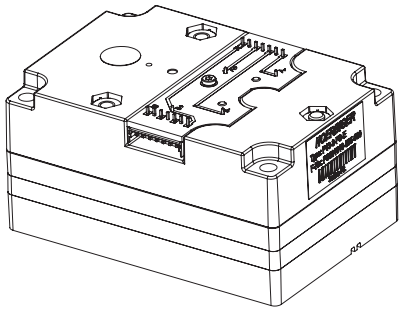
SMART POSITIONER MODUL

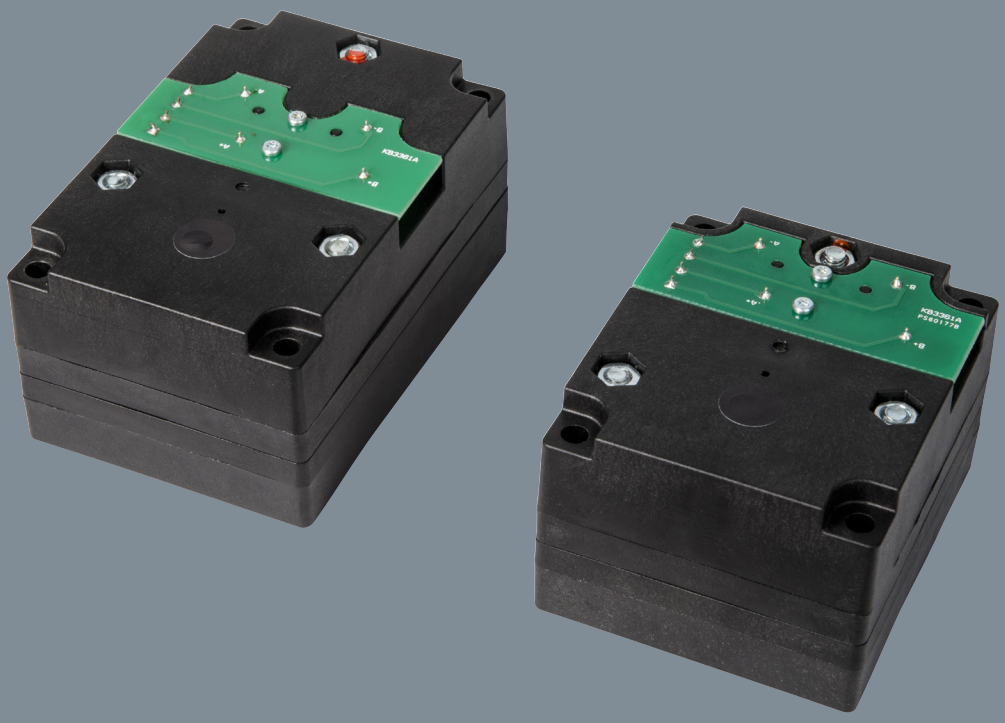
Standardized Switching Piezo-Pneumatic system for Smart valve positioners

EN MET

Technical Data

HOERBIGER
because performance counts





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.

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 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, Purchaseing, OC, After Sales
- Possibilty 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)	0.145 kg	0.170 kg
Installation	in any position	
Medium	Compressed air acc. ISO8573-1	
Filtration	Class 4 (filtered 15 µm)	
Lubrication	Class 4 permanently (25 mg/m³ 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	–25… +80 °C (–40 °C optional)	
Ambient temperature	–25… +80 °C (–40 °C optional)	
Medium temperature	–25… +80 °C (–40 °C optional)	
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	6 bar	
Working pressure inlet	$p_1$min	1.5 bar	
	$p_1$max	8 bar	
Output pressure range	p_2	0.2 bar... p_1	
Ambient pressure	p amb	< 0.1 bar rel.	
Nominal flow rate p1 → out (@25°C)	QN	≥ 130 l/min 6 bar → 5 bar	
Nominal flow rate out → Exh (@25°C)	QN	≥ 130 l/min 6 bar → 5 bar	≥ 240 l/min 6 bar → 5 bar
Own air consumption (@25°C)	QLS	≤ 0.4 l/min	
Chamber leakage (@25°C)	QLC	≤ 0.05 l/min 6 bar → 0 bar	

