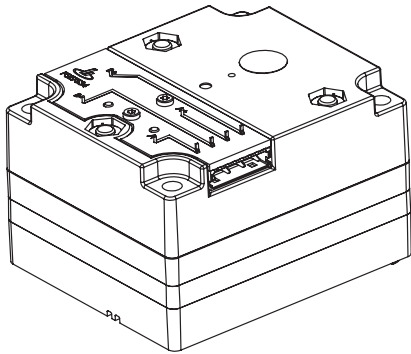


## SMART POSITIONER MODUL

Standardized Switching Piezo-Pneumatic system  
for Smart valve positioners

Technical Data



„OUR NEW SMART, PIEZO-PNEUMATIC POSITIONER MODULES CONSUME APPROXIMATELY 1 % OF THE AIR OF A TRADITIONAL ELECTROPNEUMATIC POSITIONER AND HAVE CLASS-LEADING LOW POWER CONSUMPTION, HELPING TO SAVE ON CONTROLLER POWER.“

MICHAEL MACK, GLOBAL PRODUCT MANAGER PIEZO TECHNOLOGY

## SMART POSITIONER MODUL

### Standardized Switching Piezo-Pneumatic system for Smart valve positioners

Ready-to-install pneumatic modules for simple use in pneumatic smart valve positioners. HOERBIGER Piezo technology allows most energy efficient and lowest air consumption to realize any electric and pneumatic fail safe functions. Over the past 20 years more than 1.5 Mio. piezo modules have been installed successfully.

#### Customer benefits:

- Cost reduction across the complete product life cycle: R&D, Purchasing, OC, After Sales
- Possibility for differentiation by implementing additional diagnostic- and smart functions
- Cost reduction potential at end-users through reduction of air- and energy consumption

#### Features:

- Available as single- and double acting pneumatic module using piezo technology
- Universal pneumatic interface
- Ready-to-install system for direct use in smart positioners
- All-in-one unit with typical fail safe functions: Hold, Close, Open, both electric and pneumatic
- Minimum energy consumption: 90 % reduction for the pneumatic actor by using piezo technology
- Minimum air consumption: 90 % reduction for the pneumatic actor by using piezo technology

## GENERAL CHARACTERISTICS

	SINGLE ACTING	DOUBLE ACTING
Mounting		Flange
Size	55 x 65 x 42 mm	55 x 81 x 42 mm
Weight (mass)	0.32 lb	0.375 lb
Installation	in any position	
Medium	Compressed air acc. ISO8573-1	
Filtration	Class 4 (filtered 15 µm)	
Lubrication	Class 4 permanently (25 mg/m <sup>3</sup> occurred for max. 24 h)	
Pressure dew point	Class 4 (10K under ambient temperature)	
Flow direction	filling: from p1 → out exhausting: from out → Exh	filling: from p1 → out1/out2 exhausting: from out1/out2 → Exh
Storage temperature	-13... +176 °F (-40°F option available)	
Ambient temperature	-13... +176 °F (-40°F option available)	
Medium temperature	-13... +176 °F (-40°F option available)	
Ambient humidity	95 %, without condensation	
Protection class	IP 00, DIN EN 60529/A1:2000	
Approval	suitable for intrinsically safe applications according IECEx	

## MATERIAL

Housing	Grivory PA 6.6
Control diaphragm	ECO
Sealings	VMQ, NBR
RoHS	conform

# CHARACTERISTICS AND INTERFACE

## Smart Positioner Modul

### PNEUMATIC CHARACTERISTICS

		SINGLE ACTING	DOUBLE ACTING
Nominal pressure	$p_1$	87 psig	
Working pressure inlet	$p_{1\min}$	22 psig	
	$p_{1\max}$	116 psig	
Output pressure range	$P_2$	3 psig ... $p_1$	
Ambient pressure	$p_{\text{amb}}$	1.45 psig rel.	
Nominal flow rate $p_1 \rightarrow \text{out}$	QN	$\geq 4.6$ SCFM (@ 77°F) 87 $\rightarrow$ 72.5 psig	
Nominal flow rate out $\rightarrow$ Exh	QN	$\geq 4.6$ SCFM (@ 77°F) 87 $\rightarrow$ 72.5 psig	$\geq 8.5$ SCFM (@ 77°F) 87 $\rightarrow$ 72.5 psig
Own air consumption	QLS	$\leq 0.01$ SCFM (@ 77°F)	
Chamber leakage	QLC	$\leq 0.0018$ SCFM (@ 77°F) 87 $\rightarrow$ 0 psig	

### ELECTRIC CHARACTERISTICS

	U	Minimum	Maximum
Switching voltage	U		
On	$U_{\text{on}}$	+24 V DC	+27 V DC*
Off	$U_{\text{off}}$	-24 V DC	-27 V DC*
Holding (steady state)	$U_{\text{hold}}$	+21 V DC	+21,5 V DC
Capacity	C	$\leq 2 \times 100$ nF ( $\leq 100$ nF for each piezopilot)	

