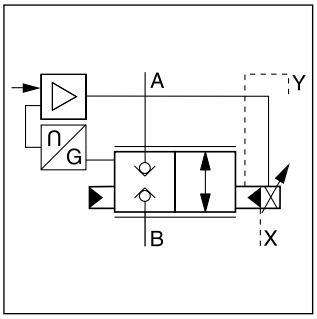
The 2-way servo proportional valves with VCD technology series TFP provide outstanding flow values and a minimized pressure drop. They are used in applications where high flow has to be precisely controlled at maximum dynamics. Typical applications are die casting, injection moulding and hydraulic presses.

Optionally, the valves can be equipped with a lock function. This lock function allows the main stage to be securely closed regardless of the condition of the pilot valve.

TFP063A

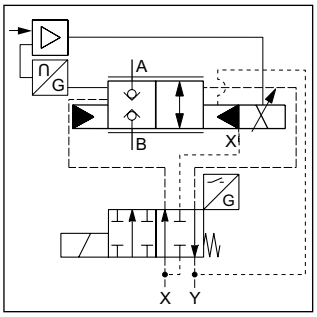


TFP*A

Structure and function

The 2-way servo proportional valves with shut-off valve TFP 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 TFP achieves extremely fast response times: from 9 ms (NG25) up to 26 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 TFP has two control loops for the main poppet and the pilot spool.

With TFP valves in version B, the main piston always remains closed, independent on the DFplus pilot valve, if the shut-off valve is not energized. If the shut-off valve is de-energized, the upper pilot control surface of the main piston is pressurized with pilot pressure and the lower one is relieved to the tank. If the solenoid of the shut-off valve is energized, the position of the main spool is controlled by DFplus pilot.

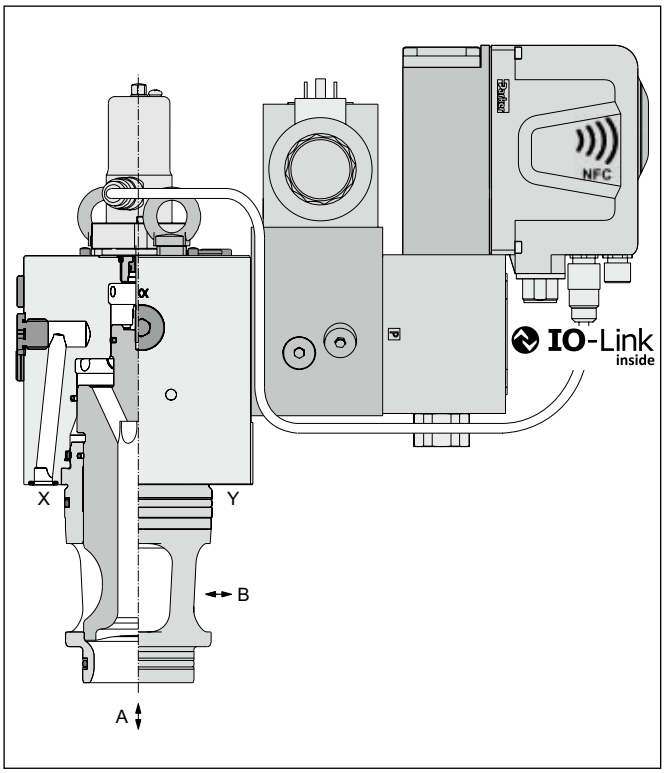


TFP*B

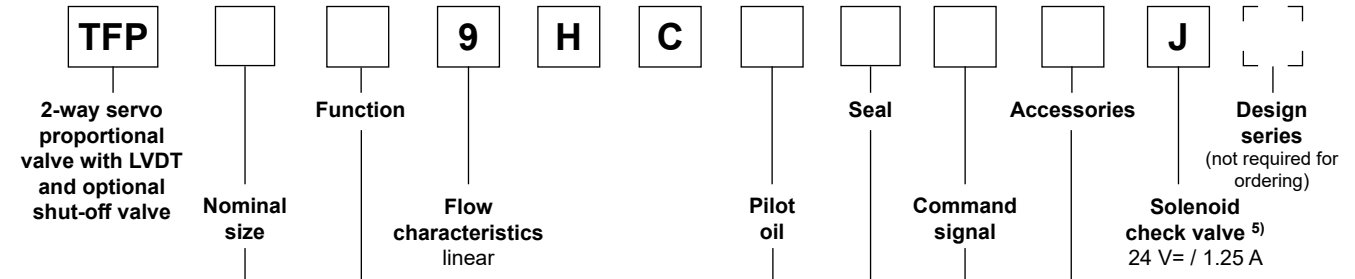
Features

- Active pilot operated 2-way servo proportional valve with optional shut-off valve
- Flow-optimized sleeve and piston design
- Cavity and mounting pattern according to ISO 7368
- Flow direction B to A and A to B
- Fast step response
- IO-Link interface for parametrizing
- RGB diode for optical status check
- NFC interface
- 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

TFP050B



Ordering code



Code	Nominal size
025	NG25
032	NG32
040	NG40
050	NG50
063	NG63
080	NG80
100	NG100

Code	Function
A 1)	Standard
B 2)	Shut-off valve with postion control

Code	Supply	Drain
2	External	External
8 3)	Plate with pipe connections X1 (00) and Y1 (99)	

Code	Accessories
0	Standard for function A
7	Standard for function B, shut-off valve with postion control

Code	Command signal
B	0...+10 V
E	0...+20 mA
S	4...+20 mA

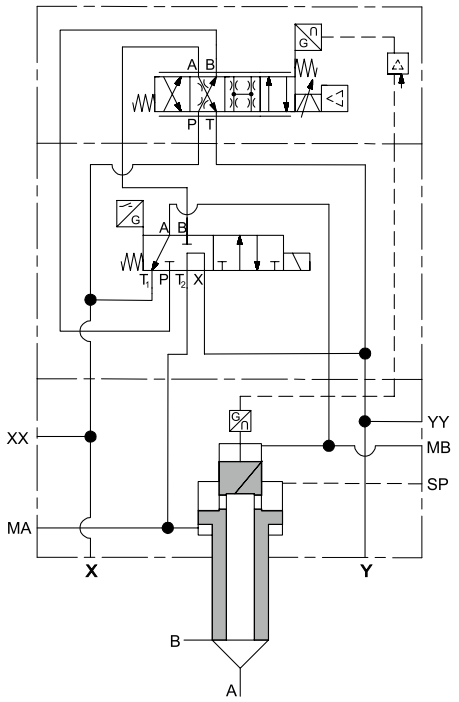
Code	Seal
N 4)	NBR
V	FPM

8

Please order connector separately, see main catalogue, chapter 3, page "Installation Recommendations / Electronics"
IO-LINK-MASTER-USB ordering no. 40983544

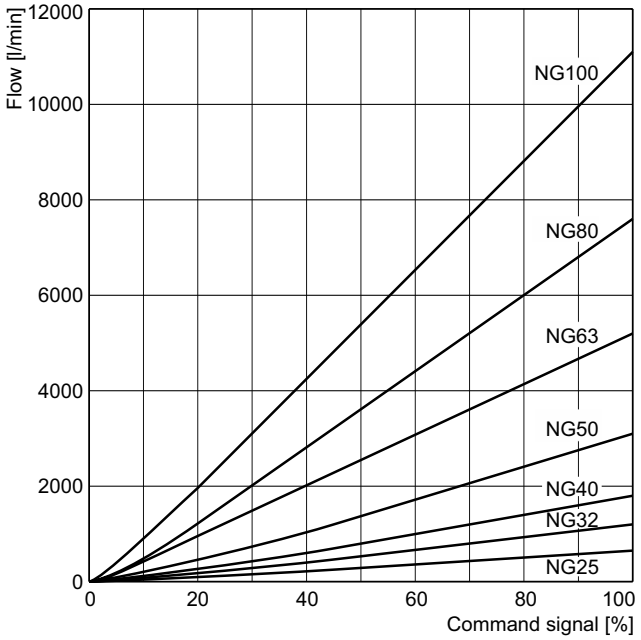
1) For accessories code 0.
2) For accessories code 7.
3) Not for function code B.
4) HFC fluids suitable.
5) Only for function code B.

Functional symbol



Characteristic flow/signal line at Δp = 5 bar

Linear



Opening point factory set to 3 %

Flow values simulated with Port A = $d3_{max}$ and Port B = $d4_{max}$

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

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...+60						
Weight (standard/with shut-off valve)	[kg]	9 / 18	11 / 20	21 / 30	28 / 43	42 / 57	77 / 92	122 / 137
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, B, SP max. 420, X max. 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]/ [mm²/s]	30 ... 80						
permitted	[cSt]/ [mm²/s]	20 ... 400						
Filtration								
Nominal flow at Δp = 5 bar (linear)	[l/min]	650	1200	1800	3100	5200	7600	11100
Max. flow (v = 30 m/s), recommended (linear)	[l/min]	1400	2600	4100	6200	9800	17000	25000
Flow direction		B to A / A to B						
Pilot pressure	[bar]	max. 350						
Pilot oil Supply		external via X						
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 pressure	[l/min]	21	33	37	54	71	86	105
Pilot pressure, recommended		Pilot pressure p_x = system pressure p_s						
Minimum pilot pressure p_{min} [1]	[bar]	140						
Static/dynamic								
(for optimal dynamics see installation recommendation)								
Step response at pilot press. >140 bar	[ms]	9	11	13	12	15	20	26
Frequency response at pilot press. >140 bar	[Hz]	on request						
Hysteresis	[%]	< 0.1						
Sensitivity	[%]	< 0.05						
Temperature drift	[%/K]	< 0.025						

Interfaces	
IO-Link	IEC 61131-9
NFC	ISO/IEC 15693; Frequency 13.56 MHz; -27.2 dBµA/m at 10 distances NFC Forum Type 5 tag certified by the NFC Forum
Electrical characteristics	
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 medium lag
Input signal	
Code B Voltage [V]	10...0...-10, ripple <0.01 % eff., surge free
Impedance [kOhm]	100
Code E Current [mA]	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 <3.6 mA = disable, >3.8 mA = according to NAMUR NE43
Impedance [Ohm]	<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	acc. EN 61131-2; Type 3
[V]	Low -3…+5; High 11…30; input current 3 mA
Diagnostic signal [V]	+10...0...-10
EMC	EN 61000-6-2, EN 61000-6-4
Electrical connection	6 + PE acc. EN 175201-804
Wiring min. [mm²]	7 x 1.0 (AWG16) overall braid shield
Wiring length max. [m]	50

[1] Generally, a pilot pressure below 140 bar can affect the valve dynamics and lead to deviations from the specified data for step and frequency response.

