

Characteristics

**2-Way Servo Prop. Valve with Shut-off Valve
Series TEP**

2-way servo proportional valves with VCD® technology and shut-off valve series TEP base on the TDP range. Additionally, TEP valves are equipped with a direction control valve for shutting off the pilot system.

Structure and function

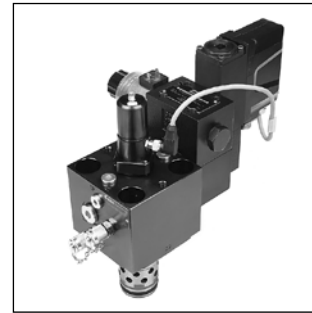
The 2-way servo proportional valves with shut-off valve TEP have a 2-stage design consisting of a DFplus pilot valve and a main stage with poppet and LVDT.

With the DFplus pilot valve the TEP achieves extremely fast response times: from 10.5 ms (NG25) up to 28 ms (NG100) with an accuracy of <0.1 % of the nominal flow. The pilot valve actively controls the poppet - independent of the pressure conditions in the main ports. It is basically required that the pilot pressure is at the level of the system pressure. At low system pressure the pilot pressure should be min. 140 bar, when high valve dynamics are desired.

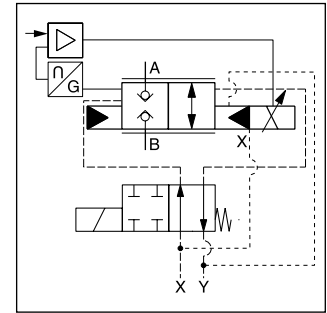
The integrated electronics in the pilot of the TEP has two control loops for the main poppet and the pilot spool. In the de-energized position of the shut-off valve, the upper pilot control surface of the main spool is pressurized, the lower one is relieved to tank. Independent of the DFplus pilot valve, the main spool remains always closed, if the shut-off valve is not activated.

If the solenoid of the shut-off valve is energized, the position of the main spool is controlled by DFplus pilot valve and LVDT.

The shut-off valve can be ordered with position control optionally.



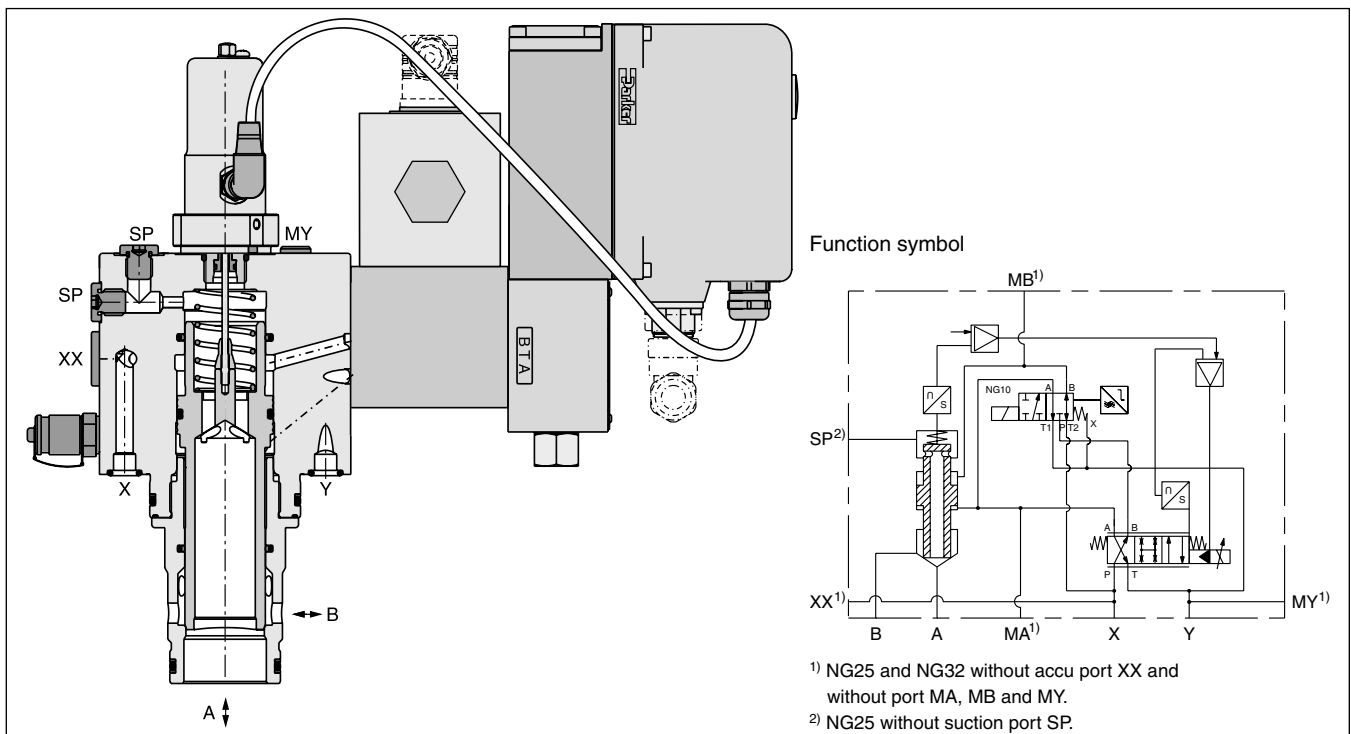
TEP040



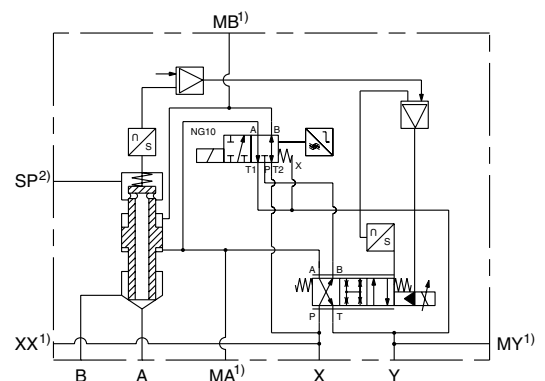
Features

- Active pilot operated 2-way servo proportional valves with shut-off valve
- Flow directions A-B and B-A
- Cavity and mounting pattern according to ISO 7368
- Fast step responses
- Completely mounted and adapted unit with integrated electronics
- In order to ensure the closed position pilot pressure is required
- 7 sizes, NG25 up to NG100
- Shut-off function

