

## Indicators and pedal valves

### › Ergonomics

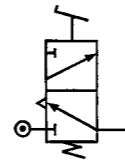


Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



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

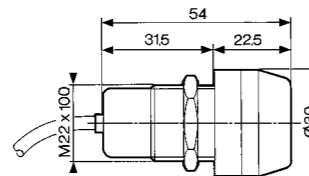


### Characteristics

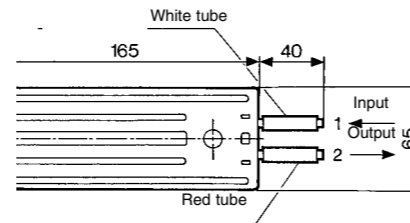
Operating pressure	bar	2 → 8	—
Push-in connection for semi-rigid tubing (NFE 49100)	mm	Ø4	Ø4
Operating temperature	°C	-5 → +50	-5 → +50
Mechanical life	operations	10 <sup>7</sup>	1.5 x 10 <sup>6</sup>
Weight	g	34	290

### Dimensions

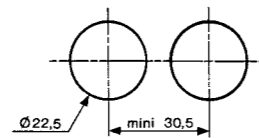
84 150 201 - 84 150 202  
84 150 203 - 84 150 204



81 999 501



### Holes drilled for indicators



# POSITION DETECTORS

## Pressure decay sensor

> 100 % pneumatic

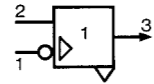
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive



Pressure decay sensor

81 504 025

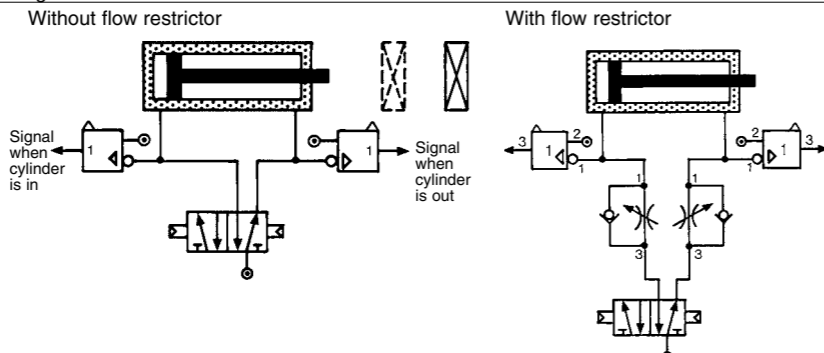
**Symbol**



### Characteristics

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

### Connections

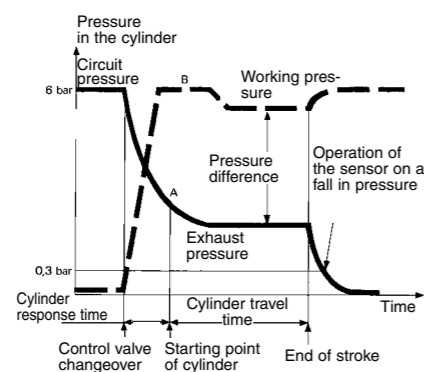


### Principle of operation

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

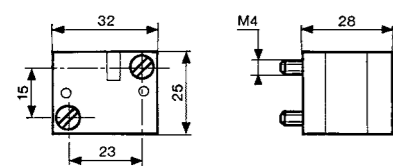
For the correct usage of sensors on a falling pressure, it is recommended that the practical cylinder load is limited to 60% of the theoretical force.

Evolution of pressure within a double-acting cylinder



### Dimensions

81 504 025

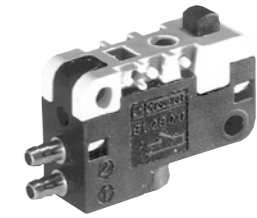


ATEX version products are available in the following catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet.com](http://www.crouzet.com)

## Low force position detector

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

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

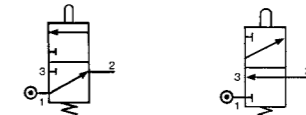


Function NO NC

81 290 501

81 290 001

**Symbol**

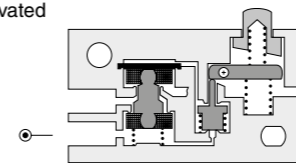


### Characteristics

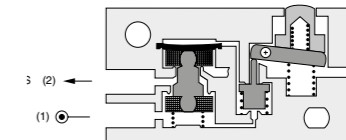
Orifice diameter mm		2	2
Operating pressure	bar	3 → 8	3 → 8
Flow at 4 bars	NI/min	100	100
Activation force at 6 bars	N	< 0,5	< 0,5
Permissible fluids (air / inert gas)		•	•
Max/min of fluid temperatures operating	°C	-10 → +50	-10 → +50
storage	°C	-10 → +60	-10 → +60
	°C	-40 → +70	-40 → +70
Mechanical life at 6 bars	operation	10 <sup>7</sup>	10 <sup>7</sup>
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



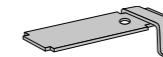
Activated



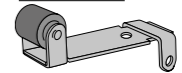
### Operation accessories

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

161 A  
flat R 25.4  
70 507 524

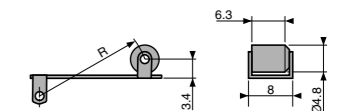
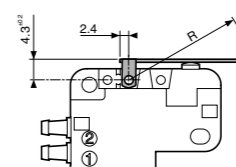
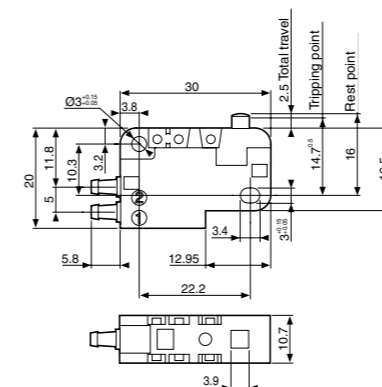


161 E  
with roller R 24.1  
70 507 529



### Dimensions

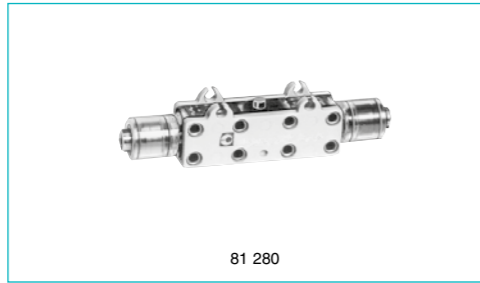
DIN 41635 Form A



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### “Microvalve” series position detectors

