

RT-TPQ

Three-way two-position cartridge proportional servo directional valve
 Driven by VCD voice coil motor
 With electrical position feedback
 With integrated amplifier

Nominal size: 25 ~ 80

Maximum operating pressure: 350bar

Rated flow: 6500L/min

Document number: RD A11101_2309a



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Features

- Pilot - operated 3 - way proportional servo directional valve with electrical position feedback on the main spool.
- The pilot valve adopts a spool-sleeve structure with servo-class performance
- Driven by VCD voice coil motor
- Fast step response
- Fluid flow directions are from A to T and from P to A
- Equipped with an integrated digital controller
- Interchangeable with similar products from Europe and the United States
- Remains in the fail - safe position in case of power loss or hydraulic power failure

Ordering details

RT-	TPQ	063	W	H	2	5	P	2	N	B	0	*
01	02	03	04	05	06	07	08	09	10	11	12	13

01	RT-	Rebo Tech
02	TPQ	High-dynamic-performance three-way two-position proportional servo directional valve
03	025	Nominal size 25
	032	Nominal size 32
	040	Nominal size 40
	050	Nominal size 50
	063	Nominal size 63
	080	Nominal size 80
04	W	Cartridge slide valve
05	H	Driven by VCD voice coil motor with electrical position feedback and integrated digital amplifier
Flow Characteristics		
06	2	Linear flow characteristic
07	5	Rated flow rate

RT-	TPQ	063	W	H	2	5	P	2	N	B	0	*
01	02	03	04	05	06	07	08	09	10	11	12	13

Function

08	P	Fault safety position P→A (Input signal 0...+100%→A→T)
	T	Fault safety position A→T (Input signal 0...+100%→P→A)

Pilot Oil Supply and Drain

09	2	External supply and external drain
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Sealing Material

10	N	NBR seals
	V	FKM seals

Amplifier Command

11	B	Control input signal 0...±10V, Actual value feedback ±10V
	E	Control input signal 0...±20mA, Actual value feedback ±10V
	S	Control input signal 4...(12)...+20mA, Actual value feedback ±10V

Connector Type

12	0	6 + PE, seven-pin socket with enable function, compliant with DIN EN 175201 - 804 standard (ordered separately)
13	*	Other information descriptions

Hydraulic Symbols

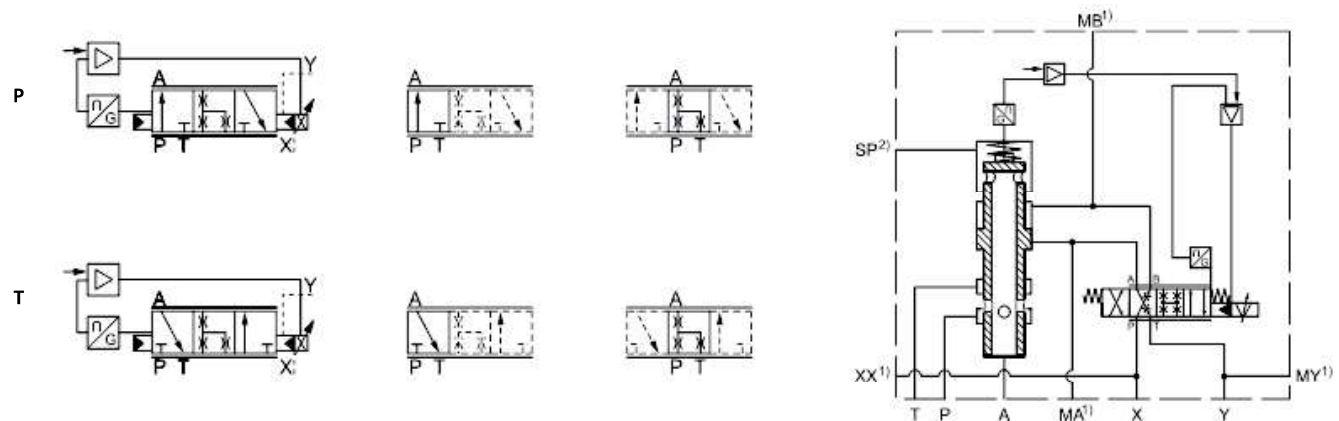
Function

Simplified symbols

Fault safety position

Command median

Detailed symbols



- 1) Valves with nominal diameters of 25 and 32 have no external accumulator port XX, and no pressure measurement ports MA, MB, and MY.
- 2) Valves with a nominal diameter of 25 have no air bleed port SP.

Function, section

This valve is a pilot operated proportional servo slide valve with plug-in connection, equipped with valve core position feedback and integrated amplifier.