TEP040



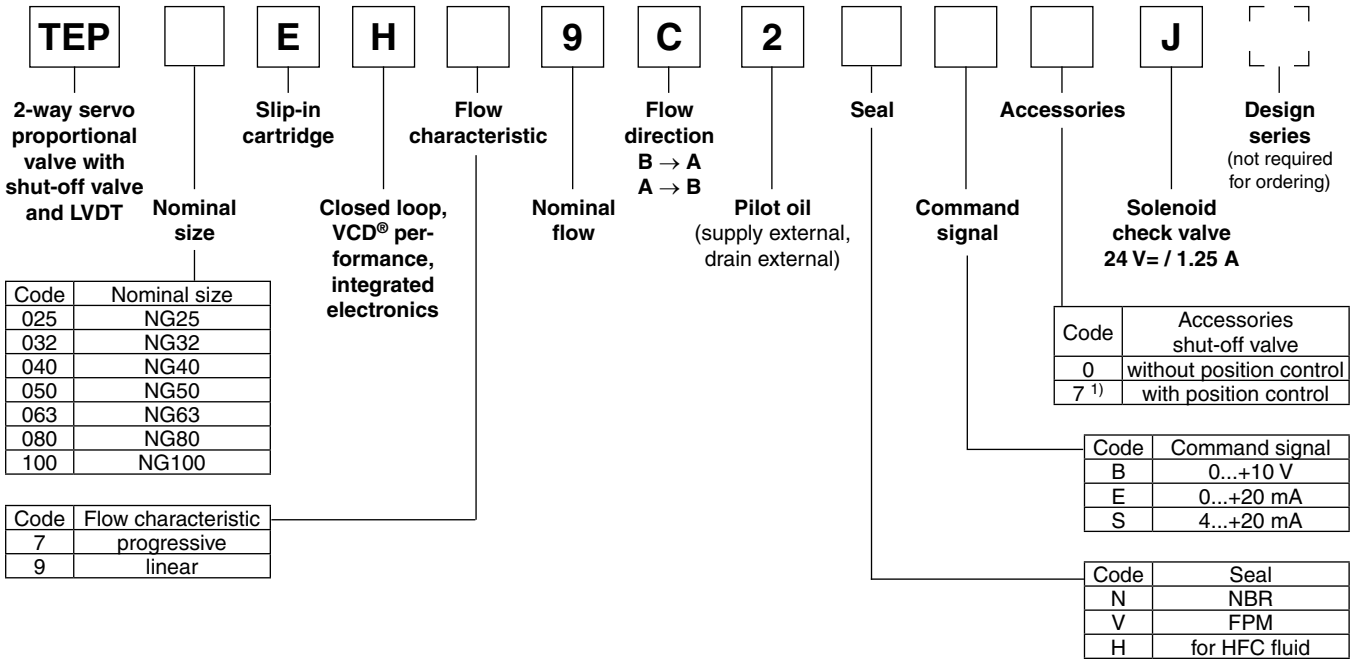
Function symbol



1) NG25 and NG32 without accu port XX and without port MA, MB and MY.
2) NG25 without suction port SP.

Ordering Code / Performance Curves

Ordering code



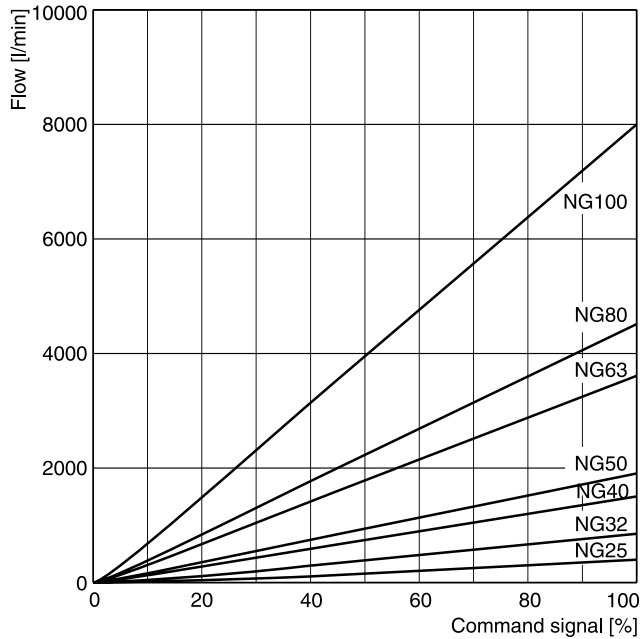
The DFplus pilot valve is also available with EtherCAT interface, see chapter 3, D*FP and D*1FP with EtherCAT.

Please order connector separately.
Angle female connector must be used for NG25 to NG50.

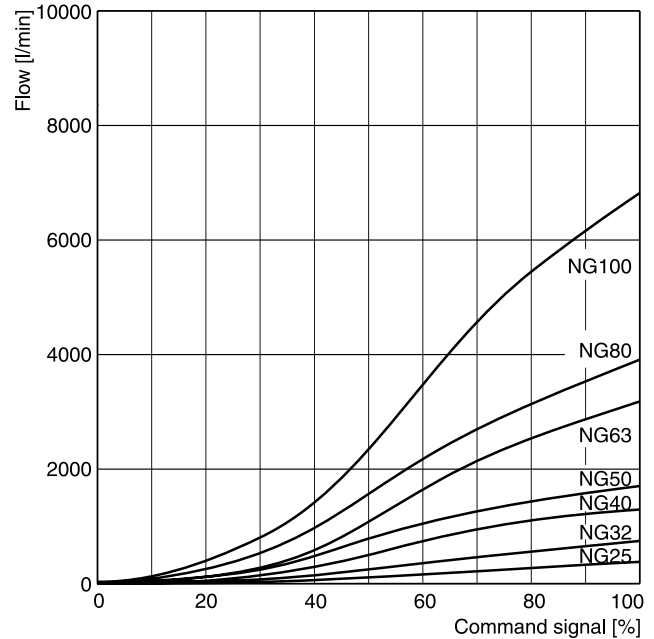
Characteristic flow/signal line

Δp = 5 bar

Linear (code 9)



Progressive (code 7)



Opening point factory set to 3 %

Characteristic curve measured with HLP46 at 50 °C.

Flow at different Δp $Q_{actual} = Q_{nominal} \cdot \sqrt{\Delta p_{actual} / \Delta p_{nominal}}$

¹⁾ Please order female connector M12x1 separately (see accessories, directional control valves, female connector M12x1 (order no.: 5004109).