> 100 % pneumatic



81 280

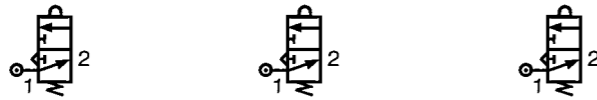


81 281

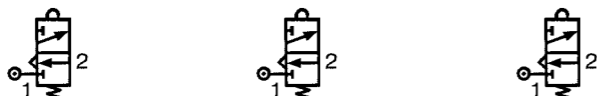
Version	NO	81 280 010	81 281 010	—
	NC	81 280 510	81 281 510	81 283 510
Features		Horizontal output	Vertical output	Rear connection by screw

**Symbol**

NO



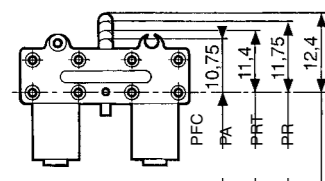
NC



**Characteristics**

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

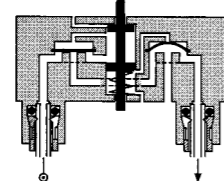
**Principle of operation**



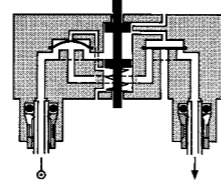
**Actuation positions :**

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

NC

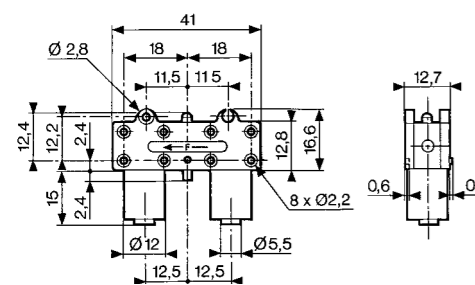


NO

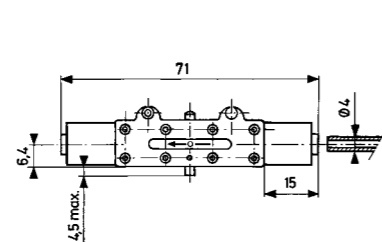


**Dimensions**

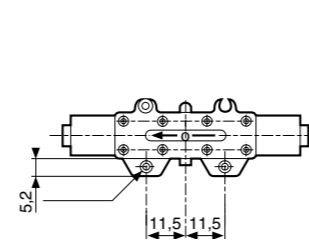
81 281 010 - 81 281 510



81 280 010 - 81 280 510

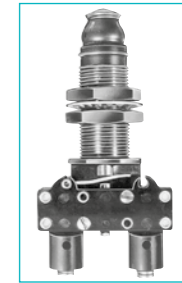
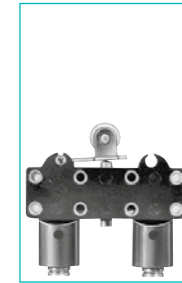
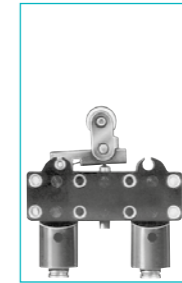
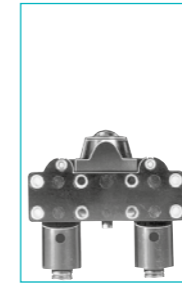


81 283 510



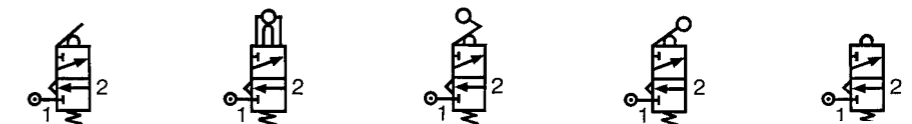
### “Microvalve” series position detectors

> 100 % pneumatic



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

**Symbol**

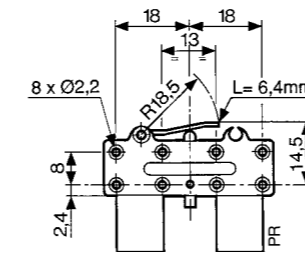


**Characteristics**

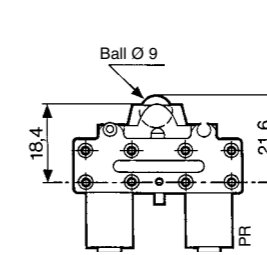
Operating pressure	bar	2 → 8	2 → 8	2 → 8	2 → 8	2 → 8
Orifice diameter	mm	2.7	2.7	2.7	2.7	2.7
Flow at 6 bars	NI/min	200	200	200	200	200
Operating force at 6 bars	N	15	15	15	15	25
Effective travel	mm	1	1	1	1	1
Push-in connection for semi-rigid tubing (NFE 49100)	mm	Ø 4	Ø 4	Ø 4	Ø 4	Ø 4
Operating temperature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

