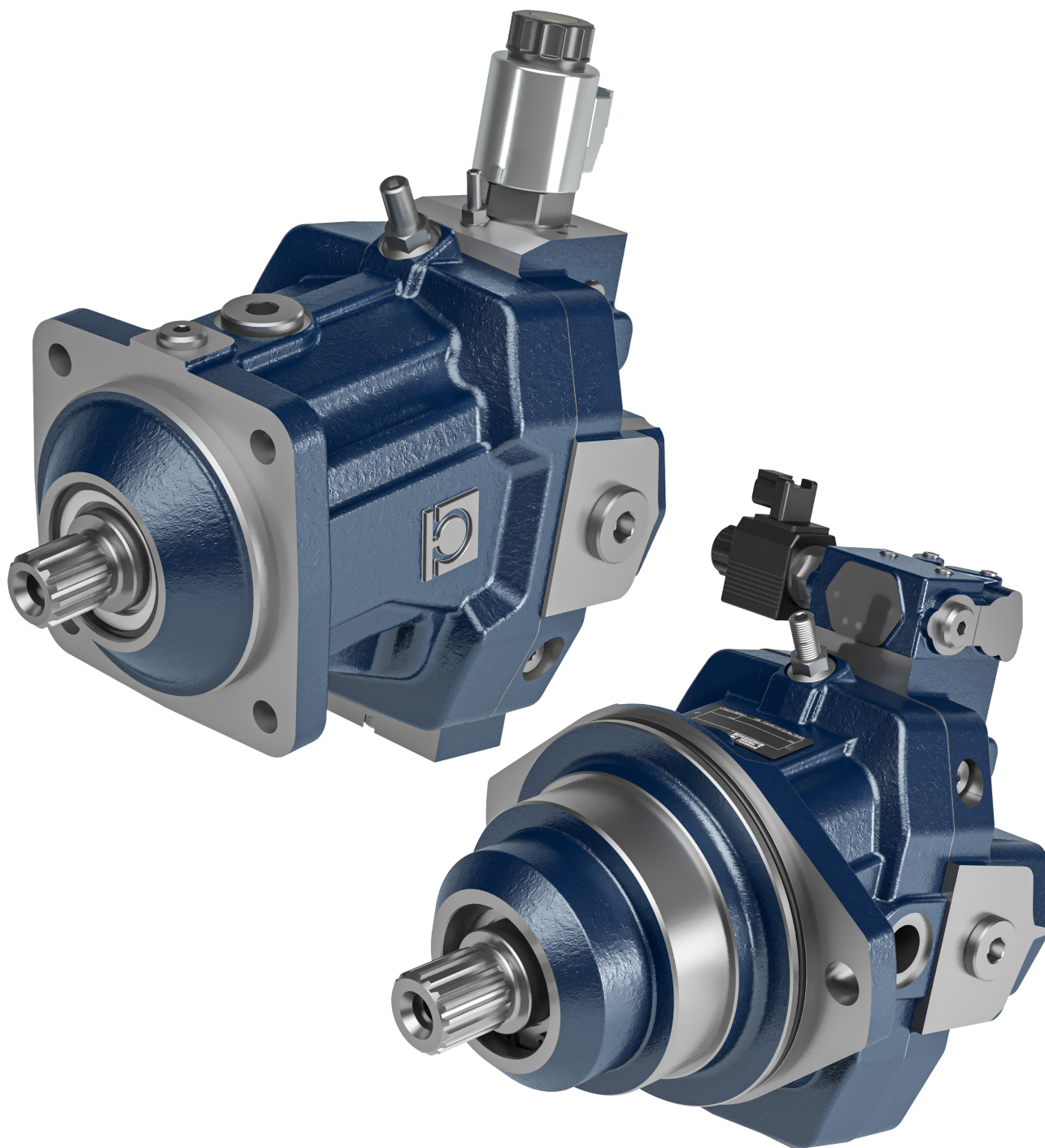


Bent axis axial piston motors



Introduction	4
Optimization of service life of bearings in applications with radial load	5
Applications of axial forces to the shaft	7
HPBA 060-078	9
HPBA 080-108	31
HPBA 110-130	53
HPBA 160-200	75

Introduction The bent axis variable motors have been designed to obtain a high angle of inclination of the pumps to the output shaft axis. Compared with swashplate motors which reach an angle of inclination of 18°, the bent axis versions reach 25°.

This geometry offers several advantages:

- high starting torque;
- high range of variation in displacement;
- high volumetric and mechanical efficiency;
- high maximum speed;
- high maximum pressures.

The Bondioli and Pavesi bent axis motors can be used with other products in open and closed circuit systems to transfer and control hydraulic power. They can be fitted with a flushing valve (the valve is fitted with a 1.7 diameter orifice as standard). The variation in displacement can be changed from maximum to minimum using high or low pressure hydraulic control or electric control, depending on customer requirements.

The ON-OFF electrically-controlled version allows a minimum displacement adjustment equal to 30% of the maximum displacement.

The proportional control version, on the other hand, thanks to the geometry used in its design, allows a wide range of variation in displacement, up to 0° of inclination of the motors (minimum zero displacement).

The extended zero-degree capability function creates opportunities to easily improve machine performance for:

- assist drive on the steering axle of high inertia machines (e.g. combine harvesters) and could include Anti Slip control;
- off-road machines that require Anti Slip Control (self-propelled sprayers);
- multi-engine applications which require optimized operating and transport modes that used the zero degree position for maximum transport speed;
- improvement in the machine's angle of inclination.

Optimization of service life of bearings in applications with radial load

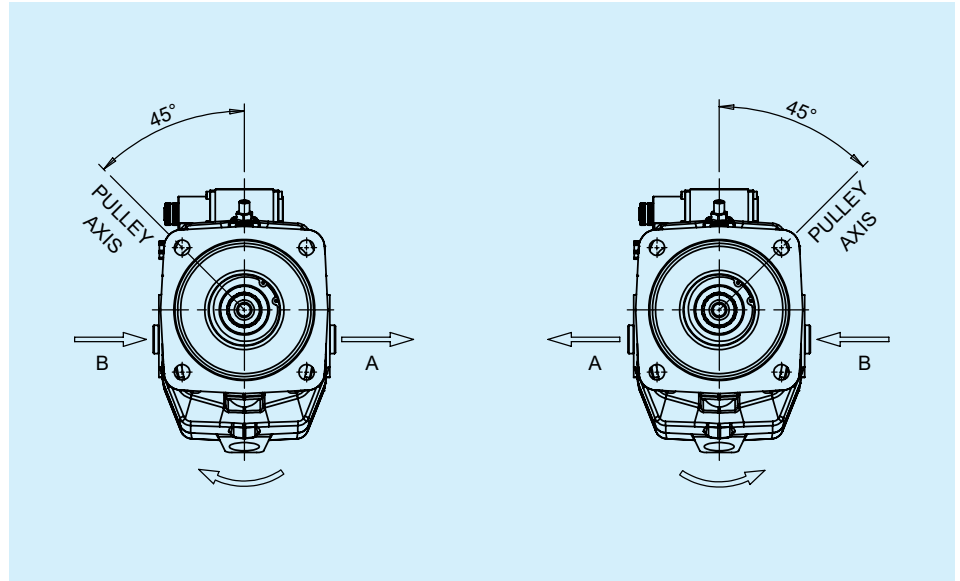
The direction of application of the radial load affects the service life of the motor bearings.

An optimal direction of the force reduce the stress on the bearings and gives them a longer service life.

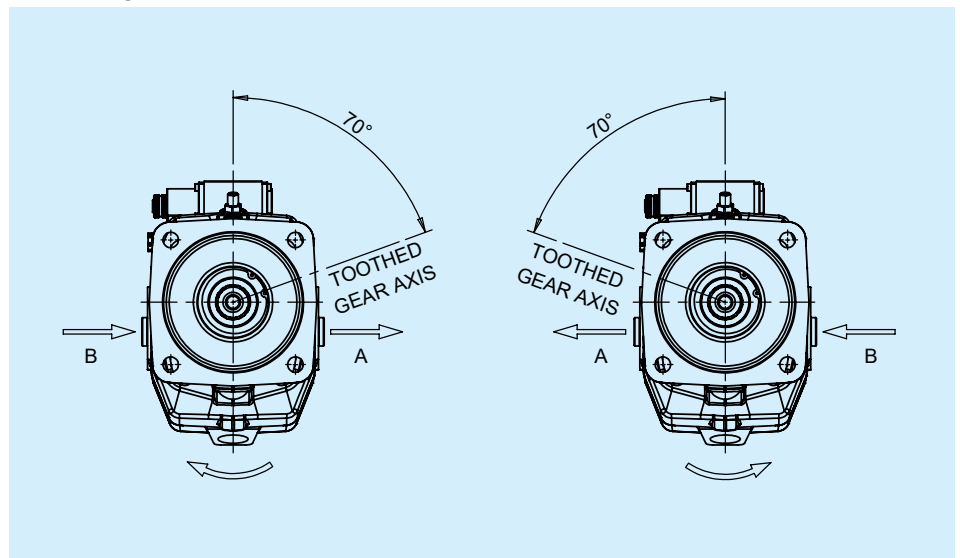
The recommended angle of load application depends on the direction of rotation and the type of application.

For application-specific bearing life calculations, please contact our technical offices.

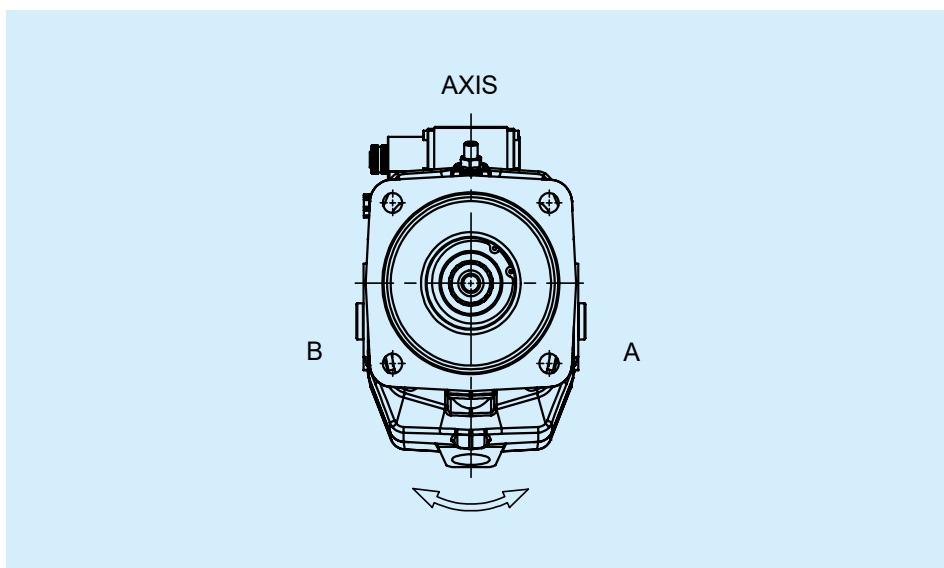
Pulley axis



Toothed gear axis

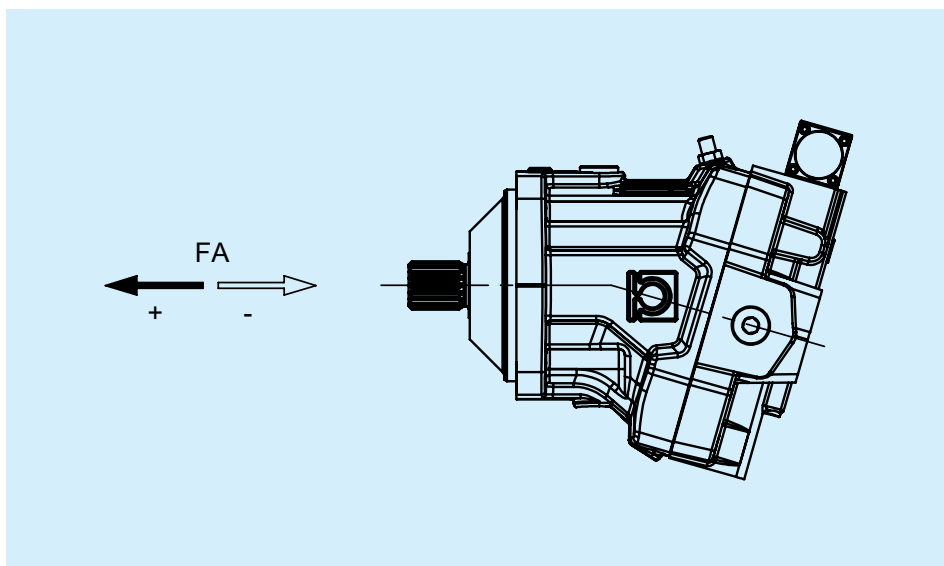


Axis for any application (alternating direction of rotation)



Application of axial forces to the shaft

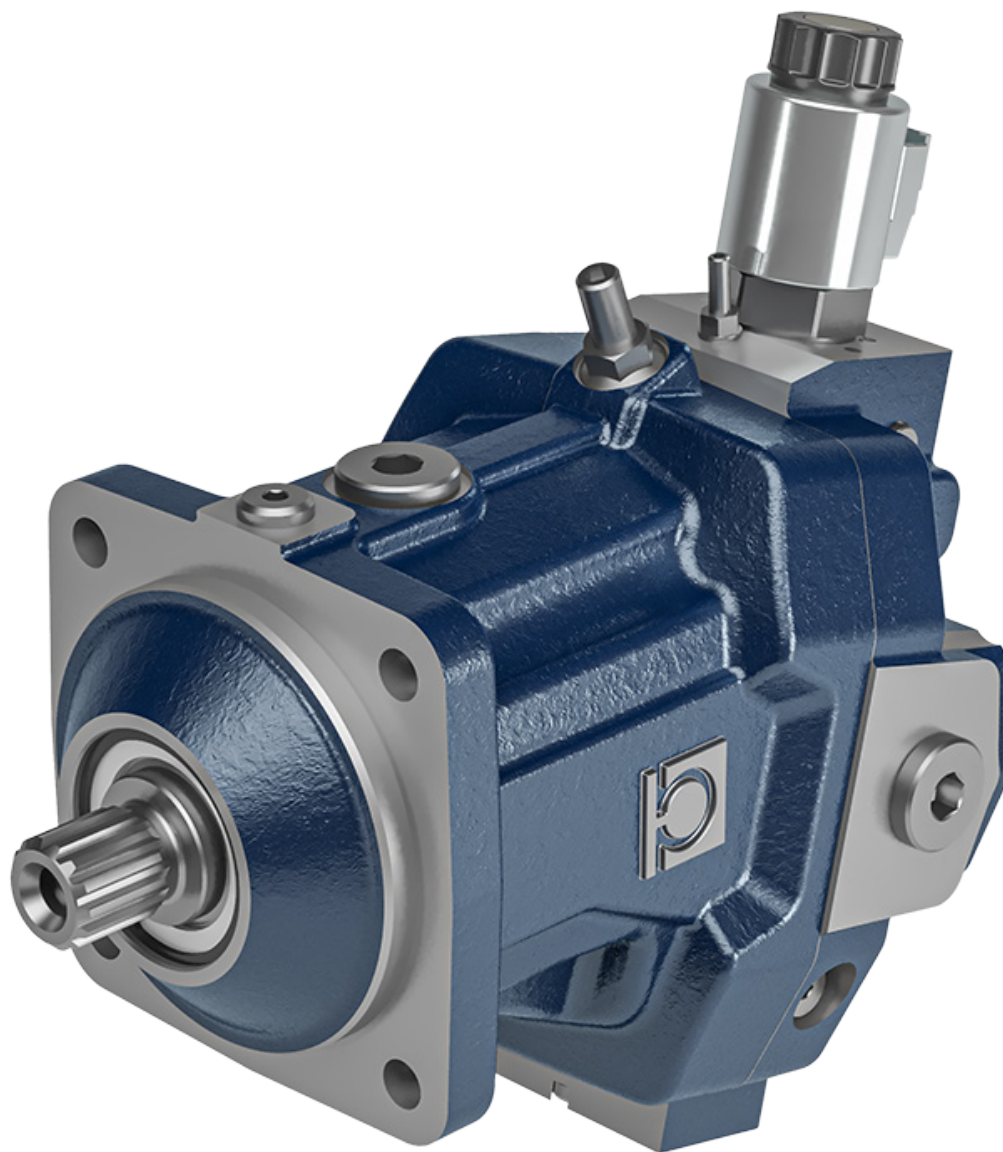
Axial compressive forces can be applied to the shaft (see table). Axial tensile loads, on the other hand, which can reduce the service life of the main bearing, should be avoided.



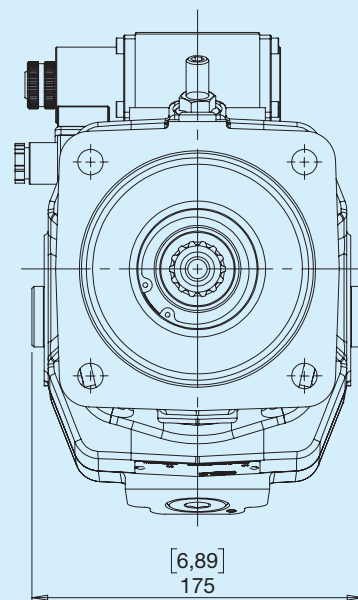
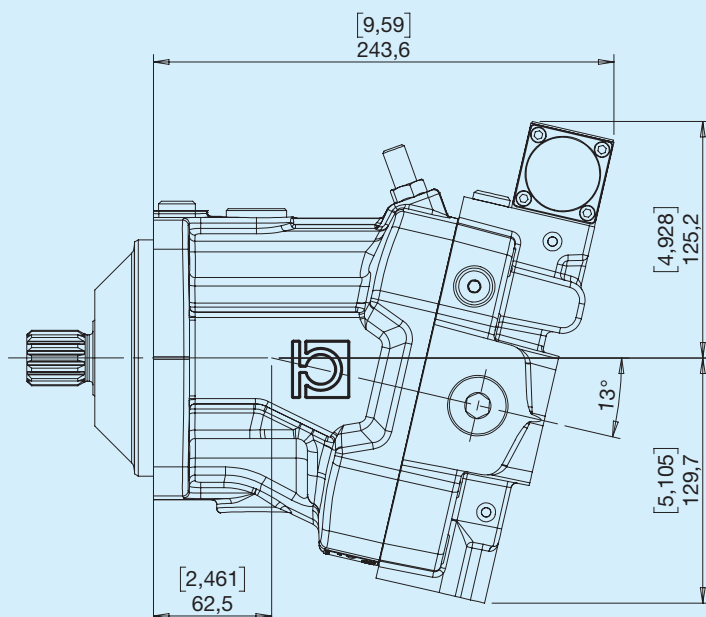
Nominal displacement		MAX axial load without pressure (*)	MAX axial load at working pressure
cm3	in3	N	N/bar
60	3.66	1340	118
78	4.76	1340	141
80	4.88	1840	141
108	6.59	1840	184
110	6.71	2000	184
130	7.93	2000	230
160	9.76	3650	230
200	12.2	3650	270

(*) The values indicated are maximum values and should not be applied during continuous operation.

