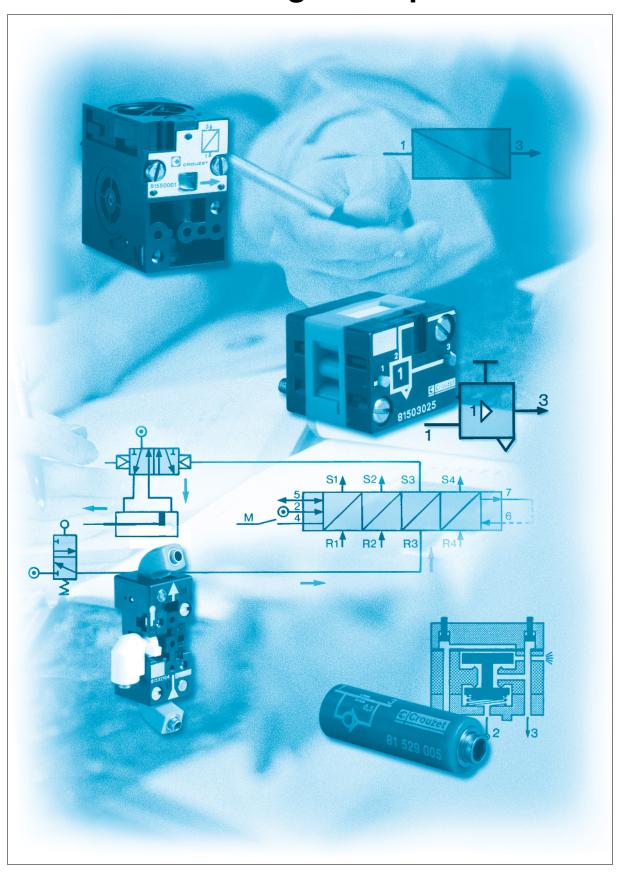
# **Pneumatic logic components**



#### 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.

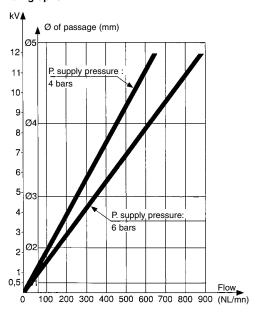
#### Mounting recommendations

- 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<sup>7</sup> operations.

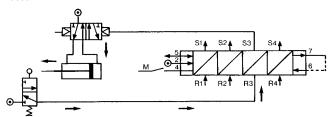
#### flow graphs



#### Sequencer modules

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

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

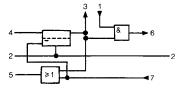


Operation results from the combination of three functions (memory, AND and OR) which constitute each module.

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

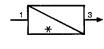
#### Brake

42

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

#### Module with auto reset





#### Brake

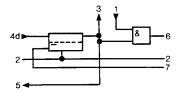
This returns the memory spool to the reset condition only when the supply is lost

#### 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.

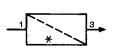
Used for example on a transfer machine to shift the information "bad component" collected at a test-test "n" steps further along the machine to a reject station.

#### **Function diagram**



#### Auto reset sequencer module





# Sequencer modules

■ 100 % pneumatic

sequencer

shift register

■ Ideal for a simple pneumatic sequence



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





with 'maintain'

Reset to zero

81 550 401 with 'maintain'

Reset to zero

# Symbol

Versions









# Characteristics

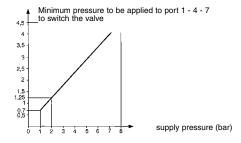
Characteristics	
Operating pressure	bar
Orifice diameter	mm
Flow at 6 bars	NI/min
Operating temperature	°C
Mechanical life 5 x 106 at 6 bars	
Connection - Sub-base page 26	
Weight	g