\*see control recommendation page 10

### ELECTRIC INTERFACE

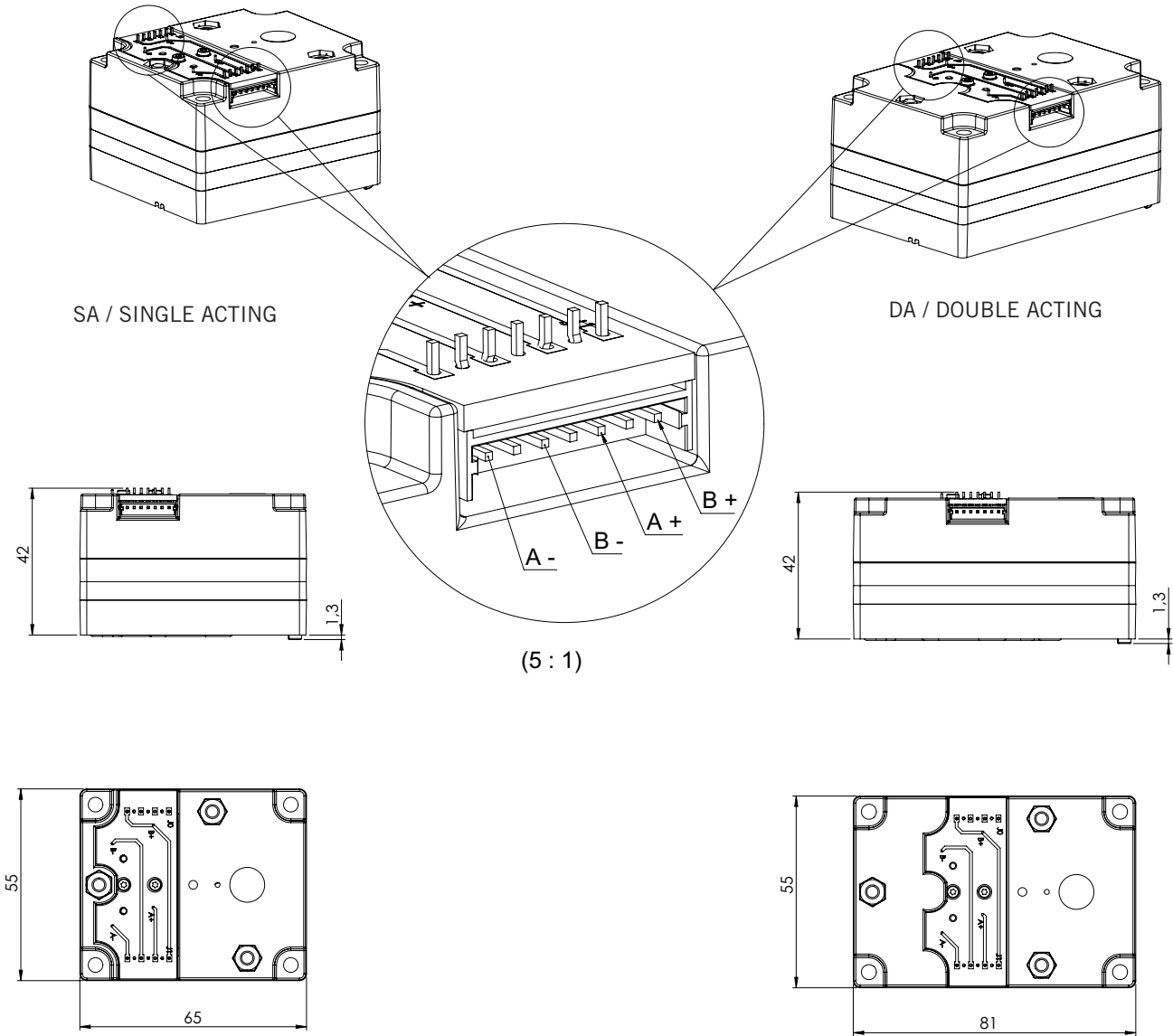
	SINGLE ACTING	DOUBLE ACTING
Type of connector	Molex Micro Blade 532540770	
Pinout	Pin1: A-	Pin1: A-
A: Piezo element A	Pin2: n.c.	Pin2: n.c.
B: Piezo element B	Pin3: B-	Pin3: B-
NC: not connected	Pin4: n.c.	Pin4: n.c.
	Pin5: A+	Pin5: A+
	Pin6: n.c.	Pin6: n.c.
	Pin7: B+	Pin7: B+

### DYNAMICAL CHARACTERISTICS

		SINGLE ACTING	DOUBLE ACTING
Switching time filling	$t_{1/10\%}$	< 25 ms (@ 77°F and $p_1 = 87$ psig)	< 35 ms (@25°C and $p_1 = 6$ bar)
	$t_{2/90\%}$	< 60 ms (@ 77°F and $p_1 = 87$ psig)	< 80 ms (@25°C and $p_1 = 6$ bar)
Switching time exhausting	$t_{3/90\%}$	< 25 ms (@ 77°F and $p_1 = 87$ psig)	< 35 ms (@25°C and out1/2=6bar)
	$t_{4/10\%}$	< 70 ms (@ 77°F and $p_1 = 87$ psig)	< 90 ms (@25°C and out1/2=6bar)
Definition	Switching time measurement is a system step reponse with nominal pressure supply and a chamber-volume of app. 0.8 cubic inch		

