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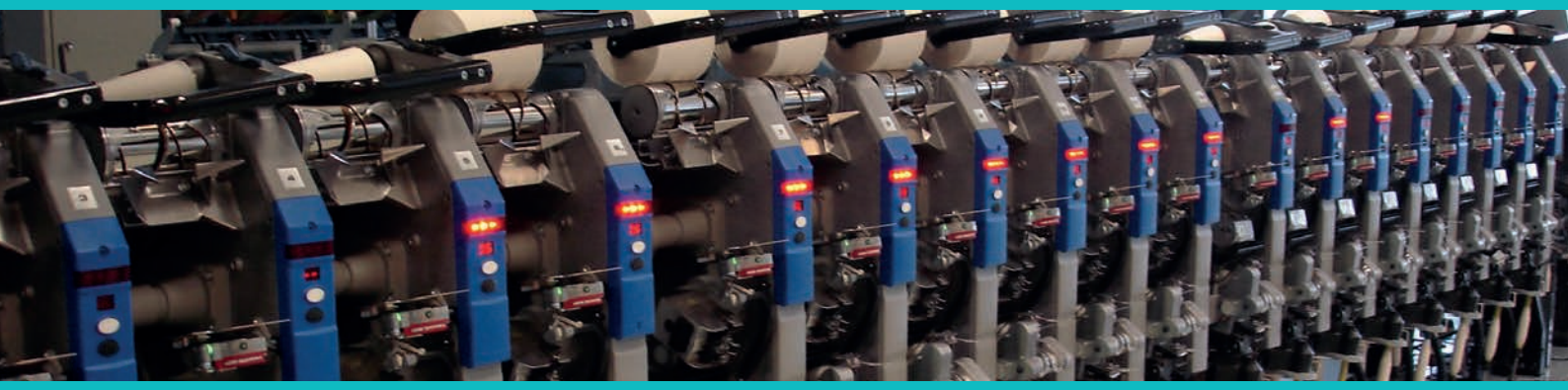
PNEUMATICS PRODUCTS



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

CROUZET CONTROL

A BRAND OF INNOVISTA SENSORS

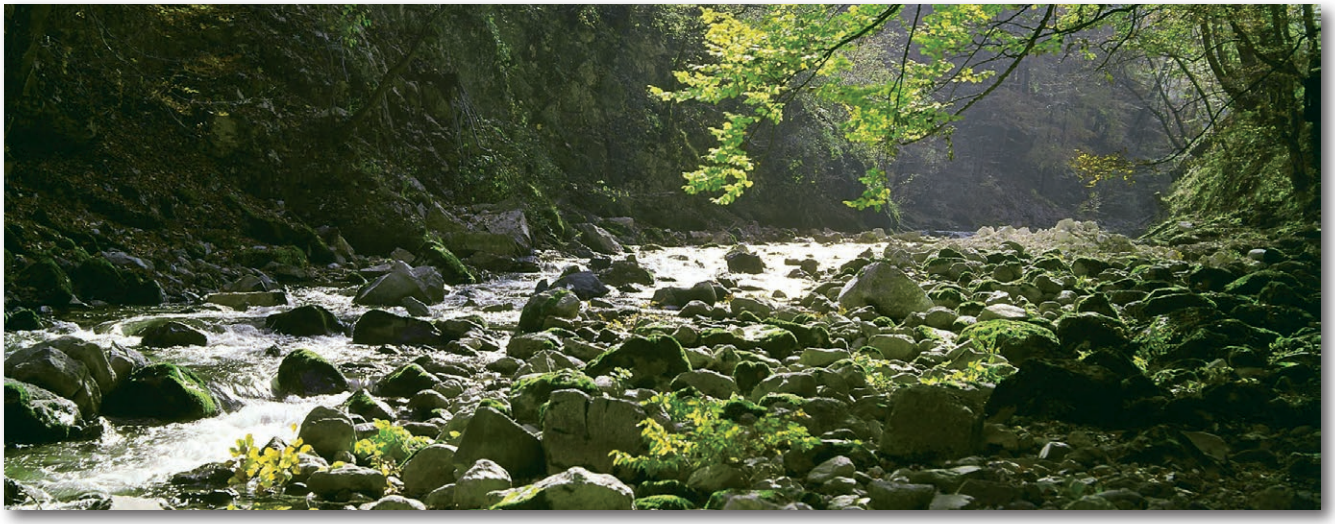
CROUZET CONTROL

- *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

RoHS

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

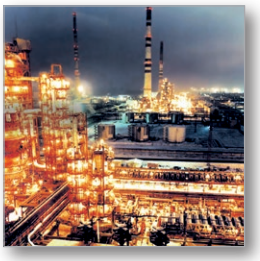
This guide has been designed to help you quickly identify the appropriate products for your requirements.Most of our pneumatic components are available in a standard range and a range for use in explosive atmospheres (ATEX): this information is given in the right-hand column on each page.

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.

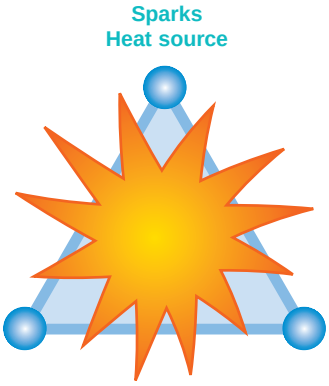
ATEX Directive 94/9/EC: general information

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

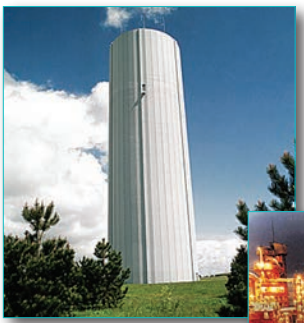
Classification:

- 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:

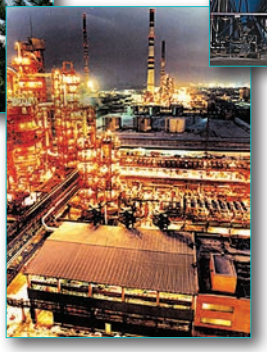
- ATEX-certified products must be supplied with an EC declaration of conformity and a user manual.
- At the time of sale, the sales representatives must check the zone in which the product is to be used. On the order, the customer must inform the manufacturer of the conditions of use.
- Manufacturers 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 G = Gas, D = Dust	G	D	G	D	G	D
Presence of Explosive atmosphere	**Continuous presence** (or for long periods, i.e. more than 1000 hours per year)		**Intermittent presence** (or occasional, i.e. 10 to 1000 hours per year)		**Fleeting presence** (or rare, i.e. 1 to 10 hours per year)	
Category of equipment that can be used 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 Ⓔx 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 Ⓔx II 1 G

➡ **The Ⓔx 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

- **X**: Reference to the operating instructions for the product
- **T6**: Temperature Class corresponding to a max. surface temperature of 85°C
- **II C**: Subdivision IIC: including hydrogen acetylene in particular, carbon bisulfur
- **ia**: Protection method used: intrinsic safety
- **Ex**: 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.**

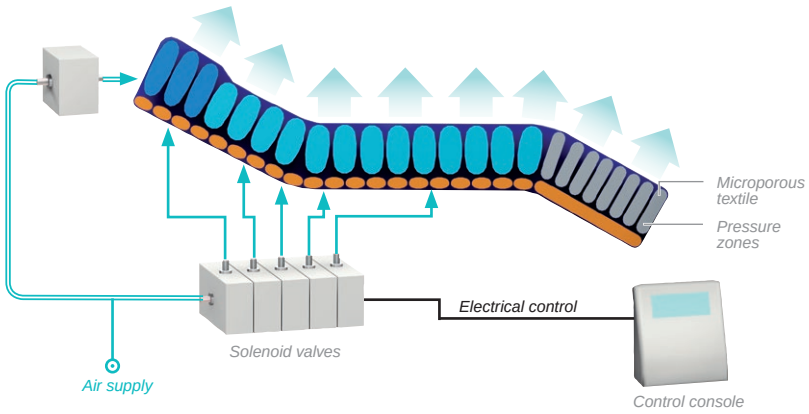
In the event of use in an explosive atmosphere caused by dust, the following items are added to the marking:

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

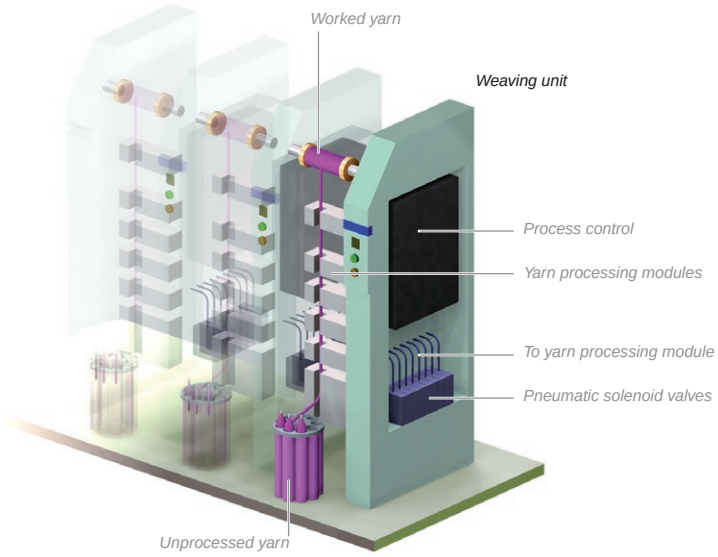
➡ **The IP rating (only for dust)**

Examples of applications:

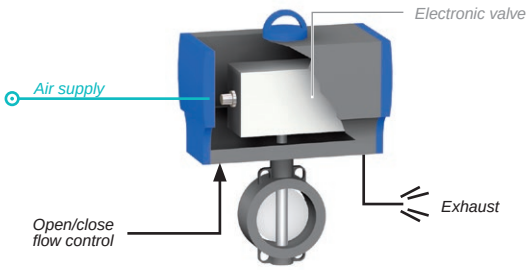
Medical mattress



Textile machine

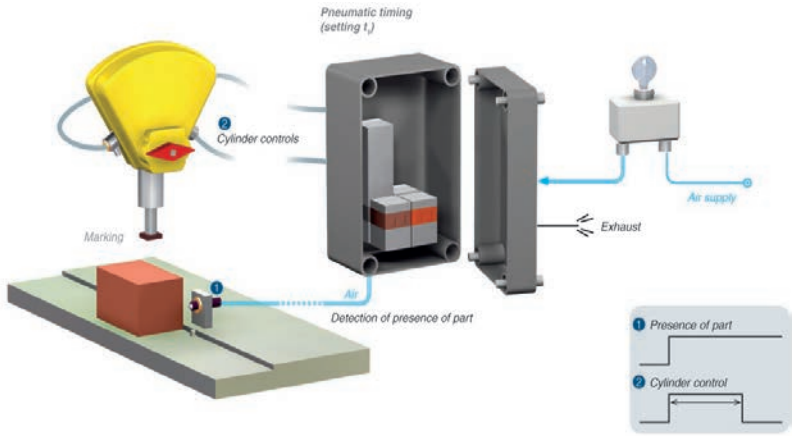


Industrial valve

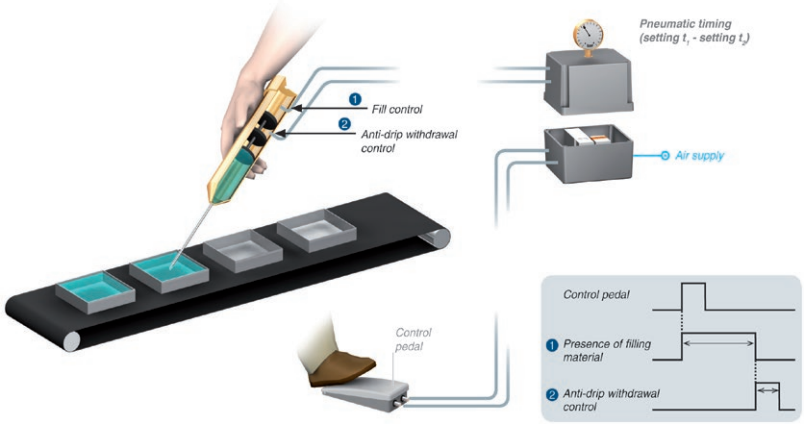


Pneumatic actuators for quarter-turn or proportional taps and valves allow open/close commands and flow rate changes to be automated.
The pneumatic actuating cylinder is operated by means of an air distributor valve built into the valve body and controlled by a solenoid valve.

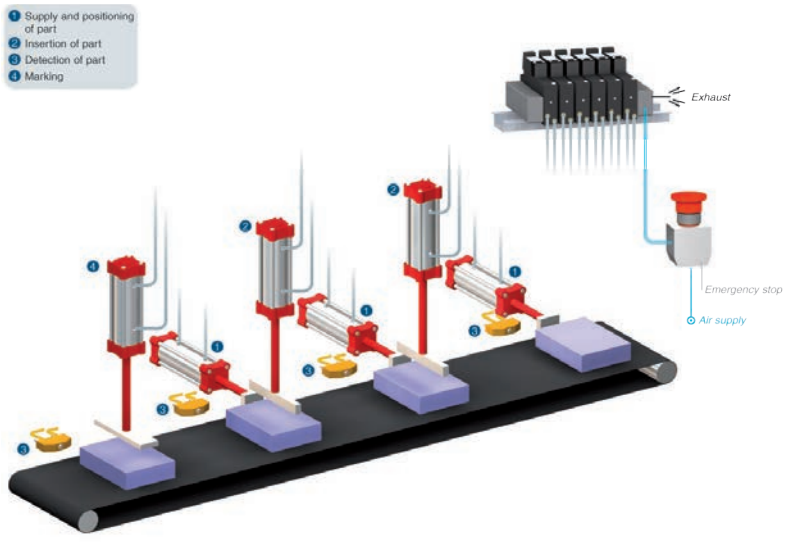
Marking control system



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

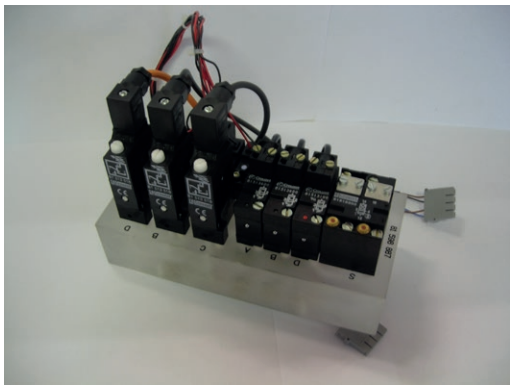


Automatic assembly system

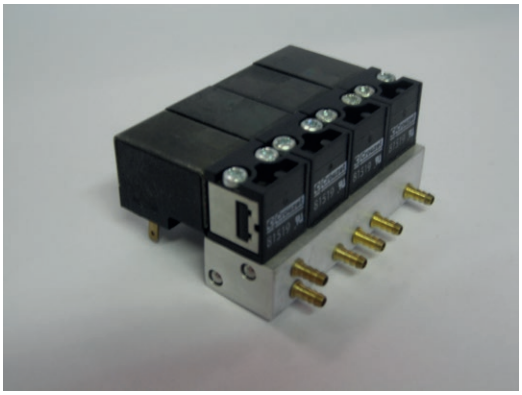


Particular realizations

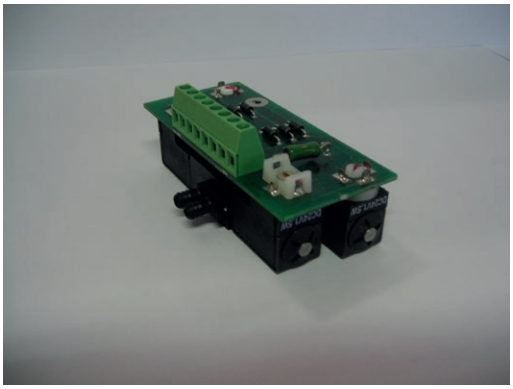
Component on manifold mastered



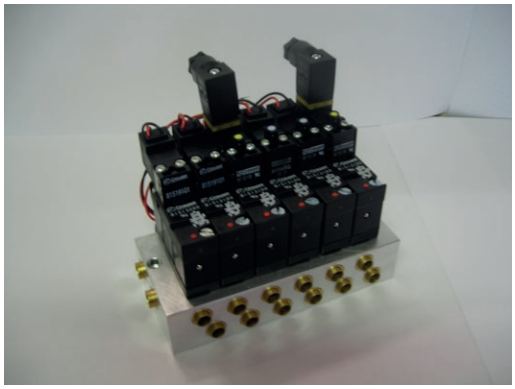
Solenoid valves on manifold



System for inflating



Valves modules on manifold

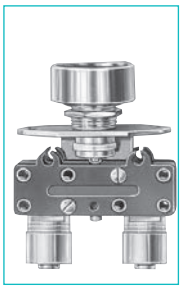


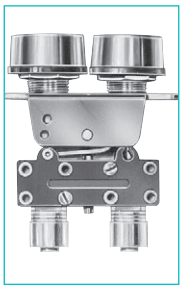
For others configurations, consult us

General summary

MANUAL ACTUATED VALVES

Push buttons diameter 12 and actuators

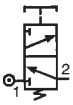


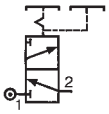


Features		Actuator color	Valve color	Push button round	Push button double round
Version	NC	black	black	81 735 511	—
		red	black	81 735 512	—
		black/red	black	—	81 733 511
	N0	black	grey	81 735 011	—
		red	grey	—	—
		black/red	grey	—	—

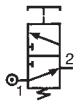
Symbol

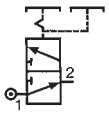
NC





NO



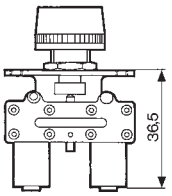


Characteristics

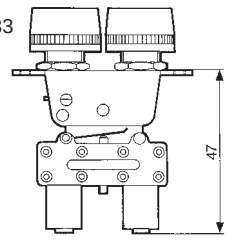
Operating pressure		bar	2 → 8	2 → 8
Orifice diameter		mm	2.7	2.7
Flow at 6 bars		Nl/mn.	200	200
Valves	NC : black		●	●
	NO : grey		●	
Operating forces (depending on actuator)		N	8 → 18	8 → 18
Effective travel		mm	1	1
Fluid: dry or lubricated air			●	●
Push-in connectors for semi-rigid tubing (NFE 49100)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

Dimensions

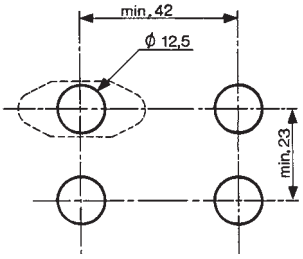
81 735



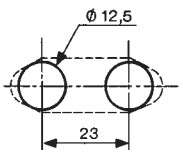
81 733

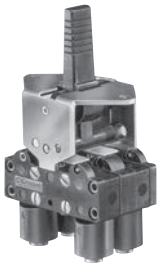


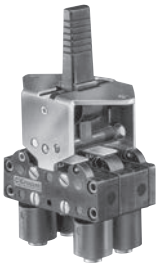
Threaded barrel

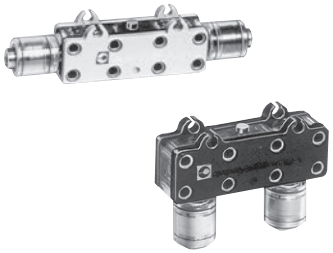


2 threaded barrels

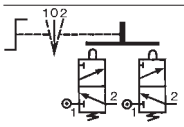


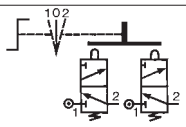






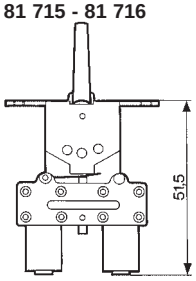
3-position lever manual return	3-position lever spring return	Horizontal outputs	Vertical outputs
81 716 511	81 715 511	81 280 510	81 281 510
81 716 512	81 715 512	—	—
—	—	—	—
—	—	81 280 010	81 281 010
—	—	—	—
—	—	—	—



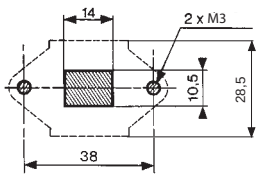


2 → 8	2 → 8	2 → 8	2 → 8
2.7	2.7	2.7	2.7
200	200	200	200
●	●	—	—
●	●	—	—
8 → 18	8 → 18	—	—
1	1	1	1
●	●	—	—
Ø 4	Ø 4	Ø 4	Ø 4
-5 → +50	-5 → +50	-5 → +50	-5 → +50
1.5 x 10^6	1.5 x 10^6	1.5 x 10^6	1.5 x 10^6
65	65	14	14

