

Characteristics

The 3-way servo proportional valve with VCD technology series TPQ are used in applications where high flow has to be precisely controlled at maximum dynamics. Typical applications are die casting, injection moulding and hydraulic presses.

Function

TPQ has a 2-stage design consisting of a DFplus pilot valve and a main stage with spool and LVDT.

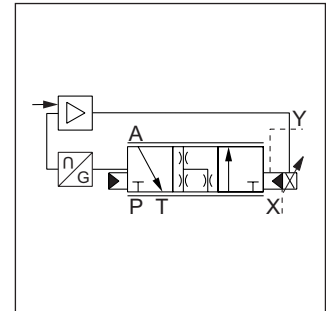
With the DFplus pilot valve the TPQ achieves extremely fast response times: from 7 ms (NG25) up to 20 ms (NG80) with an accuracy of <0.1 % of the nominal flow. The pilot valve actively controls the spool – independent of the pressure conditions in the main ports.

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 TPQ has two control loops for the main cone and the pilot spool.



TPQ 040



Features

- Active pilot operated 3-way servo proportional valve
- Cavity according to Parker house norm
- Fast step response
- Flow direction A to T
- Completely mounted adapted unit with integrated electronics
- In order to ensure the basic position, pilot pressure is required
- IO-Link interface for parametrizing
- RGB diode for optical status check
- NFC interface
- 6 sizes NG25 up to NG80



TPQ 040 P

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Basic position:

Zero position:

Function symbol
 Basic position spool type P

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

Ordering Code / Performance Curves

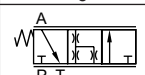
Ordering code

TPQ		W	H	2	6		2			0	
3-way servo proportional valve with LVDT	Nominal size	Parker Slip-in cartridge	Closed loop, VCD performance, integrated electronics	Linear spool	Nominal flow	Spool type	Pilot oil supply external, drain external	Seal	Input signal	Standard electronics	Design series (not required for ordering)

Code	Nominal size
025	NG25
032	NG32
040	NG40
050	NG50
063	NG63
080	NG80

Code	Signal range
B	0...±10 V
E	0...±20 mA
S	4...+20 mA

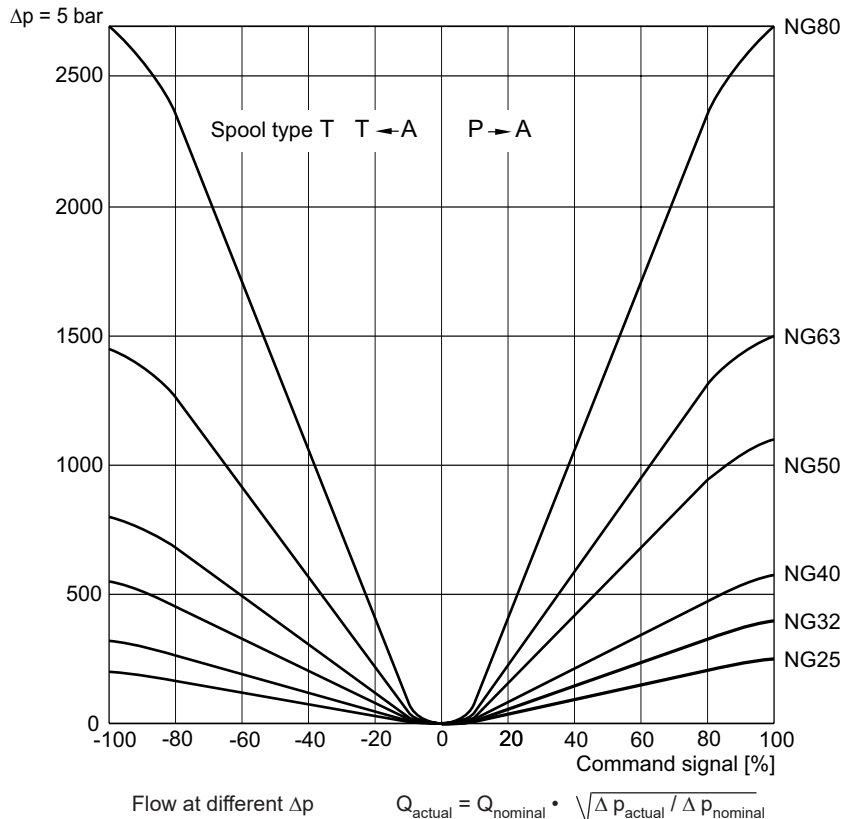
Code	Seal
N	NBR
V	FPM
H	for HFC fluid

Zerolap		
Code	Spool type	Basic position
	Input signal - 0 +	
T		A → T

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.
IO-LINK-MASTER-USB ordering number 40983544

Characteristic flow/signal line



Characteristic curve measured with HLP46 at 50 °C.