ELECTRIC CHARACTERISTICS

Switching voltage	U	**Minimum**	**Maximum**
On	U_{on}	+24 V DC	+27 V DC*
Off	U_{off}	–24 V DC	–27 V DC*
Holding (steady state)	U_{hold}	+21 V DC	+21.5 V DC
Capacity	C	≤ 2x100 nF (≤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 (@25°C und p1=6bar)	< 35 ms (@25°C und p1=6bar)
	$t_{2/90\%}$	< 60 ms (@25°C und p1=6bar)	< 80 ms (@25°C und p1=6bar)
Switching time exhausting	$t_{3/90\%}$	< 25 ms (@25°C und out=6bar)	< 35 ms (@25°C und out1/2=6bar)
	$t_{4/10\%}$	< 70 ms (@25°C und out=6bar)	< 90 ms (@25°C und out1/2=6bar)
Definition	Switching time measurement is a system step reponse with nominal pressure supply and a chamber-volume of app. 13 cm^3		

DIMENSIONAL DRAWING

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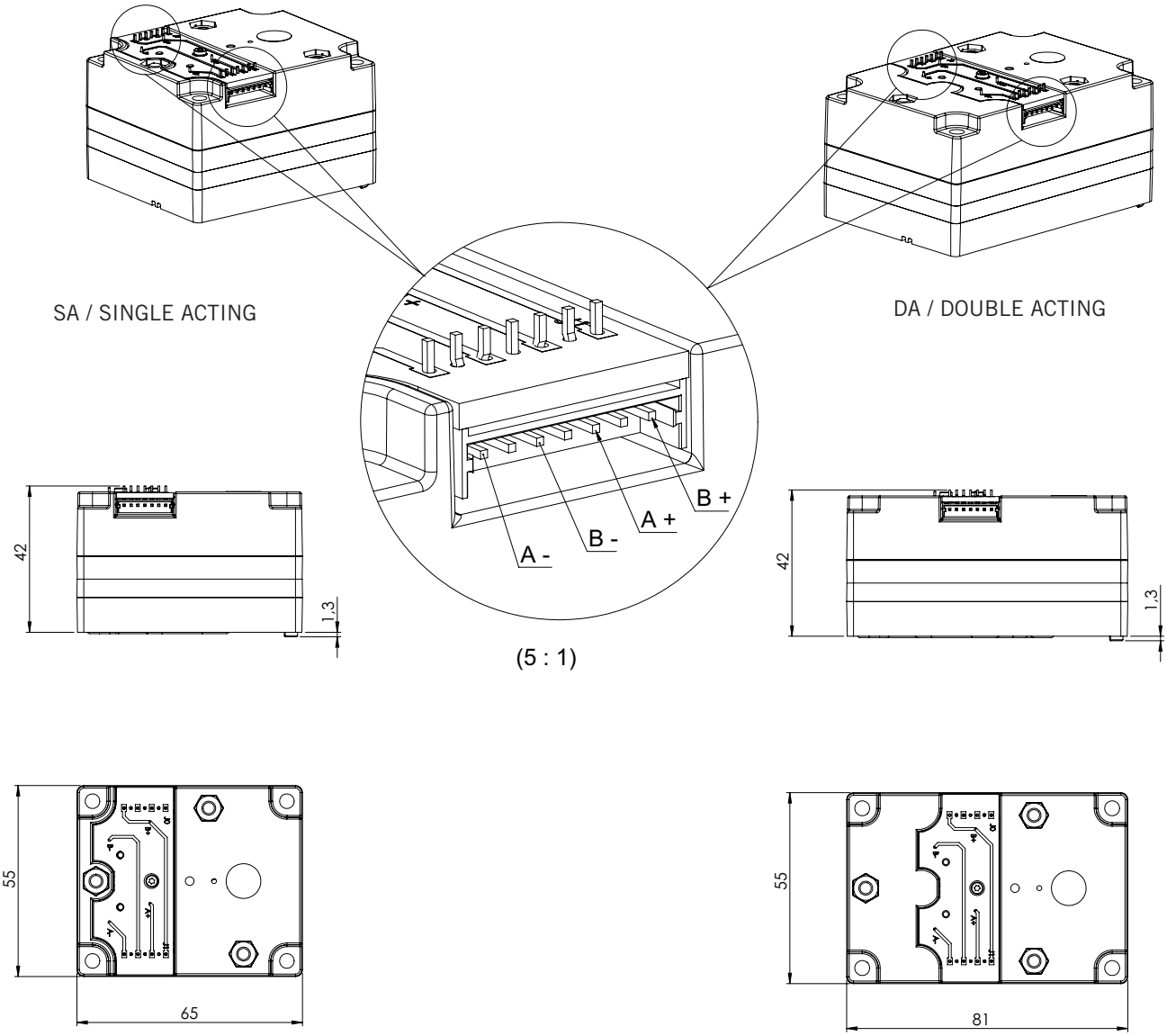