TFP UK.indd 05.06.24

Installation recommendations

The maximum pilot flow is given in the technical data.

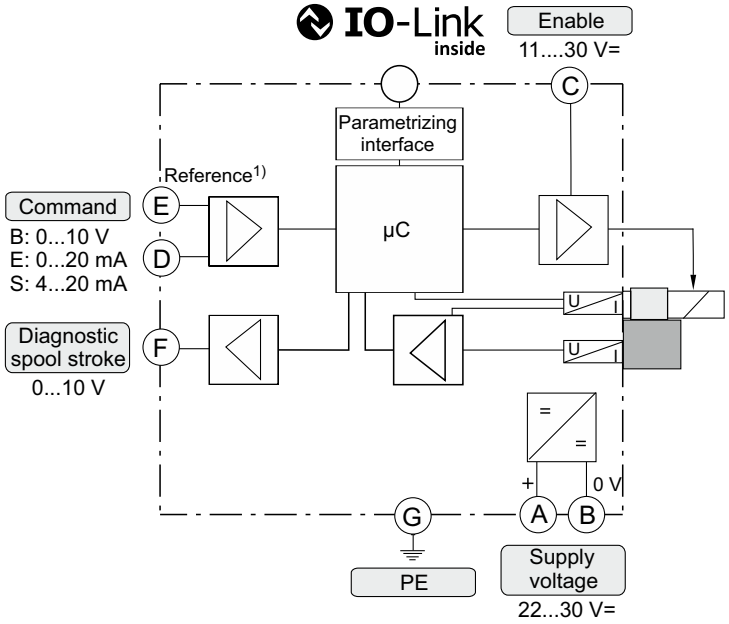
An insufficient pilot oil supply (e.g. due to long distances and/or small diameters) can negatively influence the dynamics of the TFP valve.

To avoid this, an accumulator can be connected to port XX at the valve body of the TFP (not for size NG25). A short-term undersupply with pilot oil can be compensated via this accumulator.

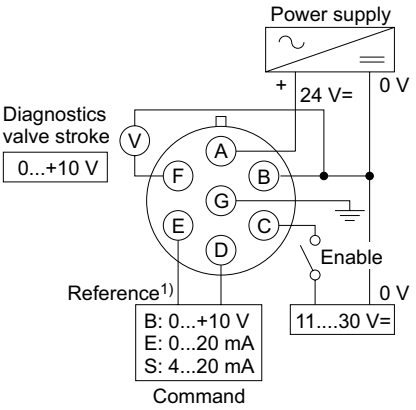
Sizing data: see operation manual.

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

Block circuit diagram electronics

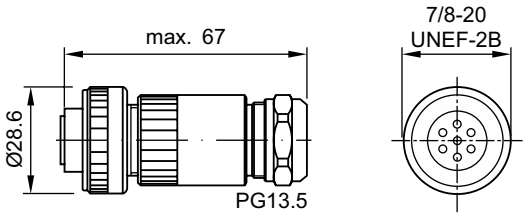


Connection diagrams electronics



Female connector

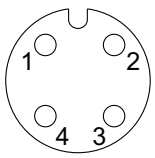
(EMC conform)



ID no. 5004072

Please order plugs separately.

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.

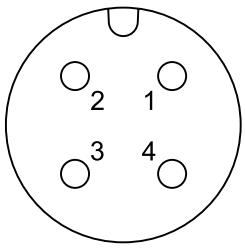
Shut-off valve

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

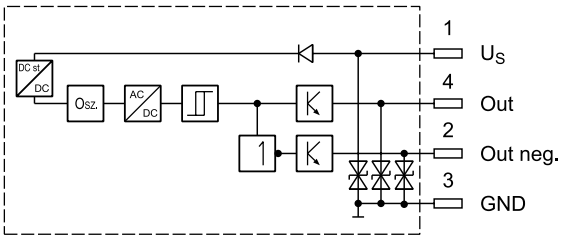
Supply voltage	[VDC]	24
Tolernace supply voltage	[%]	±20
Ripple supply voltage	[%]	≤10
Polarity protection	[V]	300
Current consumption without load	[mA]	≤20
Switching hysteresis	[mm]	<0.06
Max. output current per channel, ohmic	[mA]	250
Ambient temperature	[°C]	-20 … +60
Protection		IP65 acc. EN 60529 (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 guaranted 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