2 → 8 2.7 150 -5 **→** +50 70

2 → 8 2.7 150 -5 <del>→</del> +50 70

2 → 8 2.7 150 -5 <del>→</del> +50 70

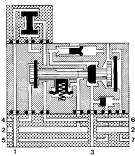
2 → 8 2.7 150 -5 **→** +50 70



#### Principle of operation

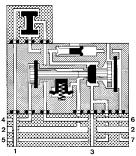
(supplied without logic element. For choice of units see pages 46/47)

#### Sequencer module with maintained reset



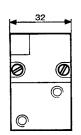
- 1 Input signal
- 2 Supply
- 3 Output signal
- 4 Start signal
- 5 In cycle signal
- 6 End of cycle signal 7 Reset to zero signal

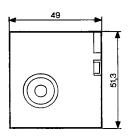
#### Shif register with maintained reset



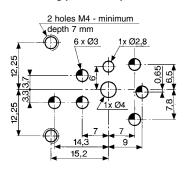
- 1 Input signal
- 2 Supply
- 3 Output signal
- 4 Start signal
- 5 In cycle signal
- 6 End of cycle signal 7 Reset to zero signal

#### **Dimensions**





#### Mounting plan for sequencer



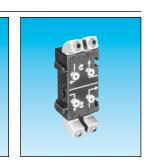




Also available in ATEX version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive







Diversion base

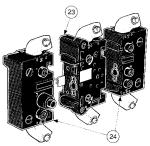
#### Front connecting (DIN-omega) Versions Rear connecting (with clips)

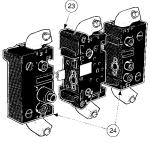
Cha	aracte	eristics
0	L	D-4-4-1-

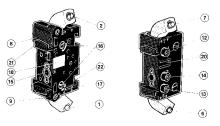
Sub-bases Rotatable connectors		•	•	•
(fitted) Pressure indicators		•	•	•
Operating temperature	°C	-5 → +50	-5 → +50	-5 → +50
Weight	g	55	135	60

#### Sequencer connections

#### Front connecting

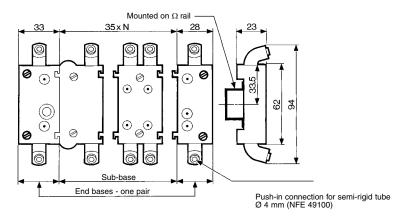






- 1 Input port (green port 1) Ø 4
- 2 Output port (red port 1) Ø 4
- 3 Input port, cycle start (green port 1) Ø 4
- 4 Output port, in-cycle signal (red port 1) Ø 4
- 5 Output port, cycle end (red port 6) Ø 4
- 6 Output port, cycle end (red port 6) Ø 4
- 7 Input port, reset to zero (green port 7) Ø 4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







81 551 001

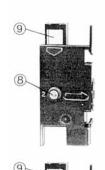
Sub-base (with clips)

81 552 001

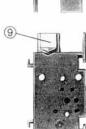
End bases - one pair

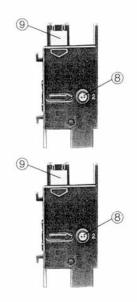
	<del></del>
<del>-</del>	•
-5 → +50	-5 → +50
40	120

#### Rear connecting





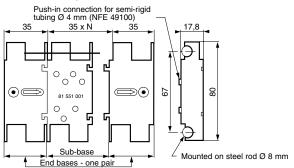




- 1 Input port (marked port 1)
- 2 Supply port (Port 2)
- 3 Output port (Port 3)
- 4 Cycle start signal port (Port 4)
- 5 In-cycle signal port (Port 5)
- 6 End of cycle signal port (Port 6)
- 7 Reset to zero signal port (Port 7)
- 8 Indicator at supply port
- 9 Marking area

#### Rear connecting

(8)