Technical Data

General								
Design	Proportional throttle valve with LVDT and integrated electronics, slip-in cartridge according to ISO 7368							
Nominal size	DIN	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Mounting position	unrestricted							
Ambient temperature	[°C]	-20...+50						
MTTF _D value ¹⁾	[years]	75						
Weight	[kg]	11	13	15	26	52	105	157
Vibration resistance	[g]	10 sinus 5...2000 Hz acc. IEC 68-2-6 30 random noise 20...2000 Hz acc. IEC 68-2-36 15 shock acc. IEC 68-2-27						
Hydraulic								
Max. operating pressure	[bar]	Ports A, B, X and SP up to 350; XX observe accumulator pressure rating; port Y: max. 35						
Fluid	Hydraulic oil according to DIN 51524							
Fluid temperature	[°C]	-20...+60 (NBR: -25...+60)						
Viscosity recommended	[cSt] / [mm ² /s]	30 ... 80						
Viscosity permitted	[cSt] / [mm ² /s]	20 ... 400						
Filtration	ISO 4406; 18/16/13							
Nominal flow at Δp= 5 bar (linear)	[l/min]	420	850	1500	1900	3600	4500	8000
Recommended max. flow (linear)	[l/min]	800	2000	3000	4500	8000	13000	20000
Nominal flow at Δp= 5 bar (progressive)	[l/min]	380	750	1300	1700	3200	3900	6800
Recommended max. flow (progressive)	[l/min]	700	1750	2600	4000	7000	11250	17000
Flow direction	B to A / A to B							
Pilot pressure	[bar]	must be as high as system pressure						
Pilot oil supply	external via X							
Pilot oil drain	external via Y							
Leakage in pilot valve at 100 bar	[ml/min]	<400						
Pilot valve size	NG06				NG10			
Max. pilot flow at 140 bar pilot pr.	[l/min]	23	30	40	40	70	80	100
Static/dynamic								
(for optimal dynamics see installation recommendation)								
Step response at pilot press. >140 bar	[ms]	10.5	12	14	20	17	23	28
Frequency response at pilot press. >140 bar	[Hz]	95	80	74	66	52	46	41
Amplitude -3 dB; 10 % ±5 %	[Hz]	85	63	59	52	56	51	47
Phase -90°; 10 % ±5 %	[Hz]							
Hysteresis	[%]	< 0.1						
Sensitivity	[%]	< 0.05						
Temperature drift	[%/K]	< 0.025						
Electrical								
Duty ratio	[%]	100						
Protection class	IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)							
Supply voltage / ripple	[V]	DC 22 ... 30, electric shut-off at < 19, ripple < 5 % eff., surge free						
Current consumption max.	[A]	3.5						
Pre-fusing	[A]	4.0 A medium lag						
Input signal Code B Voltage	[V]	0...+10, ripple < 0.01 % eff., surge free						
Impedance	[kOhm]	100						
Code E Current	[mA]	0...+20, ripple <0.01 % eff., surge free						
Impedance	[Ohm]	< 250						
Code S Current	[mA]	4...20, ripple <0.01 % eff., surge free						
Impedance	[Ohm]	<3.6 mA = disable, >3.8 mA = enable on according to NAMUR NE43						
Differential input max.	[V]	30 for terminal D and E against PE (terminal G) 11 for terminal D and E against 0V (terminal B)						
Enable signal	[V]	5...30, Ri = >8 kOhm						
Diagnostic signal	[V]	0...+10 / +12.5 error detection, rated max. 5 mA						
EMC	EN 61000-6-2, EN 61000-6-4							
Electrical connection	6 + PE acc. EN 175201-804							
Wiring min.	[mm ²]	7 x 1.0 (AWG16) overall braid shield						
Wiring length max.	[m]	50						

¹⁾ If valves with onboard electronics are used in safety-related parts of control systems, in case the safety function is requested, the valve electronics voltage supply is to be switched off by a suitable switching element with sufficient reliability.



Installation recommendations

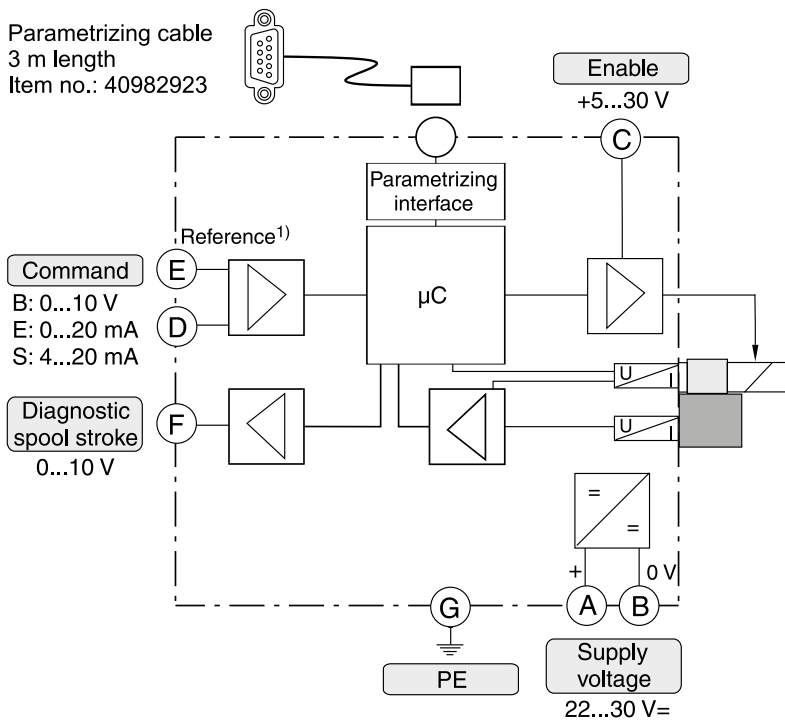
The maximum pilot flow is given in the technical data. At insufficient pilot oil supply - e.g. because of long distances and/or small diameters - an accumulator can be connected to port XX. See selection guide for correct dimensions.

Selection guide

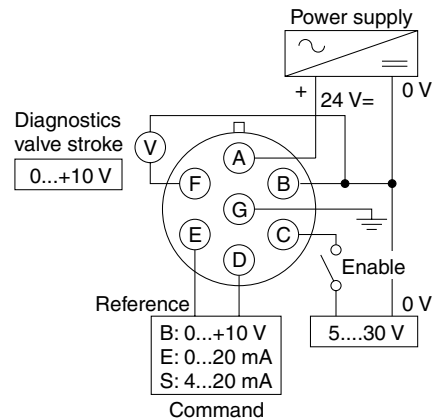
Size	Capacity [l]	Product type	Max. operating pressure [bar]	Recommended precharge pressure [bar]	Accu port XX
NG40	0.243	ADE016-25R	250	126	G ½
NG50	0.243	ADE032-21R	210	126	G ½
NG63	0.405	ADE050-21R	210	126	G ¾
NG80	0.647	ADE075-21R	210	126	G ¾
NG100	0.944	ADE100-21R	210	126	G ¾

Maximum operating pressure and precharge pressure of the accumulator must be adapted to the pilot pressure.