Technical Data

General								
Design	Proportional throttle valve, slip-in cartridge							
Nominal size	DIN	NG25	NG32	NG40	NG50	NG63	NG80	
Mounting position	unrestricted							
Ambient temperature	[°C]	-20...+60						
Weight	[kg]	11	13	15	26	52	105	
Vibration resistance	[g]	10 sinus 5...2000 Hz acc. IEC 60068-2-6 10 (RMS) random noise 20...2000 Hz acc. IEC 60068-2-64 15 shock acc. IEC 60068-2-27						
Hydraulic								
Max. operating pressure	[bar]	Ports A, P, T, X 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	[l/min]	250	400	600	1100	1550	2700	
Recommended max. flow	[l/min]	500	1000	1600	2250	3500	6500	
Nominal overlap	[%]	< 1.5						
Flow direction	A to T or P to A							
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						
Leakage in main stage at 100 bar	[l/min]	NG32 to 63 < 2.5; NG80 < 4.0						
Pilot valve size	NG06			NG10				
Max. pilot flow at 140 bar pilot press.	[l/min]	25	25	25	25	50	60	
Static/dynamic								
Step response at pilot press. >140 bar	[ms]	7	11	11	18	19	20	
Frequency response at pilot press. >140 bar	Amplitude -3 dB; ±5 %	[Hz]	210	105	70	45	35	30
	Phase -90°; ±5 %	[Hz]	170	125	110	95	75	70
Hysteresis	[%]	< 0.1						
Sensitivity	[%]	< 0.05						
Temperature drift of center position	[%/K]	< 0.025						
Interfaces								
IO-Link	IEC 61131-9							
NFC	ISO/IEC 15693 - NFC Forum Type 5 tag certified by the NFC Forum Frequency 13.56 MHz; -27.2 dBμA/m at 10 meters distance							
Electrical								
Duty ratio	[%]	100						
Protection class	IP65 in accordance with EN 60529 (with correctly mounted plug-in connector) 6 = Full protection against contact, dust tight 5 = Protection against water jets (nozzle) from any angle							
Supply voltage / ripple	[V]	24 nominal (tolerance range 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	+10...0...-10, ripple < 0.01 % eff., surge free					
		Impedance	[kOhm] 100					
	Code E	Current	+20...0...-20, ripple < 0.01 % eff., surge free					
		Impedance	[Ohm] < 250					
Code S	Current	[mA] 4...12...20, ripple < 0.01 % eff., surge free						
	Impedance	[Ohm] < 250						
Differential input max.	[V]	30 for terminal D and E against PE (terminal G),						
	[V]	11 for terminal D and E against 0V (terminal B)						
Enable signal	[V]	acc. EN 61131-2; Type 3; low -3...+5; High 11...30; input current 3 mA						
Diagnostic signal	[V]	+10...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]	7x1.0 (AWG16) overall braid shield						
Wiring length	[m]	50						

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Installation Recommendations / Electronics

Installation recommendation

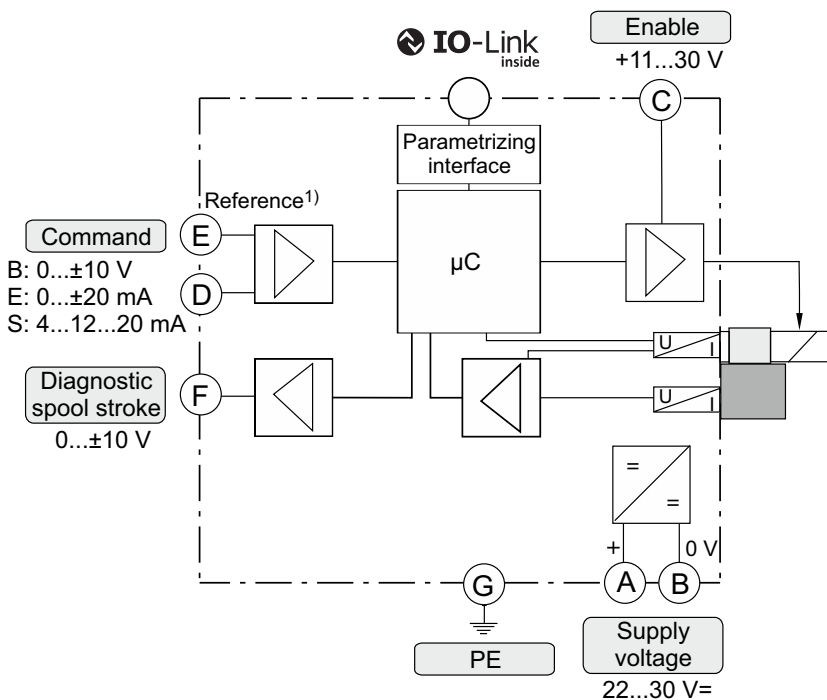
An insufficient pilot oil supply (e.g. due to long distances and/or small diameters) can negatively influence the dynamics of the TPQ valve.

