Electropneumatic positioner type SPC/ RPC



Type SPC positioner
with diaphragm valve DIASTAR



Type RPC positioner
with pneumatic actuator PPA and ball valve type 546 Pro

Product description

The types SPC (Stroke Process Controller) and RPC (Rotary Process Controller) are digital, electro-pneumatic positioners for integrated mounting on pneumatically operated industrial valves with single-acting stroke actuators e.g. DIASTAR diaphragm valves as well as single- and double-acting rotary actuators e.g. PA and PPA.

Benefits

- Compact and robust design
- Putting into operation by TUNE function of positioner and process controller
- Integrated diagnostic functions for valve monitoring
- Dynamic control system without air consumption in the controlled state
- PID closed loop process controller function (type SPC PID; RPC PID)

Product features

- For pneumatic actuators in double-acting and single-acting function (SPC only single-acting)
- Power supply voltage 24V DC
- Activation 0-10 V, 0-5 V, 4-20 mA, 0-20 mA adjustable
- Multi-pin plug electrical connection
- Operation/configuration via display or internal DIP switch
- Protection rating IP65/IP67
- Binary input (fail-safe position, changeover)
- Operating mode (Automatic/Manual)
- Analog position indicator (0/4 to 20 mA, 0 to 5/10 V) for setpoints and actual values
- Approved and listed according to cULus and cCSAus

Variants

Positioner (SPC, SPC*, SPC D, RPC, RPC D)

The positioner is assembled to a pneumatically driven valve and regulates the position of the valve. The positioner detects the valve position wear-free via a contactless, analog position sensor. The microprocessor electronics in the positioner continuously compares the current position (actual position value) with the position setpoint value specified via the standard signal input (or via fieldbus). If there is a control difference, the electropneumatic control system causes the actuator to correct the actual position value accordingly.

Process controller (SPC PID, RPC PID)

The process controller is integrated in a control loop. The position setpoint value of the valve is calculated from the process setpoint value and the actual process value (sensor signal) via the control parameters (PID controller). The process setpoint value can be specified by an external signal (or via fieldbus). The process controller processes all common current and voltage standard signals and can optionally be equipped with a fieldbus interface. The actual value of the process variable is fed directly to the device as a 4 to 20 mA, Pt 100 or frequency signal. The process controller calculates the internal setpoint value for the subordinate positioner from the setpoint/actual value comparison.

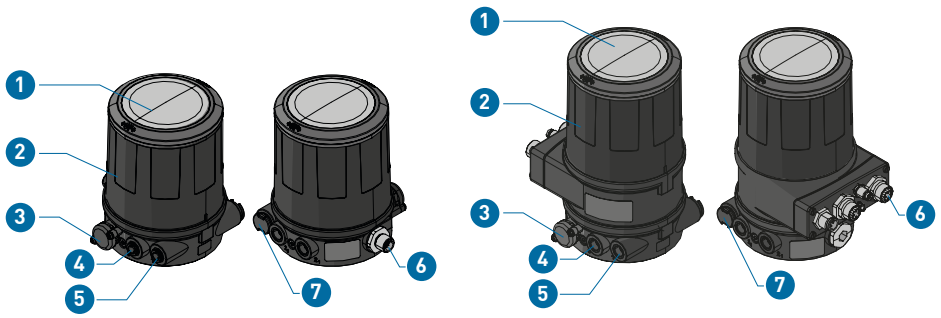
Control head (SPC Lite)

The type SPC Lite positioner is a control head designed for decentralized automation of pneumatic process valves for simple OPEN/CLOSED applications. The valve position is detected via a non-contact, analog sensor element, which automatically detects and stores the valve end positions via a teach function upon putting into operation. The integrated pilot valve controls single-acting actuators.