Block circuit diagram electronics

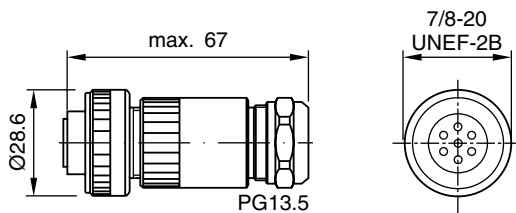


Connection diagrams electronics



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Female connector for NG63 to NG100
 (EMC conform)

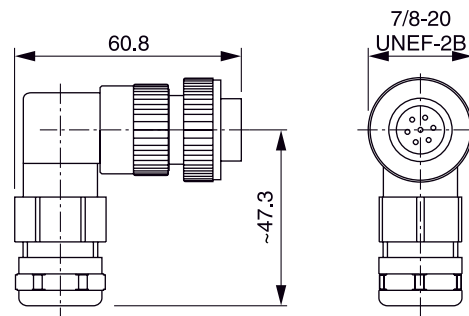


ID no. 5004072

Please order plugs separately.

¹⁾ Do not connect with the supply voltage zero.

Angle female connector for NG25 to NG50
 (EMC conform)



ID no. 5005160

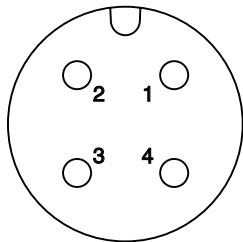
Single solenoid valve

Electrical characteristics of position control as per IEC 61076-2-101 (M12x1)

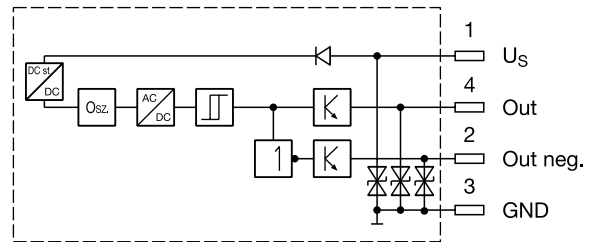
Supply voltage	[VDC]	24
Tolerance supply voltage	[%]	±20
Ripple supply voltage	[%]	≤10
Polarity protection	[V]	300
Current consumption without load	[mA]	≤20
Switching hysteresis	[mm]	<0.06
Max. output current per channel, ohmic	[mA]	250
Ambient temperature	[°C]	-20 ... +60
Protection		IP65 acc. EN 60529 (with correctly mounted plug-in connector)
Min. distance to next AC solenoid	[m]	0.1
Interface		M12x1 to IEC 61076-2-101
CE conform		EN 61000-4-2 / EN 61000-4-4 / EN 61000-4-6 ¹⁾ / ENV 50140 / ENV 50204

¹⁾ Only guaranteed with screened cable and female connector

M12 pin assignment



- 1 + U_S 19.2...28.8 V
- 2 Out B: normally open
- 3 0V
- 4 Out A: normally closed

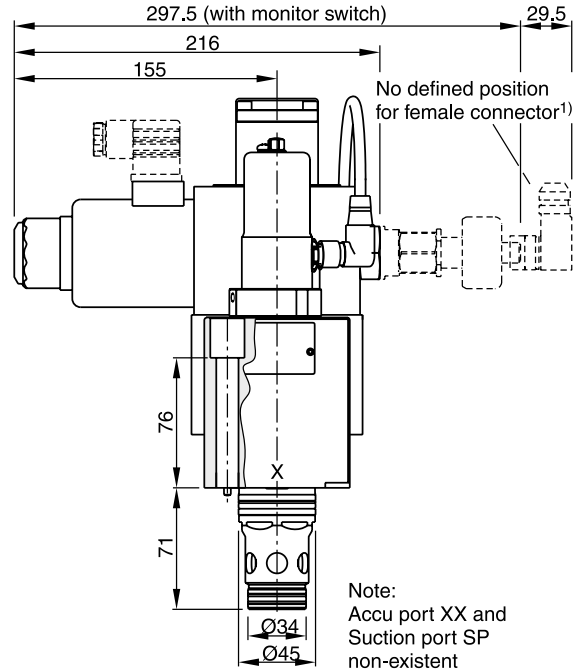
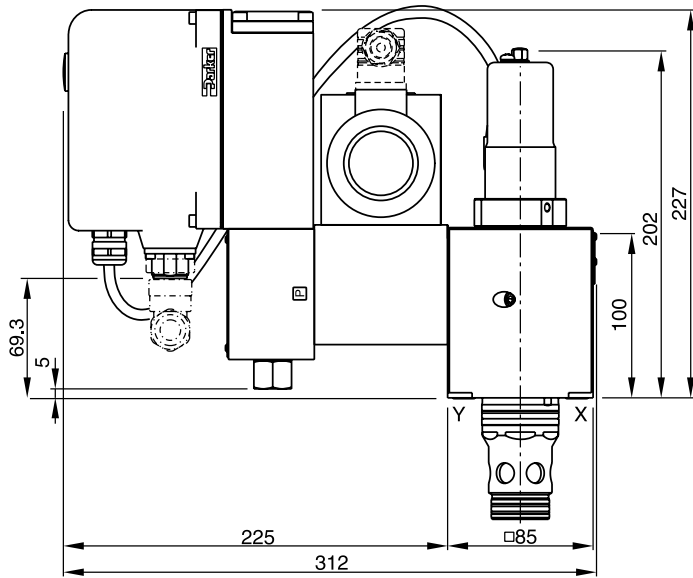