Variable-displacement motors HPBA 060-078

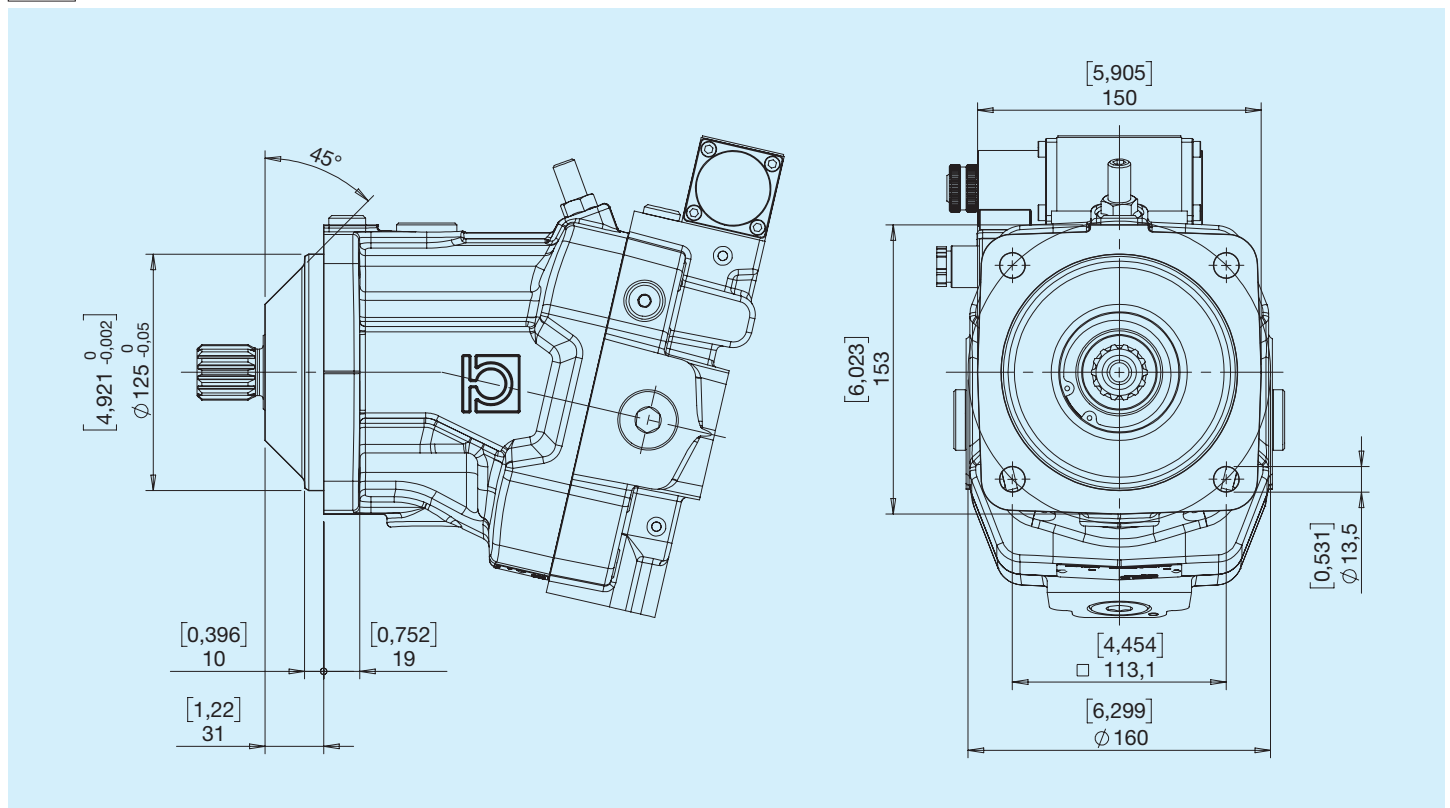


Before use, carefully read the GENERAL INSTRUCTIONS FOR USE OF CLOSED CIRCUIT AXIAL PISTON PUMPS AND MOTORS.

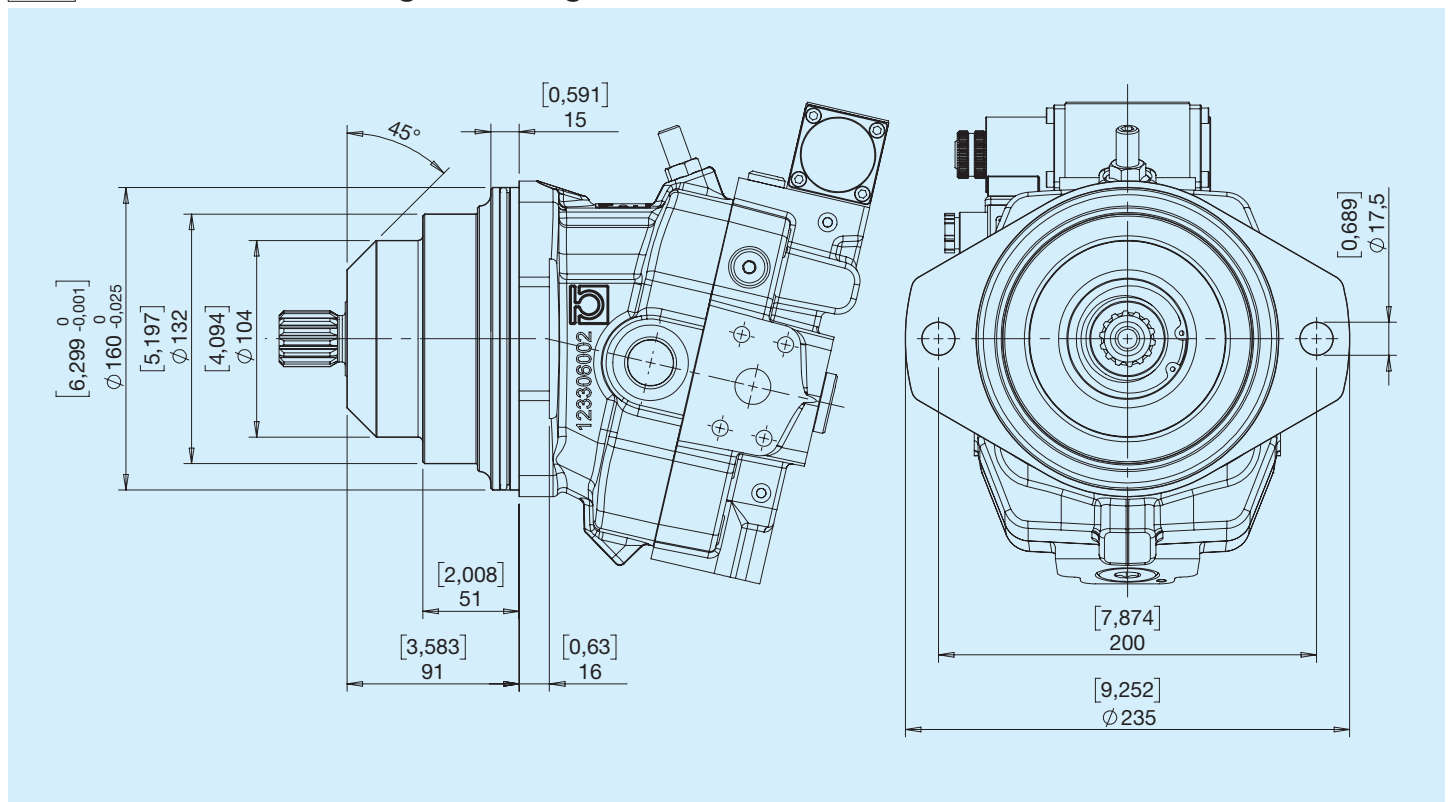


HPBA	Nominal displacement		Swash plate	Continuous pressure		Intermittent pressure		Peak pressure		Rotational speed			Weight	
	cm ³	in ³		bar	psi	bar	psi	bar	psi	MAX (max V) min ⁻¹	MAX (min V) min ⁻¹	MIN min ⁻¹	kg	lbs
060	60	3.66	25	380	5510	400	5800	450	6525	4400	5500	500	28	62
078	78	4.73	26	300	4350	350	5075	400	5800	4400	5500	500	28.7	63

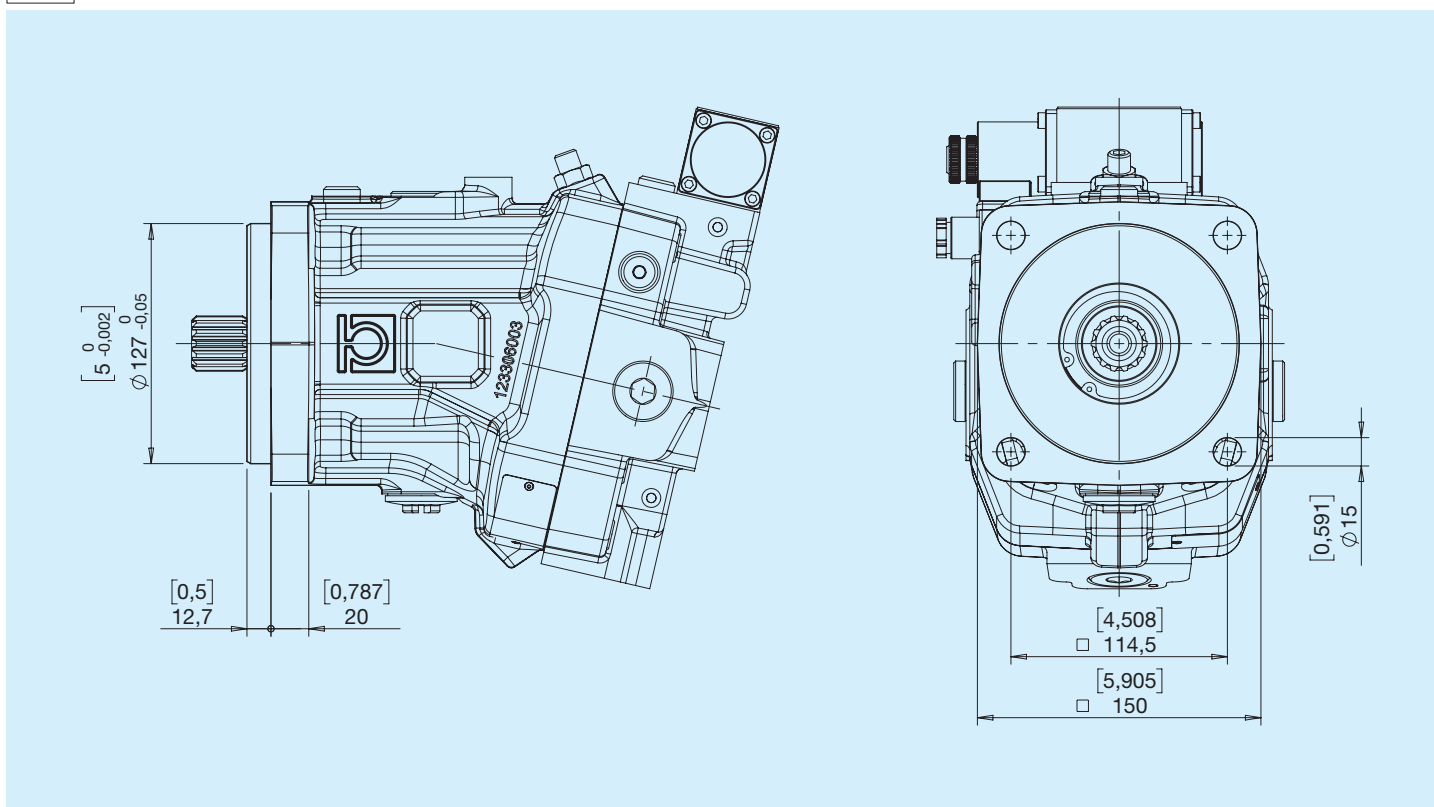
I ISO 4 holes standard



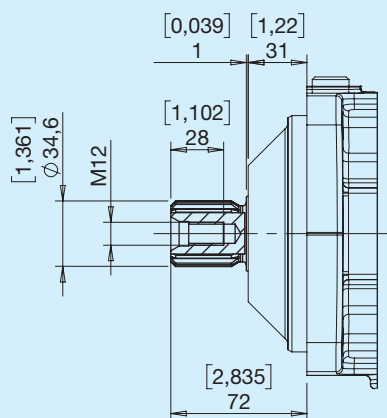
P ISO 2 holes cartridge centring



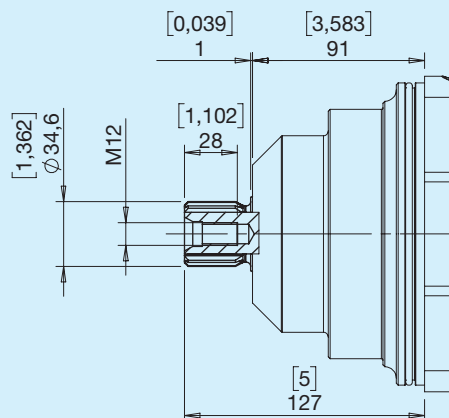
S SAE C



C DIN 5480 W35x2x30x16

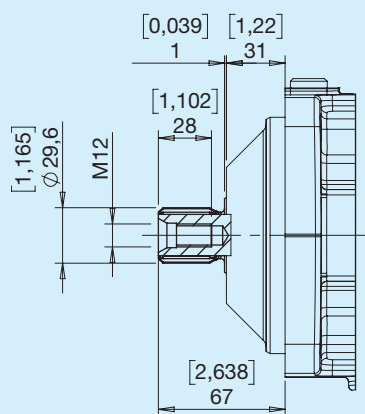


Max. torque 860 Nm

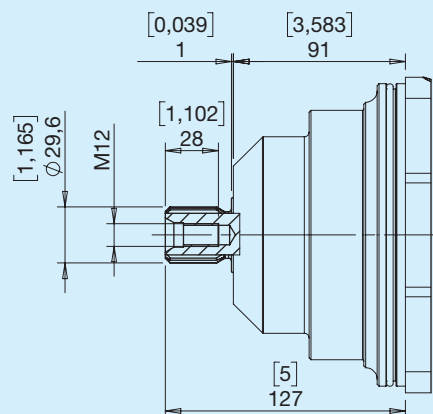


Max. torque 860 Nm

1 DIN 5480 W30x2x30x14

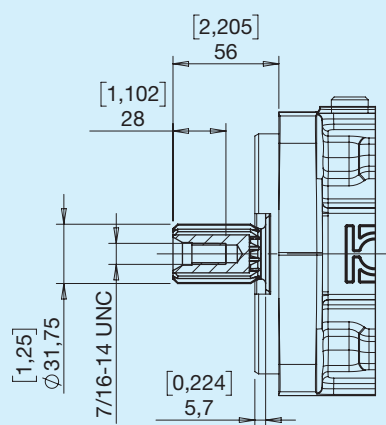


Max. torque 590 Nm



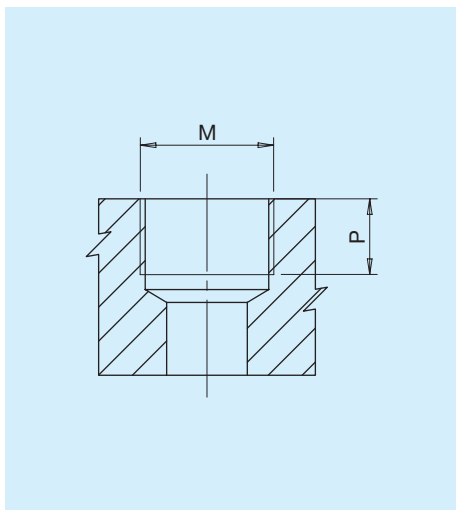
Max. torque 590 Nm

3 SAE 14T 12/24 DP



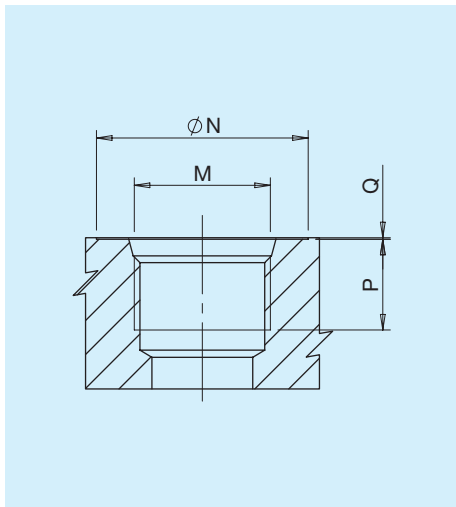
Max. torque 590 Nm

Type G



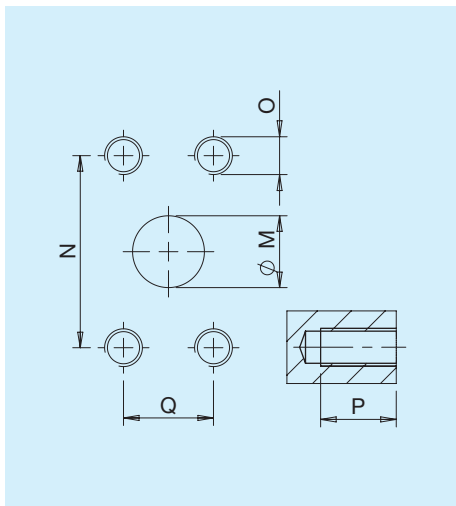
Type	M		P	
		Nm	mm	in
G2	Port ISO 1179-1 - G 1/4	17	8	0.31
G6	Port ISO 1179-1 - G 3/4	90	19	0.75
G7	Port ISO 1179-1 - G 1	160	19	0.75

Type U



Type	Dim.	N		P		Q		M	Nm
		mm	in	mm	in	mm	in		
U2	1/4"	20	0.79	12	0.47	0.3	0.01	Port ISO 11926-1-7/16-20	17
U6	3/4"	41	1.61	20	0.79	0.3	0.01	Port ISO 11926-1-1 1/16-12	90
U7	1"	49	1.93	18	0.70	0.3	0.01	Port ISO 11926-1-1 5/16-12	160

Type N

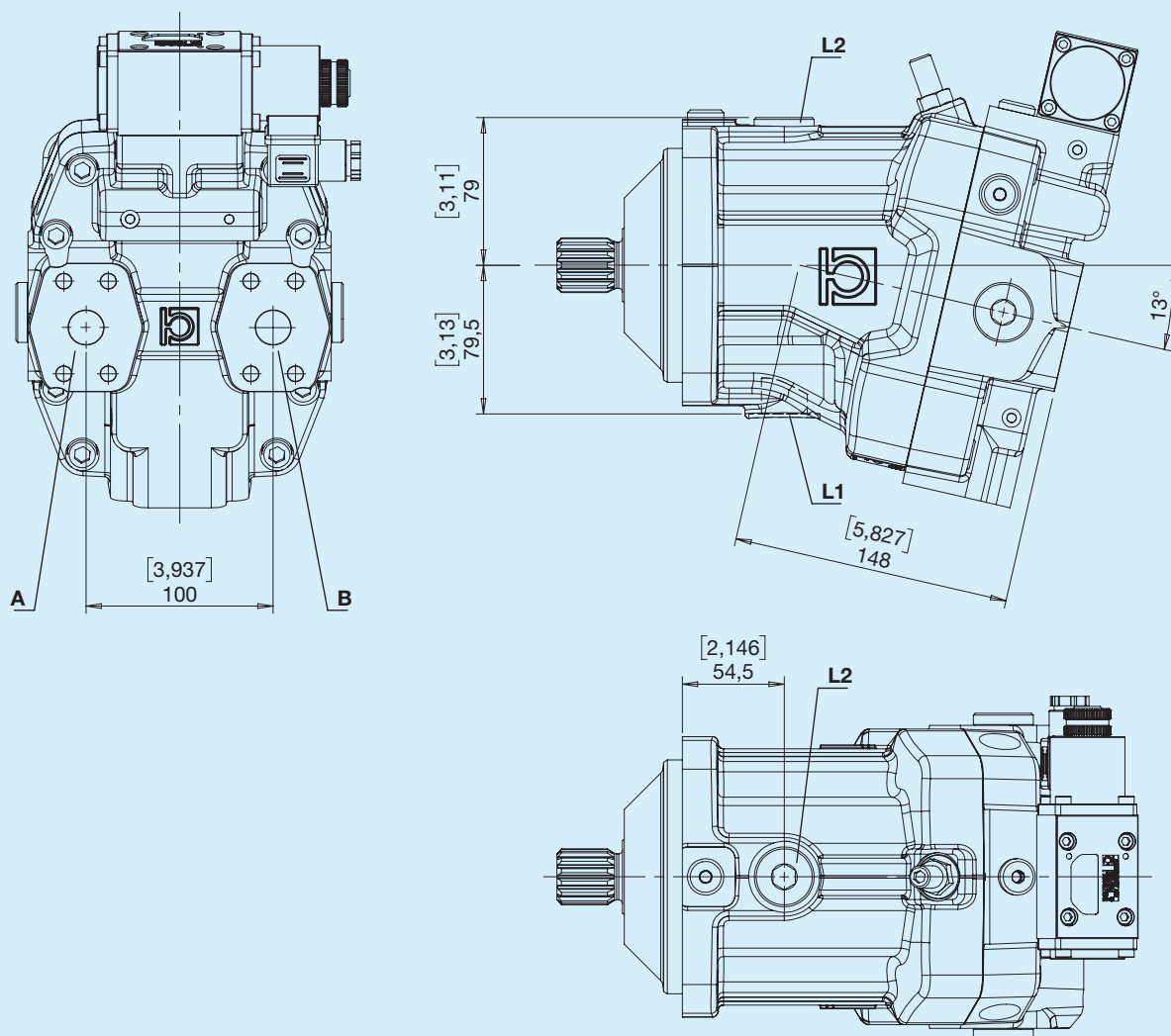


Type	M		N		Q		P		O	Nm
	mm	in	mm	in	mm	in	mm	in		
N6	19	0.75	50.8	2	23.8	0.94	17	0.67	M10	38