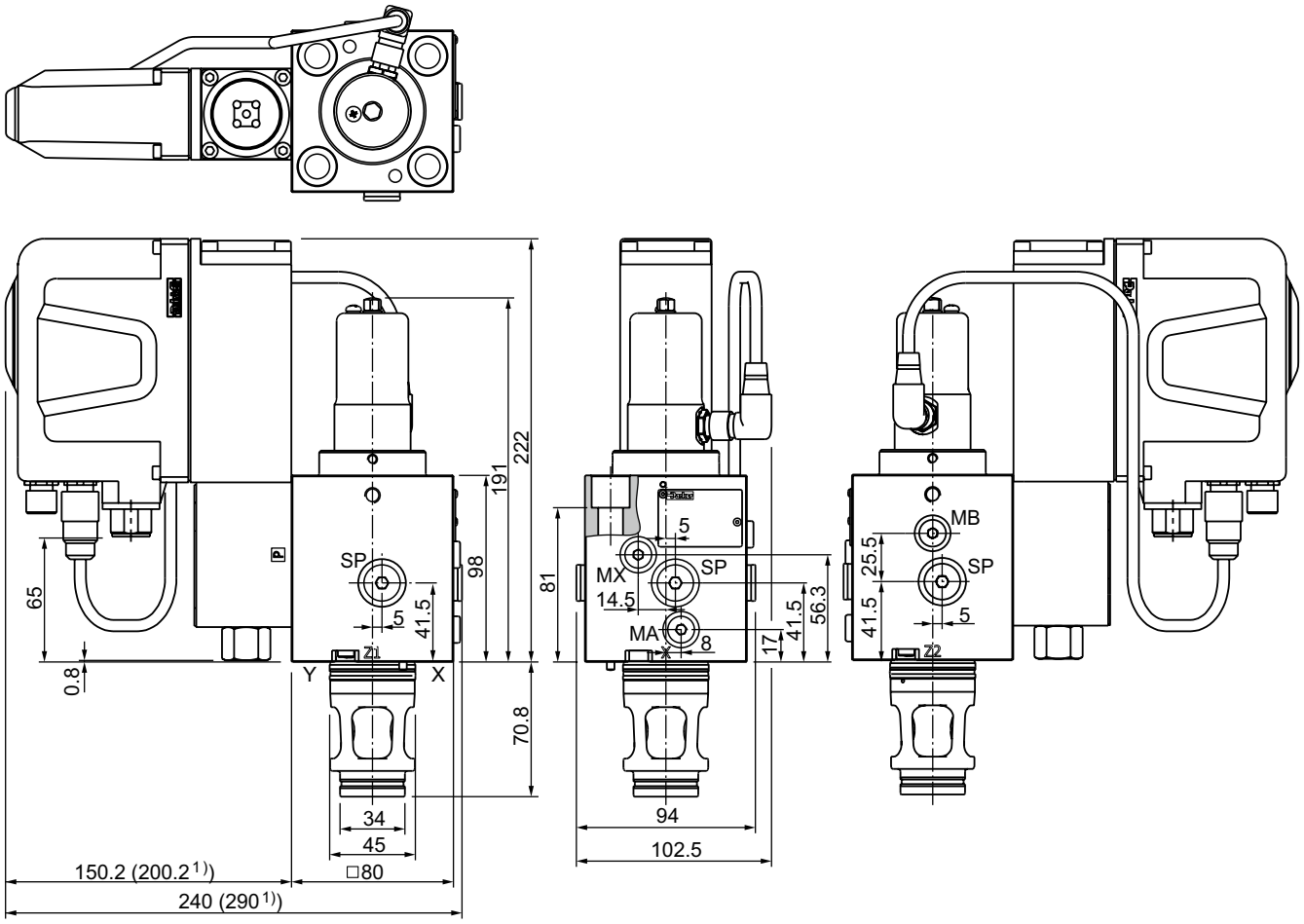


Outputs: Open collector

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

8

TFP*A, Standard, NG25

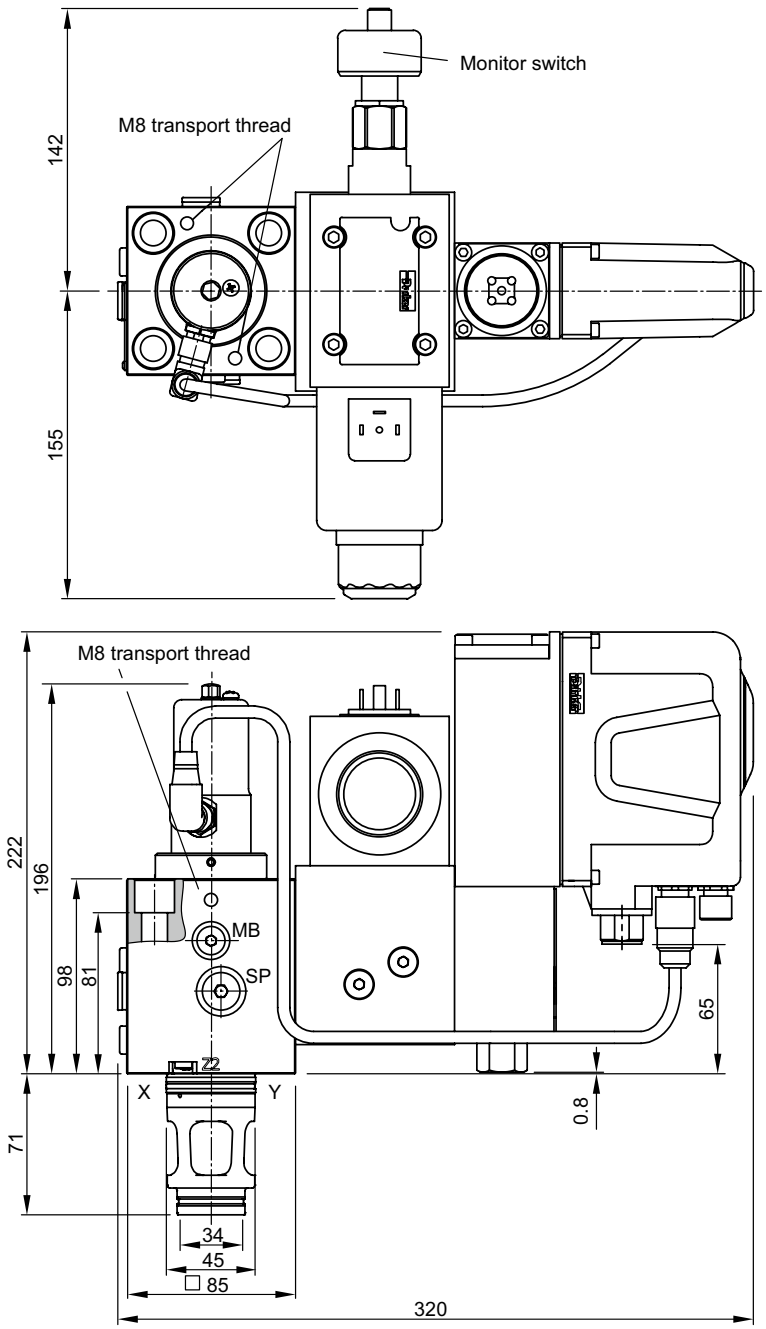


Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
MA	G1/8	Gauge port - pressure in control chamber A
MB	G1/8	Gauge port - pressure in control chamber B
MX	G1/8	Gauge port - pressure control chamber
SP	M14x1.5 OR	Suction port / gauge port 1)

1) The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
25	BK504 4 x M12x100 ISO 4762-12.9	108 Nm	SK-TFW025AN	SK-TFW025AV

TFP*B, with Shut-off valve, NG25



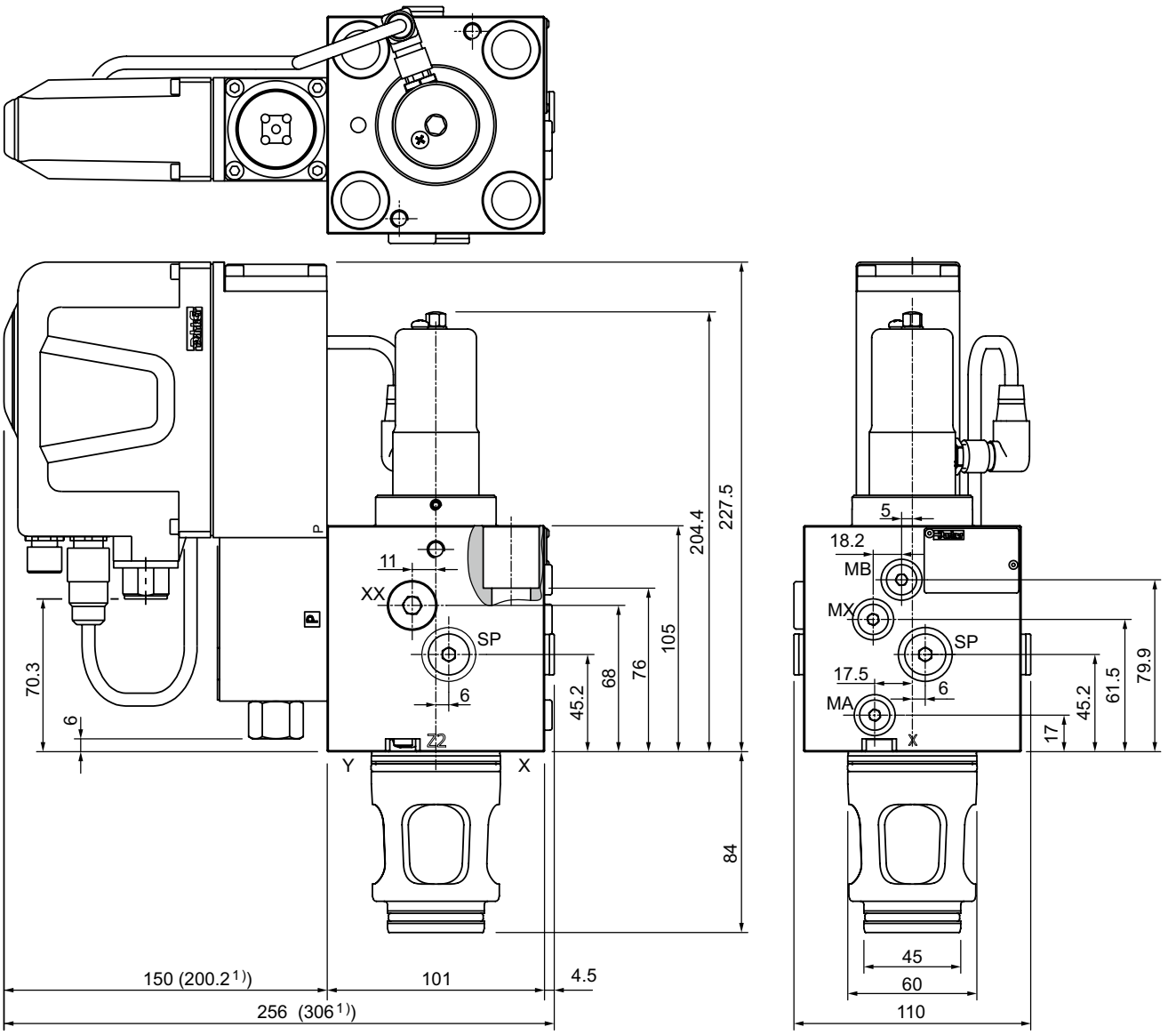
Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
MA	G1/8	Gauge port - pressure in control chamber A
MB	G1/8	Gauge port - pressure in control chamber B
MX	G1/8	Gauge port - pressure control chamber
SP	M14x1.5 OR	Suction port / gauge port [1]

[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
25	BK504 4 x M12x100 ISO 4762-12.9	108 Nm	SK-TFW025AN	SK-TFW025AV