all dimensions in mm

PNEUMATIC PORTS

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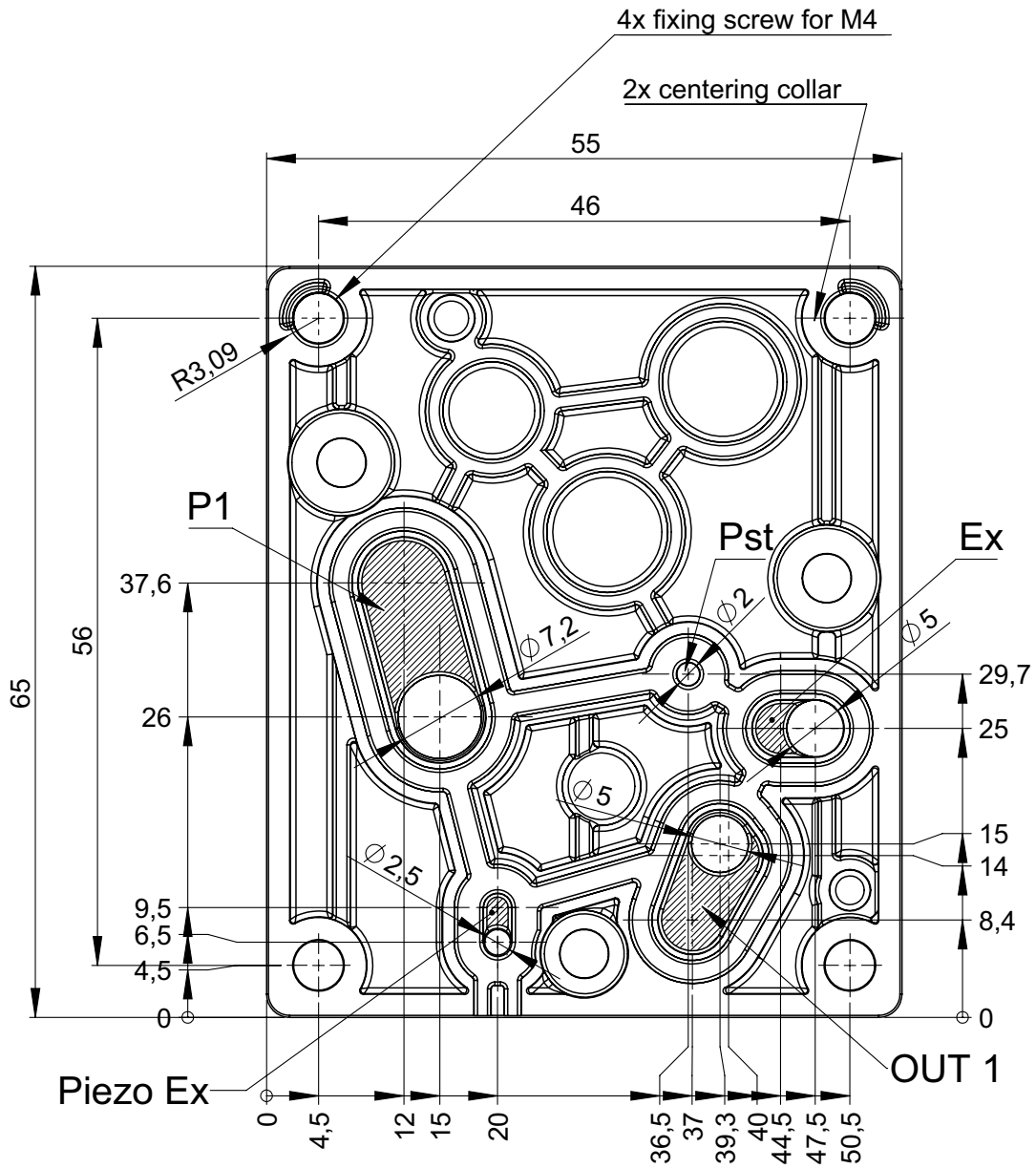
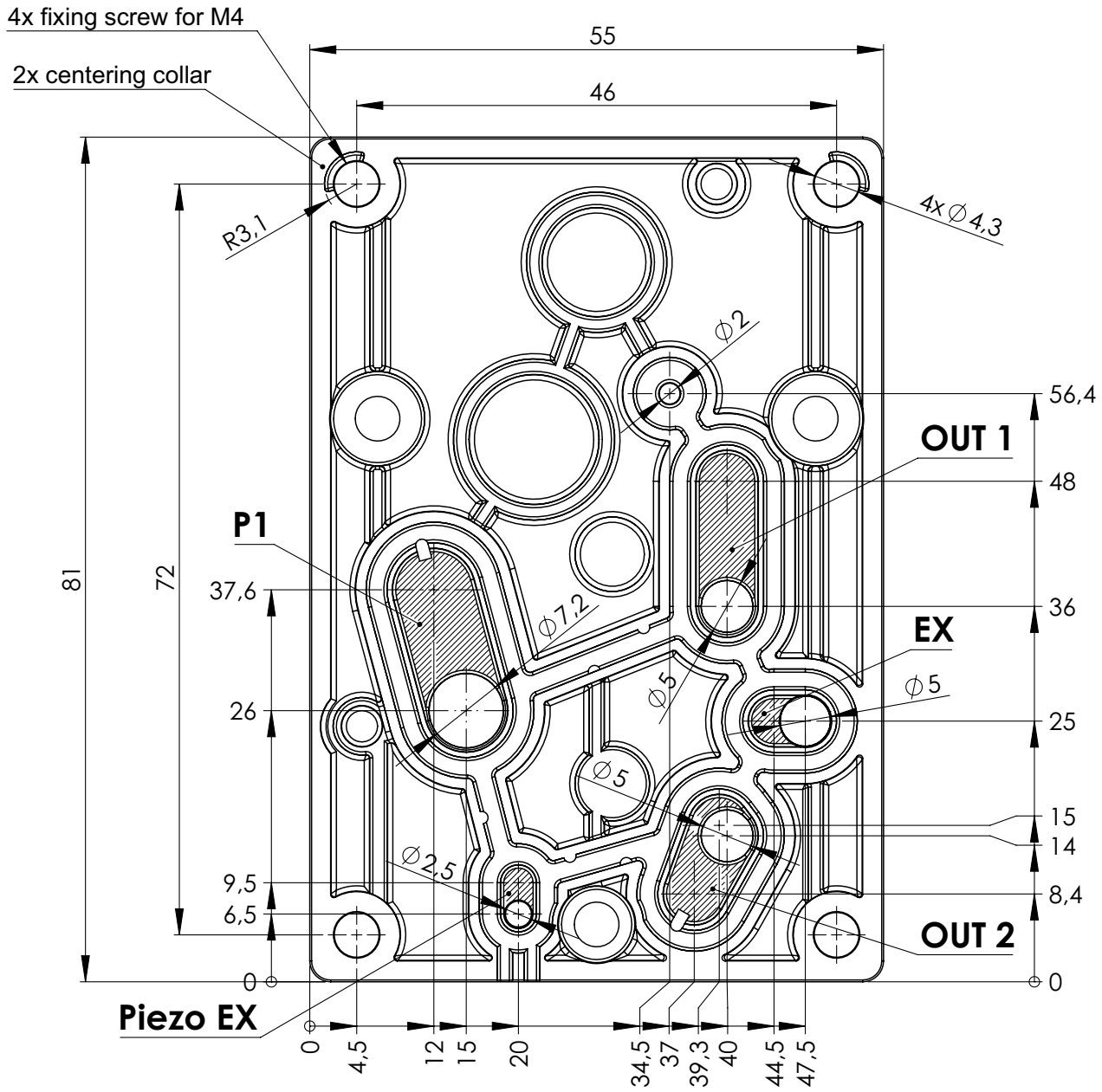


