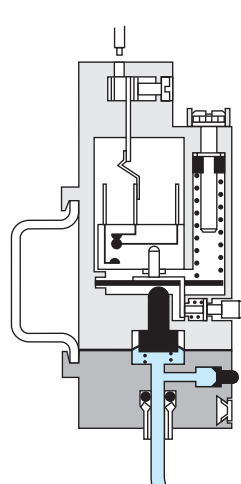
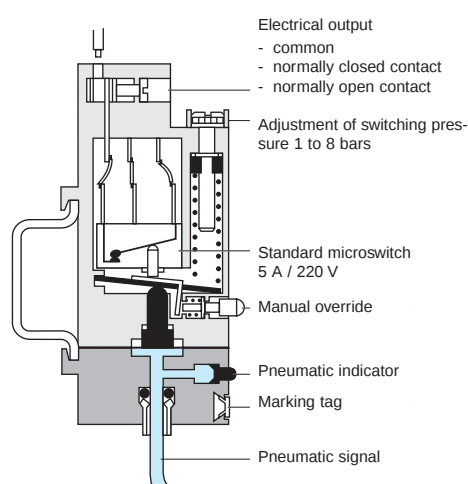
### Operation

Pressure operated

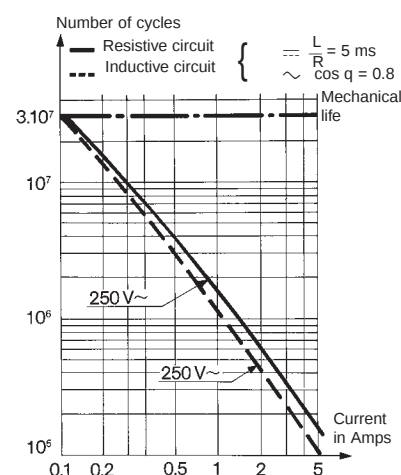
Vacuum operated

### Electrical life

(Crouzet microswitch "V4" ref 83 170 4-1-W2)



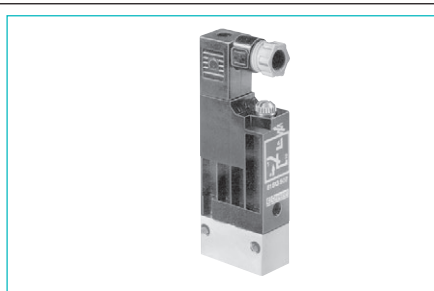
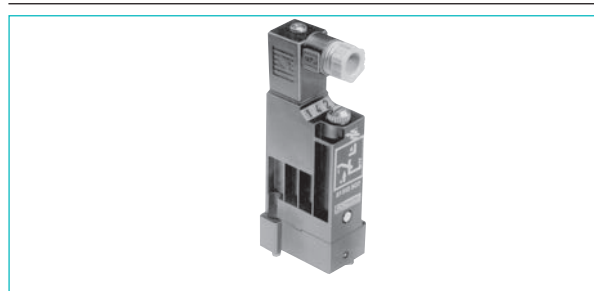
For continuous vacuum applications, please consult us.



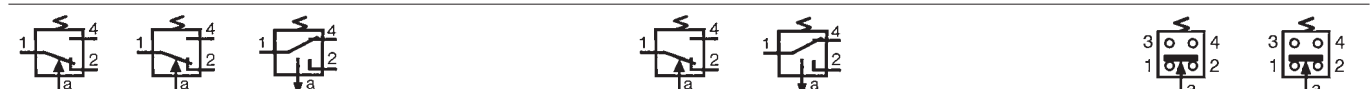
### Other information

On request :

- Microswitch V4 ref. 83 170 0 i W2 high current
- Microswitch V4 ref. 83 170 9 i W2 low current



| 81 513 516                | 81 513 510                | 81 513 527                | 81 513 533          | 81 513 523        | 81 509 080                | 81 509 085                |
|---------------------------|---------------------------|---------------------------|---------------------|-------------------|---------------------------|---------------------------|
| Base mounted<br>page 4/14 | Base mounted<br>page 4/14 | Base mounted<br>page 4/14 | 2 screws M4         | 2 screws M4       | Base mounted<br>page 4/14 | Base mounted<br>page 4/14 |
| Pressure<br>without       | Pressure<br>with          | Vacuum<br>without         | Pressure<br>without | Vacuum<br>without | Pressure<br>without       | Pressure<br>with          |



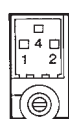
|                  |                  |                  |                  |                  |                       |                       |
|------------------|------------------|------------------|------------------|------------------|-----------------------|-----------------------|
| Ø 4 ext.         | Ø 4 ext.         | Ø 4 ext.         | —                | —                | —                     | —                     |
| IP 54            | IP 54            | IP 54            | 1/8 BSP<br>IP 54 | 1/8 BSP<br>IP 54 | Via sub-base<br>IP 54 | Via sub-base<br>IP 54 |
| 2 → 8            | 2 → 8            | -0.3 → -0.9      | 2 → 8            | -0.3 → -0.8      | 1.4 ± 0.5             | 1.4 ± 0.5             |
| 0.5              | 0.5              | —                | 0.5              | —                | —                     | —                     |
| 0.6              | 0.6              | —                | 0.6              | —                | —                     | —                     |
| 0.8              | 0.8              | —                | 0.8              | —                | —                     | —                     |
| 1                | 1                | —                | 1                | —                | —                     | —                     |
| —                | —                | —                | —                | —                | —                     | —                     |
| —                | —                | —                | —                | —                | —                     | —                     |
| 10 <sup>6</sup>  | 10 <sup>6</sup>  | 10 <sup>6</sup>  | 10 <sup>6</sup>  | 10 <sup>6</sup>  | 0.6 ± 0.2             | 0.6 ± 0.2             |
| 5A - 220-230 V   | 5A - 220-230 V   | 5A - 220-230 V   | 5A - 220-230 V   | 5A - 220-230 V   | 10 <sup>6</sup>       | 10 <sup>6</sup>       |
| 0.75             | 0.75             | 0.75             | 0.75             | 0.75             | 5A - 220-230 V        | 5A - 220-230 V        |
| -10 → +70        | -10 → +70        | -10 → +70        | -10 → +70        | -10 → +70        | 1.5                   | 1.5                   |
| 56               | 58               | 56               | 65               | 65               | -10 → +70             | -10 → +70             |
| V4 83 170 4 I W2 | V4 83 170 4 I W2 | V4 83 170 4 I W2 | V4 83 170 4 I W2 | V4 83 170 4 I W2 | 80                    | 80                    |
| MH15213 (R)      | MH15213 (R)      | MH15213 (R)      | MH15213 (R)      | MH15213 (R)      | 83 133 004            | 83 133 004            |

**Electrical connections**  
81 513 501 - 81 513 502  
81 513 522 - 81 513 552

**Dimensions**  
81 513 552 - 81 513 502  
81 513 501 - 81 513 522

**Pressure switch with connector**  
81 513 516 - 81 513 510  
81 513 527

**81 516 082**  
**81 513 533**  
**81 513 523**

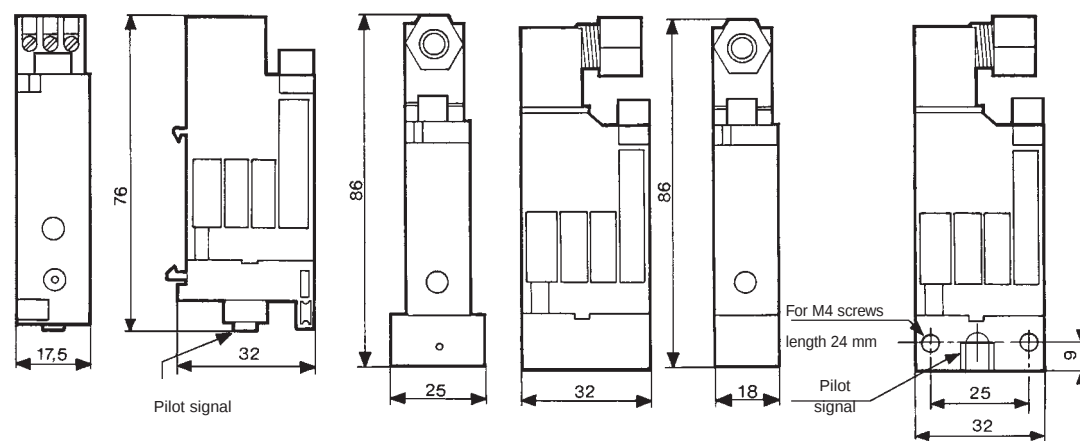


1 - Common  
4 - NO contact  
2 - NC contact

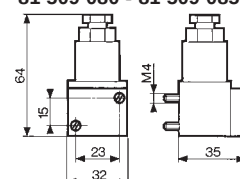
**81 513 510**  
**81 513 516 - 81 513 527**



**81 513 533**  
**81 513 523 - 81 513 533**



**81 509 080 - 81 509 085**

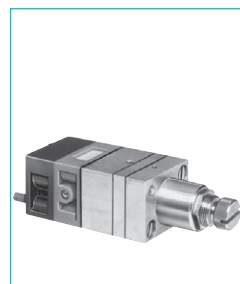
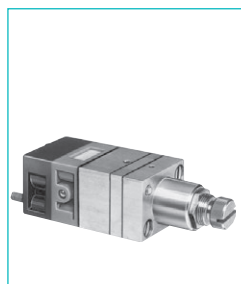


## Adjustable pressure switches (manostats) (pneumatic output)

### 100 % pneumatic



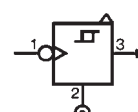
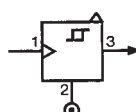
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



### Part numbers (and adjustment ranges)

|                  |             |                 |                 |
|------------------|-------------|-----------------|-----------------|
| Adjustment range | 50 → 500 mb | 81 505 140      | 81 502 140      |
|                  | 0.1 → 2.5 b | 81 505 150      | 81 502 150      |
|                  | 2 → 8 b     | 81 505 160      | 81 502 160      |
| Version          |             | Positive output | Negative output |
| Accuracy         | 50 → 500 mb | 10 %            | 10 %            |
|                  | 0.1 → 2.5 b | 4 %             | 4 %             |
|                  | 2 → 8 b     | 4 %             | 4 %             |

### Symbol

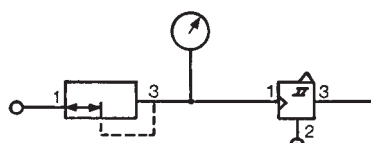


### Characteristics

|                                   |             |                     |                     |
|-----------------------------------|-------------|---------------------|---------------------|
| Orifice diameter                  | mm          | 2.5                 | 2.5                 |
| Flow at 4 bars                    | NI/min      | 170                 | 170                 |
| Hysteresis                        | 50 → 500 mb | 60 mb               | 60 mb               |
|                                   | 0.1 → 2.5 b | 100 mb              | 100 mb              |
|                                   | 2 → 8 b     | 320 mb              | 320 mb              |
| Connection - sub-base pages 54/55 |             |                     |                     |
| Operating temperature             | °C          | -5 → +50            | -5 → +50            |
| Mechanical life                   | operations  | 3 x 10 <sup>6</sup> | 3 x 10 <sup>6</sup> |
| Weight                            | g           | 160                 | 160                 |

### Connections

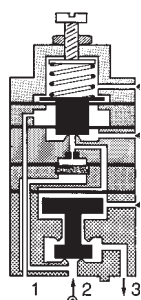
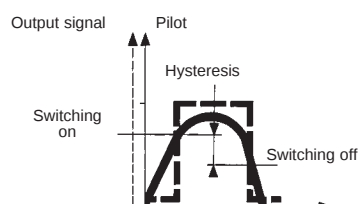
Example of pressure threshold adjustment (mini-regulator - manostat)



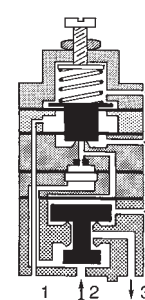
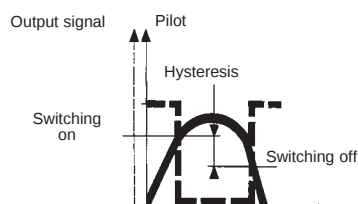
### Principle of operation

The manostats provide an on or off output signal when the input signal reaches a predetermined pressure threshold.

#### Positive output

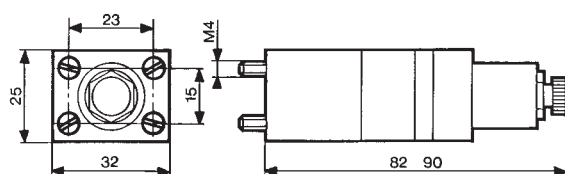


#### Negative output



### Dimensions

81 502 140 - 81 502 150 - 81 502 160  
81 505 140 - 81 505 150 - 81 505 160

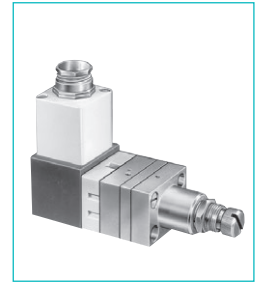
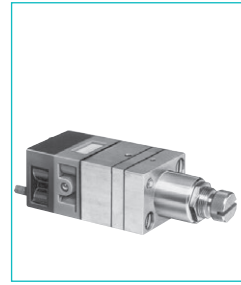
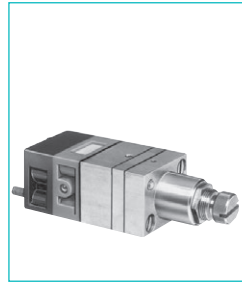


**Other information** Pressure switches with electrical output on request.

ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-control.com](http://www.crouzet-control.com)

## Adjustable vacuum switches (vacuostat)

- › 100 % pneumatic
- › For vacuum  $-0,1 \rightarrow -0,9$  Bar



### Part numbers

81 505 110

Positive output

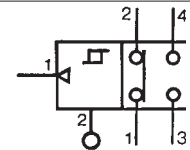
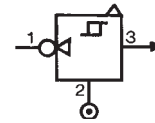
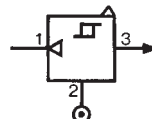
81 502 110

Negative output

81 508 110

Electrical output

### Symbol



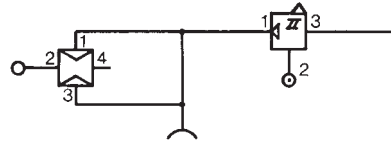
### Characteristics

|                                   |            |                 |                 |                 |
|-----------------------------------|------------|-----------------|-----------------|-----------------|
| Adjustment range                  | b          | - 0.1 → -0.9    | - 0.1 → -0.9    | - 0.1 → -0.9    |
| Flow at 6 bars                    | NI/min     | 170             | 170             | 170             |
| Hysteresis                        | mb         | 80              | 80              | 80              |
| Connection - sub-base pages 54/55 |            |                 |                 |                 |
| Operating temperature             | °C         | -5 → +50        | -5 → +50        | -5 → +50        |
| Mechanical life                   | operations | $3 \times 10^6$ | $3 \times 10^6$ | $3 \times 10^6$ |
| Weight                            | g          | 160             | 160             | 180             |

### Connections

Example of use:

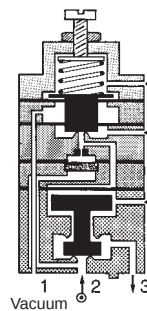
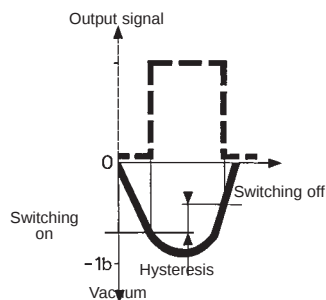
Vacuum handling (vacuum generator, vacuum pad, vacuostats).