Composition of valve:

1. VCD driven spool valve sleeve structure pilot servo valve (1)
2. Main valve with reset spring and position feedback (2)
3. Main valve displacement sensor (3)

Working principle:

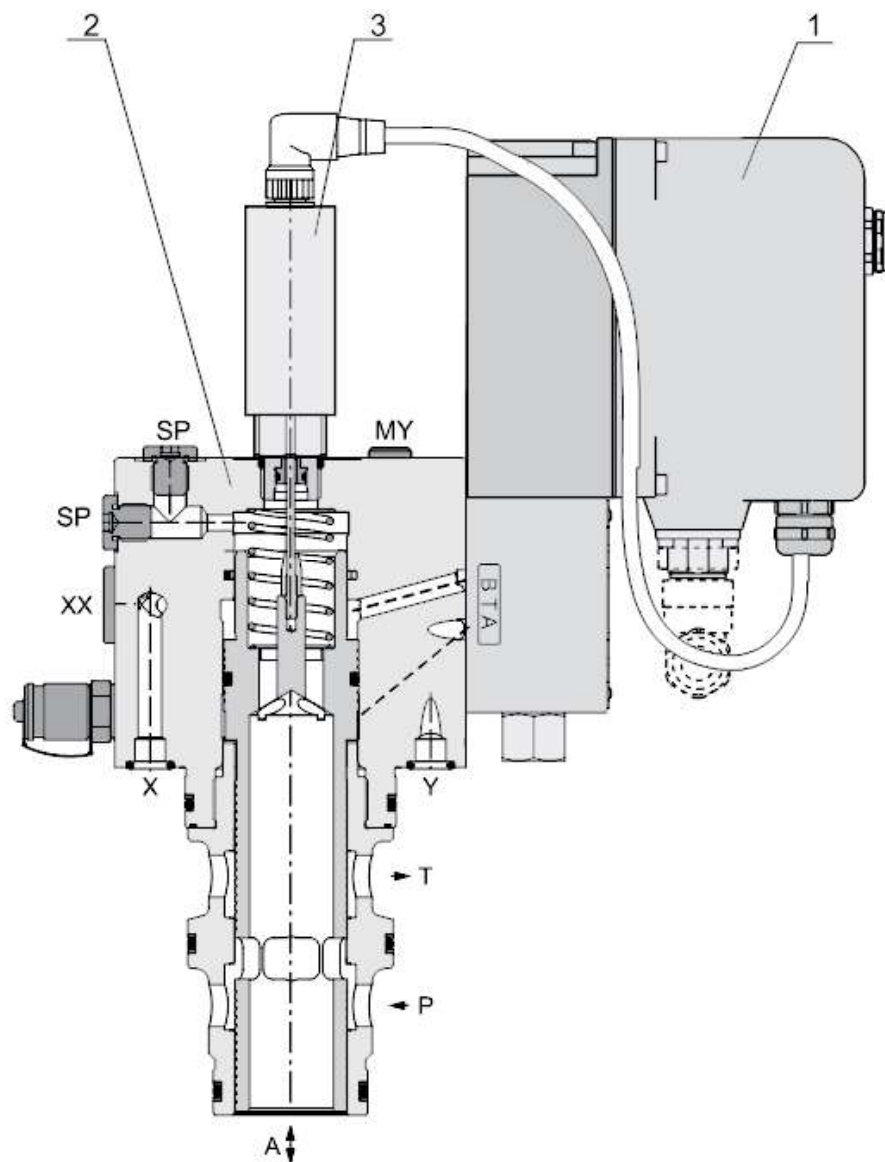
This valve is designed for two-stage control, consisting of a pilot servo valve and an LVDT spool position sensor. The main stage composition. Due to the use of a voice coil motor as the pilot valve driver,

This valve has an extremely fast response speed, with a response time of 10.5ms (NG25) to 28ms (NG100), and a control accuracy of <0.1% of the rated flow rate.

The stroke of the main valve core is actively controlled by the pilot servo valve, regardless of the pressure conditions of the main circuit oil port. As a basic working condition, the pilot pressure of the valve should be greater than the system pressure. Under low system pressure conditions, if the valve is required to still have high dynamic response, it should be ensured that the pilot pressure is not less than 140 bar.

The pilot servo valve of this valve is equipped with a digital integrated electronic controller with two closed-loop control circuits, which controls the position of its main valve core and pilot valve core.

RT-TPQ 040



Technical data (for applications outside these parameters, please consult us!)

General

Nominal size		25	32	40	50	63	80
Installation		Any, it is recommended to install horizontally					
Storage temperature range	°C	-20.....+80					
Ambient temperature range	°C	-20.....+50					
Weight	Kg	11	13	15	26	52	105

Hydraulic

Maximum operating pressure	Pilot Oil Supply Pressure X	bar	350bar				
	ports A, B, SP, XX	bar	350bar				
	port Y	bar	35bar				
Nominal flow $q_{V nom}$ at $\Delta p=5bar^{1)}$	L/min	200	320	550	800	1450	2700
Max. permissible flow	L/min	500	1000	1600	2250	3500	6500
Dead zone	%	< 1.5					
Flow direction		P→A or A→T					
Pilot valve pressure ²⁾	bar	Must be greater than the system pressure					
Pilot valve specification		D1FP, NG6				D3FP, NG10	
Maximum pilot control flow rate, $P_x=140bar$	L/min	25	25	25	25	50	60
Pilot valve leakage at 100 bar	mL/min	≤ 400					
Main valve leakage at 100 bar	L/min	< 2.5					< 4
Oil temperature range	°C	-20 to +80 (preferably +40 to +50)					
Viscosity	mm ² /s	20 to 380 (preferably 30 to 80)					
Oil cleanliness ³⁾ (minimum requirement)	Pilot valve	ISO4406 18/16/13					
	Main valve	ISO4406 20/18/15					

Dynamic/Static Performance

Step response when pilot pressure $P_x > 140 bar$	ms	7	11	11	18	19	20
Frequency response when pilot pressure $P_x > 140 bar$							
Amplitude ratio -3dB; 10%±5%	Hz	210	105	70	45	35	30
Phase shift 90°; 10%±5%	Hz	170	125	110	95	75	70
Hysteresis	%	< 0.1					
Sensitivity	%	< 0.05					
Temperature drift	%/K	< 0.025					

1) Flow rate at other pressure differences $q_x = q_{V nom} \cdot \sqrt{\frac{\Delta P_x}{5}}$

2) To ensure the best dynamic performance, the minimum pilot pressure should be greater than 140 Bar.

