

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.

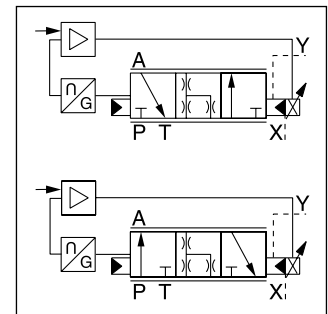
With the DFplus pilot valve the TPQ achieves extremely fast response times: from 7 ms (NG25) up to 20 ms (NG80) with an accuracy of <0.1 % of the nominal flow. The pilot valve actively controls the spool – independent of the pressure conditions in the main ports.

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

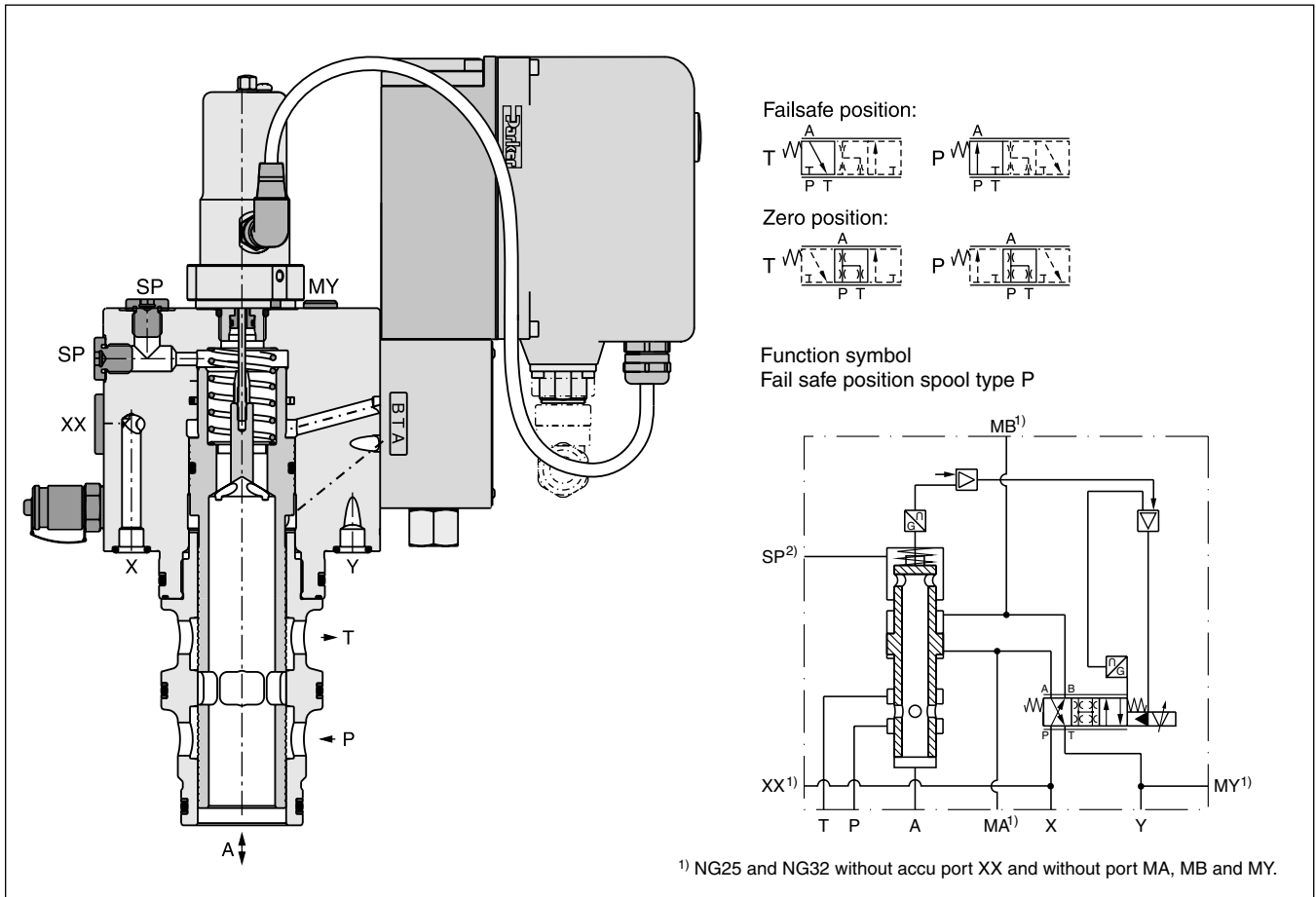


Features

- Active pilot operated 3-way servo proportional valve
- Cavity according to Parker house norm
- Fast step response
- Flow direction A to T and P to A
- Completely mounted adapted unit with integrated electronics
- In order to ensure the basic position, pilot pressure is required
- 6 sizes NG25 up to NG80