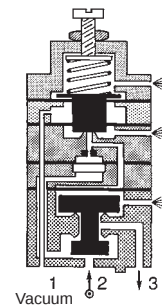
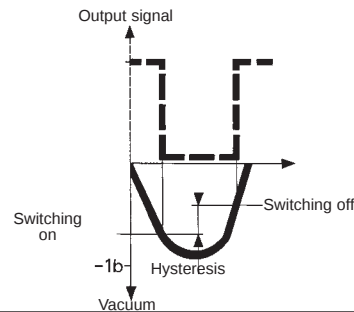
### Principle of operation

Vacuostats provide an on or off output signal when the input signal reaches a predetermined pressure threshold.

#### Positive output

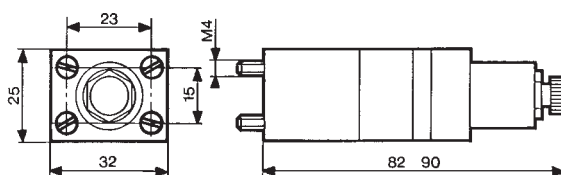


#### Negative output

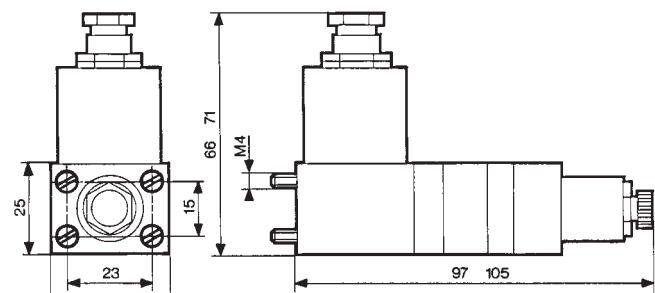


### Dimensions

81 502 110 - 81 505 110



81 508 110

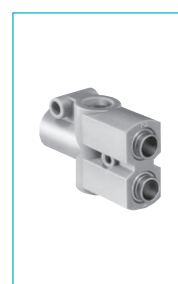
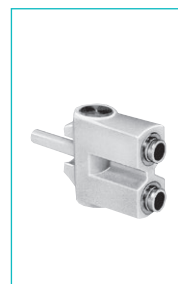
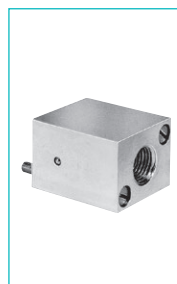


## Vacuum handling components

- Sur le principe du Venturi
- Facilement raccordable



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



### Part numbers

Vacuum generators

81 535 301

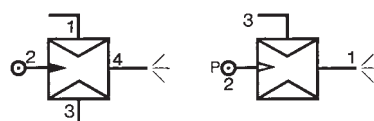
Sub-base mounting

81 545 001

Plug-in

81 545 005

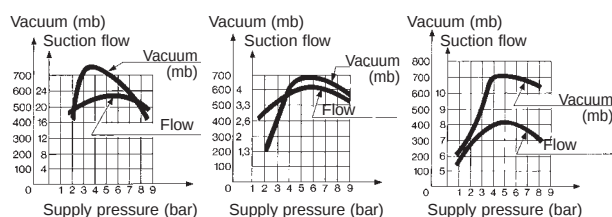
Plug-in



### Characteristics

|                                                      |                            |       |        |        |
|------------------------------------------------------|----------------------------|-------|--------|--------|
| Push-in connectors for semi-rigid tubing (NFE 49100) | Male/Female/Female (MFF)   | —     | Ø 4 mm | —      |
|                                                      | Female/Female/Female (FFF) | —     | —      | Ø 6 mm |
| Operating pressure                                   | bar                        | 2 → 8 | 2 → 8  | 2 → 8  |
| Vacuum pad material                                  |                            | —     | —      | —      |
| Weight                                               | g                          | 80    | 13     | 25     |

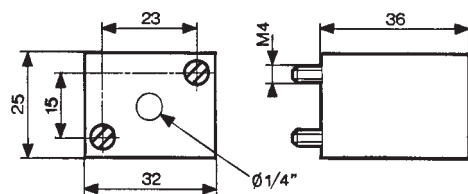
Detection of the pressure decrease can be achieved by the use of manostats (see pages 38/39)



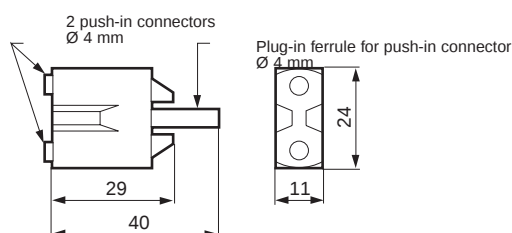
### Dimensions

#### 81 535 301

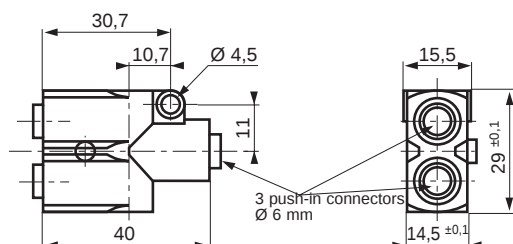
Sub-base mounting 81 531... and 81 532...



#### 81 545 001



#### 81 545 005



ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-control.com](http://www.crouzet-control.com)

# **PNEUMATIC LOGIC COMPONENTS**

## General characteristics

### Operating fluid

- Compressed air or inert gas.

### Conditions of use

- Operating pressure 2 to 8 bars (except for special conditions).
- Fluid: Filtered air to 50 microns - non lubricated.
- Operating temperature from - 5° C to + 50° C (under + 5° C the dew point must be below 10° C for the application).
- For optimum performance, the elements should be inter-connected by air supply tubing with an internal diameter  $\geq$  at 2.5 mm.

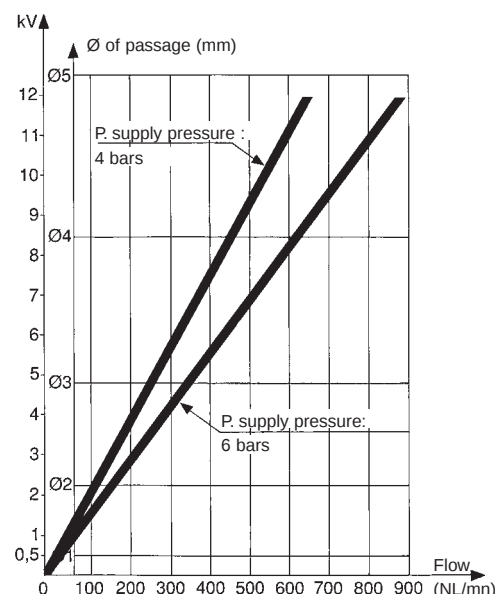
### Mounting recommendations

- The elements should be mounted and piped in a clean atmosphere in order to prevent any form of pollution entering the system.
- Minimum torque for element fixing screws: 5 cm/kg.
- maximum torque for element fixing screws: 10 cm/kg.

### Characteristics common to all elements in the modular system

- The characteristics have been obtained with a supply pressure at 6 bars.
- The flow in NI/min is the number of litres of air at normal atmospheric pressure obtained with the output open to atmosphere and the supply pressure at 4 bars
- The consumption in NI/min is the number of litres of free air necessary for the unit to function.
- kV = the flow coefficient of the equipment.
- Mechanical life > 10<sup>7</sup> operations.

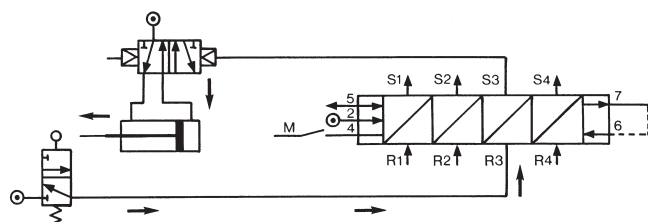
### flow graphs



### Sequencer modules

Operation results from the combination of a sequential cycle. A system comprises individual modules which are joined together by means of a sub-base. Each module has a memory which delivers an output signal and receives an input signal.

An indicator on each module allows the operator to monitor the progress of the cycle and identify quickly and easily any fault which may occur.

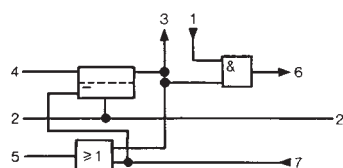


Operation results from the combination of three functions (memory, AND and OR) which constitute each module.

The memory activates the output and gives priority to the reset signal. The AND element ensures the transition to the next module but only if an input signal is present.

The OR element ensures the resetting of all previously operated modules

### Function diagram

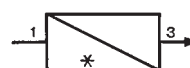
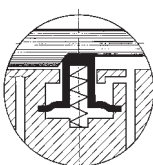


### sequencer module with maintained reset

#### Brake

This maintains the memory spool in position only when the supply is lost.

### Module with auto reset



#### Brake

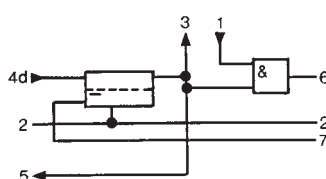
This returns the memory spool to the reset condition only when the supply is lost

#### Shift register

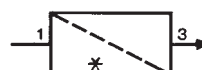
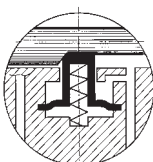
The general principle is to advance the sequencer step by command impulses to the inputs of the even steps, alternating with the command impulses to the inputs of the odd steps.

Used for example on a transfer machine to shift the information "bad component" collected at a test-test "n" steps further along the machine to a reject station.

### Function diagram



### Auto reset sequencer module

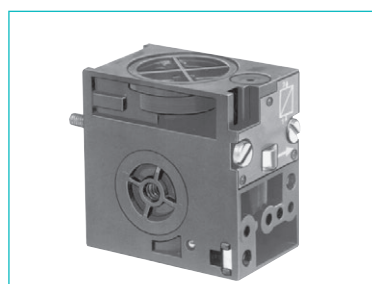


## Sequencer modules

- › 100 % pneumatic
- › Ideal for a simple pneumatic sequence



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



81 550 001  
with 'maintain'



81 550 401  
with 'maintain'

Versions sequencer  
shift register

81 550 201  
Reset to zero

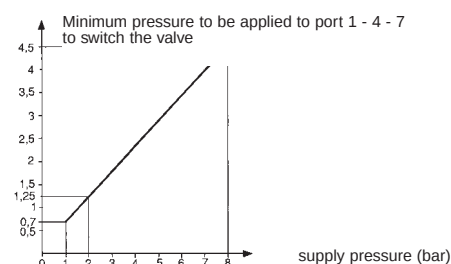
81 550 601  
Reset to zero

### Symbol



### Characteristics

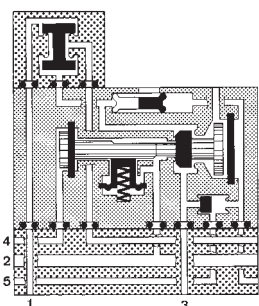
|                                               |        |          |          |          |          |
|-----------------------------------------------|--------|----------|----------|----------|----------|
| Operating pressure                            | bar    | 2 → 8    | 2 → 8    | 2 → 8    | 2 → 8    |
| Orifice diameter                              | mm     | 2.7      | 2.7      | 2.7      | 2.7      |
| Flow at 6 bars                                | NI/min | 150      | 150      | 150      | 150      |
| Operating temperature                         | °C     | -5 → +50 | -5 → +50 | -5 → +50 | -5 → +50 |
| Mechanical life 5 x 10 <sup>6</sup> at 6 bars |        | •        | •        | •        | •        |
| Connection - Sub-base page 26                 |        | •        | •        | •        | •        |
| Weight                                        | g      | 70       | 70       | 70       | 70       |



### Principle of operation

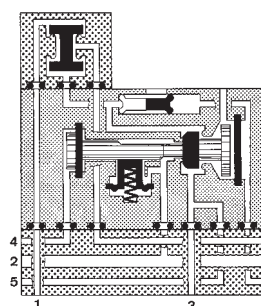
(supplied without logic element. For choice of units see pages 46/47)

#### Sequencer module with maintained reset



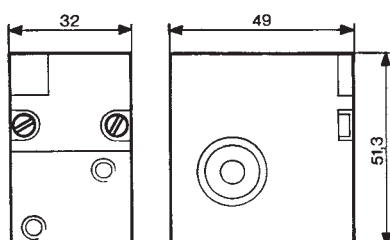
- 1 - Input signal
- 2 - Supply
- 3 - Output signal
- 4 - Start signal
- 5 - In cycle signal
- 6 - End of cycle signal
- 7 - Reset to zero signal

#### Shift register with maintained reset

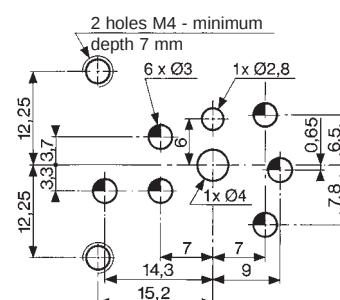


- 1 - Input signal
- 2 - Supply
- 3 - Output signal
- 4 - Start signal
- 5 - In cycle signal
- 6 - End of cycle signal
- 7 - Reset to zero signal

### Dimensions



### Mounting plan for sequencer

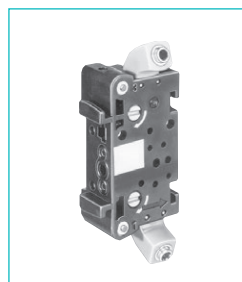


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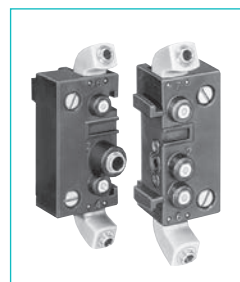
## Sequencer sub-bases



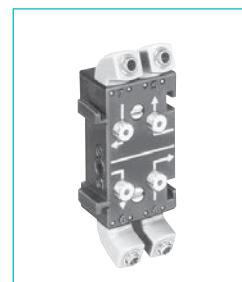
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



**81 551 101**  
Sub-base (DIN oméga)



**81 552 101**  
End bases - one pair



**81 552 601**  
Diversion base

Versions Front connecting (DIN-omega)  
Rear connecting (with clips)

### Characteristics

Sub-bases Rotatable connectors

(fitted) Pressure indicators

Operating temperature

°C

Weight

g

-5 → +50

55

-5 → +50

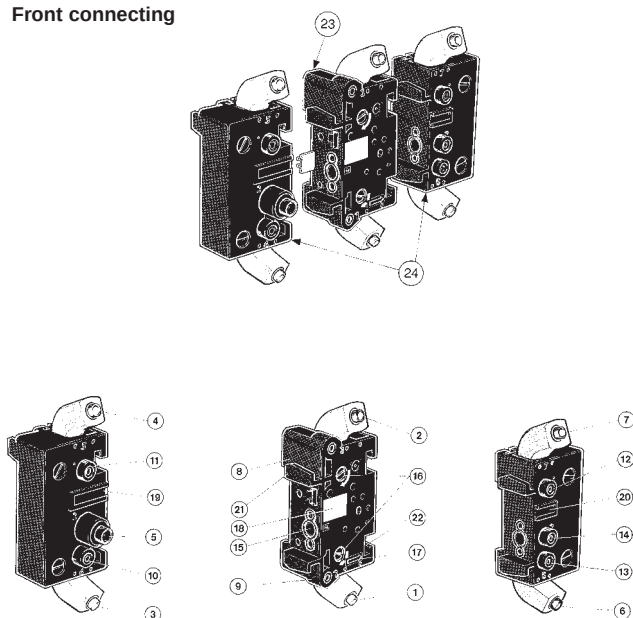
135

-5 → +50

60

### Sequencer connections

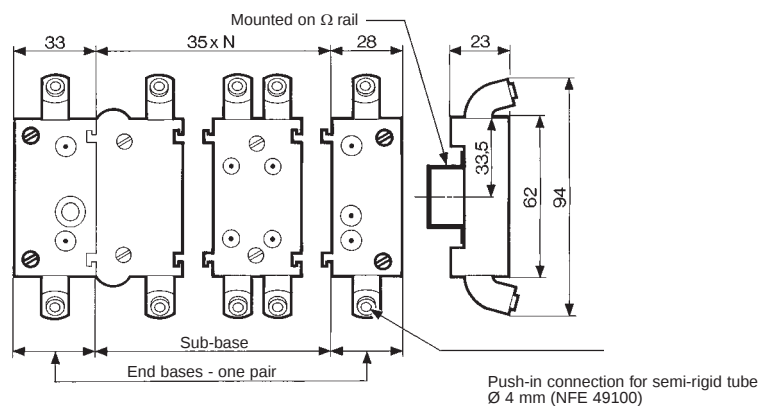
#### Front connecting

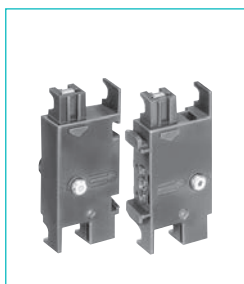
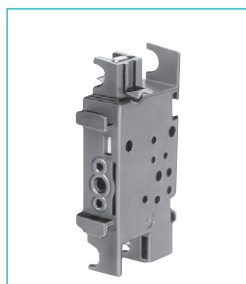