all dimensions in mm

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

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

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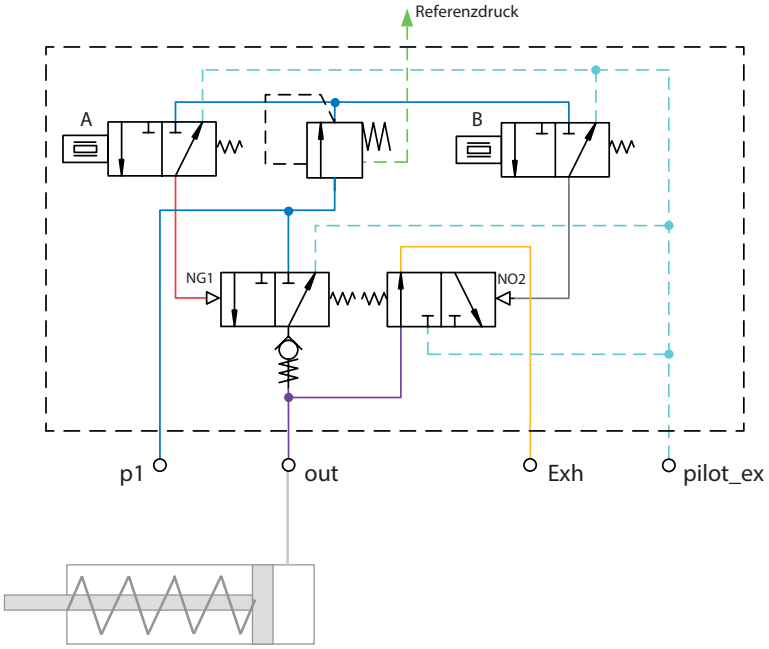
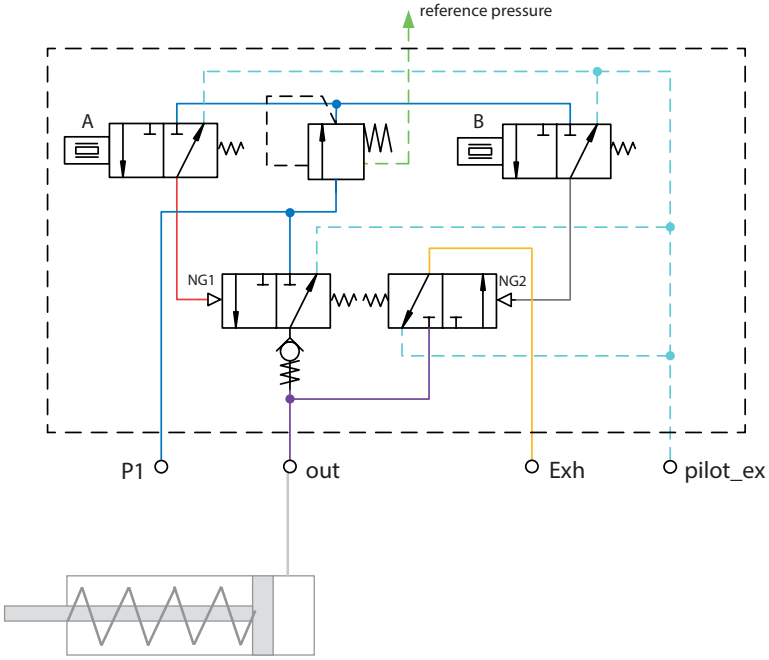
SINGLE ACTING POLYMER / FAIL SAFE EXHAUST