# DIMENSIONAL DRAWING

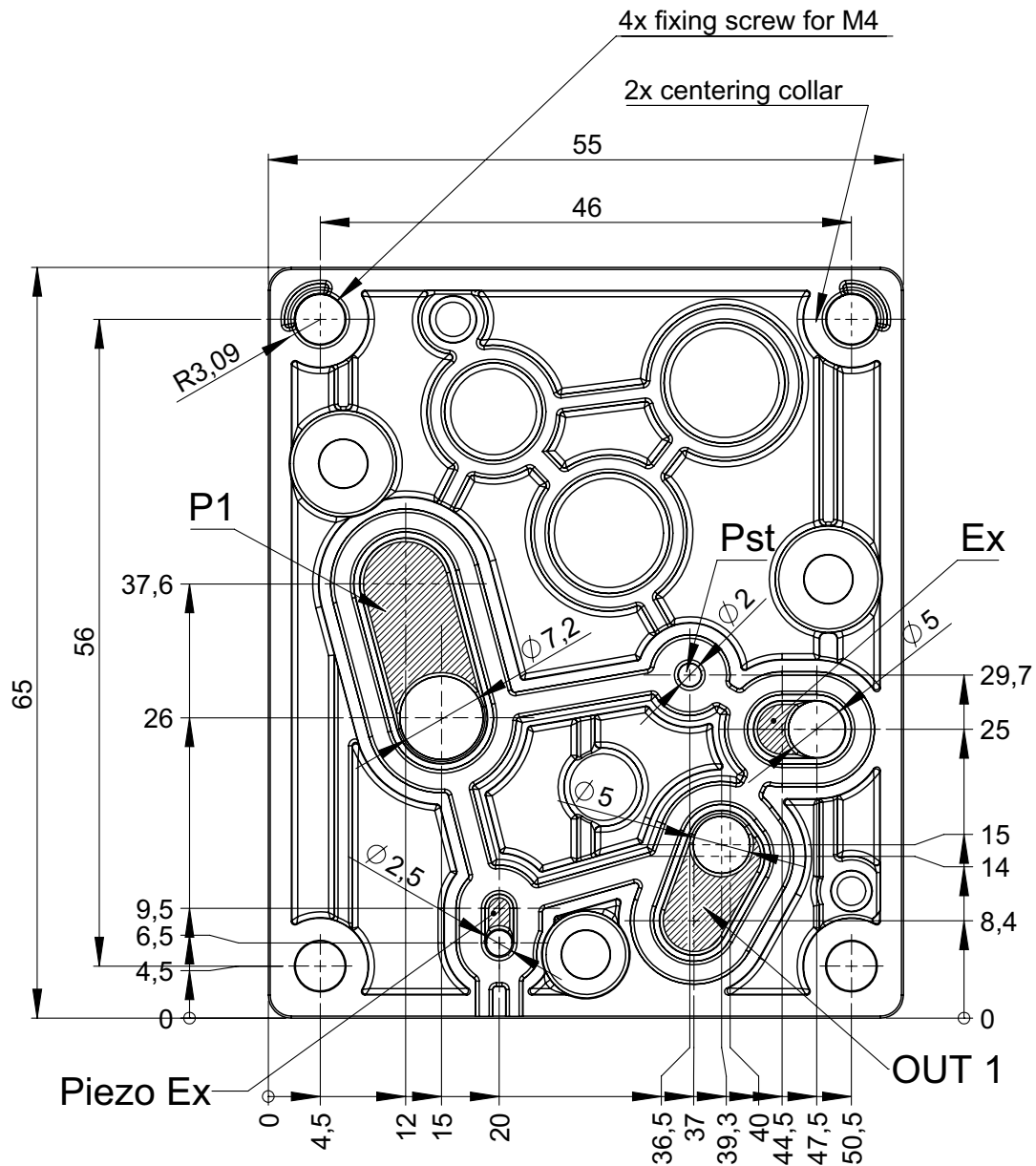
## Smart Positioner Modul



all dimensions in mm  
convert to inch:  
dimension divided by 25.4

# PNEUMATIC PORTS

## Smart Positioner Modul

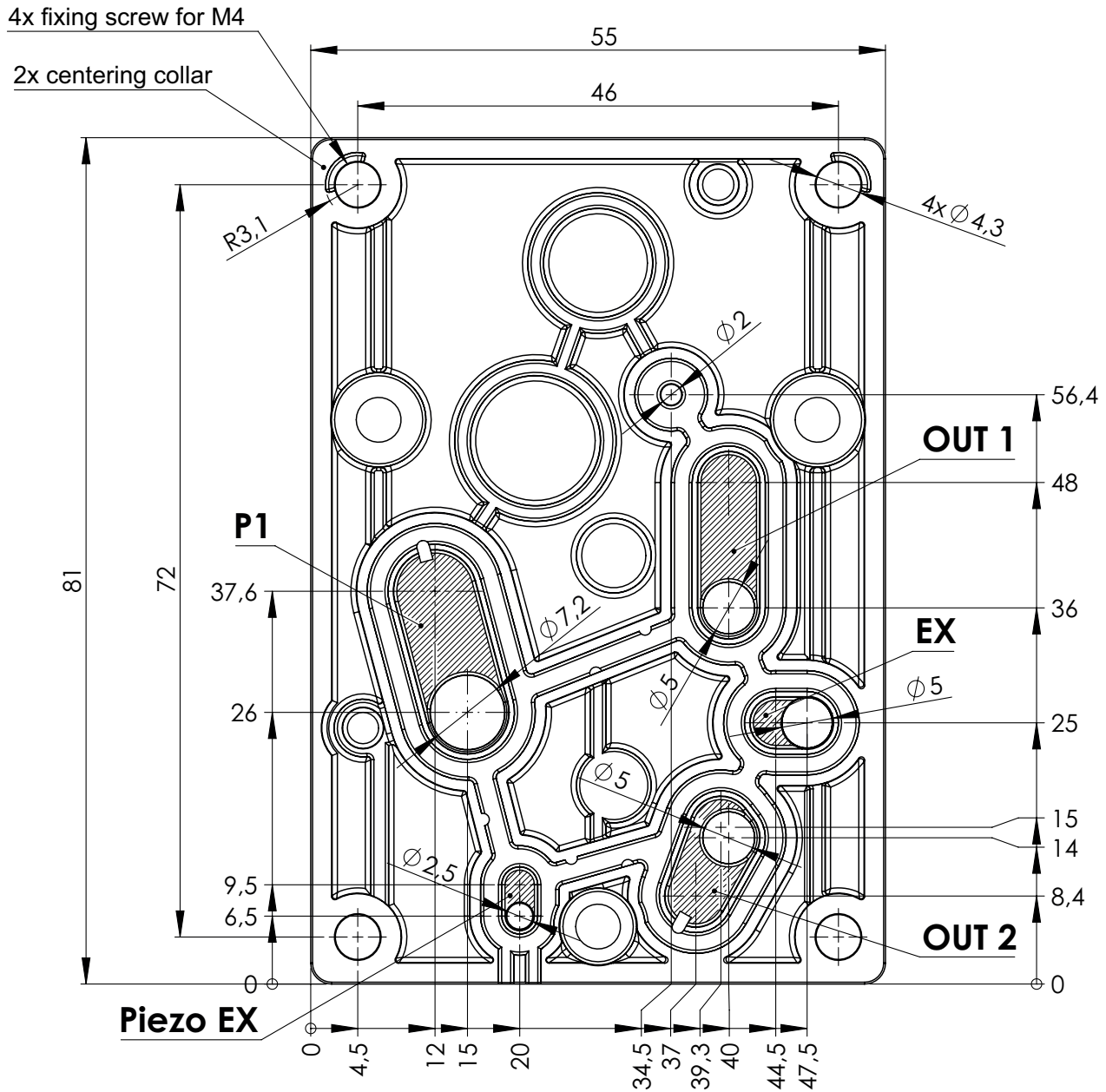


all dimensions in mm  
 convert to inch:  
 dimension divided by 25.4

### PNEUMATIC PORTS SINGLE ACTING

Piezo Ex	collected air from piezo valve
P1	inlet pressure
OUT 1	outlet chamber