TPQ 040 P

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Ordering Code / Performance Curves

Ordering code

TPQ		W	H	2	5		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

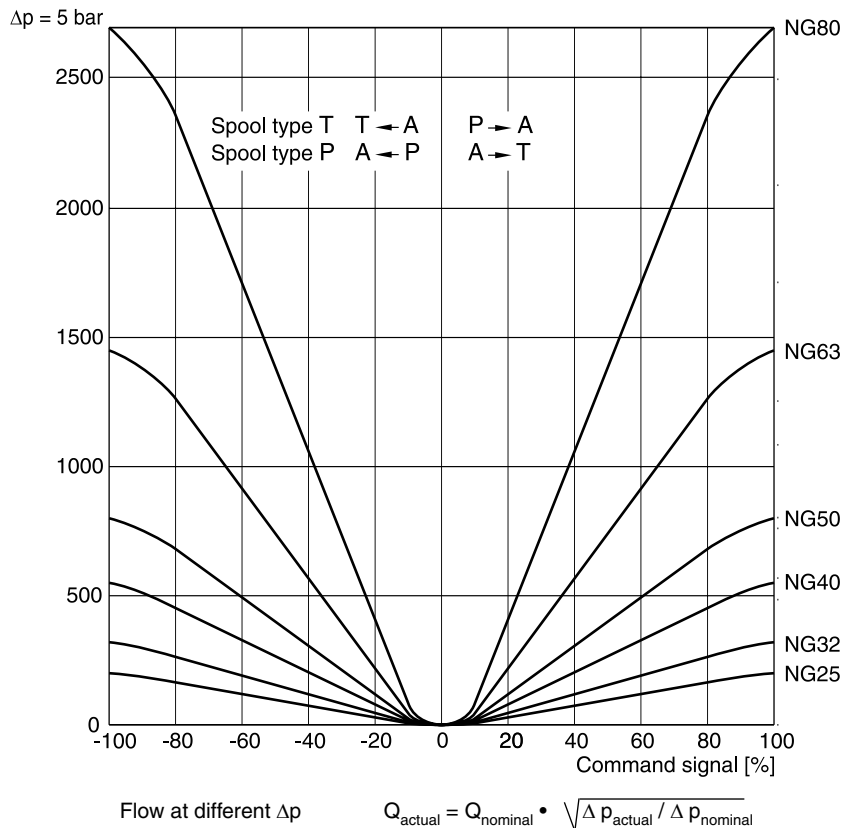
Zerolap		
Code	Spool type	Basic position
	Input signal - 0 +	
P		P → A
T		A → T

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.