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

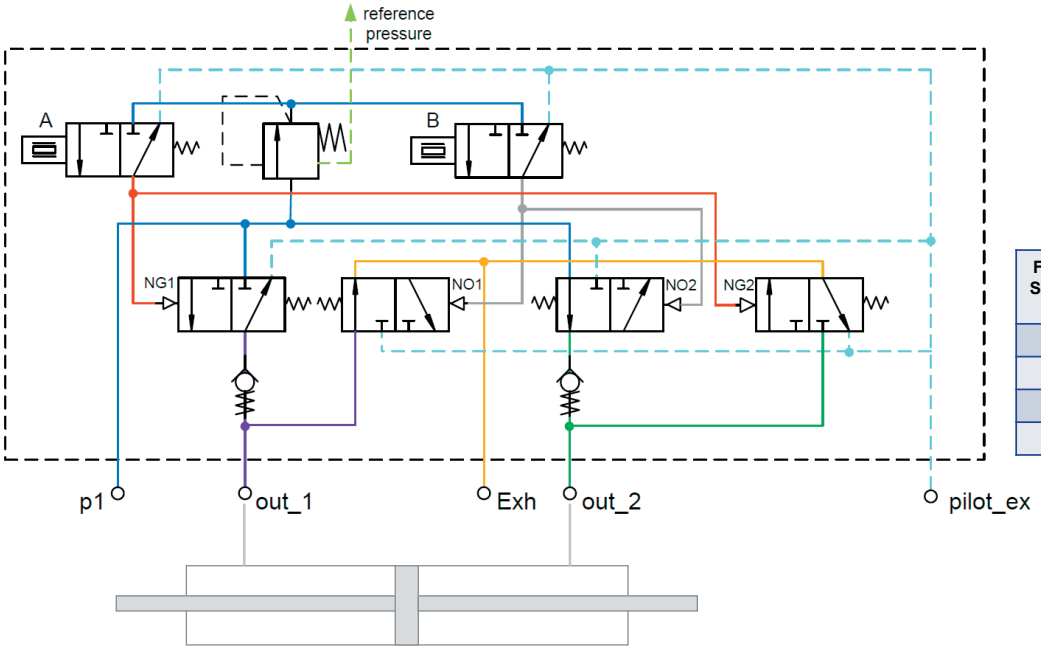
SINGLE ACTING POLYMER / FAIL SAFE HOLD



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

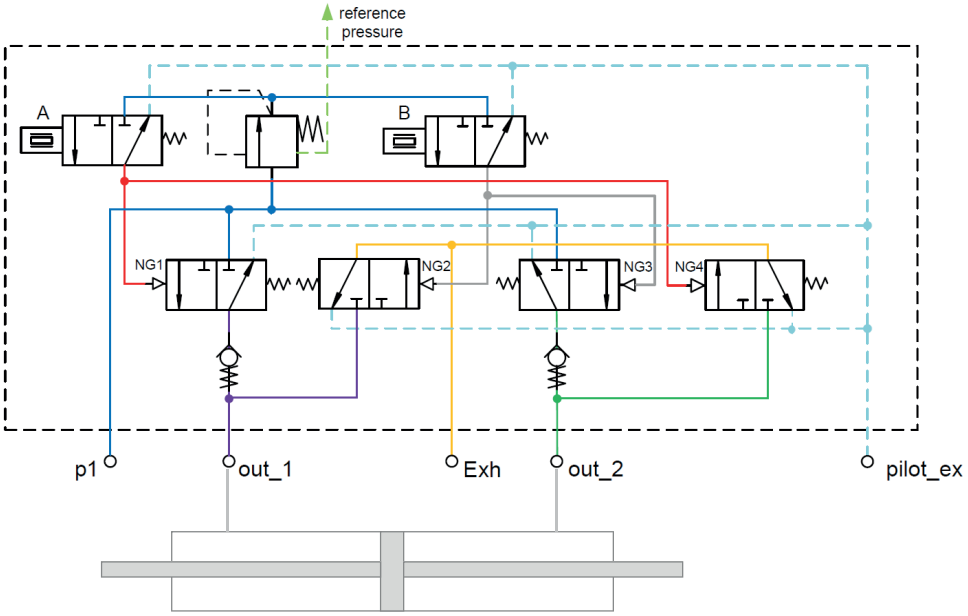
DOUBLE ACTING POLYMER / FAIL SAFE EXHAUST



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

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

DOUBLE ACTING POLYMER / FAIL SAFE HOLD



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

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

PNEUMATIC DIAGRAMS

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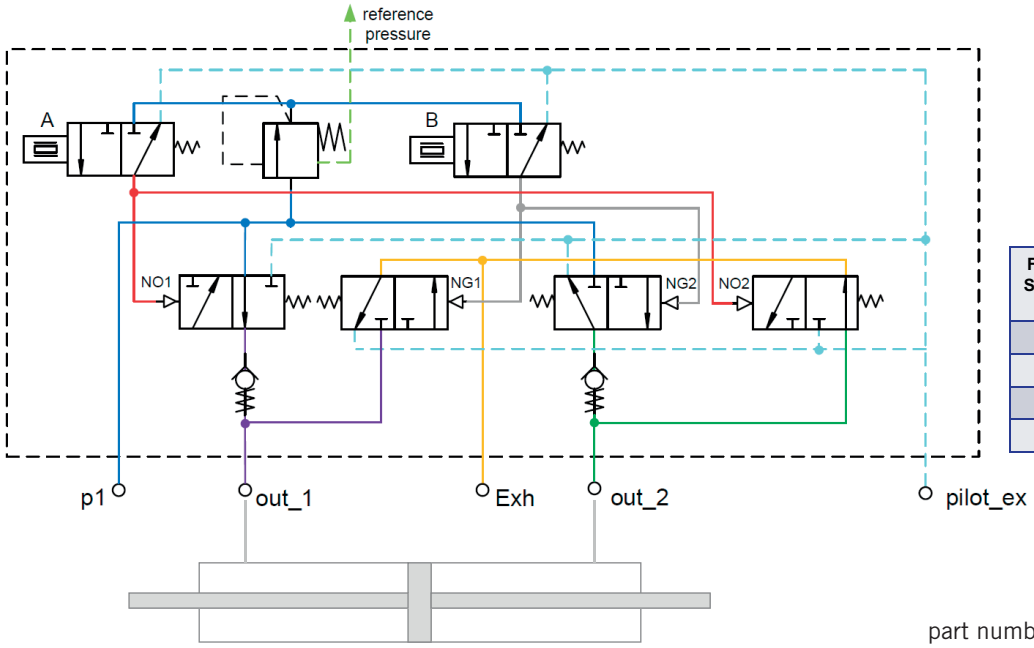
DOUBLE ACTING / FAIL SAFE FILLING