# **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

	OR	
Functions	AND	
	YES	
	NO	

Version



On Sub-base

Blue

2 → 8 2.7

-5 → +50

>107

25

170

page 4/14-4/15







81 540 005	
_	81 522
_	
_	
Plug-in	On Su
Ø 6	page

Ø 6 mm

-5 **→** +50

>107

Blue

200

2 → 8 4

81 522 501	
On Sub-base	
nage 4/14-4/	15

#### Symbol



Ø 4 mm

Blue

2 → 8 2.7

-5 **→** +50

170

>107

12

Plug-in

Ø4



Green

2 → 8 2.7

-5 **→** +50

>107

25

170

Characteristics	
Push-in connection for semi-rigid	Male/Female/Female
tubing (NFE 49100)	Female/Female/Female
Colour	
Operating pressure	bar
Orifice diameter	mm
Flow at 6 bars	NI/min
Pressure indicator	
Switching time	ms
Operating temperature	°C

Operating pressure	bar
Orifice diameter	mm
Flow at 6 bars	NI/min
Pressure indicator	
Switching time	ms
Operating temperature	°C
Mechanical life	operations
Weight	g
Dilot/pressure curves	<del>-</del>

Pilot/pressure curves

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

#### Principle of operation



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

S = a OR b

S = a + b



#### **Cellule AND**

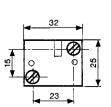
The output signal "S" is present only when signals "a" AND "b" are present simultaneously:

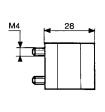
S = a AND b

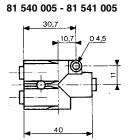
 $S = a \cdot b$ 

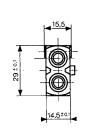
#### Dimensions

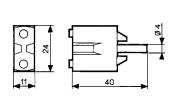
81 521 501 - 81 522 501











81 540 001 - 81 541 001

#### Other information

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















81 541	001
	_
	_
Plug-in	

Ø4



On sub-base page 36-37

81 503 025

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

81 504 025

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

81 506 025

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



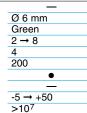




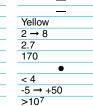




Ø 4 mm
_
Green
2 → 8
2.7
150
_
_
-5 → +50
>107
13



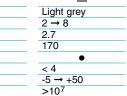
25

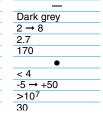


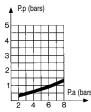
30

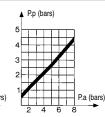
	2 → 8
	2.7
	170
•	•
	< 4
0	-5 <b>→</b> +50
	>10 <sup>7</sup>
	30

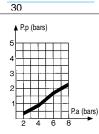
Orange

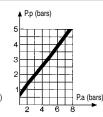














#### YES element

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

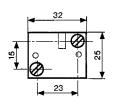
 $S = \overline{a}$ 

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

S = NOT a AND b

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

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







# **Memory element**

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



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

Version

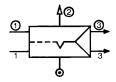


81 523 201

With pressure indicator

With pressure indicator and manual override

#### **Symbol**



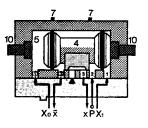
#### Characteristics

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

#### Principle of operation

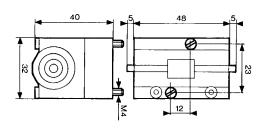
The function is that of a 4/2 valves. The appearence of signal "X1" causes the displacement of the slide valve. The output port "x" is then put under pressure. This state is remembered until the arrival of signal "X0". This signal reverses the slide valve, the output "x" is put under pressure. This state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

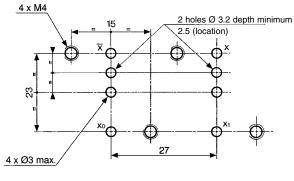


#### **Dimensions**

81 523 201 - 81 523 601



#### Dimensions of logic and memory elements



Viewed from above

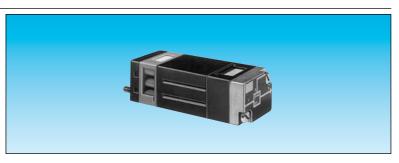


# **Timers fixed timing**

#### ■ Fixed 0.4 s



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



81 503 540 Positive output

# Version **Symbol**

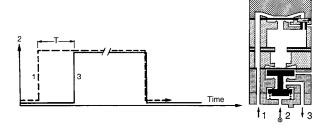


# Characteristics

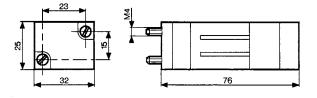
Timing	S
Operating pressure	bar
Flow at 6 bars	NI/min
Orifice diameter	mm
Accuracy	%
Min. reset time	S
Connection - On sub-base page 36-37	
Operating temperature	°C
Mechanical life	operations
Weight	g
	_