Technical Data

Type SPC Positioner design

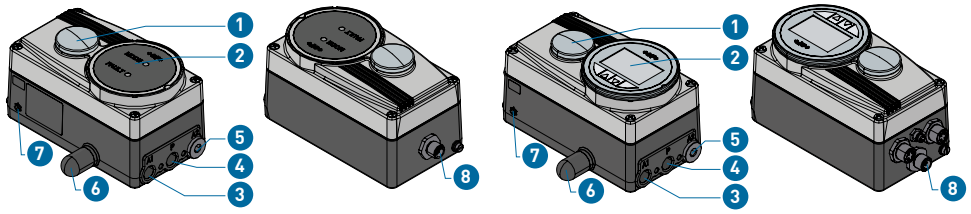
Type SPC/SPC Lite | **Type SPC D/PID**



1 Transparent cover, underneath decoding module
2 Housing cover
3 Pressure limiting valve
4 Exhaust air connection Lettering: 3
5 Control air connection Lettering: 1
6 Electrical connection
7 Supply air filter

Type RPC Positioner design

Type RPC | **Type RPC D/PID**



1 Mechanical position indication
2 Display/control module
3 Working connection 1 (connection: A1)
4 Pressure connection 1.4 - 7 bar (connection: P)
5 Working connection 2 (connection: A2)
6 Venting connection/Venting filter
7 Overpressure valve
8 Electrical connection

Type	SPC Lite	SPC	SPC D	SPC PID	RPC	RPC D	RPC PID
Pneumatic actuator type	Stroke actuator SPC*: large air capacity for DIASTAR DN>50				Rotary/multiturn actuator		
Function	Control head	Positioner		Process controller	Positioner		Process controller
General data							
Operating Temperature	-10 to +55 °C						
Storage Temp	-20 to +65 °C						
Protection rating	IP65/IP67 as per EN 60529 (evaluated by the manufacturer)						
Deployment height	up to 2'000 m above sea level relative humidity max. 95% at 50 °C (non-condensing)						
Housing material	External: PPS, PC, VA, PP-FR Internal: PA 6; ABS				Plastic-coated aluminum stainless steel (V4A), PC, PE, POM, PTFE		
Sealing material	NBR/EPDM				EPDM, NBR, FKM		
Stroke range valve stem (all SPC)	2 - 47 mm	3 - 45 mm					
Integrated displacement transducer	Non-contact (wear-free) analog inductive position sensor				Conductive plastic rotary potentiometer Rotation angle 30° to 180°		
Putting into operation/ Initialization	Automatically through X.TUNE function (automatic adjustment of positioner)						
Pneumatic data							
Control medium	Neutral gases, air Quality class as per ISO 8573-1						
Dust content	Quality class 7, max. particle size 40 µm, max. particle density 10 mg/m^3						
Water content	Quality class 3, max. pressure dew point -20 °C or min. 10 °C below the lowest operating temperature						
Oil content	Quality class X, max. 25 mg/m^3						

Type	SPC Lite	SPC	SPC D	SPC PID	RPC	RPC D	RPC PID
Temperature range of control medium	-10 to 50 °C						
Pressure range of control medium	3 - 7 bar				1.4 - 7 bar		
Positioning system nominal diameter	DN0.6	DN0.6 SPC*: DN2.5	DN0.6		DN3.0		
Air output control valve for ventilation and vent outlet (QNn value according to definition with pressure drop from 7 to 6 bar absolute)	250 l_N/min	SPC: 7 l_N/min SPC*: 130 l_N/min	7 l_N/min		50 l_N/min (at 1.4 bar2.) 150 l_N/min (at 6 bar2.) QNn=100 l_N/min		
Fluidic connection	Threaded joint G ⅛				Threaded joint G ¼		
Electrical data							
Protection class	III as per DIN EN 61140 (VDE 0140-1)						
Connections	Round connector (see accessories, not included in delivery)						
M12 8-pin Power supply, input/output signals	x	x	x	x	x	x	x
M12 4-pin Power supply			x	x		x	x
M8 4-pin Process current value from sensor				x			x
M12 D-coded Fieldbus connection	Only with fieldbus device, not available as accessories						
Supply voltage	24 V DC ± 10% - max. residual ripple 10% SPC: 24 V DC ± 25% - max. residual ripple 10%						
Power consumption	< 5 W						
Input data for actual value signal (PID only)	4 ... 20 mA: • Input resistance 70 Ω Resolution 12 bit						
	Frequency: • Measurement range 0 - 1000 Hz • Input resistance 20 kΩ Resolution 1‰ of measured value Input signal > 300 mVss • Signal form: sine, rectangle, triangle						
	PT 100: • Measuring range -20 to +220 °C • Resolution < 0.1 °C • Measuring current < 1 mA						
Input data for setpoint value signal		0/4 - 20 mA: Input resistance 75 Ω Resolution 12 bit					
			0 - 5/10 V: Input resistance 22 kΩ, Resolution 12 bit (at 0 - 5 V only 11 bit)			0 - 5/10 V: Input resistance 22 kΩ, Resolution 12 bit (at 0 - 5 V only 11 bit)	
						+Inductive proximity switches 100 mA current limitation	
Analog position indicator		Load: 0 - 560 Ω (for current output 0/4 - 20 mA)					
			Max. current: 10 mA (for voltage output 0 - 5/10 V)			Max. current: 10 mA (for voltage output 0 - 5/10 V)	
Digital outputs		Galvanically isolated, PNP Current limiting 100 mA, output is clocked on overload					
Digital input		PNP					
		0 - 5 V = log "0", 12 - 30 V = log "1"	0 - 5 V = log "0", 10 - 30 V = log "1"				
		Inverted input correspondingly inverted (input current < 6 mA)					
Approvals/Standards	cULus and cCSAus						