To avoid this, an accumulator can be connected to port XX at the valve body of the TPQ. A short-term undersupply with pilot oil can be compensated via this accumulator.

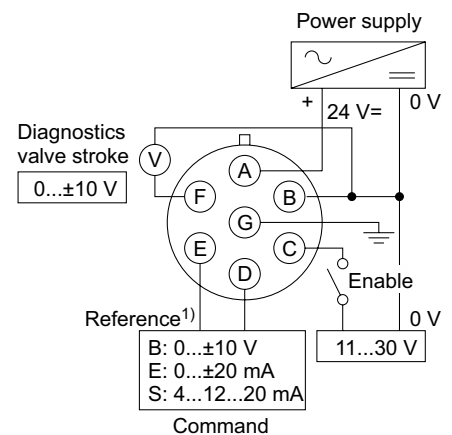
Sizing data: see operation manual.

Please also consider the Parker accumulator product range and the Parker Accumulator Sizing Software.

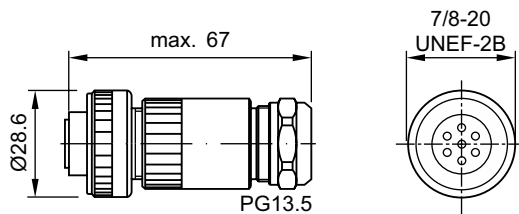
Block circuit diagram electronics



Connection diagrams electronics

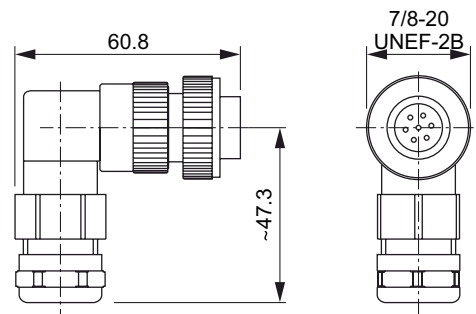


Female connector for NG63 to NG80
(EMC conform)



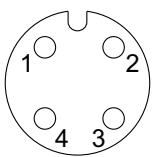
ID no. 5004072

Angle female connector for NG25 to NG50
(EMC conform)



ID no. 5005160

Pin assignment IO-Link (parametrizing) interface, M12 socket



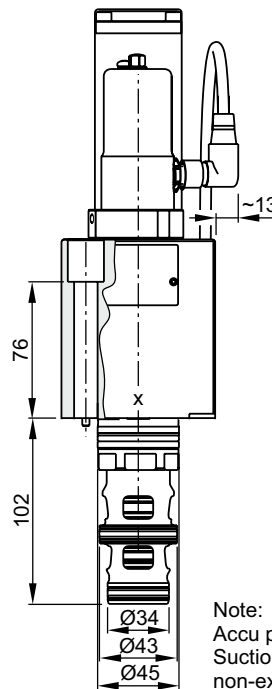
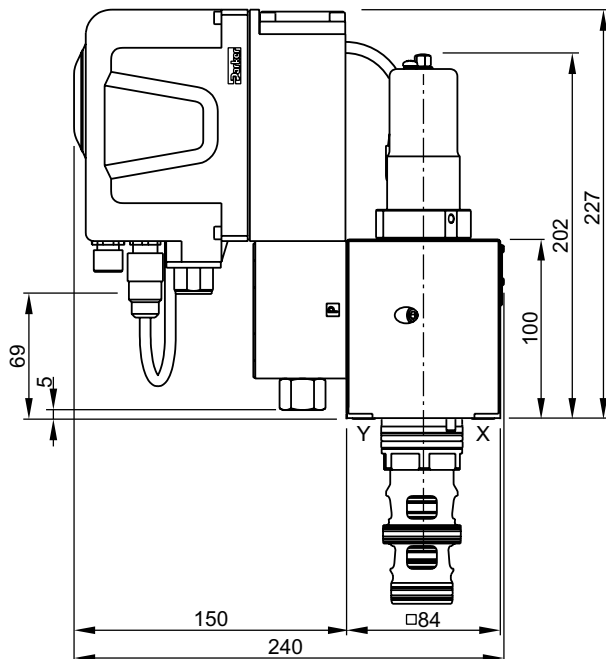
PIN assignment acc. IEC 60974-5-2

- Pin 1: 24 VDC
- Pin 3: GND
- Pin 4: IO-Link Communication (C/Q)

¹⁾ Do not connect with the supply voltage zero.