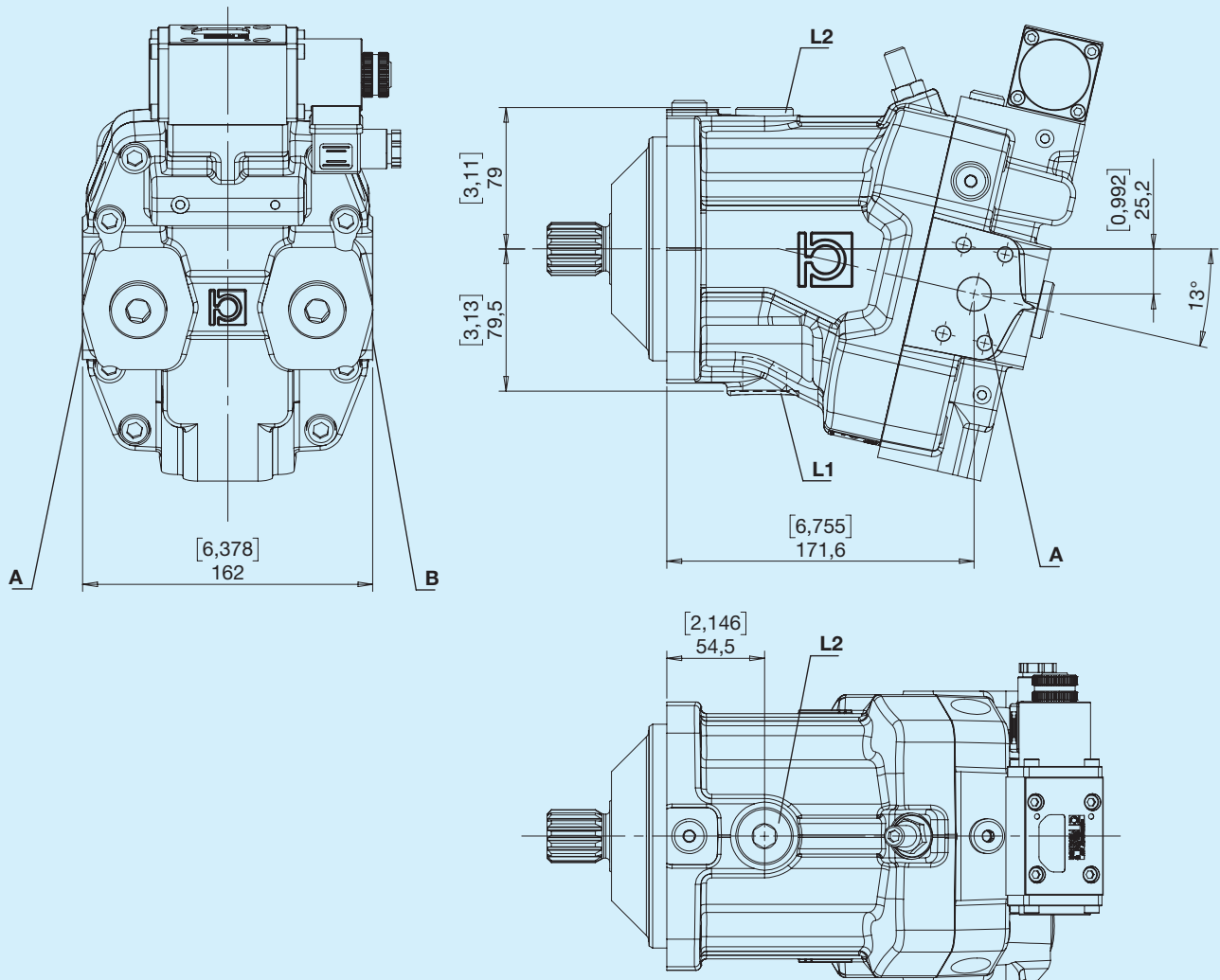
Combinations

Type	Inlet/outlet A-B	Drain port L1-L2	Pilot a-b-x
G	G6	G6	G6
U	U6	U6	U6
N	N6	G6	G2
M	N6	U6	U2

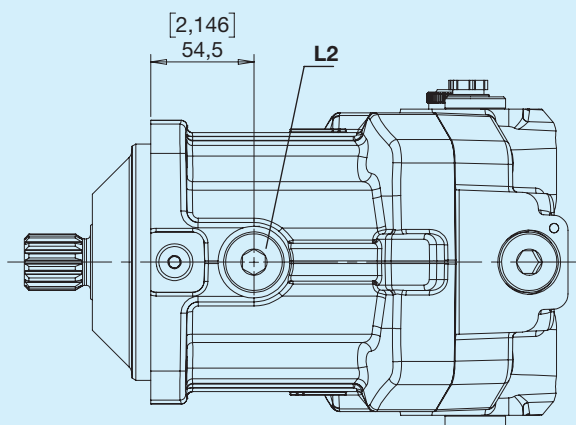
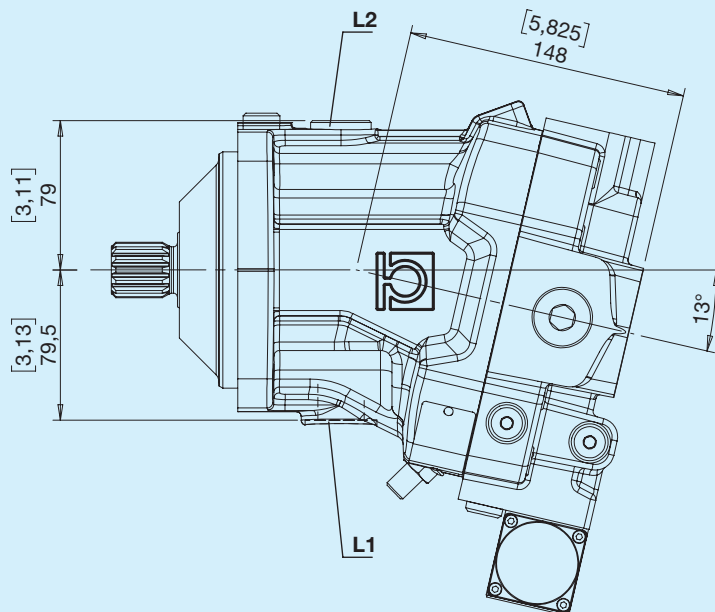
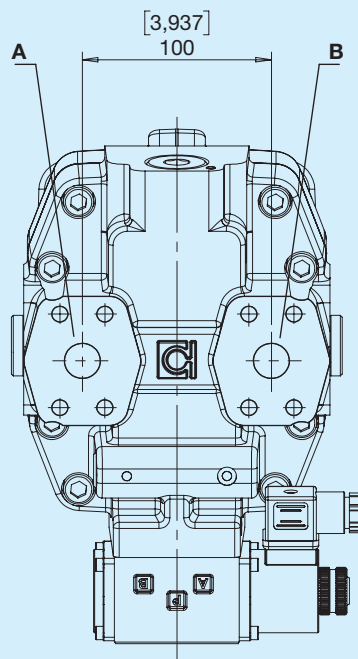
P Rear