TFP UK.indd 05.06.24

TFP*A, Standard, NG32

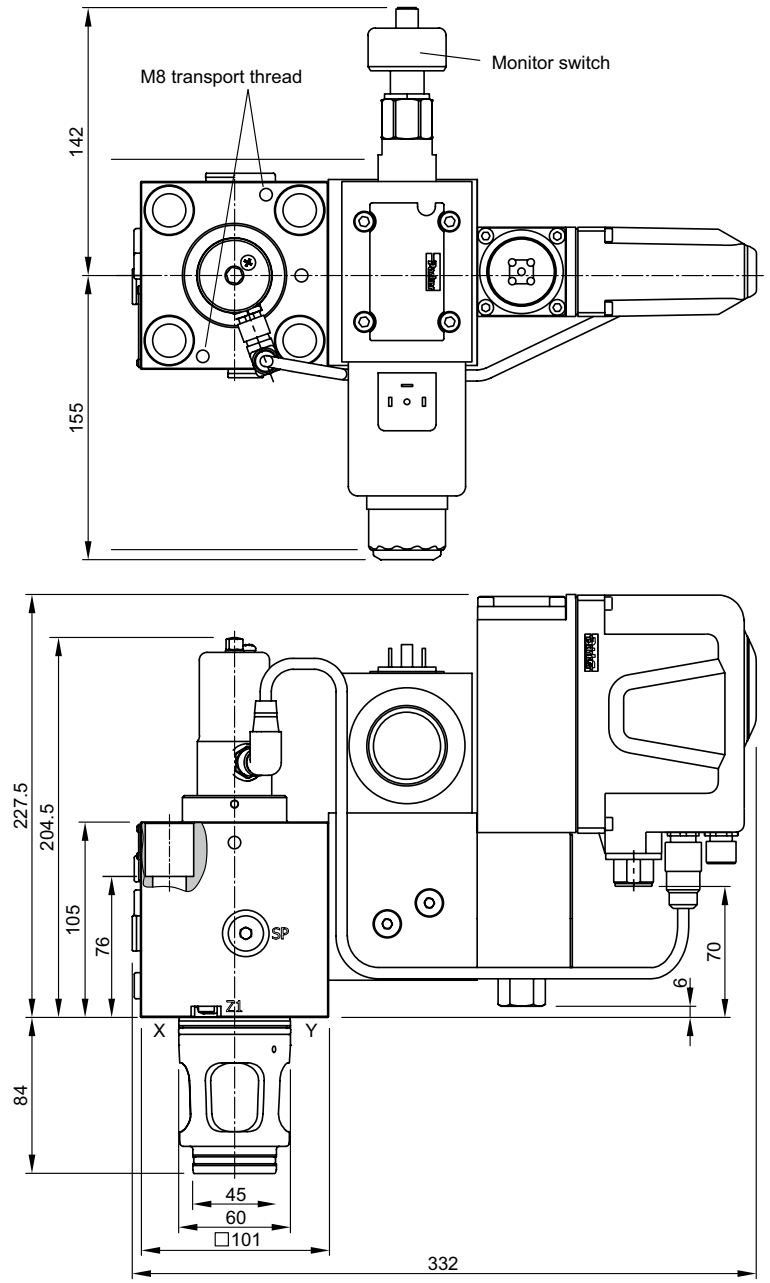


Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G3/8	External pilot oil supply / accumulator port
MA	G1/8	Gauge port - pressure in control chamber A
MB	G1/8	Gauge port - pressure in control chamber B
MX	G1/8	Gauge port - pressure control chamber
SP	M14x1.5 OR	Suction port / gauge port 1)

1) The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
32	BK529 4 x M16x100 ISO 4762-12.9	264 Nm	SK-TFP032AN	SK-TFP032AV

TFP*B, with Shut-off valve, NG32

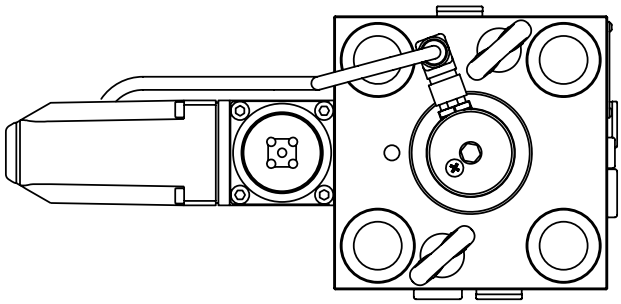


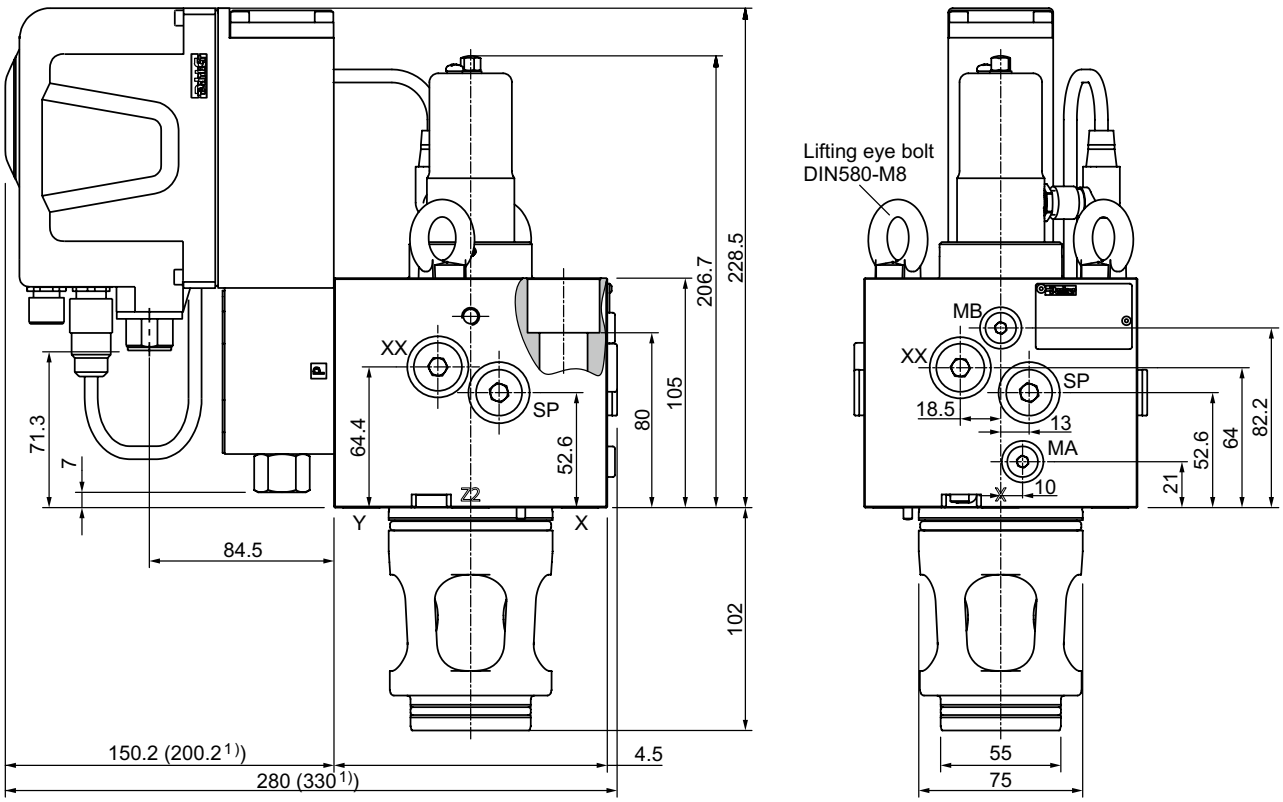
Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G3/8	External pilot oil supply / accumulator port
MA	G1/8	Gauge port - pressure in control chamber A
MB	G1/8	Gauge port - pressure in control chamber B
MX	G1/8	Gauge port - pressure control chamber
SP	M14x1.5 OR	Suction port / gauge port [1]

[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
32	BK529 4 x M16x100 ISO 4762-12.9	264 Nm	SK-TFP032AN	SK-TFP032AV

TFP*A, Standard, NG40



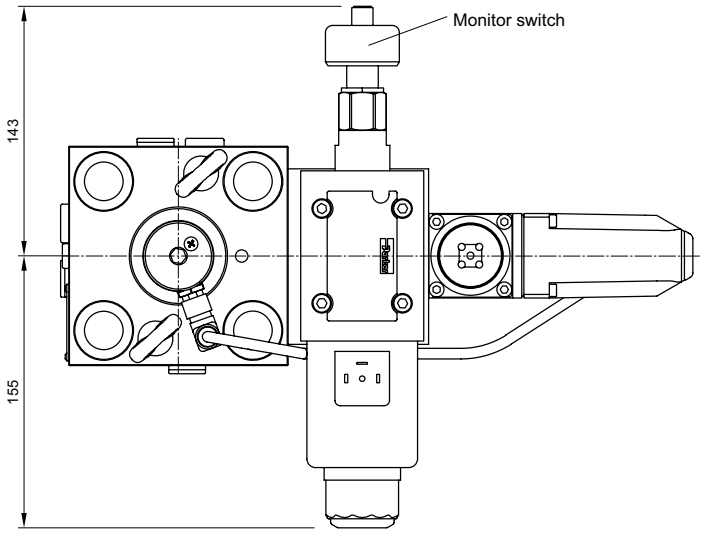


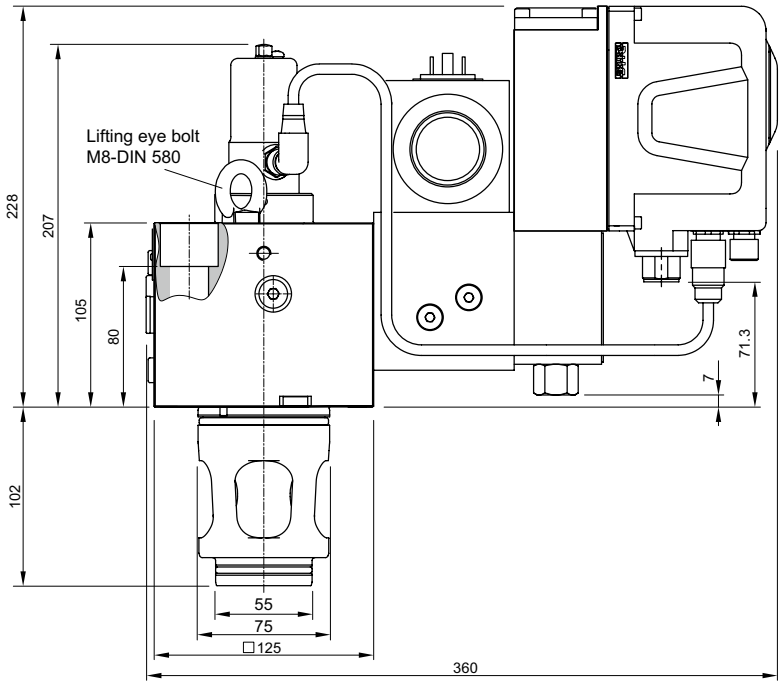
Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G3/8	External pilot oil supply / accumulator port
MA	G1/8	Gauge port - pressure in control chamber A
MB	G1/8	Gauge port - pressure in control chamber B
SP	M16x1.5 OR	Suction port / gauge port 1)