Performance curves

Characteristic flow/signal line



Technical Data

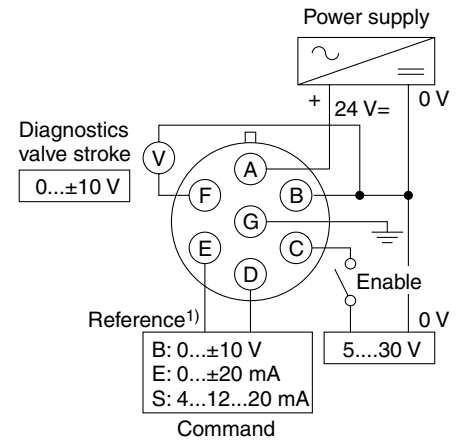
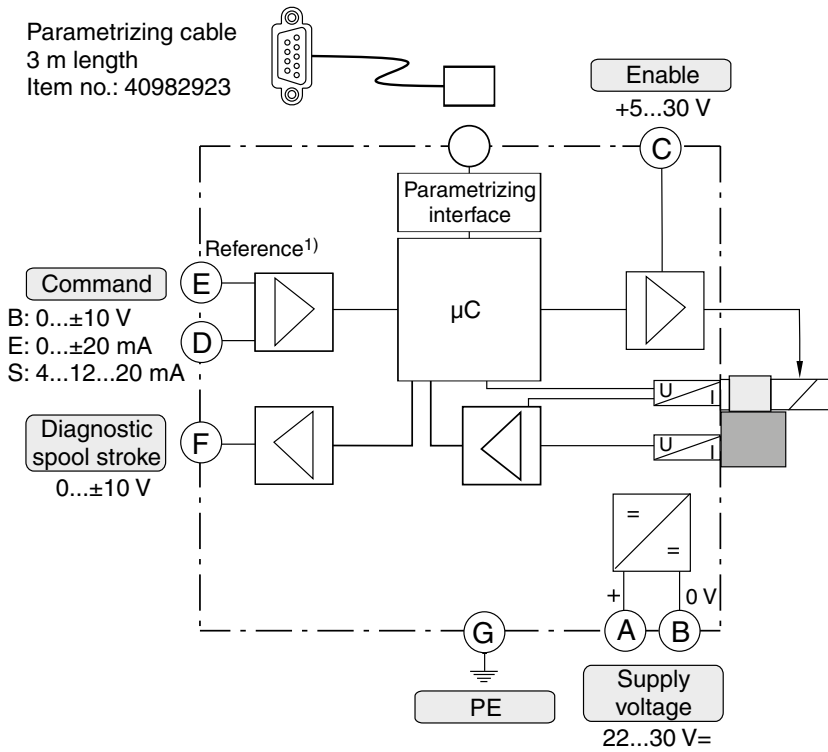
General						
Design	Proportional throttle valve, slip-in cartridge					
Nominal size	DIN	NG25	NG32	NG40	NG50	NG63 NG80
Mounting position	unrestricted					
Ambient temperature	[°C]	-20...+50				
MTTF _D value ¹⁾	[years]	75				
Weight	[kg]	11	13	15	26	52 105
Vibration resistance	[g]	10 sinus 5...2000 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, P, T, X up to 350, XX ²⁾ 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]	200	320	550	800	1450 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				
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	+10...0...-10, ripple < 0.01 % eff., surge free				
	Impedance	100				
Code E	Current	+20...0...-20, ripple < 0.01 % eff., surge free				
	Impedance	< 250				
Code S	Current	4...12...20, ripple < 0.01 % eff., surge free				
	Impedance	< 250				
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, R _i = > 8 kOhm				
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				

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.

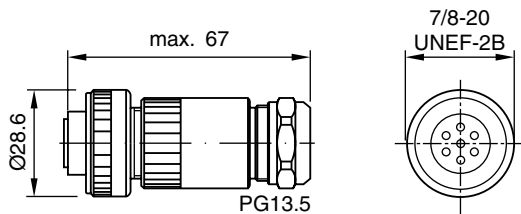
²⁾ Accu port XX: Please contact Parker for installation recommendation.

Block circuit diagram electronics

Connection diagrams electronics

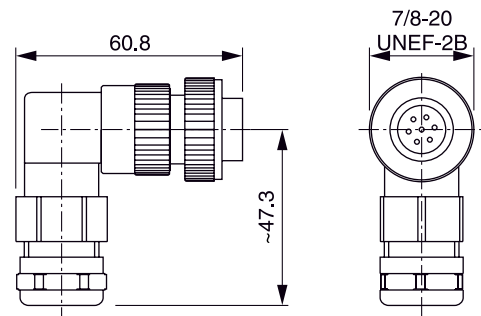


Female connector for NG63 to NG80
 (EMC conform)



ID no. 5004072

Angle female connector for NG25 to NG50
 (EMC conform)



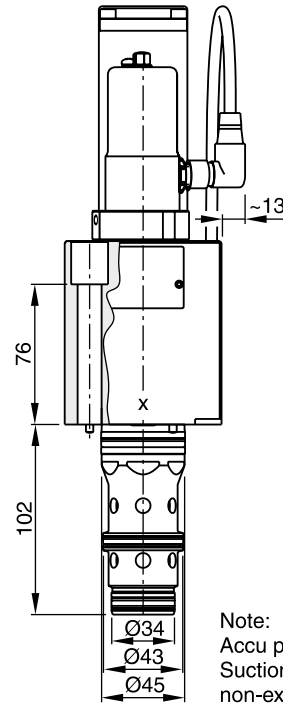
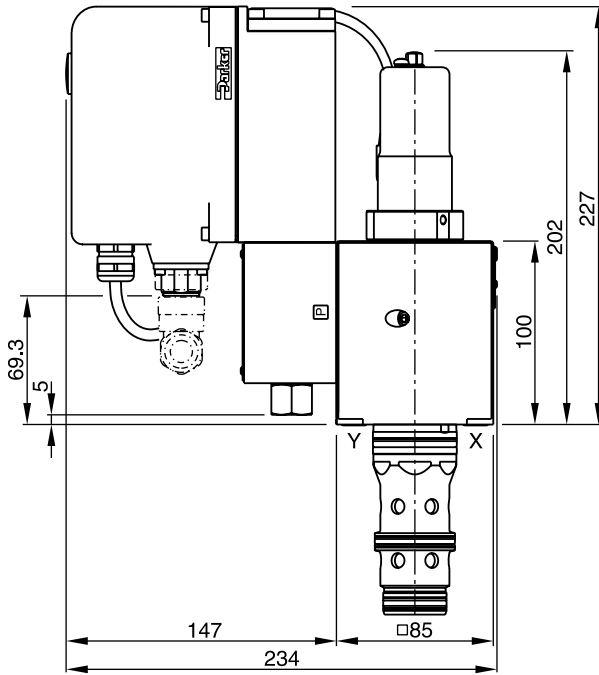
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Please order plugs separately.