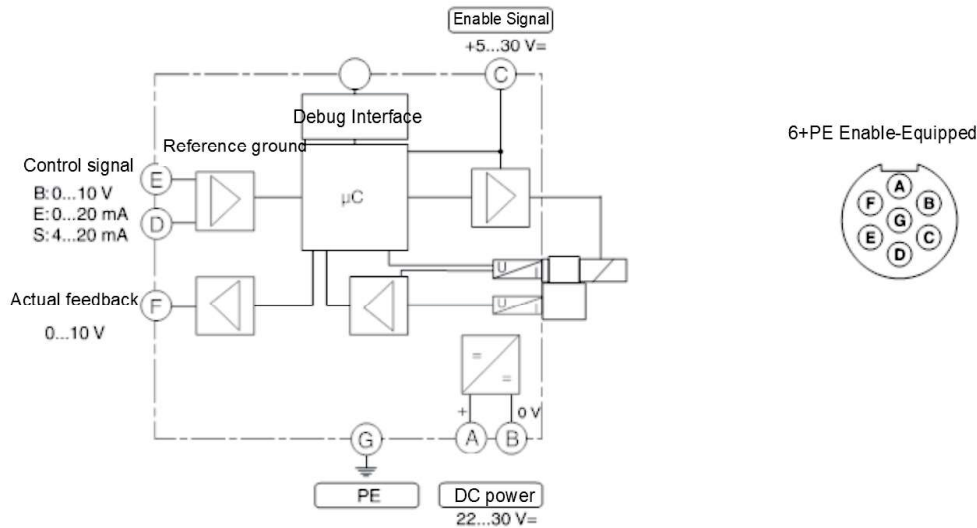
3) In the hydraulic system, the oil cleanliness must meet the requirements of the components. Effective filtration can prevent malfunctions in the hydraulic system and extend the service life of the components.

Techincal data (for applications outside these parameters, please consult us!)

Electrical			
Duty	%		100
Valve protection			IP65
Power supply	VDC		24
	Power +	VDC	Min. 22 / Max. 30
	Power -	VDC	0 (Maximum ripple voltage 2)
Maximum power current	A		3.5
External fuse	A		4.0, medium lag
Shielded grounding			See the "Pin Arrangement" diagram, conforming to CE requirements
Electromagnetic compatibility			Comforming to EN61000-6-2:2005-08 and EN61000-6-3:2007-01
Command type: B	Voltage	V	-10...0...+10, fluctuation < 0.01%RMS, no shock
	Impedance	kΩ	>50
Command type: E	Current	mA	-20...0...+20, fluctuation < 0.01% RMS, no shock
	Impedance	Ω	< 250
Command type: S	Current	mA	+4...(12)...20, fluctuation < 0.01%RMS, no shock < 3.6mA=Off, >3.8mA=Enable
	Impedance	Ω	< 250
Position feedback	Voltage	V	0...±10, Maximum load 5mA
Enablesignal		V	Enable input 24 VDC (Enable ≥ 11 VDC, Disable ≤ 5 VDC)
ElectricalConnection interface			6+ PE, seven - pin socket compliant with DIN EN 175201 - 804

Electrical connection

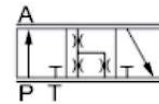
Electrical Block Diagram



Work polarity

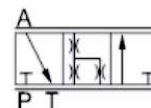
Function: P

Input signal (0~+100%)	0~+10V 12~20mA 0~+20mA	Working Position A→T	Input signal -100% ← 0 → +100%
Input signal (0~-100%)	0~-10V 12~4mA 0~-20mA	Working Position P→A	
Fault safety position		P→A	

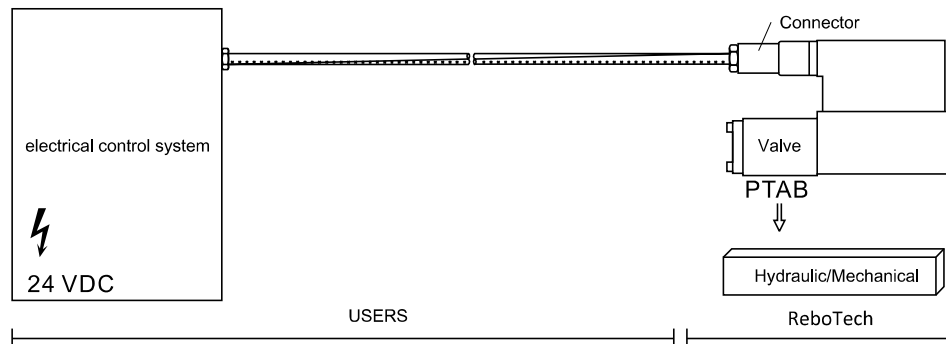


Function: T

Input signal (0~+100%)	0~+10V 12~20mA 0~+20mA	Working Position P→A	Input signal 100% ← 0 → +100%
Input signal (0~-100%)	0~-10V 12~4mA 0~-20mA	Working Position A→T	
Fault safety position		A→T	