**Dimensions**

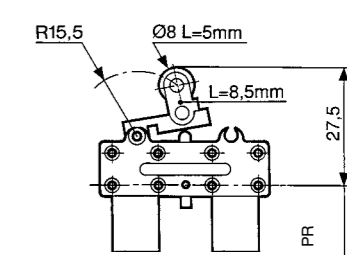
81 281 502



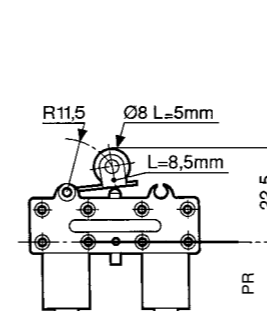
81 281 504



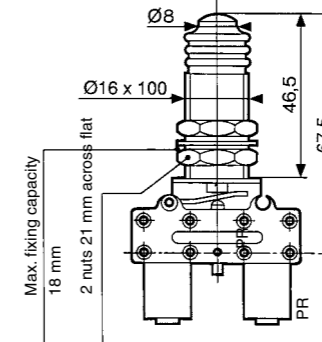
81 281 508



81 281 509



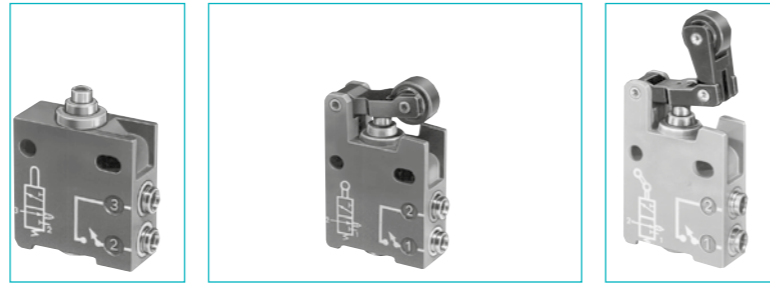
81 737 501



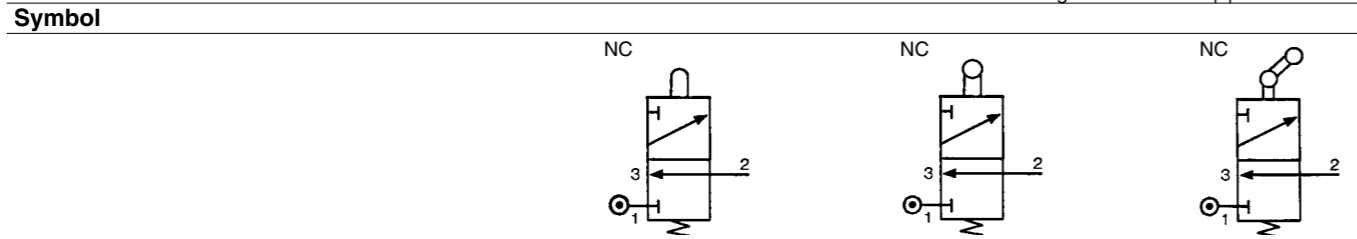
**Actuation positions :**  
PR : Rest position

## "Miniature" series position detectors

- > 100 % pneumatic
- > All metal

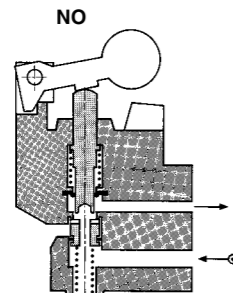
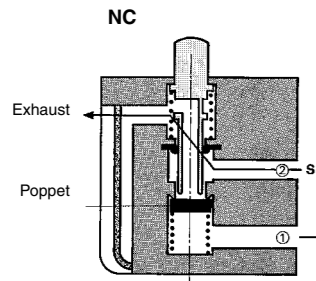


Part numbers					
Version	Push-in connection for semi-rigid tubing (NFE 49100)				
NC	Ø 4 silenced exhaust	81 921 501	81 921 701	81 921 702	81 921 707
	M5 connectable exhaust	—	—	—	—
	Ø 4 connectable exhaust *	—	—	—	—
NO	Ø 6 connectable exhaust *	—	—	—	—
	Ø 4 silenced exhaust	—	—	—	—
Control	Ø 6 silenced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



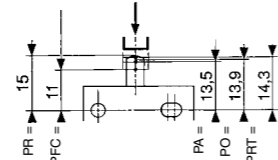
Characteristics					
Operating pressure	bar	0.1 → 8	0.1 → 8	0.1 → 8	0.1 → 8
Orifice diameter	mm	2.7	2.7	2.7	2.7
Flow at 6 bars	NI/min	200	200	200	200
Actuation force at 6 bars	N	18	18	18	18
Circuit function : NC		•	•	•	•
Circuit function: NO		—	—	—	—
Connectable exhaust		—	—	—	—
Operating temperature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

### Principle of operation



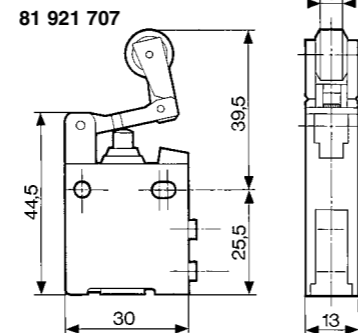
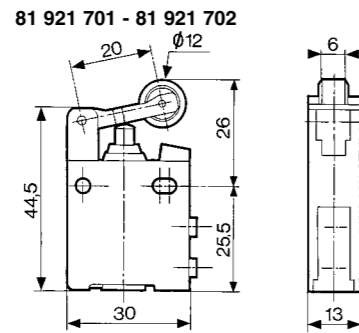
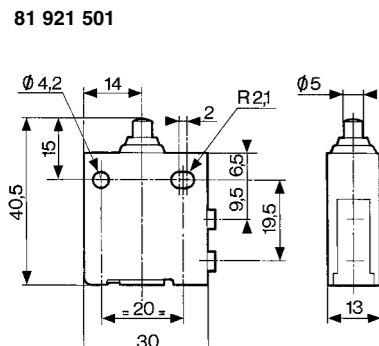
### Actuation travel

Vertical attack  
Simple plunger

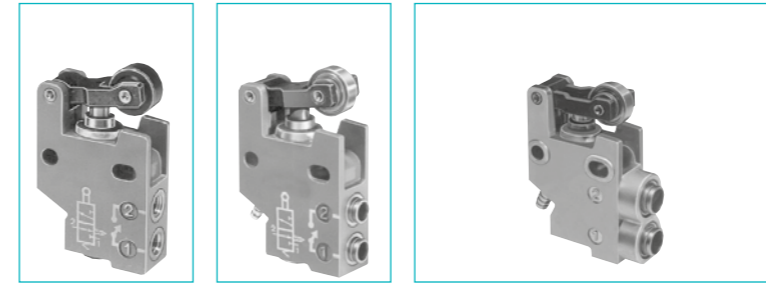


- Actuation positions :**
- PA : Operating position (max output kV)
  - PFC : End of travel position
  - PO : Mid-position closed (no exhaust, no outlet)
  - PRT : Release position (max exhaust kV)
  - PR : Rest position

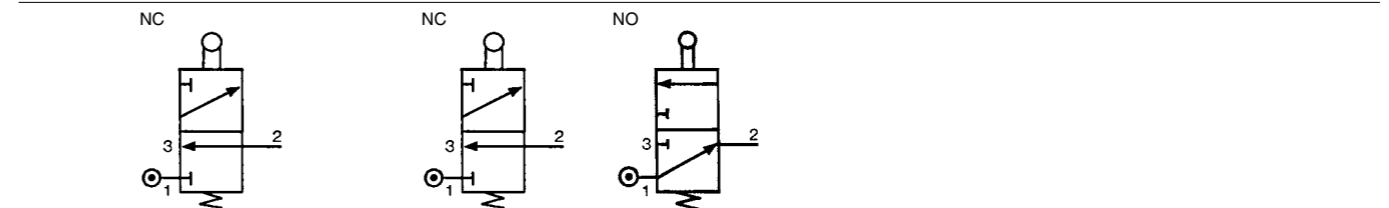
### Dimensions



\* with barb for tube Ø 2.7 x 4  
Material: body zamak

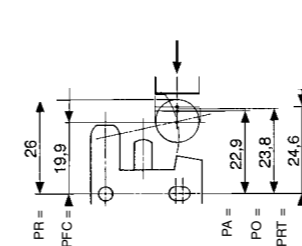


—	—	—	—
81 921 806	—	—	—
—	81 921 714	—	—
—	—	81 921 719	81 921 717
—	—	81 921 911	81 921 912
—	—	81 921 901	81 921 902
Lever with plastic roller	Lever with roller bearing	Lever with plastic roller	Lever with roller bearing