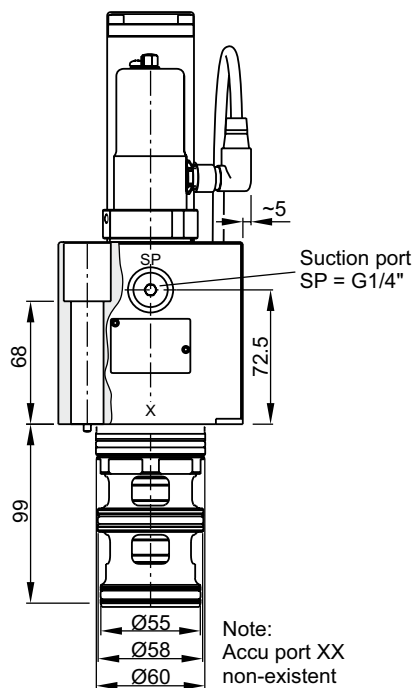
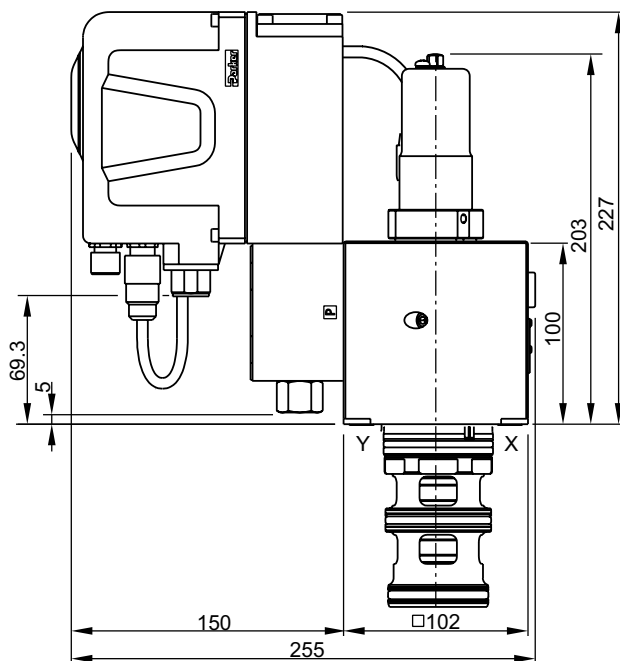
Please order plugs separately.