¹⁾ Do not connect with the supply voltage zero.

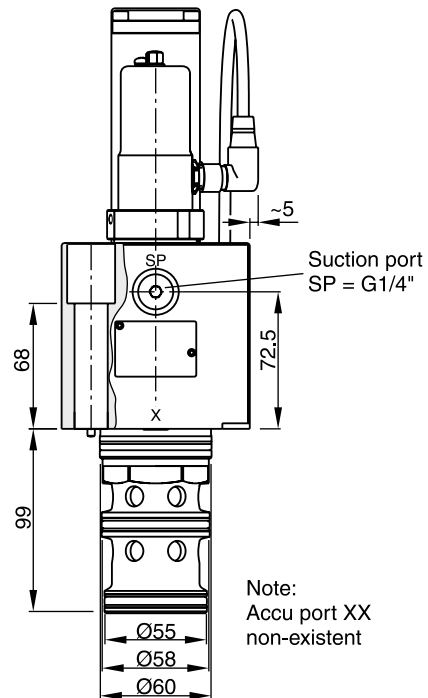
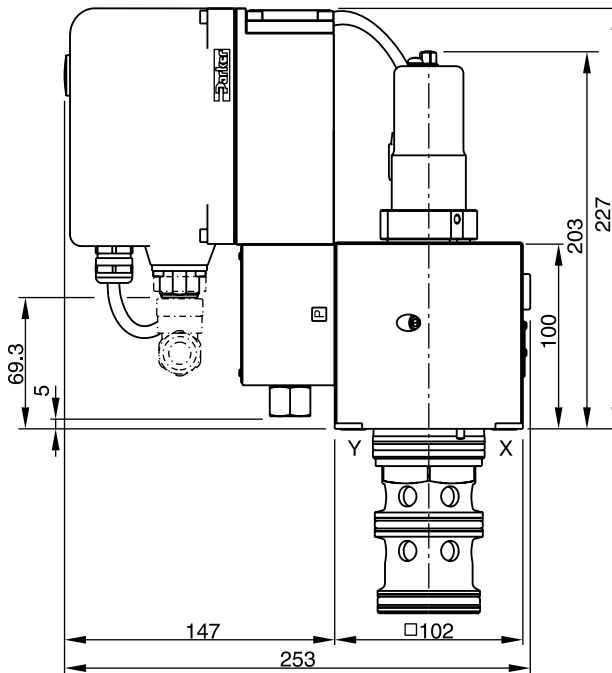
Dimensions