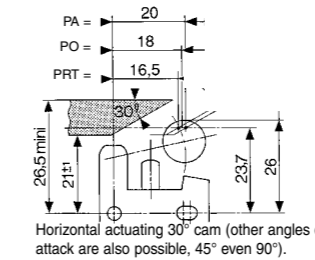
0.1 → 8	0.1 → 8	0.1 → 8	0.1 → 8
2.7	2.7	2.7	2.7
200	200	200	200
18	18	18	18
•	•	•	•
—	—	•	•
-5 → +50	-5 → +50	-5 → +50	-5 → +50
≥10 <sup>7</sup>	≥10 <sup>7</sup>	≥10 <sup>7</sup>	≥10 <sup>7</sup>
75	80	100	100

### With lever

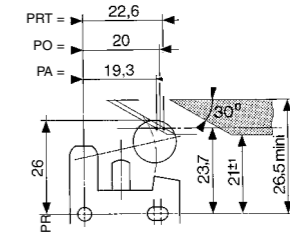


### Horizontal actuating 30° cam (other angles of attack are also possible, 45° even 90°).

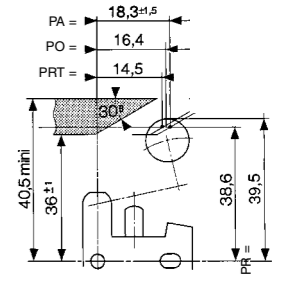
#### With lever



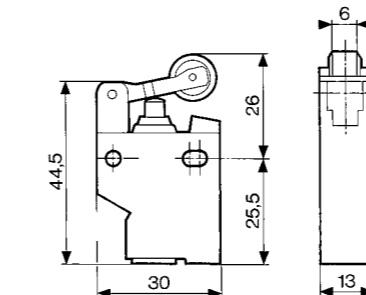
#### With lever



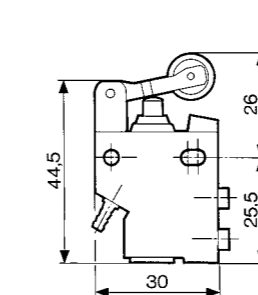
#### One-way trip lever



### 81 921 806



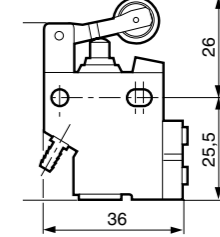
### 81 921 714



### 81 921 717 - 81 921 719

### 81 921 901 - 81 921 902

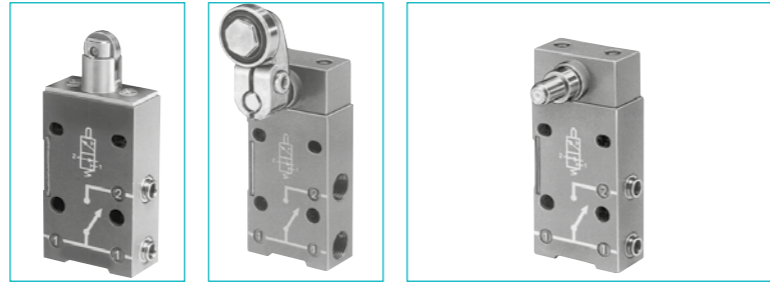
### 81 921 911 - 81 921 912



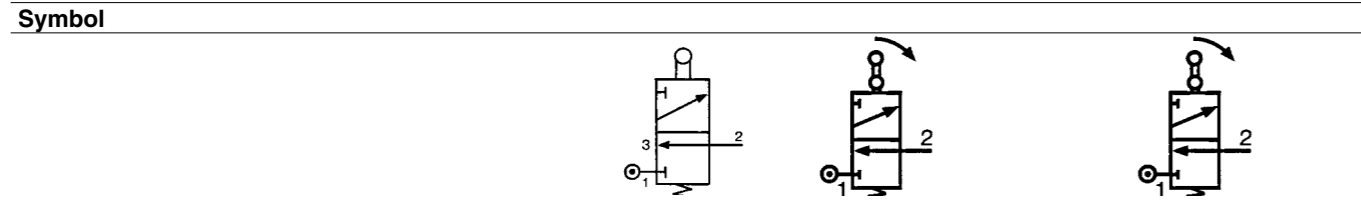
Material: body zamak  
Other configuration on demand