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

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

CONTROL ADVICE

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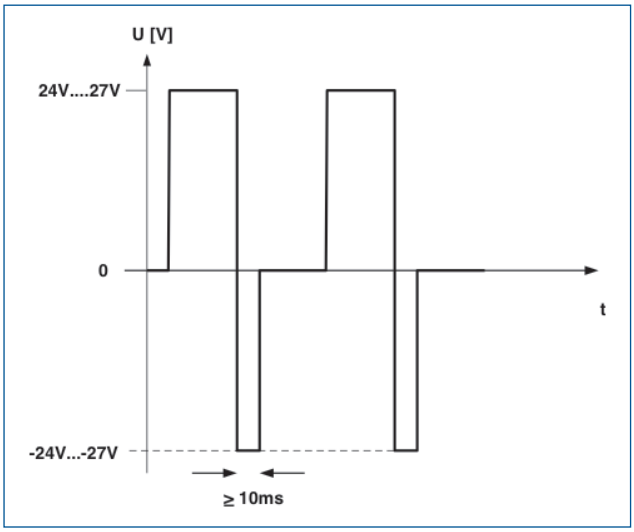

The physical characteristics of piezo ceramics under electrical voltage or temperature will cause a drift (relaxation) of the factory set switch on/off voltage.
To avoid negative influence on the smart positioner function we strongly recommend to use the following piezo specific electrical control.

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

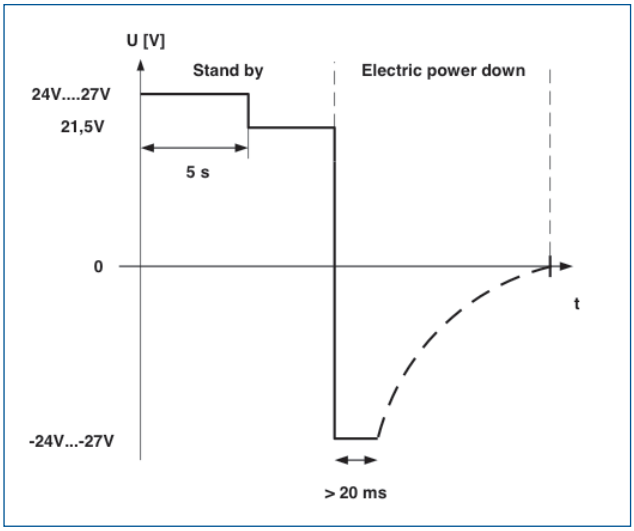

Fig. 2

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 safe):

–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).

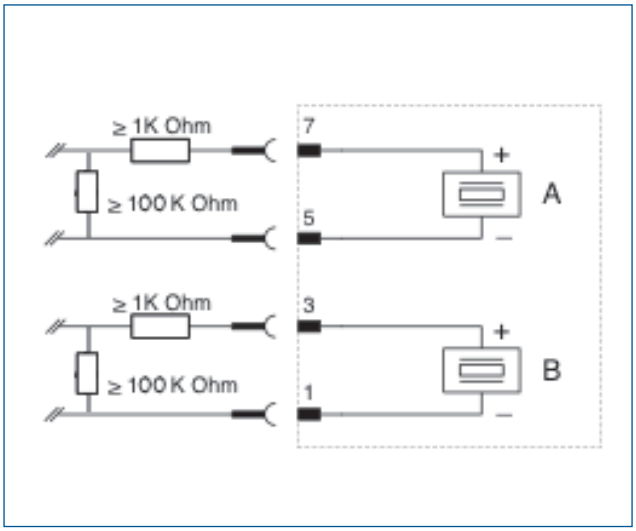

Fig. 3:

For current limiting a serial resistor
≥ 1 K Ohm must be provided.