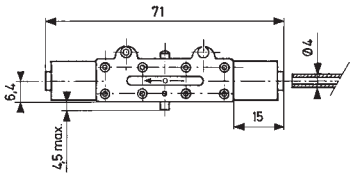
81 715 - 81 716



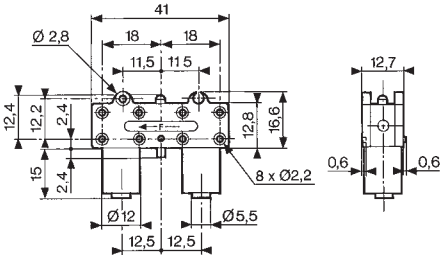
Square lever



81 280 010 - 81 280 510



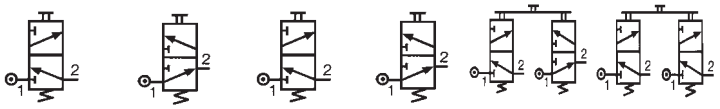
81 281 010 - 81 281 510



3/2 valves for manual actuators Ø 22 mm

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

Symbol

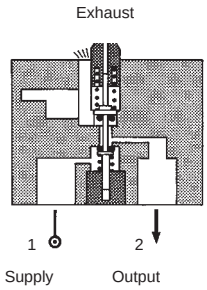


Characteristics

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	Nl/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 10^6	1.5 x 10^6	1.5 x 10^6	1.5 x 10^6	1.5 x 10^6	1.5 x 10^6	—
Non-connectable exhaust		●	●	●	●	●	●	—
Weight	g	50	50	60	60	110	110	40

Principle of operation

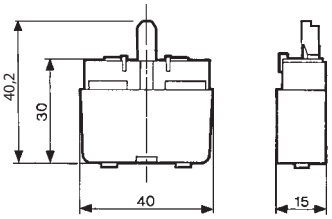
NC version



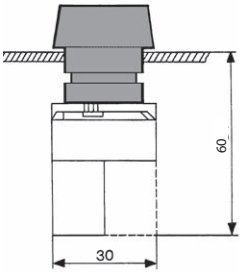
Dimensions

89 543 001 - 89 543 201

89 543 501 - 89 543 701

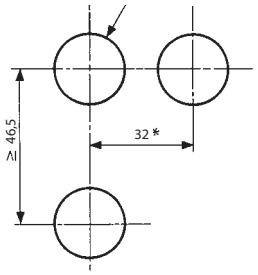


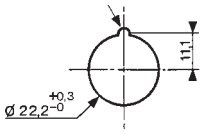
Ø 22 series



Holes drilled in panel for actuators Ø 22

EN 50007

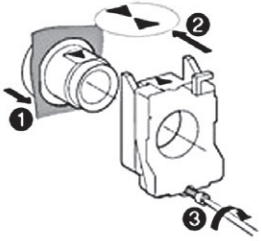


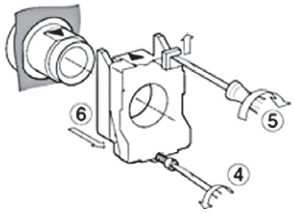


Holes drilled for the (optional) use of a round lug.

* > 40 Ø 40 push-buttons
* > 45 for lever type rotary switches

Installation





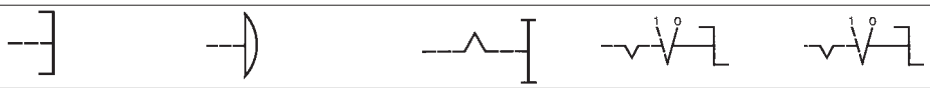
Actuators Ø 22 mm for manually operated valves





Push buttons	Red	24 678 129	24 678 173	24 678 171	—	—
	Green	24 678 128	—	—	—	—
	Black	24 678 127	24 678 172	—	—	—
2-positions rotary switches		—	—	—	24 678 174	24 678 175
3-positions rotary switches		—	—	—	—	—
Function		Flush push contact	Emergency stop plastic Ø 40	Emergency stop Ø 40 mm push-turn	Black symmetrical actuator	Long lever Black

Symbol

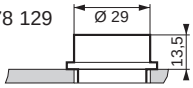


Position

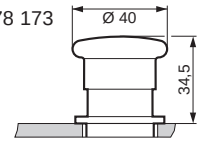
Weight	g	30	45	45	45	45

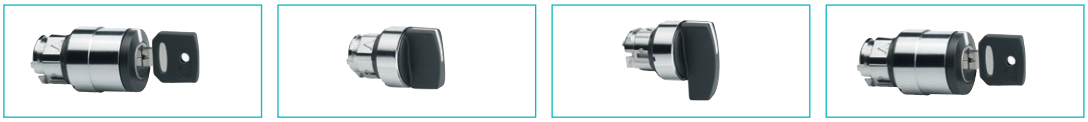
Dimensions

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	—	24 678 176	24 678 178	24 678 177	24 678 179	24 678 182	24 678 181
3-positions rotary switches	—							
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

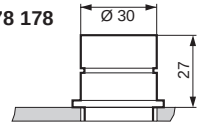
Symbol

Position

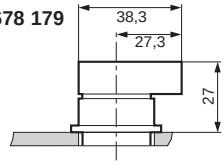
Weight	70	45	45	16	45	70	70

Dimensions

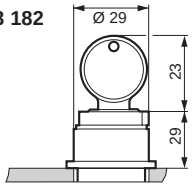
24 678 174 - 24 678 176
24 678 178



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

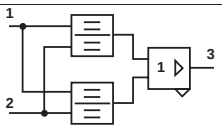
The release of a single control device interrupts the output signal, but a reset is only possible once both control devices have been released.

Pneumatic relay for two-hand control

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

	81 580 101	81 580 202
Pneumatic relay for two-hand control		
EN 574 +A1 classification	III A	III B

Symbol

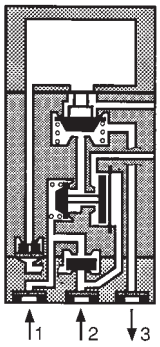


Characteristics

		81 580 101	81 580 202
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	10^7	10^7
Weight	g	90	320

Principle of operation

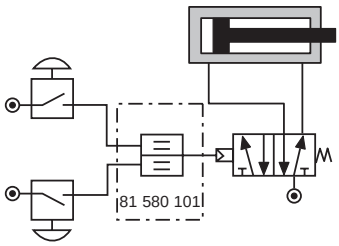
81 580 101



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.

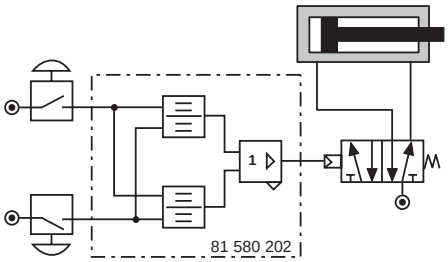
Connections (Typical application with double-acting cylinder)

81 580 101



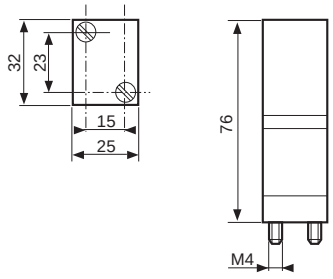
Components follow current standards

81 580 202



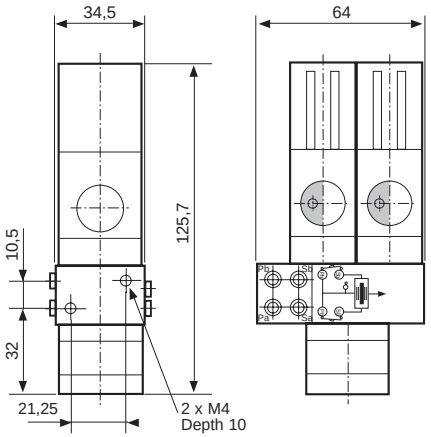
Dimensions

81 580 101



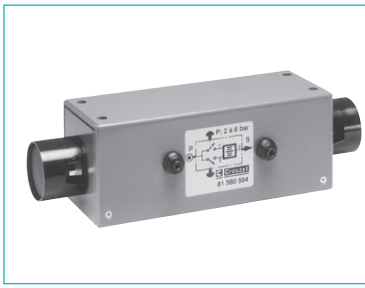
Mounted on sub-base 81 532 001
(See page 55 of Pneumatic catalogue)

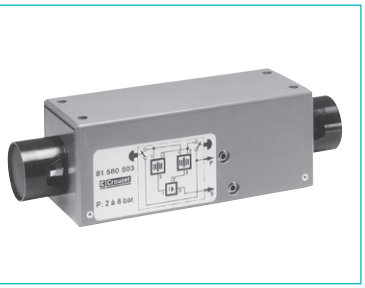
81 580 202



Two-hand pneumatic safety start module

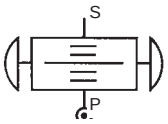
- **Conforms to the Machinery Directive and standard EN 574**
- **Including pneumatic relay to classification IIIA or IIIB depending on version**

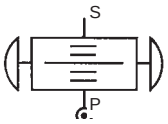




Two-hand pneumatic safety start module		**81 580 504**	**81 580 503**
Pneumatic relay (to EN 574)		Type III A	Type III B

Symbol



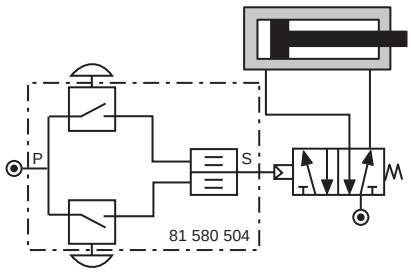


Characteristics

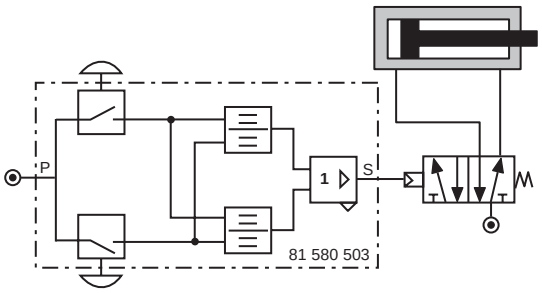
Operating pressure	bar	2 → 8	2 → 8
Orifice diameter	mm	2.5	2.5
Max. delay between input signals	s	0.2 max.	0.2 max.
Connection		Semi-rigid tubing Ø 4 (NFE 49100)	Semi-rigid tubing Ø 4 (NFE 49100)
Operating temperature	°C	-5 → +50	-5 → +50
Mechanical life	operations	1.5 x 10^6	1.5 x 10^6
Weight	g	1000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

Connections (Typical application with double-acting cylinder)

81 580 504



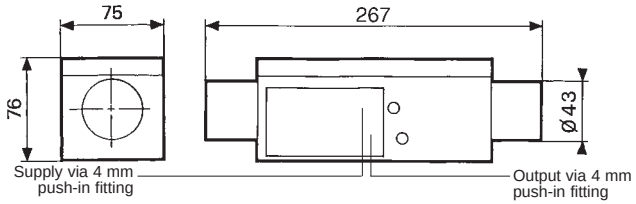
81 580 503



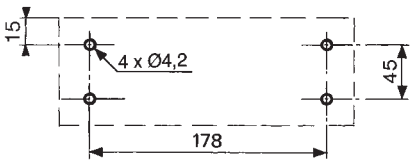
Components follow current standards

Dimensions

81 580 503 - 81 580 504

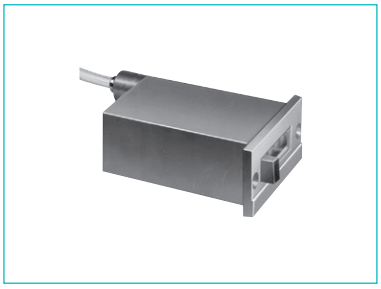


Fixing viewed from below



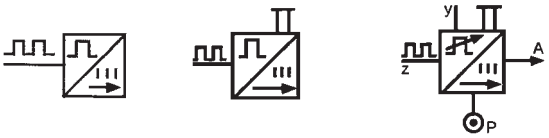
Pneumatic impulse counters

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



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

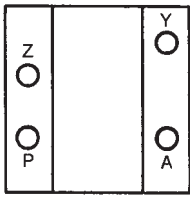
Symbol



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			—	—	2 → 8
bar			—	—	●
Signal emitted when preset is reached			0 → +60	0 → +60	0 → +60
Operating temperature		°C	150	150	136
Weight	-	g			

Connection

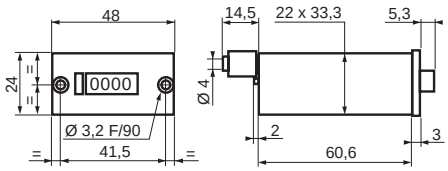


A - Output signal
P - Supply
Y - 'Reset to zero' signal
Z - Input signal

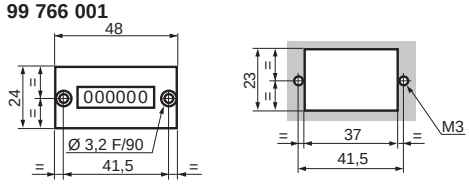
Note : the count pulse must be removed before the reset pulse is applied. The preset value can be changed during operation without the counter resetting to zero.

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

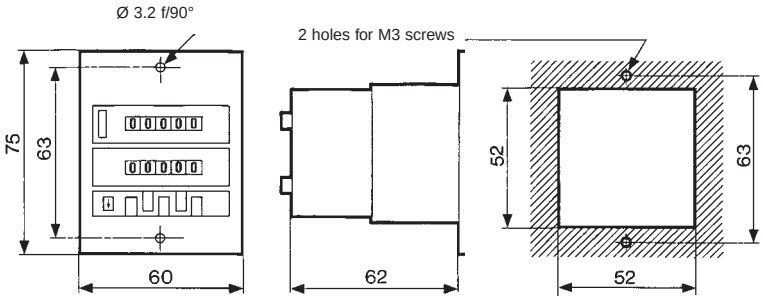
99 766 002



99 766 001



89 538 201



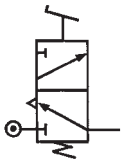
Indicators and pedal valves

› Ergonomics

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

Pneumatic indicators Ø 22	Red	**84 150 201**	—
	Green	**84 150 202**	—
	Yellow	**84 150 203**	—
	Blue	**84 150 204**	—
Pedal valve - Version NC		—	**81 999 501**

Symbol

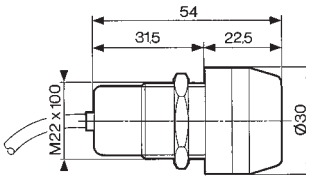


Characteristics

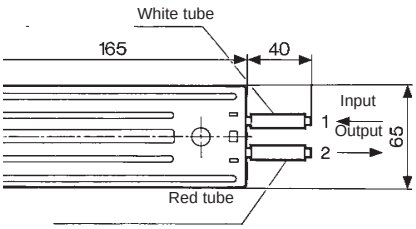
Operating pressure	bar	2 → 8	—
Push-in connection for semi-rigid tubing (NFE 49100)	mm	Ø4	Ø4
Operating temperature	°C	-5 → +50	-5 → +50
Mechanical life	operations	10^7	1.5 x 10^6
Weight	g	34	290

Dimensions

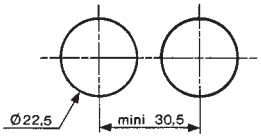
84 150 201 - 84 150 202
84 150 203 - 84 150 204



81 999 501



Holes drilled for indicators



ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-control.com**

POSITION DETECTORS

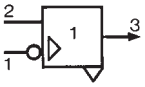
Pressure decay sensor

› **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

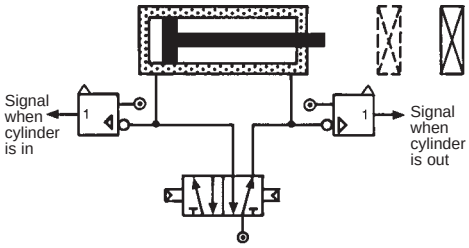


Characteristics

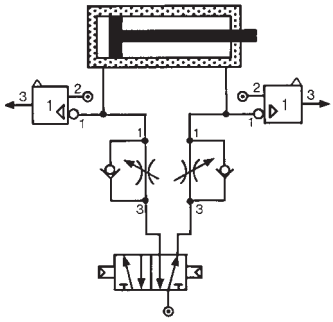
Operating pressure	bar	2 → 8
Flow at 6 bars	Nl/min	200
Tripping point with 6 bar supply	b	0.3
Connection		Sub-base page 54-55
Operating temperature	°C	-5 → +50
Mechanical life	operations	≥10^7
Weight	g	25

Connections

Without flow restrictor



With flow restrictor

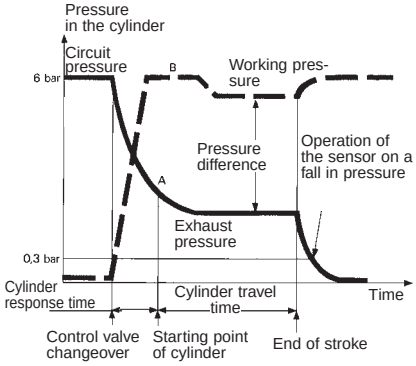


Principle of operation

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.

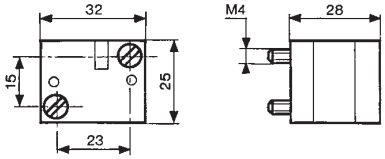
For the correct usage of sensors on a falling pressure, it is recommended that the practical cylinder load is limited to 60% of the theoretical force.