0.4 2 → 8 170 2.7 ± 5 <0.1 -5 **→** +50 >10<sup>7</sup> 106

#### Principle of operation with positive output



#### Dimensions 81 503 540





# Timers (with adjustable timing)

#### ■ 60 s adjustable (60 s max.)



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







Function Positive			81 503 710	81 506 710	81 503 720	81 506 720	81 503 725	81 506 725	
ruiction negative — — — — — —	Eupotion	positive	•		•		•	_	
- Togatio	Function	negative	_	•		•	_	•	

# **Symbol**









0.1 → 30

2 → 8 170

2.7

<0.1



0.1 → 60

170

2.7

± 5

<0.1



0.1 → 60 2 → 8 170

2.7 ± 5 <0.1

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

Commodium On our bacc	pago 1/11 1/10	•	•	•	•	•	•
Operating temperature	°C	-5 <b>→</b> +50	-5 <del>→</del> +50	-5 <b>→</b> +50	-5 <del>→</del> +50	-5 <b>→</b> +50	-5 <b>→</b> +50
Mechanical life	operations	>10 <sup>7</sup>	>10 <sup>7</sup>	>10 <sup>7</sup>	>10 <sup>7</sup>	>10 <sup>7</sup>	>10 <sup>7</sup>
Weight	g	90	90	100	100	120	120
Accessories							
Panel mounting adaptator		79 451 698	79 451 698	79 451 903	79 451 903	_	_
Weight	g	53	53	53	53		

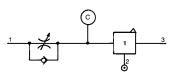
#### Principle

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

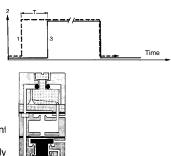
#### Principle of operation

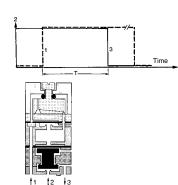
with negative output

#### Timing by charging of reservoir

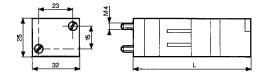


The reservoir fills via the flow restrictor until the switching point of the timer output is reached (positive or negative). The non-return valve allows the reservoir to be emptied rapidly for the next timing.





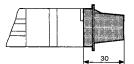
## **Dimensions**

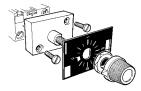


	L (mm)
81 503 710 - 81 506 710	78
81 503 720 - 81 506 720	92
81 503 725 - 81 506 725	125

#### Adaptator 79 451 . . .







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



## **Timers**

#### ■ Fixed and adjustable



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







Single impulse generator

Adjustable frequency generator

Fixed

Adjustable

81 507 540

81 506 940

#### **Symbol**



0.4

2 → 8

170





Characteristics	
Timing	S
Frequency	Hz
Operating pressure	bar
Flow at 6 bars	NI/min
Orifice diameter	mm
Accuracy	%
Min reset time	c

Min. reset time Connection - On sub-base page 4/14-4/15 Operating temperature Mechanical life °C operations Weight g Accessories