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

INSTRUCTIONS FOR INSTALLATION

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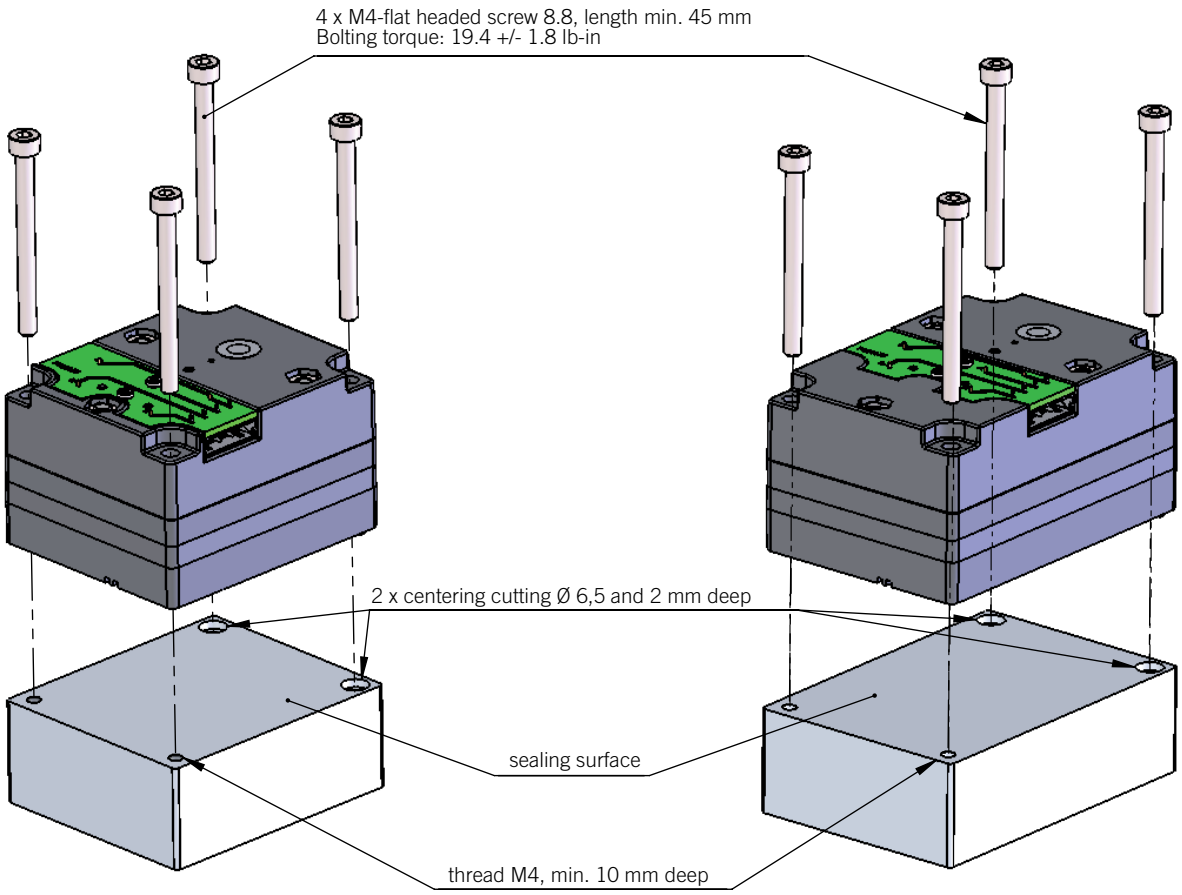
Single acting

Double acting



Specifications to sealing surface: ⏥ 0,05 Ra 1,6

all dimensions in mm

ACCESSORY
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	DESCRIPTION	ORDER NUMBER
	PLUG CONNECTOR WITH WIRES 0.5 M	
	cross section: 0.14 mm² / AWG 26	PS60086C
	CONNECTION AND MOUNTING SET (NECESSARY ONLY IN TEST PHASE)	
	Universal connection set for single and double acting modules, Connection G1/8	PS60266B
	Plug connector with wires 0.5 m cross section: 0.14 mm² / AWG 26	

NOTES
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NOTES

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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
www.hoerbiger.com

HOERBIGER
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