- 1 - Input port (green port 1) Ø 4
- 2 - Output port (red port 1) Ø 4
- 3 - Input port, cycle start (green port 1) Ø 4
- 4 - Output port, in-cycle signal (red port 1) Ø 4
- 5 - Output port, cycle end (red port 6) Ø 4
- 6 - Output port, cycle end (red port 6) Ø 4
- 7 - Input port, reset to zero (green port 7) Ø 4
- 8 - Output indicator (red)
- 9 - Input indicator (green)
- 10 - Cycle start indicator at port 4 (green)
- 11 - In-cycle indicator at port 5 (red)
- 12 - Input indicator at port 7 (green)
- 13 - End of cycle indicator at port 6 (red)
- 14 - Supply indicator at port 2 (yellow)
- 15 - Interconnecting ports
- 16 - Fixing screws
- 17 - Engraved arrow to indicate direction of sequence
- 18 - Marking tag
- 19 - Marking tag position
- 20 - Marking tag position
- 21 - Mounting tongue
- 22 - Mounting groove
- 23 - Sub-base
- 24 - End bases

### Dimensions

#### Front connecting





81 551 001

Sub-base (with clips)

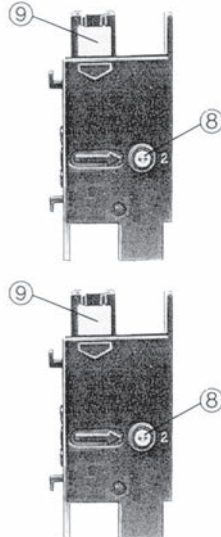
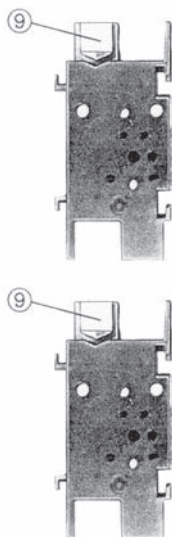
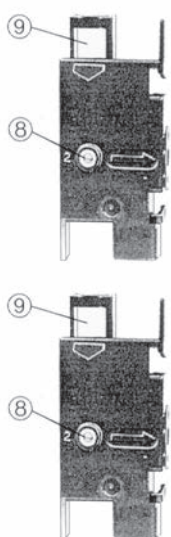
81 552 001

End bases - one pair

-5 → +50  
40

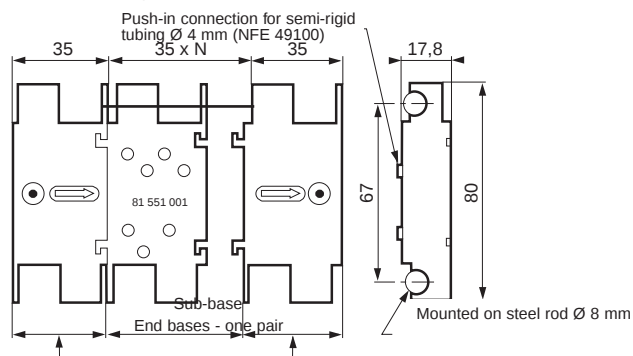
-5 → +50  
120

#### Rear connecting



- 1 - Input port (marked port 1)
- 2 - Supply port (Port 2)
- 3 - Output port (Port 3)
- 4 - Cycle start signal port (Port 4)
- 5 - In-cycle signal port (Port 5)
- 6 - End of cycle signal port (Port 6)
- 7 - Reset to zero signal port (Port 7)
- 8 - Indicator at supply port
- 9 - Marking area

#### Rear connecting

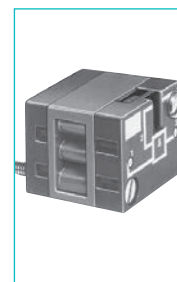
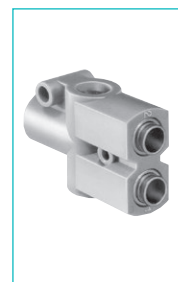
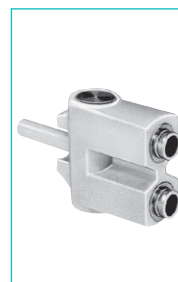
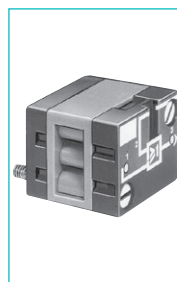


## Logic elements

- Performs "combined" Pneumatic
- Easy to use

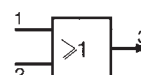


Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



|           |     |                               |                |                |                               |
|-----------|-----|-------------------------------|----------------|----------------|-------------------------------|
| Functions | OR  | 81 521 501                    | 81 540 001     | 81 540 005     | 81 522 501                    |
|           | AND | —                             | —              | —              | —                             |
|           | YES | —                             | —              | —              | —                             |
|           | NO  | —                             | —              | —              | —                             |
| Version   |     | On Sub-base<br>page 4/14-4/15 | Plug-in<br>Ø 4 | Plug-in<br>Ø 6 | On Sub-base<br>page 4/14-4/15 |

### Symbol



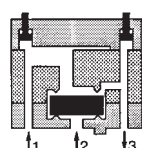
### Characteristics

|                                                      |                      |                  |                  |                  |                  |
|------------------------------------------------------|----------------------|------------------|------------------|------------------|------------------|
| Push-in connection for semi-rigid tubing (NFE 49100) | Male/Female/Female   | —                | Ø 4 mm           | —                | —                |
| Colour                                               | Female/Female/Female | —                | —                | —                | —                |
| Operating pressure                                   | bar                  | Blue             | Blue             | Blue             | Green            |
| Orifice diameter                                     | mm                   | 2 → 8            | 2 → 8            | 2 → 8            | 2 → 8            |
| Flow at 6 bars                                       | NI/min               | 2.7              | 2.7              | 4                | 2.7              |
| Pressure indicator                                   |                      | 170              | 170              | 200              | 170              |
| Switching time                                       | ms                   | •                | —                | —                | •                |
| Operating temperature                                | °C                   | —                | —                | —                | —                |
| Mechanical life                                      | operations           | -5 → +50         | -5 → +50         | -5 → +50         | -5 → +50         |
| Weight                                               | g                    | >10 <sup>7</sup> | >10 <sup>7</sup> | >10 <sup>7</sup> | >10 <sup>7</sup> |
|                                                      |                      | 25               | 12               | 25               | 25               |

### Pilot/pressure curves

P.p : Pilot pressure  
P.a : Supply pressure

### Principle of operation

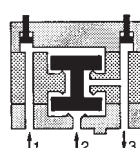


#### Cellule OR

The output signal "S" is present when a signal at "a" OR "b" is present:

$$S = a \text{ OR } b$$

$$S = a + b$$



#### Cellule AND

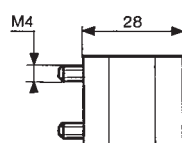
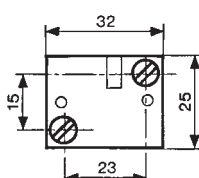
The output signal "S" is present only when signals "a" AND "b" are present simultaneously:

$$S = a \text{ AND } b$$

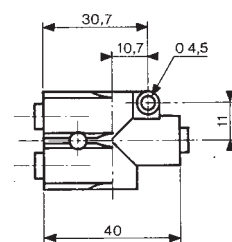
$$S = a . b$$

### Dimensions

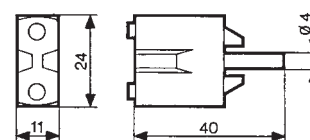
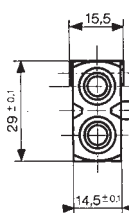
81 521 501 - 81 522 501



81 540 005 - 81 541 005

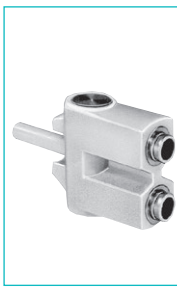


81 540 001 - 81 541 001



### Other information

See pages 54/55 for mounting plan for logic elements.



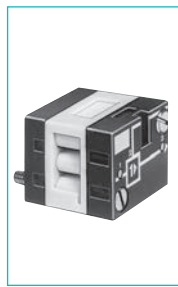
81 541 001

Plug-in  
Ø 4



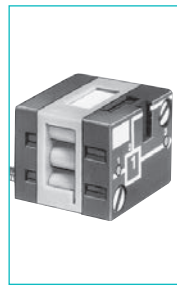
81 541 005

Plug-in  
Ø 6



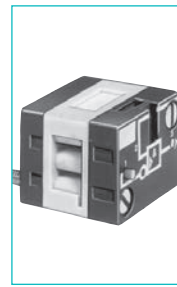
81 501 025

On sub-base  
page 36-37



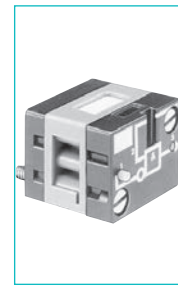
81 503 025

Threshold  
On sub-base page  
4/14-4/15



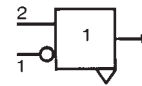
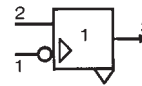
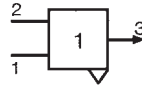
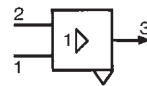
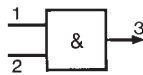
81 504 025

Threshold  
On sub-base page  
4/14-4/15



81 506 025

Threshold  
On sub-base page  
4/14-4/15



Ø 4 mm

Green

2 → 8

2.7

150

-5 → +50

>10<sup>7</sup>

13

Ø 6 mm

Green

2 → 8

4

200

-5 → +50

>10<sup>7</sup>

25

Yellow

2 → 8

2.7

170

< 4

-5 → +50

>10<sup>7</sup>

30

Orange

2 → 8

2.7

170

< 4

-5 → +50

>10<sup>7</sup>

30

Light grey

2 → 8

2.7

170

< 4

-5 → +50

>10<sup>7</sup>

30

Dark grey

2 → 8

2.7

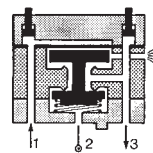
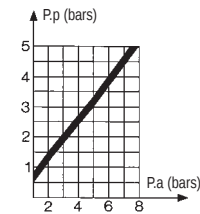
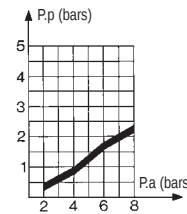
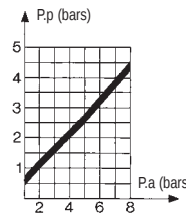
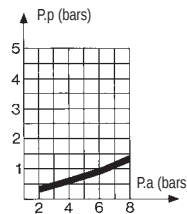
170

< 4

-5 → +50

>10<sup>7</sup>

30

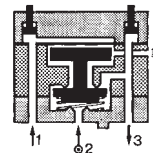


#### YES element

The output signal "S" is only present when the pilot is present "a" is present:

$S = a$  YES b

$S = a$



#### NOT element

The output signal "s" is present only if the input signal "a" is NOT present. The output signal is therefore the inverse of the pilot signal:

$S = \overline{a}$  NOT a

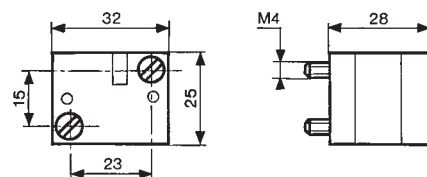
$S = \overline{a}$

If the supply port is connected to a 2nd input "b", the function obtained is called inhibition:

$S = \overline{a} \text{ AND } b$

$S = \overline{a} \cdot b$

81 501 025 - 81 503 025  
81 504 025 - 81 506 025

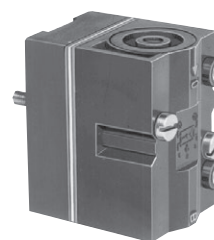


## Memory element

- › 100 % pneumatic
- › Bistable pneumatic



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive

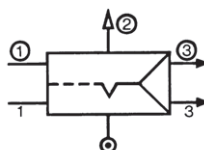


Version

**81 523 201**  
With pressure indicator

**81 523 601**  
With pressure indicator and manual override

### Symbol



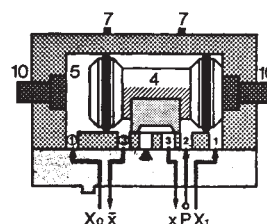
### Characteristics

|                                         |        |          |          |
|-----------------------------------------|--------|----------|----------|
| Colour                                  |        | Black    | Black    |
| Operating pressure                      | bar    | 2 → 8    | 2 → 8    |
| Orifice diameter                        | mm     | 2.7      | 2.7      |
| Minimum memory pilot pressure           | bar    | 2.5      | 2.5      |
| Operating temperature                   | °C     | -5 → +50 | -5 → +50 |
| Flow at 6 bars                          | NI/min | 200      | 200      |
| Connection - On sub-base page 4/14-4/15 |        | ●        | ●        |
| Weight                                  | g      | 90       | 90       |

### Principle of operation

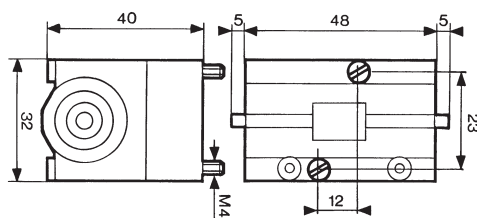
The function is that of a 4/2 valves. The appearance of signal "X1" causes the displacement of the slide valve. The output port "x" is then put under pressure. This state is remembered until the arrival of signal "X0". This signal reverses the slide valve, the output "x" is put under pressure. This state is likewise remembered. The output:

- "x" under pressure indicates that the information in the MEMORY is "X1",
- "x" under pressure indicates that the information in the MEMORY is "X0".