2.7 ± 5 <0.1 -5 **→** +50 >10<sup>7</sup> 106

2.7 ± 5 <0.1 -5 **→** +50

**79 451 904** 53

0.1 → 30

2 **→** 8

170

>10<sup>7</sup> 180

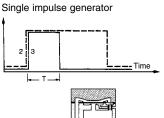
0.02 → 8 2 → 8 170 2.7 ± 5 <0.1

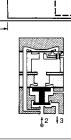
-5 **→** +50 >10<sup>7</sup> 85

79 451 905 53

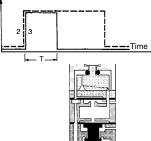
# Panel mounting adaptators

Weight (g) Principle of operation

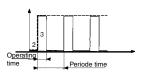


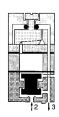


# Adjustable impulse generator

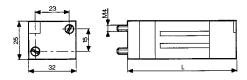


# Frequency generator



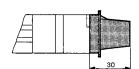


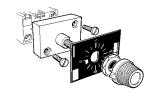
#### **Dimensions**



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



# **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 orific	e (mm)
	$0.18 \rightarrow 0.30$	0.3	white
	0.35 → 0.50	0.4	yellow
	$0.58 \rightarrow 0.77$	0.5	red
	0.80 → 1.06	0.6	green
	1.10 → 1.39	0.7	blue
	1.45 → 1.65	0.8	grey
	2.30 → 2.80	1	black
	$0.08 \rightarrow 0.12$	0.25	white

	0.08 → 0.12	0.25	whit
One-way adjustable flow restritor			
Capacity for timing	10 • 60 s		

81 529 003
81 529 004
81 529 005
81 529 006
81 529 007
81 529 008
81 529 010
81 529 025
_
_

_
_
_
_
_
_
_
 81 525 101

_	_
_	_
_	_
_	_
_	_
_	_
	_
_	_
81 526 001	_
_	79 458 808

**Symbol** 









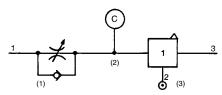
Characteris	tics					
Free flow		NI/min	Depending on orifice	30	200	_
Orifice diamete	er	mm	Depending on orifice	0 → 0.5	0 → 1.7	_
Operating pres	sure	bars	1 → 8	1 → 8	2 → 8	_
Timing		s	<del>_</del>	_		10 → 60
Capacity		cm <sup>3</sup>	<del>-</del>	_	_	30
Connection	Sub-base page 4/14-4/15		<del>-</del>	•	•	_
Connection	Push-in connection for semi- rigid tubing (NFE 49100)	mm	Ø 4	_	<del>_</del>	Ø 4
Operating tem	perature	°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

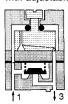


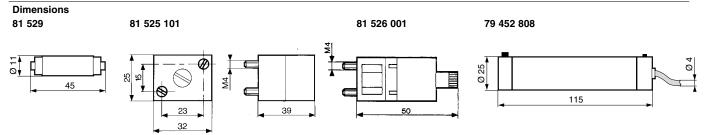
#### Principle of operation

One-way with fixed flow



One-way with adjustable flow







# **Regulator accessories**







€<sub>x</sub>>

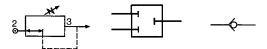
Also available in **ATEX** version for use in potentially explosive atmospheres in accordance with 94/9/EC Directive

#### Part numbers

Mini-détenteur 81 527 001 — —

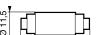
Plug element	 81 520 601	_
In-line non-return	 	81 529 901

#### Symbol

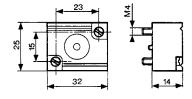


Characteris	tics				
Operating pres	sure	bars	2 → 8		2 → 8
Flow at 6 bars		NI/min	200	_	200
Adjustable outp	out pressure	bar	0,1 → 8		
Connection	Sub-base		•	•	
Johnsellon	Push-in connection for semi- rigid tubing (NFE 49100)	mm			Ø 4
Weight		g	150	70	70

#### Dimensions 81 529 901



81 520 601





# **Sub-bases for logic elements**



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





Two-hand start module
Manostats - vacuostats
Leak sensor and amplifier relays
Logic elements AND Timers
Regulator accessories
Memory element
Operating temperature °C
Electro-pneumatic miniature solenoid
ND: The number indicates the number of components may

81 532 104	ı
<u> </u>	
● 1	
<b>● 1</b>	
● 1	
<b>•</b> 1	
<del>_</del>	
-5 → +50	
• 1	