NG25

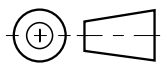





Note:
Accu port XX and
Suction port SP
non-existent

NG32

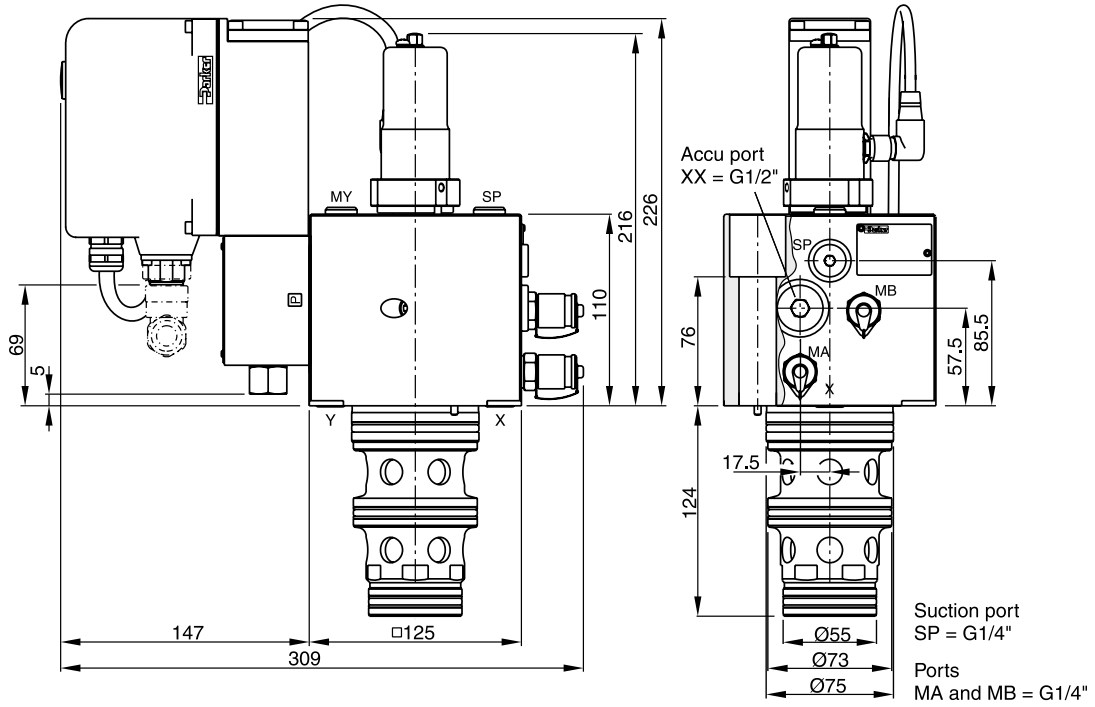


Note:
Accu port XX
non-existent

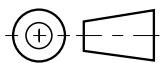
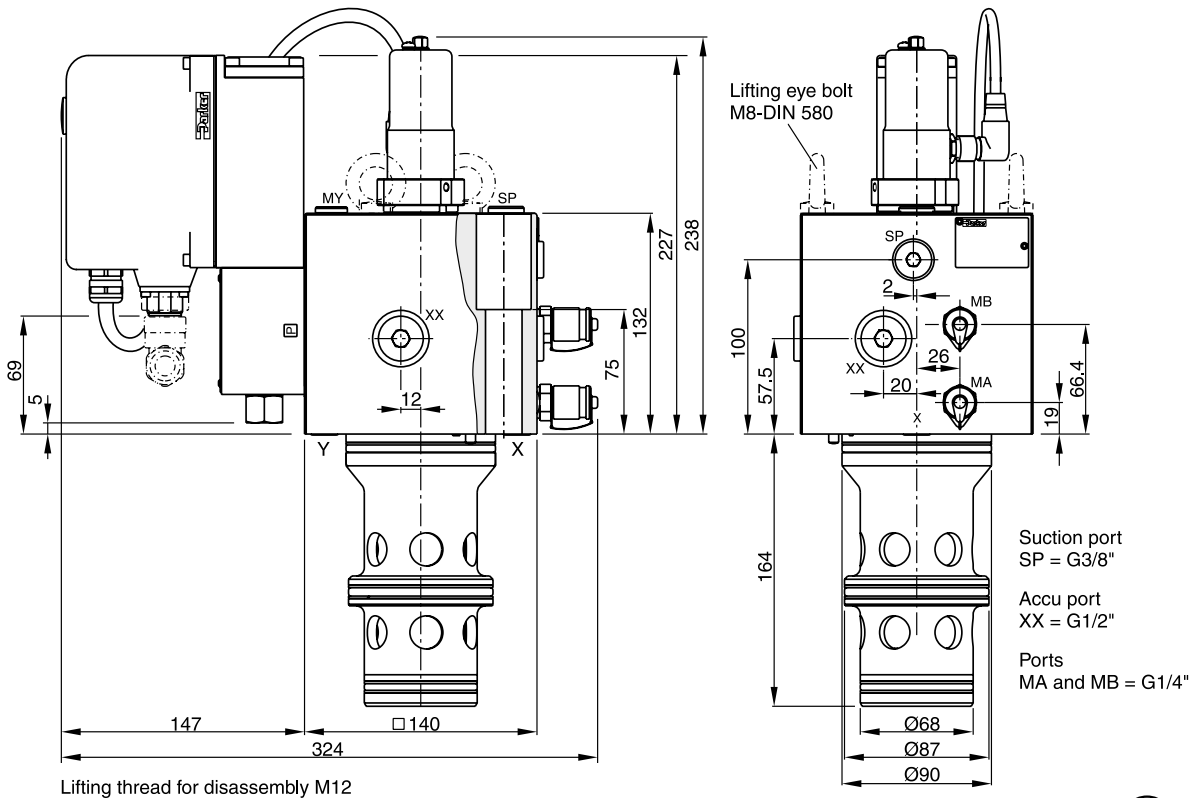