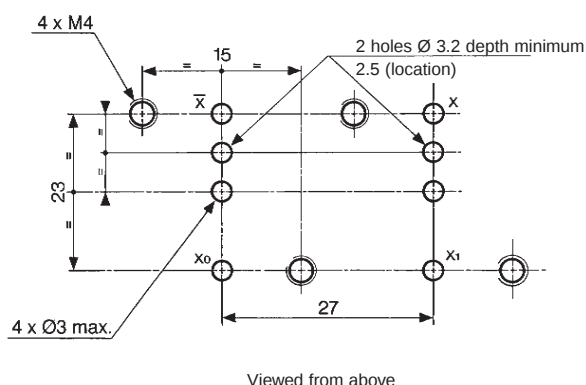


### Dimensions

81 523 201 - 81 523 601



### Dimensions of logic and memory elements



ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-control.com](http://www.crouzet-control.com)

## Timers fixed timing

### Fixed 0.4 s



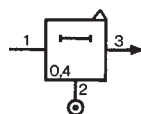
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



81 503 540  
Positive output

Version

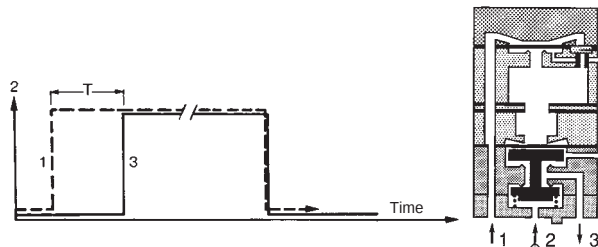
### Symbol



### Characteristics

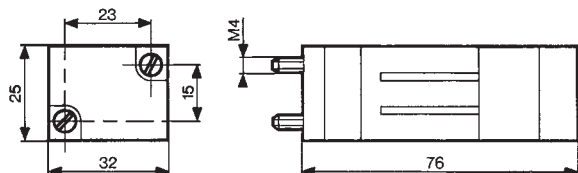
|                                     |            |                  |
|-------------------------------------|------------|------------------|
| Timing                              | s          | 0.4              |
| Operating pressure                  | bar        | 2 → 8            |
| Flow at 6 bars                      | NI/min     | 170              |
| Orifice diameter                    | mm         | 2.7              |
| Accuracy                            | %          | ± 5              |
| Min. reset time                     | s          | <0.1             |
| Connection - On sub-base page 36-37 |            | ●                |
| Operating temperature               | °C         | -5 → +50         |
| Mechanical life                     | operations | >10 <sup>7</sup> |
| Weight                              | g          | 106              |

### Principle of operation with positive output



### Dimensions

81 503 540



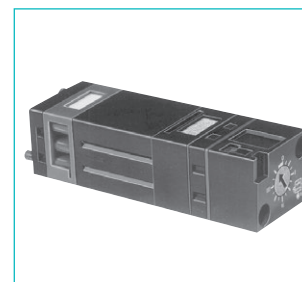
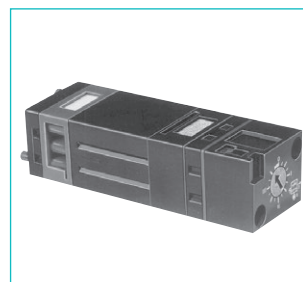
ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-crouzet.com](http://www.crouzet-crouzet.com)

## Timers (with adjustable timing)

### 60 s adjustable (60 s max.)

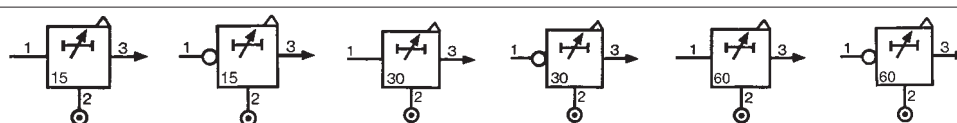


Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



| Function | positive | negative | 81 503 710 | 81 506 710 | 81 503 720 | 81 506 720 | 81 503 725 | 81 506 725 |
|----------|----------|----------|------------|------------|------------|------------|------------|------------|
|          | •        | —        | •          | —          | •          | —          | •          | —          |
|          | —        | •        | —          | •          | —          | •          | —          | •          |

### Symbol



### Characteristics

|                                         |            |                  |                  |                  |                  |                  |                  |
|-----------------------------------------|------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Timing                                  | s          | 0.1 → 15         | 0.1 → 15         | 0.1 → 30         | 0.1 → 30         | 0.1 → 60         | 0.1 → 60         |
| Operating pressure                      | bar        | 2 → 8            | 2 → 8            | 2 → 8            | 2 → 8            | 2 → 8            | 2 → 8            |
| Flow at 6 bars                          | NI/min     | 170              | 170              | 170              | 170              | 170              | 170              |
| Orifice diameter                        | mm         | 2.7              | 2.7              | 2.7              | 2.7              | 2.7              | 2.7              |
| Accuracy                                | %          | ± 5              | ± 5              | ± 5              | ± 5              | ± 5              | ± 5              |
| Min. reset time                         | s          | <0.1             | <0.1             | <0.1             | <0.1             | <0.1             | <0.1             |
| Connection - On sub-base page 4/14-4/15 |            | •                | •                | •                | •                | •                | •                |
| Operating temperature                   | °C         | -5 → +50         | -5 → +50         | -5 → +50         | -5 → +50         | -5 → +50         | -5 → +50         |
| Mechanical life                         | operations | >10 <sup>7</sup> | >10 <sup>7</sup> | >10 <sup>7</sup> | >10 <sup>7</sup> | >10 <sup>7</sup> | >10 <sup>7</sup> |
| Weight                                  | g          | 90               | 90               | 100              | 100              | 120              | 120              |

### Accessories

|                        |   |            |            |            |            |   |   |
|------------------------|---|------------|------------|------------|------------|---|---|
| Panel mounting adaptor |   | 79 451 698 | 79 451 698 | 79 451 903 | 79 451 903 | — | — |
| Weight                 | g | 53         | 53         | 53         | 53         | — | — |

### Principle

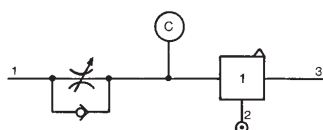
The operation of these pneumatic timers is similar to that of electronic timers (circuit with capacitor/resistor)

### Principle of operation

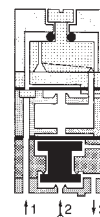
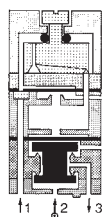
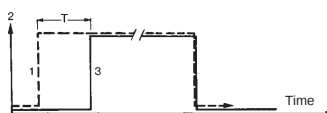
with positive output

with negative output

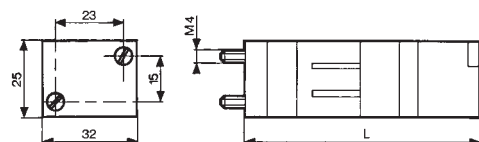
### Timing by charging of reservoir



The reservoir fills via the flow restrictor until the switching point of the timer output is reached (positive or negative). The non-return valve allows the reservoir to be emptied rapidly for the next timing.

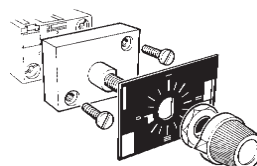
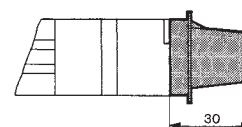
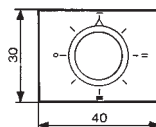


### Dimensions



|                         | L (mm) |
|-------------------------|--------|
| 81 503 710 - 81 506 710 | 78     |
| 81 503 720 - 81 506 720 | 92     |
| 81 503 725 - 81 506 725 | 125    |

### Adaptor 79 451 ...



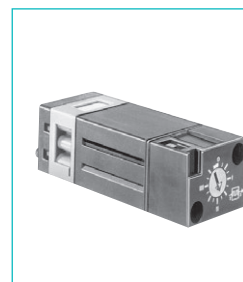
For panel mounting, a pre-drilled hole Ø 10.5 mm is required

# Timers

## Fixed and adjustable



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



|                                |            |            |            |            |
|--------------------------------|------------|------------|------------|------------|
| Single impulse generator       | Fixed      | 81 507 540 | —          | —          |
|                                | Adjustable | —          | 81 507 720 | —          |
| Adjustable frequency generator | —          | —          | —          | 81 506 940 |

## Symbol



## Characteristics

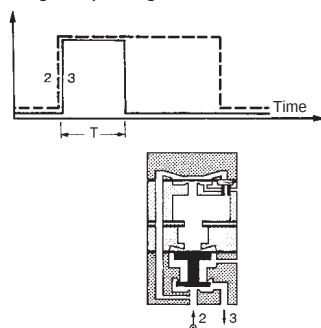
|                                         |            |                  |                  |                  |
|-----------------------------------------|------------|------------------|------------------|------------------|
| Timing                                  | s          | 0.4              | 0.1 → 30         | —                |
| Frequency                               | Hz         | —                | —                | 0.02 → 8         |
| Operating pressure                      | bar        | 2 → 8            | 2 → 8            | 2 → 8            |
| Flow at 6 bars                          | Nl/min     | 170              | 170              | 170              |
| Orifice diameter                        | mm         | 2.7              | 2.7              | 2.7              |
| Accuracy                                | %          | ± 5              | ± 5              | ± 5              |
| Min. reset time                         | s          | <0.1             | <0.1             | <0.1             |
| Connection - On sub-base page 4/14-4/15 |            | •                | •                | •                |
| Operating temperature                   | °C         | -5 → +50         | -5 → +50         | -5 → +50         |
| Mechanical life                         | operations | >10 <sup>7</sup> | >10 <sup>7</sup> | >10 <sup>7</sup> |
| Weight                                  | g          | 106              | 180              | 85               |

## Accessories

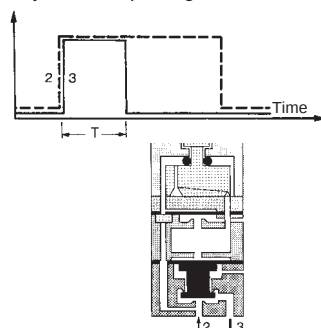
|                           |   |            |            |
|---------------------------|---|------------|------------|
| Panel mounting adaptators | — | 79 451 904 | 79 451 905 |
| Weight (g)                | — | 53         | 53         |

## Principle of operation

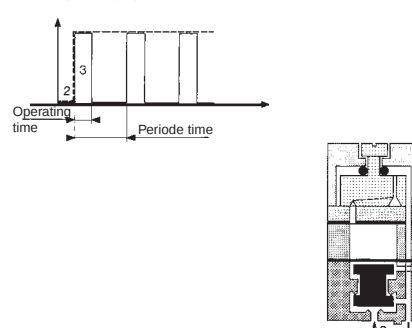
### Single impulse generator



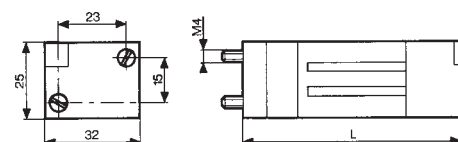
### Adjustable impulse generator



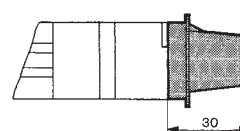
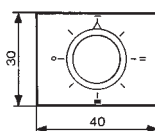
### Frequency generator



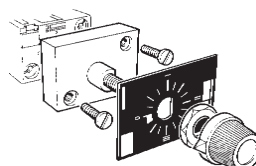
## Dimensions



79 451



| Part numbers | L (mm) |
|--------------|--------|
| 81 507 540   | 73     |
| 81 507 720   | 99     |
| 81 506 940   | 72     |

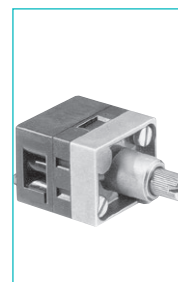
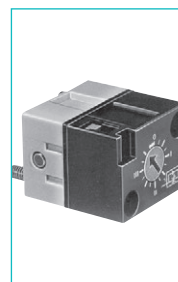


For panel mounting, a pre-drilled hole Ø 10.5 mm is required

## Timing Accessories



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



One-way in-line fixed flow restrictors

Flow at 4 bars  $\text{Nm}^3/\text{h}$   $\varnothing$  orifice (mm)

|             |      |        |
|-------------|------|--------|
| 0.18 → 0.30 | 0.3  | white  |
| 0.35 → 0.50 | 0.4  | yellow |
| 0.58 → 0.77 | 0.5  | red    |
| 0.80 → 1.06 | 0.6  | green  |
| 1.10 → 1.39 | 0.7  | blue   |
| 1.45 → 1.65 | 0.8  | grey   |
| 2.30 → 2.80 | 1    | black  |
| 0.08 → 0.12 | 0.25 | white  |

|            |
|------------|
| 81 529 003 |
| 81 529 004 |
| 81 529 005 |
| 81 529 006 |
| 81 529 007 |
| 81 529 008 |
| 81 529 010 |
| 81 529 025 |

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One-way adjustable flow restrictor  
Capacity for timing

10 • 60 s

|   |
|---|
| — |
| — |

|            |
|------------|
| 81 525 101 |
| —          |

|            |
|------------|
| 81 526 001 |
| —          |

|            |
|------------|
| —          |
| 79 458 808 |

### Symbol



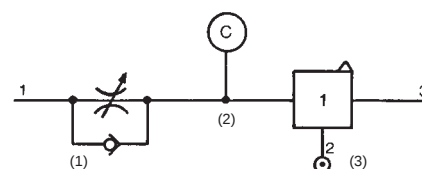
### Characteristics

|                       |                                                                                 |                      |          |          |          |
|-----------------------|---------------------------------------------------------------------------------|----------------------|----------|----------|----------|
| Free flow             | Nl/min                                                                          | Depending on orifice | 30       | 200      | —        |
| Orifice diameter      | mm                                                                              | Depending on orifice | 0 → 0.5  | 0 → 1.7  | —        |
| Operating pressure    | bars                                                                            | 1 → 8                | 1 → 8    | 2 → 8    | —        |
| Timing                | s                                                                               | —                    | —        | —        | 10 → 60  |
| Capacity              | cm <sup>3</sup>                                                                 | —                    | —        | —        | 30       |
| Connection            | Sub-base page 4/14-4/15<br>Push-in connection for semi-rigid tubing (NFE 49100) | —                    | •        | •        | —        |
|                       | mm                                                                              | Ø 4                  | —        | —        | Ø 4      |
| Operating temperature | °C                                                                              | -5 → +50             | -5 → +50 | -5 → +50 | -5 → +50 |
| Weight                | g                                                                               | 8                    | 60       | 70       | 40       |

### Connections

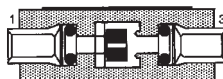
For timing circuit

- One-way flow restrictor 81 525 1 - 81 529 0 (1)
  - Reservoir 79 458 018 (2)
  - Relay element 81 503 0 - 81 506 0 (3) page 4/6-4/7
- Sub-base page 4/14-4/15

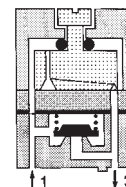


### Principle of operation

One-way with fixed flow



One-way with adjustable flow



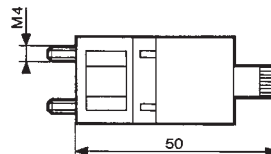
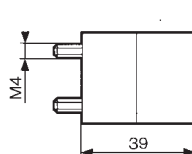
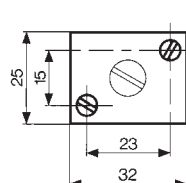
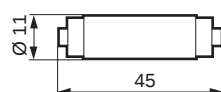
### Dimensions

81 529

81 525 101

81 526 001

79 452 808

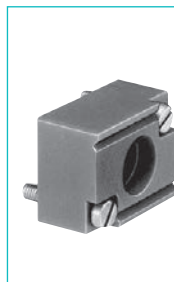
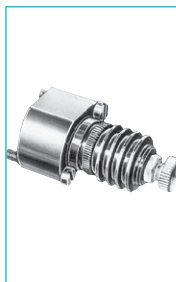


ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-control.com](http://www.crouzet-control.com)

## Regulator accessories



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



### Part numbers

Mini-détenteur

81 527 001

—

—

Plug element

—

81 520 601

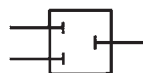
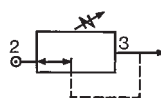
—

In-line non-return

—

81 529 901

### Symbol

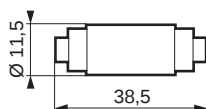


### Characteristics

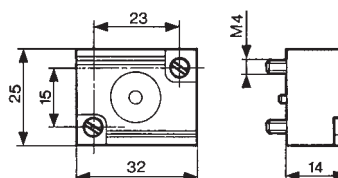
|                            |                                                      |         |    |       |
|----------------------------|------------------------------------------------------|---------|----|-------|
| Operating pressure         | bars                                                 | 2 → 8   | —  | 2 → 8 |
| Flow at 6 bars             | NI/min                                               | 200     | —  | 200   |
| Adjustable output pressure | bar                                                  | 0,1 → 8 | —  | —     |
| Connection                 | Sub-base                                             | •       | •  | —     |
|                            | Push-in connection for semi-rigid tubing (NFE 49100) | mm      |    | Ø 4   |
| Weight                     | g                                                    | 150     | 70 | 70    |