NG25



Note:
 Accu port XX and
 Suction port SP
 non-existent




NG32



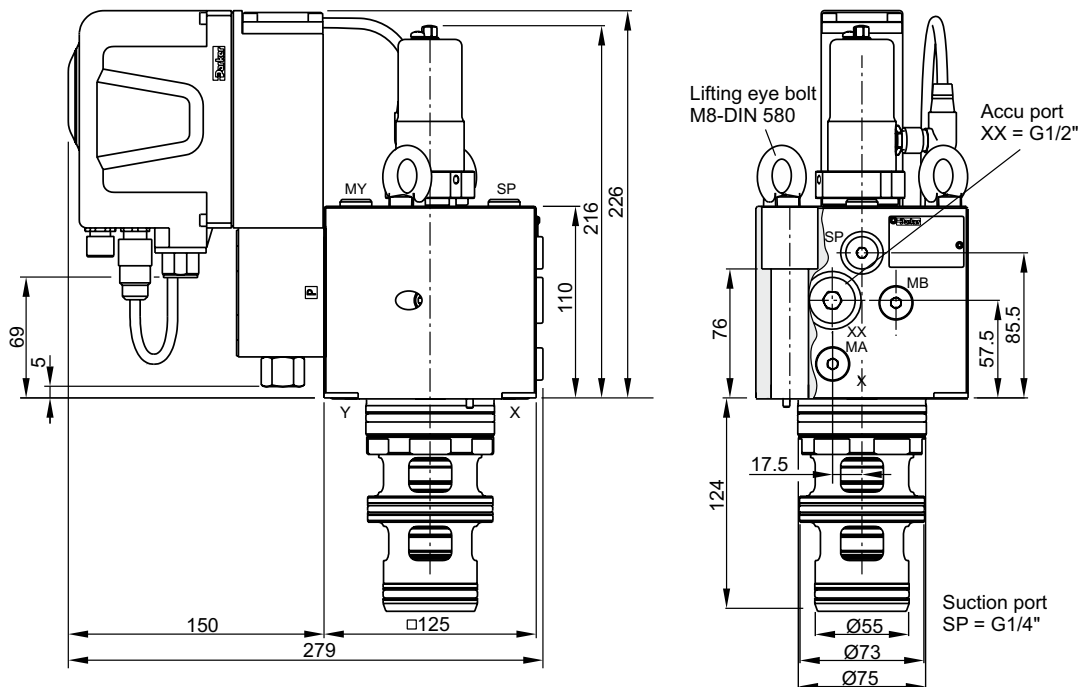
Note:
 Accu port XX
 non-existent



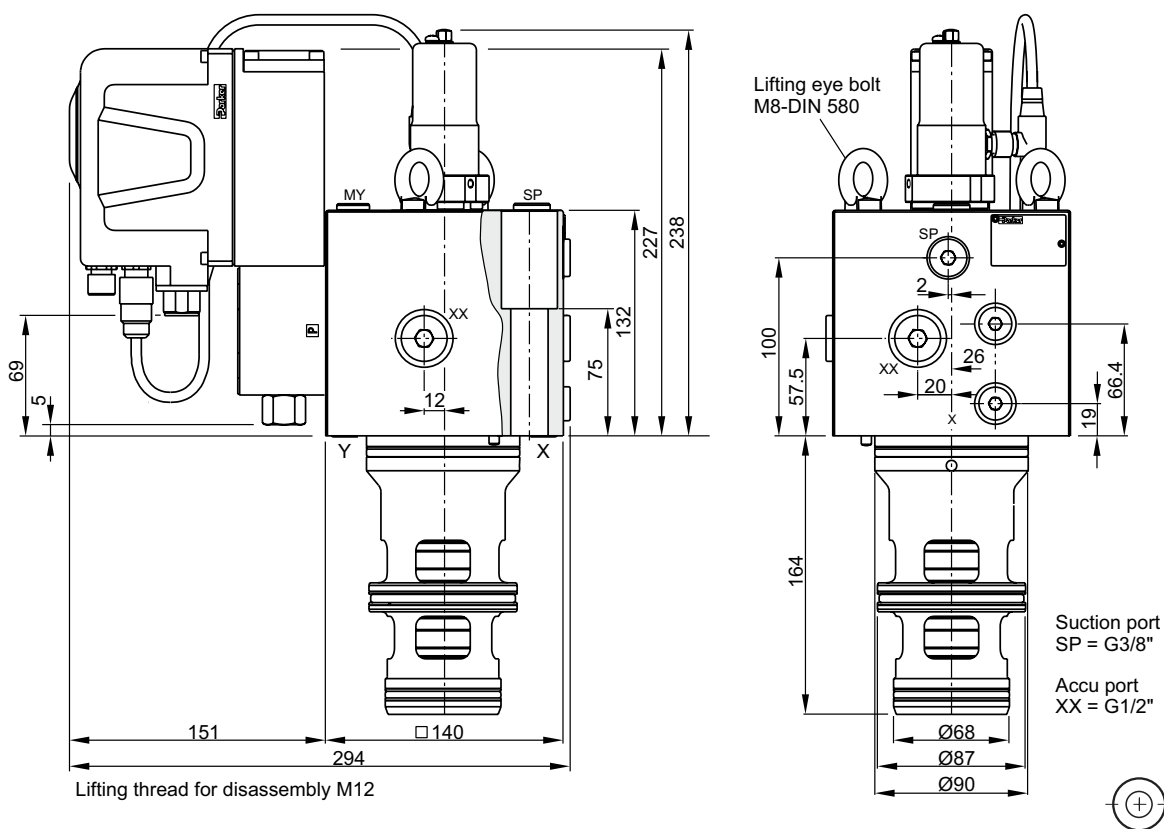
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NG	Bolt kit - 		NBR	Kit 	FPM
25	BK504 4x M12x100 ISO 4762-12.9	108 Nm	SK-TPQ025EN30		SK-TPQ025EV30
32	BK529 4x M16x100 ISO 4762-12.9	264 Nm	SK-TPQ032EN30		SK-TPQ032EV30