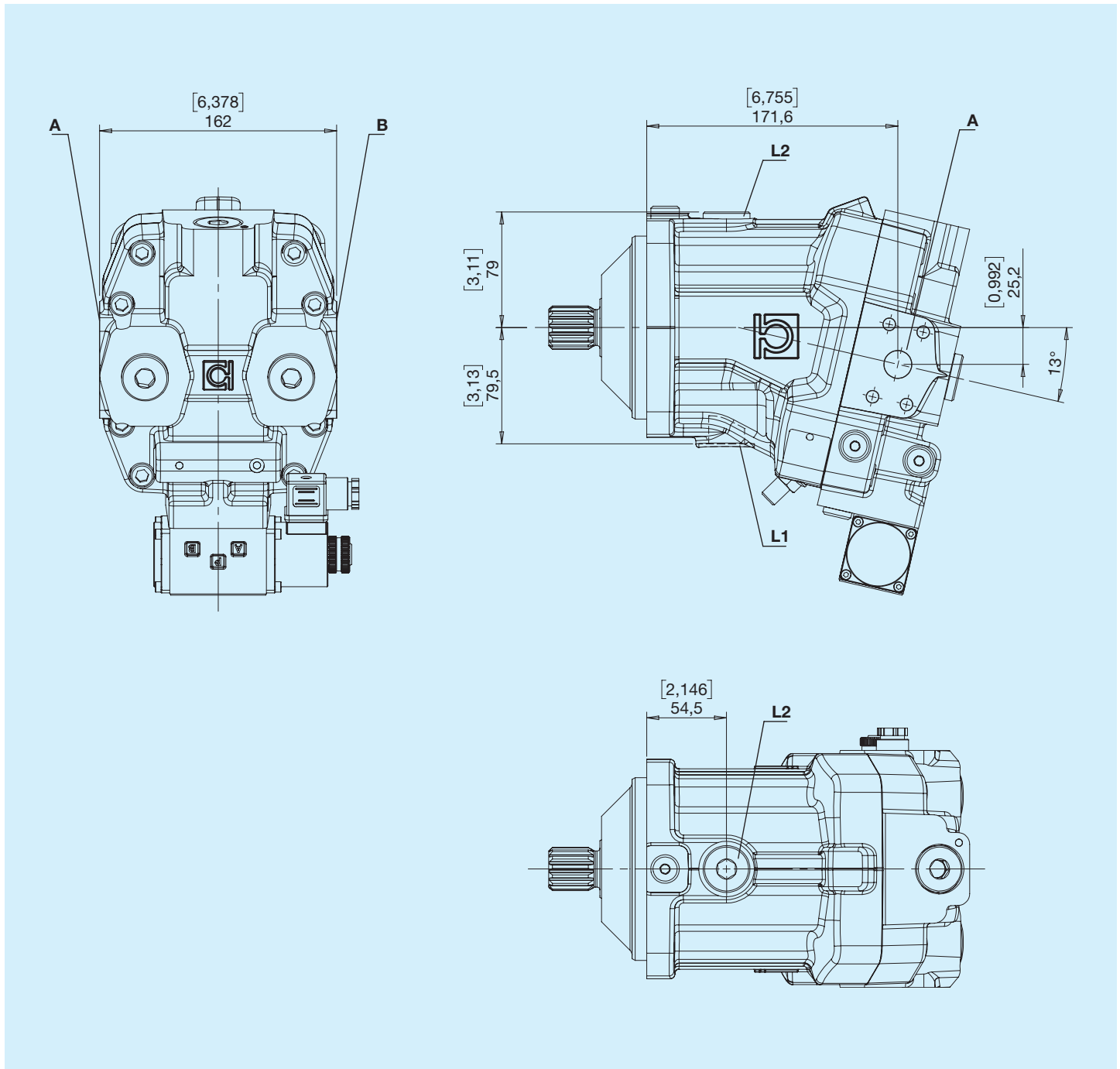
L Opposite sideways



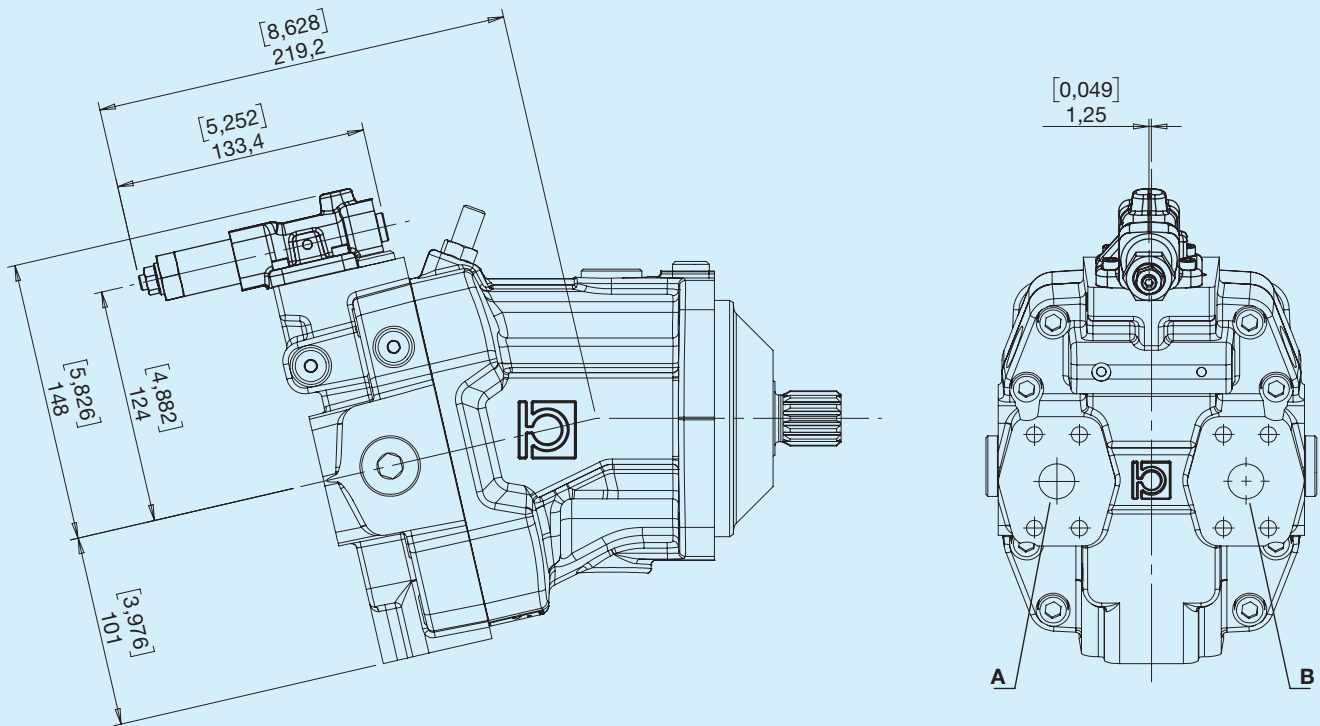
Y Rear with rotated valve



J Opposite sideways with rotated valve

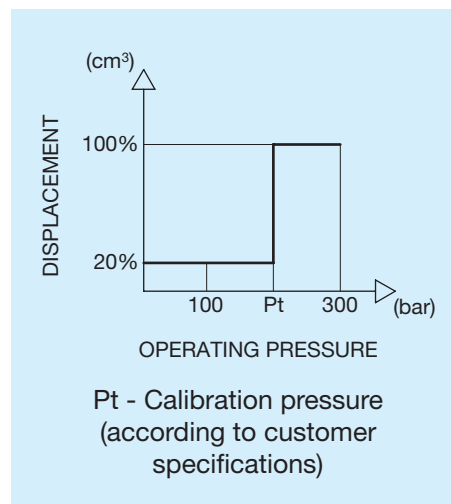


A Hydraulic automatic, ON/OFF

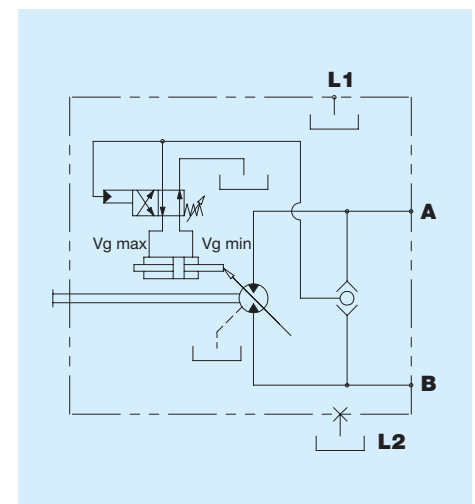


Inlet	Rotation
Right	Left
Right	Right

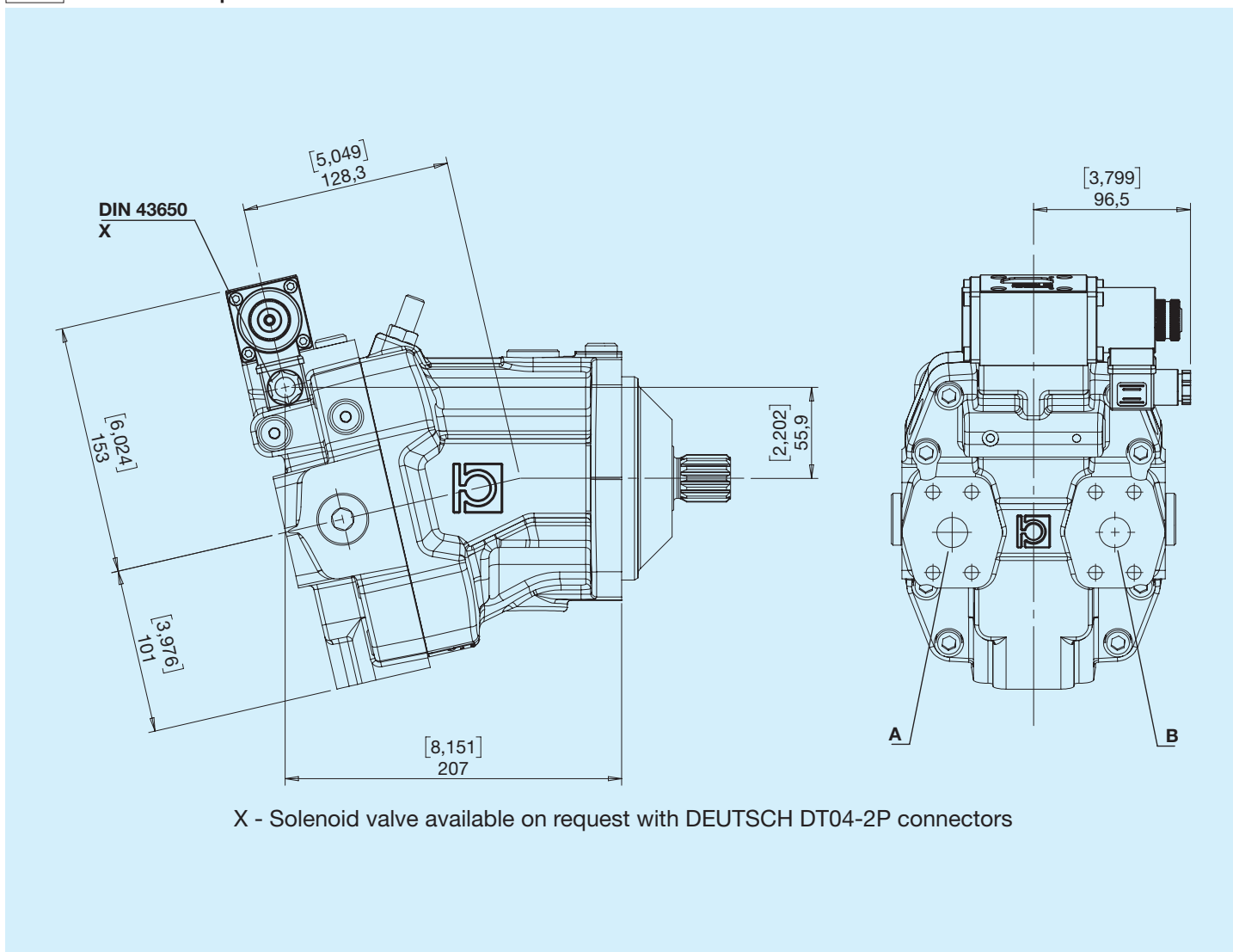
Pilot



Hydraulic diagram

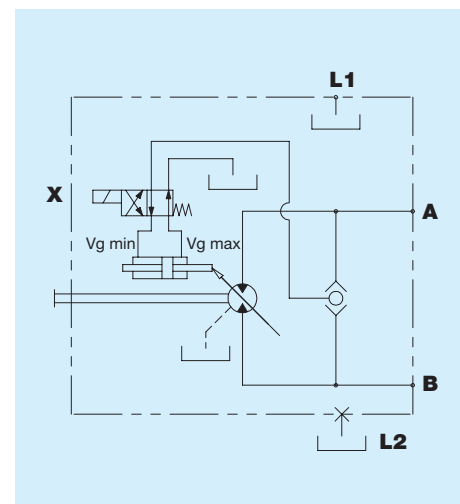


E Electric 2-position 12V

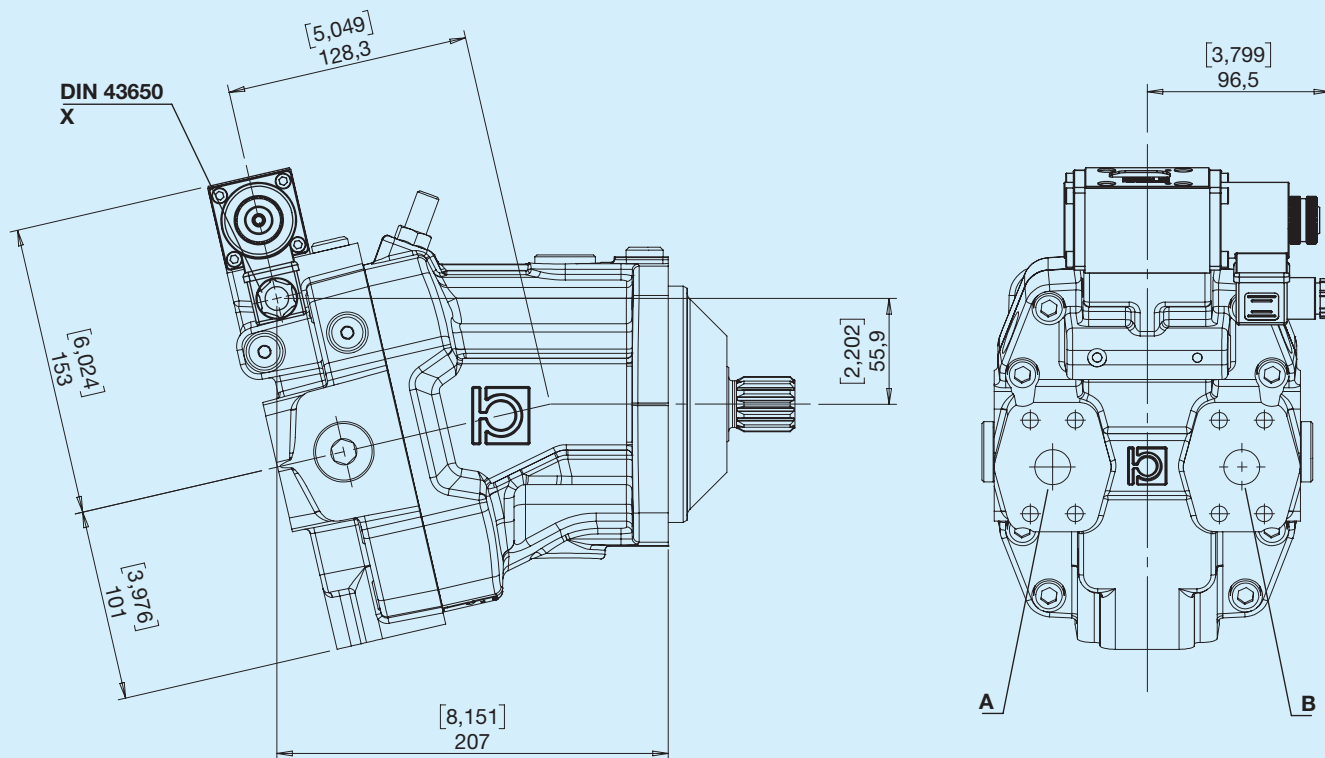


Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram



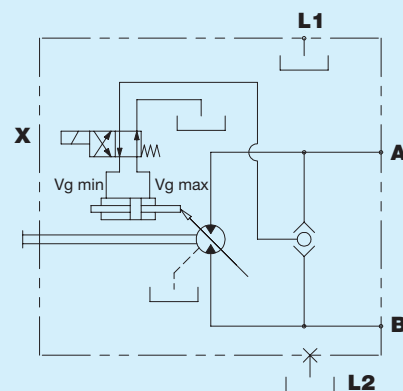
F Electric 2-position 24V



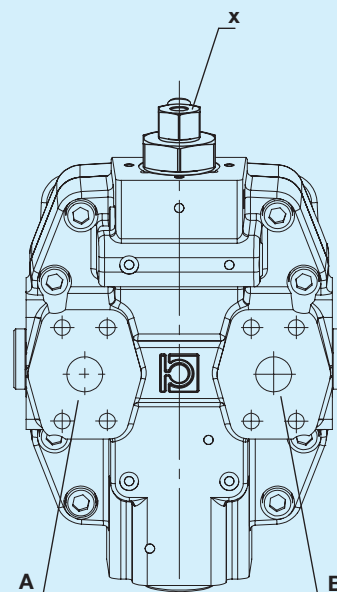
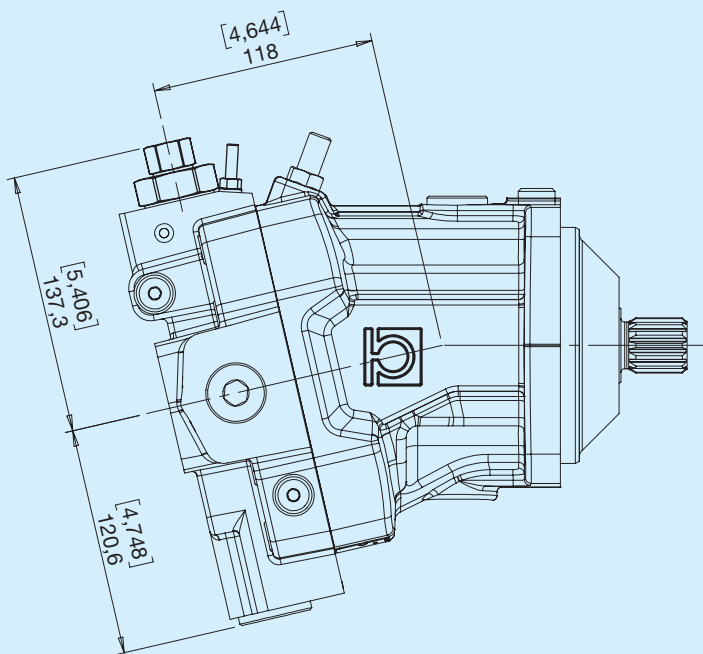
X - Solenoid valve available on request with DEUTSCH DT04-2P connectors

Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram

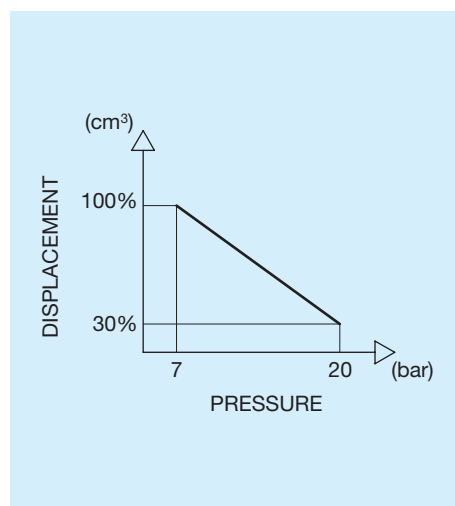


G Proportional hydraulic

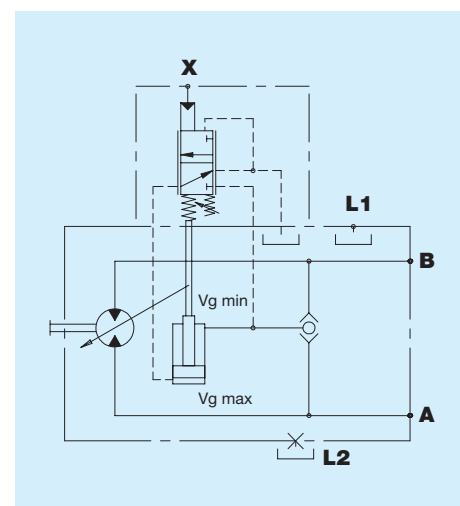


X - Pilot G1/8

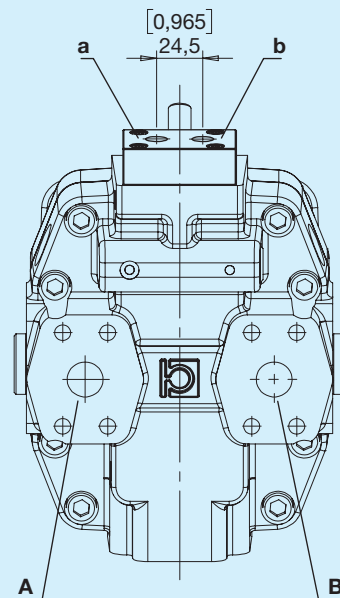
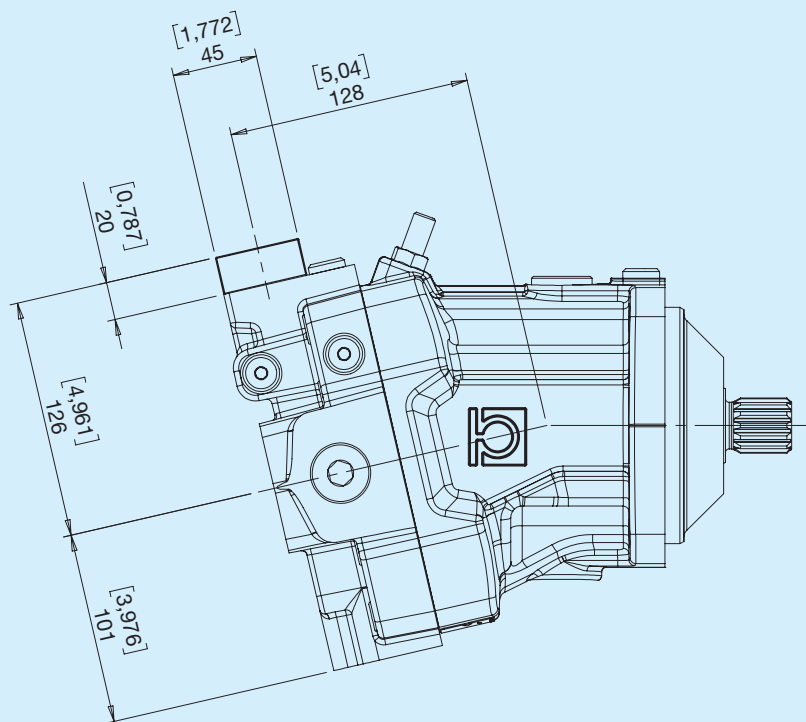
Pilot



Hydraulic diagram

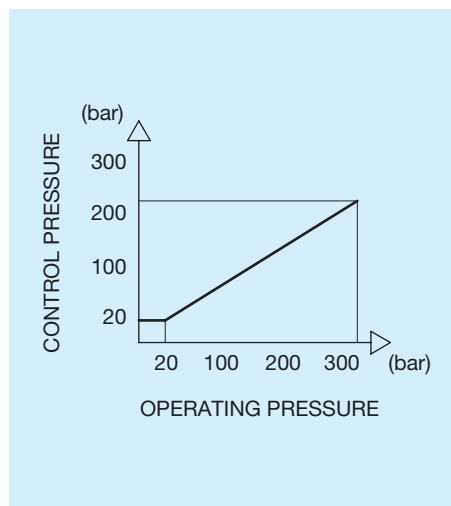


H Direct hydraulic, 2-position

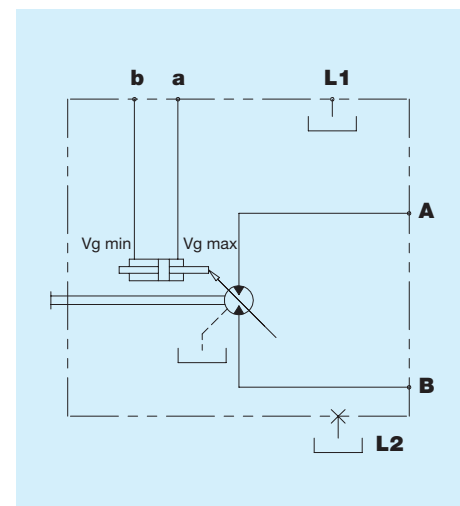


Inlet	Rotation
Right	Left
Right	Right

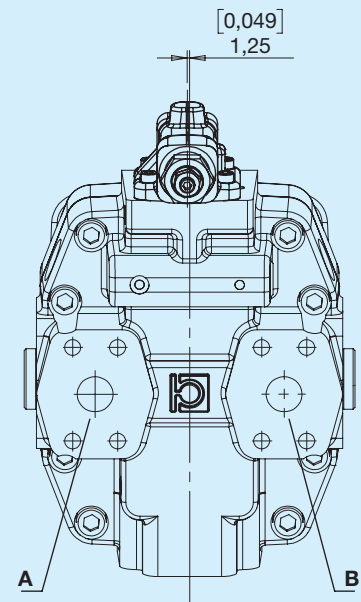
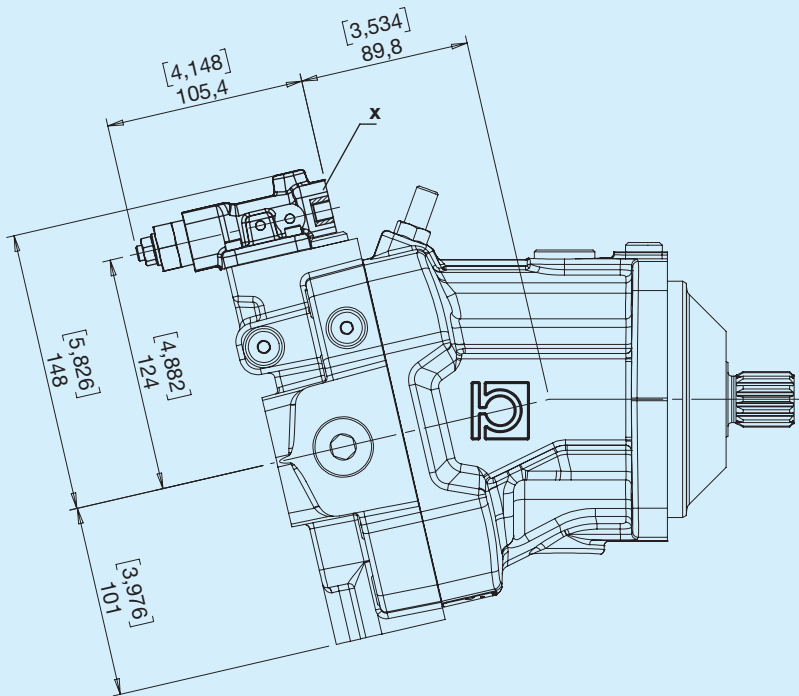
Pilot



Hydraulic diagram



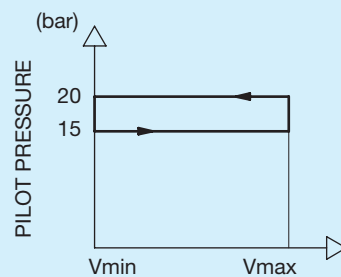
K Hydraulic, 2-position, low pressure



X - Pilot G1/8

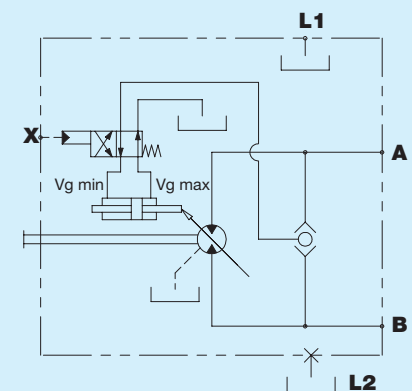
Inlet	Rotation
Right	Left
Right	Right

Diagram

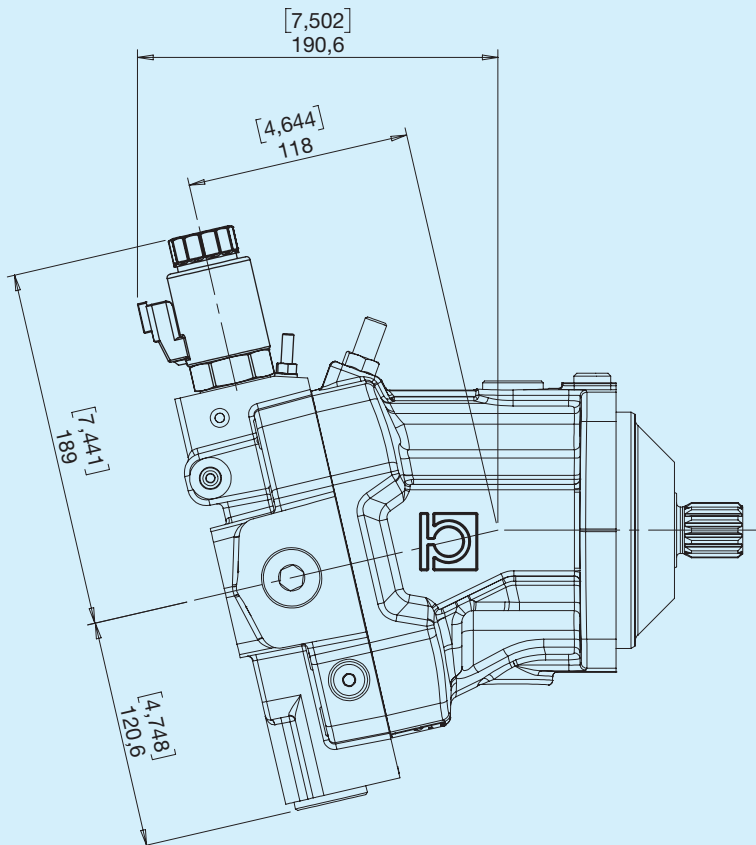


The motor is normally at maximum displacement. By applying external pressure to the pilot valve, the motor switches to minimum displacement. For correct displacement variation, observe the pilot pressure values shown in the diagram.