## "Compact" series position detectors

- > 100 % pneumatic
- > All metal



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

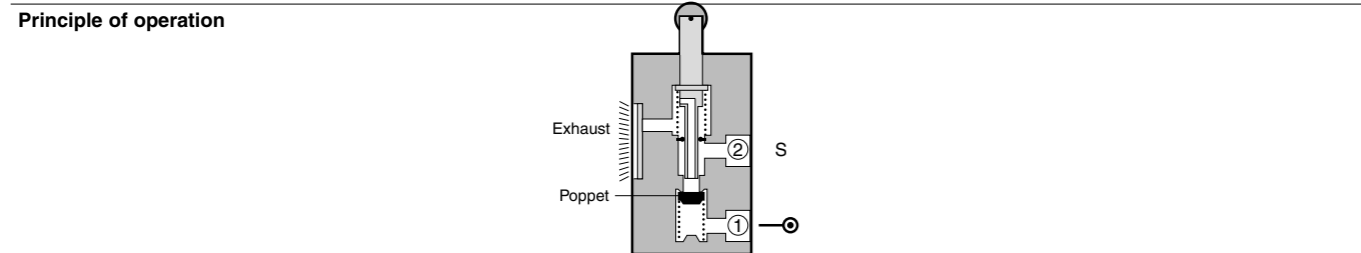


**Characteristics**

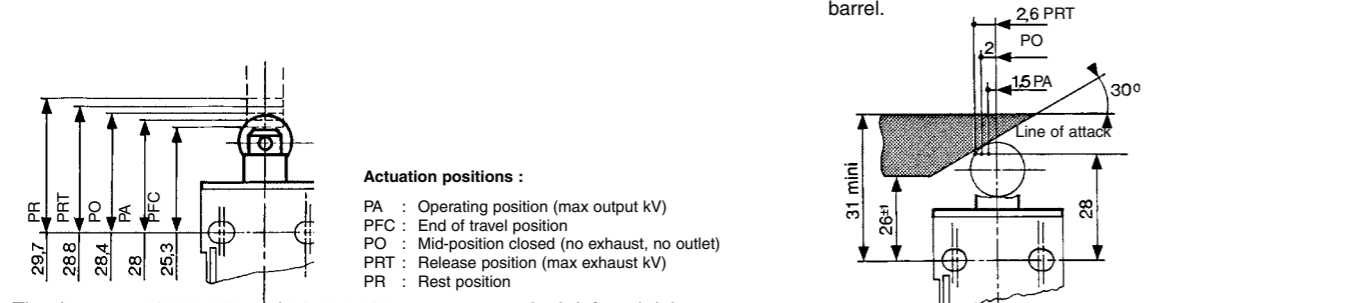
Connection	BSP	—	1/8	—	1/8
push-in for semi-rigid tubing (NFE 49100)	mm	Ø 4	—	Ø 4	—
Operating pressure	bar	0.1 → 8	0.1 → 8	0.1 → 8	0.1 → 8
Bore diameter	mm	3	3	3	3
Flow at 6 bars	Nm³/h	200	200	200	200
Activation force at 6 bars	daN	2.5	2.5	2.5	2.5
Circuit function: NC		•	•	•	•
Mechanical life	operations	> 10 <sup>7</sup>	> 10 <sup>7</sup>	> 10 <sup>7</sup>	> 10 <sup>7</sup>
Silenced or connectable (1/8) exhaust		•	•	•	•
Operating temperature	°C	-5 → +50	-5 → +50	-5 → +50	-5 → +50
Weight	g	150	193	175	175

**Accessories**

Accessories	Material	81 922 401	81 922 205	81 922 010	81 922 210
Lever with roller	plastic	79 452 103	•	•	•
Lever with adjustable roller	bearing	79 452 104	•	•	•
Adjustable steel rod lever	plastic	79 452 123	•	•	•
	bearing	79 452 124	•	•	•
		79 452 133	•	•	•



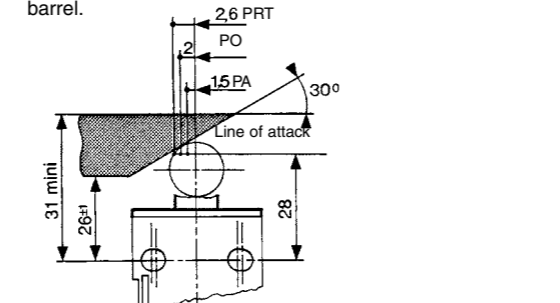
**Vertical attack**  
Detectors with roller plunger with unthreaded barrel.



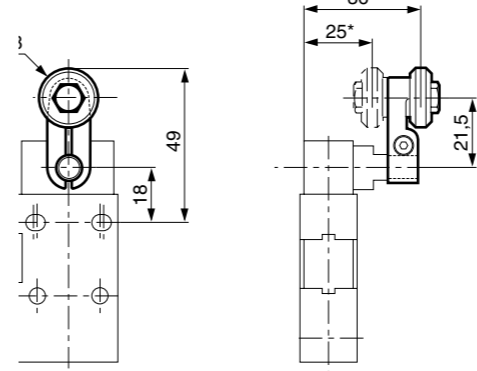
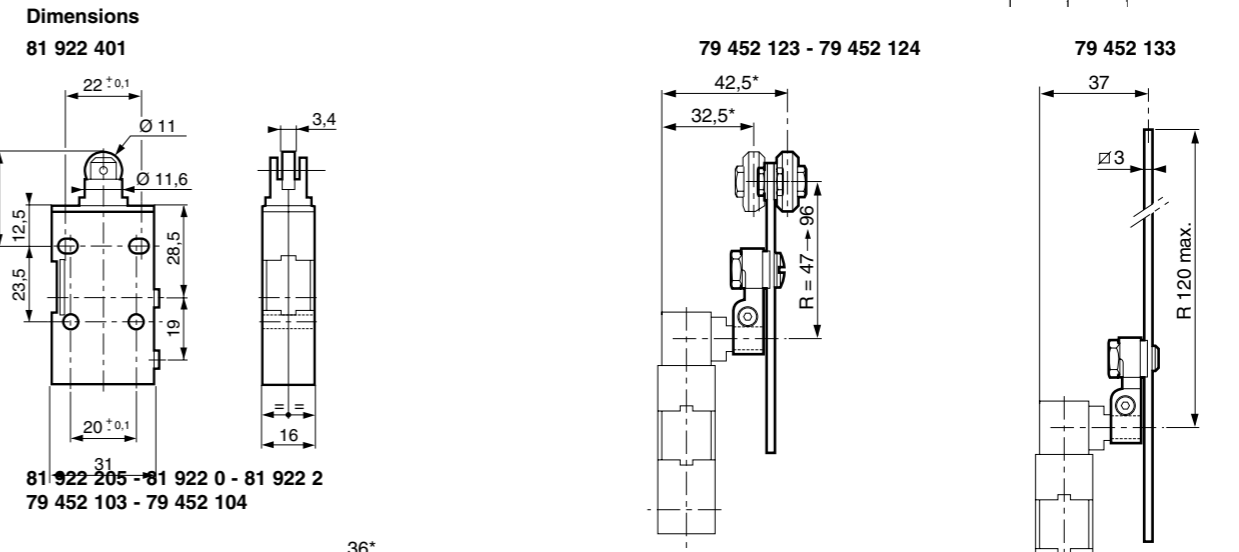
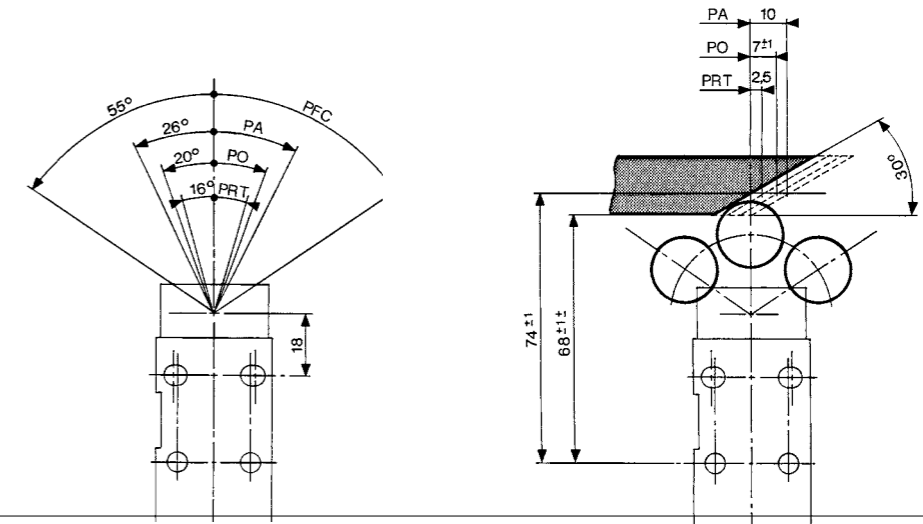
The detectors 81 922 010 and 81 922 210 can operate to both left and right.