Outputs: Open collector

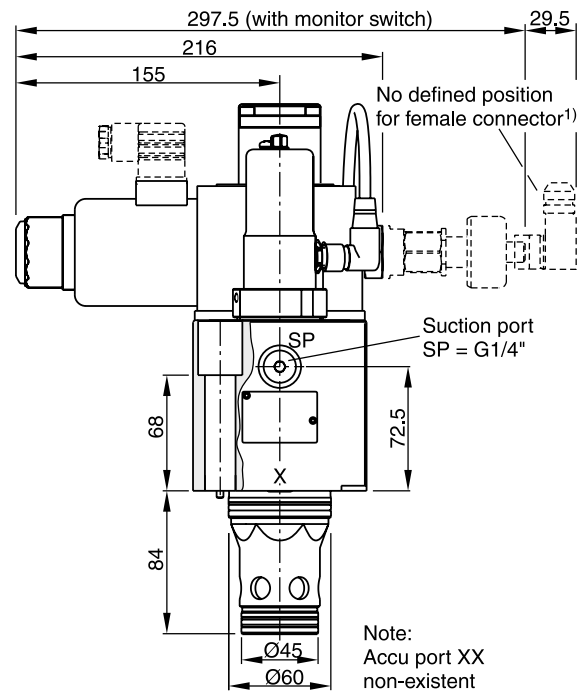
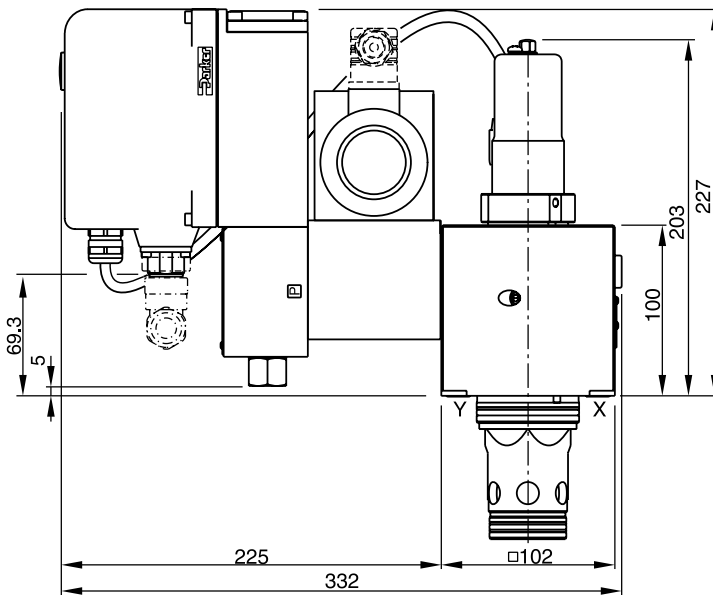
Please order female connector M12x1 separately (see accessories, directional control valves, female connector M12x1 (order no.: 5004109).

Dimensions

NG25

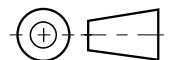


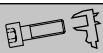


NG32



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Suction port SP: Contact Parker for installation recommendation.

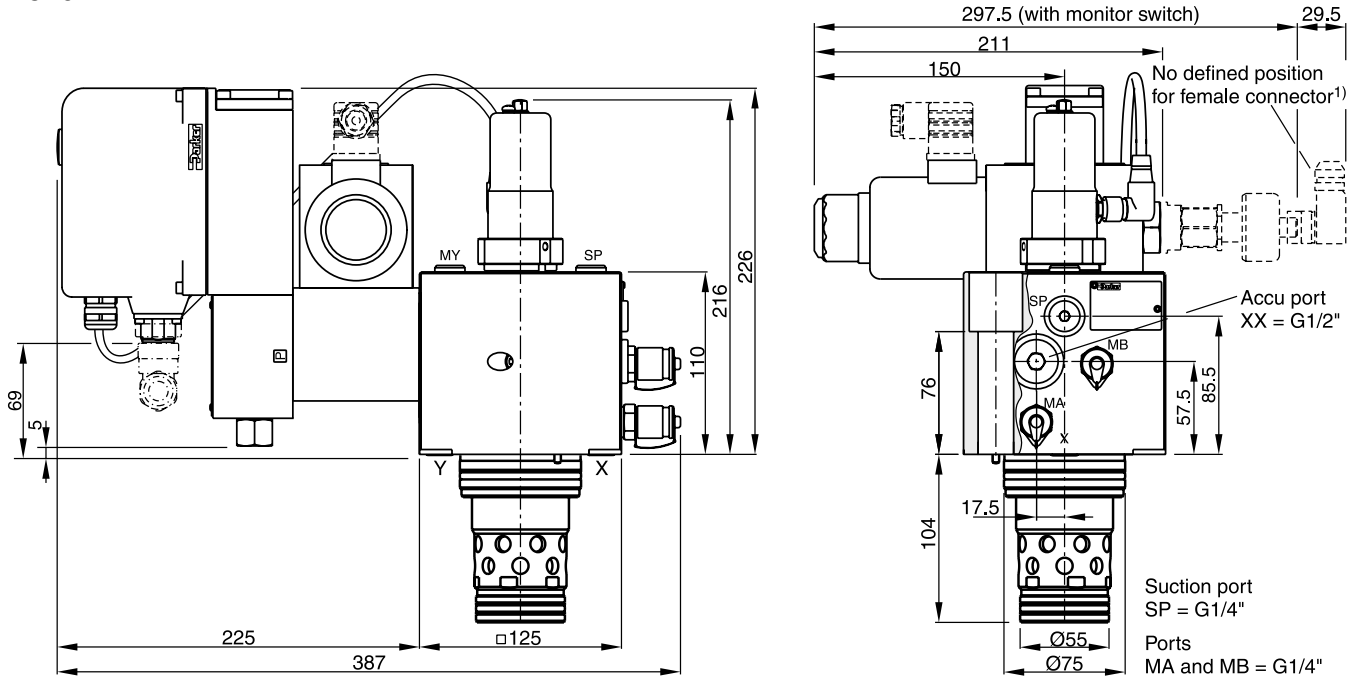


NG	Bolt kit - 		NBR	Kit 	FPM
25	BK504 4 x M12x100 ISO 4762-12.9	108 Nm	SK-TEP025EN		SK-TEP025EV
32	BK529 4 x M16x100 ISO 4762-12.9	264 Nm	SK-TEP032EN		SK-TEP032EV