### Dimensions

81 529 901



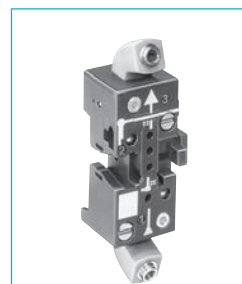
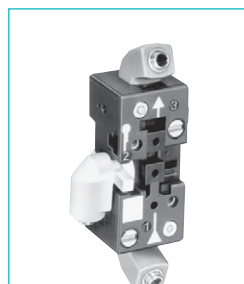
81 520 601



## Sub-bases for logic elements



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



Two-hand start module

Manostats - vacuostats

Leak sensor and amplifier relays

Logic elements AND Timers

Regulator accessories

Memory element

Operating temperature °C

Electro-pneumatic miniature solenoid

81 532 104

● 1

● 1

● 1

● 1

● 1

—

-5 → +50

● 1

81 532 102

● 1

● 1

● 1

● 1

● 1

—

-5 → +50

● 1

**NB:** The number indicates the number of components mounted on the sub-base ↑

### Characteristics

Push-in connection for semi-rigid tubing  
Ø 4 mm (NFE 49100)

Fixation

rotatable

DIN rail 35 mm

rotatable

DIN rail 35 mm

Weight

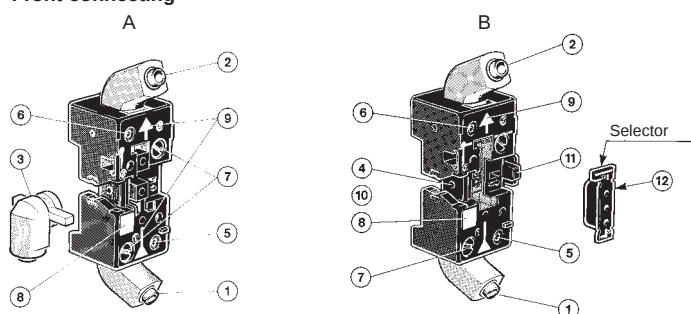
g

56

52

### Connections elements and relays

#### Front connecting



A - Single sub-base or end base

B - Associable sub-base

1 - Input port (green port 1)

2 - Output port (red port 3)

3 - Input/supply port (yellow port 2) Ø 4

4 - Input port integral to sub-base

5 - Input indicator (green)

6 - Output indicator (red)

7 - 1/4 turn screws

8 - Marking tag

9 - Arrow indicating flow direction

10 - Mounting tongue

11 - Mounting groove

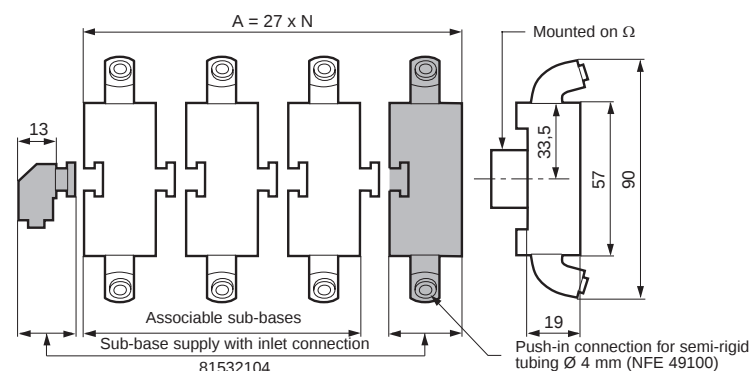
12 - Selector

### Dimensions

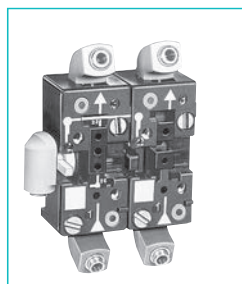
81 532 104



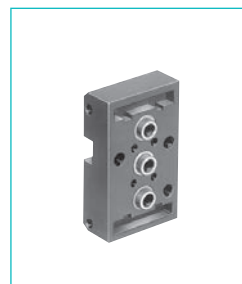
3 x 81532102



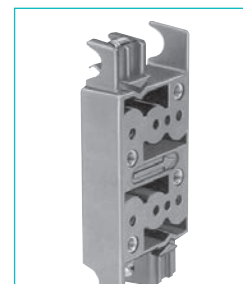
ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-control.com](http://www.crouzet-control.com)



81 542 002



81 532 001



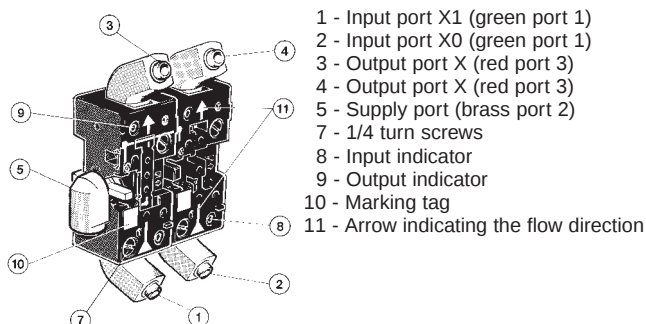
81 531 001

|                                      |          |          |          |
|--------------------------------------|----------|----------|----------|
| Two-hand start module                | —        | ● 1      | ● 2      |
| Manostats - vacuostats               | —        | ● 1      | ● 2      |
| Leak sensor and amplifier relays     | —        | ● 1      | ● 2      |
| Logic elements AND Timers            | —        | ● 1      | ● 2      |
| Regulator accessories                | —        | ● 1      | ● 2      |
| Memory element                       | ● 1      | —        | ● 1      |
| Operating temperature °C             | -5 → +50 | -5 → +50 | -5 → +50 |
| Electro-pneumatic miniature solenoid | —        | ● 1      | ● 2      |

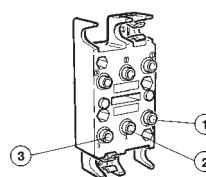
## Caractéristiques

|                                                                |                |             |                           |
|----------------------------------------------------------------|----------------|-------------|---------------------------|
| Push-in connection for semi-rigid tubing<br>Ø 4 mm (NFE 49100) | rotatable      | rear        | rear                      |
| Fixation                                                       | DIN rail 35 mm | 2 M4 screws | Clips for rails<br>Ø 8 mm |
| Weight g                                                       | 95             | 10          | 35                        |

## Memory element sub-base, front and rear connecting



## Rear connection



The modular system elements are fixed with two screws on the sub-base.

A locating device on each logic element prevents incorrect assembly.

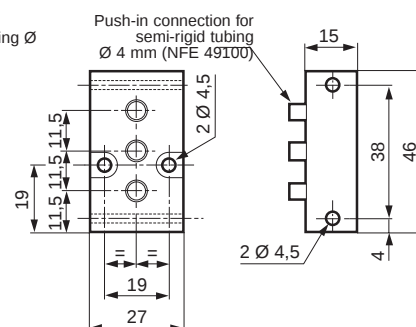
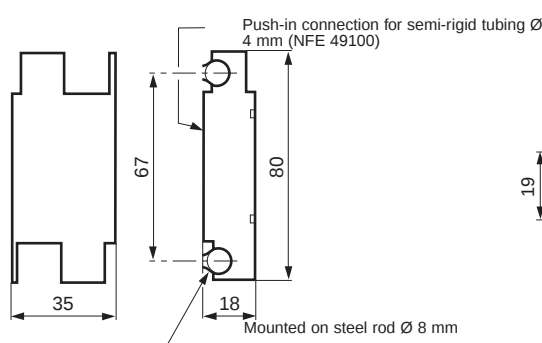
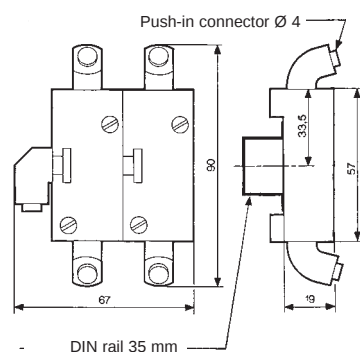
The logic element is connected via the sub-base. This sub-base has 3 instant connections for connecting semi-rigid tubes with outer Ø 4.

- 1 - Input signal
- 2 - Signal port for passive logic elements, air supply for active logic elements.
- 3 - Output signal

81 542 002 (for memory 81523201/601)

81 531 001

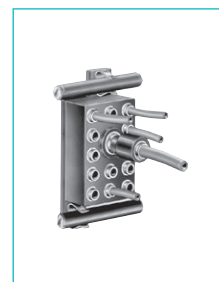
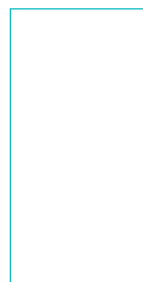
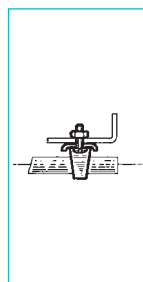
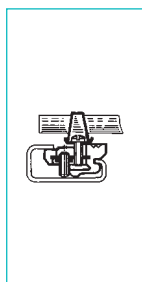
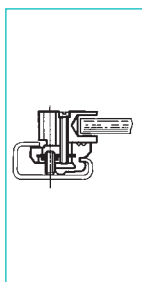
81 532 001



## Mounting accessories



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



Mounting equipment

81 533 501  
Hole domino

81 533 001  
Clip domino

79 450 609  
Bar clips  
Ø 8

—

Supply manifold 13 outputs

—

—

—

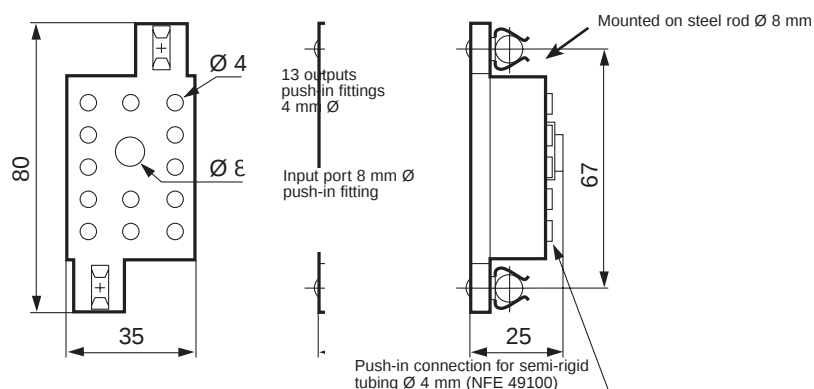
81 536 801

### Characteristics

|                          |                                                                                                 |                                                                                                 |                            |          |
|--------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------|----------|
| Weight (g)               | 8<br>For mounting on the end of a zinc-coated mild steel rod Ø 8 mm on an asymmetrical DIN rail | 4<br>For adjustable mounting on a zinc-coated mild steel rod Ø 8 mm on an asymmetrical DIN rail | 80<br>Packet of 100 pieces | 80       |
| Operating temperature °C | -5 → +50                                                                                        | -5 → +50                                                                                        | -5 → +50                   | -5 → +50 |

### Dimensions

81 536 804



### Other information

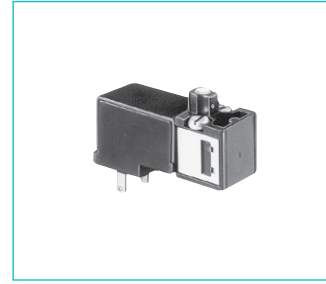
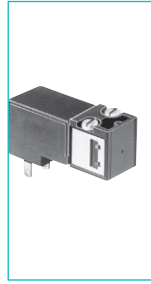
Use Weidmuller plastic labels for marking components part number FW 4734-6.

ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-control.com](http://www.crouzet-control.com)

# **ELECTRO-PNEUMATIC CONTROL VALVES**

## Miniature solenoid valves for alternating current

- › Conform to the Low Voltage Directive
- › For mounting on sub-base or footprint in accordance with CNOMO recommendation E-06-36-120N



### Part numbers (and voltages)

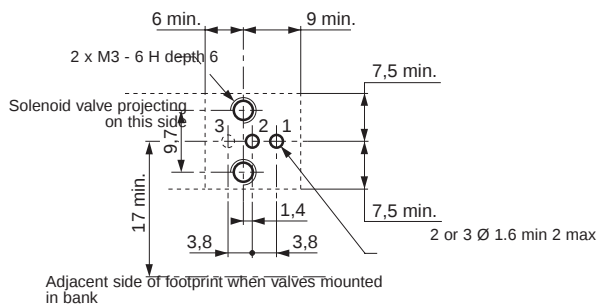
| Consumption | Voltage                 |                         |                                 |                                             |
|-------------|-------------------------|-------------------------|---------------------------------|---------------------------------------------|
| 2.5 VA      | 24 V ~ 50-60 Hz         | 81 519 080              | 81 519 380                      | 81 519 680                                  |
| 2.5 VA      | 48 V ~ 50-60 Hz*        | —                       | 81 519 381                      | —                                           |
| 2.5 VA      | 110 V ~ 50-60 Hz        | —                       | 81 519 378                      | 81 519 678                                  |
| 2.5 VA      | 220 V- 230 V ~ 50-60 Hz | —                       | 81 519 379                      | 81 519 679                                  |
| Function    |                         | 3/2 NC                  | 3/2 NC                          | 3/2 NC                                      |
| Version     |                         | Without manual override | With manual override by impulse | With manual override by latching (1/4 turn) |

### Characteristics

|                                                             |         |                   |                   |                   |
|-------------------------------------------------------------|---------|-------------------|-------------------|-------------------|
| Operating pressure                                          | bar     | 1 → 8             | 1 → 8             | 1 → 8             |
| Orifice diameter                                            | mm      | 0.5               | 0.5               | 0.5               |
| Flow at 6 bars                                              | NI/min  | 12                | 12                | 12                |
| kV                                                          |         | 0.12              | 0.12              | 0.12              |
| Switching time                                              | ms      | 5 → 15            | 5 → 15            | 5 → 15            |
| Mechanical life (operations)                                |         | 5 10 <sup>7</sup> | 5 10 <sup>7</sup> | 5 10 <sup>7</sup> |
| Operating temperature                                       | °C      | -10 → +50         | -10 → +50         | -10 → +50         |
| Compressed air or inert gas - oil-free air filtered to 50 µ |         | •                 | •                 | •                 |
| Duty factor                                                 |         | 100 % ED          | 100 % ED          | 100 % ED          |
| Insulation class                                            | IEC 85  | F                 | F                 | F                 |
| Weight                                                      |         | 35                | 35                | 35                |
| Rotatable connector 4 positions in 90° steps                |         | •                 | •                 | •                 |
| Degree of protection with sub-base (page 62)                | IEC 529 | IP 20             | IP 20             | IP 20             |
| with connector 81 516 082 (page 65)                         | IEC 529 | IP 65             | IP 65             | IP 65             |
| UL and cUL approval                                         |         | MH 15085          | MH 15085          | MH 15085          |

### 15x15 mm footprint

according to CNOMO E 06-36-120N



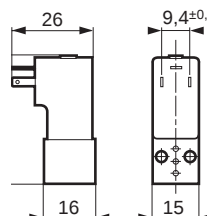
- 1 - Supply
- 2 - Output
- 3 - Exhaust

### Dimensions

81 519 0

81 519 3  
81 519 6

Manual  
override

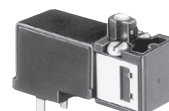


## Miniature solenoid valves for direct current

- Conform to the Low Voltage Directive
- For mounting on sub-base or footprint in accordance with CNOMO recommendation E-06-36-120N



Also available in ATEX version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