Assignments

Assignment of SPC and RPC positioners to pneumatic stroke/rotary actuators:

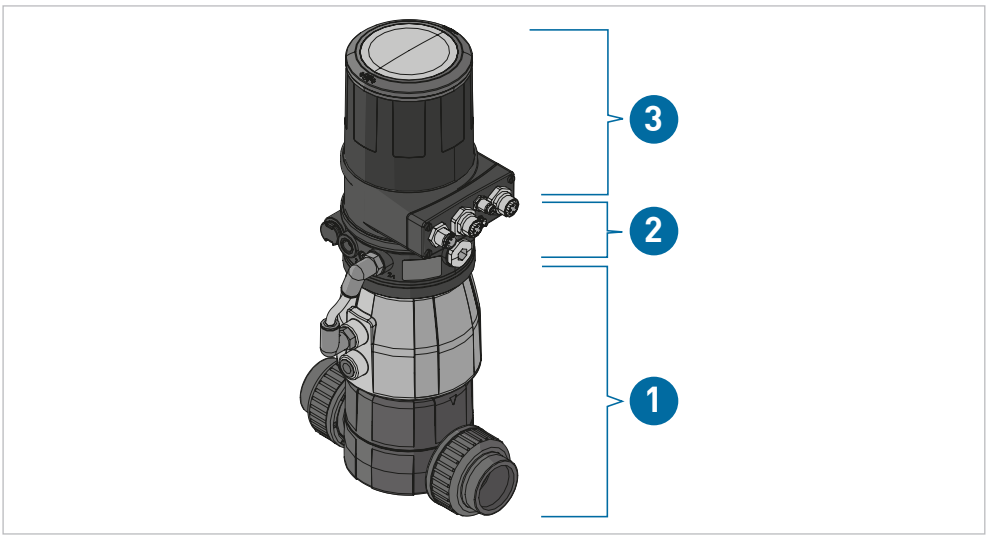
	DIASTAR							PA30-90	PPA04-80
	Six FC	Ten FC/FO	Ten DA	Ten Plus FC	Sixteen FC/FO	Sixteen DA	025 FC/FO	FC/FO/DA	FC/FO/DA
Type SPC		x		x	x		x*		
Type RPC								x	x

only SPC

! Opening times SPC D for DIASTAR FO Sz.5/DN50 up to 30 seconds possible. This should be taken into account when selecting the valve.

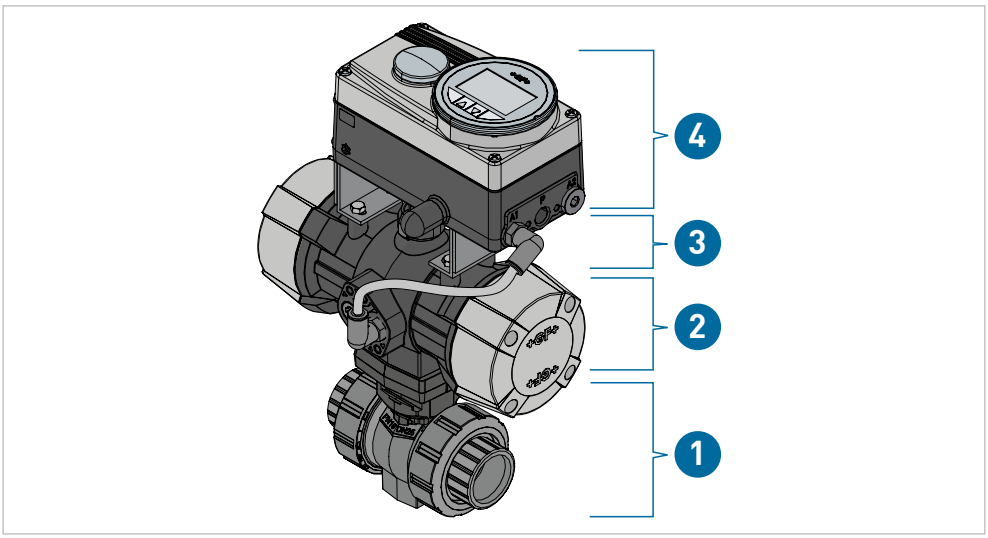
! For diaphragm valves with EPDM diaphragms and 16 bar version, flipping the diaphragm can cause overshooting.