EX	exhaust
Pst*	pilot pressure

\*Only for internal use. Need to be closed in operation!



all dimensions in mm  
 convert to inch:  
 dimension divided by 25.4

### PNEUMATIC PORTS DOUBLE ACTING

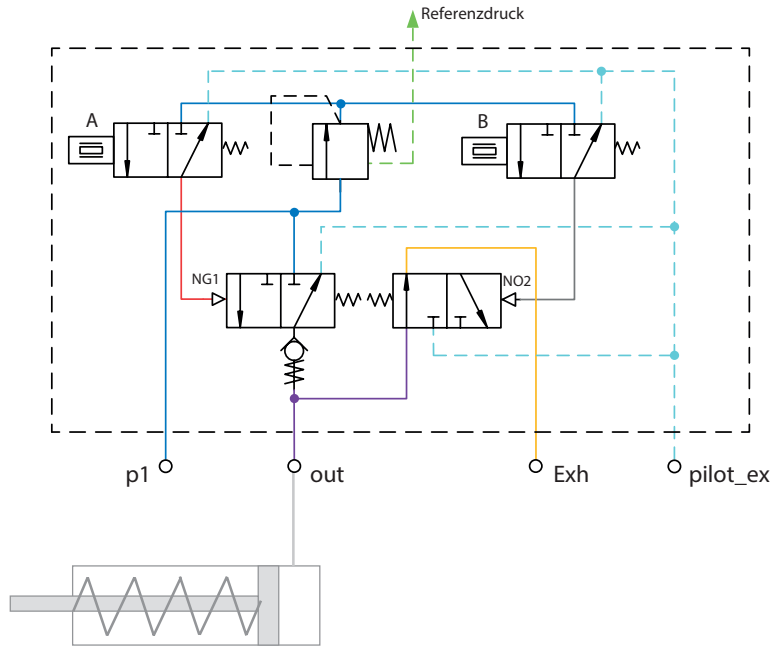
Piezo Ex	collected air from piezo valve
P1	inlet pressure
OUT 1	outlet chamber
OUT 2	outlet chamber
EX	exhaust
Pst*	pilot pressure

\*Only for internal use. Need to be closed in operation!