**Material: body zamak**  
**Other configuration on demand**

**Horizontal attack**  
Detectors with roller plunger with unthreaded barrel.



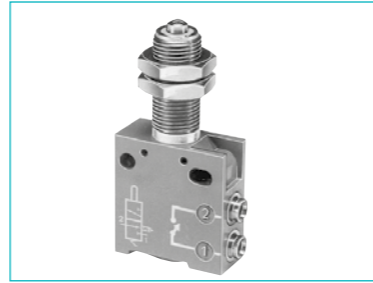
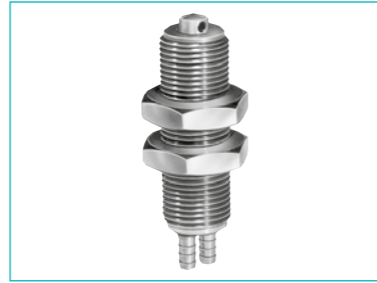
**Rotary actuator**  
Detectors with levers  
81 922 - 81 922 0 - 81 922 2





## "Adjustable stop" series position detectors

- > 100 % pneumatic
- > All metal

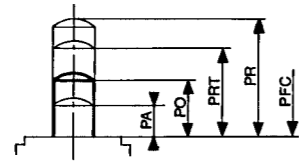
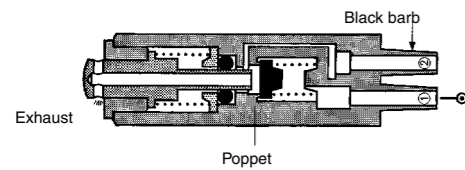


Part numbers	81 923 001	81 921 505
Push-in connection for semi-rigid tubing (NFE 49100)	Barb for tube 2.7 x 4	Push-in connector for tube Ø 4
<b>Symbol</b>		

### Characteristics

	81 923 001	81 921 505
Operating pressure	bar 0,1 → 8	0,1 → 8
Orifice diameter	mm 2	2,7
Flow at 6 bars	NI/min 130	200
Actuation force at 6 bars	N 16	21
Circuit function: NC		
Max. load: without shock	daN 1000	1000
Will stop a 63 mm Ø cylinder : 6 bar supply		
Operating temperature	°C -5 → +50	-5 → +50
Mechanical life	operations ≥10 <sup>7</sup>	≥10 <sup>7</sup>
Weight	g 27	90
Actuation positions		
PA : Operating position (max output kV)	mm 0,4	0,7
PFC : End of travel position	mm 0	0
PO : Mid-point closed (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

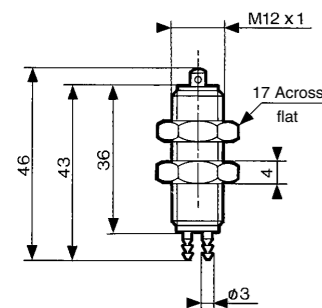
Values in mm

### 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

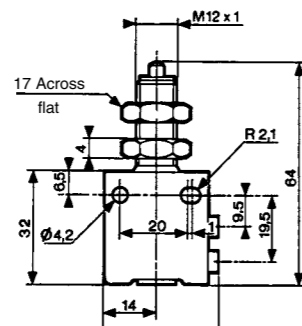
### Dimensions

81 923 001



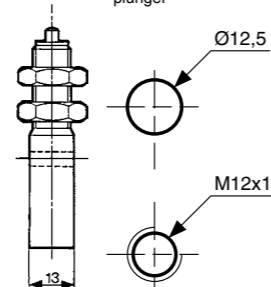
Material: body zamak

81 921 505



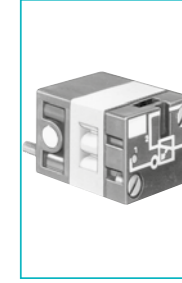
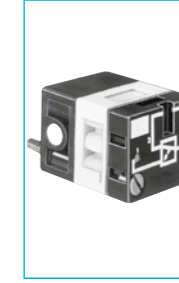
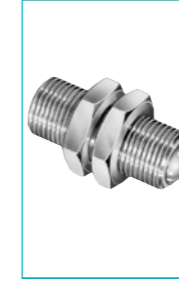
### Fixing

This should be as close as possible to the plunger



## Position detectors use with relay

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

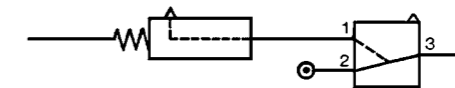


References	81 512 201	81 512 401	81 502 435	81 505 435
Version	with ball	with wire	Positive	Negative
<b>Symbol</b>				

### Characteristics

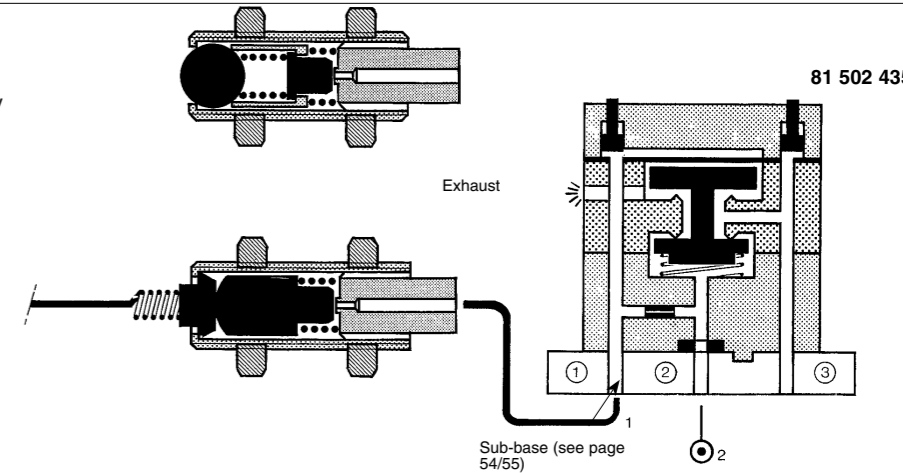
	81 512 201	81 512 401	81 502 435	81 505 435
Push-in connection for semi-rigid tubing (NFE 49100)	mm Ø 4	Ø 4		
Life at 6 bars	operations 10 <sup>7</sup>	10 <sup>7</sup>		
Actuation force at 6 bars	N 0,8	0,025		
Fluid used: that delivered by the leak sensor relay..				
Operating temperature	°C -5 → +50	-5 → +50	-5 → +50	-5 → +50
Weight	g 24,5	23,5	35	35
Operating pressure	bar		2 → 8	2 → 8
Sensor consumption for relay supply at 6 bar	NI/		5	5
The distance between relay and sensor must be less than 15 m for a tube Ø 2.7 x 4 mm				
Connection - sub-base see pages 54/55				
Mechanical life	operations		≥10 <sup>7</sup>	≥10 <sup>7</sup>