Type SPC positioner



1 DIASTAR diaphragm valve
2 Adaption SPC
3 Type SPC Positioner

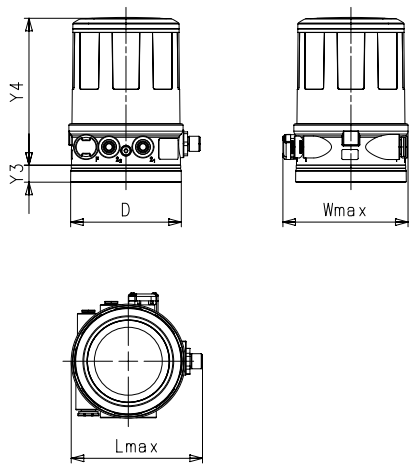
Type RPC positioner



1 Ball valve type 546 Pro
2 Pneumatic actuator type PPA04 – PPA80
3 Adaption RPC
4 Type RPC positioner

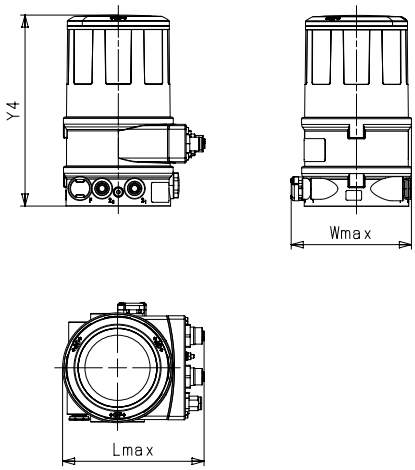
Dimensions

Type SPC / SPC Lite



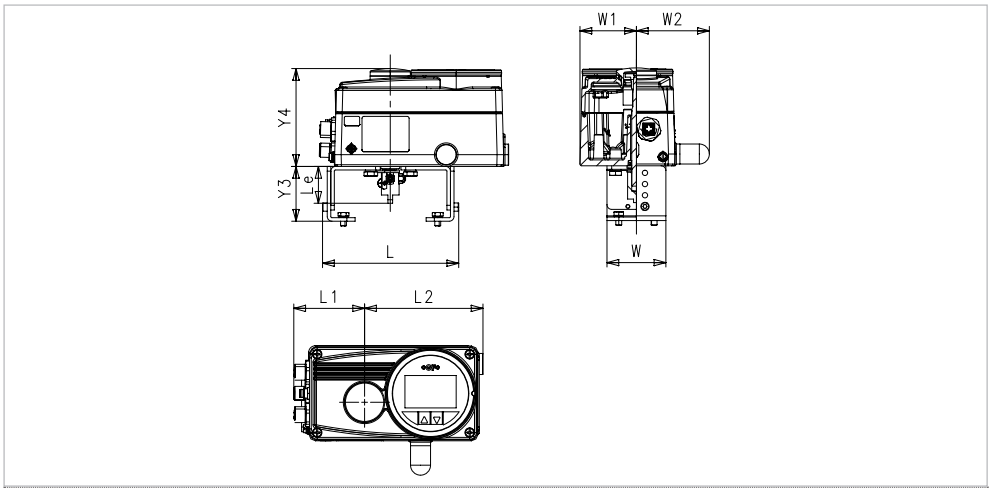
Designation	Order code	Y4	Lmax	Wmax
SPC	199 190 620	117.5	104.5	99.5
SPC*	199 190 621	117.5	104.5	99.5
SPC Lite	199 190 619	117.5	104.5	99.5