1) The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

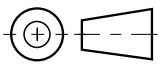
NG	Bolt kit -		Kit NBR	Kit FPM
40	BK481 4 x M20x110 ISO 4762-12.9	517 Nm	SK-TFP040AN	SK-TFP040AV

TFP*B, with Shut-off valve, NG40





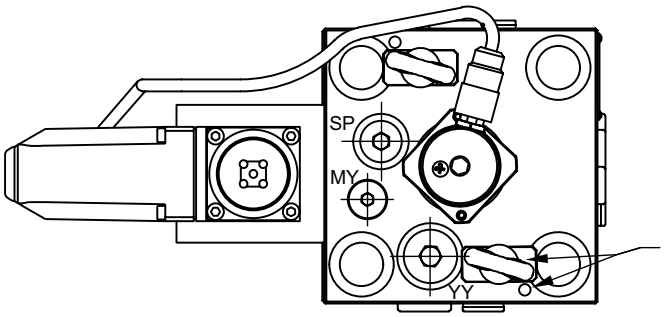
Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G3/8	External pilot oil supply / accumulator port
MA	G1/8	Gauge port - pressure in control chamber A
MB	G1/8	Gauge port - pressure in control chamber B
SP	M16x1.5 OR	Suction port / gauge port [1]



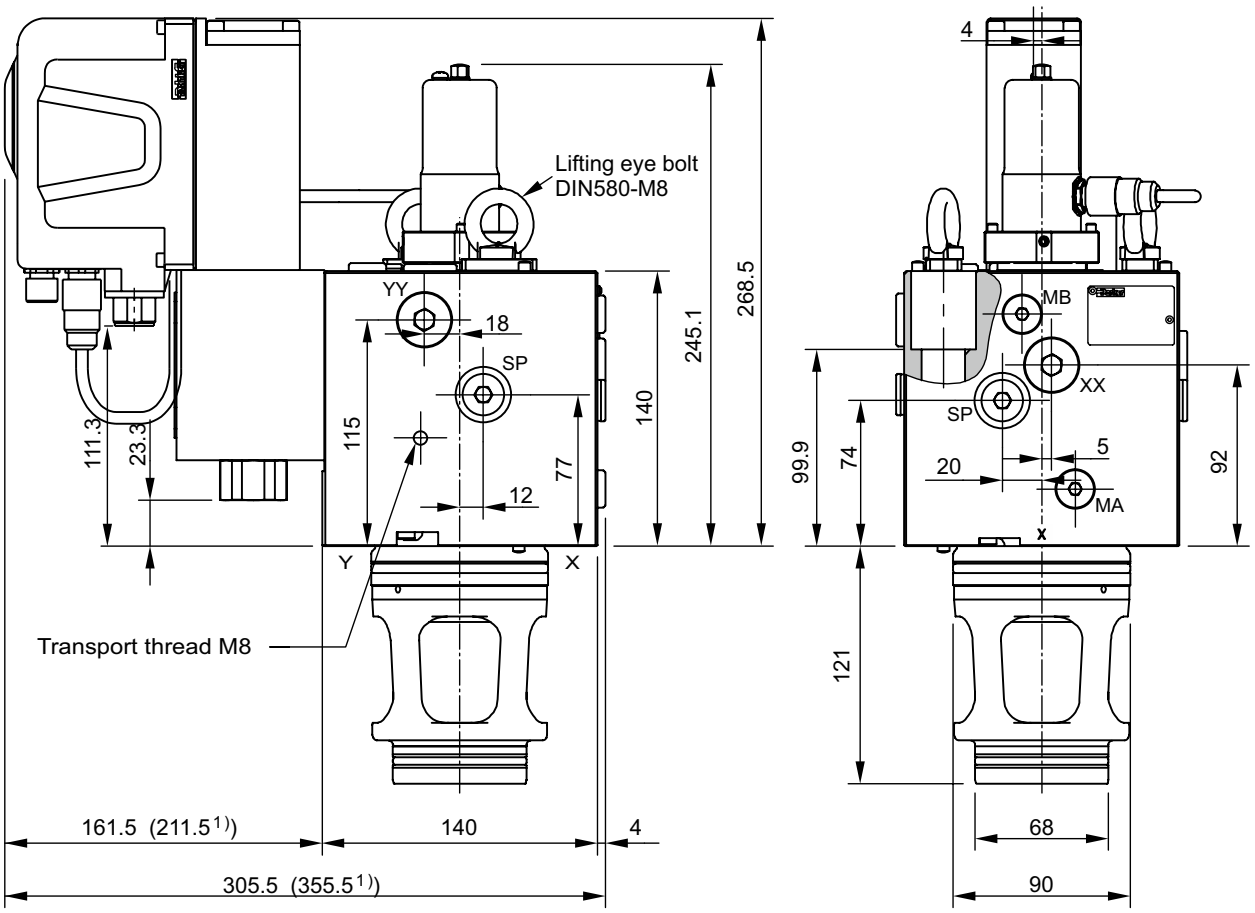
[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
40	BK481 4 x M20x110 ISO 4762-12.9	517 Nm	SK-TFP040AN	SK-TFP040AV

TFP*A, Standard, NG50



For disassembly of the valve loosen the two ring bolts and turn straps 90° against the stop.



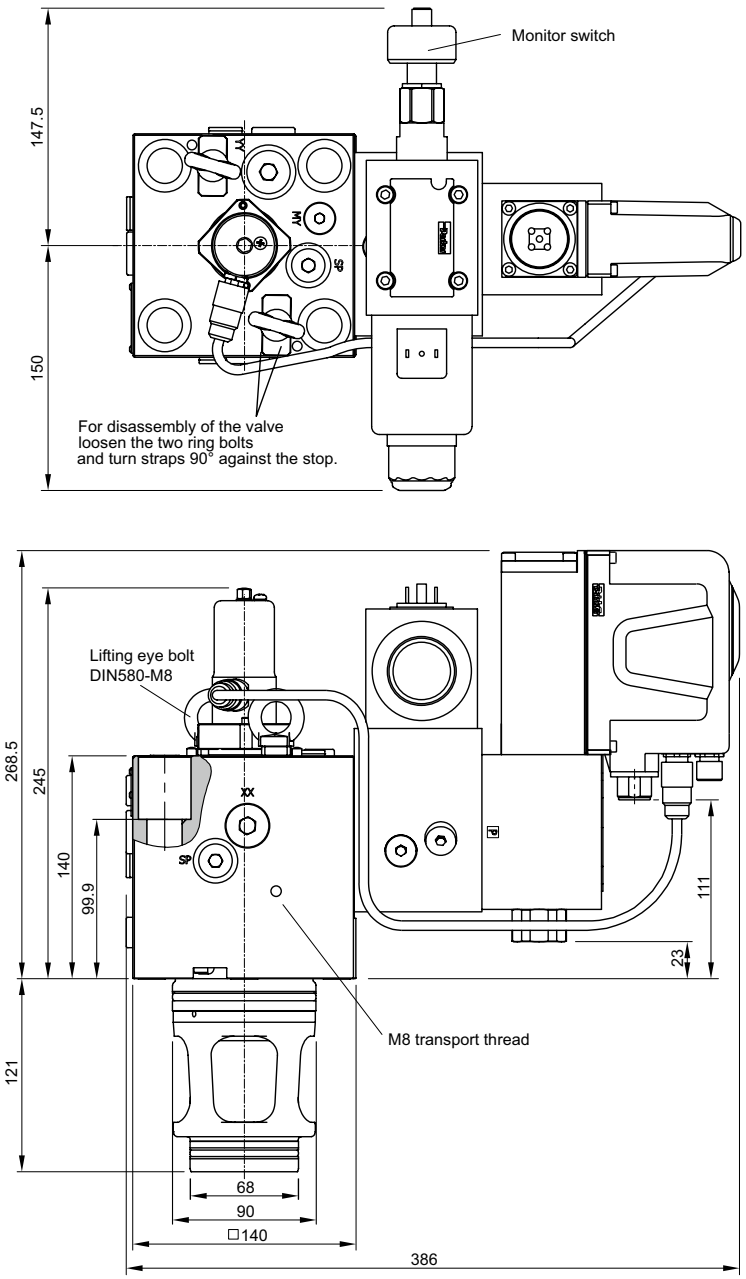
Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G1/2	External pilot oil supply / accumulator port
YY	G1/2	External pilot oil drain / accumulator port
MA	G1/4	Gauge port - pressure in control chamber A
MB	G1/4	Gauge port - pressure in control chamber B
MY	G1/4	Gauge port - pressure control chamber
SP	M16x1.5 OR	Suction port / gauge port [1]

[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
50	BK544 4 x M20x130 ISO 4762-12.9	517 Nm	SK-TFP050AN	SK-TFP050AV