NG40



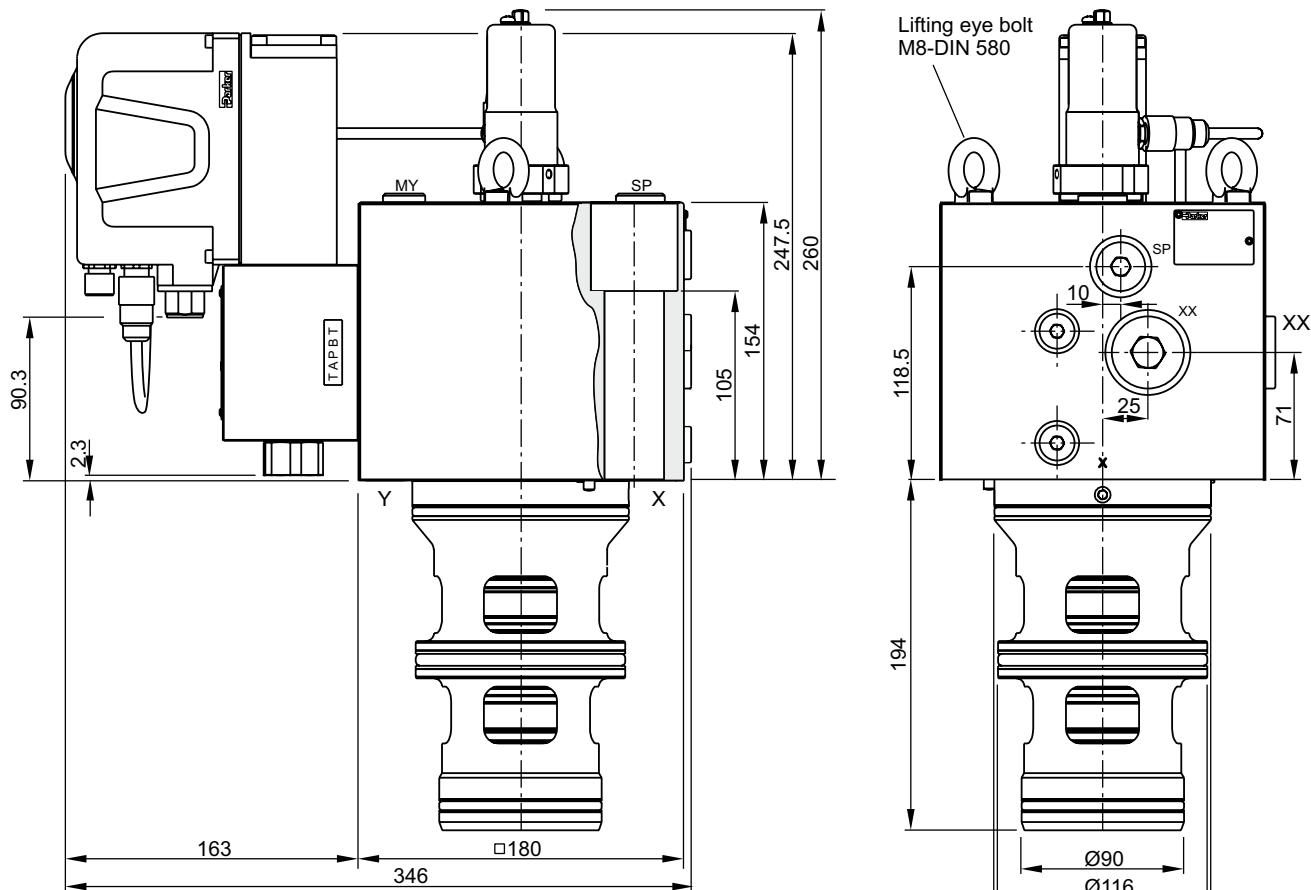
NG50



NG	Bolt kit - 		NBR	 Kit	FPM
40	BK481 4 x M20x110 ISO 4762-12.9	517 Nm	SK-TPQ040EN30		SK-TPQ040EV30
50	BK481 4 x M20x110 ISO 4762-12.9	517 Nm	SK-TPQ050EN30		SK-TPQ050EV30

Dimensions

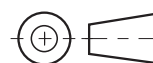
NG63

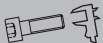




Suction port Accu port
SP = G1/2" XX = G3/4"