# PNEUMATIC DIAGRAMS

## Smart Positioner Modul

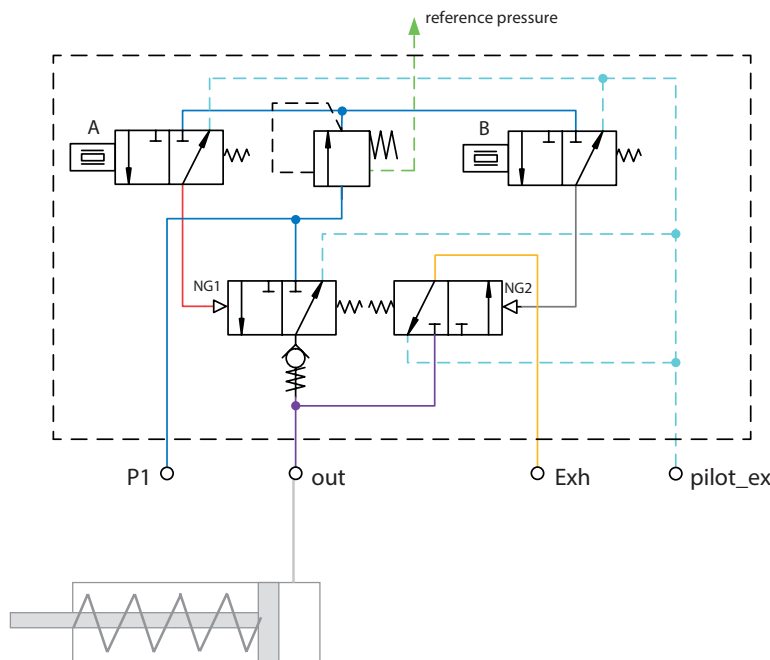
### SINGLE ACTING POLYMER / FAIL SAFE EXHAUST