TFP UK.indd 05.06.24

TFP*B, with Shut-off valve, NG50



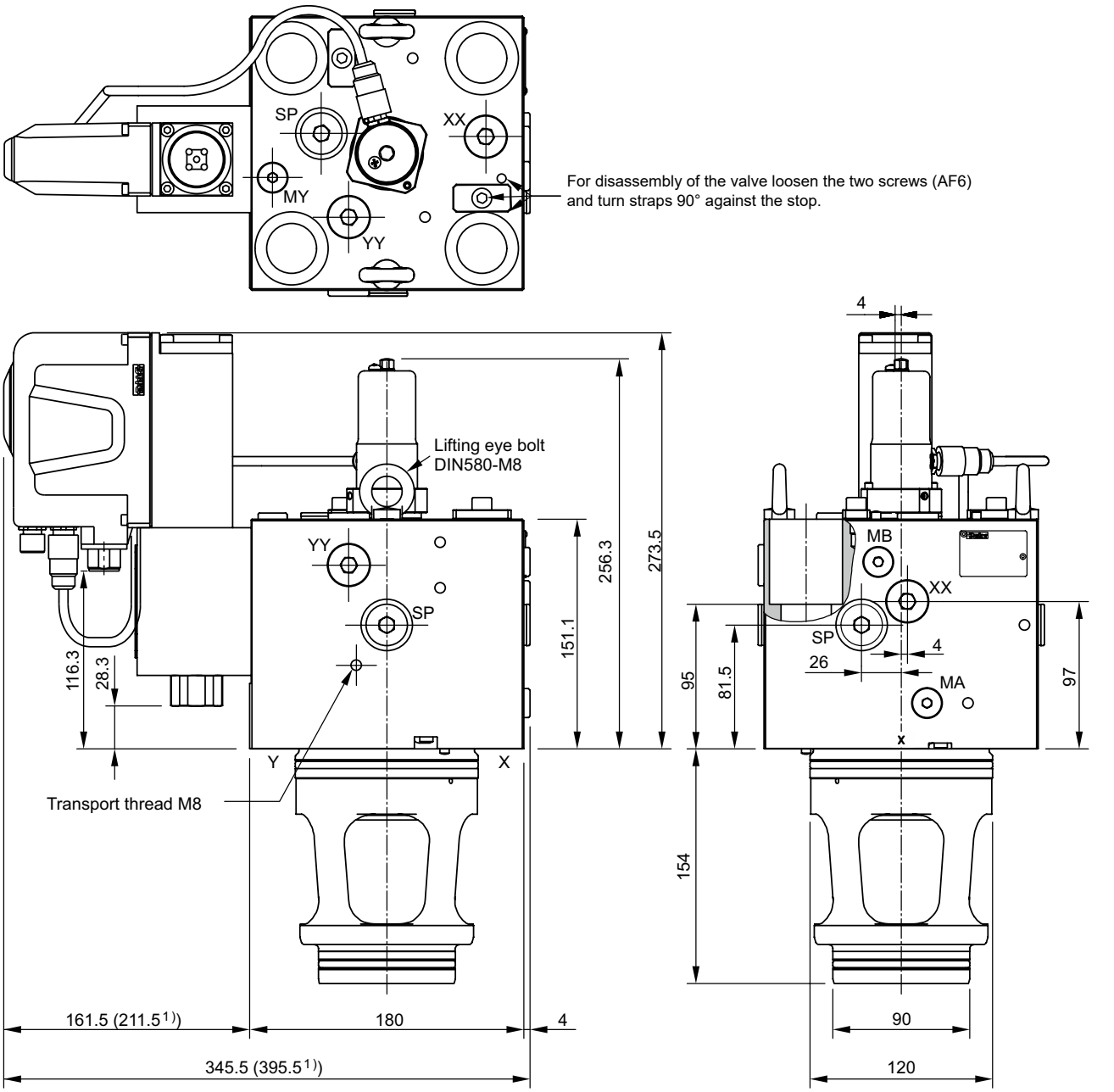
Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G1/2	External pilot oil supply / accumulator port
YY	G1/2	External pilot oil drain / accumulator port
MA	G1/4	Gauge port - pressure in control chamber A
MB	G1/4	Gauge port - pressure in control chamber B
MY	G1/4	Gauge port - pressure control chamber
SP	M16x1.5 OR	Suction port / gauge port [1]

[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
50	BK544 4 x M20x130 ISO 4762-12.9	517 Nm	SK-TFP050AN	SK-TFP050AV

TFP UK.indd 05.06.24

TFP*A, Standard, NG63

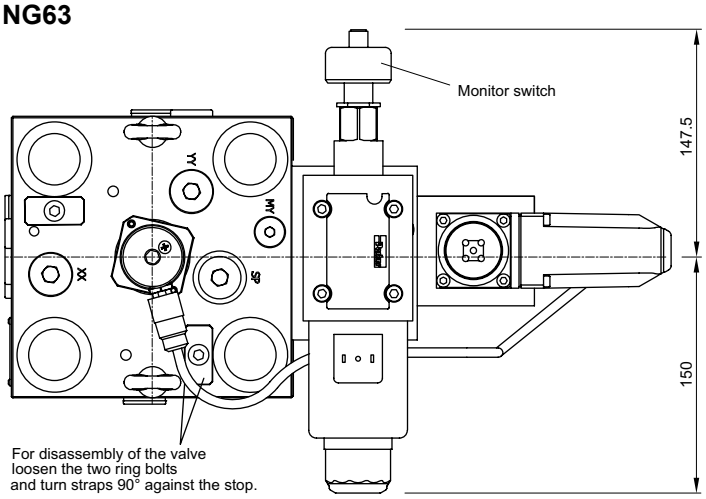


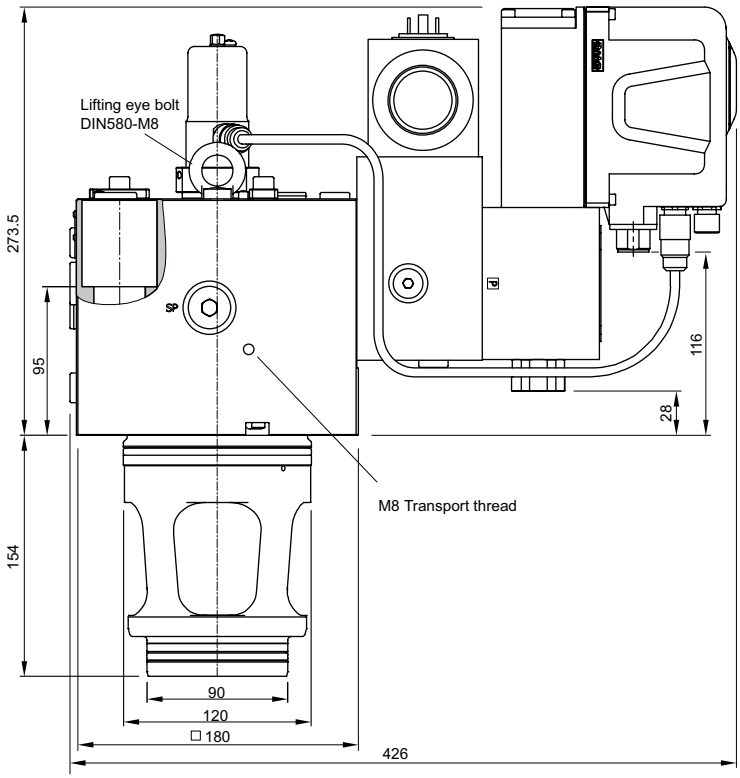
Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G1/2	External pilot oil supply / accumulator port
YY	G1/2	External pilot oil drain / accumulator port
MA	G1/4	Gauge port - pressure in control chamber A
MB	G1/4	Gauge port - pressure in control chamber B
MY	G1/4	Gauge port - pressure control chamber
SP	M22x1.5 OR	Suction port / gauge port [1]

[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
63	BK545 4x M30x140 ISO 4762-12.9	1775 Nm	SK-TFP063AN	SK-TFP063AV