Type SPC D/PID



Designation	Order code	Y4	Lmax	Wmax
SPC D	199 190 622	158.5	115.5	99.5
SPC PID	199 190 625	158.5	115.5	99.5

Type RPC / RPC D / RPC PID



Designation	Order code	Y4	W1	W2	L1	L2
RPC	199 190 640	83.5	48	62	60.5	100.5
RPC D	199 190 641	83.5	48	62	60.5	100.5
RPC PID	199 190 644	83.5	48	62	60.5	100.5

Accessories

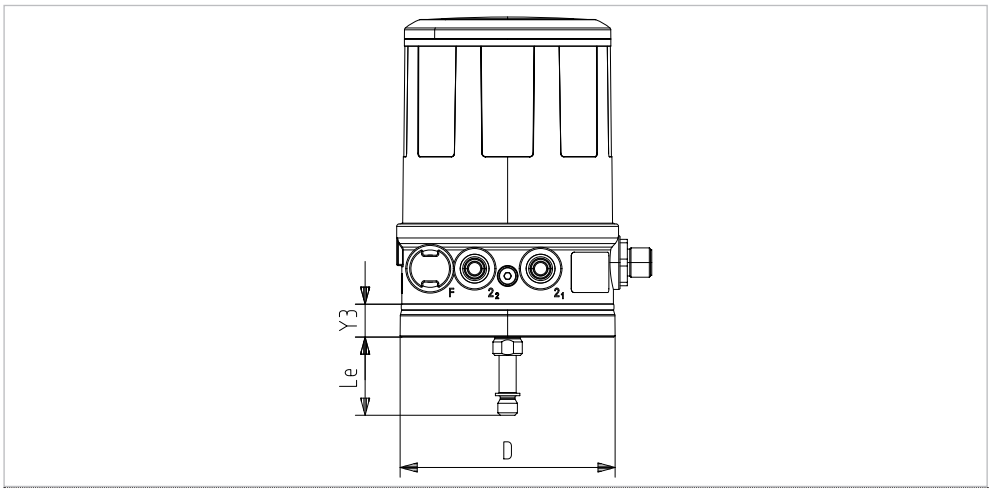
Adaption for positioner type SPC, SPC Lite, SPC D, SPC PID

SPC adapter assignment depending on the DIASTAR stroke actuator used:

	DIASTAR						
Nominal diameter	Six FC	Ten FC/FO	Ten DA	Ten Plus FC	Sixteen FC/FO	Sixteen DA	025 FC/FO
DN15		1		2	2		
DN20		2		2	2		
DN25		2		3	3		
DN32		3		4	4		
DN40		4		5	5		
DN50		4		5	5		
DN65							6
DN80							6
DN100							6
DN150							6

For mounting positioner on pneumatic stroke actuator type DIASTAR.