Electrical connection



Type: LiYCYflexible shielded data transmission wire
 Wire number: Determined by the valve's signal, plug model, and plug pin assignment
 Cable diameter Φ : 0.75mm², length up to 20m;

1mm², length up to 40m

Outer diameter Φ : 12...14mm

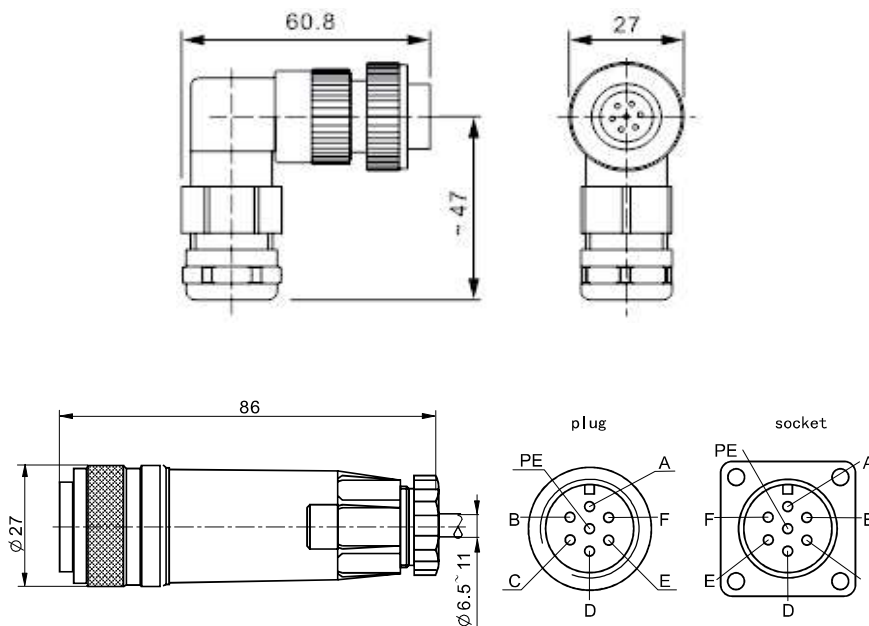
Note:

- Nominal supply voltage is 24 VDC.
- If the voltage drops below 18 VDC, an internal quick - off occurs, similar to an "enable switch".
- For Type S:
 Command signal $I_{D-E} \geq 3 \text{ mA}$, the valve operates.
 Command signal $I_{D-E} \leq 2 \text{ mA}$, the valve does not operate.
- Electrical signals generated by the integrated controller (e.g., LVDT feedback signal) are not allowed to be used as functional signals related to equipment safety!

Seven - pin plug compliant with DIN EN

175201 - 804 (ordered separately)