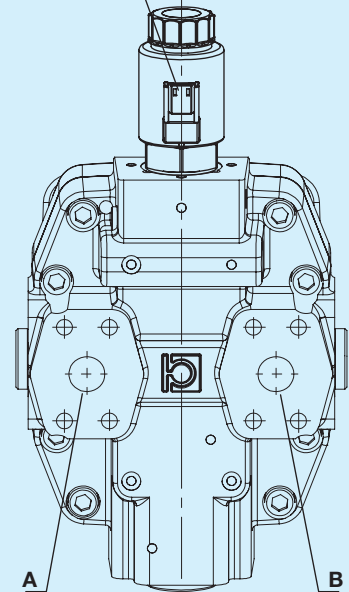
Hydraulic diagram



O Electronic proportional feedback control 12V



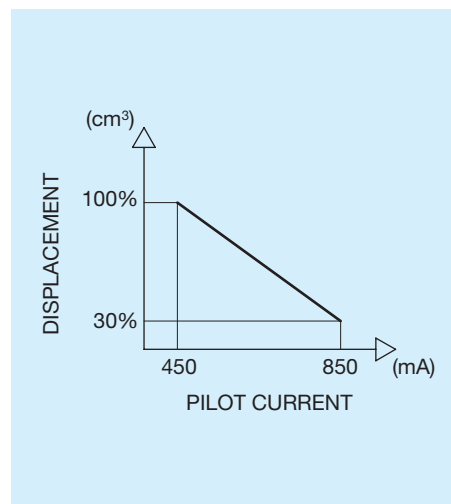
DEUTSCH DT04-2P
X



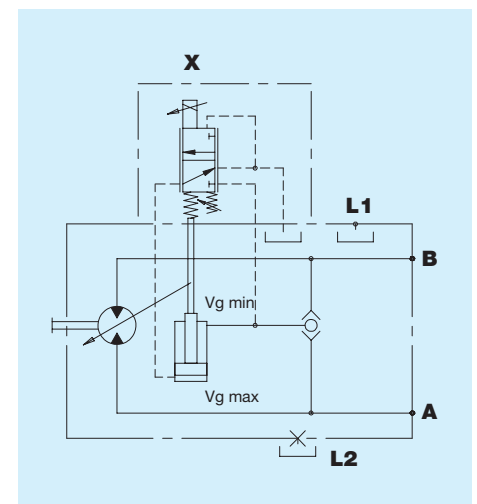
X - Solenoid valve

Inlet	Rotation
Right	Left
Right	Right

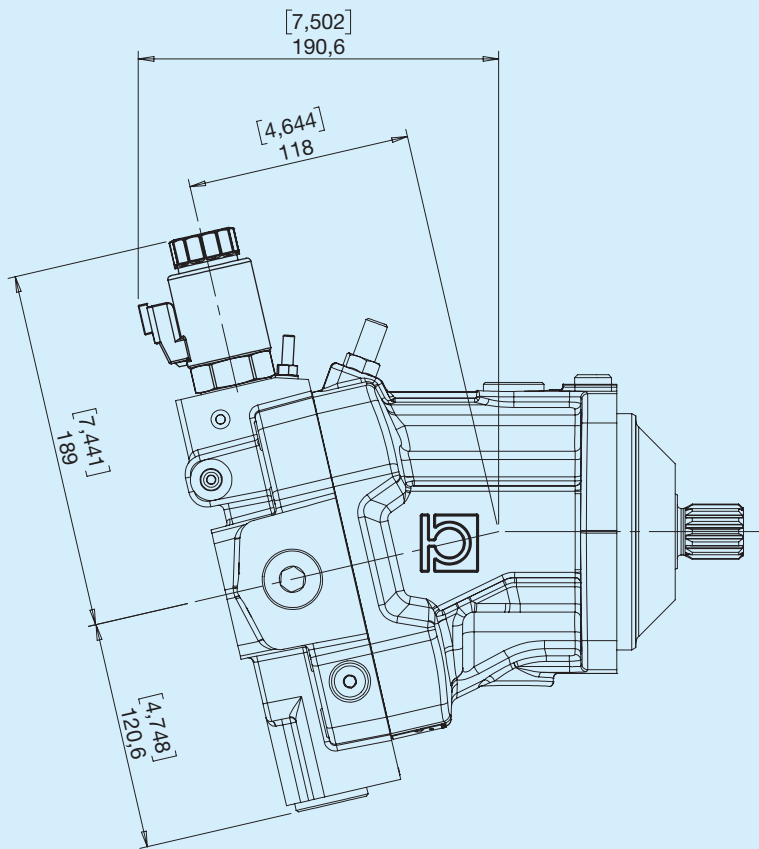
Pilot



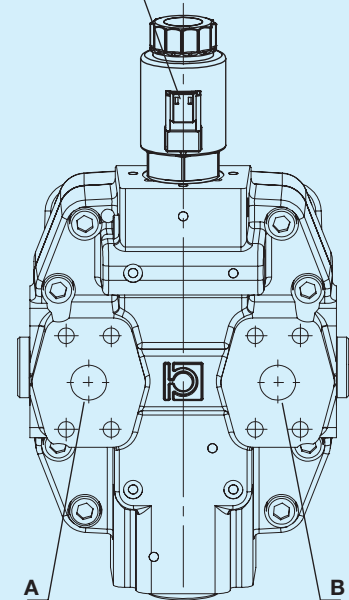
Hydraulic diagram



V Electronic proportional feedback control 24V



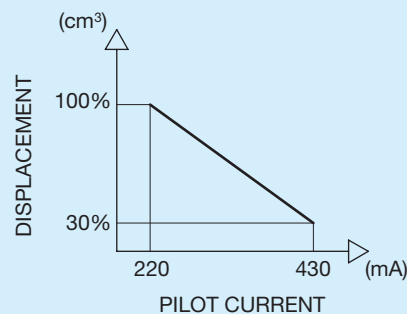
DEUTSCH DT04-2P
X



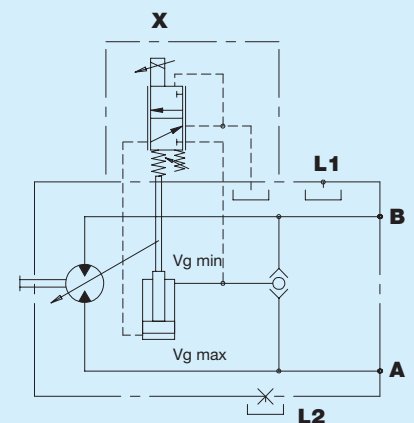
X - Solenoid valve

Pilot

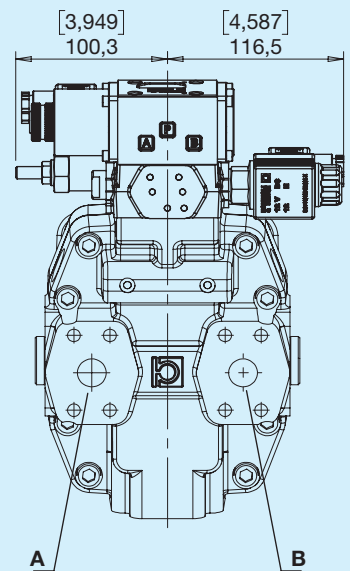
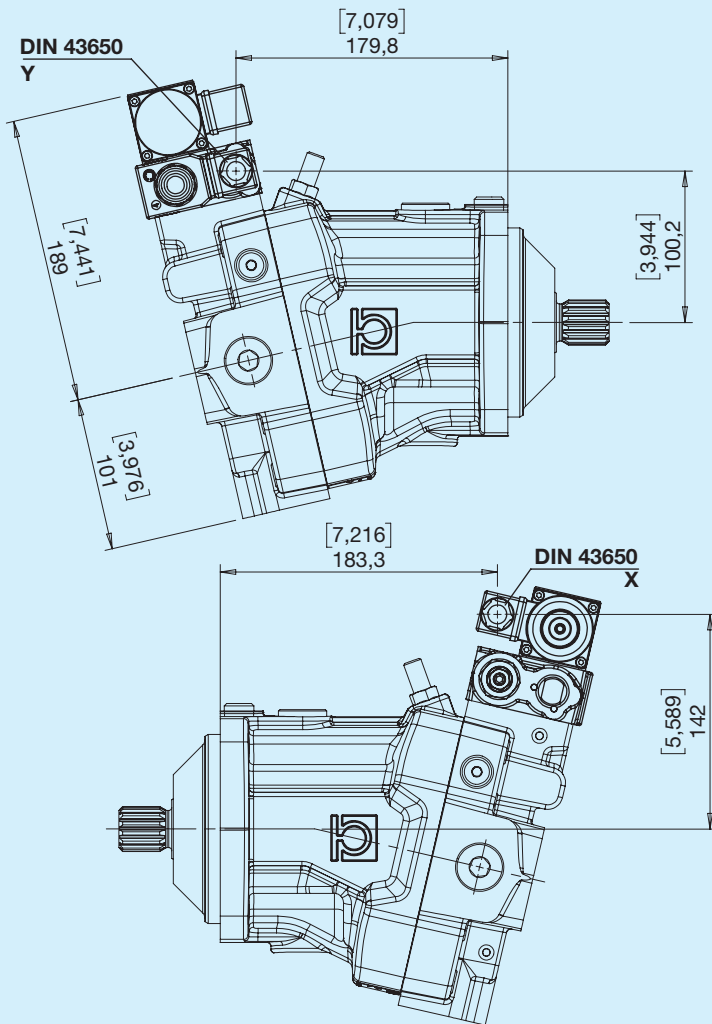
Inlet	Rotation
Right	Left
Right	Right



Hydraulic diagram

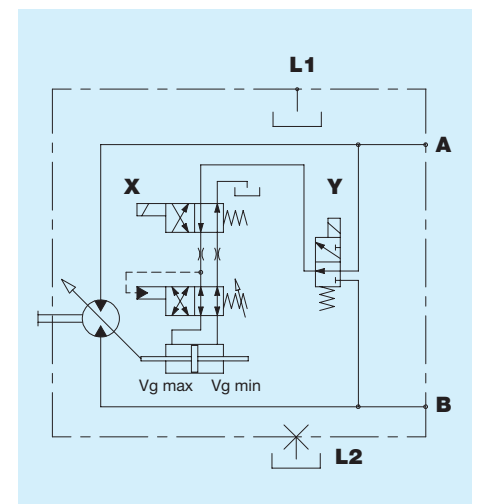


R Electric ON/OFF with pressure override and channel selector

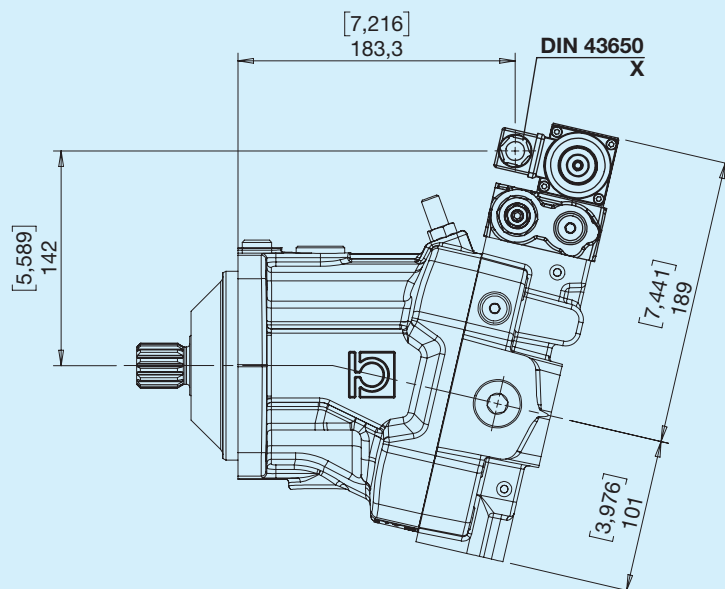
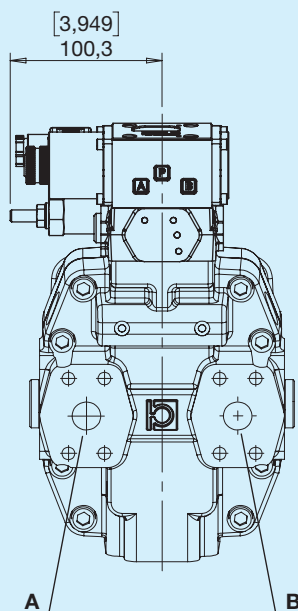


Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram

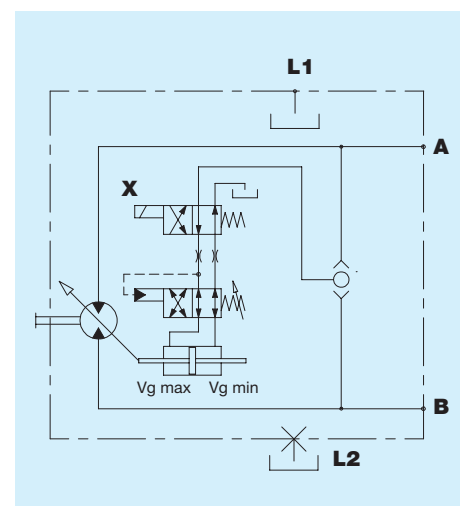


U Electric ON/OFF with pressure override

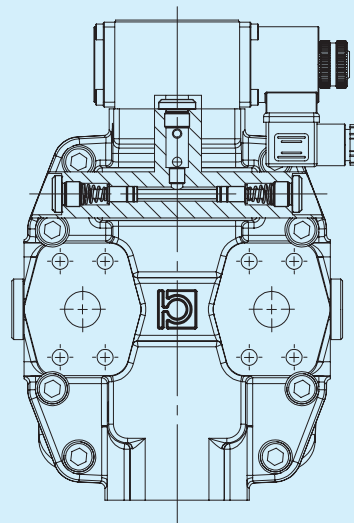
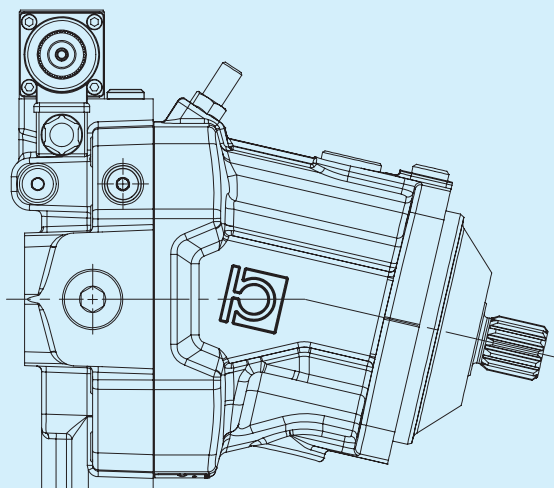


Inlet	Rotation
Right	Left
Right	Right

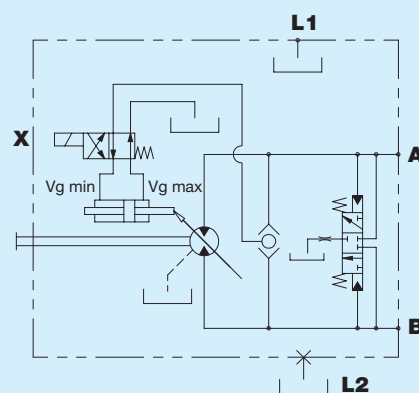
Hydraulic diagram



V Flushing valve (5-7 l/min)



Hydraulic diagram

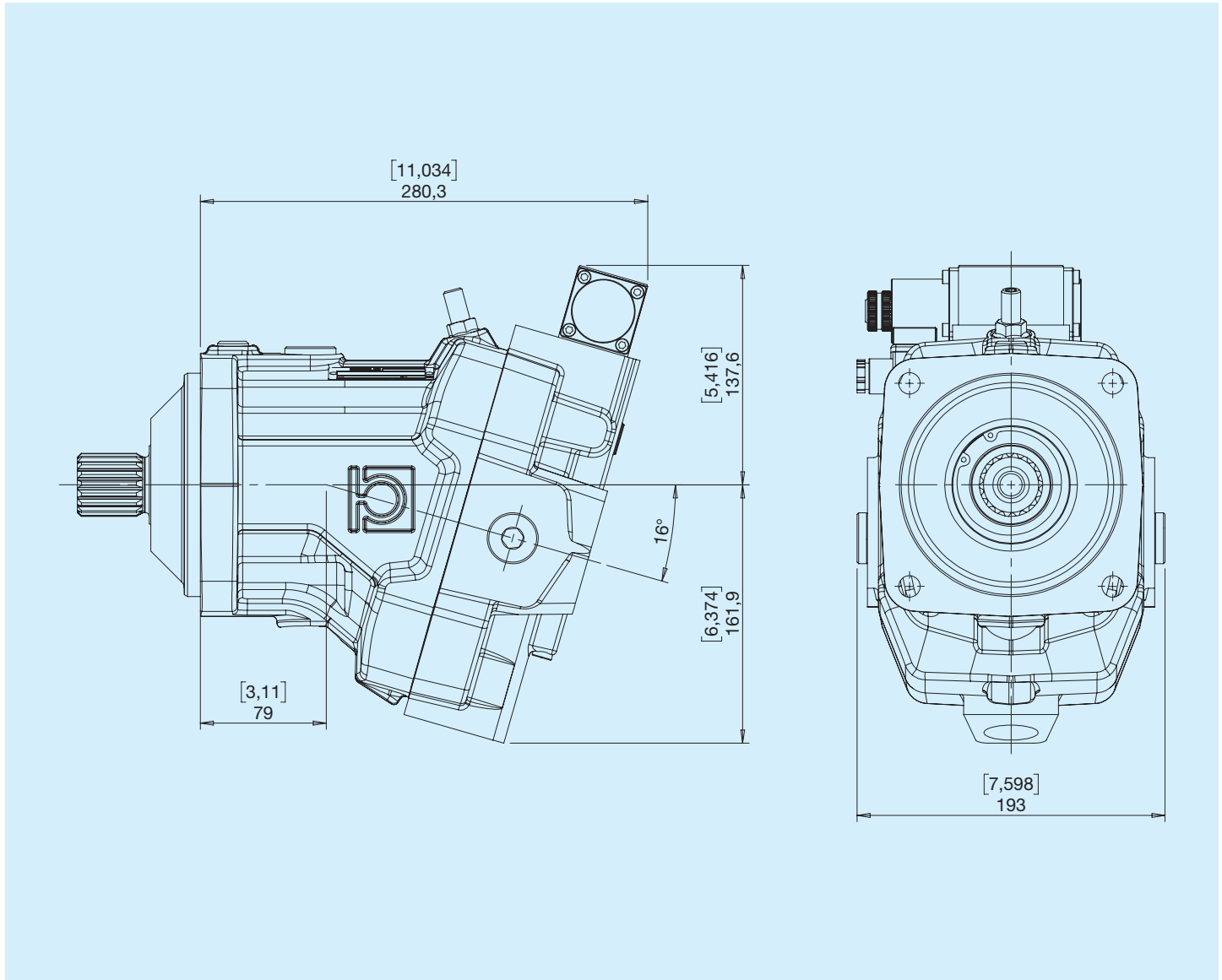


	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
HPBA																		
1 2 3	Standard displacement																	
	060					078												
4 5	Minimum displacement																	
	...																	
6	Flanges																	
	I ISO 4 holes standard					P ISO 2 holes cartridge centring					S SAE C							
7	Shafts																	
	C DIN 5480 W35x2x30x16					1 DIN 5480 W30x2x30x14					3 SAE 14T 12/24 DP							
8	Type of ports																	
	G Gas					U UNF					N Gas-SAE inlet/outlet				M UNF-SAE inlet/outlet			
9	Position of ports																	
	P Rear					Y Rear with rotated valve (not available for O - V - G controls)					J Opposite sideways with rotated valve (not available for O - V - G controls)				L Opposite sideways			
10	Controls																	
	A Hydraulic automatic, ON/OFF					G Proportional hydraulic					O Electronic proportional feedback control 12V				U Electric ON/OFF with pressure override			
	E Electric 2-position 12V					H Direct hydraulic, 2-position					V Electronic proportional feedback control 24V							
	F Electric 2-position 24V					K Hydraulic, 2-position, low pressure					R Electric ON/OFF with pressure override and channel selector							
11	Accessories																	
	0 No option					C Paint					V Flushing valve							
12 13 14	Special versions																	
	...																	