Fail Safe	Funktion	A	B
X	→	0	0
	←	1	1
	Stop	0	1
	nicht erlaubt	1	0

Type P13-3-FS-E  
part number PS601010-555-000

### SINGLE ACTING POLYMER / FAIL SAFE HOLD

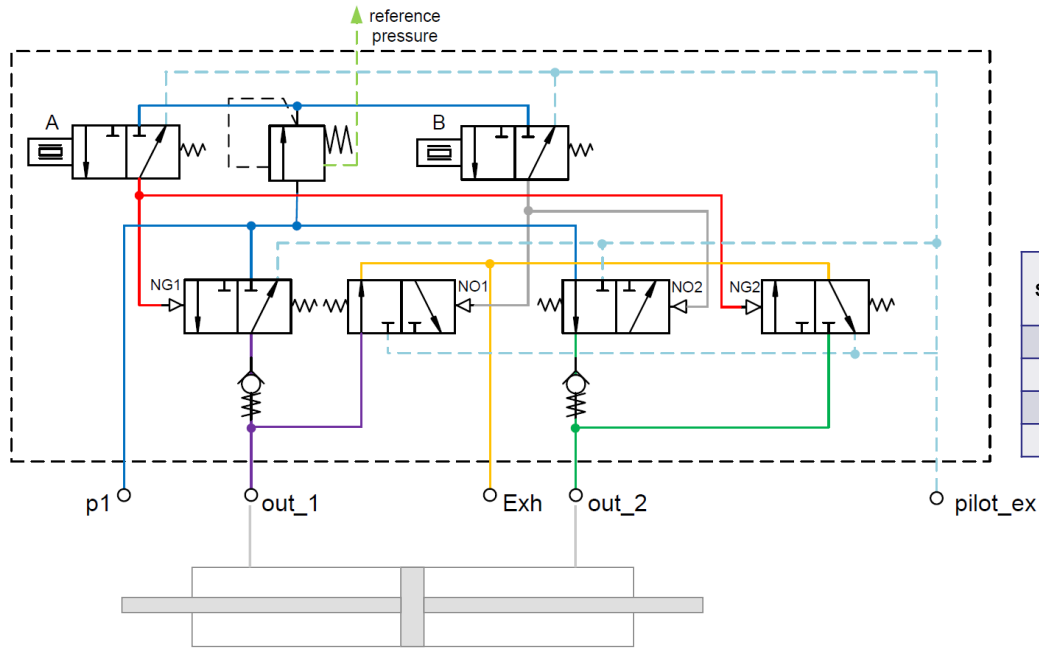


Fail Safe	function	A	B
	→	0	1
	←	1	0
X	Stop	0	0
	not allowed	1	1

Type P13-3-FS-H  
part number PS601012-555-000

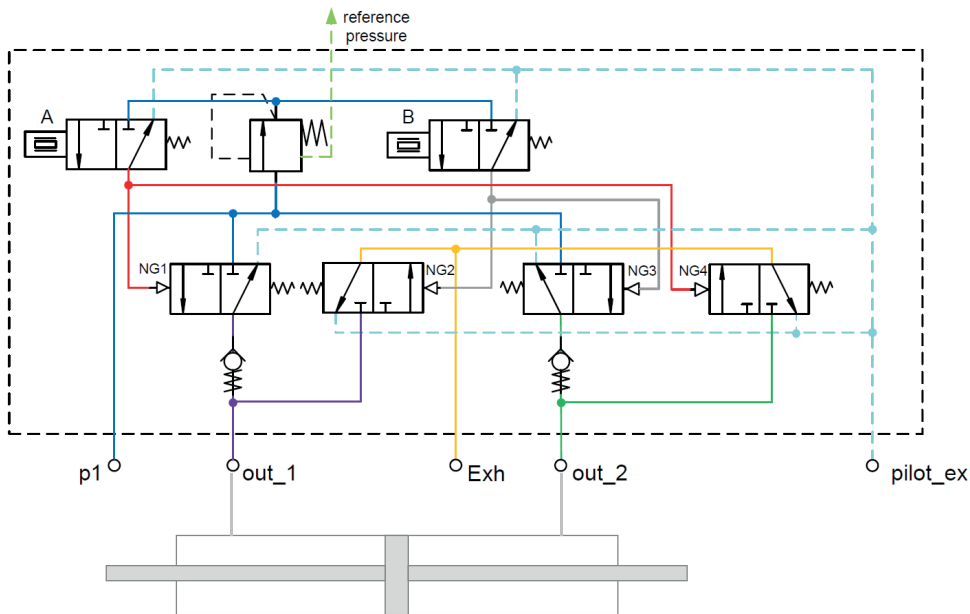


**DOUBLE ACTING POLYMER / FAIL SAFE EXHAUST**



P13-4-FS-E  
PS601014-555-000

**DOUBLE ACTING POLYMER / FAIL SAFE HOLD**

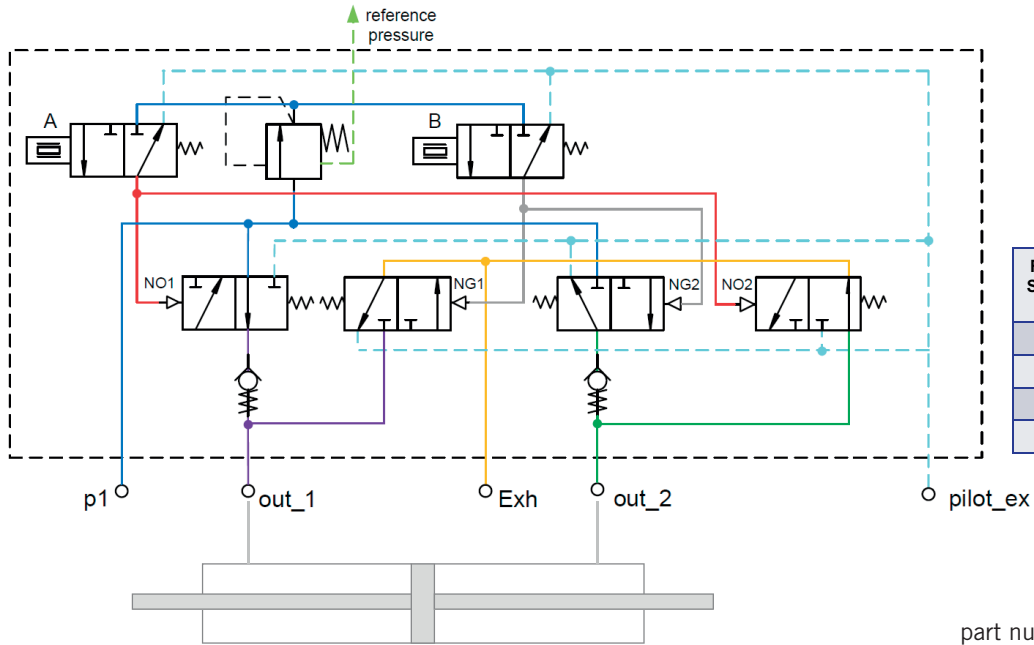


P13-4-FS-H  
PS601015-555-000

# PNEUMATIC DIAGRAMS

## Smart Positioner Modul

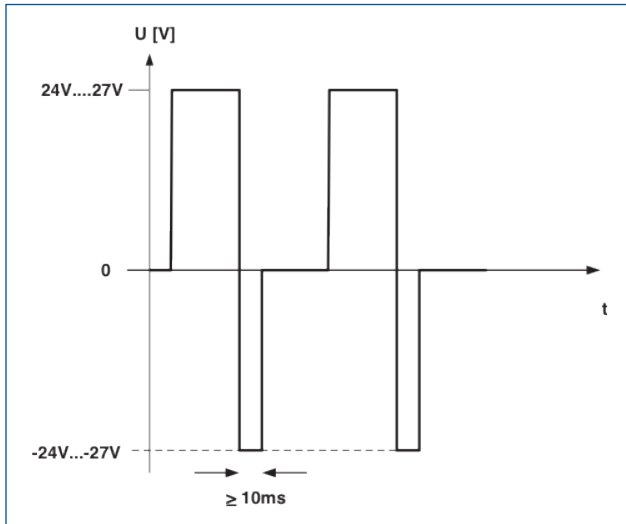
### DOUBLE ACTING / FAIL SAFE FILLING



Type P13-4-FS-B  
part number PS601013-555-000

## CONTROL ADVICE

### Smart Positioner Modul



The physical characteristics of piezo ceramics under electrical voltage or temperature will cause a drift (relaxation) of the factory set switch on/off voltage. To avoid negative influence on the smart positioner function we strongly recommend to use the following piezo specific electrical control.