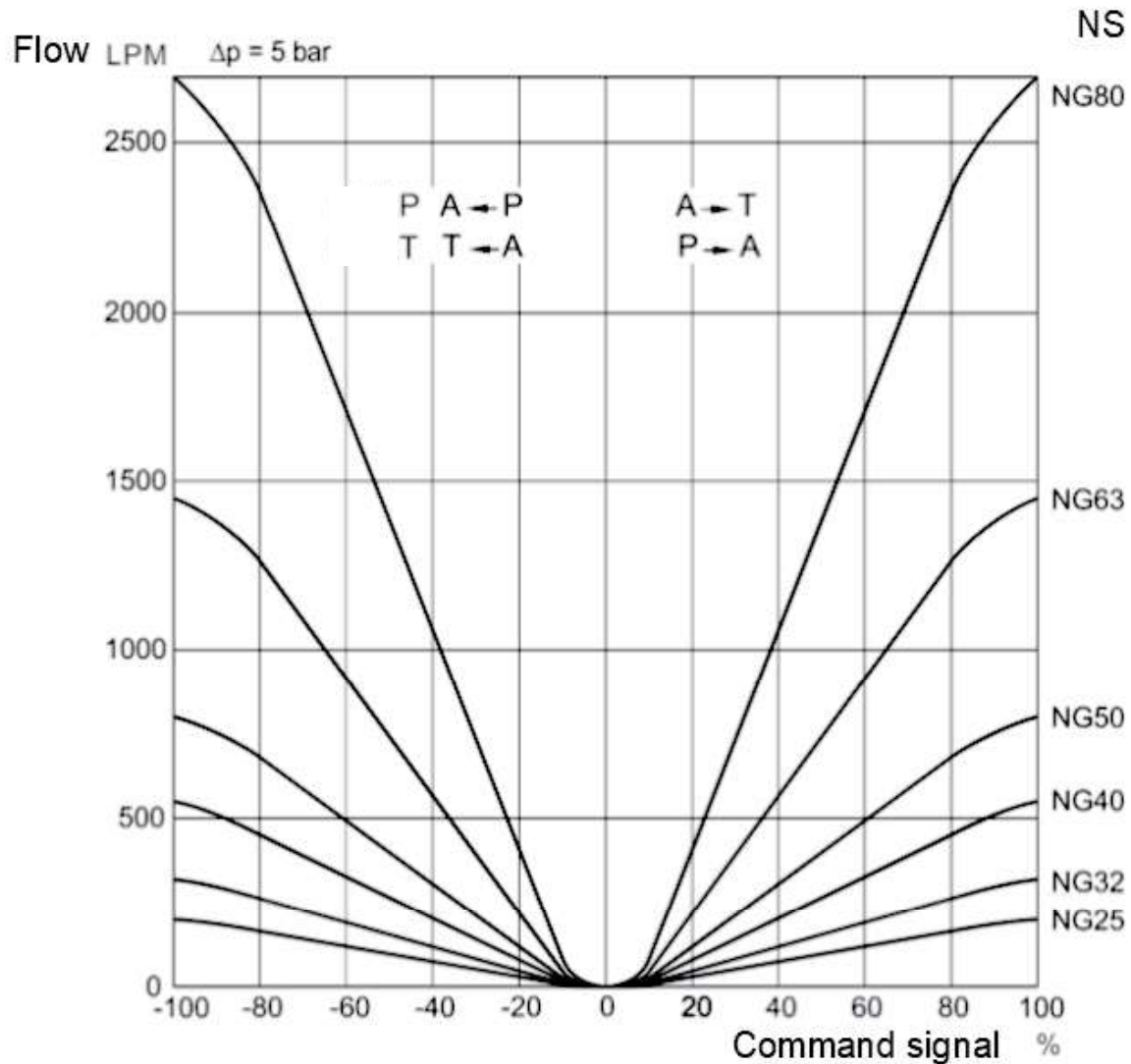
dimensions: mm



Elbow - type seven - pin plug;
 Suitable for specifications above 25 nominal diameter
 Metal nut structure (preferred model)
 Order separately
 Order No.: R00050381

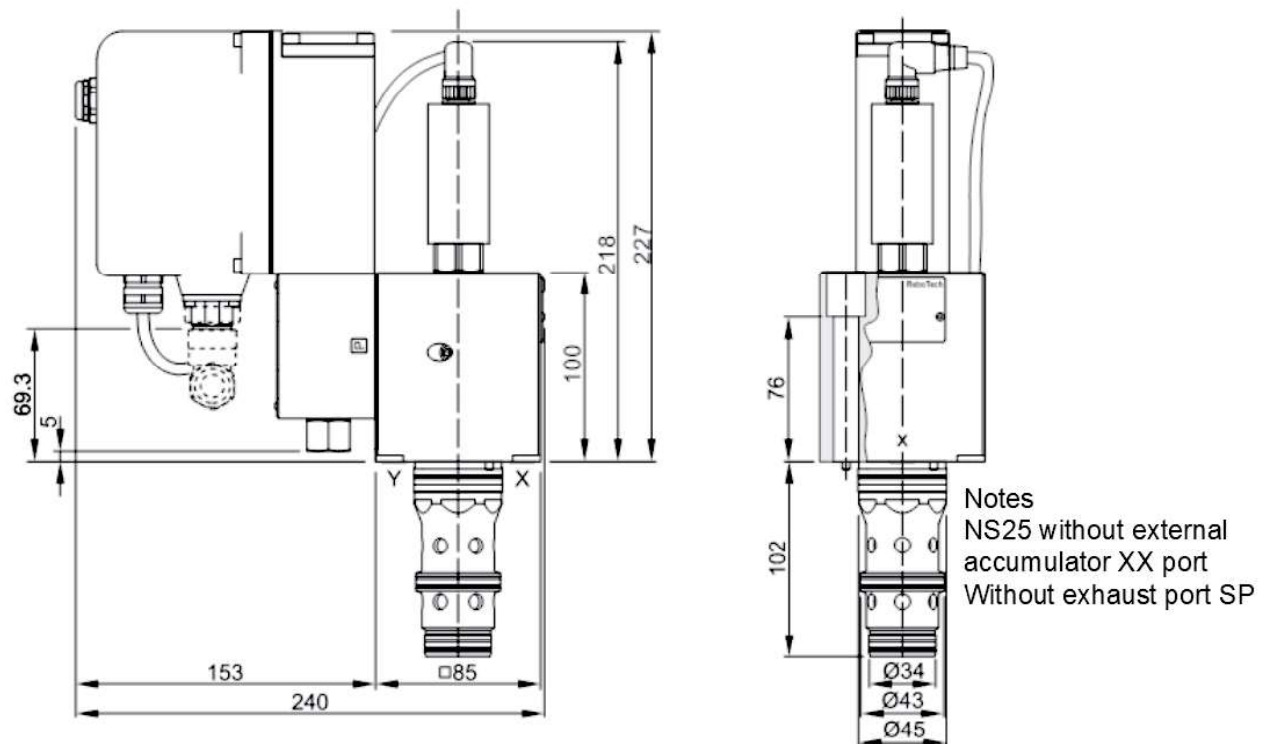
Straight - type seven - pin plug;
 Suitable for specifications above 63 nominal diameter
 Metal nut structure (preferred model), order separately
 Order No.: R00050406
 Plastic nut structure, order separately
 Order No.: R00050408
 All - metal structure, order separately,
 Order No.: R00050407

Characteristic curves (46# Anti - wear Hydraulic Oil, oil temperature $40 \pm 5^\circ\text{C}$)