Evolution of pressure within a double-acting cylinder



Dimensions

81 504 025

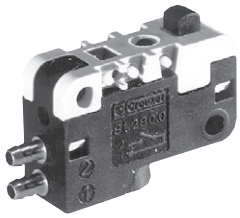


ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-control.com**

Low force position detector

- **100 % pneumatic**
- **Conforme à la nore 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		81 290 501	—
	NO		81 290 001
	NC	—	

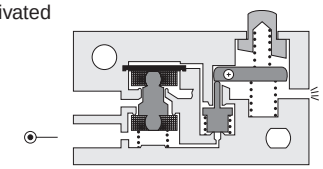
Symbol

Characteristics

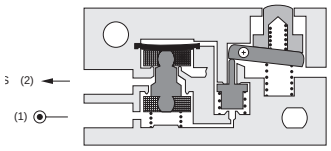
Orifice diameter		mm	2	2
Operating pressure		bar	3 → 8	3 → 8
Flow at 4 bars		Nl/min	100	100
Activation force at 6 bars		N	< 0,5	< 0,5
Permissible fluids (air / inert gas)			●	●
Max/min temperatures	of fluid	°C	-10 → +50	-10 → +50
	operating	°C	-10 → +60	-10 → +60
	storage	°C	-40 → +70	-40 → +70
Mechanical life at 6 bars		operation	10^7	10^7
Response time	on activation	ms	≤ 15	≤ 15
	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



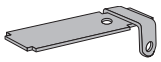
Activated



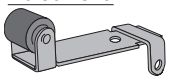
Operation accessories

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

161 A
flat R 25.4
70 507 524

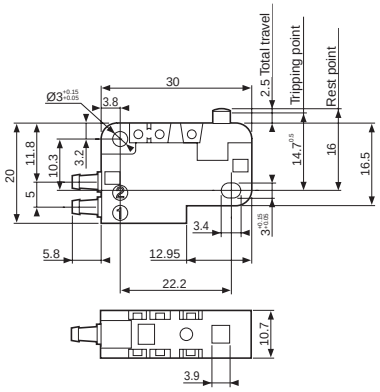


161 E
with roller R 24.1
70 507 529

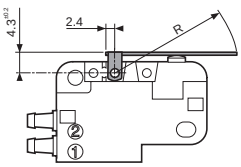


Dimensions

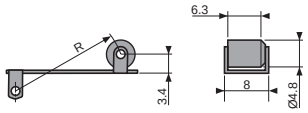
DIN 41635 Form A



161 A
R 25.4 ±0,2



161 E
R 24.1 ±0,2

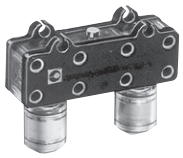


ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-control.com**

“Microvalve” series position detectors

› **100 % pneumatic**

81 280

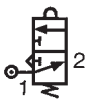
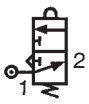
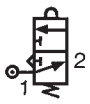


81 281

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

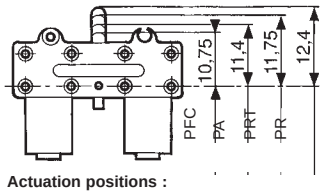
NC



Characteristics

Operating pressure	bar	2 → 8	2 → 8	2 → 8
Orifice diameter	mm	2.7	2.7	
Flow at 6 bars	Nl/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 10^6	5 x 10^6	5 x 10^6
Weight	g	14	14	20

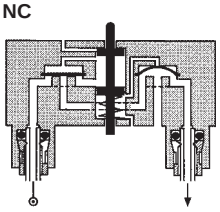
Principle of operation



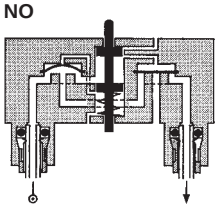
Actuation positions :

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

NC

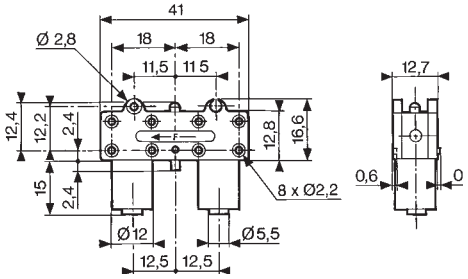


NO

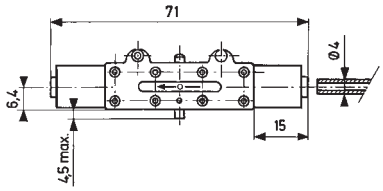


Dimensions

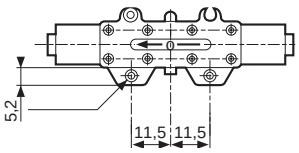
81 281 010 - 81 281 510



81 280 010 - 81 280 510

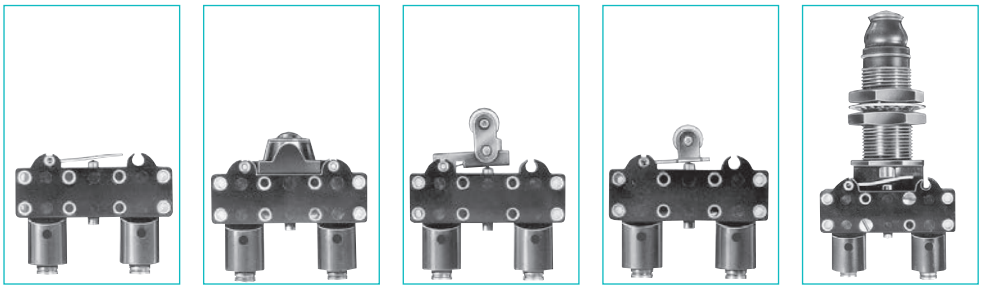


81 283 510



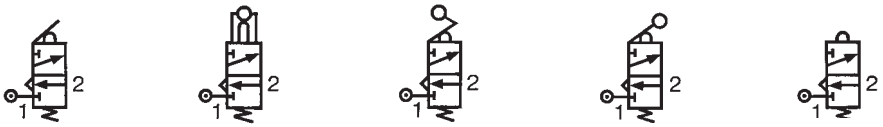
“Microvalve” series position detectors

› **100 % pneumatic**



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

Symbol

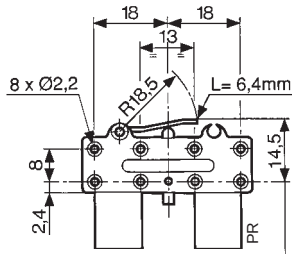


Characteristics

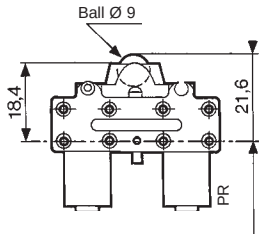
Operating pressure	bar	2 → 8	2 → 8	2 → 8	2 → 8	2 → 8
Orifice diameter	mm	2.7	2.7	2.7	2.7	2.7
Flow at 6 bars	Nl/min	200	200	200	200	200
Operating force at 6 bars	N	15	15	15	15	25
Effective travel	mm	1	1	1	1	1
Push-in connection for semi-rigid tubing (NFE 49100)	mm	Ø 4	Ø 4	Ø 4	Ø 4	Ø 4
Operating temperature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

Dimensions

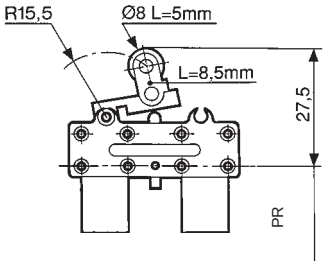
81 281 502



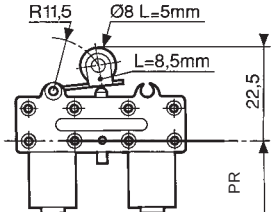
81 281 504



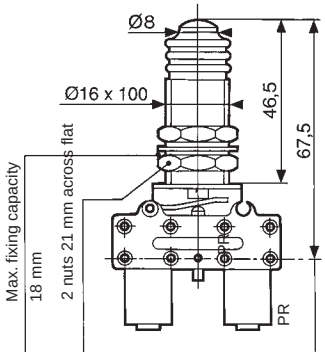
81 281 508



81 281 509



81 737 501

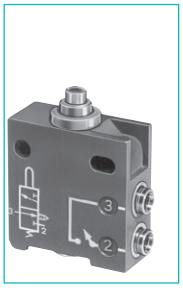
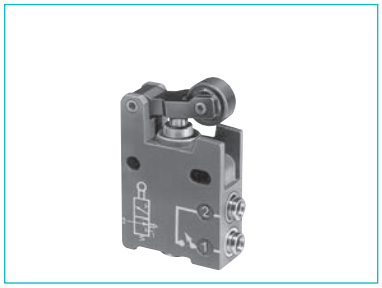
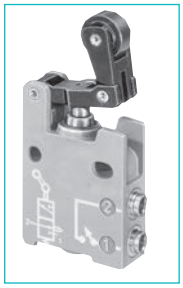


Actuation positions :

PR : Rest position

"Miniature" series position detectors

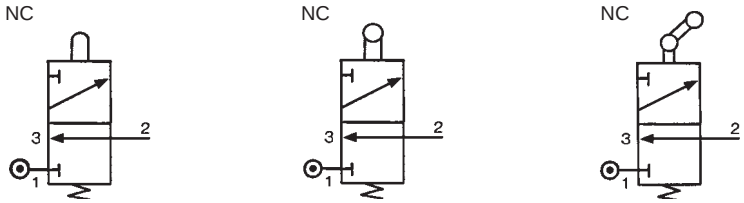
› **100 % pneumatic**
› **All metal**

Part numbers

		81 921 501	81 921 701	81 921 702	81 921 707
Version	Push-in connection for semi-rigid tubing (NFE 49100)				
NC	Ø 4 silenced exhaust	—	—	—	—
	M5 connectable exhaust	—	—	—	—
	Ø 4 connectable exhaust *	—	—	—	—
	Ø 6 connectable exhaust *	—	—	—	—
NO	Ø 4 silenced exhaust	—	—	—	—
	Ø 6 silenced exhaust	—	—	—	—
Control		Simple plunger	Lever with plastic roller	Lever with roller bearing	Lever with one-way trip plastic roller

Symbol

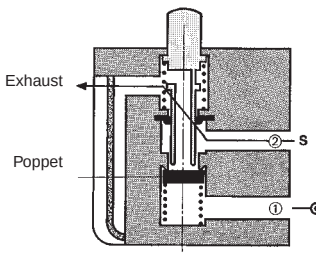


Characteristics

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	Nl/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	$\geq 10^7$	$\geq 10^7$	$\geq 10^7$	$\geq 10^7$
Weight	g	62	75	80	77

Principle of operation

NC



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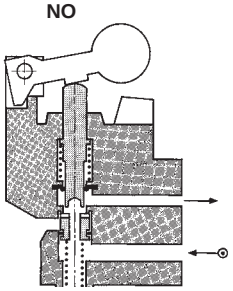
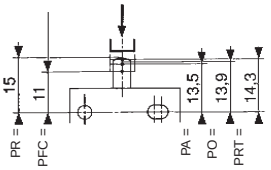


Actuation travel

Vertical attack

Simple plunger

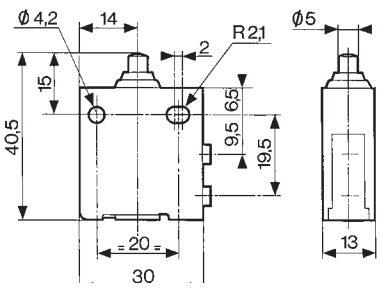


Actuation positions :

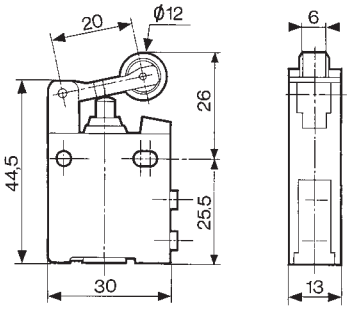
PA : Operating position (max output kV)
PFC : End of travel position
PO : Mid-position closed (no exhaust, no outlet)
PRT : Release position (max exhaust kV)
PR : Rest position

Dimensions

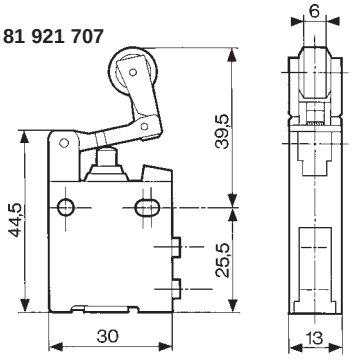
81 921 501



81 921 701 - 81 921 702

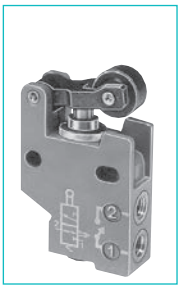


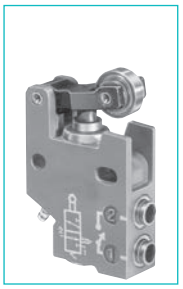
81 921 707

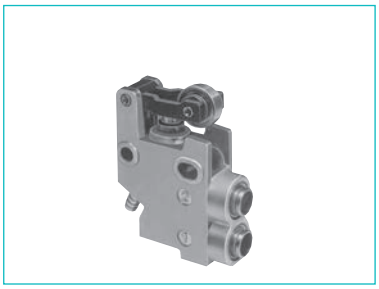


* with barb for tube Ø 2.7 x 4

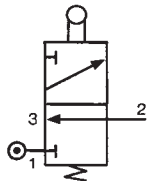
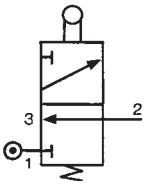
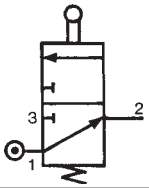
Material: body zamak





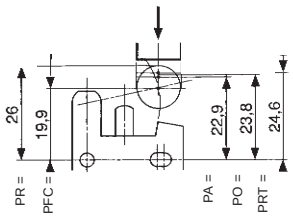


—	—	—	—
—	—	—	—
81 921 806	—	—	—
—	**81 921 714**	—	—
—	—	**81 921 719**	**81 921 717**
—	—	**81 921 911**	**81 921 912**
—	—	**81 921 901**	**81 921 902**
Lever with plastic roller	Lever with roller bearing	Lever with plastic roller	Lever with roller bearing

NC		NC	NO
			

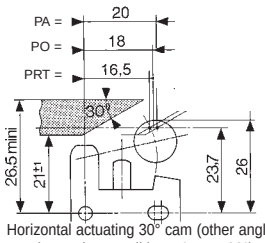
0.1 → 8	0.1 → 8	0.1 → 8	0.1 → 8
2.7	2.7	2.7	2.7
200	200	200	200
18	18	18	18
●	●	●	●
—	—	●	●
		●	●
-5 → +50	-5 → +50	-5 → +50	-5 → +50
≥10^7	≥10^7	≥10^7	≥10^7
75	80	100	100

With lever



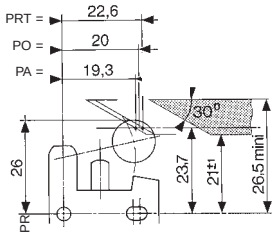
Horizontal actuating 30° cam (other angles of attack are also possible, 45° even 90°).

With lever

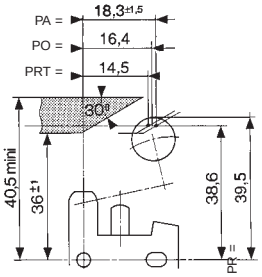


Horizontal actuating 30° cam (other angles of attack are also possible, 45° even 90°).

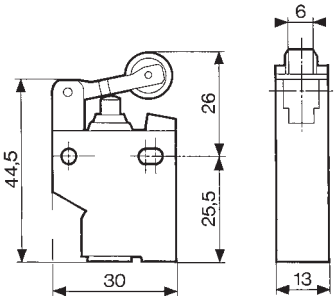
With lever



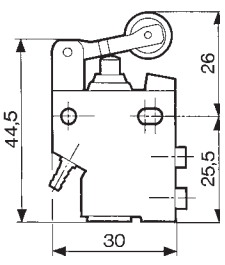
One-way trip lever



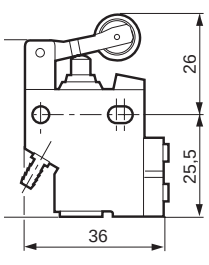
81 921 806



81 921 714



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

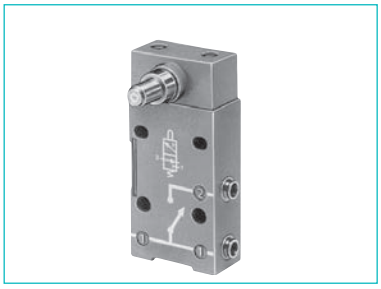


Material: body zamak
Other configuration on demand

"Compact" series position detectors

› **100 % pneumatic**
› **All metal**

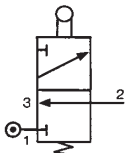


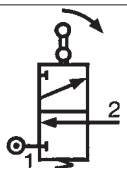


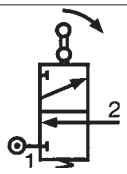
Part numbers

Features	Direct acting	Rotary actuator	Rotary actuator	Rotary actuator
	81 922 401	**81 922 205**	**81 922 010**	**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







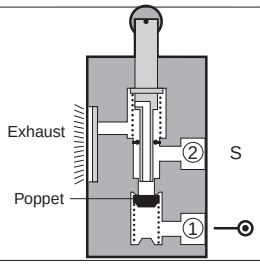
Characteristics

Connection	BSP		—	1/8	—	1/8
	push-in for semi-rigid tubing (NFE 49100)	mm	Ø 4	—	Ø 4	—
Operating pressure		bar	0.1 → 8	0.1 → 8	0.1 → 8	0.1 → 8
Bore diameter		mm	3	3	3	3
Flow at 6 bars		Nm^3/h	200	200	200	200
Activation force at 6 bars		daN	2.5	2.5	2.5	2.5
Circuit function: NC			●	●	●	●
Mechanical life		operations	> 10^7	> 10^7	> 10^7	> 10^7
Silenced or connectable (1/8) exhaust			●	●	●	●
Operating temperature		°C	-5 → +50	-5 → +50	-5 → +50	-5 → +50
Weight		g	150	193	175	175

Accessories

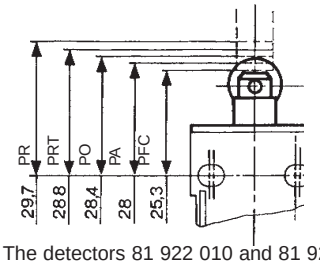
Lever with roller	plastic	**79 452 103**	—	●	●	●
	bearing	**79 452 104**	—	●	●	●
Lever with adjustable roller	plastic	**79 452 123**	—	●	●	●
	bearing	**79 452 124**	—	●	●	●
Adjustable steel rod lever		**79 452 133**	—	●	●	●

Principle of operation



Vertical attack

Detectors with roller plunger with unthreaded barrel.



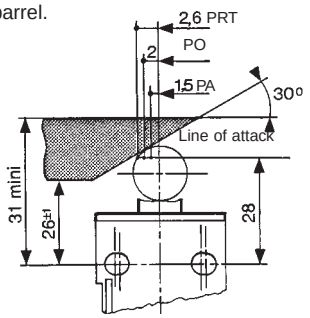
Actuation positions :

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.

Horizontal attack

Detectors with roller plunger with unthreaded barrel.

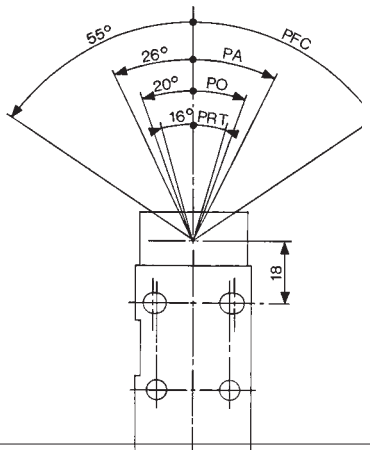


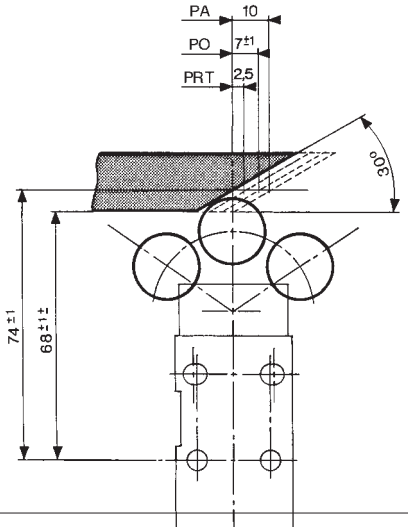
Material: body zamak
Other configuration on demand

Rotary actuator

Detectors with levers

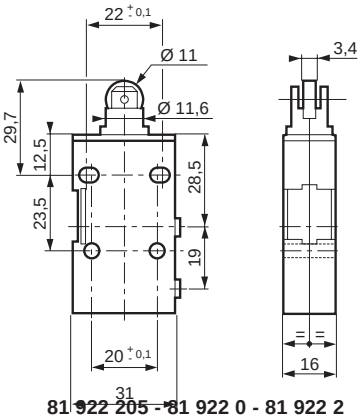
81 922 - 81 922 0 - 81 922 2



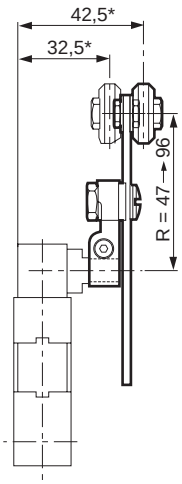


Dimensions

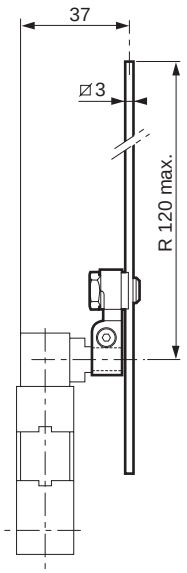
81 922 401



79 452 123 - 79 452 124

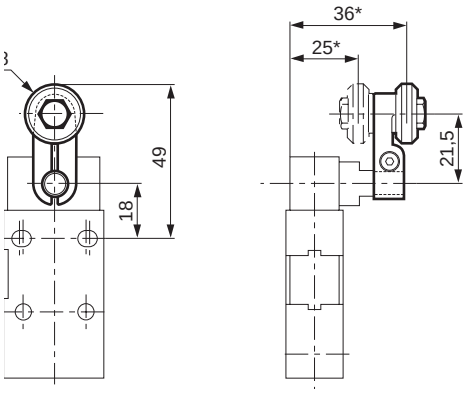


79 452 133



81 922 205 - 81 922 0 - 81 922 2

79 452 103 - 79 452 104



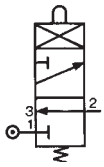
"Adjustable stop" series position detectors

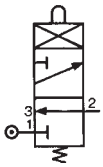
› **100 % pneumatic**
› **All metal**

Part numbers

	81 923 001	81 921 505
Push-in connection for semi-rigid tubing (NFE 49100)	Barb for tube 2.7 x 4	Push-in connector for tube Ø 4

Symbol

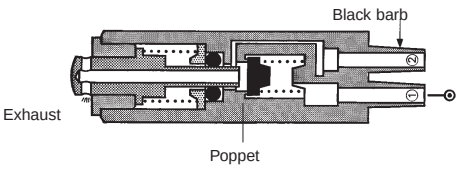


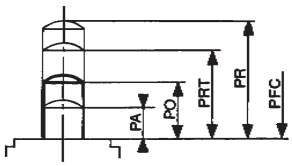


Characteristics

Operating pressure	bar	0,1 → 8	0,1 → 8
Orifice diameter	mm	2	2,7
Flow at 6 bars	Nl/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	$\geq 10^7$	$\geq 10^7$
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 (no exhaust, no outlet)	mm	0,9	1
PRT : Release position (max. exhaust kV)	mm	1,5	1,5
PR : Rest position	mm	3	3