### Part numbers (and voltages)

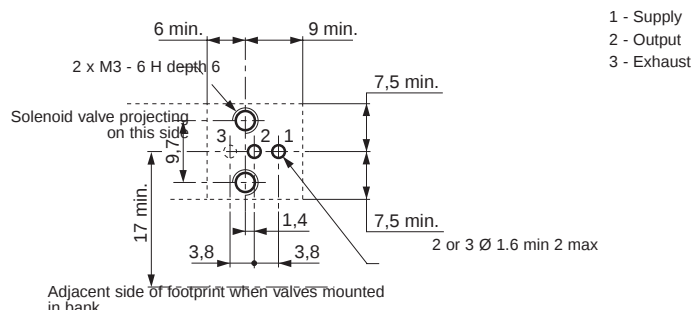
|          | Consumption<br>1 W | Voltage<br>24 V --- |                                   |                                           |                                           |                                           |
|----------|--------------------|---------------------|-----------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|
| Function |                    |                     | <b>81 519 032</b>                 | <b>81 519 332</b>                         | <b>81 519 632</b>                         | <b>81 519 340</b>                         |
| Version  |                    |                     | 3/2 NC<br>Without manual override | 3/2 NC<br>With manual override by impulse | 3/2 NC<br>With maintained manual override | 3/2 NF<br>With maintained manual override |

### Characteristics

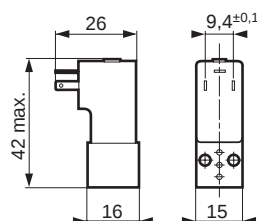
|                                                             |         |                   |                   |                   |                   |
|-------------------------------------------------------------|---------|-------------------|-------------------|-------------------|-------------------|
| Operating pressure                                          | bar     | 1 → 8             | 1 → 8             | 1 → 8             | 1 → 8             |
| Orifice diameter                                            | mm      | 0.8               | 0.8               | 0.8               | 0.8               |
| Flow at 6 bars                                              | NI/min  | 25                | 25                | 25                | 25                |
| kV                                                          |         | 0.3               | 0.3               | 0.3               | 0.3               |
| Switching time                                              | ms      | 5 → 15            | 5 → 15            | 5 → 15            | 5 → 15            |
| Mechanical life (operations)                                |         | 5 10 <sup>7</sup> | 5 10 <sup>7</sup> | 5 10 <sup>7</sup> | 5 10 <sup>7</sup> |
| Operating temperature                                       | °C      | -10 → +50         | -10 → +50         | -10 → +50         | -10 → +50         |
| Compressed air or inert gas - oil-free air filtered to 50 µ |         | •                 | •                 | •                 | •                 |
| Duty factor                                                 |         | 100 % ED          | 100 % ED          | 100 % ED          | 100 % ED          |
| Insulation class                                            | IEC 85  | F                 | F                 | F                 | F                 |
| Weight                                                      |         | 35                | 35                | 35                | 35                |
| Rotatable connector 4 positions in 90° steps                |         | •                 | •                 | •                 | •                 |
| Degree of protection with M12 5-pin connector               | IEC 529 | —                 | —                 | —                 | —                 |
| UL and cUL approval with connector 81 516 082               | IEC 529 | IP 65<br>MH 15085 | IP 65<br>MH 15085 | IP 65<br>MH 15085 | IP 65<br>MH 15085 |

### 15x15 mm footprint

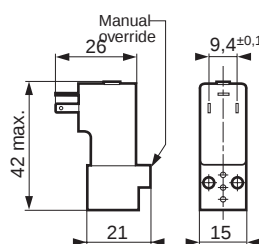
according to CNOMO E 06-36-120N



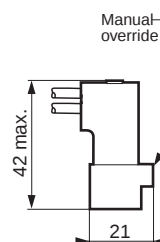
### Encombrement 81 519 0



### 81 519 3 81 519 6



### 81 519 3



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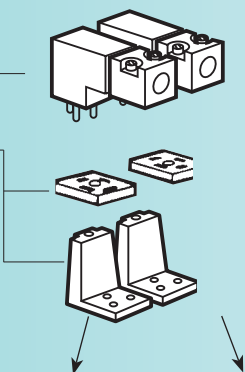
## Electro-pneumatic miniature control valves

### Mounting

#### Miniature solenoid valves

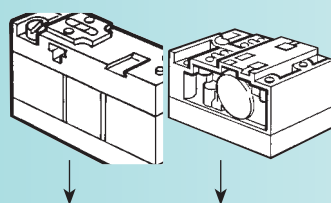
#### Indicators

- LED seals
- LED



#### Valve modules

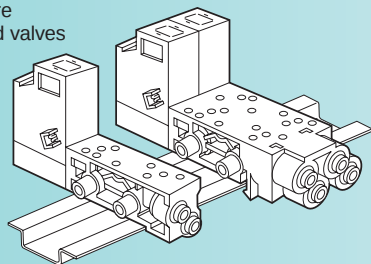
- Poppet
  - 3/2 monostable (17.5 mm)
  - 4/2 monostable (17.5 mm)
- Slide valve
  - 4/2 bistable (35 mm)
  - 4/2 monostable spring-return (35 mm)



#### Sub-bases

For  
miniature  
solenoid valves

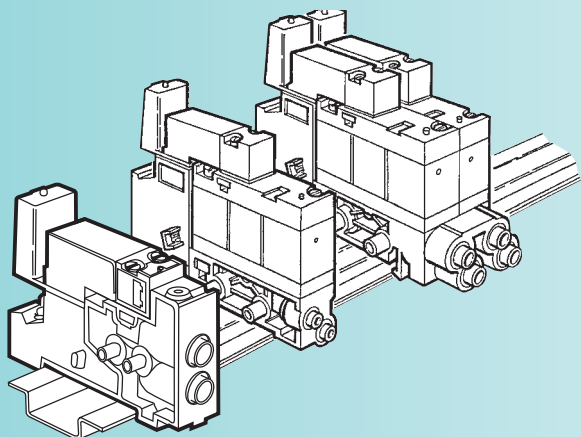
For valve modules



Double

Single

#### Complete product



## Valve modules

- Monostable, bistable
- 3/2, 4/2



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



81 513 100



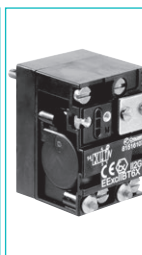
81 513 600



81 513 200



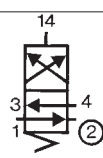
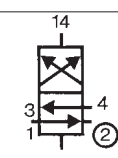
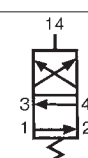
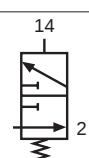
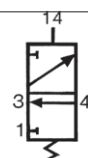
81 516 200



81 516 100

| Function | 3/2 NC monostable | 3/2 NO monostable | 4/2 monostable | 4/2 bistable | 4/2 monostable |
|----------|-------------------|-------------------|----------------|--------------|----------------|
|----------|-------------------|-------------------|----------------|--------------|----------------|

### Symbol

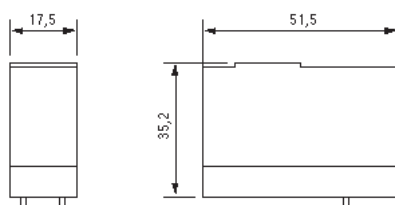


### Characteristics

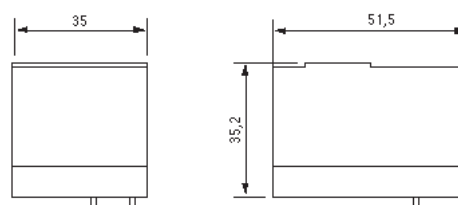
|                                   |                                |                       |                       |                       |                 |                 |
|-----------------------------------|--------------------------------|-----------------------|-----------------------|-----------------------|-----------------|-----------------|
| Width                             | mm                             | 17.5                  | 17.5                  | 17.5                  | 35              | 35              |
| Working pressure                  | bars                           | 3→8                   | 3→8                   | 3→8                   | 2→8             | 3.5→8           |
| Orifice diameter                  | mm                             | 3                     | 3                     | 3                     | 4               | 4               |
| Flow at 6 bars                    | with Ø 4 mm sub-base (page 63) | 200                   | 200                   | 200                   | 300             | 300             |
|                                   | with Ø 6 mm sub-base (page 63) | 300                   | 300                   | 300                   | 400             | 400             |
| Flow Rate                         | with Ø 4 mm sub-base (page 63) | 2.2                   | 2.2                   | 2.2                   | 4               | 4               |
|                                   | with Ø 6 mm sub-base (page 63) | 2.5                   | 2.5                   | 2.5                   | 5               | 5               |
| Operating temperature             | ° C                            | -10 → +50             | -10 → +50             | -10 → +50             | -10 → +50       | -10 → +50       |
| Switching time for the valve only | ms                             | 15                    | 15                    | 15                    | 50              | 50              |
| Mechanical life                   | operations                     | 1.5 x 10 <sup>7</sup> | 1.5 x 10 <sup>7</sup> | 1.5 x 10 <sup>7</sup> | 10 <sup>7</sup> | 10 <sup>7</sup> |
| Weight                            | g                              | 38                    | 38                    | 38                    | 106             | 106             |

### Dimensions

#### 81 513



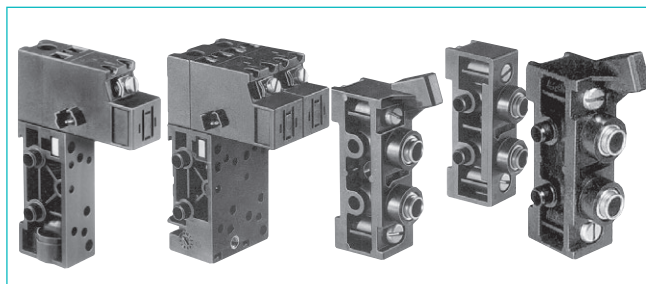
#### 81 516



## Sub-bases and end bases for miniature control valves



Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



### Part numbers

| Mounting                                             |                  |                            | Cabinet    | Cabinet    | Cabinet    | Cabinet    |
|------------------------------------------------------|------------------|----------------------------|------------|------------|------------|------------|
| Version                                              |                  |                            | 17.5 mm    | 35 mm      | —          | —          |
| Push-in connection for semi-rigid tubing (NFE 49100) | Sub-bases        | Ø 4 mm                     | 81 513 060 | 81 517 101 | —          | —          |
|                                                      |                  | Ø 6 mm                     | 81 513 065 | 81 517 201 | —          | —          |
|                                                      | End bases (pair) | Ø 6 mm                     | —          | —          | 81 513 011 | —          |
|                                                      |                  | Intermediate supply module | —          | —          | —          | 81 513 001 |

### Characteristics

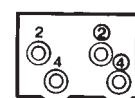
|                     |     |                |                |                |                |
|---------------------|-----|----------------|----------------|----------------|----------------|
| Torque capacity     | mm² | 3              | 3              | —              | —              |
| UL and cUL approval |     | MM15085        | MM15085        | —              | —              |
| Mounting            |     | DIN rail 35 mm | DIN rail 35 mm | DIN rail 35 mm | DIN rail 35 mm |
| Weight              | g   | 55             | 110            | 86             | 44             |

### Connections

#### Pneumatic

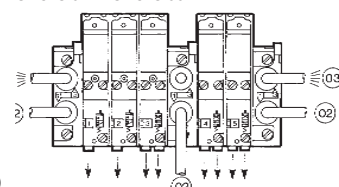


- 2 - Pneumatic output 4/2 (NO)
- 4 - Pneumatic output 3/2 or 4/2 (NC)



- ② Output at rest (NO)
- 2 - Output at rest \*
- ④ Output at rest \*
- 4 - Output operating (NC)

#### 81 513 011 - 81 513 001



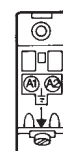
#### Note :

- Each sub-base can accept
- sub-base 81 513 060-065 : 1 relay 3/2 or 4/2, width 17.5 mm
- sub-base 81 517 101-201 : 1 bistable relay 4/2 (width 35 mm) or 2 relays 3/2 or 4/2 (width 17.5 mm)

- ② 2 Supply ports
- ③ 2 Exhaust ports

Integral push-in connections Ø 6 mm

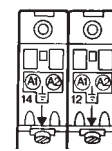
#### Electrical



- A1 - Pilot signal
- A2 - Common



- Earth



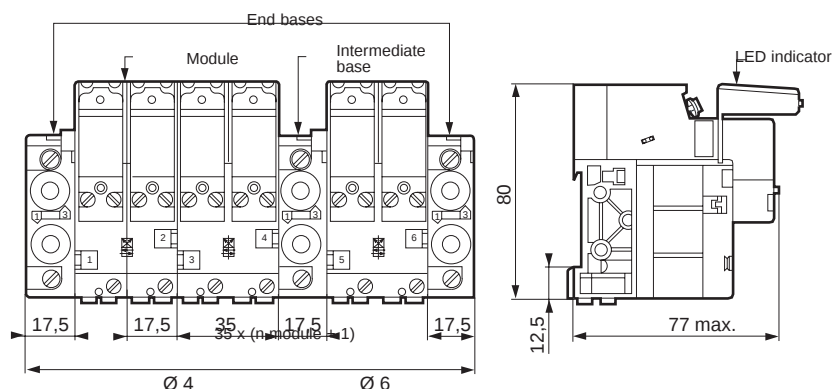
- A1 - Operating control signal (14)
- A2 - Common
- A1 - Rest control signal (12)
- A2 - Common



- Earth

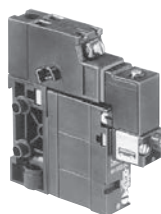
Degree of protection : IP20 when assembled.

**Dimensions** with miniature control valves (page 62) + miniature solenoid valves (page 58) + indicators (page 65)



ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet-control.com](http://www.crouzet-control.com)

## Valves and solenoids valves assembled



Contact us for  
Other versions

### Part numbers

|                                                                    |                                                |                                                |            |  |
|--------------------------------------------------------------------|------------------------------------------------|------------------------------------------------|------------|--|
| Function                                                           | 3/2 NC                                         | 4/2 monostable                                 |            |  |
| Sub-base with push-in connection for semi-rigid tubing (NFE 49100) | Ø 4 ext.                                       | Ø 4 ext.                                       |            |  |
| Version                                                            | Solenoid valve with manual override by impulse | Solenoid valve with manual override by impulse |            |  |
| Voltage                                                            | 24 VDC (+10% -15%)                             | 81 513 103                                     | 81 513 203 |  |

### Symbol

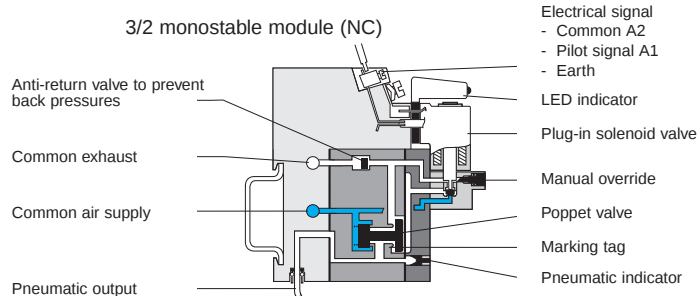


### Characteristics

|                                                                                                |        |                       |                       |  |  |
|------------------------------------------------------------------------------------------------|--------|-----------------------|-----------------------|--|--|
| Operating pressure                                                                             | bar    | 3→8                   | 3→8                   |  |  |
| Orifice diameter                                                                               | mm     | 3                     | 3                     |  |  |
| Flow at sub-base 81 513 060                                                                    | NL/min | 200                   | 200                   |  |  |
| 6 bars sub-base 81 517 101                                                                     | NL/min | —                     | —                     |  |  |
| KV with sub-base 81 513 060                                                                    |        | 2.2                   | 2.2                   |  |  |
| with sub-base 81 517 101                                                                       |        | —                     | —                     |  |  |
| Operating temperature                                                                          | °C     | -10 → +50             | -10 → +50             |  |  |
| Switching time of the assembly                                                                 | ms     | 20                    | 20                    |  |  |
| Mechanical life (operations) at 4 bars                                                         |        | 1.5 x 10 <sup>7</sup> | 1.5 x 10 <sup>7</sup> |  |  |
| Valve position will be maintained in the event of pressure loss and/or electrical current loss |        | —                     | —                     |  |  |
| Mounting                                                                                       |        | DIN rail 35 mm        | DIN rail 35 mm        |  |  |
| Weight                                                                                         | g      | 130                   | 130                   |  |  |
| UL and cUL approval                                                                            |        | MH15085               | MH15085               |  |  |