Variable-displacement motors HPBA 080-108

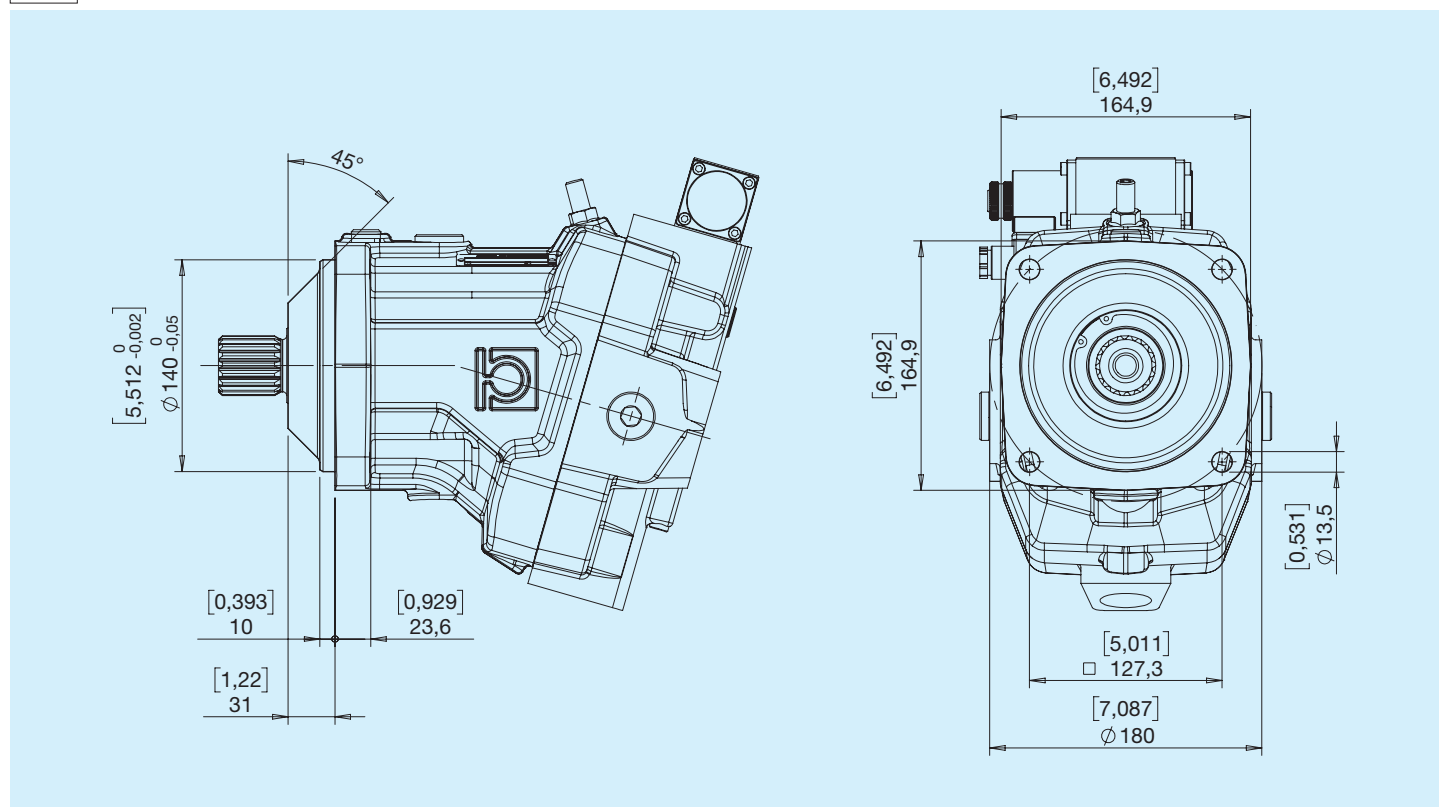


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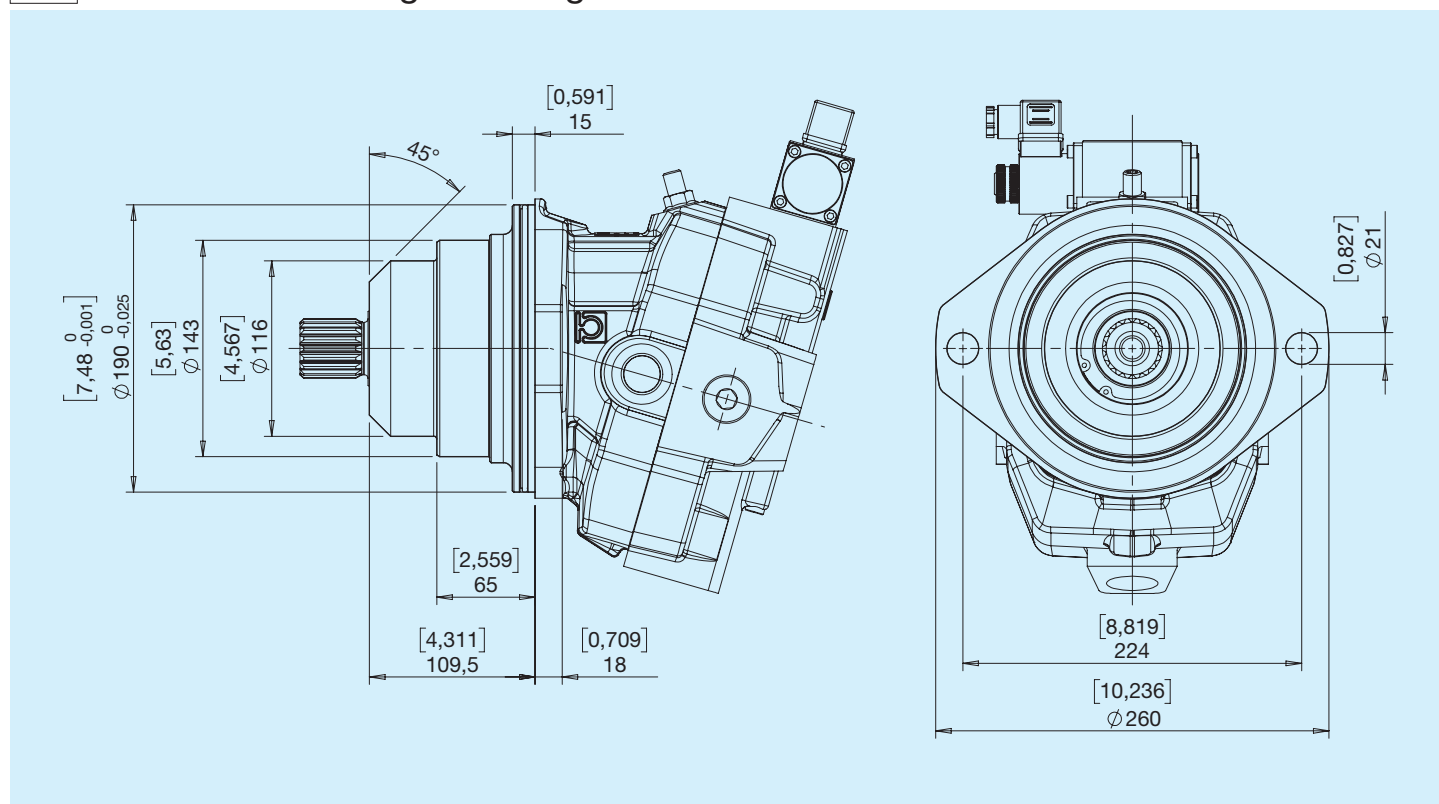


HPBA	Nominal displacement		Swash plate	Continuous pressure		Intermittent pressure		Peak pressure		Rotational speed			Weight	
	cm ³	in ³		bar	psi	bar	psi	bar	psi	MAX (max V) min ⁻¹	MAX (min V) min ⁻¹	MIN min ⁻¹	kg	lbs
080	80	4.88	25	350	5075	400	5800	450	6525	3200	5000	500	38	84
108	108	6.59	25	350	5075	400	5800	450	6525	3200	5000	500	38	84

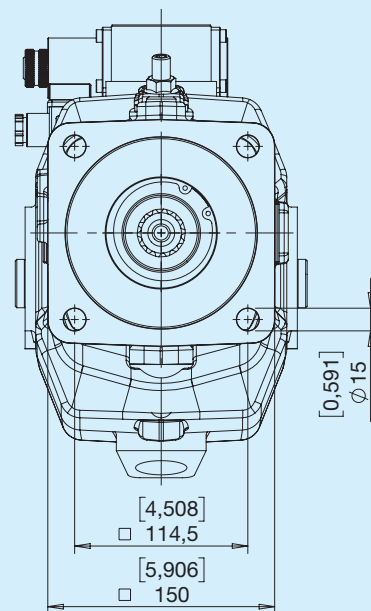
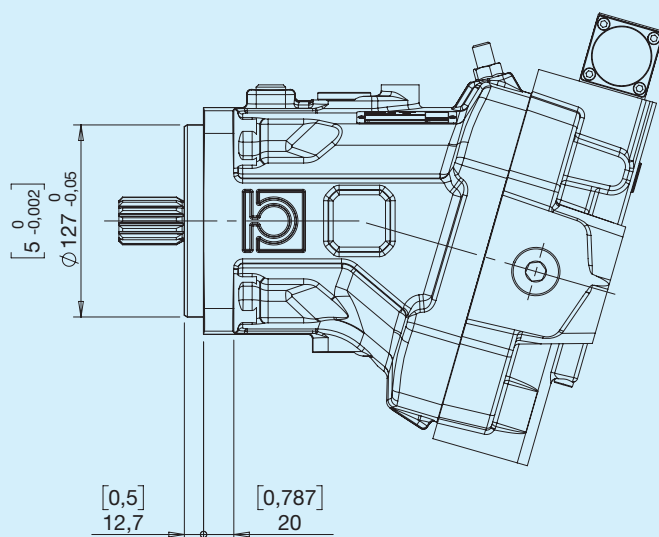
I ISO 4 holes standard



P ISO 2 holes cartridge centring

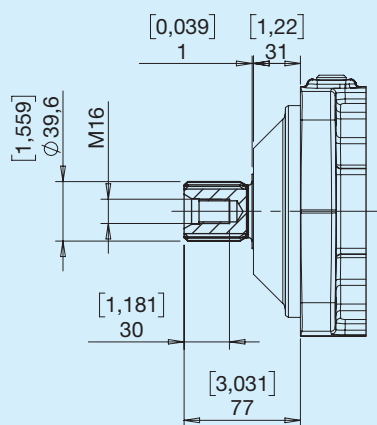


S SAE C



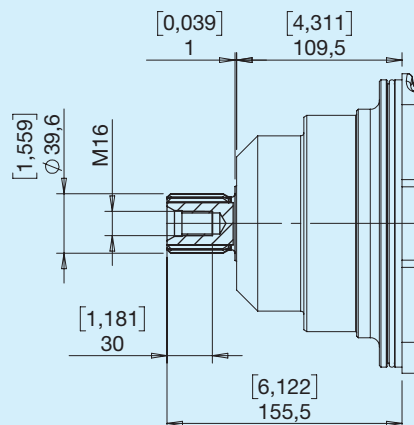
B DIN 5480 W40x2x30x18

ISO 4-hole standard version



Max. torque 1310 Nm

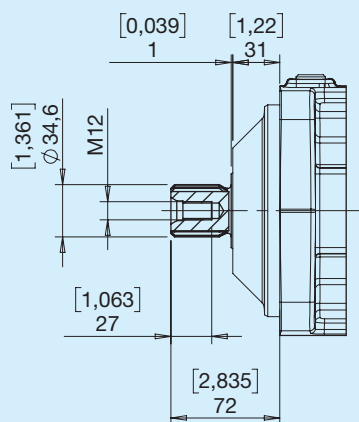
ISO 2-hole cartridge version



Max. torque 1310 Nm

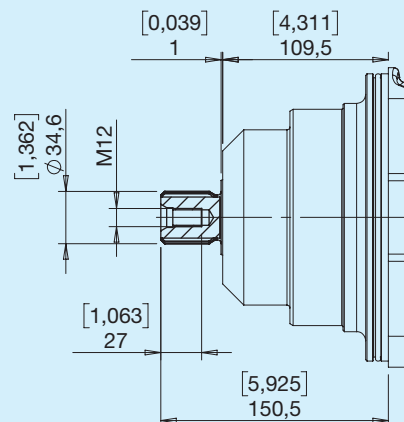
C DIN 5480 W35x2x30x16

ISO 4-hole standard version



Max. torque 860 Nm

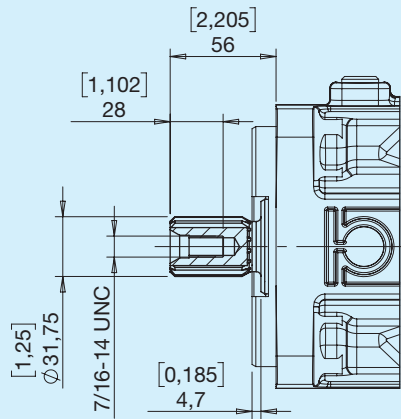
ISO 2-hole cartridge version



Max. torque 860 Nm

3 14T 12/24DP

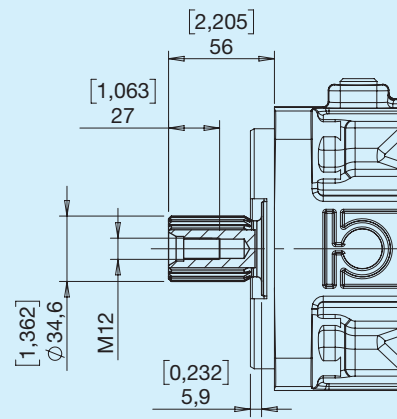
SAE C version



Max. torque 860 Nm

7 DIN 5480 W35x2x30x16

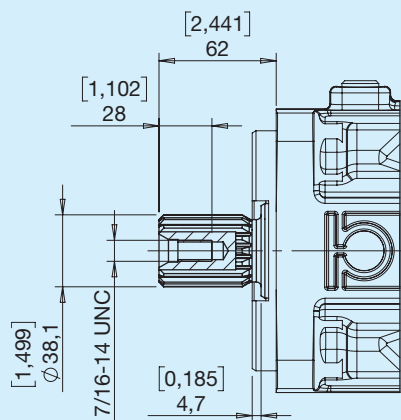
SAE C version



Max. torque 860 Nm

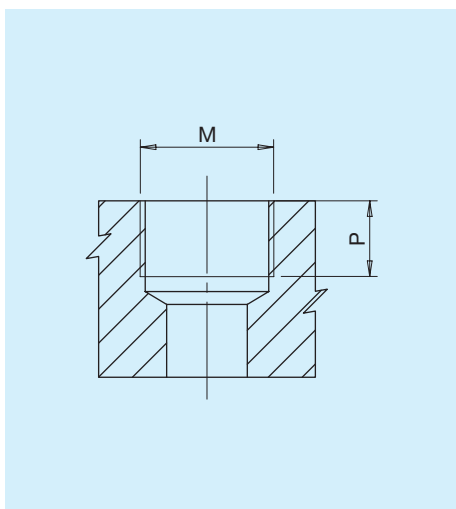
Z DIN 5480 W35x2x30x16

SAE C version



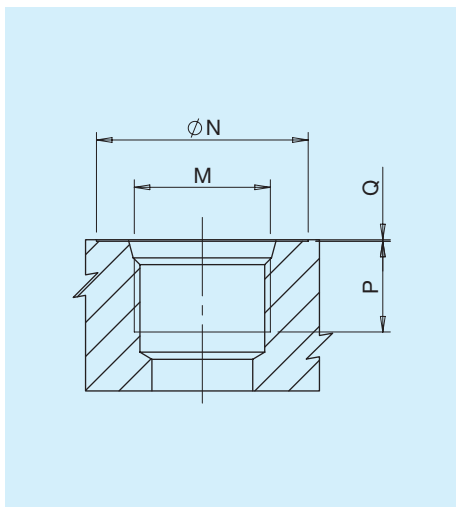
Max. torque 860 Nm

Type G



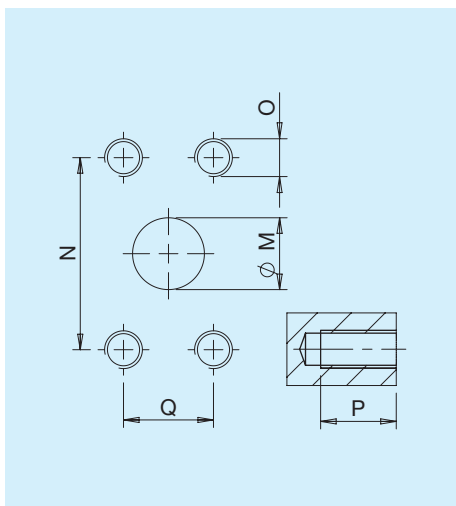
Type	M		P	
		Nm	mm	in
G2	Port ISO 1179-1 - G 1/4	17	8	0.31
G6	Port ISO 1179-1 - G 3/4	90	19	0.75
G7	Port ISO 1179-1 - G 1	160	19	0.75

Type U



Type	Dim.	N		P		Q		M	Nm
		mm	in	mm	in	mm	in		
U2	1/4"	20	0.79	12	0.47	0.3	0.01	Port ISO 11926-1-7/16-20	17
U6	3/4"	41	1.61	20	0.79	0.3	0.01	Port ISO 11926-1-1 1/16-12	90
U7	1"	49	1.93	18	0.70	0.3	0.01	Port ISO 11926-1-1 5/16-12	160

Type N

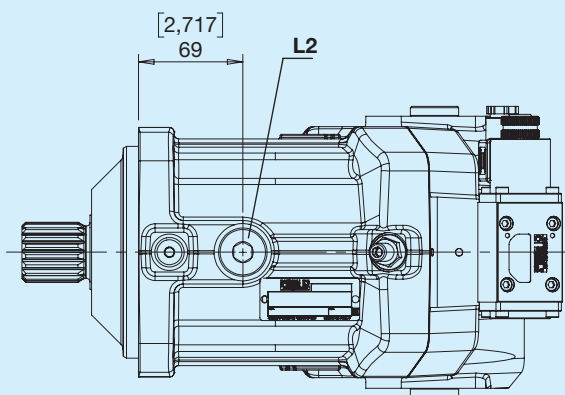
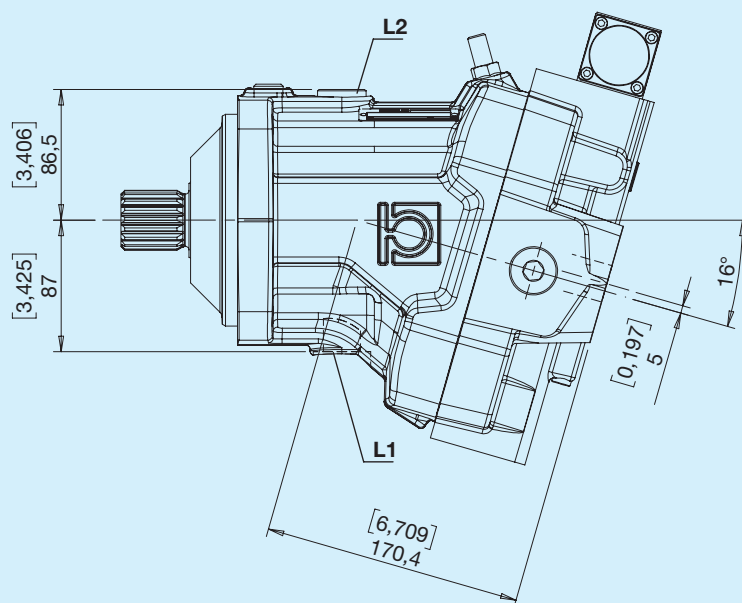
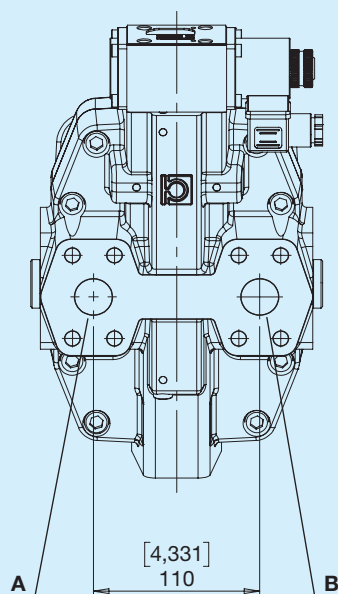


Type	M		N		Q		P		O	Nm
	mm	in	mm	in	mm	in	mm	in		
N7	25	1	57.15	2.25	27.76	1.09	20	0.79	M12	70

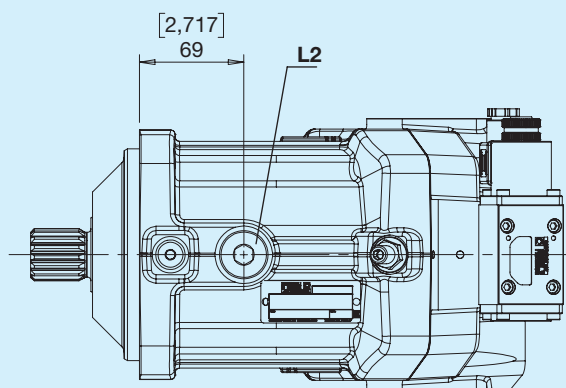
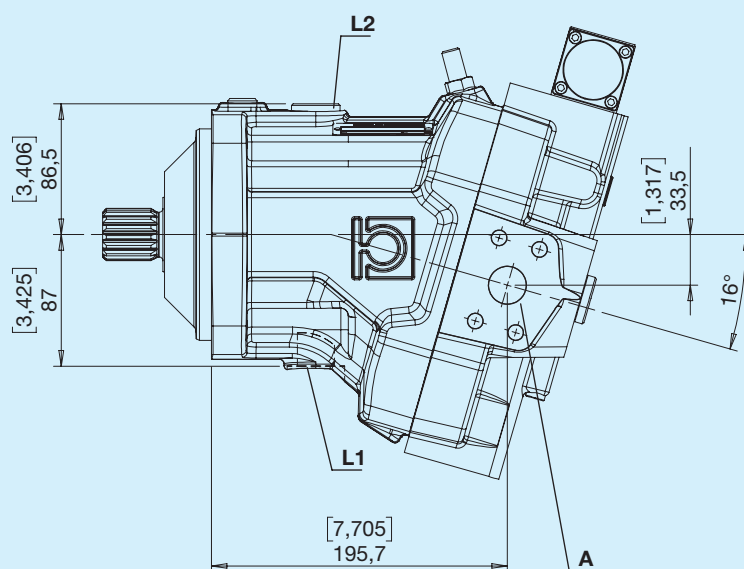
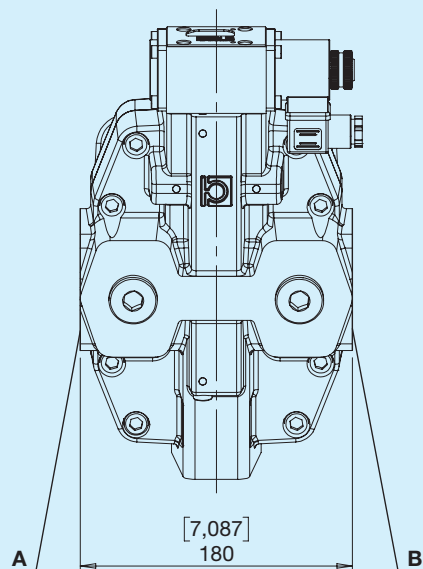
Combinations