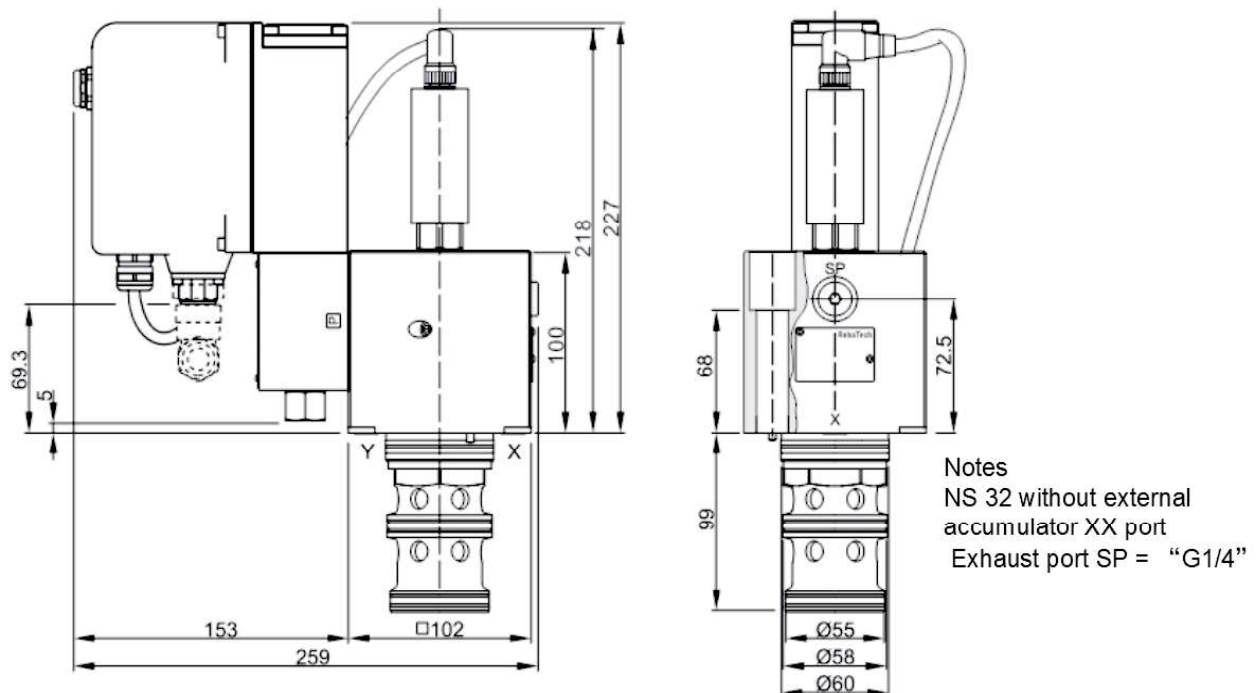


Unit dimensions NS 25 and NS 32 Dimensions in mm

NS 25



NS 32

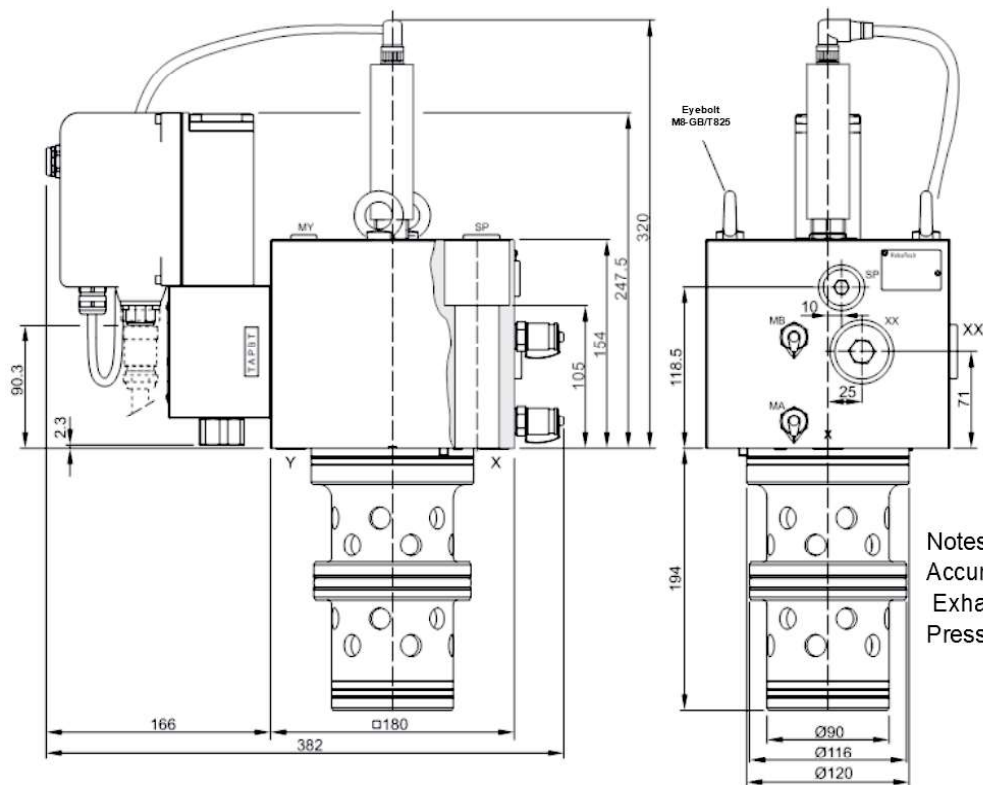


NS	Installation Screw Specifications	Numbers	Torque Nm
25	GB/T 70.1-M12X100-12.9	4	108±10%
32	GB/T 70.1-M16X100-12.9	4	264±10%