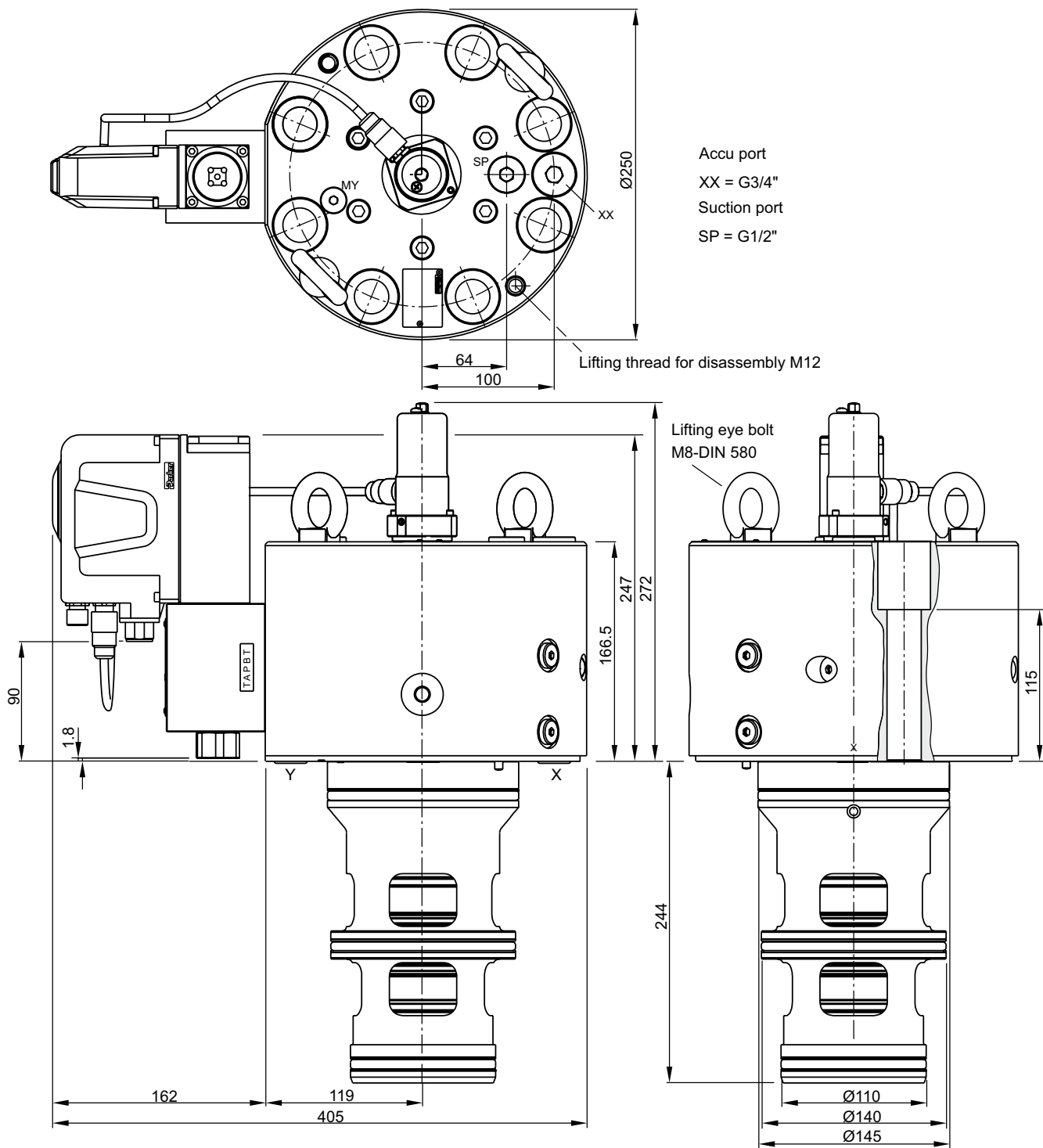
Lifting thread for disassembly M12




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NG	Bolt kit - 		NBR	Kit 	FPM
63	BK518 4x M30x160 ISO 4762-12.9	1775 Nm	SK-TPQ063EN30		SK-TPQ063EV30