NG	Bolt kit - 		NBR	 Kit	FPM
25	BK504 4x M12x100 ISO 4762-12.9	108 Nm	SK-TPQ025EN30		SK-TPQ025EV30
32	BK529 4x M16x100 ISO 4762-12.9	264 Nm	SK-TPQ032EN30		SK-TPQ032EV30

NG40

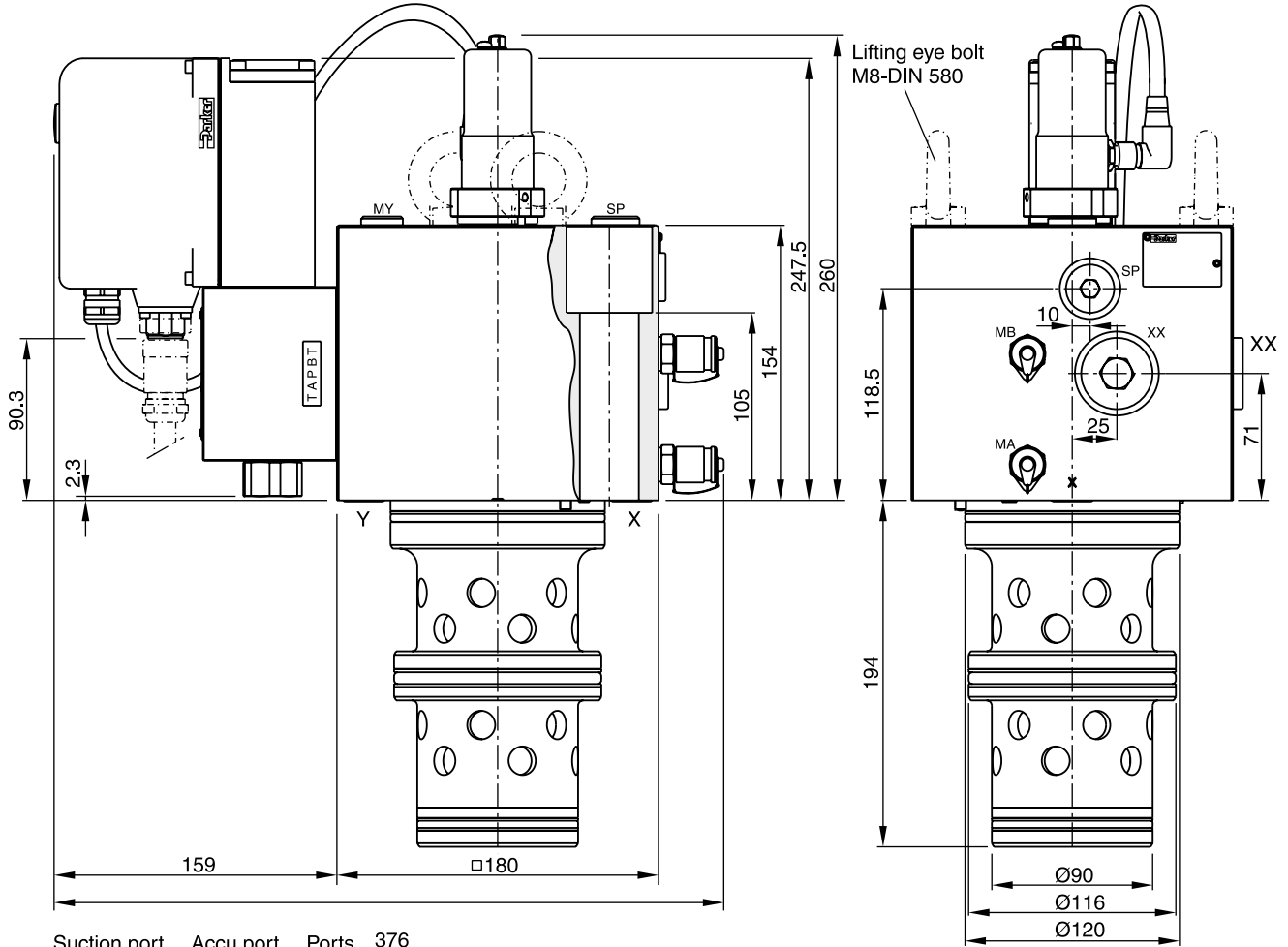


NG50



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

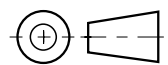
NG63






Suction port Accu port Ports 376
 SP = G1/2" XX = G3/4" MA and MB = G1/4"