Unit dimensions NS 63

Dimensions in mm

NS 63



Notes

Accumulator oil port XX = "G3/4"

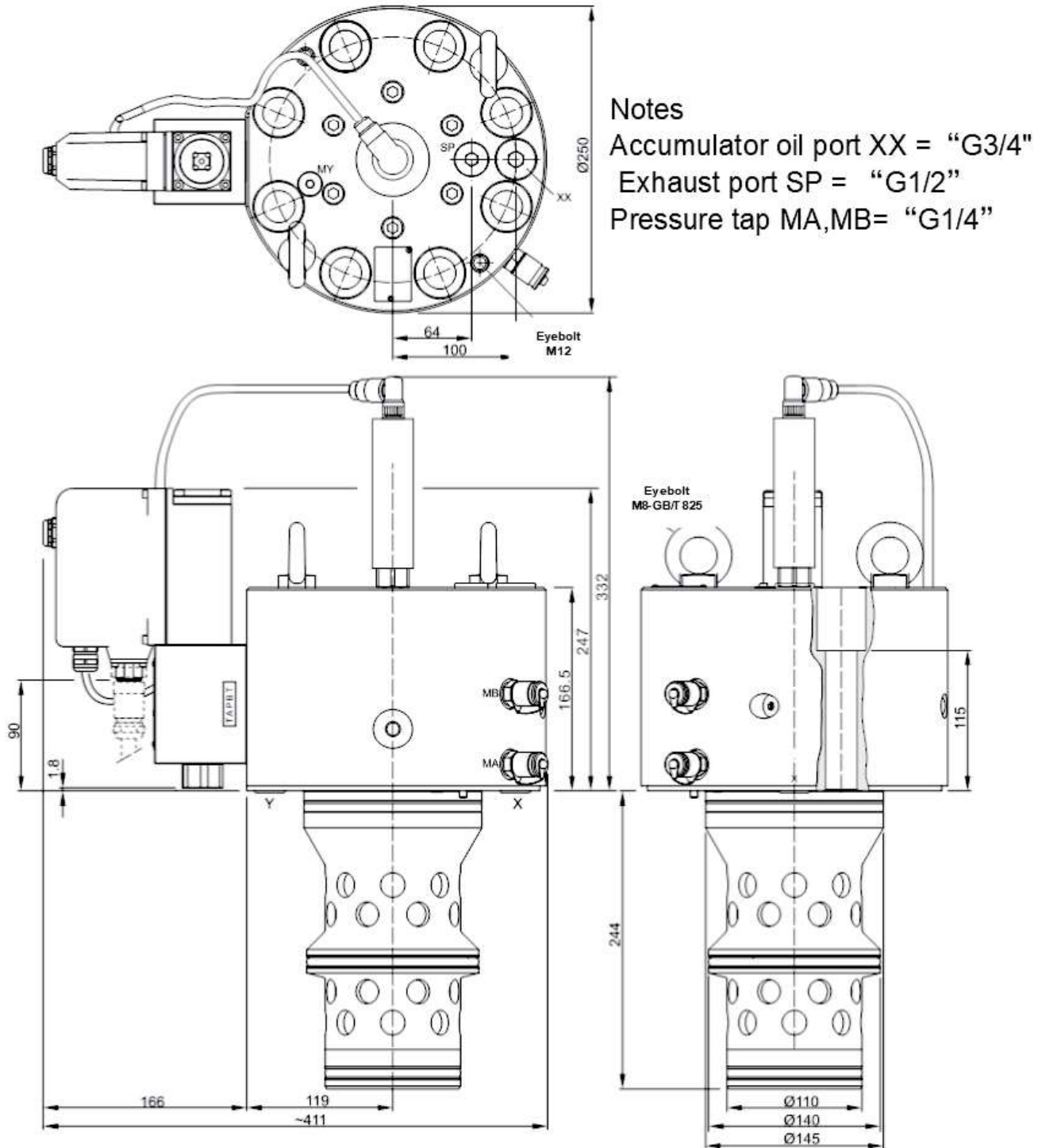
Exhaust port SP = "G1/2"

Pressure tap MA, MB= "G1/4"

NS	Installation Screw Specifications	Numbers	Torque Nm
63	GB/T 70.1-M30X160-12.9	4	1775±10%

Unit dimensions(NS 80 Dimensions in mm)