Principle of operation





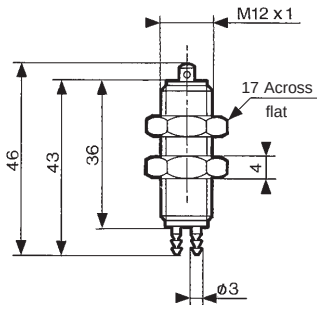
Versions	PO	PA	PFC	PRT	PR
With barb	0.9	0.4	0	1.5	3
Ø 4	1	0.7	0	1.5	3

Values in mm

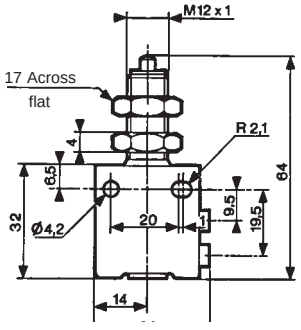
Actuation positions :
PA : Operating position (max output kV)
PFC : End of travel position
PO : Mid-position closed (no exhaust, no outlet)
PRT : Release position (max exhaust kV)
PR : Rest position

Dimensions

81 923 001

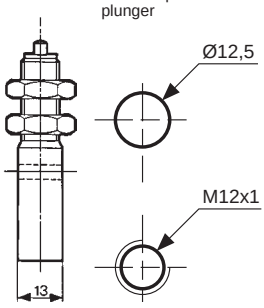


81 921 505



Fixing

This should be as close as possible to the plunger

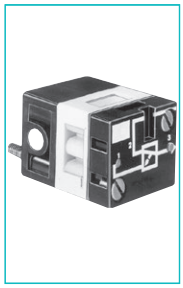
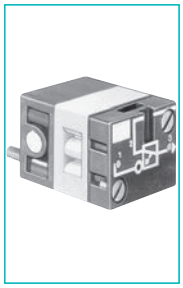


Material: body zamak

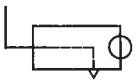
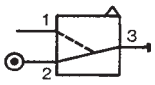
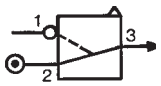
Position detectors use with relay

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

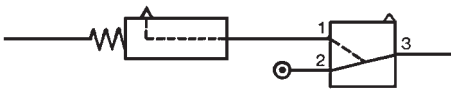


References

	81 512 201	81 512 401	81 502 435	81 505 435
Version	with ball	with wire	Positive	Negative
Symbole				
				
Characteristics				
Push-in connection for semi-rigid tubing (NFE 49100) mm	Ø 4	Ø 4		
Life at 6 bars operations	10^7	10^7		
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 Nl/			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			≥10^7	≥10^7

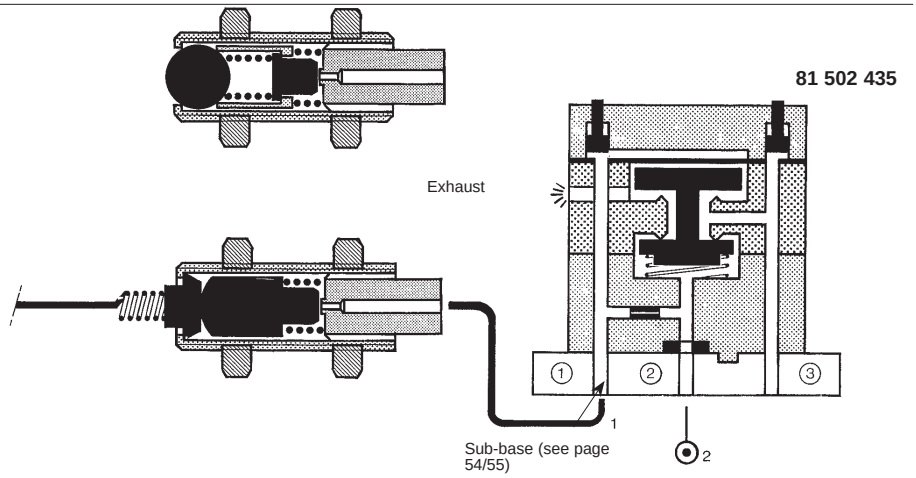
Connection



Principle of operation

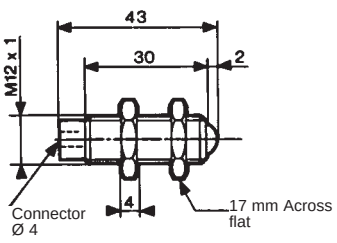
Supplied at industrial pressure, the relay produces a permanent bleed at its input port.

A sensor shutting off this bleed causes the relay to switch.

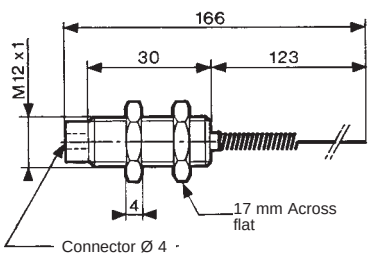


Dimensions

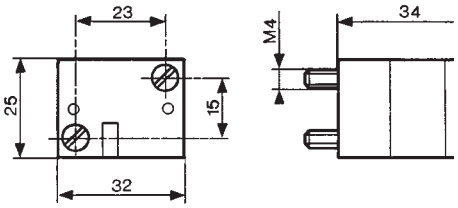
81 512 201



81 512 401



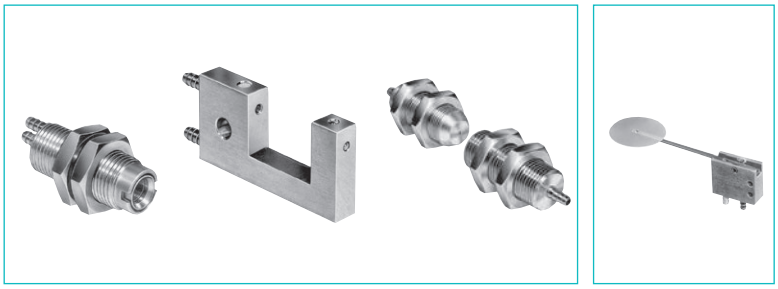
81 502 435 - 81 505 435



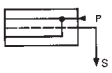
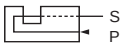
Material: brass

Position detectors

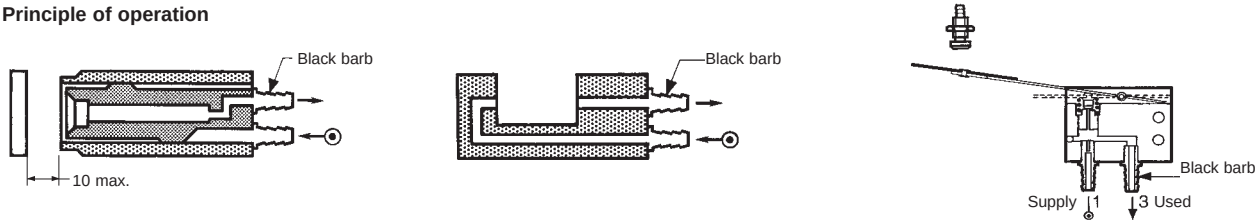
- **100 % pneumatic**
- **All metal**
- **Gap, proximity, paddle**



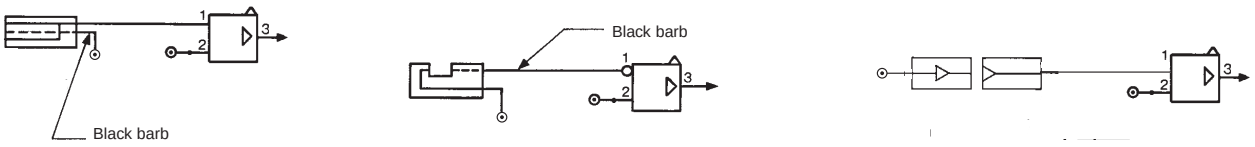
Part numbers

			81 371 401	81 372 201	81 372 401	81 372 901
Detector			de proximité	gap	gap	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:	0.5 b	Nl/h	800	70	100	—
	2.5 b	Nl/h	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		—	—	—	2 → 8
	sensor	d. detection 200 mm	—	—	—	2 → 8
		d. detection 100 mm	—	—	—	1 → 4
Flow	nozzle at 2 bars	Nl/h	—	—	—	320
	sensor at 2 bars	Nl/h	—	—	—	320
	at 2 bars	N	—	—	—	0.03
	at 6 bars	N	—	—	—	0.09
Sensor consumption for relay supply at 6 bars		Nl/min	—	—	—	5
Weight		g	36	9	63	14

Principle of operation

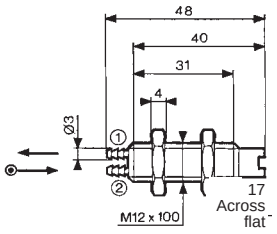


Connection

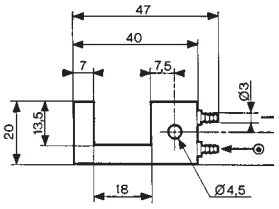


Encombrements

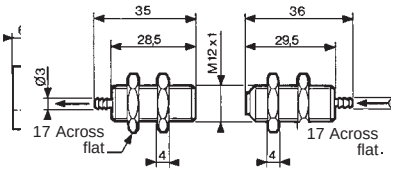
81 371 401



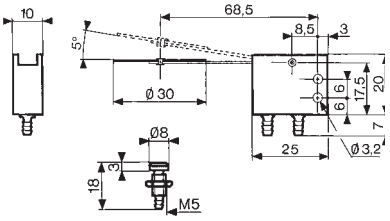
81 371 201



81 372 401



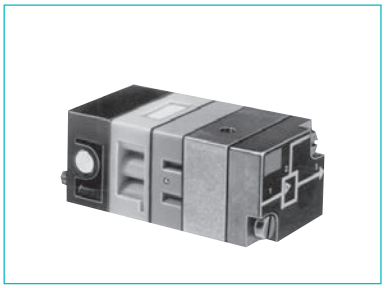
81 372 901

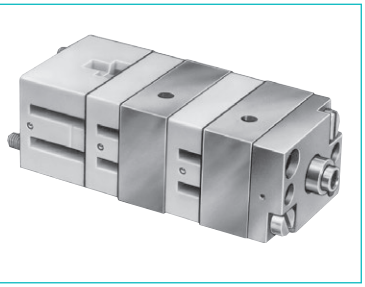


Ampliers for mounting on installation plan

› 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)	81 502 230	81 505 230	—	—
Sensitive amplifiers (for 81 371 401)	—	—	81 502 320	81 505 320
Version	positive	negative	positive	negative

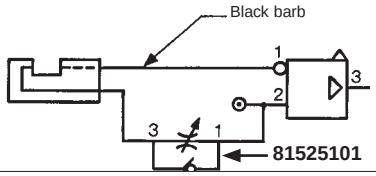
Symbol

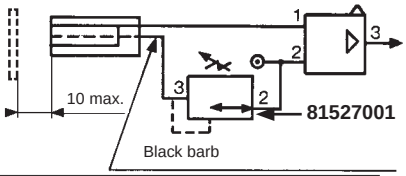
Characteristics

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 10^6	3 x 10^6	3 x 10^6	3 x 10^6
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

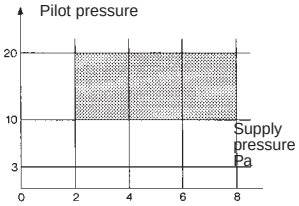




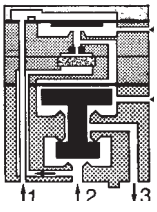
Principle of operation

Simple amplifiers

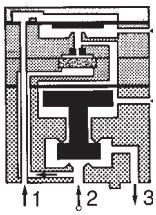
An output at normal industrial pressure is delivered on a low pressure input.
NB: Hysteresis is 20% of the pilot pressure.



81 502 230
Positive output



81 505 230
Negative output

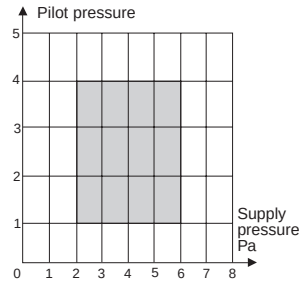


1- pilot
2- supply
3- output

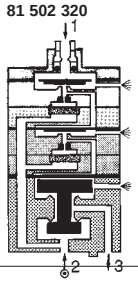
Sensitive amplifiers

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

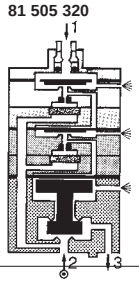
Note: The specifications are given for a supply pressure of 6 bars, and for detection at the mid-point of the gap.



81 502 320

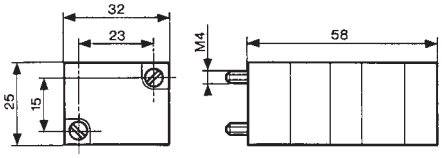


81 505 320

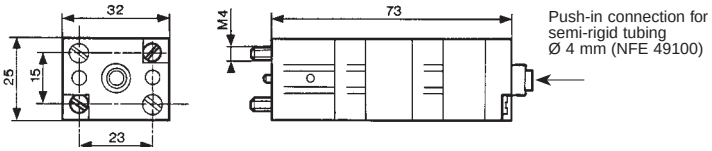


Dimensions

81 502 238 - 81 505 231



81 502 322 - 81 505 321



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 catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-control.com**

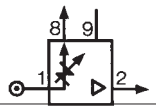
Amplifier with intégral régulator, positive output

› **Setting Flow**
› **Fixing rail 35mm wide**

Part numbers

Amplifiers with integral regulator	**81 510 001**
Version	Positive output

Symbol



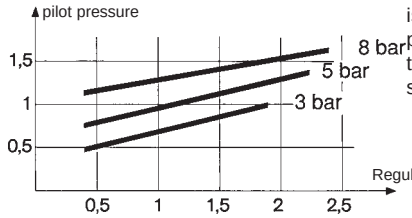
Characteristics

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	Nl/h	100 → 200	—	—
Permissible overload for 1 hour	mb	300	—	—
Operating temperature	°C	-5 → +50	-5 → +50	-5 → +50
Mechanical life	operations	3 x 10^6	3 x 10^6	3 x 10^6
Weight	g	380	—	—
Detectors (see page 28)		Proximity Ø 12	Gap Ø 18	Proximity Ø 12
Nominal range	mm	81 371 401	81 372 201	81 372 401
Min. total consumption for detection (0.5 b regulated pressure) Max. total consumption for short response time (2.5 b regulated pressure)	Nl/h	8 / 880	18 / 140	100 / —
Min. detectable dimensions (nominal sensing distance 2)	mm	Ø 3	Ø 2 - Ø 1.5	Ø 7 - Ø 6.5
Max. frequency of use	mm	2	—	—
Force exerted by the jet on the parts 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

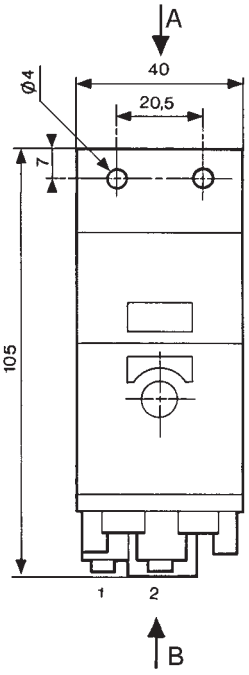
Principle of operation



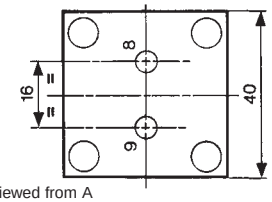
This amplifier is suitable for providing a supply to associated sensors.

Dimensions

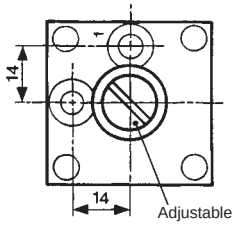
Push-in connection for semi-rigid tubing Ø 4 mm (NFE 49100)



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**

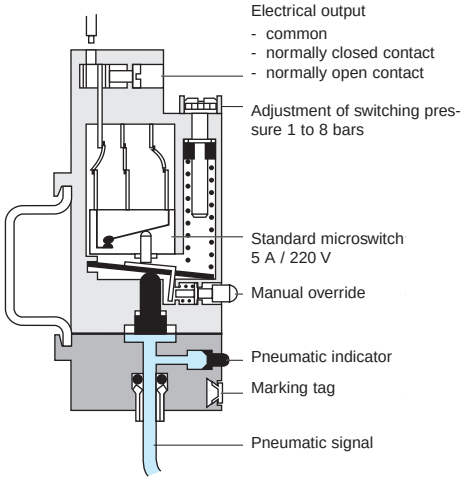
Part numbers

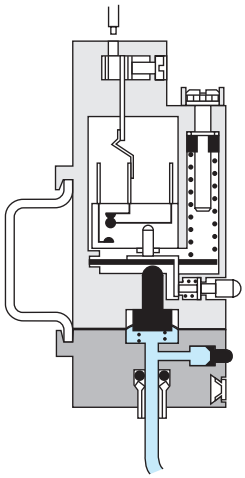
			81 513 552	81 513 502	81 513 501	81 513 522
Pressure and vacuum switches						
Mounting			DIN rail	DIN rail	DIN rail	DIN rail
Actuators			Pressure	Pressure	Low pressure	Vacuum
Manual override			with	without	without	without
Symbol						
Characteristics						
Pneumatic connection	Push-in connection for semi-rigid tubing (NFE 49100)	mm	Ø 4 ext.	Ø 4 ext.	Ø 4 ext.	Ø 4 ext.
	Tapped BSP via connector		—	—	—	—
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)			10^6	10^6	10^6	10^6
Contact rating (V resistive)			5A - 220-230 V	5A - 220-230 V	5A - 220-230 V	5A - 220-230 V
Wire cross-section		mm^2	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

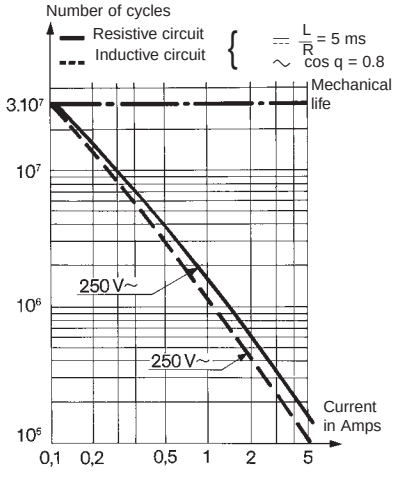
Vacuum operated

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





For continuous vacuum applications, please consult us.