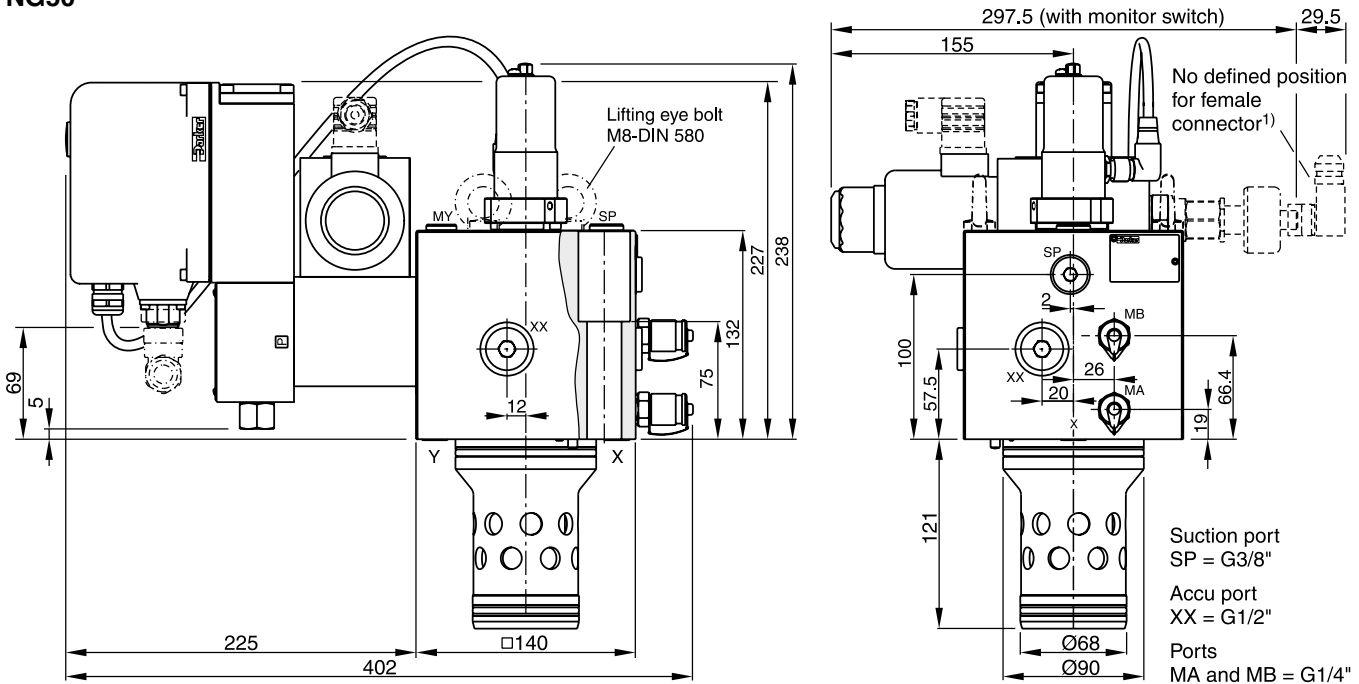
¹) Please order female connector M12x1 separately (see accessories, directional control valves, female connector M12x1 (order no.: 5004109).

Dimensions

NG40






NG50



Lifting thread for disassembly M12

Suction port SP: Contact Parker for installation recommendation.

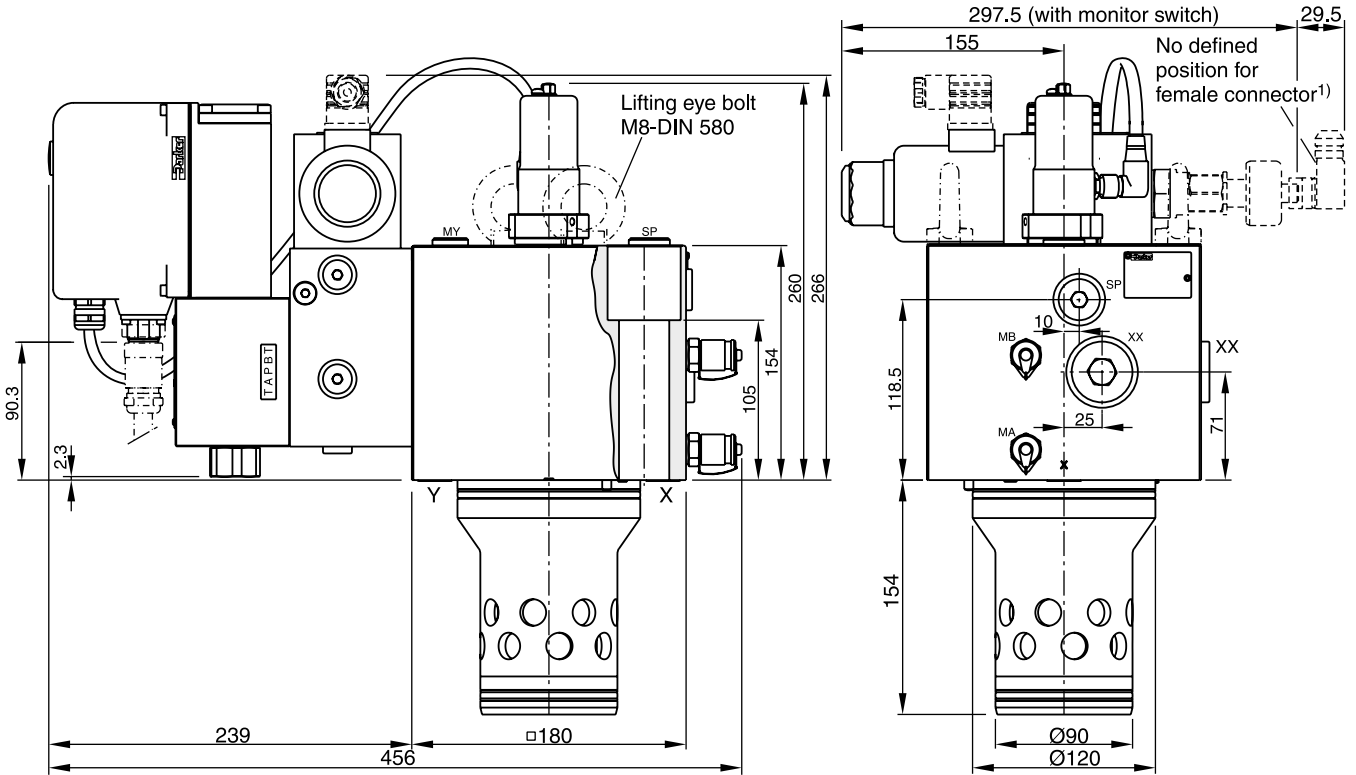


NG	Bolt kit - 		NBR	Kit 	FPM
40	BK481 4 x M20x110 ISO 4762-12.9	517 Nm	SK-TEP040EN		SK-TEP040EV
50	BK481 4 x M20x110 ISO 4762-12.9	517 Nm	SK-TEP050EN		SK-TEP050EV

¹⁾ Please order female connector M12x1 separately (see accessories, directional control valves, female connector M12x1 (order no.: 5004109).

Dimensions

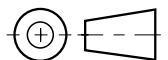
NG63

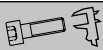




Suction port Accu port Ports
 SP = G1/2" XX = G3/4" MA and MB = G1/4"
 Lifting thread for disassembly M12

8

Suction port SP: Contact Parker for installation recommendation.