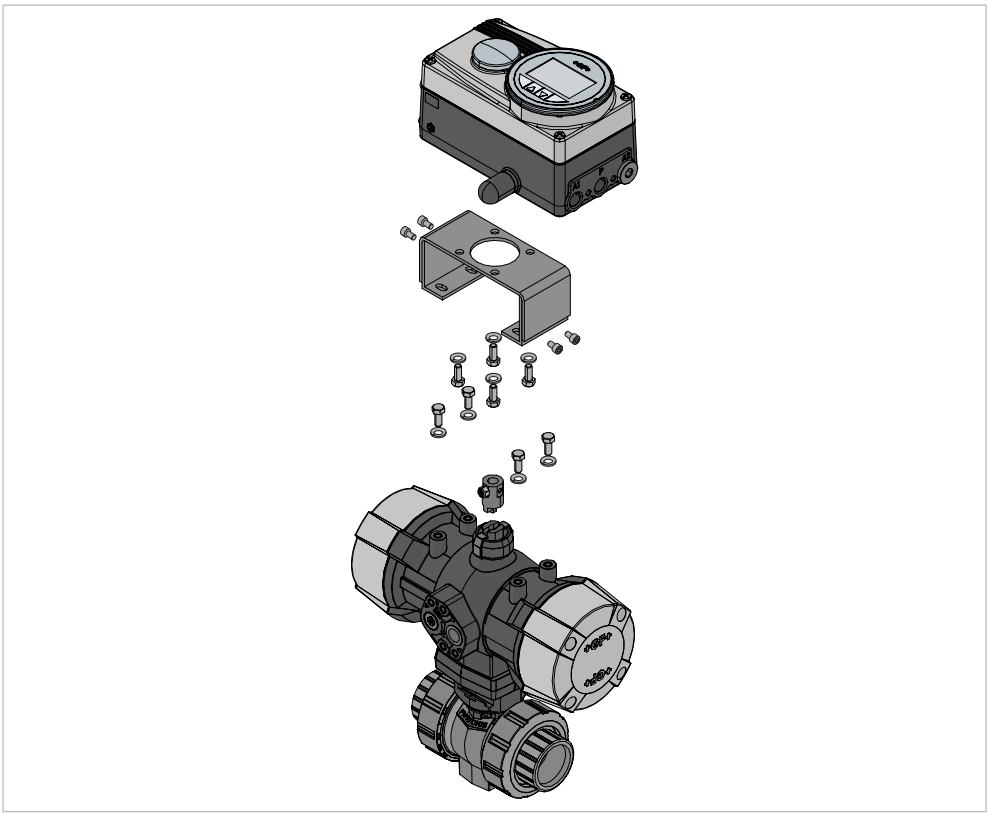


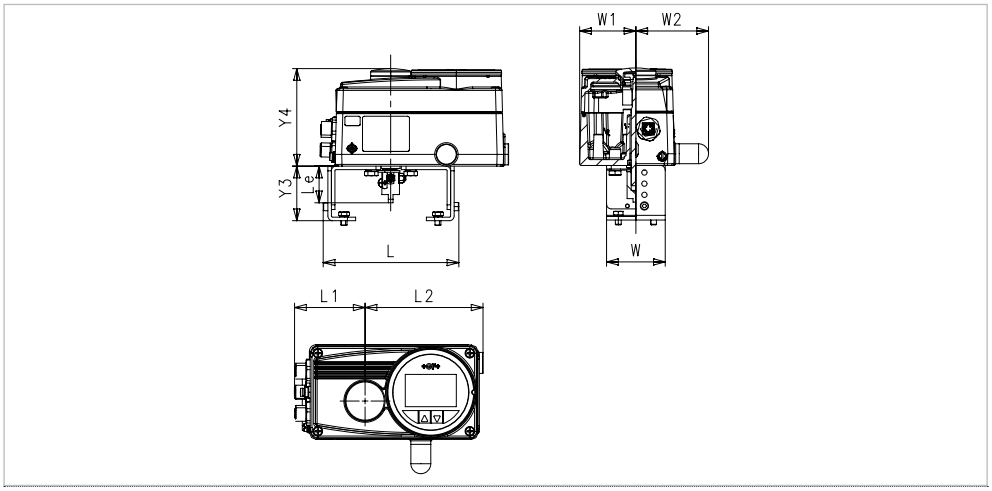
Order code	Designation	Y3	D
199 190 628	Adaption SPC 1 + 2	13.5	88
199 190 629	Adaption SPC 3 + 4	13.5	88
199 190 630	Adaption SPC 5	13.5	88
199 190 631	Adaption SPC 6	13.5	88

! Note: Observe the assignment of adaptation to actuator size.

Adaption for positioner type RPC, RPC D, RPC PID

For mounting positioner on pneumatic rotary actuator type PPA08-80.





Order code	Designation	Y3	L	Le	W
199 190 647	Adaption RPC	46.5	116	31.5	50

Multi-pin connector

For electrical connection of positioner type SPC, type RPC to customer's control system

Order code	Designation	
199 190 649	Round socket M12 8-pin w. cable 5m PUR	Protection rating IP67/IP68/IP69, A-coded, angled plug, free cable end, operating voltage max. 250 V AC/DC, operating current max. 4 A, microbe and hydrolysis resistant, halogen free, ambient temperature: • Connector: -40 - 90 °C (-40 - 194 °F) • Cable, permanently installed: -40 - 80 °C (-40 - 176 °F) • Cable, movable: -25 - 80 °C (-13 - 176 °F) Contamination level: 3
199 190 650	Round socket M12 4-pin w. cable 5m PUR	
199 190 651	Round socket M8 4-pin w. cable 5m PUR	

! The connections to be used for the respective positioner can be taken from the electrical data above.

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