TFP*B, with Shut-off valve, NG63



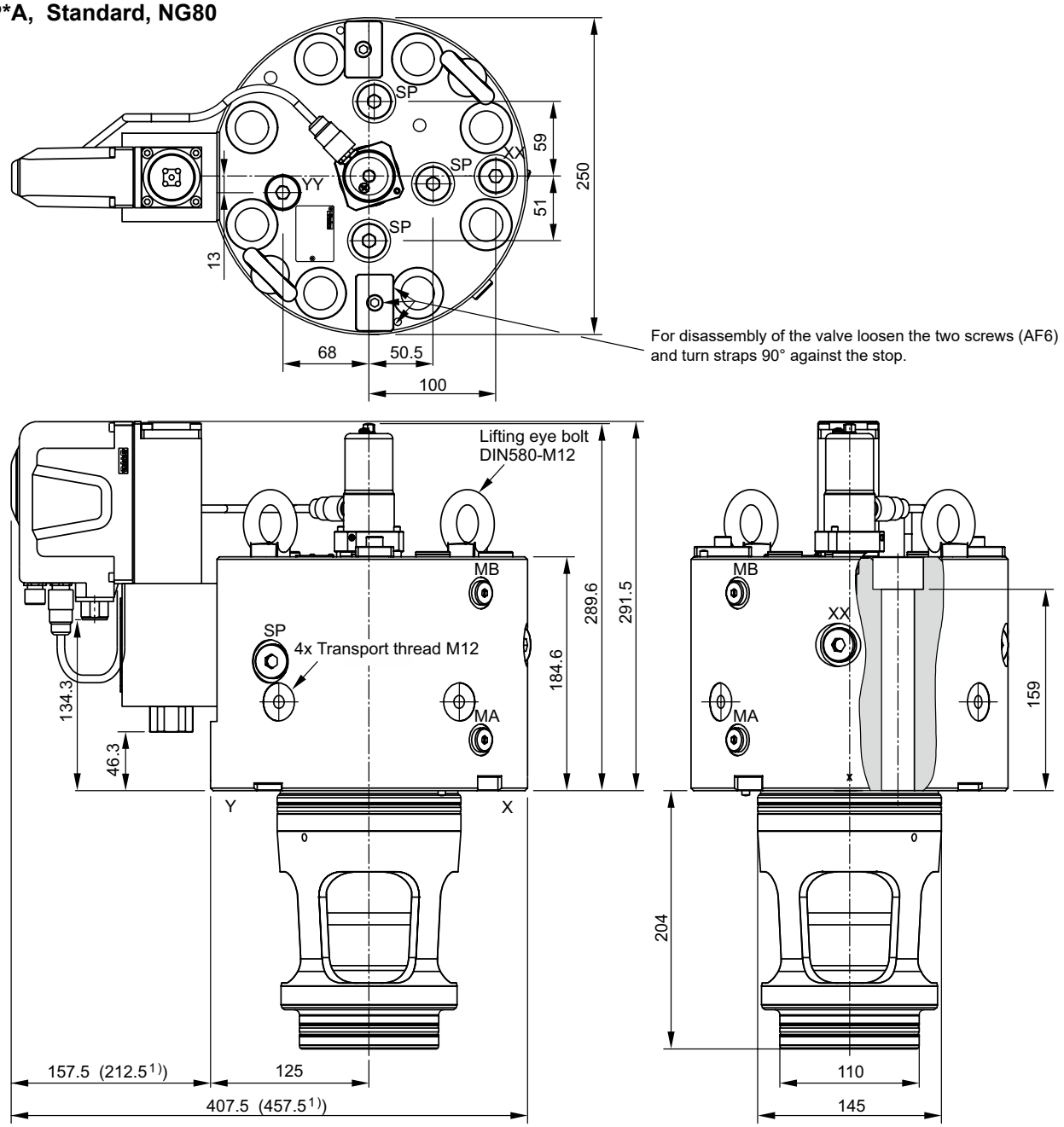


Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G1/2	External pilot oil supply / accumulator port
YY	G1/2	External pilot oil drain / accumulator port
MA	G1/4	Gauge port - pressure in control chamber A
MB	G1/4	Gauge port - pressure in control chamber B
MY	G1/4	Gauge port - pressure control chamber
SP	M22x1.5 OR	Suction port / gauge port [1]

[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
63	BK545 4x M30x140 ISO 4762-12.9	1775 Nm	SK-TFP063AN	SK-TFP063AV

TFP*A, Standard, NG80

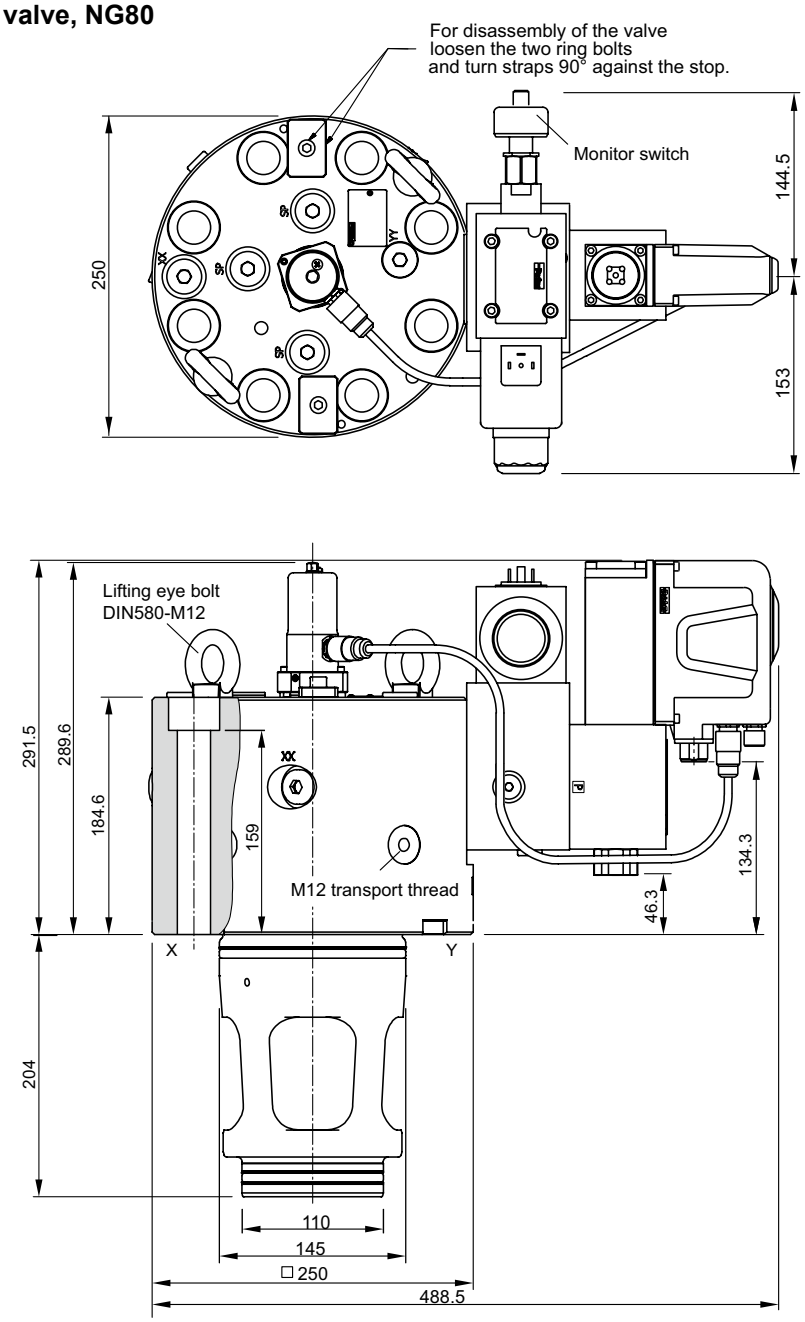


Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G1/2	External pilot oil supply / accumulator port
YY	G1/2	External pilot oil drain / accumulator port
MA	G1/4	Gauge port - pressure in control chamber A
MB	G1/4	Gauge port - pressure in control chamber B
SP	M22x1.5 OR	Suction port / gauge port [1]

[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
80	BK546 8x M24x200 ISO 4762-12.9	890 Nm	SK-TFP080AN	SK-TFP080AV

TFP*B, with Shut-off valve, NG80

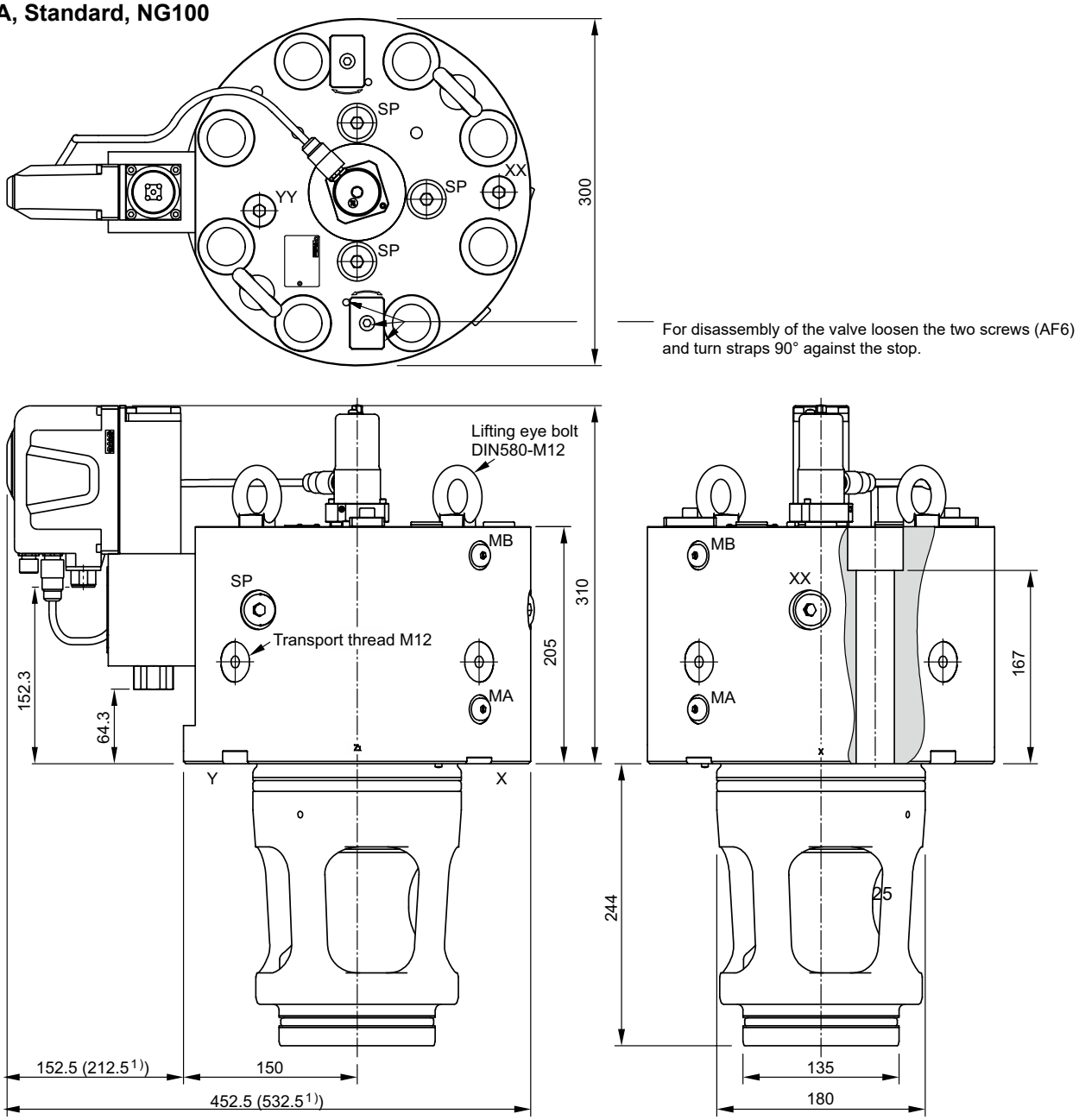


Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil drain (ISO7368)
XX	G1/2	External pilot oil supply / accumulator port
YY	G1/2	External pilot oil drain / accumulator port
MA	G1/4	Gauge port - pressure in control chamber A
MB	G1/4	Gauge port - pressure in control chamber B
SP	M22x1.5 OR	Suction port / gauge port [1]