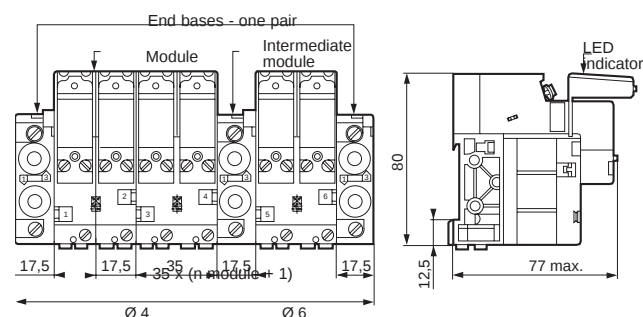
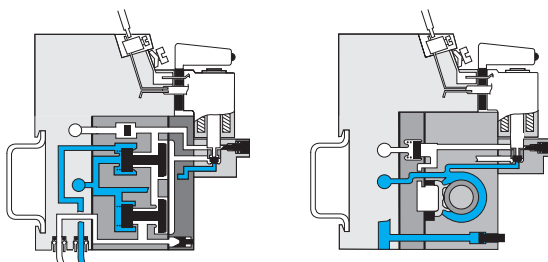
### Principle of operation

### Dimensions



4/2 monostable module

4/2 bistable module



End bases not supplied (page 63)  
Intermediate bases not supplied (page 63)  
Indicators not supplied (page 65)

## Accessories



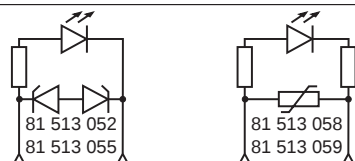
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



### Part numbers

|                                                             |                                 |                    |   |            |            |            |   |            |
|-------------------------------------------------------------|---------------------------------|--------------------|---|------------|------------|------------|---|------------|
| Visual indicators with anti-surge                           | 24 V - 50-60 Hz ~               | 81 513 052         | — | —          | —          | —          | — | —          |
|                                                             | 48 V - 50-60 Hz ~               | 81 513 055         | — | —          | —          | —          | — | —          |
|                                                             | 110 V - 50-60 Hz ~              | 81 513 058         | — | —          | —          | —          | — | —          |
|                                                             | 230 V - 50-60 Hz (-10% +6 %)    | 81 513 059         | — | —          | —          | —          | — | —          |
| LED seal Packaging                                          | 12 to 24 V - DC - AC (by 5)     | 81 513 064 (by 10) | — | —          | —          | —          | — | —          |
| Exhaust silencer                                            | Plug-in Ø 6                     | —                  | — | 81 537 001 | —          | —          | — | —          |
|                                                             | Plug-in Ø 8                     | —                  | — | 81 537 201 | —          | —          | — | —          |
| Connector for solenoid valve                                | Without manual override         | —                  | — | —          | 81 516 082 | —          | — | —          |
|                                                             | With manual override by impulse | —                  | — | —          | —          | 81 516 081 | — | —          |
| Pneumatic pilots                                            | With manual override by impulse | —                  | — | —          | —          | 81 516 091 | — | —          |
| Push-in connection for semi-rigid tubing Ø 4 mm (NFE 49100) | —                               | —                  | — | —          | —          | •          | — | —          |
| Blanking plate                                              | —                               | —                  | — | —          | —          | —          | — | 81 516 085 |

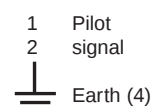
### Symbol



### Characteristics

|                                                                     |    |   |            |    |    |   |                     |   |
|---------------------------------------------------------------------|----|---|------------|----|----|---|---------------------|---|
| Consumption                                                         | W  | — | 0.24       | —  | —  | — | —                   | — |
| Temperature                                                         | °C | — | - 10 → +50 | —  | —  | — | —                   | — |
| Connection                                                          | mm | — | —          | —  | —  | — | Instantané Ø 4 ext. | — |
| Mounted between the pilot solenoid valve and the body of the module | •  | • | •          | —  | —  | — | —                   | — |
| Supplied in multiples of 5                                          | •  | — | —          | —  | —  | — | —                   | — |
| Supplied in multiples of 10                                         | —  | • | •          | —  | •  | • | •                   | • |
| Packet of 10 pieces                                                 | —  | — | —          | —  | —  | — | —                   | • |
| Weight                                                              | g  | 6 | 2          | 30 | 10 | 5 | 3                   | — |

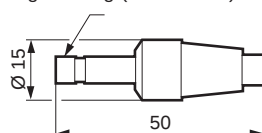
### Connection



### Dimensions

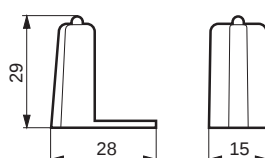
#### 81 537 001 - 81 537 201

Mounted by plugging into push-in connector for semi-rigid tubing (NFE 49100)

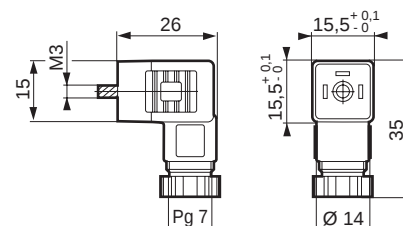


#### 81 513 052 - 81 513 055

#### 81 513 058 - 81 513 059



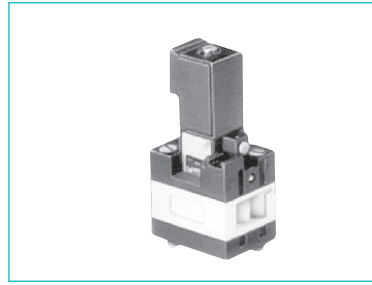
#### 81 516 082



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## Solenoid valves

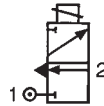
- › Reduced "dimensions"
- › Mounted on sub-base



### Part numbers and voltages

|                 |                                    |                  |  |
|-----------------|------------------------------------|------------------|--|
| Function        |                                    | 3/2 NC           |  |
| Mounting        |                                    | On sub-base (54) |  |
| Solenoid valves | 24 V (+10% -15%)                   | 81 519 732       |  |
| with            | 24 V - 50/60 Hz (+10% -15%)        | 81 519 774       |  |
| manual          | 48V - 50/60 Hz (+10% -15%)         | 81 519 775       |  |
| override        | 110 V - 50/60 Hz (+10% -15%)       | 81 519 776       |  |
| by impulse      | 220 - 230 V - 50/60 Hz (+10% -15%) | 81 519 777       |  |

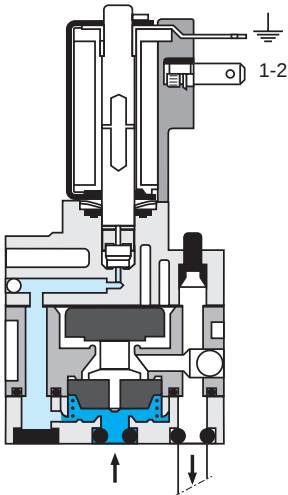
### Symbol



### Characteristics

|                                                                             |            |                       |  |
|-----------------------------------------------------------------------------|------------|-----------------------|--|
| Operating pressure                                                          | bar        | 2 → 8                 |  |
| Orifice diameter                                                            | mm         | 2.7                   |  |
| Flow at 6 bars                                                              | NI/min     | 170                   |  |
| Rotatable coil 4 positions in 90° steps                                     |            | •                     |  |
| Degree of protection (with connector 81 516 082 not supplied) (see page 65) | IEC 529    | IP 65                 |  |
| Mechanical life                                                             | operations | 1.5 x 10 <sup>7</sup> |  |
| Consumption                                                                 | W          | 1                     |  |
|                                                                             | VA         | 2.5                   |  |
| Operating temperature                                                       | °C         | -5 → +50              |  |
| Weight                                                                      | g          | 70                    |  |
| UL and cUL approval                                                         |            | MH15085               |  |

### Principle of operation



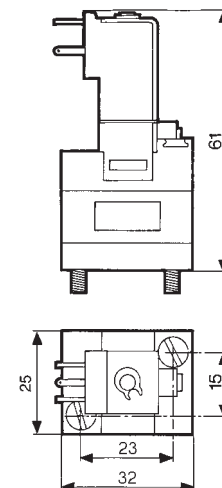
### Connections

- Pneumatic { 1 - Supply  
2 - Output
- Electrical { 1 - 2 - Pilot signal  
⊥ Earth

Electrical connection by connector  
81 516 062 (see page 65)

### Dimensions 81 519

On separate sub-base



# Miniature control valves, 17.5 mm

## → Electro-pneumatic interface block

Complete block, ready to install, consisting of:

- Preconfigured 8-position sub-base
- 6 4/2 monostable valve modules with 24 V $\square$  pilot holes
- 2 blanking plates (for extension if necessary)
- 1 connection cable

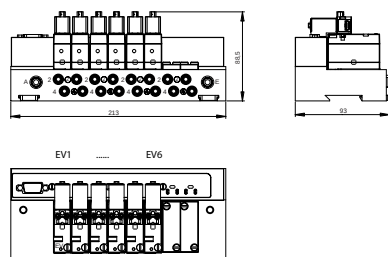


## Part numbers

| Part numbers                                  | 16 outputs                                                          | 16 outputs                                                           |
|-----------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------|
|                                               | 81513241                                                            | 81513238                                                             |
| <b>Electrical characteristics</b>             |                                                                     |                                                                      |
| Supply voltage                                | 24 V $\square$ $\pm$ -10%                                           | 24 V $\square$ $\pm$ -10%                                            |
| Courant max. absorbé sur le 24 V de SUBD (mA) | 500                                                                 | 500                                                                  |
| Courant absorbé par chaque électrovanne       | 60                                                                  | 60                                                                   |
| Response time (ms)                            | 15                                                                  | 15                                                                   |
| LED display                                   | Yes (integrated in the sub-base)                                    | Yes (integrated in the sub-base)                                     |
| Protection against voltage surges             | Yes                                                                 | Yes                                                                  |
| <b>Electrical connections</b>                 |                                                                     |                                                                      |
| Type of cable                                 | Sub D9 AWG 24 wires                                                 | Sub D9 AWG 24 wires                                                  |
| Cable length                                  | 2 m                                                                 | 2 m                                                                  |
| <b>Pneumatic characteristics</b>              |                                                                     |                                                                      |
| Function                                      | 6 4/2 monostable valve modules (81513200) + 2 free positions        | Whitout                                                              |
| Operating pressure bars                       | 3 $\rightarrow$ 8 b                                                 | 3 $\rightarrow$ 8 b                                                  |
| Flow at 6 bars NL/mim                         | 300                                                                 | 300                                                                  |
| Mechanical life (operations)                  | 1.5 x 10 <sup>7</sup>                                               | 1.5 x 10 <sup>7</sup>                                                |
| Working medium                                | Compressed air or inert gas, 50 $\mu$ m filtered non-lubricated air | Compressed aire or inet gaés, 50 $\mu$ m filtered non-lubricated air |
| <b>Pneumatic connections</b>                  |                                                                     |                                                                      |
| Power supply connection                       | Push-in connection $\varnothing$ 8 mm                               | Push-in connection $\varnothing$ 8 mm                                |
| Output connections                            | Push-in connection $\varnothing$ 6 mm                               | Push-in connection $\varnothing$ 6 mm                                |
| Connection of common exhaust                  | Push-in connection $\varnothing$ 8 mm                               | Push-in connection $\varnothing$ 8 mm                                |
| <b>General characteristics</b>                |                                                                     |                                                                      |
| Operating temperature range IEC 68214 (°C)    | -5 $\rightarrow$ +50                                                | -5 $\rightarrow$ +50                                                 |
| Storage temperature IEC 68-2-14 (°C)          | -15 $\rightarrow$ +50                                               | -15 $\rightarrow$ +50                                                |
| Protection (IEC/EN 60529)                     | IP 20                                                               | IP20                                                                 |
| Mounting                                      | On DIN rail or via two M5 screws (according to mounting plan)       | On DIN rail or via two M5 screws (according to mounting plan)        |
| Weight (g)                                    | 1350                                                                | 960                                                                  |
| <b>Comments</b>                               |                                                                     |                                                                      |
| Other configurations on request               |                                                                     |                                                                      |

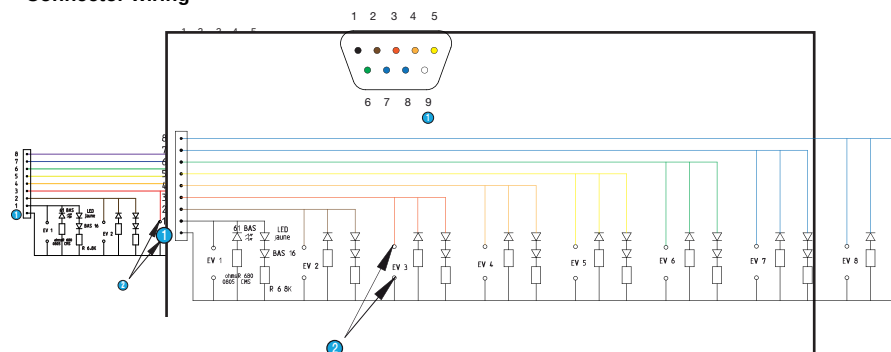
## Dimensions (mm)

81513241



## Connections

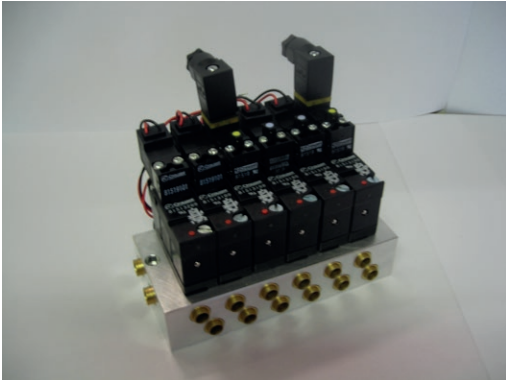
Connector wiring



- ① Commun 0 V
- ② Clips femelle CI

## ► Specific islands "for integrators" (supplied in packs of 20)

### ► Versions with interfaces 300 NL / mm



#### Configuration

- 1 - Specify the number and type of interfaces (3 / 2 mono - 4 / 2 mono - 4 / 2 bistable) see page 62.
- 2 - Specify the voltage, the type and method of the control valve connections, see page: 58-59 (Example: 24 V DC with manual switch maintained, exit leads).
- 3 - Please send us your application specifying your requirements and quantities per year, and we will respond as soon as possible.

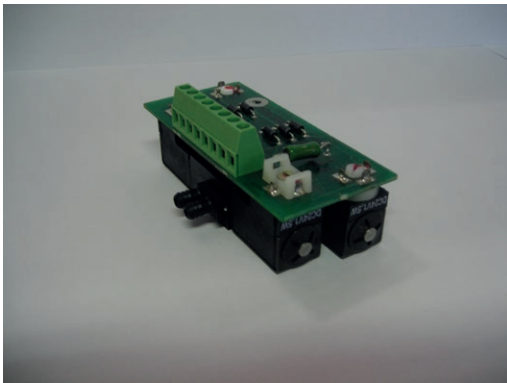
### ► Versions with interfaces 30 NL / mm



#### Configuration

- 1 - Specify the voltage, the type and method of the control valve connections, see page: 58-59 (Example: 24 V DC with manual switch maintained, exit leads).
- 2 - Please send us your application specifying your requirements and quantities per year, and we will respond as soon as possible.

### ► Develop customised versions to specifications

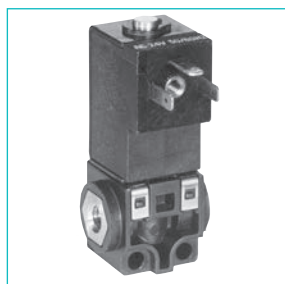


Crouzet analyses your needs and offers a customised solution.