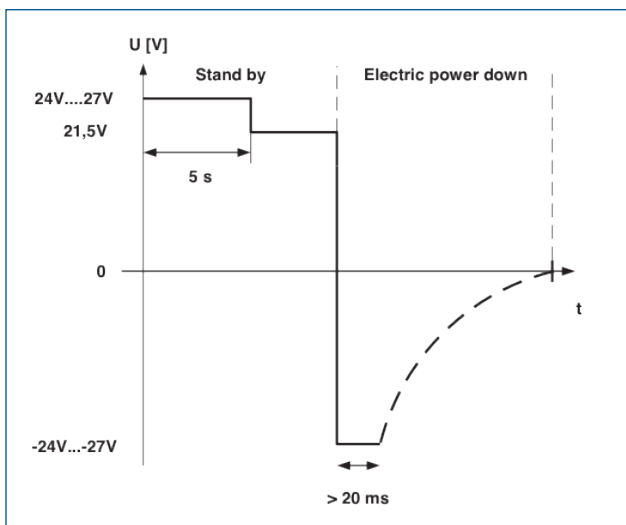
**Fig. 1**

#### Pulse modulation (PWM)

Control voltage ON: +24...+27 VDC

Control voltage OFF: -24...-27 VDC → 0V

The time a negative switch off voltage applied (-24 VDC) shall be min. 10 ms



**Fig. 2**

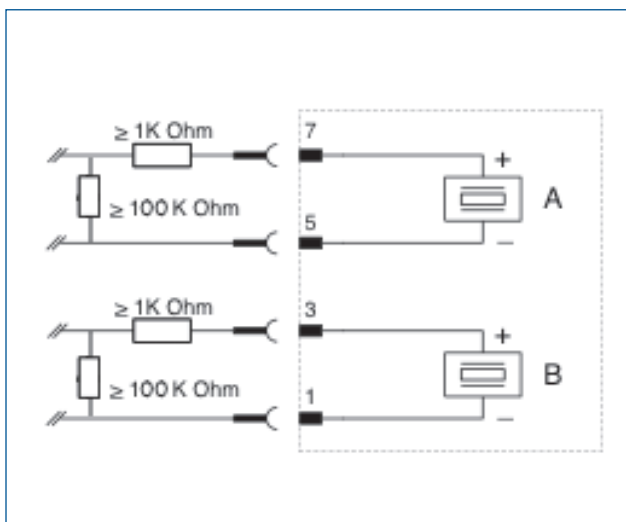
#### Normal operation

Stand by (Pressure hold): +24...+27 VDC → 21,5 V after ca. 5 seconds "ON" (power hold), lower down control voltage to +21,5 V

#### Electrical power down (Fail save):

-24...-27 VDC → 0V

After electrical power down, a negative switch off voltage shall be longer than 20 ms at the valve. A switch off impulse must be spent also in case of power loss (make appropriate switch off energy available; eg. capacitor).



**Fig. 3:**

For current limiting a serial resistor  $\geq 1 \text{ K Ohm}$  must be provided.