Lifting thread for disassembly M12

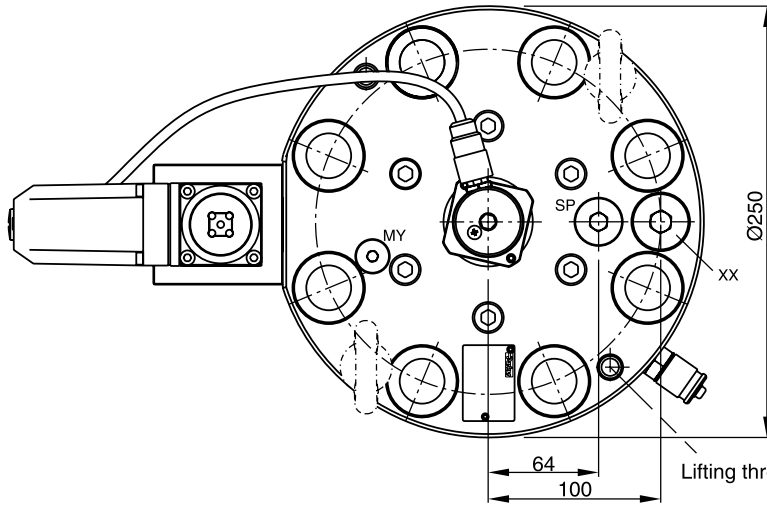
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NG	Bolt kit - 		NBR	Kit 	FPM
63	BK518 4x M30x160 ISO 4762-12.9	1775 Nm	SK-TPQ063EN30		SK-TPQ063EV30

Dimensions

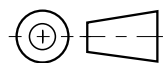
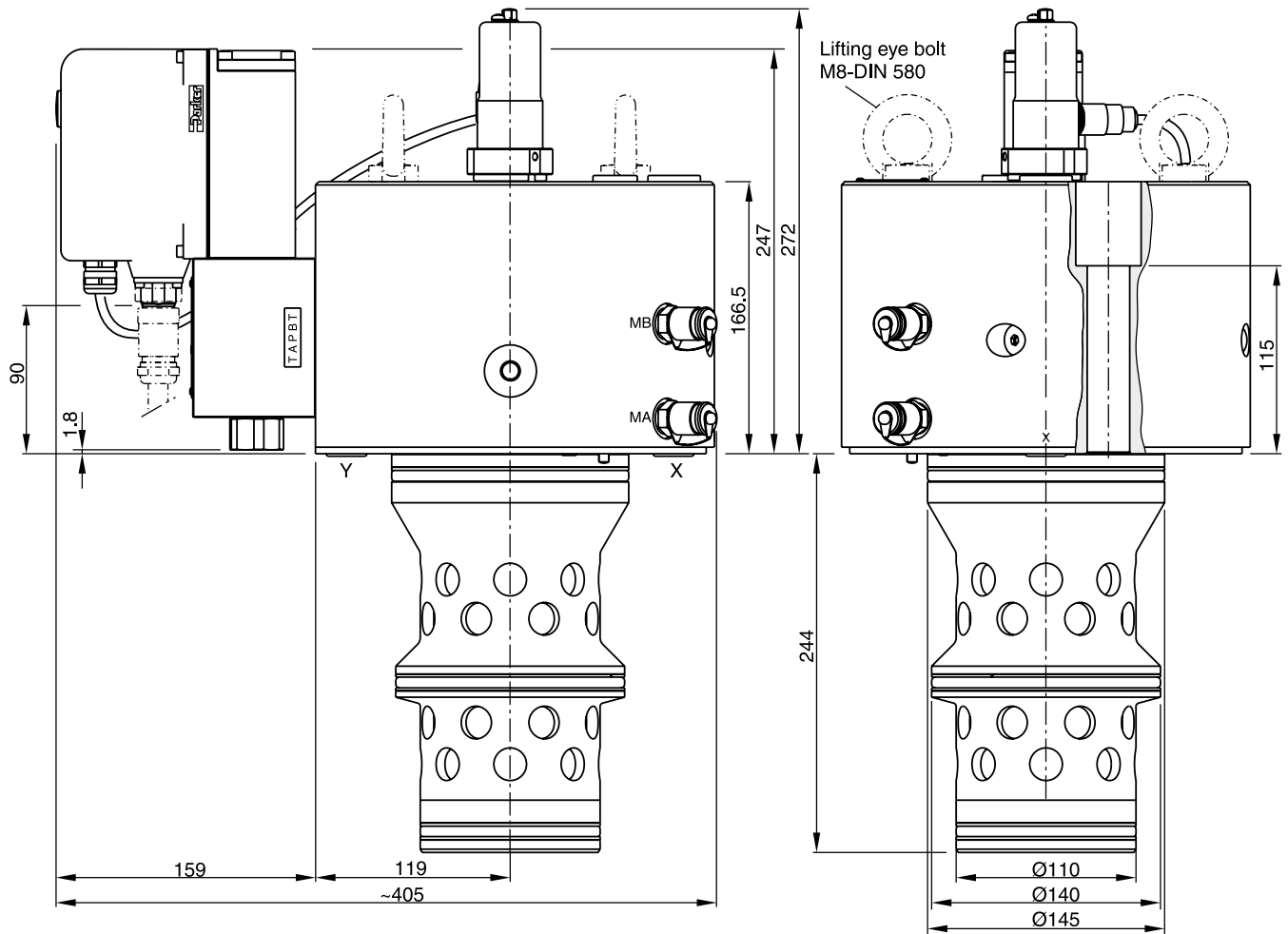
NG80