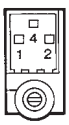
Other information

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	Base mounted	Base mounted			2 screws M4	2 screws M4			Base mounted	Base mounted
page 4/14	page 4/14	page 4/14							page 4/14	page 4/14
Pressure	Pressure	Vacuum			Pressure	Vacuum			Pressure	Pressure
without	with	without			without	without			without	with
										
Ø 4 ext.	Ø 4 ext.	Ø 4 ext.			—	— —			—	—
—	—	—			1/8 BSP	1/8 BSP			Via sub-base	Via sub-base
IP 54	IP 54	IP 54			IP 54	IP 54			IP 54	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	—			—	—
—	—	—			—	—			—	—
—	—	●			—	●			—	—
—	—	—			—	—			0.6 ± 0.2	0.6 ± 0.2
10^6	10^6	10^6			10^6	10^6			10^6	10^6
5A - 220-230 V	5A - 220-230 V	5A - 220-230 V			5A - 220-230 V	5A - 220-230 V			5A - 220-230 V	5A - 220-230 V
0.75	0.75	0.75			0.75	0.75			1.5	1.5
-10 → +70	-10 → +70	-10 → +70			-10 → +70	-10 → +70			-10 → +70	-10 → +70
56	58	56			65	65			80	80
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			83 133 004	83 133 004
MH15213 (R)	MH15213 (R)	MH15213 (R)			MH15213 (R)	MH15213 (R)				

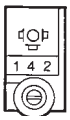
Electrical connections

81 513 501 - 81 513 502
81 513 522 - 81 513 552



1 - Common
4 - NO contact
2 - NC contact

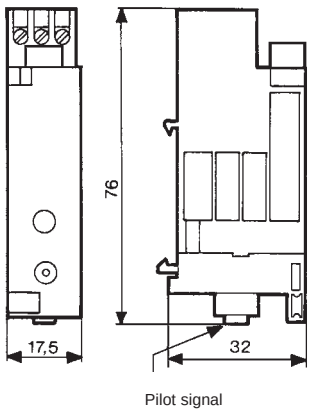
81 513 510
81 513 516 - 81 513 527



81 513 533
81 513 523 - 81 513 533

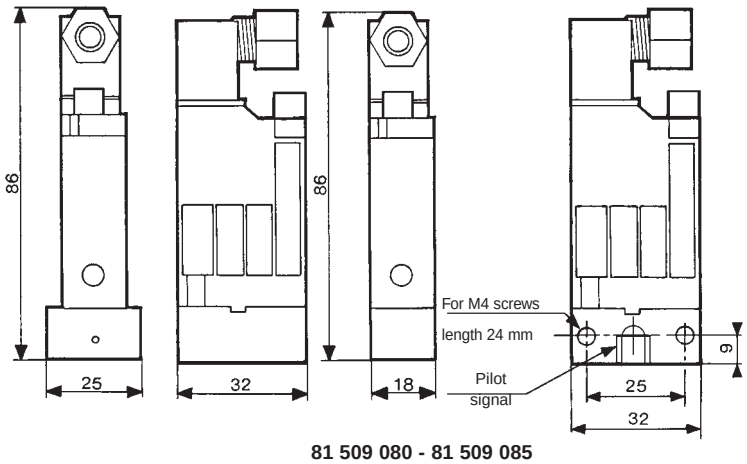
Dimensions

81 513 552 - 81 513 502
81 513 501 - 81 513 522

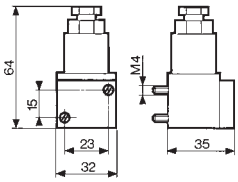


Pressure switch with connector
81 513 516 - 81 513 510
81 513 527

81 516 082
81 513 533
81 513 523



81 509 080 - 81 509 085



Adjustable pressure switches (manostats) (pneumatic output)

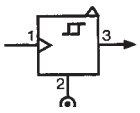
› **100 % pneumatic**

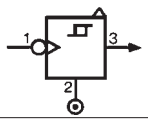
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive

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



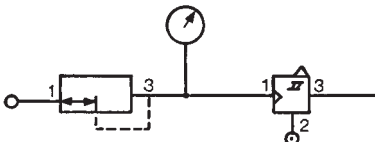


Characteristics

Orifice diameter	mm	2.5	2.5
Flow at 4 bars	Nl/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 10^6	3 x 10^6
Weight	g	160	160

Connections

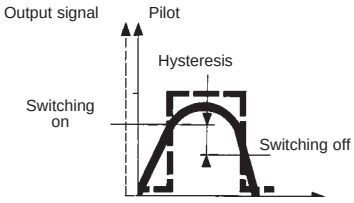
Example of pressure threshold adjustment (mini-regulator - manostat)

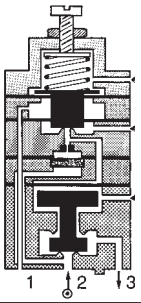


Principle of operation

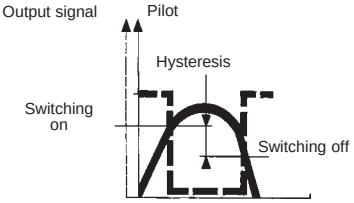
The manostats provide an on or off output signal when the input signal reaches a predetermined pressure threshold.

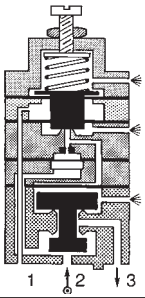
Positive output





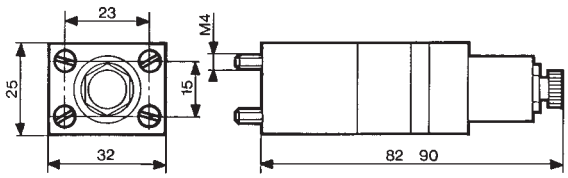
Negative output





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 catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-Control.com**

Adjustable vacuum switches (vacuostat)

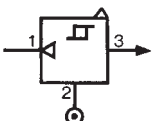
› **100 % pneumatic**
› **For vacuum -0,1 → -0,9 Bar**

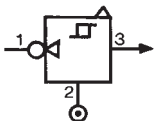


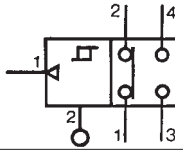
Part numbers

	81 505 110	81 502 110	81 508 110
	Positive output	Negative output	Electrical output

Symbol





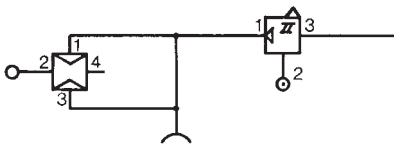


Characteristics

Adjustment range	b	- 0.1 → -0.9	- 0.1 → -0.9	- 0.1 → -0.9
Flow at 6 bars	Nl/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 x 10^6	3 x 10^6	3 x 10^6
Weight	g	160	160	180

Connections

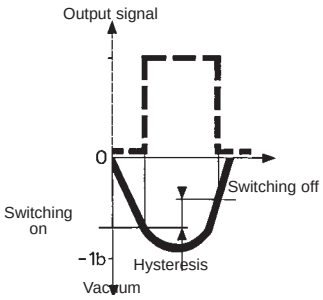
Example of use:
Vacuum handling (vacuum generator, vacuum pad, vacuostats).

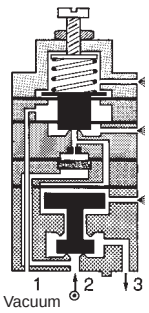


Principle of operation

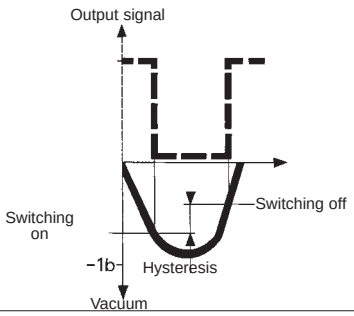
Vacuostats provide an on or off output signal when the input signal reaches a predetermined pressure threshold.

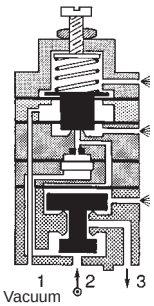
Positive output





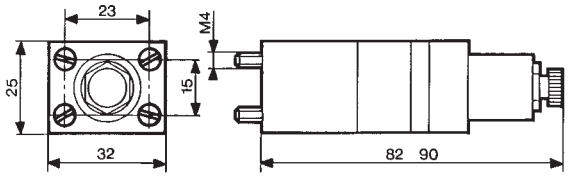
Negative output



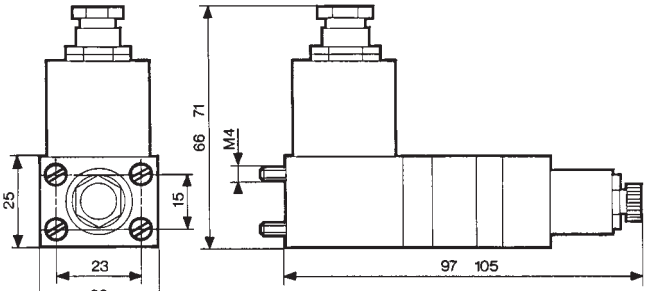


Dimensions

81 502 110 - 81 505 110



81 508 110

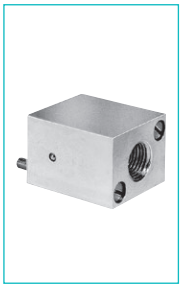


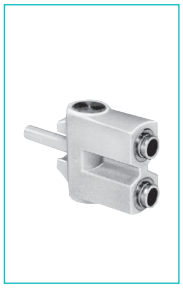
Vacuum handling components

› **Sur le principe du Venturi**

› **Facilement raccordable**

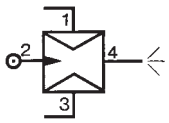
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive

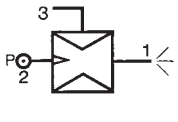




Part numbers

Vacuum generators	81 535 301 Sub-base mounting	81 545 001 Plug-in	81 545 005 Plug-in

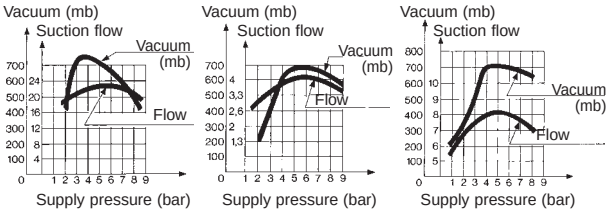




Characteristics

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

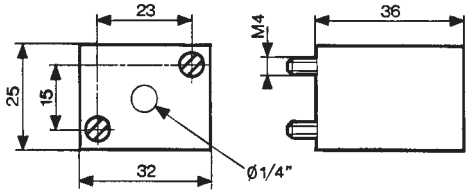
Detection of the pressure decrease can be achieved by the use of manostats (see pages 38/39)



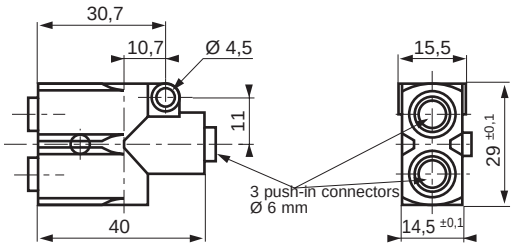
Dimensions

81 535 301

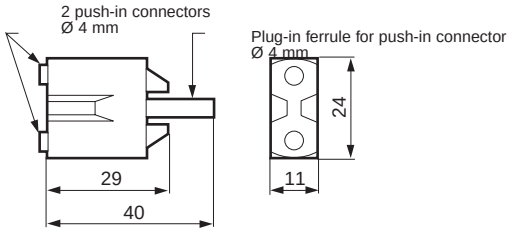
Sub-base mounting 81 531… and 81 532…



81 545 005



81 545 001



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PNEUMATIC LOGIC COMPONENTS

General characteristics

Operating fluid

- Compressed air or inert gas.

Conditions of use

- Operating pressure 2 at 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 ≥ at 2.5 mm.

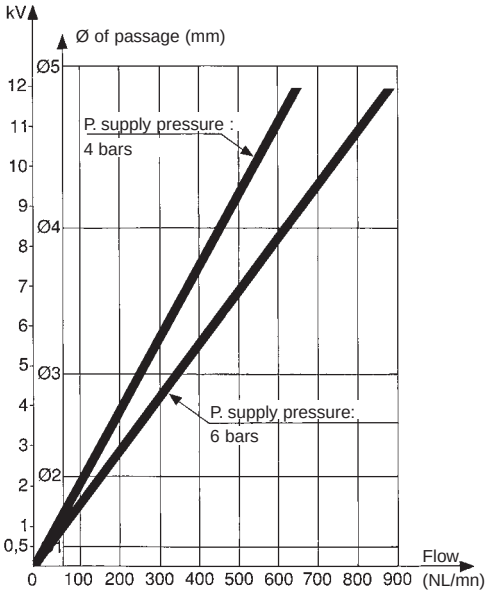
Mounting recommendations

- 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 atmophere 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 > 10^7 operations.

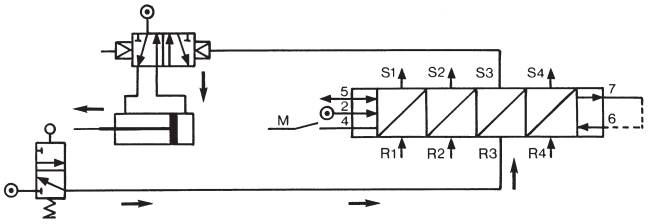
flow graphs



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 identity quickly and easily any fault which may occur.

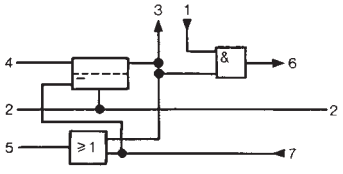


Operation results from the combination of three functions (memory, AND and OR) which constitute each module.

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

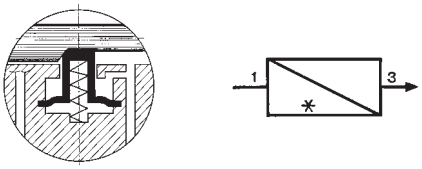


sequencer module with maintained reset

Brake

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

Module with auto reset



Brake

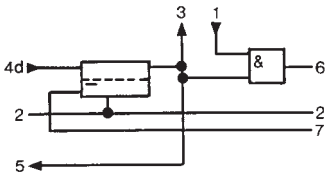
This returns the memory spool to the reset condition only when the supply is lost

Shift register

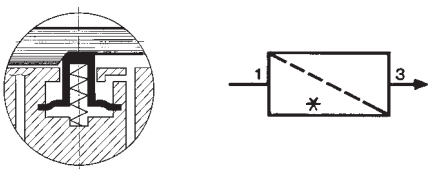
The general principle is to advance the sequencer step by command impulses to the inputs of the even steps, alternating with the command impulses to the inputs of the odd steps.

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



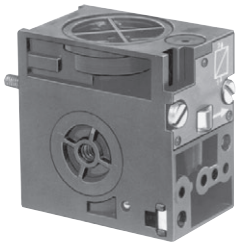
Auto reset sequencer module

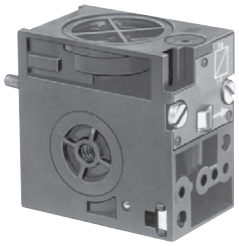


Sequencer modules

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

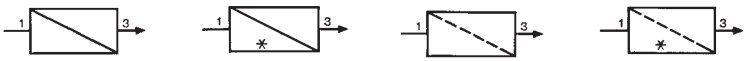
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive





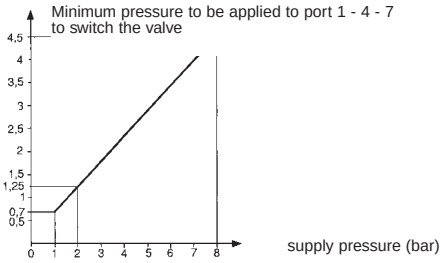
		81 550 001	81 550 201	81 550 401	81 550 601
Versions	sequencer	with 'maintain'	Reset to zero	—	—
	shift register	—	—	with 'maintain'	Reset to zero

Symbol



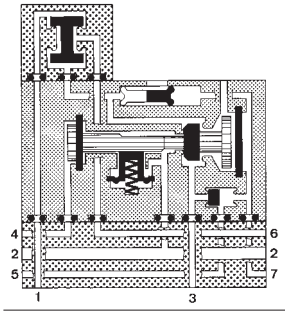
Characteristics

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	Nl/min	150	150	150	150
Operating temperature	°C	-5 → +50	-5 → +50	-5 → +50	-5 → +50
Mechanical life 5 x 10^6 at 6 bars		●	●	●	●
Connection - Sub-base page 26		●	●	●	●
Weight	g	70	70	70	70



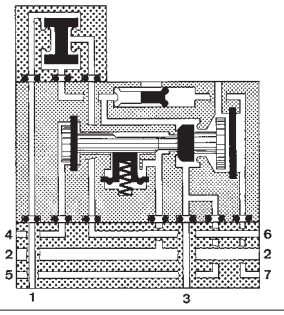
Principle of operation
(supplied without logic element. For choice of units see pages 46/47)

Sequencer module with maintained reset



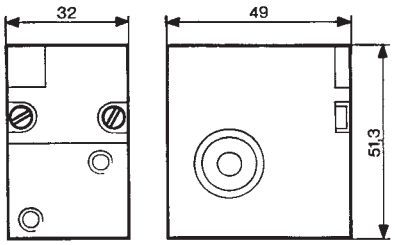
1 - Input signal
2 - Supply
3 - Output signal
4 - Start signal
5 - In cycle signal
6 - End of cycle signal
7 - Reset to zero signal

Shif register with maintained reset

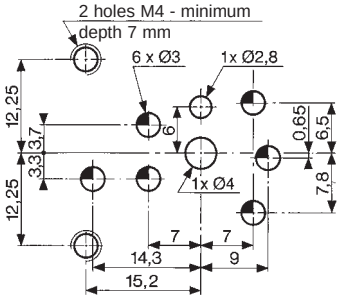


1 - Input signal
2 - Supply
3 - Output signal
4 - Start signal
5 - In cycle signal
6 - End of cycle signal
7 - Reset to zero signal

Dimensions



Mounting plan for sequencer



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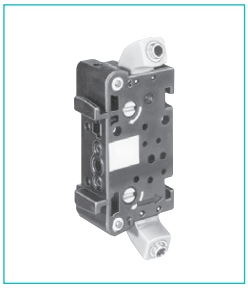
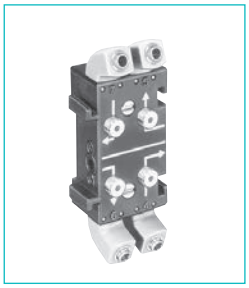
Sequencer sub-bases

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





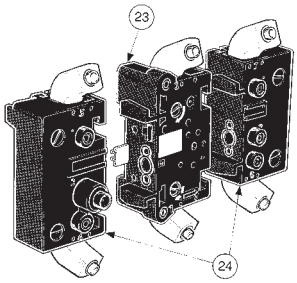
		81 551 101	81 552 101	81 552 601
Versions	Front connecting (DIN-omega)	Sub-base (DIN oméga)	End bases - one pair	Diversion base
	Rear connecting (with clips)	—	—	—

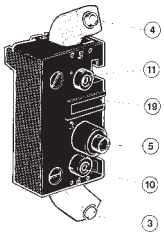
Characteristics

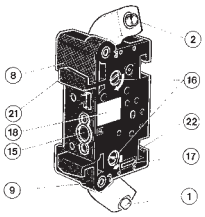
Sub-bases (fitted)	Rotatable connectors		●	●	●
	Pressure indicators		●	●	●
Operating temperature		°C	-5 → +50	-5 → +50	-5 → +50
Weight		g	55	135	60

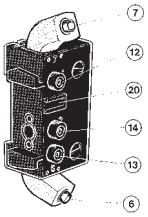
Sequencer connections

Front connecting





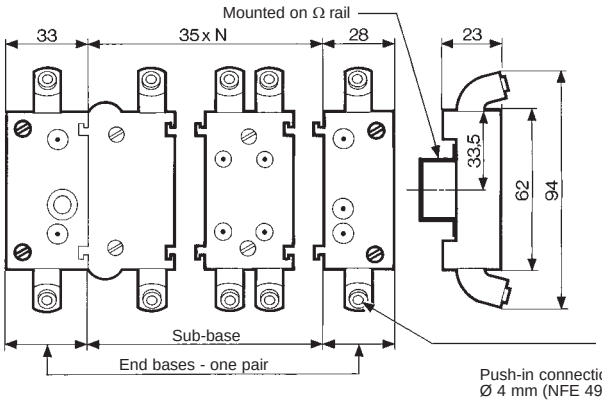




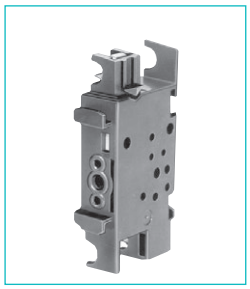
1 - Input port (green port 1) Ø 4
2 - Output port (red port 1) Ø 4
3 - Input port, cycle start (green port 1) Ø 4
4 - Output port, in-cycle signal (red port 1) Ø 4
5 - Output port, cycle end (red port 6) Ø 4
6 - Output port, cycle end (red port 6) Ø 4
7 - Input port, reset to zero (green port 7) Ø 4
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



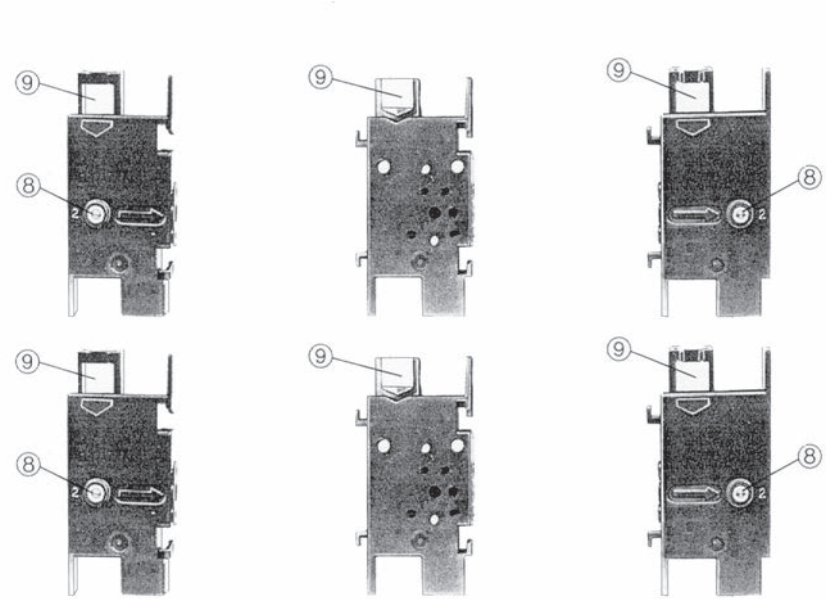
Push-in connection for semi-rigid tube Ø 4 mm (NFE 49100)