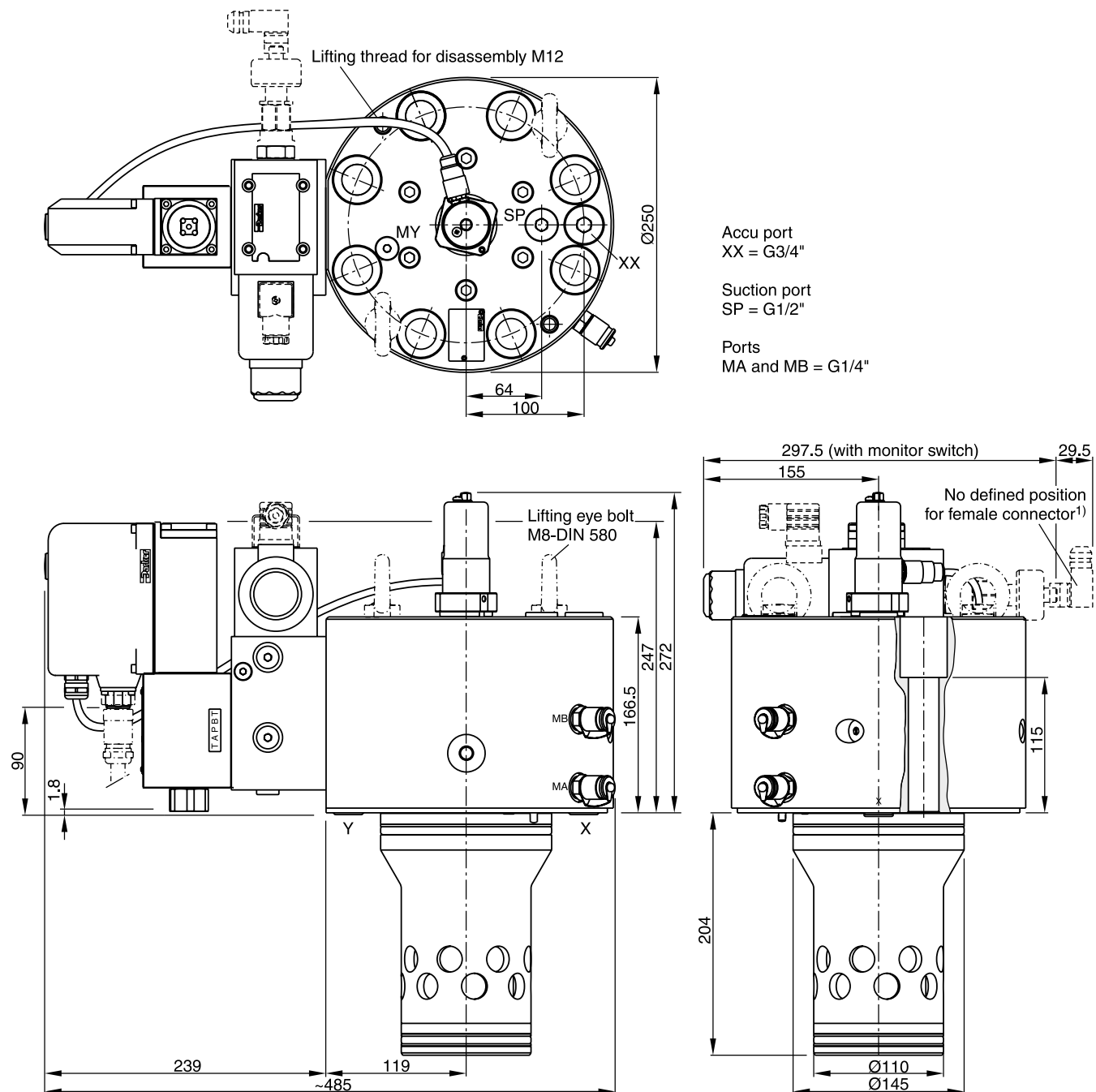


NG	Bolt kit - 		NBR	 Kit	FPM
63	BK518 4x M30x160 ISO 4762-12.9	1775 Nm	SK-TEP063EN		SK-TEP063EV

¹⁾ Please order female connector M12x1 separately (see accessories, directional control valves, female connector M12x1 (order no.: 5004109).

Dimensions

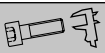

NG80



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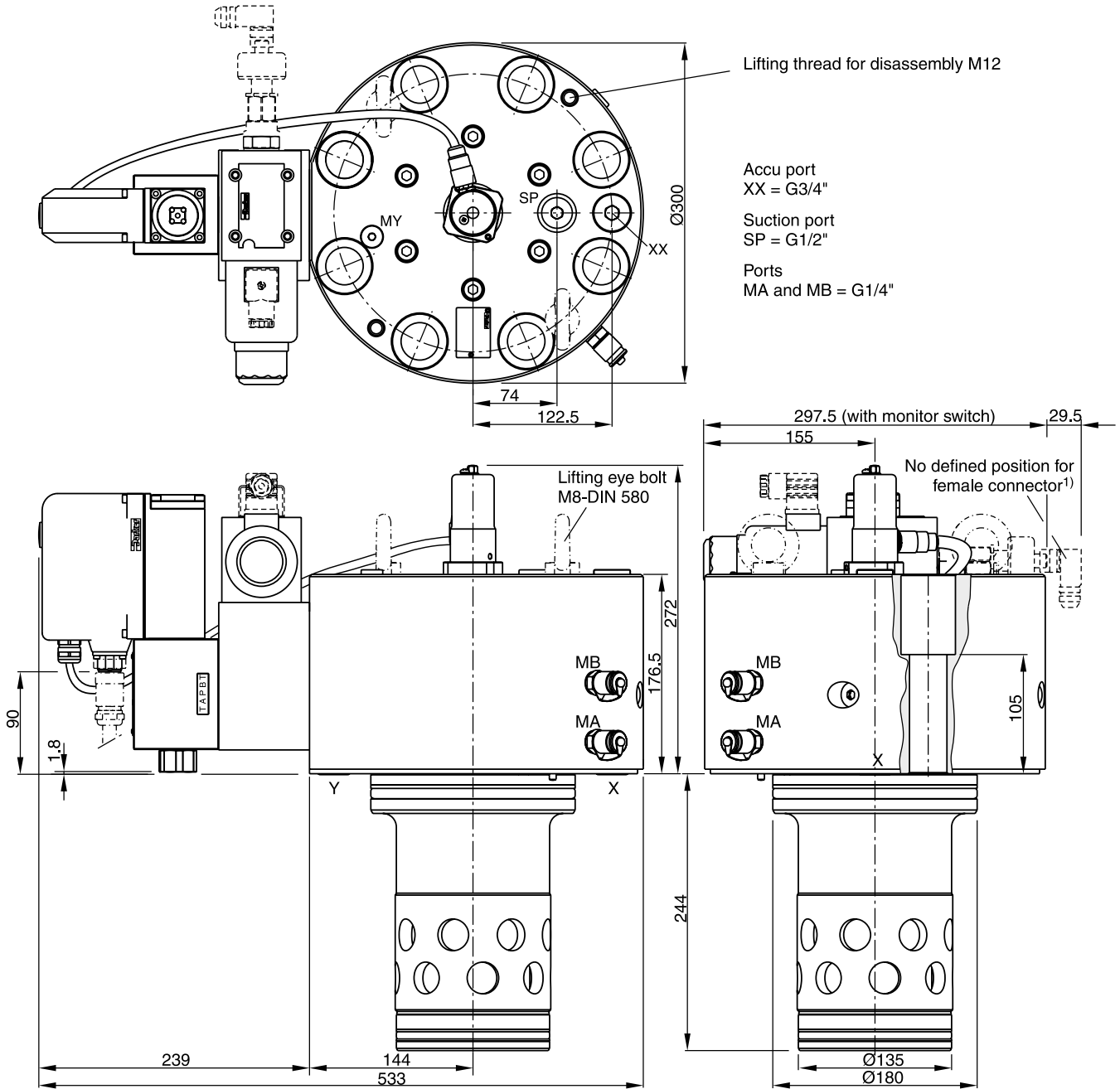
Suction port SP: Contact Parker for installation recommendation.