Accu port
XX = G3/4"

Suction port
SP = G1/2"

Ports
MA and MB = G1/4"

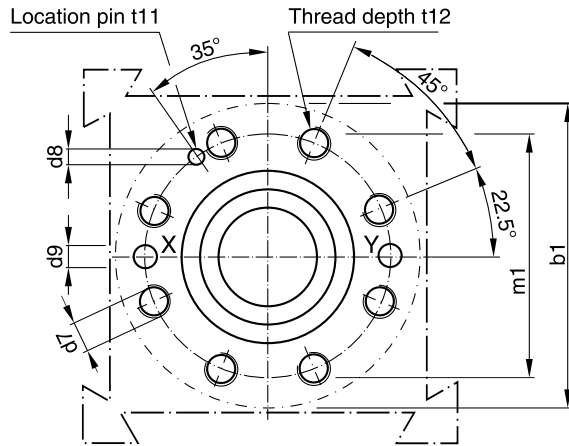
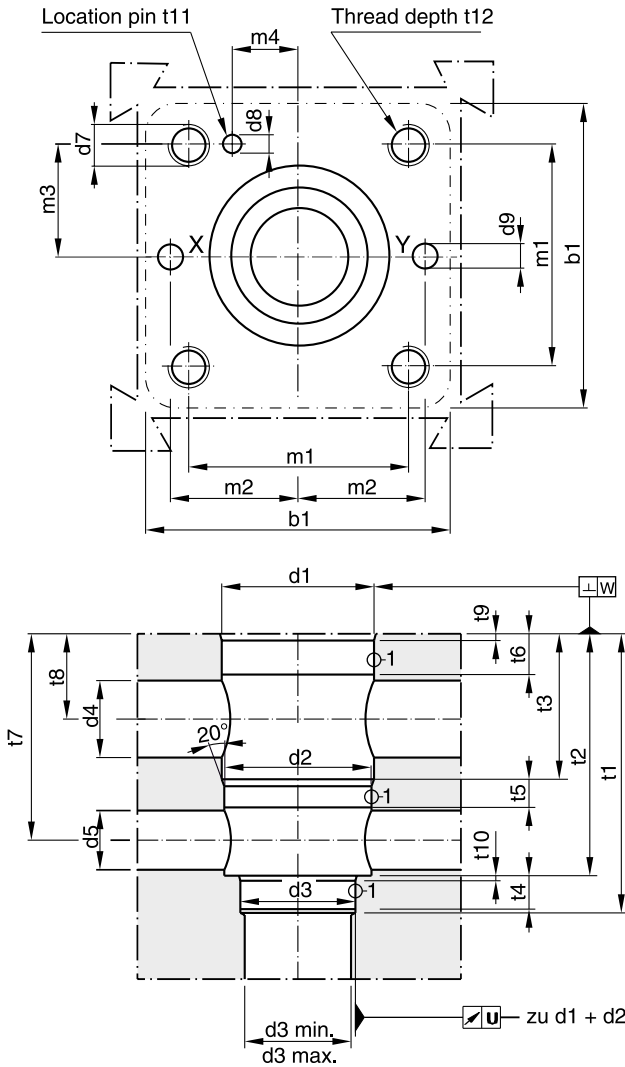


NG	Bolt kit - 		NBR	Kit	FPM
80	BK530 8x M24x160 ISO 4762-12.9	890 Nm	SK-TPQ080EN30	SK-TPQ080EV30	

Dimensions

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