81 551 001	81 552 001
—	—
Sub-base (with clips)	End bases - one pair

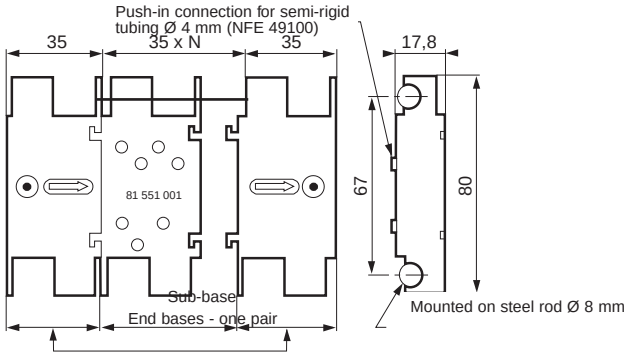
—	—
—	●
-5 → +50	-5 → +50
40	120

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



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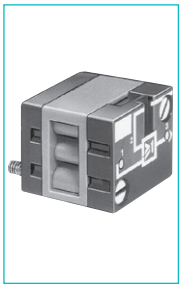
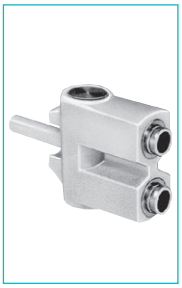
Logic elements

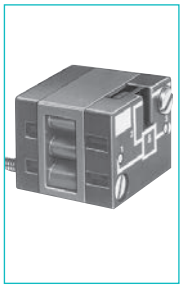
› **Performs "combined" Pneumatic**

› **Easy to use**

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

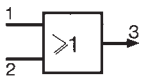


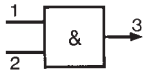




Functions		81 521 501	81 540 001	81 540 005	81 522 501
	OR	—	—	—	—
	AND	—	—	—	—
	YES	—	—	—	—
	NO	—	—	—	—
Version		On Sub-base page 4/14-4/15	Plug-in Ø 4	Plug-in Ø 6	On Sub-base page 4/14-4/15

Symbol





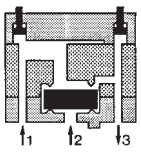
Characteristics

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

Pilot/pressure curves

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

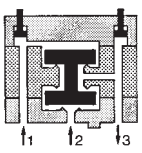
Principle of operation



Cellule OR

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

S = a OR b S = a + b



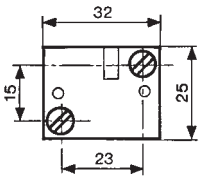
Cellule AND

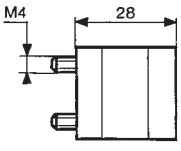
The output signal "S" is present only when signals "a" AND "b" are present simultaneously:

S = a AND b S = a . b

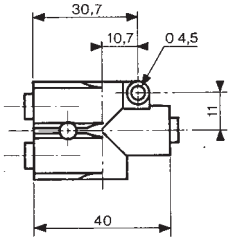
Dimensions

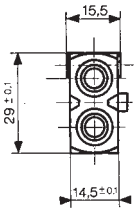
81 521 501 - 81 522 501



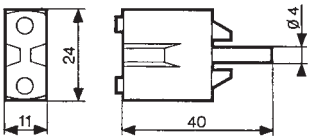


81 540 005 - 81 541 005



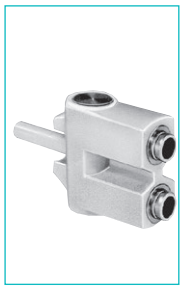


81 540 001 - 81 541 001

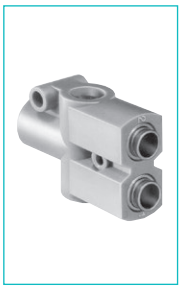


Other information

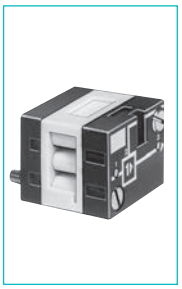
See pages 54/55 for mounting plan for logic elements.



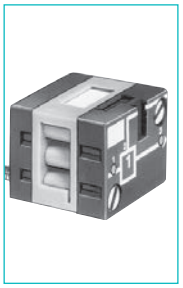
—
81 541 001
—
—
Plug-in
Ø 4



—
81 541 005
—
—
Plug-in
Ø 6

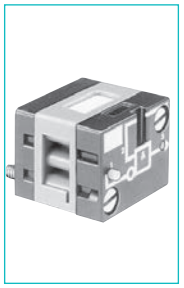


—
—
81 501 025
—
On sub-base
page 36-37

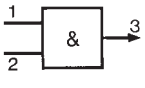


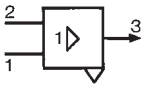
—
—
81 503 025
—
Threshold
On sub-base page
4/14-4/15

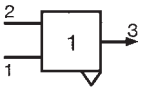
—
—
—
81 504 025
Threshold
On sub-base page
4/14-4/15

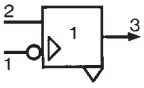


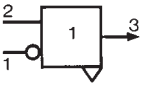
—
—
—
81 506 025
Threshold
On sub-base page
4/14-4/15



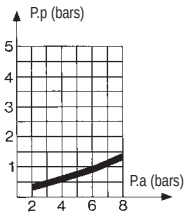


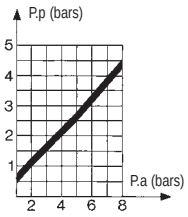


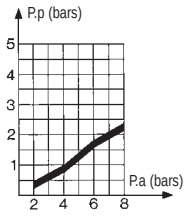


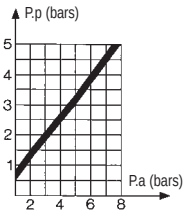


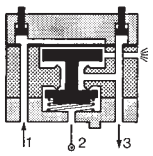
Ø 4 mm	—	—	—	—	—
—	Ø 6 mm	—	—	—	—
Green	Green	Yellow	Orange	Light grey	Dark grey
2 → 8	2 → 8	2 → 8	2 → 8	2 → 8	2 → 8
2.7	2.7	2.7	2.7	2.7	2.7
150	200	170	170	170	170
—	●	●	●	●	●
—	—	< 4	< 4	< 4	< 4
-5 → +50	-5 → +50	-5 → +50	-5 → +50	-5 → +50	-5 → +50
$>10^7$	$>10^7$	$>10^7$	$>10^7$	$>10^7$	$>10^7$
13	25	30	30	30	30







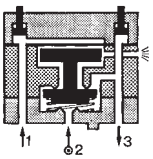




YES element

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

S = a YES b S = a



NOT element

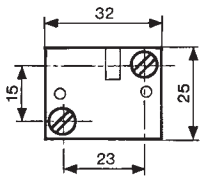
The output signal "s" is present only if the input signal "a" is NOT present. The output signal is therefore the inverse of the pilot signal:

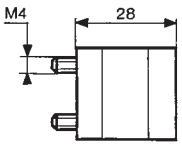
S= NOT a S = $\overline{a}$

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

S = NOT a AND b S = $\overline{a}$. b

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



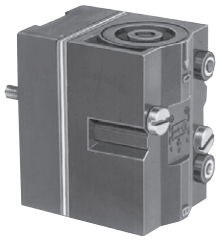


ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-crouzet.com**

Memory element

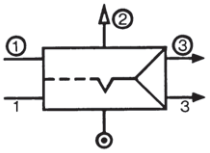
- **100 % pneumatic**
- **Bistable pneumatic**

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



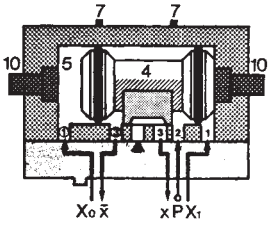
Characteristics

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	Nl/min	200	200
Connection - On sub-base page 4/14-4/15		●	●
Weight	g	90	90

Principle of operation

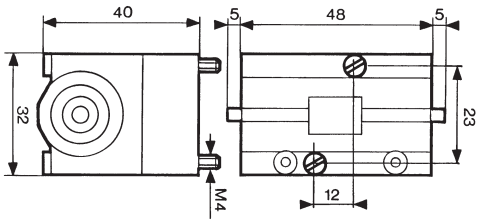
The function is that of a 4/2 valves. The appearence of signal "X1" causes the displacement of the slide valve. The output port "x" is then put under pressure. This state is remembered until the arrival of signal "X0". This signal reverses the slide valve, the output "x" is put under pressure. This state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

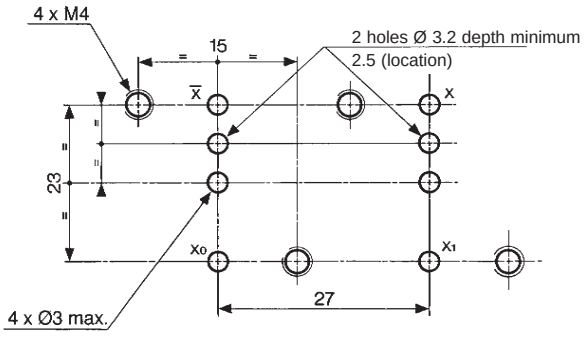


Dimensions

81 523 201 - 81 523 601



Dimensions of logic and memory elements



Viewed from above

ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-control.com**

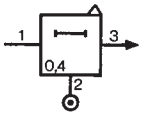
Timers fixed timing

› Fixed 0.4 s

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

Version	81 503 540 Positive output

Symbol

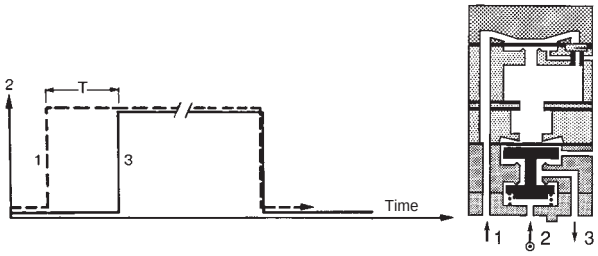


Characteristics

Timing	s	0.4
Operating pressure	bar	2 → 8
Flow at 6 bars	Nl/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	$>10^7$
Weight	g	106

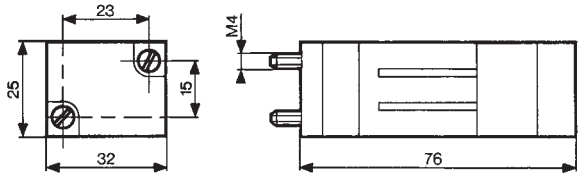
Principle of operation

with positive output



Dimensions

81 503 540

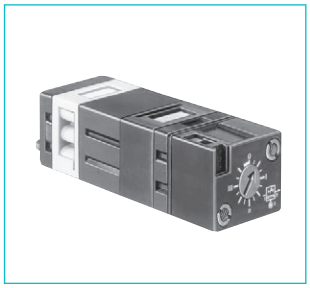
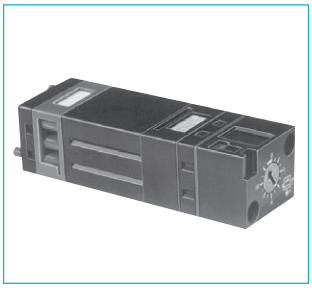
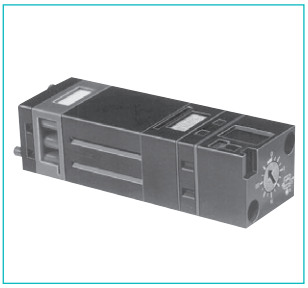


ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-crouzet.com**

Timers (with adjustable timing)

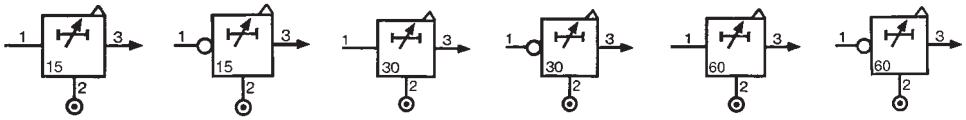
› 60 s adjustable (60 s max.)

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

		81 503 710	81 506 710	81 503 720	81 506 720	81 503 725	81 506 725
Function	positive	●	—	●	—	●	—
	negative	—	●	—	●	—	●

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	Nl/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	$>10^7$	$>10^7$	$>10^7$	$>10^7$	$>10^7$	$>10^7$
Weight	g	90	90	100	100	120	120

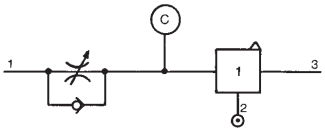
Accessories

Panel mounting adaptator		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)

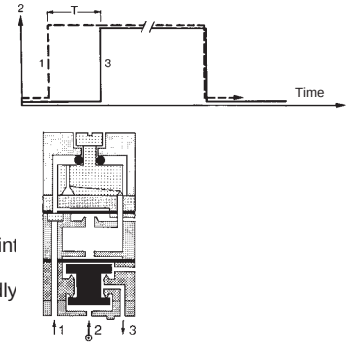
Timing by charging of reservoir



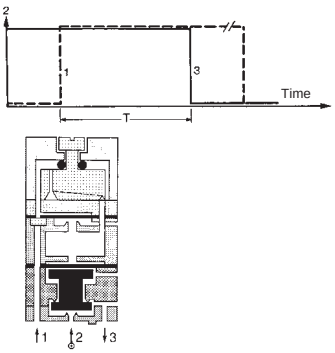
The reservoir fills via the flow restrictor until the switching point of the timer output is reached (positive or negative).
The non-return valve allows the reservoir to be emptied rapidly for the next timing.

Principle of operation

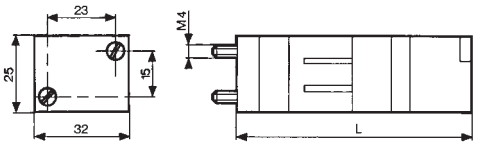
with positive output



with negative output

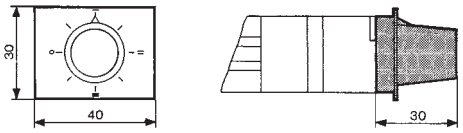


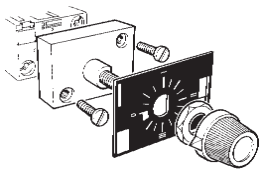
Dimensions



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

Adaptator 79 451 . . .





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

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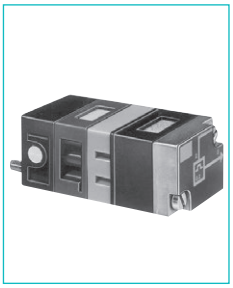
Timers

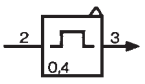
› Fixed and adjustable



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

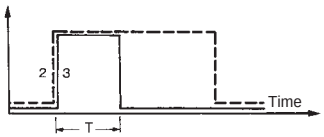
Timing	s	0.4	0.1 → 30	—
Frequency	Hz	—	—	0.02 → 8
Operating pressure	bar	2 → 8	2 → 8	2 → 8
Flow at 6 bars	Nl/min	170	170	170
Orifice diameter	mm	2.7	2.7	2.7
Accuracy	%	± 5	± 5	± 5
Min. reset time	s	<0.1	<0.1	<0.1
Connection - On sub-base page 4/14-4/15		●	●	●
Operating temperature	°C	-5 → +50	-5 → +50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

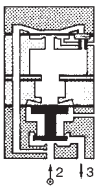
Accessories

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

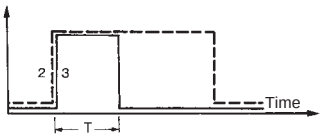
Principle of operation

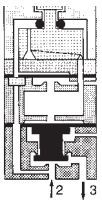
Single impulse generator



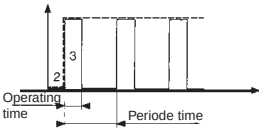


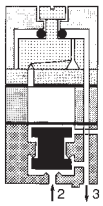
Adjustable impulse generator



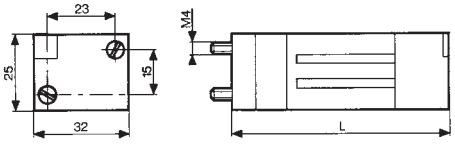


Frequency generator

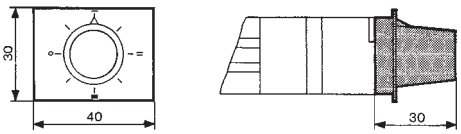




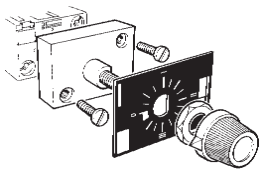
Dimensions



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 si required

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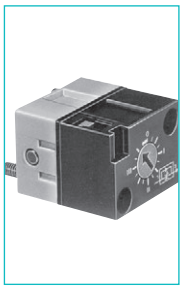
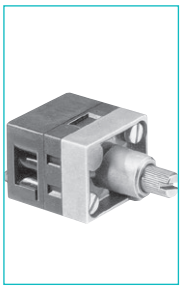
Timing Accessories

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


One-way in-line fixed flow restritors	Flow at 4 bars Nm³/h	Ø orifice (mm)					
	0.18 → 0.30	0.3	white	81 529 003	—	—	—
	0.35 → 0.50	0.4	yellow	81 529 004	—	—	—
	0.58 → 0.77	0.5	red	81 529 005	—	—	—
	0.80 → 1.06	0.6	green	81 529 006	—	—	—
	1.10 → 1.39	0.7	blue	81 529 007	—	—	—
	1.45 → 1.65	0.8	grey	81 529 008	—	—	—
	2.30 → 2.80	1	black	81 529 010	—	—	—
	0.08 → 0.12	0.25	white	81 529 025	—	—	—
One-way adjustable flow restritor				—	81 525 101	81 526 001	—
Capacity for timing	10 • 60 s			—	—	—	79 458 808

Symbol

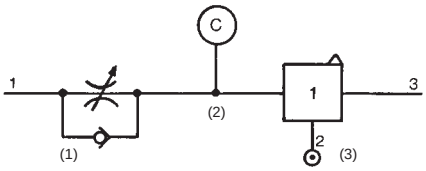
Characteristics

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		cm³	—	—	—	30
Connection	Sub-base page 4/14-4/15		—	●	●	—
	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

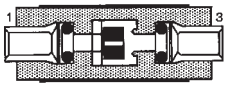
For timing circuit
- One-way flow restrictor 81 525 1 - 81 529 0 (1)
- Reservoir 79 458 018 (2)
- Relay element 81 503 0 - 81 506 0 (3) page 4/6-4/7

Sub-base page 4/14-4/15

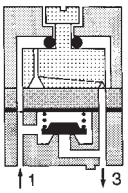


Principle of operation

One-way with fixed flow

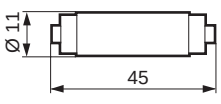


One-way with adjustable flow

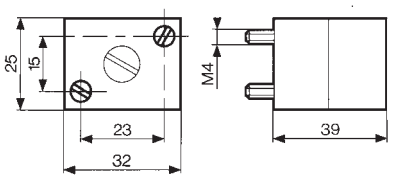


Dimensions

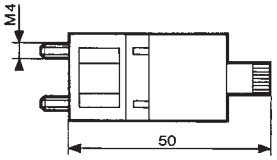
81 529



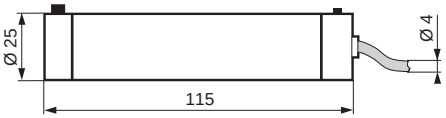
81 525 101



81 526 001



79 452 808



ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-control.com**

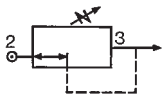
Regulator accessories

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	—	—
In-line non-return	—	**81 529 901**

Symbol

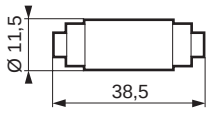


Characteristics

Operating pressure		bars	2 → 8	2 → 8
Flow at 6 bars		Nl/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