NS 80



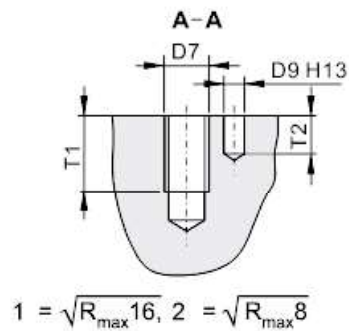
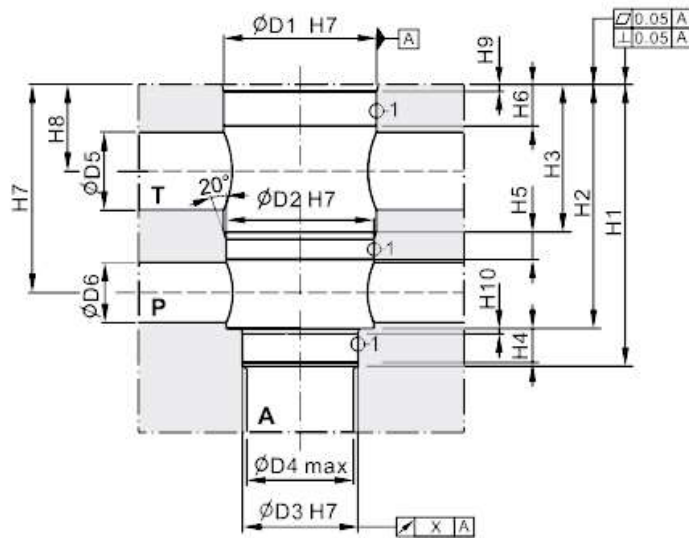
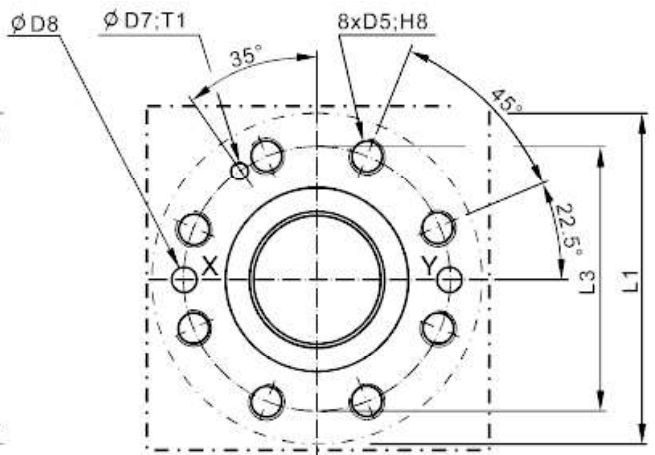
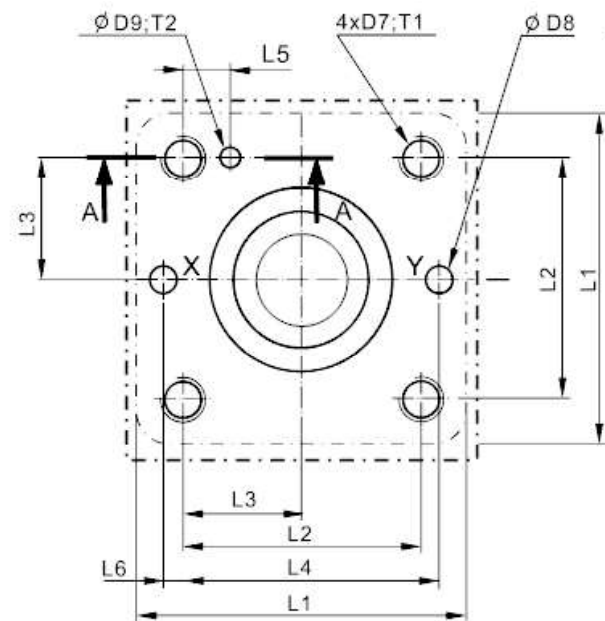
NS	Installation Screw Specifications	Numbers	Torque Nm
80	GB/T 70.1-M24X160-12.9	8	890±10%

Socket dimensions

Dimensions in mm

2NS:5~63

NS 80



1. H5 and H6 are the minimum fitting depth dimensions
2. The oil port T can be at any dimensional position between the dimensions of H6 and H3.
3. The oil port P can be at any dimensional position between the dimensions of H3 + H5 and H2.

NS	D1 H7	D2 H7	D3 H7	D4 max	D5 max	D6 max	D7	D8 max	D9 H13	H1 ⁺³	H2 ^{+0.2}	H3 ^{+0.2}	H4	H5
25	45	43	34	25	25	21	M12	6	4	103	89	56	11.5	15
32	60	58	55	54	28	28	M16	8	6	100	85	43	13.5	16
40	75	73	55	54	38	32	M20	10	6	125	105	54	15	18
50	90	87	68	67	63	38	M20	10	8	165	143	84.5	18	18
63	120	116	90	89	64	52	M30	12	8	195	165	83.5	29.5	29.5
80	145	140	110	109	70	66	M24	16	10	245	215	123	27	27

NS	H6	H7±0.2	H8±0.2	H9	H10	L1	L2±0.2	L3±0.2	L4±0.2	L5±0.2	L6±0.2	X	T1	T2 min
25	17	78	43.5	2.5x15°	2.5x15°	85	58	29	62	13	4	0.03	35	10
32	18	71	28.5	2.5x15°	2.5x15°	102	70	35	76	18	6	0.03	35	10
40	21	88	34	3x15°	3x15°	125	85	42.5	92.5	19.5	7.5	0.05	45	10
50	21	122	51.5	4x15°	3x15°	140	100	50	108	20	8	0.05	45	10
63	33	138.5	50	4x15°	4x15°	180	125	62.5	137.5	24.5	12.5	0.05	65	10
80	60	181	87	5x15°	5x15°	250	-	200	-	-	-	0.05	50	10