### Connection



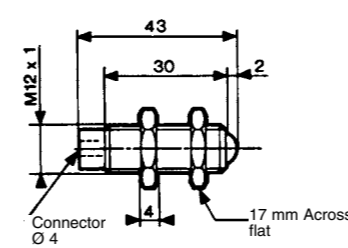
### Principle of operation

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

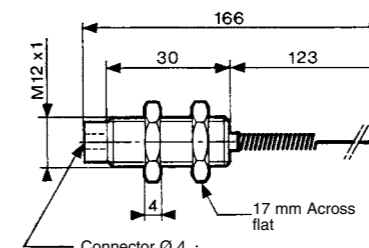


### Dimensions

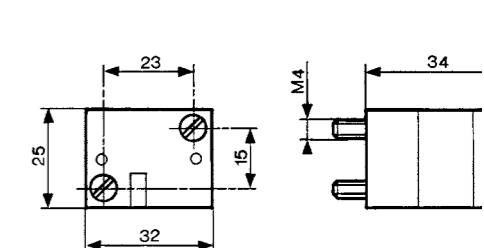
81 512 201



81 512 401



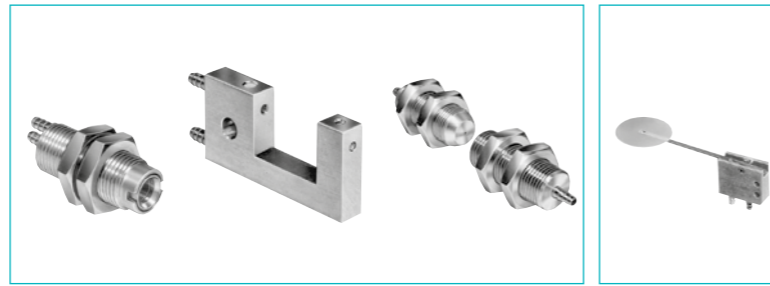
81 502 435 - 81 505 435



Material: brass

## Position detectors

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

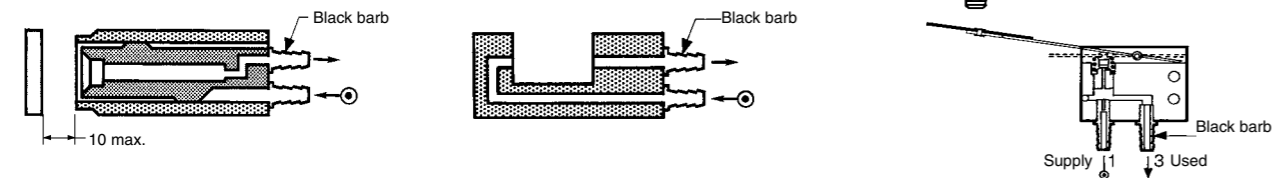


Part numbers	81 371 401	81 372 201	81 372 401	81 372 901
Detector	de proximité	gap	gap	with palette
Symbol				

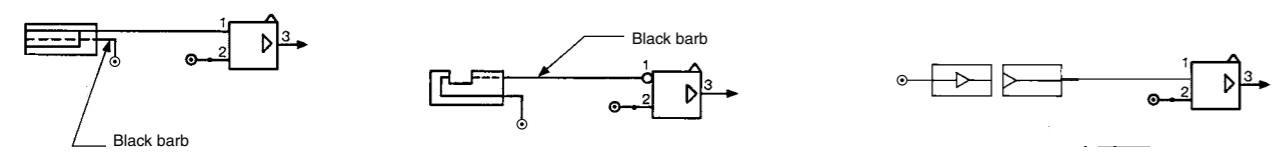
### Characteristics

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

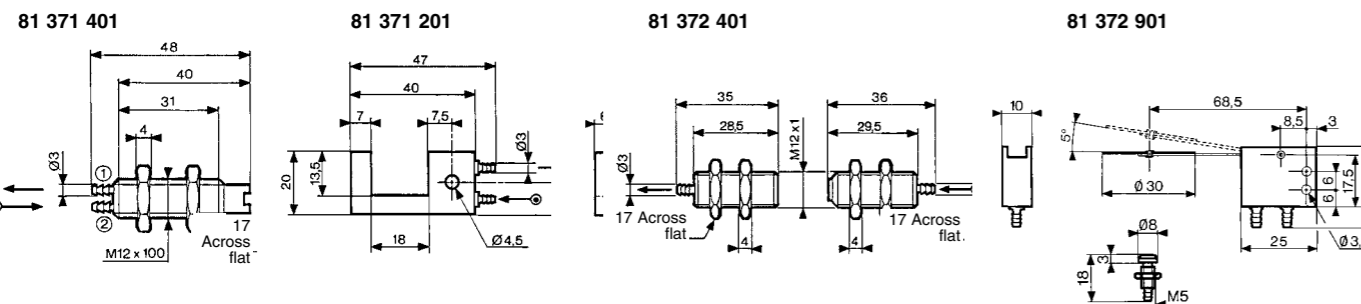
### Principle of operation



### Connection

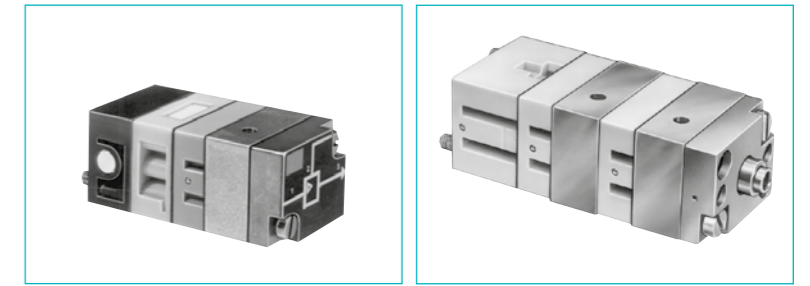


### Encombremments



## Amplifiers for mounting on installation plan

### > Gap sensor



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

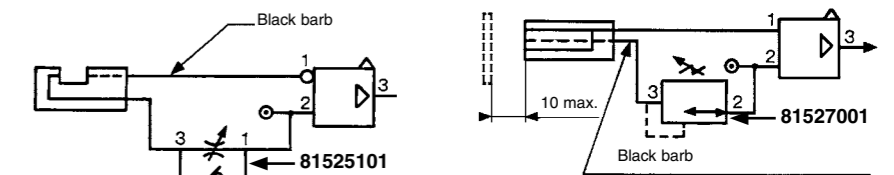
Part numbers	81 502 230	81 505 230	81 502 320	81 505 320
Simple amplifiers (for 81 372 201/401)	—	—	—	—
Sensitive amplifiers (for 81 371 401)	—	—	—	—
Version	positive	negative	positive	negative
Symbol				