NG80



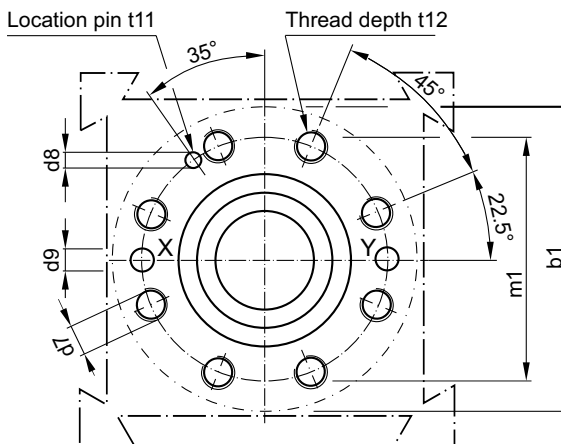
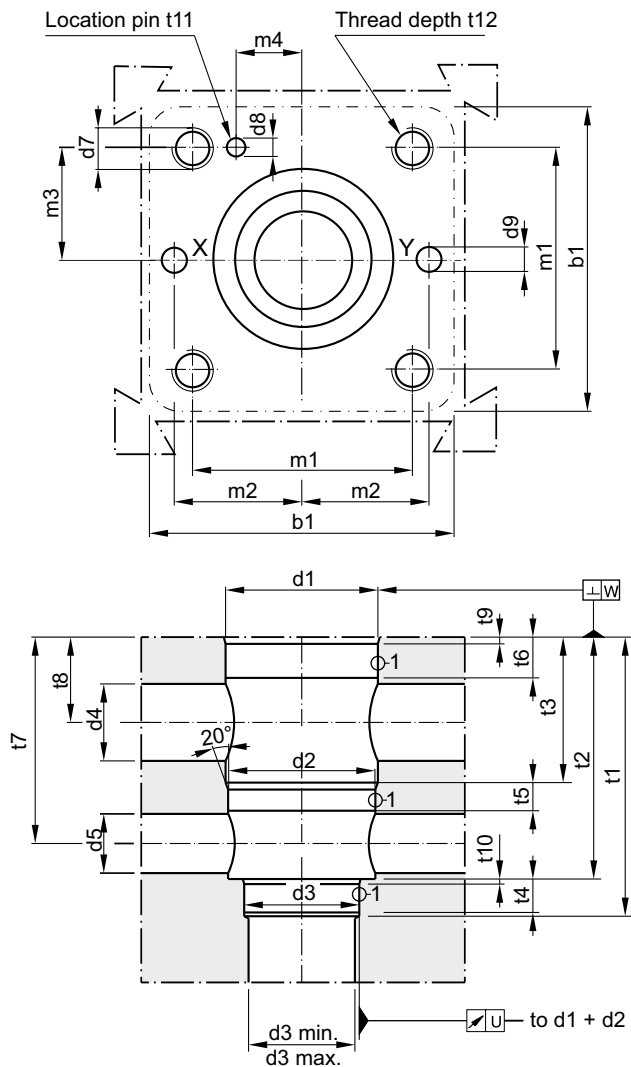
NG	Bolt kit - 		NBR	Kit 	FPM
80	BK530 8x M24x160 ISO 4762-12.9	890 Nm	SK-TPQ080EN30		SK-TPQ080EV30

Dimensions

**3-Way Servo Prop. Valve with VCD Technology
Series TPQ**

NG32 to NG63

NG80



Required surface finish:

$$\sqrt{R_{\max} 25}, \textcircled{1} = \sqrt{R_{\max} 8}$$

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Size	b1	d1 H7	d2 H7	d3 H7	d3 min.	d3 max.	d4 max.	d5 max.	d7	d8 H13	d9	U	W
25	85	45	43	34	17	25	25	21	M 12	4	7.5	0.03	0.05
32	102	60	58	55	32	54	28	28	M 16	6	8	0.03	0.1
40	125	75	73	55	40	54	38	32	M 20	6	10	0.05	0.1
50	140	90	87	68	50	67	63	38	M 20	8	10	0.05	0.1
63	180	120	116	90	63	89	64	52	M 30	8	12	0.05	0.2
80	250	145	140	110	80	109	70	66	M 24	10	16	0.05	0.2

Size	m1 ±0.2	m2 ±0.2	m3 ±0.2	m4 ±0.2	t1 ⁺³ / ₊₁	t2 ±0.2	t3 ±0.2	t4	t5	t6	t7 ±0.2	t8 ±0.2	t9	t10	t11	t12
25	58	33	29	16	103	89 ^{+0.3}	56	11.5	15	17	78	43.5	2.5x15°	2.5x15°	10	35
32	70	41	35	17	100	85	43	13.5	16	18	71	28.5	2.5x15°	2.5x15°	10	35
40	85	50	42.5	23	125	105	54	15	18	21	88	34	3x15°	3x15°	10	45
50	100	58	50	30	165	143	84.5	18	18	21	122	51.5	4x15°	3x15°	10	45
63	125	75	62.5	38	195	165	83.5	25	29.5	33	138.5	50	4x15°	4x15°	10	65
80	200	-	-	-	245	215	123	25	27	60	181	87	5x15°	5x15°	10	50