NG	Bolt kit - 		NBR	Kit	FPM
80	BK530 8x M24x160 ISO 4762-12.9	890 Nm	SK-TEP080EN		SK-TEP080EV

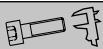


¹⁾ Please order female connector M12x1 separately (see accessories, directional control valves, female connector M12x1 (order no.: 5004109).

NG100



Suction port SP: Contact Parker for installation recommendation.



NG	Bolt kit - 		NBR	Kit 	FPM
100	BK531 8x M30x150 ISO 4762-12.9	1775 Nm	SK-TEP100EN		SK-TEP100EV

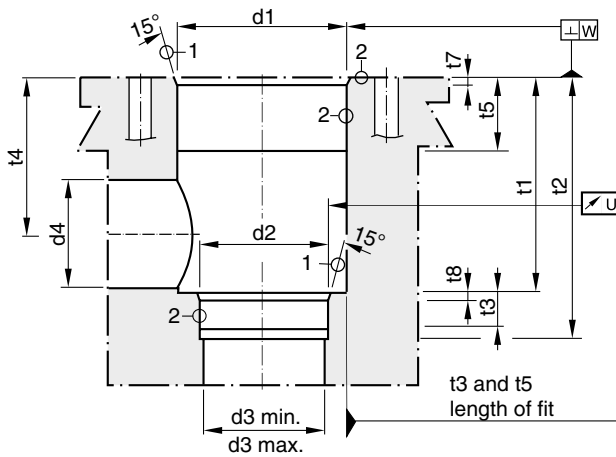
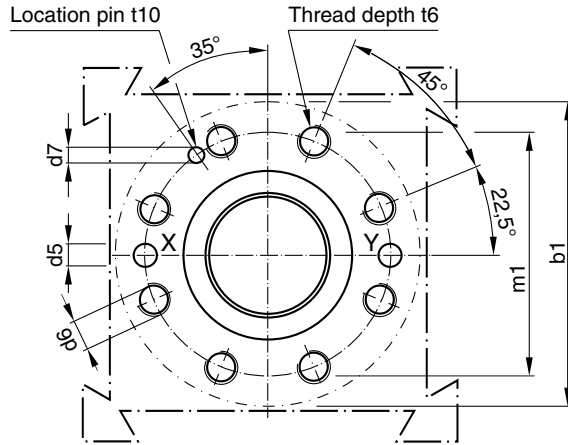
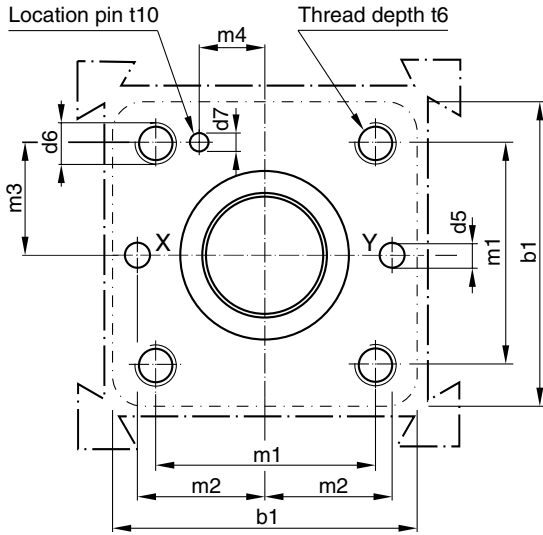
¹⁾ Please order female connector M12x1 separately (see accessories, directional control valves, female connector M12x1 (order no.: 5004109).

Dimensions

**2-Way Servo Prop. Valve with Shut-off Valve
Series TEP**

Code: ISO 7368-B*-2-A/B
NG25 to NG63

Code: ISO 7368-B*-2-A
NG80 to NG100



Required surface finish:

① = $\sqrt{R_{max} 16}$, ② = $\sqrt{R_{max} 8}$

Deviating from ISO 7368 it is advisable to increase the diameters d3, d4 and d5.

Size	b1	d1 H7	d2 H7	d3 / d4	d3 max	d4 max ¹⁾	d5	d6	d7 H13	m1±0.2	m2±0.2	m3±0.2
25	85	45	34	25	27	32	6	M 12	4	58	33	29
32	102	60	45	32	44	50	8	M 16	6	70	41	35
40	125	75	55	40	54	63	10	M 20	6	85	50	42.5
50	140	90	68	50	67	80	10	M 20	8	100	58	50
63	180	120	90	63	89	100	12	M 30	8	125	75	62.5
80	250	145	110	80	109	110	16	M 24	10	200	—	—
100	300	180	135	100	134	150	20	M 30	10	245	—	—

Size	m4±0.2	t1+0.5	t2+1	t3	t4	t4 max ¹⁾	t5	t6	t7	t8	t10	U	W
25	16	58	72	12	44	40.5	30	35	25	25	10	0.03	0.05
32	17	70	85	13	52	44	15	35	2.5	2.5	10	0.03	0.1
40	23	87	105	15	64	54	15	45	3	3	10	0.05	0.1
50	30	100	122	17	72	59	17	45	4	3	10	0.05	0.1
63	38	130	155	20	95	78	19	65	4	4	10	0.05	0.2
80	—	175	205	25	130	115	32	50	5	5	10	0.05	0.2
100	—	210	245	29	155	133	32	53	5	5	10	0.05	0.2

¹⁾ d4max only in combination with t4max.