Dimensions

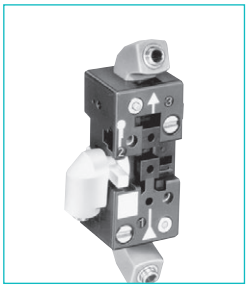
81 529 901

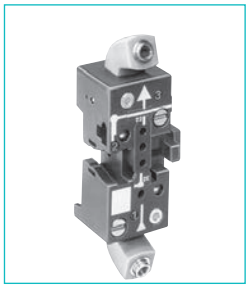


ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-crouzet.com**

Sub-bases for logic elements

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





		81 532 104	81 532 102	
Two-hand start module		● 1	● 1	
Manostats - vacuostats		● 1	● 1	
Leak sensor and amplifier relays		● 1	● 1	
Logic elements AND Timers		● 1	● 1	
Regulator accessories		● 1	● 1	
Memory element		—	—	
Operating temperature	°C	-5 → +50	-5 → +50	
Electro-pneumatic miniature solenoid		● 1	● 1	

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

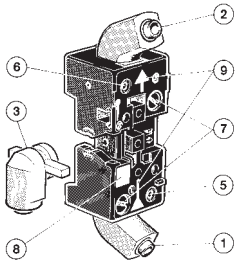
Characteristics

Push-in connection for semi-rigid tubing Ø 4 mm (NFE 49100)		rotatable	rotatable	
Fixation		DIN rail 35 mm	DIN rail 35 mm	
Weight	g	56	52	

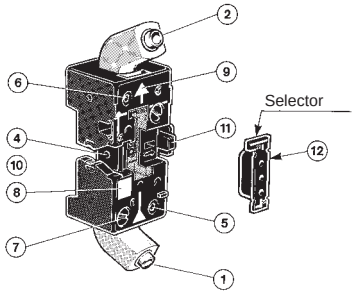
Connections elements and relays

Front connecting

A



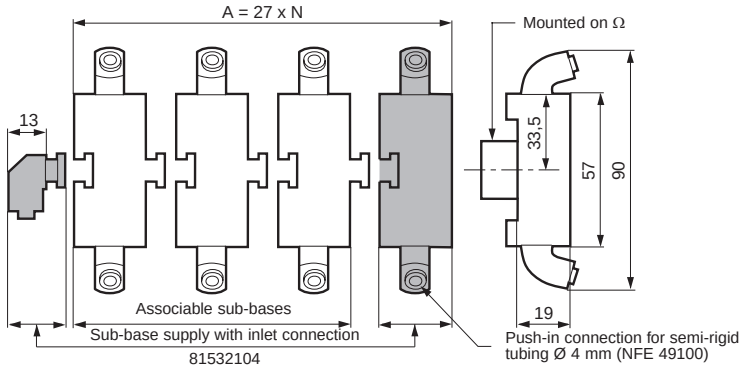
B



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**



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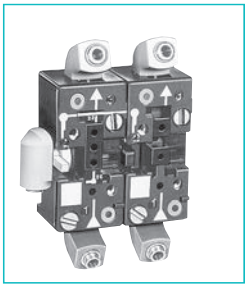
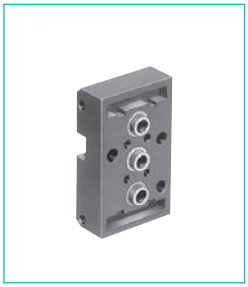
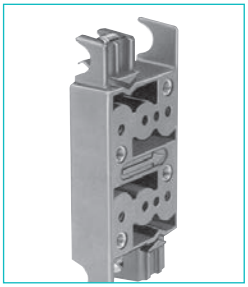




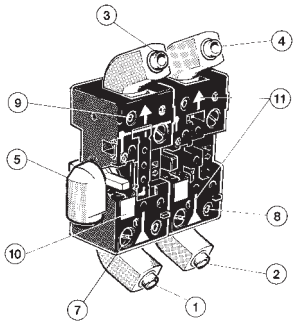


	81 542 002	81 532 001	81 531 001
Two-hand start module	—	● 1	● 2
Manostats - vacuostats	—	● 1	● 2
Leak sensor and amplifier relays	—	● 1	● 2
Logic elements AND Timers	—	● 1	● 2
Regulator accessories	—	● 1	● 2
Memory element	● 1	—	● 1
Operating temperature °C	-5 → +50	-5 → +50	-5 → +50
Electro-pneumatic miniature solenoid	—	● 1	● 2

Caractéristiques

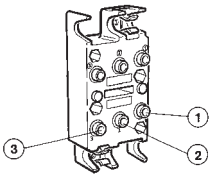
Push-in connection for semi-rigid tubing Ø 4 mm (NFE 49100)	rotatable	rear	rear
Fixation	DIN rail 35 mm	2 M4 screws	Clips for rails Ø 8 mm
Weight g	95	10	35

Memory element sub-base, front and rear connecting



1 - Input port X1 (green port 1)
2 - Input port X0 (green port 1)
3 - Output port X (red port 3)
4 - Output port X (red port 3)
5 - Supply port (brass port 2)
7 - 1/4 turn screws
8 - Input indicator
9 - Output indicator
10 - Marking tag
11 - Arrow indicating the flow direction

Rear connection



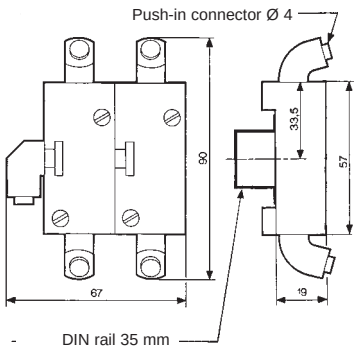
The modular system elements are fixed with two screws on the sub-base.

A locating device on each logic element prevents incorrect assembly.

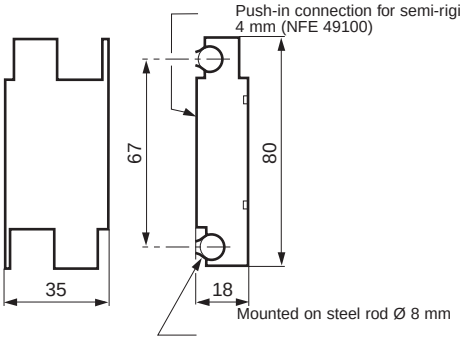
The logic element is connected via the sub-base. This sub-base has 3 instant connections for connecting semi-rigid tubes with outer Ø 4.

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

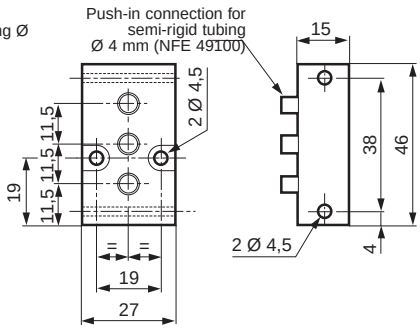
81 542 002 (for memory 81523201/601)



81 531 001



81 532 001



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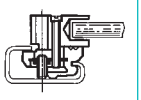
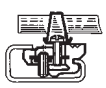
Mounting accessories

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

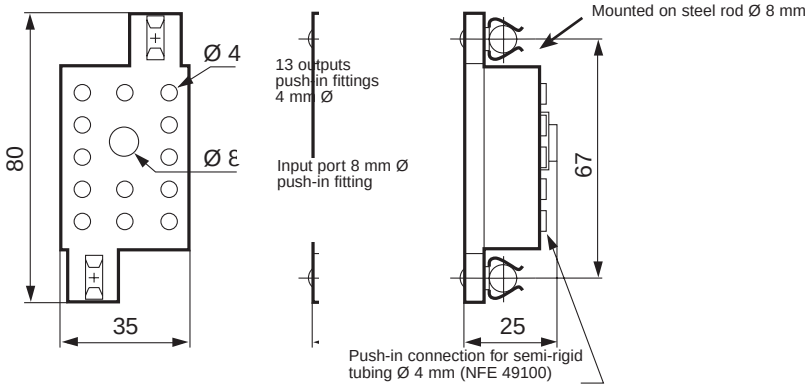



Mounting equipment		81 533 501 Hole domino	81 533 001 Clip domino	79 450 609 Bar clips Ø 8		— —
Supply manifold 13 outputs		—	—	—		81 536 801

Characteristics

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

Dimensions
81 536 804



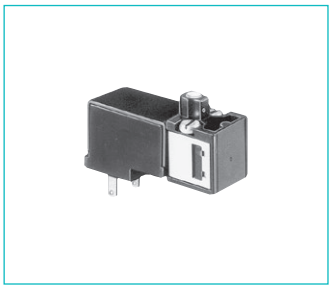
Other information

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

ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **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	81 519 080	81 519 380	81 519 680
2.5 VA	24 V ∿ 50-60 Hz		81 519 381	
2.5 VA	48 V ∿ 50-60 Hz*	—		
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

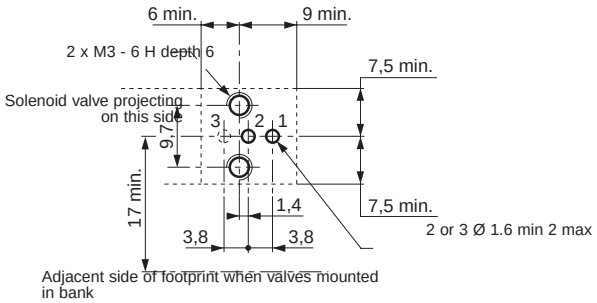
Function	3/2 NC	3/2 NC	3/2 NC
Version	Without manual override	With manual override by impulse	With manual override by latching (1/4 turn)

Characteristics

Operating pressure	bar	1→ 8	1→ 8	1 → 8
Orifice diameter	mm	0.5	0.5	0.5
Flow at 6 bars	Nl/min	12	12	12
kV		0.12	0.12	0.12
Switching time	ms	5 → 15	5 → 15	5 → 15
Mechanical life (operations)		5 10^7	5 10^7	5 10^7
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
Degree of protection 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

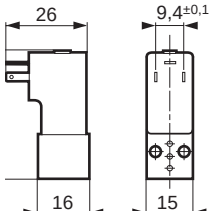
according to CNOMO E 06-36-120N



1 - Supply
2 - Output
3 - Exhaust

Dimensions

81 519 0



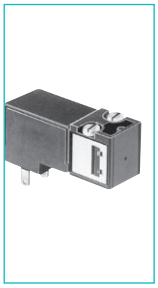
81 519 3
81 519 6

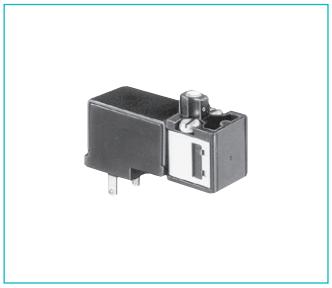
Manual override

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)

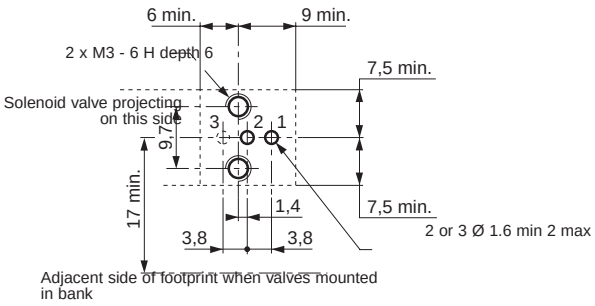
	Consumption	Voltage	81 519 032	81 519 332	81 519 632	81 519 340
	1 W	24 V ⎓				
Function			3/2 NC	3/2 NC	3/2 NC	3/2 NF
Version			Without manual override	With manual override by impulse	With maintained manual override	With maintained manual override

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		Nl/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 10^7	5 10^7	5 10^7	5 10^7
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	—	—	—	—
	with connector 81 516 082	IEC 529	IP 65	IP 65	IP 65	IP 65
UL and cUL approval			MH 15085	MH 15085	MH 15085	MH 15085

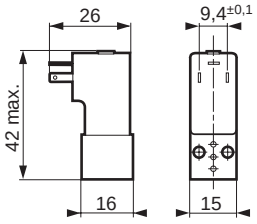
15x15 mm footprint

according to CNOMO E 06-36-120N

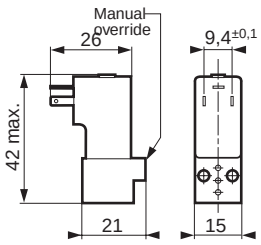


1 - Supply
2 - Output
3 - Exhaust

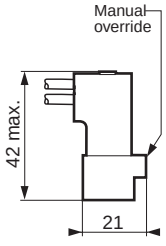
Encombrement
81 519 0



81 519 3
81 519 6



81 519 3

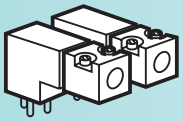


ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-control.com**

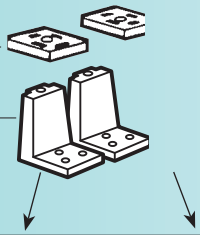
Electro-pneumatic miniature control valves

Mounting

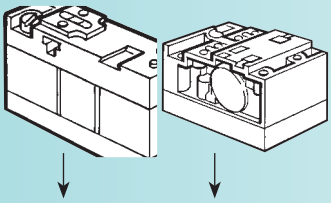
Miniature solenoid valves



Indicators
- LED seals
- LED



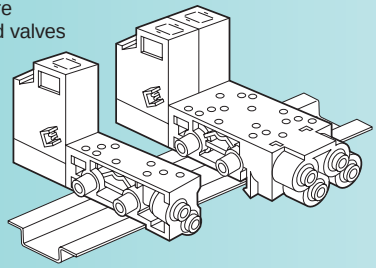
Valve modules
- Poppet
  3/2 monostable (17.5 mm)
  4/2 monostable (17.5 mm)
- Slide valve
  4/2 bistable (35 mm)
  4/2 monostable spring-return (35 mm)



Sub-bases

For miniature solenoid valves

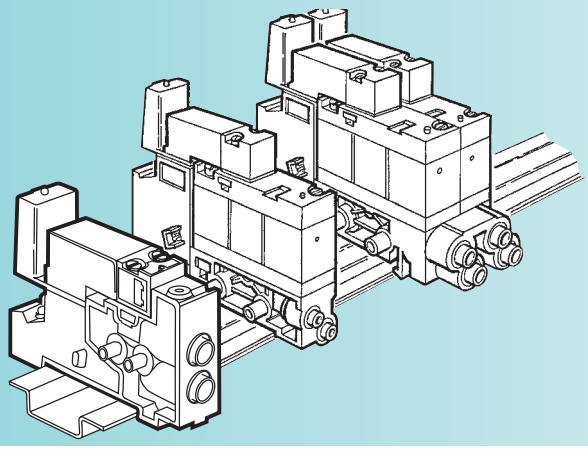
For valve modules



Double

Single

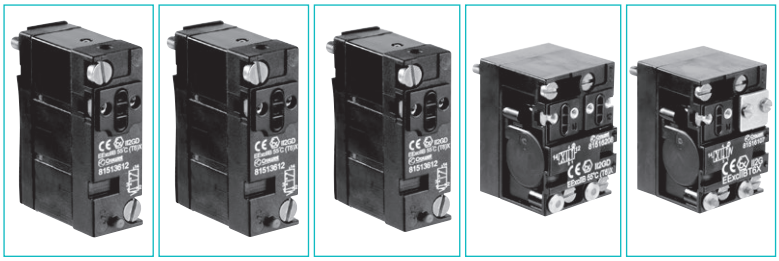
Complete product



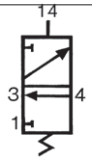
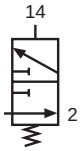
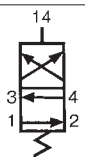
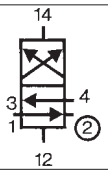
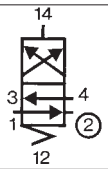
Valve modules

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

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

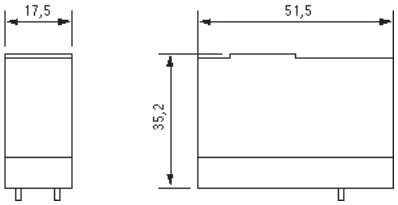


81 513 100	81 513 600	81 513 200	81 516 200	81 516 100

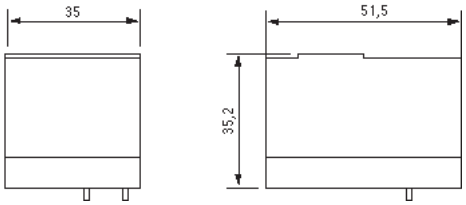
Function			3/2 NC monostable	3/2 NO monostable	4/2 monostable	4/2 bistable	4/2 monostable
Symbol							
Characteristics							
Width		mm	17.5	17.5	17.5	35	35
Working pressure		bars	3→8	3→8	3→8	2→8	3.5→8
Orifice diameter		mm	3	3	3	4	4
Flow at 6 bars	with Ø 4 mm sub-base (page 63)		200	200	200	300	300
	with Ø 6 mm sub-base (page 63)	Nl/min	300	300	300	400	400
Flow Rate	with Ø 4 mm sub-base (page 63)	kV	2.2	2.2	2.2	4	4
	with Ø 6 mm sub-base (page 63)		2.5	2.5	4	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 10^7	1.5 x 10^7	1.5 x 10^7	10^7	10^7
Weight		g	38	38	38	106	106

Dimensions

81 513



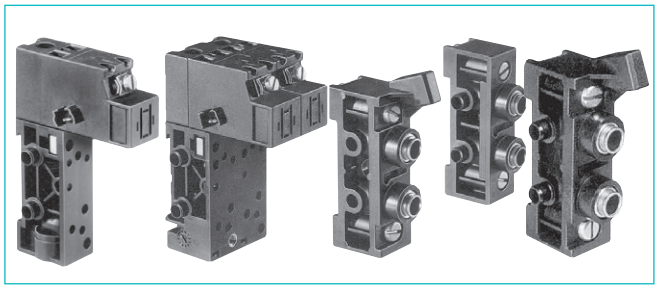
81 516



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

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	Ø 6 mm	—	—	—	**81 513 001**

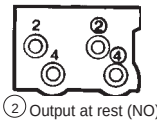
Characteristics

Torque capacity		mm^2	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

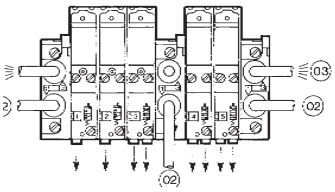
Connections — **Pneumatic**

81 513 011 - 81 513 001

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



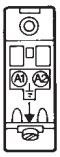
(2) Output at rest (NO)
2 Output at rest *
(4) Output at rest *
4 Output operating (NC)



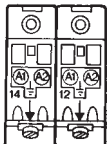
Note :
Each sub-base can accept
- sub-base 81 513 060-065 : 1 relay 3/2 or 4/2, width 17.5 mm
- sub-base 81 517 101-201 : 1 bistable relay 4/2 (width 35 mm) or 2 relays 3/2 or 4/2 (width 17.5 mm)

(02) 2 Supply ports
(03) 2 Exhaust ports
Integral push-in connections Ø 6 mm

Electrical



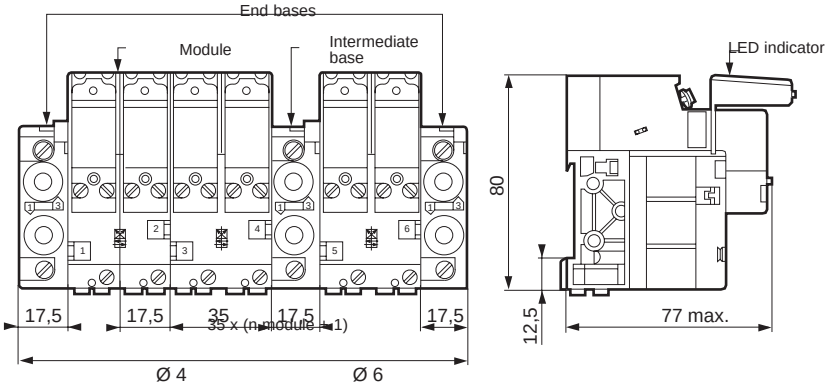
A1 - Pilot signal
A2 - Common
Earth



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)



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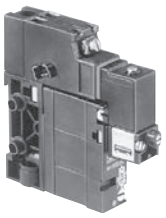
Valves and solenoids valves assembled



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**	

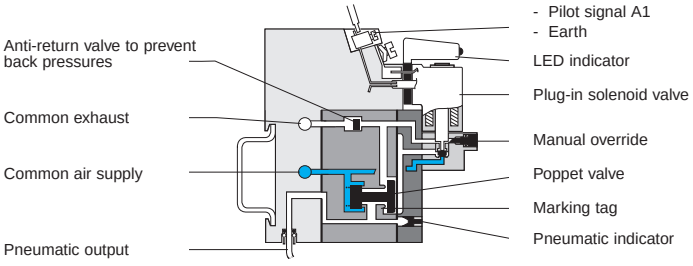
Symbol

Characteristics

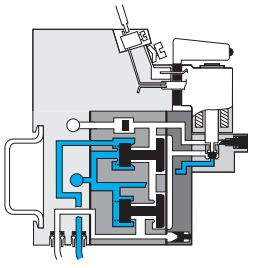
Operating pressure	bar	3→8	3→8	
Orifice diameter	mm	3	3	
Flow at sub-base 81 513 060	NL/min	200	200	
6 bars sub-base 81 517 101	NL/min	—	—	
KV with sub-base 81 513 060		2.2	2.2	
KV with sub-base 81 517 101		—	—	
Operating temperature	°C	-10 → +50	-10 → +50	
Switching time of the assembly	ms	20	20	
Mechanical life (operations) at 4 bars		1.5 x 10^7	1.5 x 10^7	
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