[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
80	BK546 8x M24x200 ISO 4762-12.9	890 Nm	SK-TFP080AN	SK-TFP080AV

TFP*A, Standard, NG100

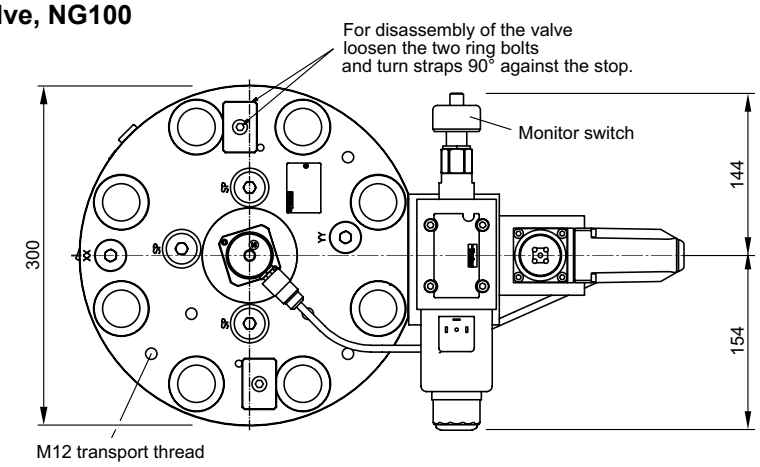


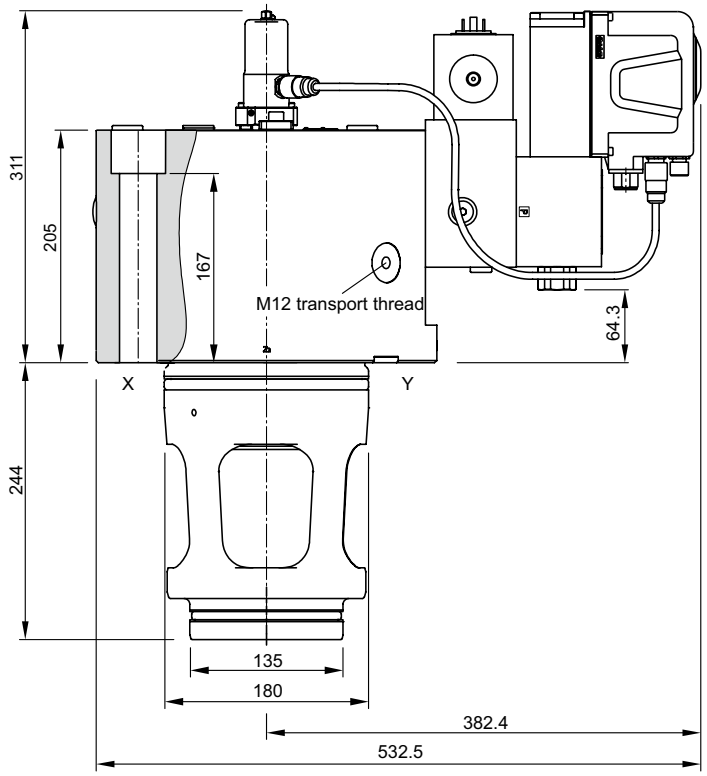
Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil supply (ISO7368)
XX	G1/2	External pilot oil supply / accumulator port
YY	G1/2	External pilot oil drain / accumulator port
MA	G1/4	Gauge port - pressure in control chamber A
MB	G1/4	Gauge port - pressure in control chamber B
SP	M22x1.5 OR	Suction port / gauge port 1)

1) The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

NG	Bolt kit -		Kit NBR	Kit FPM
100	BK547 8x M30x220 ISO 4762-12.9	1775 Nm	SK-TFP100AN	SK-TFP100AV

TFP*B, with Shut-off valve, NG100



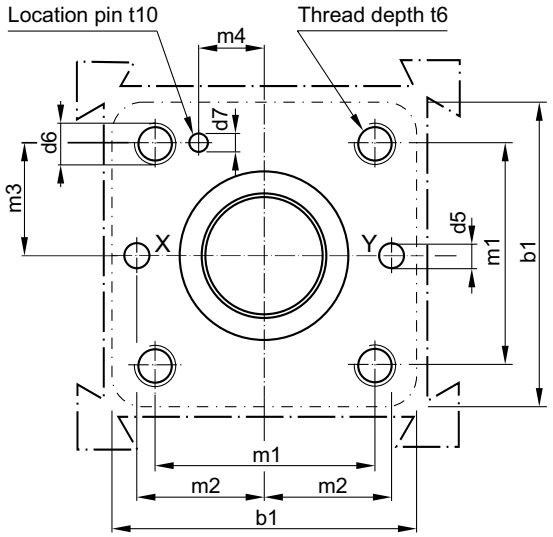


Port	Size	Description
X		Pilot oil supply (ISO7368)
Y		Pilot oil supply (ISO7368)
XX	G1/2	External pilot oil supply / accumulator port
YY	G1/2	External pilot oil drain / accumulator port
MA	G1/4	Gauge port - pressure in control chamber A
MB	G1/4	Gauge port - pressure in control chamber B
SP	M22x1.5 OR	Suction port / gauge port [1]

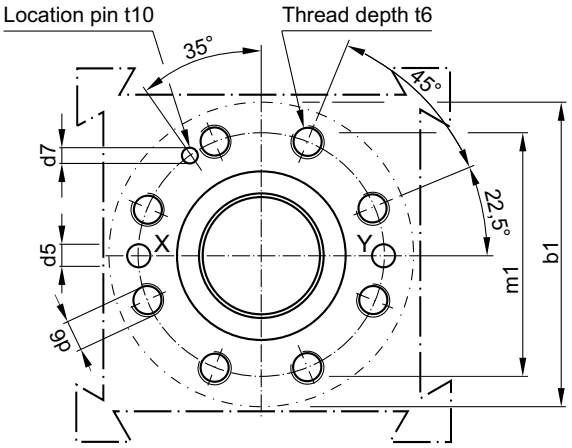
[1] The use of the suction port is required for applications respectively for installation situations where the risk of diesel effects and cavitation inside the valve exists.

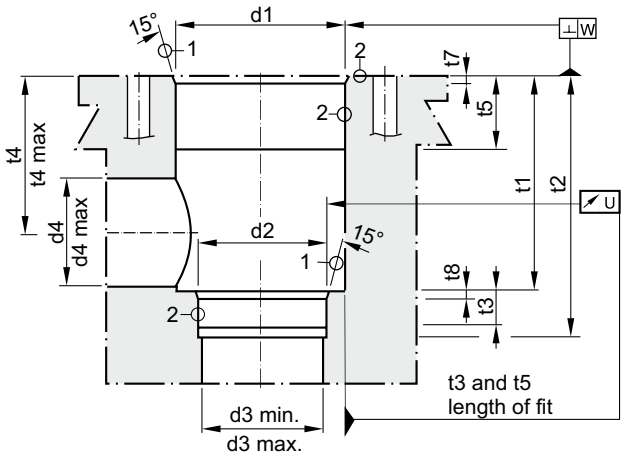
NG	Bolt kit -		Kit NBR	Kit FPM
100	BK547 8x M30x220 ISO 4762-12.9	1775 Nm	SK-TFP100AN	SK-TFP100AV

Code: ISO 7368-B*-*-2-A/B
NG50 bis NG63



Code: ISO 7368-B*-*-2-A
NG80 bis 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	d3 max	d4	d4 max[1)]	d5 max	d6	d7 H13	m1±0.2	m2±0.2	m3±0.2
25	85	45	34	25	30	25	30	6	M12	4	58	33	29
32	102	60	45	32	39	32	39	8	M 16	6	70	41	35
40	125	75	55	40	50	40	50	10	M 20	6	85	50	42.5
50	140	90	68	50	62	50	63	10	M 20	8	100	58	50
63	180	120	90	63	80	63	80	12	M 30	8	125	75	62.5
80	250	145	110	80	100	80	100	16	M 24	10	200	—	—
100	300	180	135	100	125	100	125	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)] Only in combination with $d4_{max}$ und $t4_{max}$.

Please note:
The flow capacity of the valve can only be up to 100 % when used with optimized ports $d3_{max}$ and $d4_{max}$.