### Characteristics

	mb	10 → 20	10 → 20	1 → 4	1 → 4
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	NI/min	5	5	5	5
Permissible overload for 1 hour	mb	800	800	800	800
Operating temperature	°C	-5 → +50	-5 → +50	-5 → +50	-5 → +50
Mechanical life	operations	3 x 10 <sup>6</sup>	3 x 10 <sup>6</sup>	3 x 10 <sup>6</sup>	3 x 10 <sup>6</sup>
Weight	g	150	150	185	185

### Connections

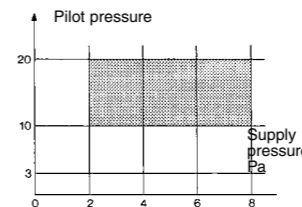
Used for gaps up to 25 mm.  
The supply to the sensor should be made via a pressure regulator or one-way flow restrictor (see page 52)  
Connection - sub-base



### Principle of operation

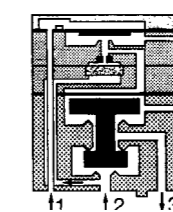
#### Simple amplifiers

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



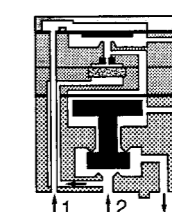
#### 81 502 230

#### Positive output



#### 81 505 230

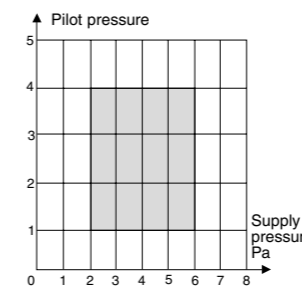
#### Negative output



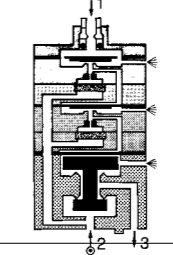
1- pilot  
2- supply  
3- output

#### Sensitive amplifiers

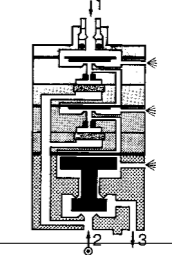
An output at normal industrial pressure is delivered on a very low pressure input.



#### 81 502 320



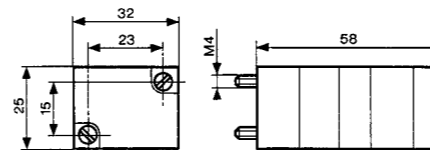
#### 81 505 320



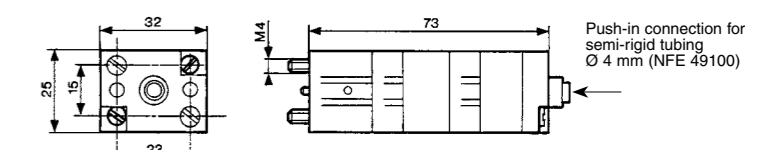
Note: The specifications are given for a supply pressure of 6 bars, and for detection at the mid-point of the gap.

### 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 catalogues: **Pneumatic products for explosive atmospheres** or on our website [www.crouzet.com](http://www.crouzet.com)

## Amplifier with intégral régulateur, positive output

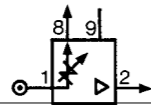
- › Setting Flow
- › Fixing rail 35mm wide



### Part numbers

Amplifiers with integral regulator	<b>81 510 001</b>
Version	Positive output

### Symbol



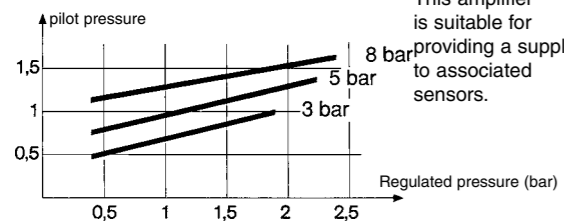
### Characteristics

Pressure to make	mb	0.5 → 1.5	—	—
Reduced pressure supplied at port 8	bar	0.5 → 2.5	—	—
Flow through port 8	Nm³/h	0.1 → 2.5	—	—
Consumption of amplifier only	NI/h	100 → 200	—	—
Permissible overload for 1 hour	mb	300	—	—
Operating temperature	°C	-5 → +50	-5 → +50	-5 → +50
Mechanical life	operations	3 x 10 <sup>6</sup>	3 x 10 <sup>6</sup>	3 x 10 <sup>6</sup>
Weight	g	380	—	—
Detectors (see page 28)			Gap	Proximity
Nominal range	mm	81 371 401	Ø 12	Ø 12
Min. total consumption for detection (0.5 b regulated pressure)		8	Ø 18	Ø 18
Max. total consumption for short response time (2.5 b regulated pressure)	NI/h	880	140	—
Min. detectable dimensions	nominal sensing distance 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

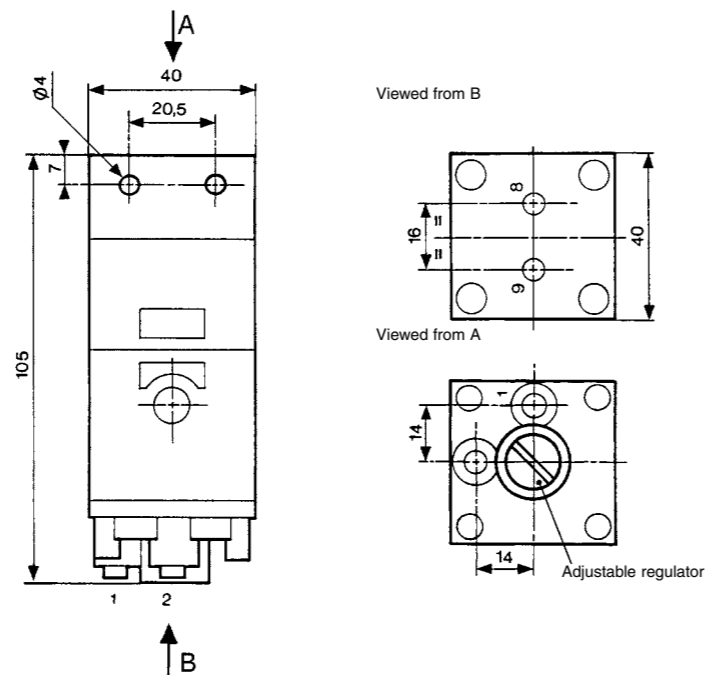
To use with detectors page 32

### Principle of operation



### Dimensions

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



# PRESSURE SWITCHES VACUUM



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