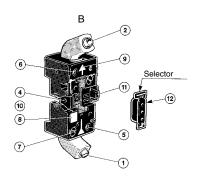
81 532 102	
<u> </u>	
<b>•</b> 1	
<b>●</b> 1	
<b>●</b> 1	
<b>●</b> 1	
<del>_</del>	
-5 → +50	
<b>●</b> 1	

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 DIN rail 35 mm DIN rail 35 mm Fixation 52 Weight

#### Connections elements and relays

# Front connecting (2) 1



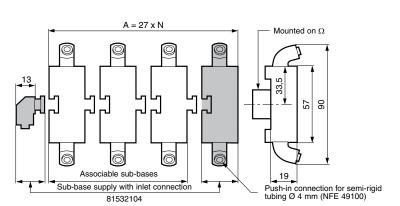
- A Single sub-base or end base

- 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



81 532 104

3 x 81532102











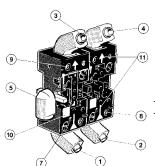
Two-hand start module
Manostats - vacuostats
Leak sensor and amplifier relays
Logic elements AND Timers
Regulator accessories
Memory element
Operating temperature °C
Electro-pneumatic miniature solenoid

81 542 002	81 532 001
<u> </u>	<u> </u>
_	<b>●</b> 1
	<b>●</b> 1
_	<b>●</b> 1
_	<b>●</b> 1
● 1	_
-5 → +50	-5 → +50
<del>-</del>	● 1

81 531 001
● 2
● 2
● 2
● 2
● 2
● 1
-5 → +50
• 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
			Z W4 SCIEWS	Ø 8 mm
Weight	g	95	10	35

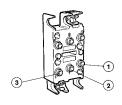
#### Memory element sub-base, front and rear connecting



- 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.

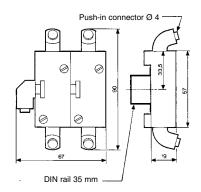
The logic element is connected via the sub-base. This sub-base has 3 instant connections for connecting semi-rigid tubes with outer  $\varnothing$  4.

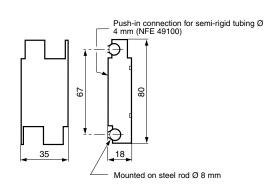
- 1 Input signal
- 2 Signal port for passive logic elements, air supply for active logic elements.
- 3 Output signal

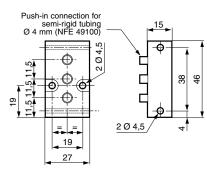
#### 81 542 002 (for memory 81523201/601)

#### 81 531 001

#### 81 532 001

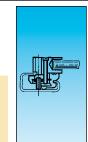




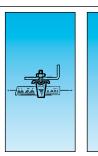




# **Mounting accessories**









atmospheres in accordance with 94/9/EC Directive

Also available in **ATEX** version for use in potentially explosive

81 533 501 Hole domino

-5 → +50

°С

81 533 001 Clip domino

-5 → +50

79 450 609 Bar clips Ø 8

-5 **→** +50

81 536 801

-5 → +50

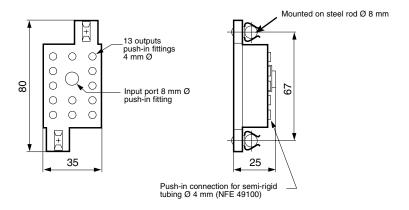
Characteristics				
Weight (g)	8	4	80	80
3 (3)	For mounting on	For adjustable	Packet of 100	
	the end of a	mounting on a	pieces	
	zinc-coated mild	zinc-coated mild	·	
	steel rod	steel rod		
	Ø 8 mm on an	Ø 8 mm on an		
	asymmetrical	asymmetrical		
	DIN rail	DIN rail		

Dimensions 81 536 804

Operating temperature

Mounting equipment

Supply manifold 13 outputs



#### Other information

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



# AMEYA360 Components Supply Platform

# **Authorized Distribution Brand:**

























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