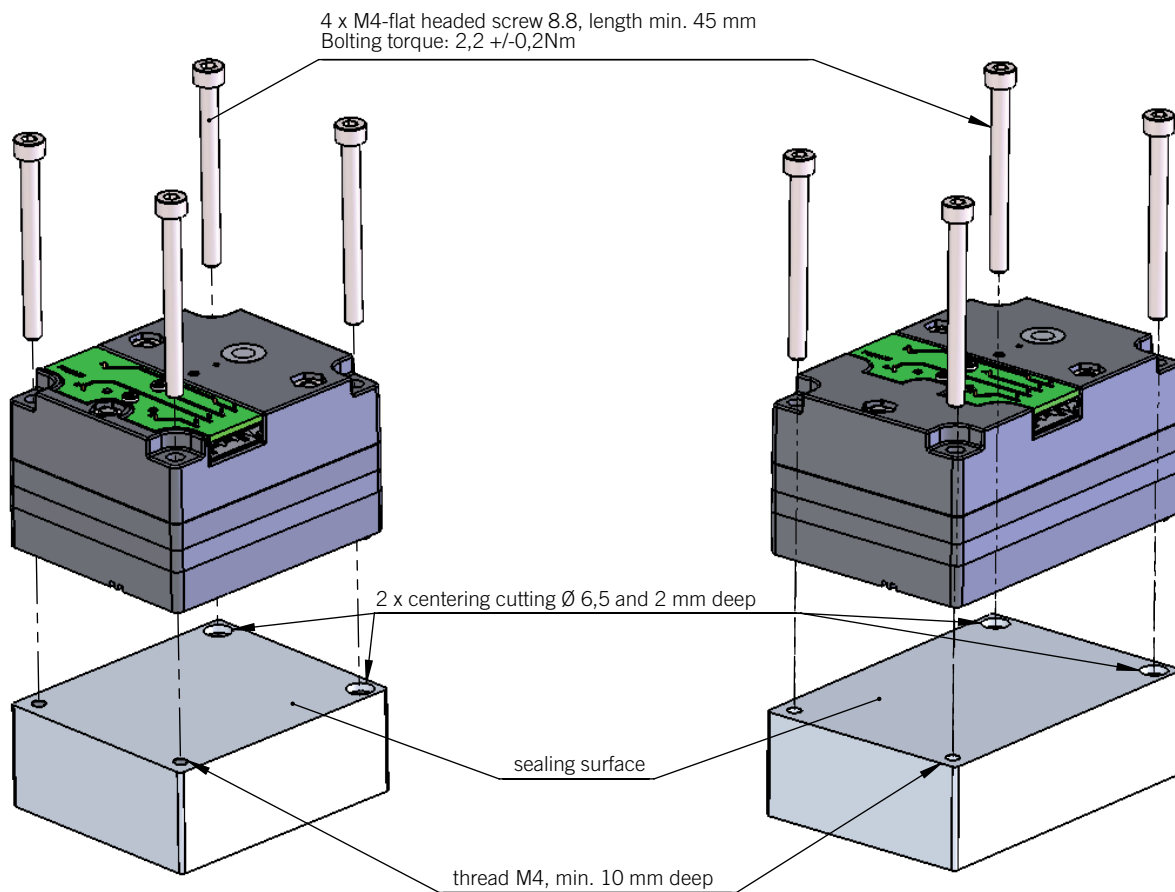
For discharge a parallel Resistor (100K) shall be provided.

# INSTRUCTIONS FOR INSTALLATION

## Smart Positioner Modul

Single acting

Double acting

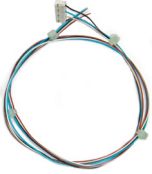




Specifications to sealing surface:  $\square$  0,05  $\nabla$  Ra 1,6

all dimensions in mm  
convert to inch:  
dimension divided by 25.4

## ACCESSORY

### Smart Positioner Modul

	DESCRIPTION	ORDER NUMBER
	<b>PLUG CONNECTOR WITH WIRES 0,5 M</b> cross section: 0,14 mm <sup>2</sup> / AWG 26	PS60086C
<b>CONNECTION AND MOUNTING SET (NECESSARY ONLY IN TEST PHASE)</b>		
	Universal connection set for single and double acting modules, Connection G1/8	PS60266B
	Plug connector with wires 0,5m cross section: 0,14 mm <sup>2</sup> / AWG 26	

**NOTES**

Smart Positioner Modul

## NOTES

Smart Positioner Modul

**HOERBIGER Flow Control GmbH**

Südliche Römerstraße 15

86972 Altenstadt, Germany

Tel. +49 (0)8861 221-0

Fax +49 (0)8861 221-1305

E-Mail: [flowcontrol@hoerbiger.com](mailto:flowcontrol@hoerbiger.com)

[www.hoerbiger.com](http://www.hoerbiger.com)



**TECHNICAL DATA AND ILLUSTRATIONS** The technical data and figures were compiled with great care and to the best of our knowledge. HOERBIGER accepts no liability for the currentness, correctness and completeness of this information. The content of this catalog shall not be construed as a quotation in the legal sense. A written order confirmation from HOERBIGER, which is provided exclusively subject to HOERBIGER's General Sales and Delivery Terms and Conditions, shall be decisive for the execution of the contract. You can obtain these from our Sales Department or from our website at: [www.hoerbiger.com](http://www.hoerbiger.com). The data and information, such as figures, drawings, descriptions, dimensions, weights, materials, technical and other deliverables contained in general product descriptions, HOERBIGER catalogs, brochures and price lists in any form, as well as the described products and services are subject to change and may be amended or updated at any time without prior announcement by HOERBIGER. They are binding only to the extent that they are expressly referenced in the contract or the order confirmation. Minor deviations from such product-describing information shall be deemed accepted and do not affect the performance of contracts, to the extent they are within reason for the customer. This catalog contains no express or implied guarantees, warranted qualities, or representations and warranties whatsoever on the part of HOERBIGER for the represented products, also with regard to the availability of the products. To the extent it is allowed by law, any liability on the part of HOERBIGER is hereby excluded for direct or indirect damage, consequential damage, claims regardless of type and on whatever legal grounds, which are caused by the use of information contained in this catalog. The liability disclaimer shall not apply to deceit, intent or gross negligence, injury to life, limb or health, or where unlimited liability is prescribed by law. Trademark, copyright and duplication The representation of industrial property rights such as brands, logos, registered trademarks or patents in this catalog shall not be construed to include the granting of licenses or rights of use. Their use is not permitted without the express written consent of HOERBIGER. The entire content of this catalog is the intellectual property of HOERBIGER. As defined by copyright, any unlawful use of intellectual property, including in extracts, is prohibited. Any full or partial reproduction, duplication or translation is only permitted with the prior written consent of HOERBIGER.