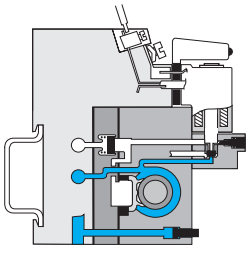
3/2 monostable module (NC)



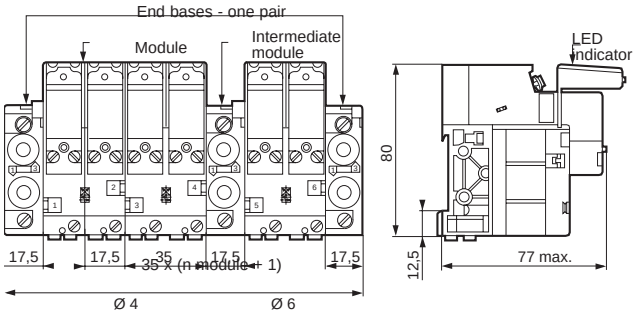
4/2 monostable module



4/2 bistable module



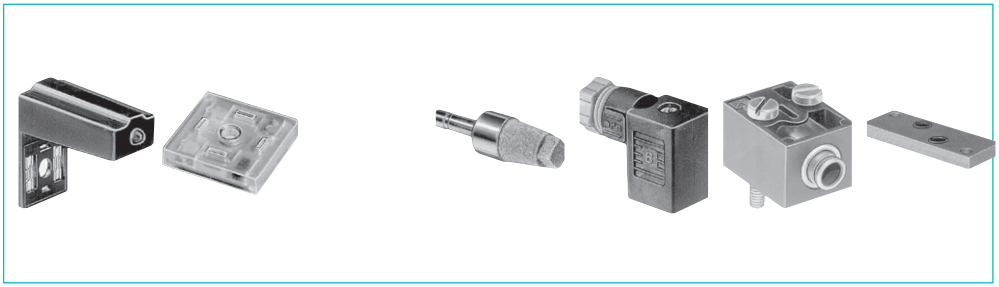
Dimensions



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

Accessories

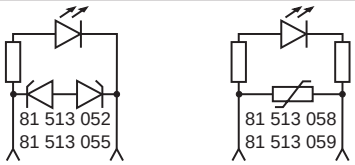
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



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	12 to 24 V - DC - AC	—	81 513 064		—	—	—	—
Packaging		(by 5)	(by 10)					
Exhaust silencer	Plug-in Ø 6	—	—		81 537 001	—	—	—
	Plug-in Ø 8	—	—		81 537 201	—	—	—
Connector for solenoid valve		—	—		—	81 516 082	—	—
Pneumatic pilots	Without manual override	—	—		—	—	81 516 081	—
	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

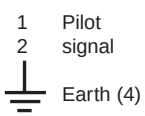
Symbol



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

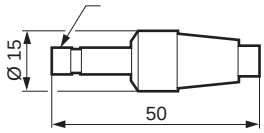
Connection



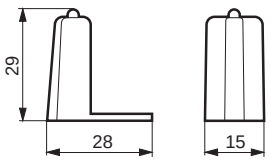
Dimensions

81 537 001 - 81 537 201

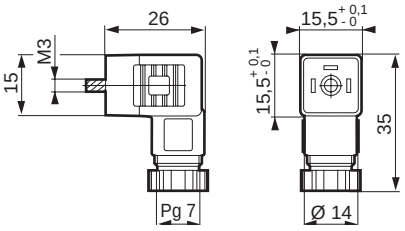
Mounted by plugging into push-in connector for semi-rigid tubing (NFE 49100)



81 513 052 - 81 513 055
81 513 058 - 81 513 059



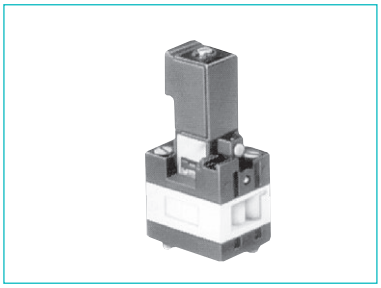
81 516 082



ATEX version products are available in the following catologues: **Pneumatic products for explosive atmospheres** or on our website **www.crouzet-control.com**

Solenoid valves

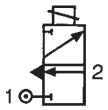
› **Reduced "dimensions"**
› **Mounted on sub-base**



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**

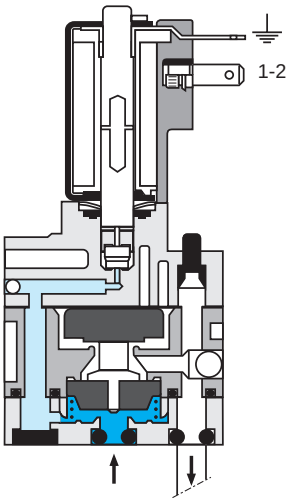
Symbol



Characteristics

Operating pressure	bar	2 → 8
Orifice diameter	mm	2.7
Flow at 6 bars	Nl/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	1.5×10^7
Consumption ⎓	W	1
Consumption ~	VA	2.5
Operating temperature	°C	-5 → +50
Weight	g	70
UL and cUL approval		MH15085

Principle of operation



Connections

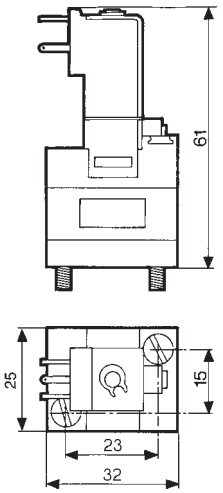
Pneumatic { 1 - Supply
2 - Output

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:

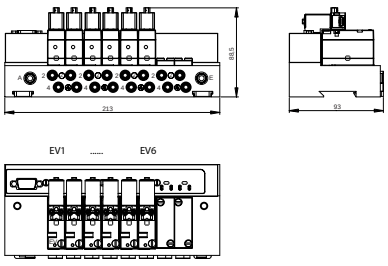
- **Preconfigured 8-position sub-base**
- **6 4/2 monostable valve modules with 24 V⎓ pilot holes**
- **2 blanking plates (for extension if necessary)**
- **1 connection cable**

Part numbers

	16 outputs	16 outputs
Part numbers	**81513241**	**81513238**
Electrical characteristics		
Supply voltage	24 V⎓ ± -10%	24 V⎓ ± -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
Electrical connections		
Type of cable	Sub D9 AWG 24 wires	Sub D9 AWG 24 wires
Cable length	2 m	2 m
Pneumatic characteristics		
Function	6 4/2 monostable valve modules (81513200) + 2 free positions	Whitout
Operating pressure bars	3 → 8 b	3 → 8 b
Flow at 6 bars NL/mim	300	300
Mechanical life (operations)	1.5 x 10^7	1.5 x 10^7
Working medium	Compressed air or inert gas, 50 µm filtered non-lubricated air	Compressed aire or inet gaés, 50 µm filtered non-lubricated air
Pneumatic connections		
Power supply connection	Push-in connection Ø 8 mm	Push-in connection Ø 8 mm
Output connections	Push-in connection Ø 6 mm	Push-in connection Ø 6 mm
Connection of common exhaust	Push-in connection Ø 8 mm	Push-in connection Ø 8 mm
General characteristics		
Operating temperature range IEC 68214 (°C)	-5 → +50	-5 → +50
Storage temperature IEC 68-2-14 (°C)	-15 → +50	-15 → +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
Comments		
Other configurations on request		

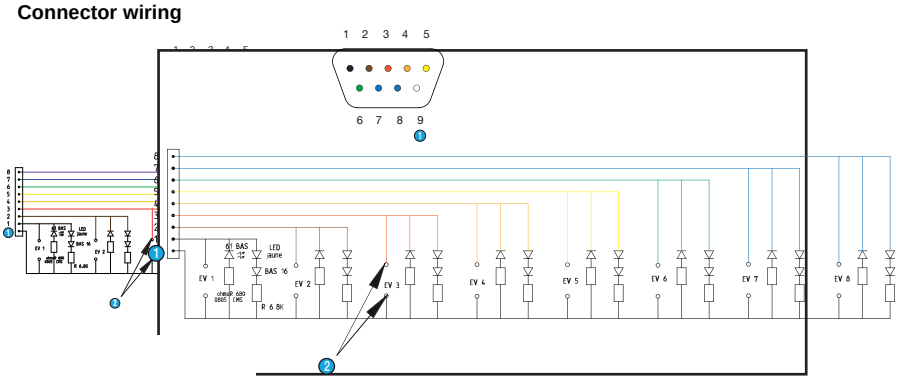
Dimensions (mm)

81513241



Connections

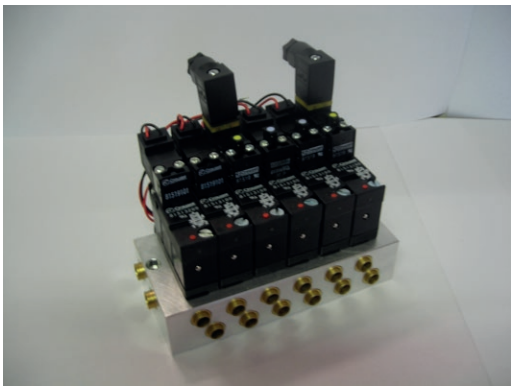
Connector wiring



(1) Commun 0 V
(2) Clips femelle CI

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

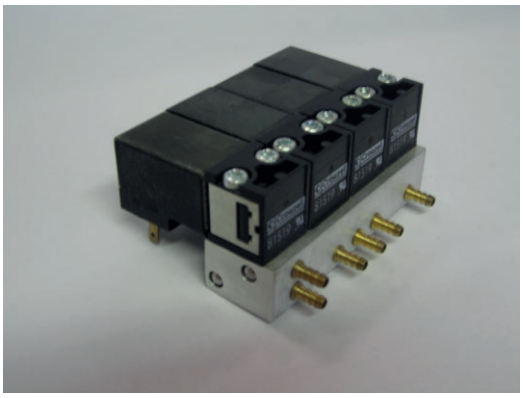
Versions with interfaces 300 NL / mm



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.

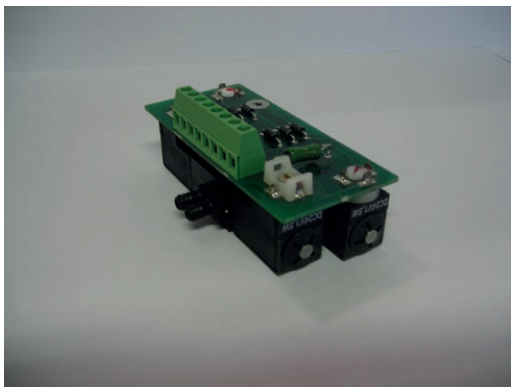
Versions with interfaces 30 NL / mm



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

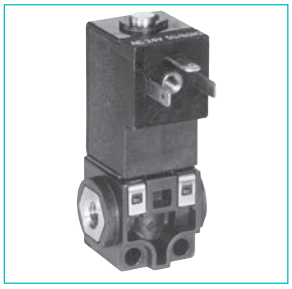


Crouzet analyses your needs and offers a customised solution.

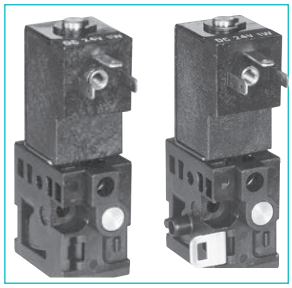
MULTI-FLUID SOLENOID VALVES

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

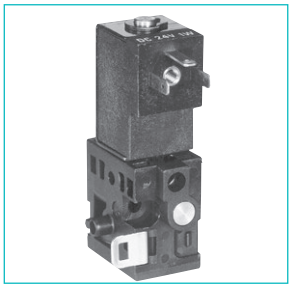
- **Autonomous**
- **Mounted individually or in a battery**
- **Variable orientation coil**
- **Low power consumption : 1 W**
- **Quick to fit together, no tools needed**
- **M5 fittings or possibility of barb**



Mounting: 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 Nl/mn
Maximum switching rate		30 Hz
Weight	Individual mounting	32.5 g
	Bank end/inner valves	35 g
Body material		Glass-reinforced polyamide 6.6
Mechanical life (operations)		1.5 x 10^7
UL and cUL approval		MH 15085

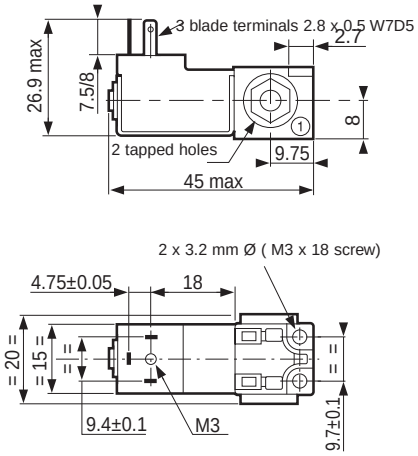
Accessories for 2/2 miniature solenoid valves

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

Dimensions

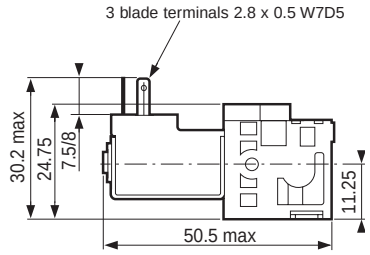
Individual

81 546 0



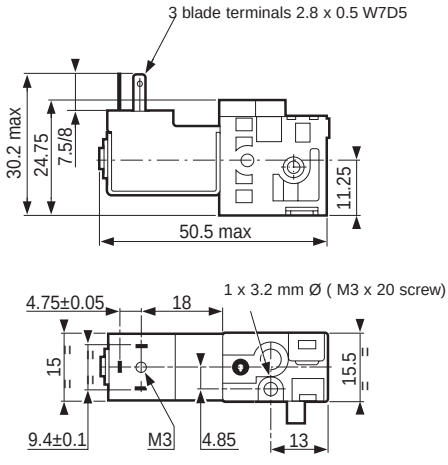
Bank end valves (1 pair)

81 547 0



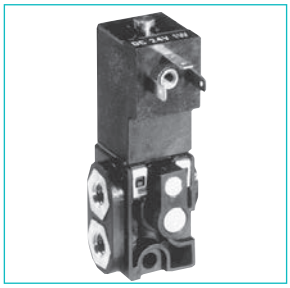
Intermediate valve

81 547 5

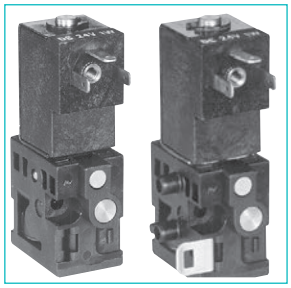


Standard 3/2 miniature solenoid valves for fluids and inert gases

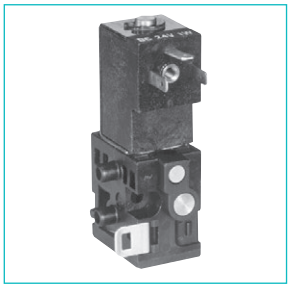
- **Autonomous**
- **Mounted individually or in a battery**
- **All connections on one face**
- **Small size**



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 Nl/min
Maximum switching rate		30 Hz
Weight	Individual mounting	32.5 g
	Bank end/inner valves	35 g
Body material		Glass-reinforced polyamide 6.6
Mechanical life (operations)		1.5 x 10^7
UL and cUL approval		MH 15085

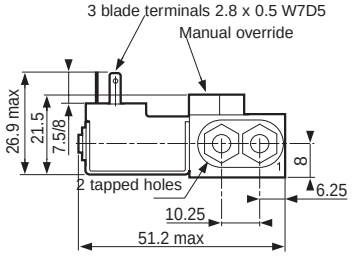
Accessories for 3/2 miniature solenoid valves

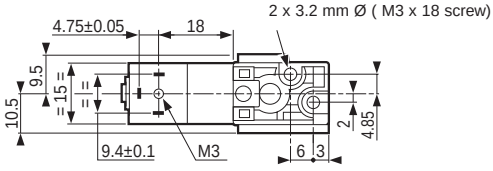
Connector for solenoid valve (see page 5/11)		81 516 082
Visual indicators (see page 65)	24 V-50/60 Hz DC	81 513 052
	48 V-50/60 Hz AC	81 513 055
	110 V-50/60 Hz AC	81 513 058
	220 V-50/60 Hz AC	81 513 059
LED seal (see page 65)	12-24 V ∿ ⎓	81 513 064

Dimensions

Individual

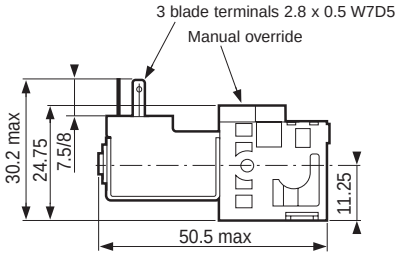
81 548 0





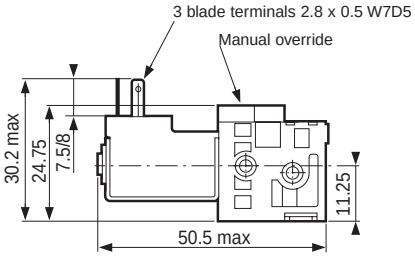
Bank end valves (1 pair)

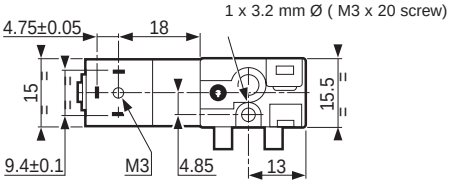
81 549 0



Intermediate valve

81 549 5





TEACHING MATERIALS

Teaching materials

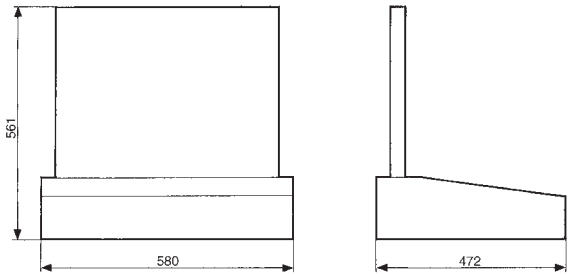
› **Ideal for learning pneumatics**

› **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
81 281 510		NF Microvalve	13-24
81 283 510		NF Microvalve	24
81 290 001	81 290 006	Low-force detector	23
81 290 501	81 290 506	Low-force detector	23
81 371 401		Special detector	32
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
81 502 160	81 502162	Pressure switch	38
81 502 230	81 502 238	Amplifier	33
81 502 320	81 502 322	Amplifier	33
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
81 506 940	81 506 945	Frequency generator	51
81 507 540	81 507 543	Frequency generator	51
81 507 720	81 507 724	Frequency generator	51
81 508 110		Vacuum switch	39
81 509 080		Pressure switch	37
81 509 085		Pressure switch	37
81 510 001		Amplifier relay	34
81 512 201		Special detector	31
81 512 401		Special detector	31
81 513 001	81 513 039	Supply module	63
81 513 011	81 513 040	End base	63
81 513 052		LED	65
81 513 055		LED	65
81 513 058		LED	65
81 513 059		LED	65
81 513 060	81 513 075	Sub-base	63
81 513 064		Indicator seal	65
81 513 065	81 513 076	Sub-base	63
81 513 100	81 513 196	Valve module	62
81 513 103		Valve module	64
81 513 200	81 513 234	Valve module	62
81 513 203		Valve module	64
81 513 501		Pressure switch	36
81 513 502		Pressure switch	36
81 513 509		Pressure switch	37
81 513 510		Pressure switch	37
81 513 516		Pressure switch	37
81 513 522		Vacuum switch	36
81 513 523		Vacuum switch	37
81 513 527		Vacuum switch	37
81 513 533		Pressure switch	37
81 513 552		Pressure switch	36
81 513 600	81 513 612	Valve module	62
81 516 081	81 516 093	Pneumatic pilot	65
81 516 082		Connector	65
81 516 085	81 516 085	Blanking plate	65
81 516 091		Accessories	65
81 516 100	81 516 107	Valve module	62
81 516 200	81 516 208	Valve module	62
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