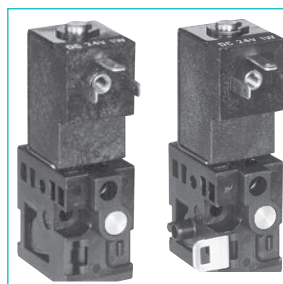
# MULTI-FLUID SOLENOID VALVES

## Standard 2/2 miniature solenoid valves for fluids and inert gases

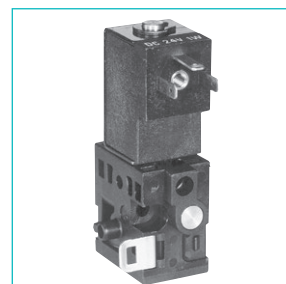
- Autonomous
- Mounted individually or in a battery
- Variable orientation coil
- Low power consumption : 1 W
- Quick to fit together, no tools needed
- M5 fittings or possibility of barb



Individual



Bank end valves (1 pair)



Intermediate valve

### Part numbers

| Orifice diameter | KV  | Adjustment range | Power | NC         | NC         | NC         |
|------------------|-----|------------------|-------|------------|------------|------------|
| 0.8 mm           | 0.3 | 1 • 8 b          | 1W    | 81 546 001 | 81 547 001 | 81 547 501 |

### Standard features

|                                      |                                                    |
|--------------------------------------|----------------------------------------------------|
| Voltage                              | 24V ---                                            |
| Electrical connections               | 2.8 x 0.5 blade terminals (W7D5) at 9.4 mm centres |
| Fluid connection                     | tapped holes M5                                    |
| Manual override + pressure indicator | without                                            |

### General characteristics

|                              |                                                            |
|------------------------------|------------------------------------------------------------|
| Response time                | 5 → 15 ms                                                  |
| Operating temperature        | - 5 °C → +50 °C                                            |
| Viscosity range              | up to 30 cst                                               |
| Vibration resistance         | up to 5 g                                                  |
| Air flow rate (at 2 bars)    | 15 → 40 NI/mn                                              |
| Maximum switching rate       | 30 Hz                                                      |
| Weight                       | Individual mounting: 32.5 g<br>Bank end/inner valves: 35 g |
| Body material                | Glass-reinforced polyamide 6.6                             |
| Mechanical life (operations) | 1.5 x 10 <sup>7</sup>                                      |
| UL and cUL approval          | MH 15085                                                   |

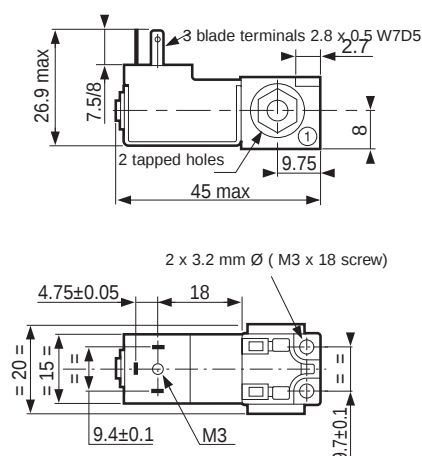
### Accessories for 2/2 miniature solenoid valves

|                                            |                                                                                                                                |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Connector for solenoid valve (see page 65) | 81 516 082                                                                                                                     |
| Visual indicators (see page 65)            | 24 V-50/60 Hz CC: 81 513 052<br>48 V-50/60 Hz AC: 81 513 055<br>110 V-50/60 Hz AC: 81 513 058<br>220 V-50/60 Hz AC: 81 513 059 |
| LED seal (see page 65)                     | 12-24 V ~ ---: 81 513 064                                                                                                      |

### Dimensions

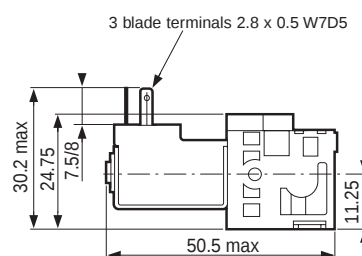
#### Individual

81 546 0



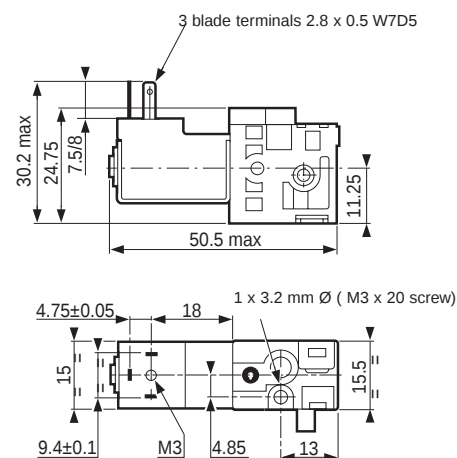
#### Bank end valves (1 pair)

81 547 0



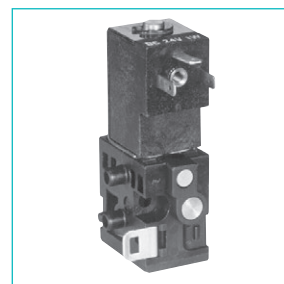
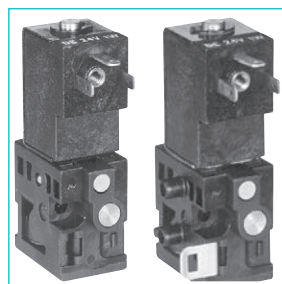
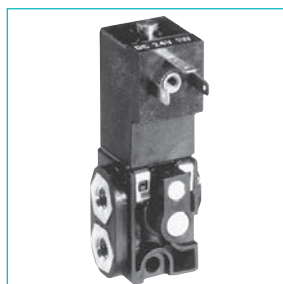
#### Intermediate valve

81 547 5



## Standard 3/2 miniature solenoid valves for fluids and inert gases

- Autonomous
- Mounted individually or in a battery
- All connections on one face
- Small size



Mounting

Individual

Bank end valves (1 pair)

Intermediate valve

### Part numbers

| Orifice diameter | KV Débit | Adjustment range | Power | NC         | NC         | NC         |
|------------------|----------|------------------|-------|------------|------------|------------|
| 0.8 mm           | 0.3 25   | 1 • 8 b          | 1W    | 81 548 010 | 81 549 010 | 81 549 510 |
| 0.8 mm           | 0.3      | 1 • 8 b          | 2W    |            |            |            |
| 1.2 mm           | 0.6 40   | - 0.9 • 3 b      | 2W    | 81 548 011 | 81 549 011 | 81 549 511 |
| 1.5 mm           | 0.8 60   | 0 • 2 b          | 2W    | 81 548 012 | 81 549 012 | 81 549 512 |

### Standard features

|                        |                                                    |
|------------------------|----------------------------------------------------|
| Voltage                | 24V ---                                            |
| Electrical connections | 2.8 x 0.5 blade terminals (W7D5) at 9.4 mm centres |
| Fluid connection       | tapped holes M5                                    |
| Manual override        | by impulse                                         |
| Pressure indicator     | without                                            |

### General characteristics

|                              |                                |
|------------------------------|--------------------------------|
| Response time                | 5 → 15 ms                      |
| Operating temperature        | - 5 °C → +50 °C                |
| Viscosity range              | up to 30 cst                   |
| Vibration resistance         | up to 5 g                      |
| Air flow rate (at 2 bars)    | 15 → 40 NI/min                 |
| Maximum switching rate       | 30 Hz                          |
| Weight                       | 32.5 g                         |
|                              | 35 g                           |
| Body material                | Glass-reinforced polyamide 6.6 |
| Mechanical life (operations) | 1.5 x 10 <sup>7</sup>          |
| UL and cUL approval          | MH 15085                       |

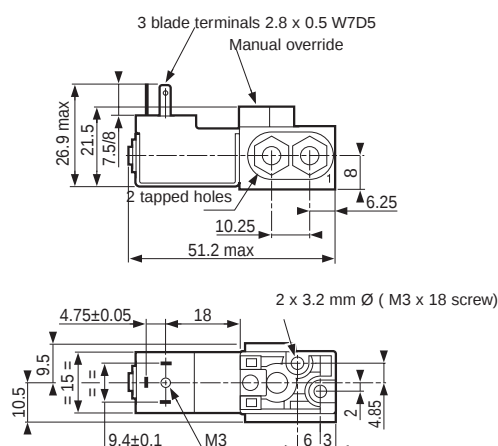
### Accessories for 3/2 miniature solenoid valves

|                                              |                   |
|----------------------------------------------|-------------------|
| Connector for solenoid valve (see page 5/11) | 81 516 082        |
| Visual indicators                            | 24 V-50/60 Hz DC  |
| (see page 65)                                | 48 V-50/60 Hz AC  |
|                                              | 110 V-50/60 Hz AC |
|                                              | 220 V-50/60 Hz AC |
| LED seal                                     |                   |
| (see page 65)                                | 12-24 V ~ ---     |

### Dimensions

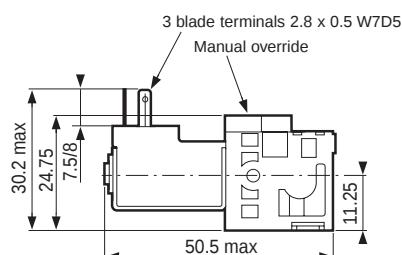
#### Individual

81 548 0



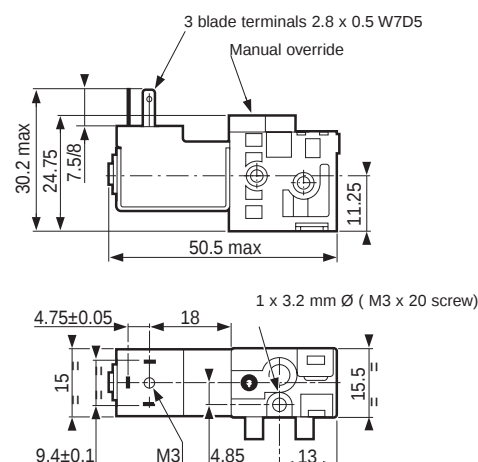
#### Bank end valves (1 pair)

81 549 0



#### Intermediate valve

81 549 5



# TEACHING MATERIALS

## Teaching materials

- › Ideal for learning pneumatics
- › For high schools, colleges and training centres



| Part numbers                                        |            |            |
|-----------------------------------------------------|------------|------------|
| Training console PUMA 2000                          | 81 598 940 | —          |
| Add-on unit                                         | —          | 81 598 941 |
| Weight (kg)                                         | 30         | 4          |
| Characteristics                                     |            |            |
| Maintained sequencer sub-base assembly              | ●          | —          |
| 1 relay sub-base                                    | ●          | —          |
| 1 peripheral sub-base                               | ●          | —          |
| 1 plate with 8 push-buttons                         | ●          | —          |
| 1 plate with 8 indicators                           | ●          | —          |
| 1 basic console                                     | ●          | —          |
| 1 cylinder mounting plate                           | ●          | —          |
| (3 cylinders + control valves + position detectors) | —          | —          |
| 2 electro-pneumatic interface units                 | —          | ●          |
| 1 pneumo-electrical interface unit                  | —          | ●          |

### Dimensions

81 598 940



## List of part numbers

| Industrial part no. | ATEX part no. | Type                    | Pages |
|---------------------|---------------|-------------------------|-------|
| 24 000 000          |               |                         |       |
| 24 678 127          |               | Pushbutton              | 15    |
| 24 678 128          |               | Pushbutton              | 15    |
| 24 678 129          |               | Pushbutton              | 15    |
| 24 678 171          |               | Mushroom button         | 15    |
| 24 678 172          |               | Mushroom button         | 15    |
| 24 678 173          |               | Mushroom button         | 15    |
| 24 678 174          |               | Symmetrical toggle      | 15    |
| 24 678 175          |               | Lever toggle            | 15    |
| 24 678 176          |               | Symmetrical toggle      | 15    |
| 24 678 177          |               | Lever toggle            | 15    |
| 24 678 178          |               | Symmetrical toggle      | 15    |
| 24 678 179          |               | Lever toggle            | 15    |
| 24 678 180          |               | Key toggle              | 15    |
| 24 678 181          |               | Key toggle              | 15    |
| 24 678 182          |               | Key toggle              | 15    |
| 24 679 702          |               | Adaptor                 | 14    |
| 79 000 000          |               |                         |       |
| 79 451 698          | 79 451 698    | Adaptor                 | 50    |
| 79 451 903          | 79 451 903    | Adaptor                 | 50    |
| 79 451 904          | 79 451 904    | Adaptor                 | 51    |
| 79 451 905          | 79 451 905    | Adaptor                 | 51    |
| 79 452 103          |               | Lever                   | 28    |
| 79 452 104          |               | Lever                   | 28    |
| 79 452 123          |               | Lever                   | 28    |
| 79 452 124          |               | Lever                   | 28    |
| 79 452 133          |               | Lever                   | 28    |
| 79 452 808          | 79 458 018    | Capacity                | 52    |
| 81 000 000          |               |                         |       |
| 81 280 010          |               | NO Microvalve           | 13-24 |
| 81 280 510          |               | NF Microvalve           | 13-24 |
| 81 281 010          |               | NO Microvalve           | 13-24 |
| 81 281 502          |               | Limit switch            | 25    |
| 81 281 504          |               | Limit switch            | 25    |
| 81 281 508          |               | Limit switch            | 25    |
| 81 281 509          |               | Limit switch            | 25    |
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| 81 372 201          |               | Special detector        | 32    |
| 81 372 401          |               | Special detector        | 32    |
| 81 372 901          |               | Special detector        | 32    |
| 81 501 025          | 81 501 031    | YES element             | 47    |
| 81 502 110          | 81 502 111    | Vacuum switch           | 39    |
| 81 502 140          | 81 502 141    | Pressure switch         | 38    |
| 81 502 150          | 81 502 151    | Pressure switch         | 38    |
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| 81 502 230          | 81 502 238    | Amplifier               | 33    |
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| 81 502 435          | 81 502 438    | Relay for leak detector | 31    |
| 81 503 025          | 81 503 028    | YES element             | 47    |
| 81 503 540          | 81 503 543    | Timer                   | 49    |
| 81 503 710          | 81 503 728    | Timer                   | 50    |
| 81 503 720          | 81 503 729    | Timer                   | 50    |
| 81 503 725          | 81 503 731    | Timer                   | 50    |
| 81 504 025          | 81 504 035    | NO element              | 22-47 |
| 81 505 110          | 81 505 111    | Vacuum switch           | 39    |
| 81 505 140          | 81 505 141    | Pressure switch         | 38    |
| 81 505 150          | 81 505 151    | Pressure switch         | 38    |
| 81 505 160          | 81 505 164    | Pressure switch         | 38    |
| 81 505 230          | 81 505 231    | Amplifier               | 33    |
| 81 505 320          | 81 505 321    | Amplifier               | 33    |
| 81 505 435          | 81 505 437    | Relay for leak detector | 31    |
| 81 506 025          | 81 506 027    | NO element              | 47    |
| 81 506 710          | 81 506 714    | Timer                   | 50    |
| 81 506 720          | 81 506 721    | Timer                   | 50    |
| 81 506 725          | 81 506 727    | Timer                   | 50    |
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| Industrial part no. | ATEX part no. | Type                     | Pages |
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| 81 509 080          |               | Pressure switch          | 37    |
| 81 509 085          |               | Pressure switch          | 37    |
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| 81 512 201          |               | Special detector         | 31    |
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| 81 513 510          |               | Pressure switch          | 37    |
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| 81 519 380          |               | Miniature solenoid valve | 58    |
| 81 519 381          |               | Miniature solenoid valve | 58    |
| 81 519 632          | 81 519 635    | Miniature solenoid valve | 59    |
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| 81 519 775          |               | Valve module             | 66    |
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| 81 520 601          | 81 520 602    | Plug-element             | 53    |
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## AMERICAS

### CANADA

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