Type	Inlet/outlet A-B	Drain port L1-L2	Pilot a-b-x
G	G6	G6	G6
U	U6	U6	U6
N	N7	G6	G2
M	N7	U6	U2

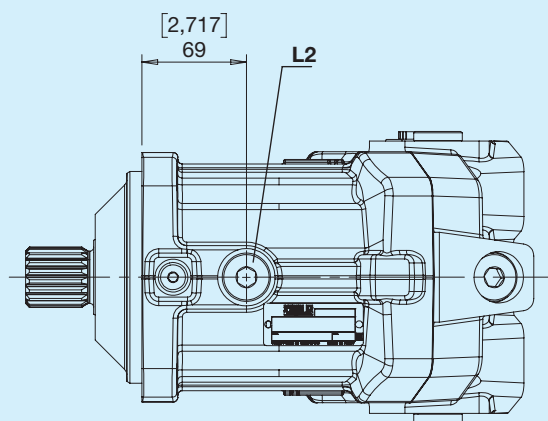
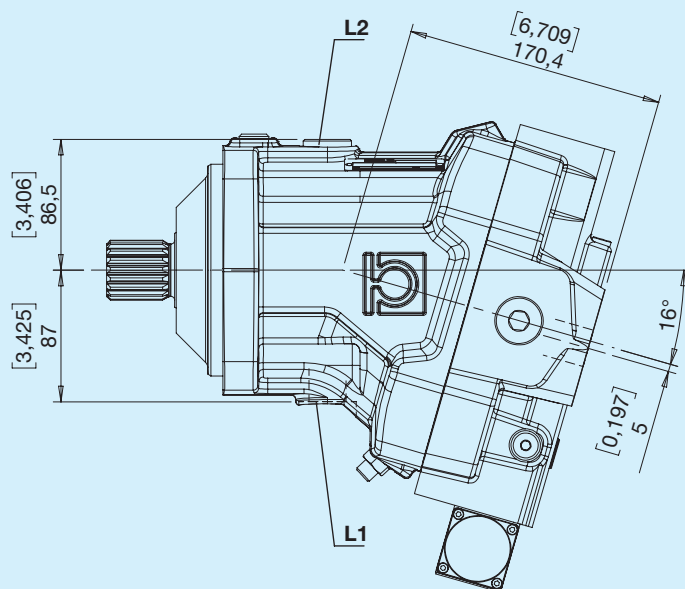
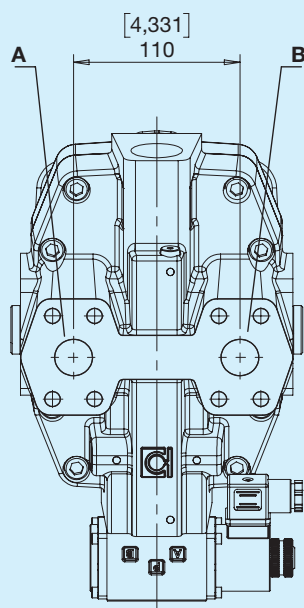
P Rear



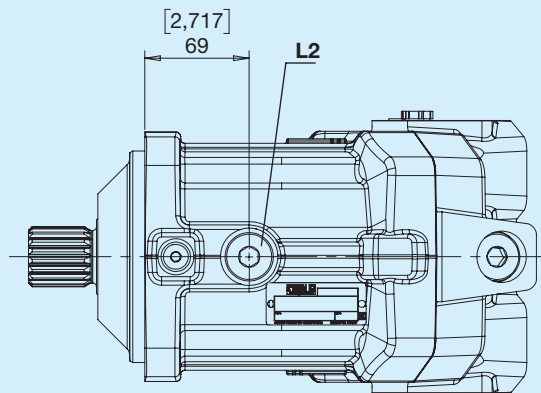
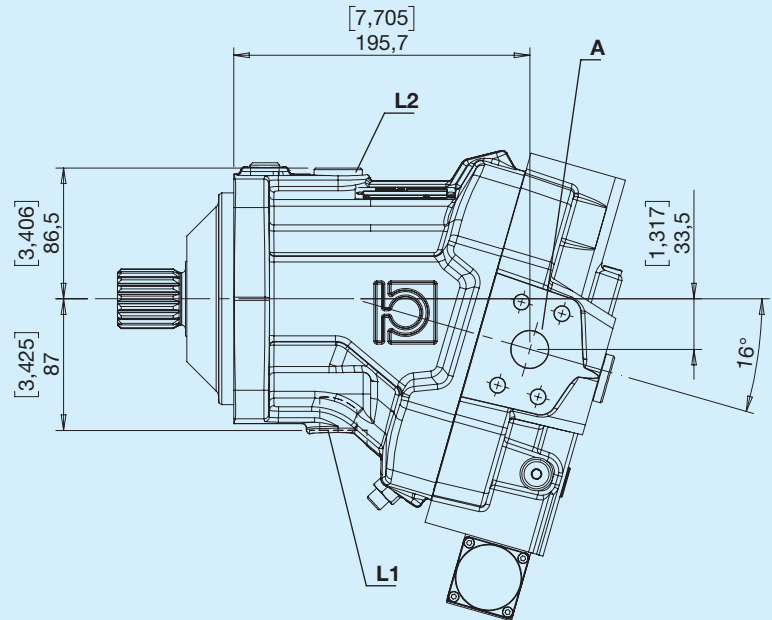
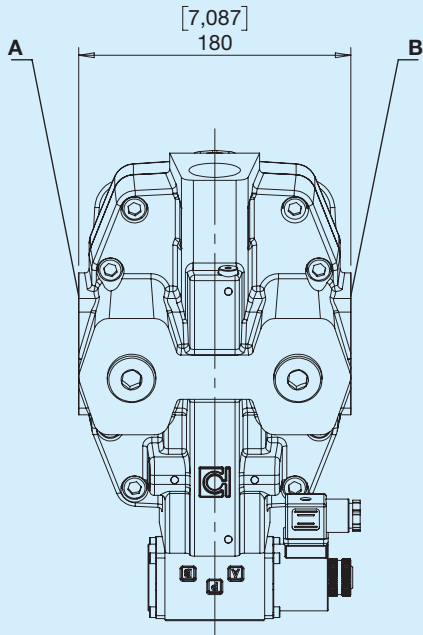
L Opposite sideways



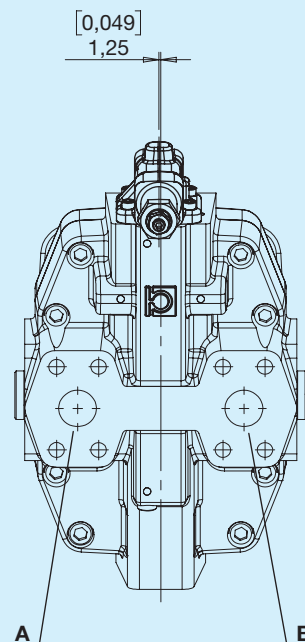
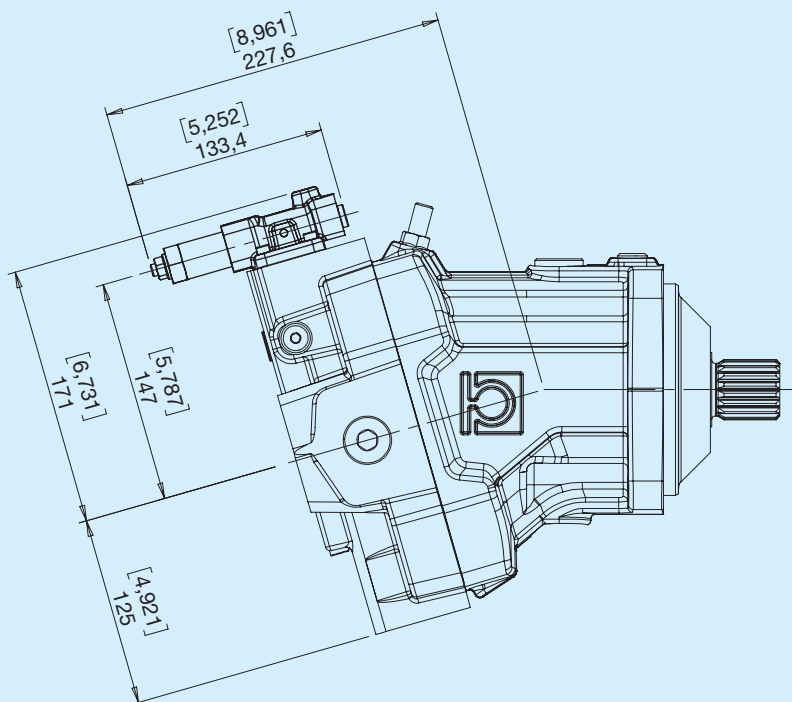
Y Rear with rotated valve



J Opposite sideways with rotated valve

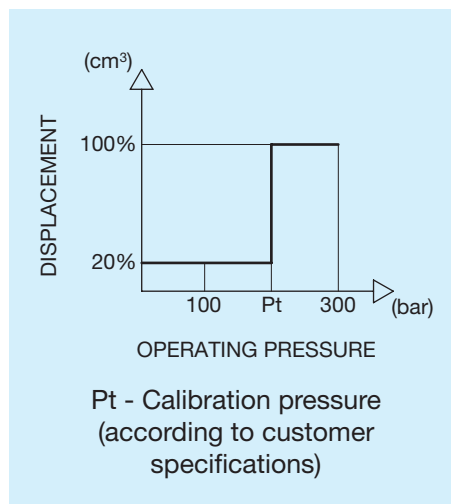


A Hydraulic automatic, ON/OFF

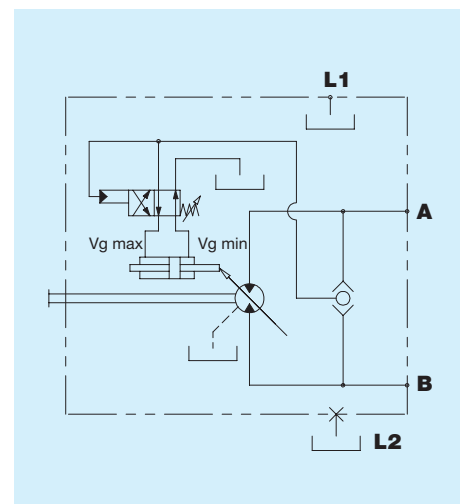


Inlet	Rotation
Right	Left
Right	Right

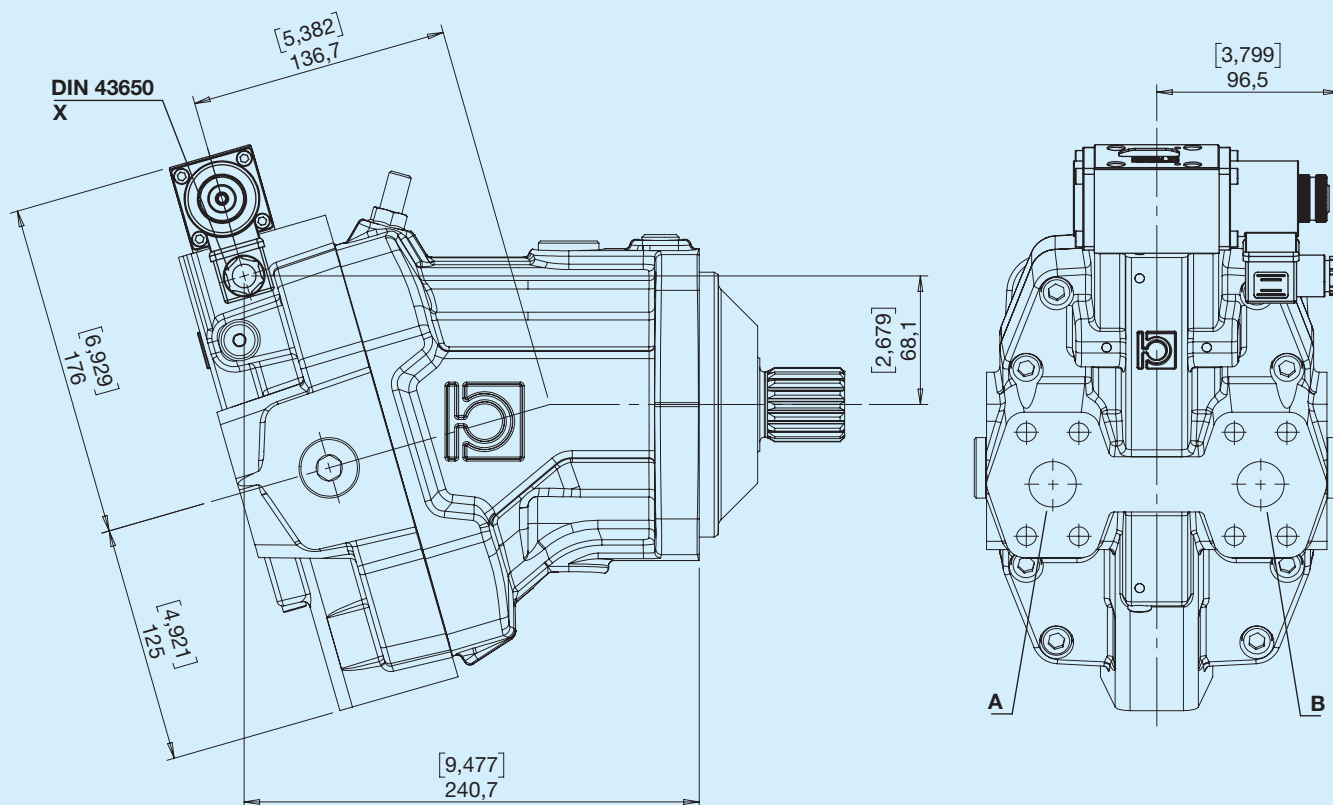
Pilot



Hydraulic diagram



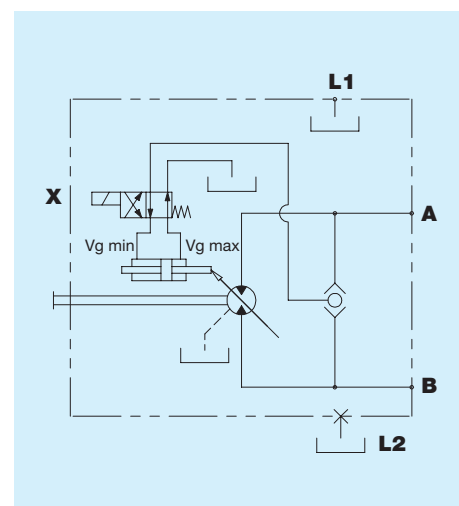
E Electric 2-position 12V



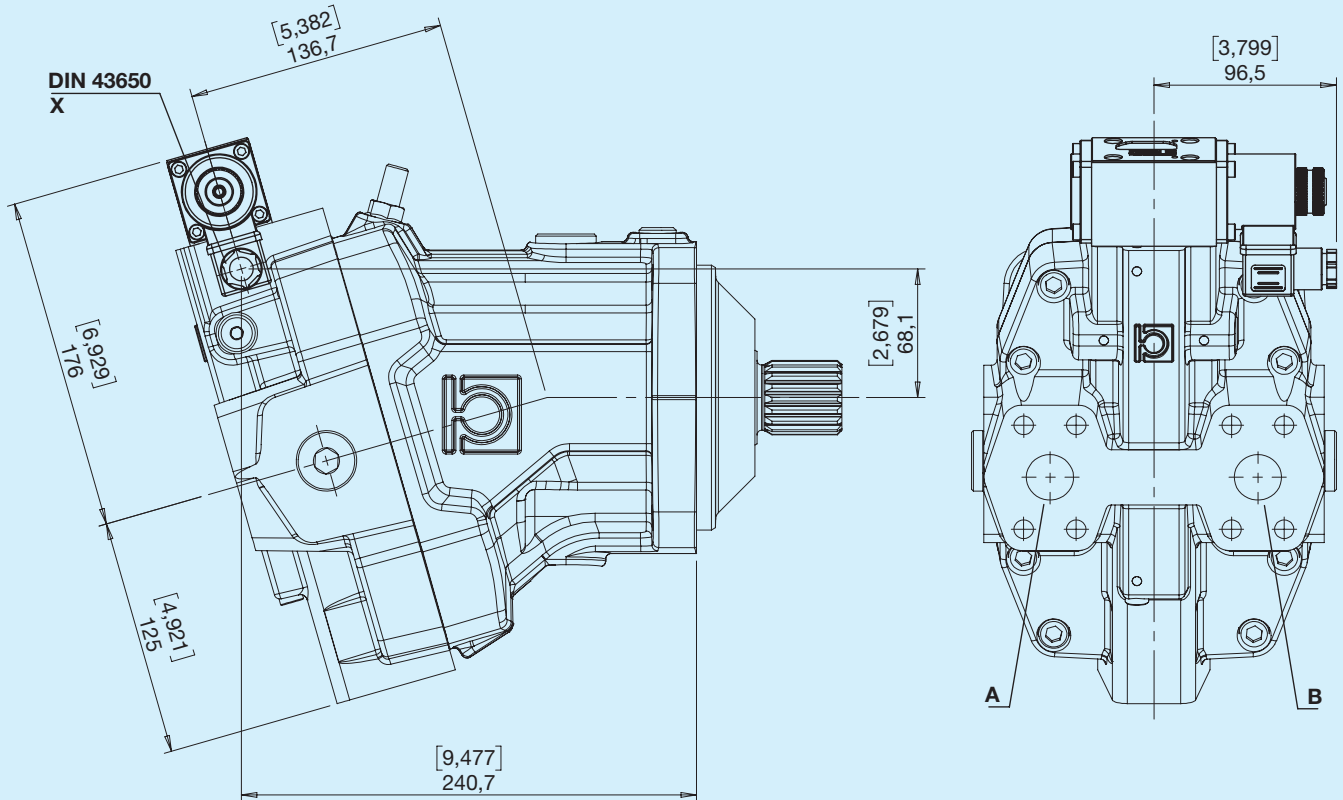
X - Solenoid valve available on request with DEUTSCH DT04-2P connectors

Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram



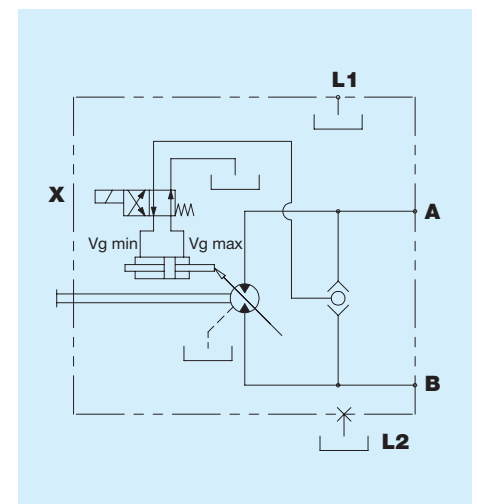
F Electric 2-position 24V



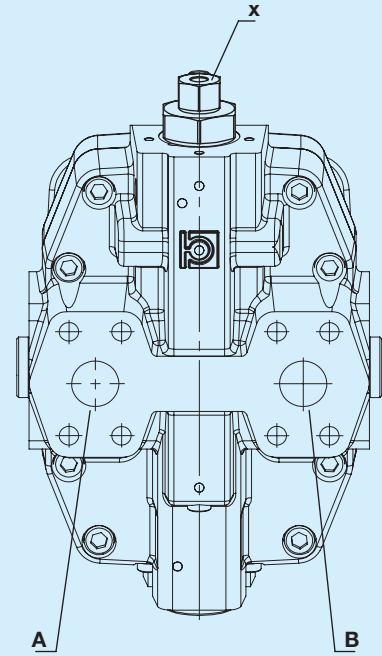
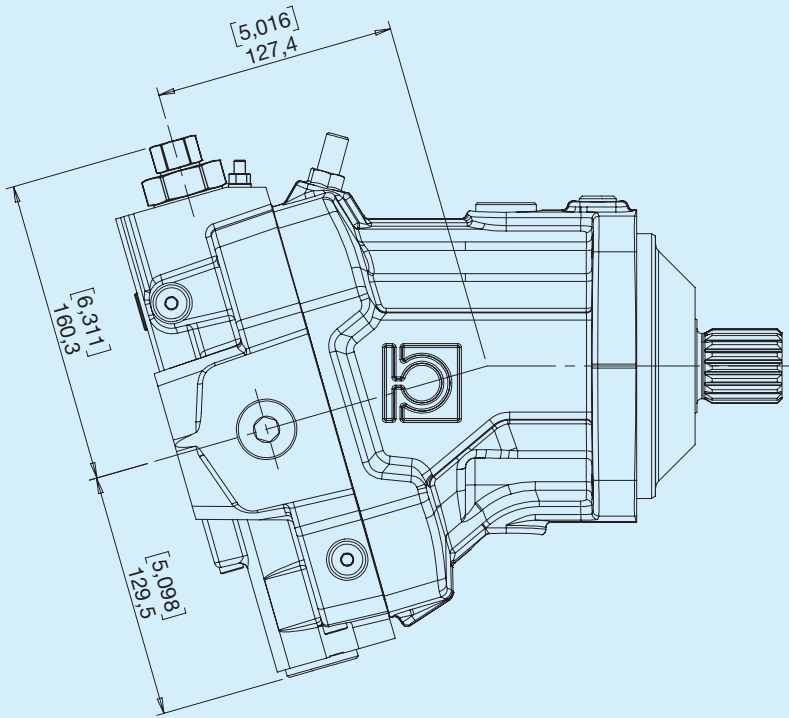
X - Solenoid valve available on request with DEUTSCH DT04-2P connectors

Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram

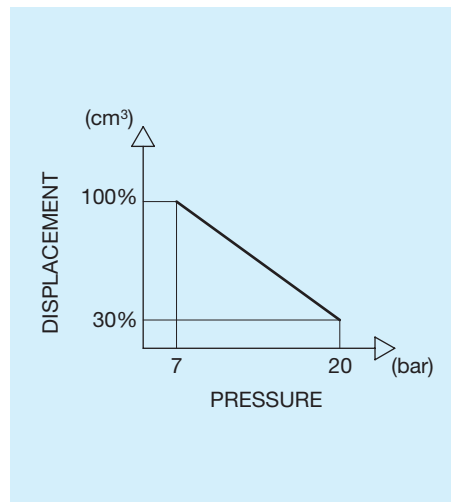


G Proportional hydraulic

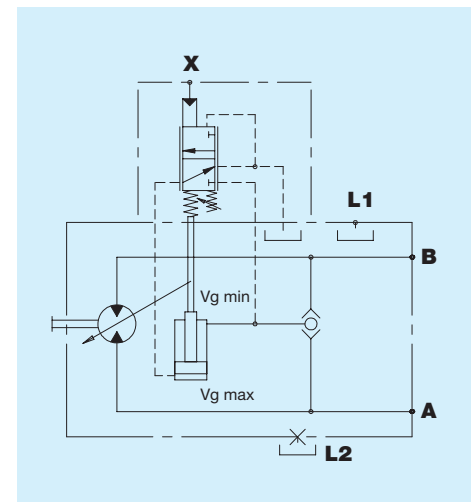


X - Pilot G1/8

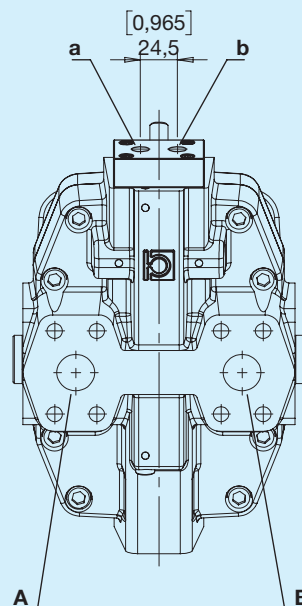
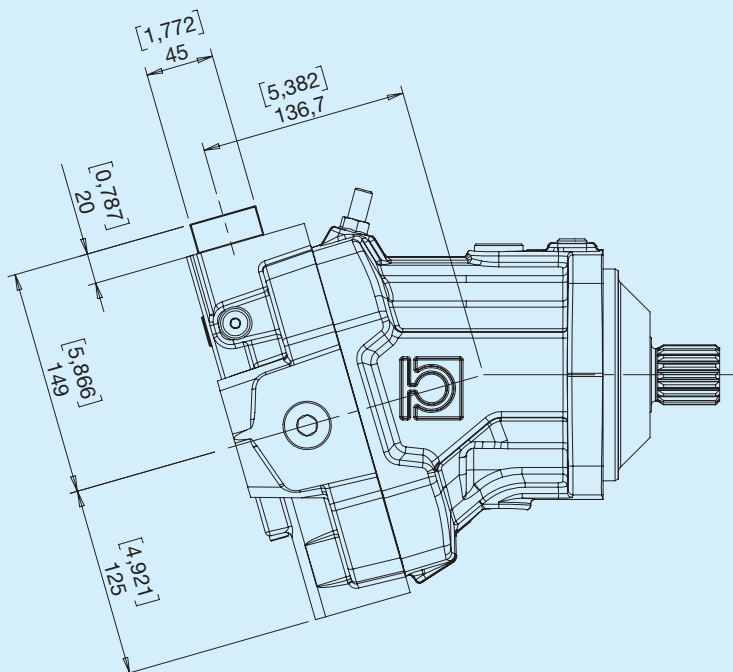
Pilot



Hydraulic diagram

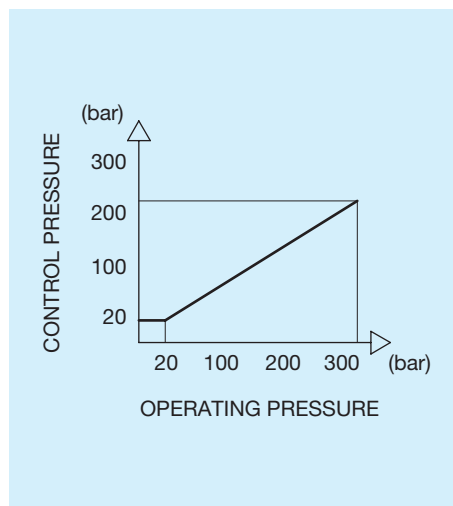


H Direct hydraulic, 2-position

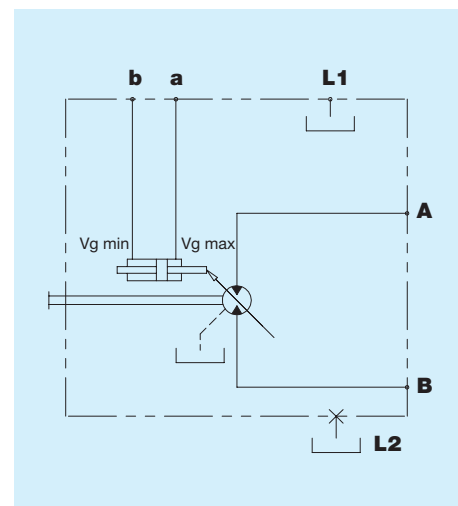


Inlet	Rotation
Right	Left
Right	Right

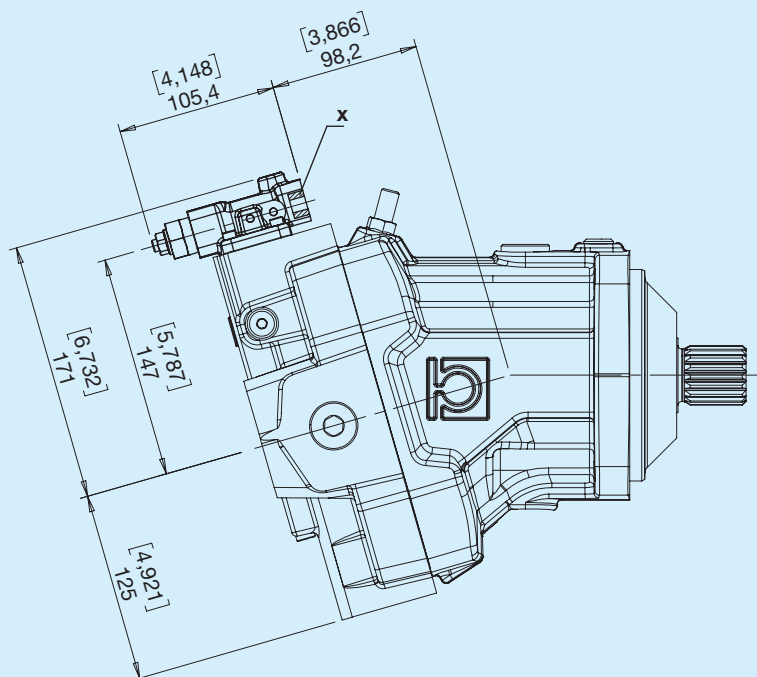
Pilot



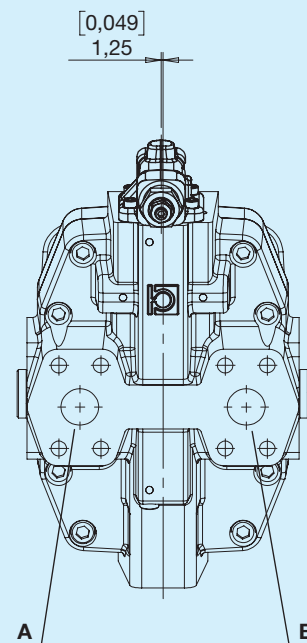
Hydraulic diagram



K Hydraulic, 2-position, low pressure

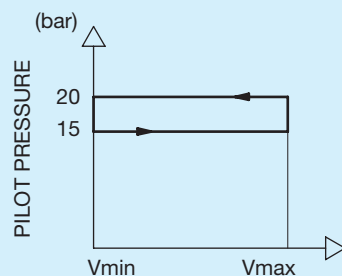


X - Pilot G1/8



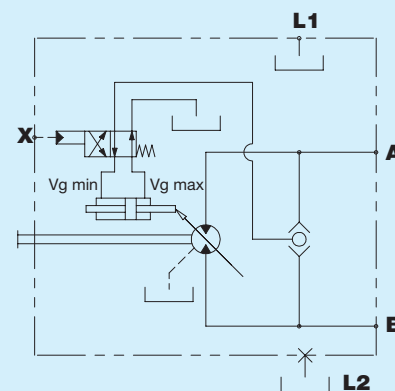
Inlet	Rotation
Right	Left
Right	Right

Diagram

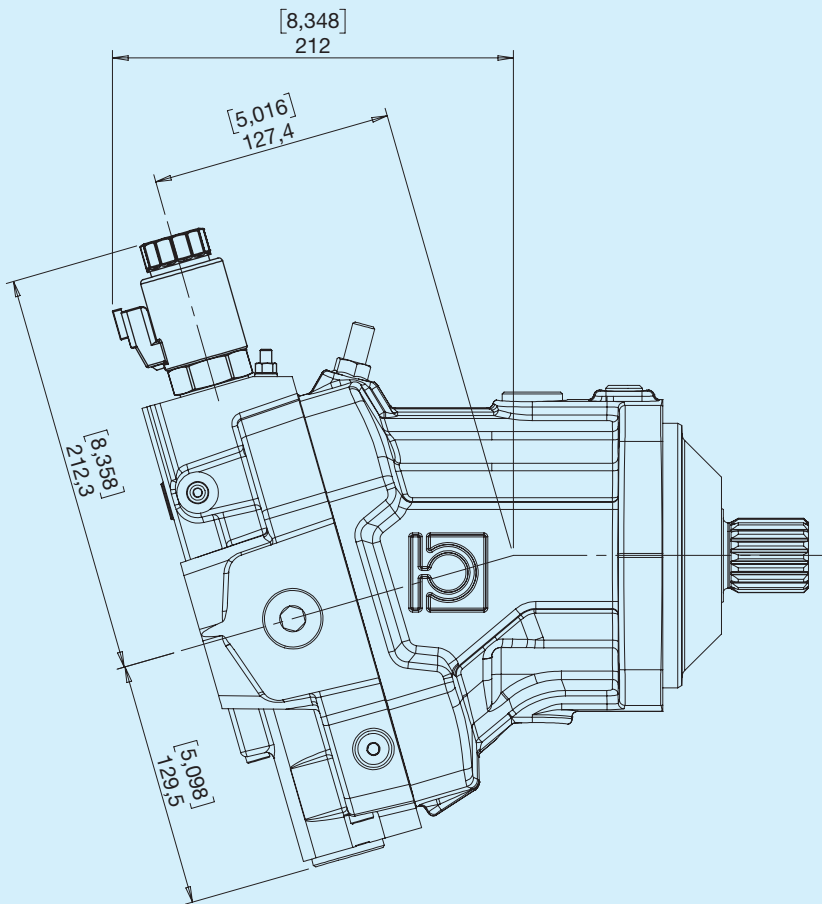


The motor is normally at maximum displacement. By applying external pressure to the pilot valve, the motor switches to minimum displacement. For correct displacement variation, observe the pilot pressure values shown in the diagram.

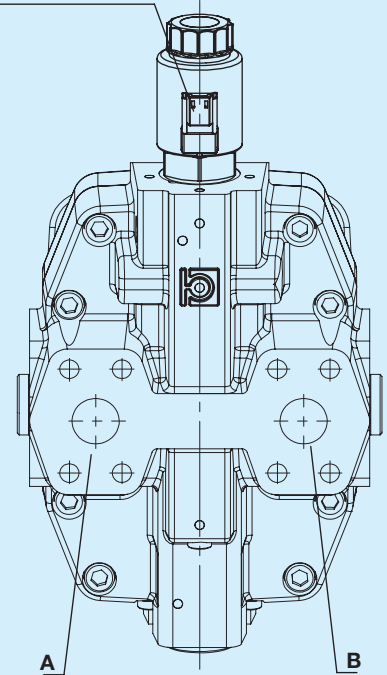
Hydraulic diagram



O Electronic proportional feedback control 12V



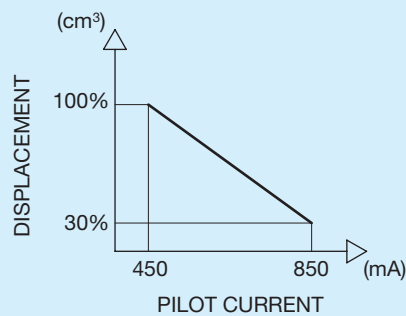
DEUTSCH DT04-2P
X



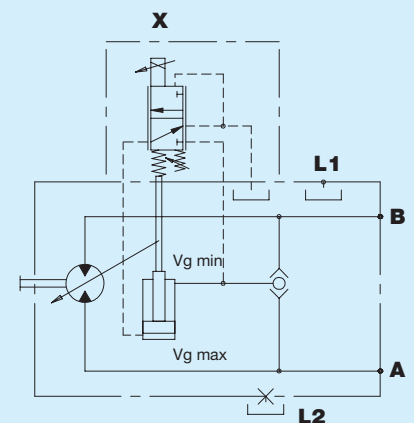
X - Solenoid valve

Inlet	Rotation
Right	Left
Right	Right

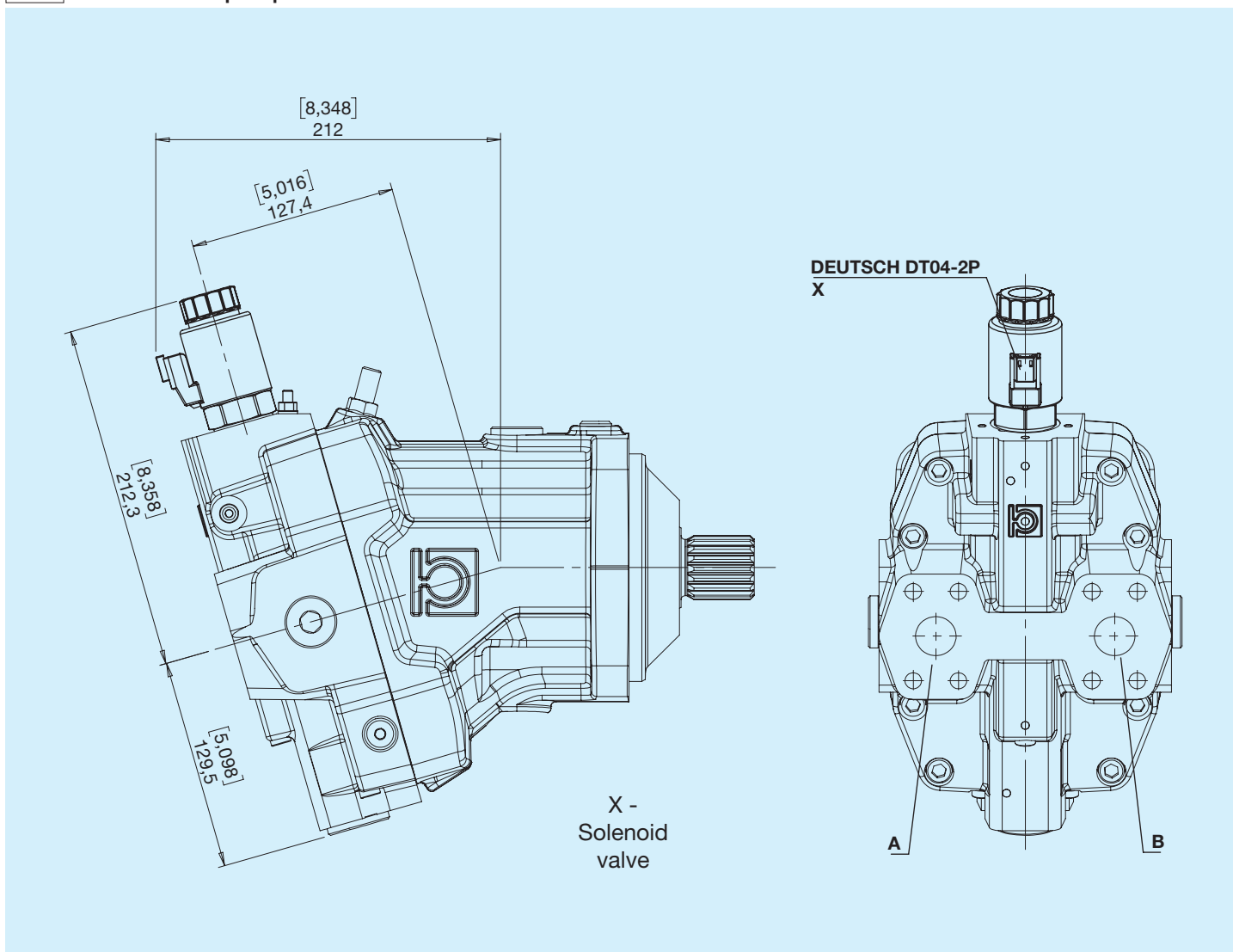
Pilot



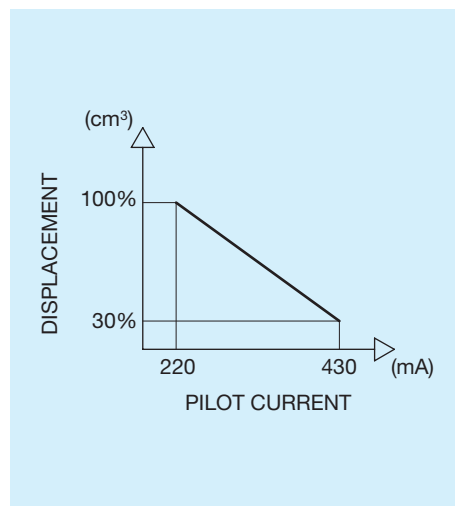
Hydraulic diagram



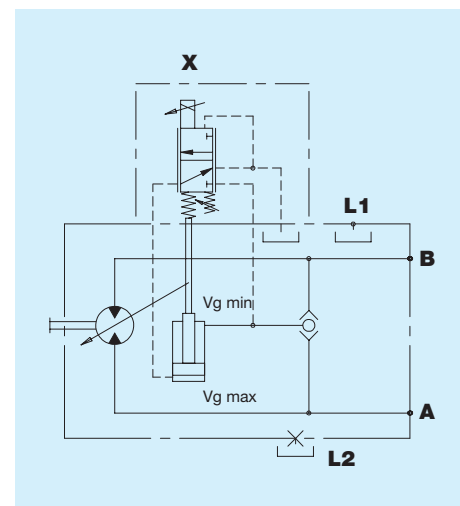
V Electronic proportional feedback control 24V



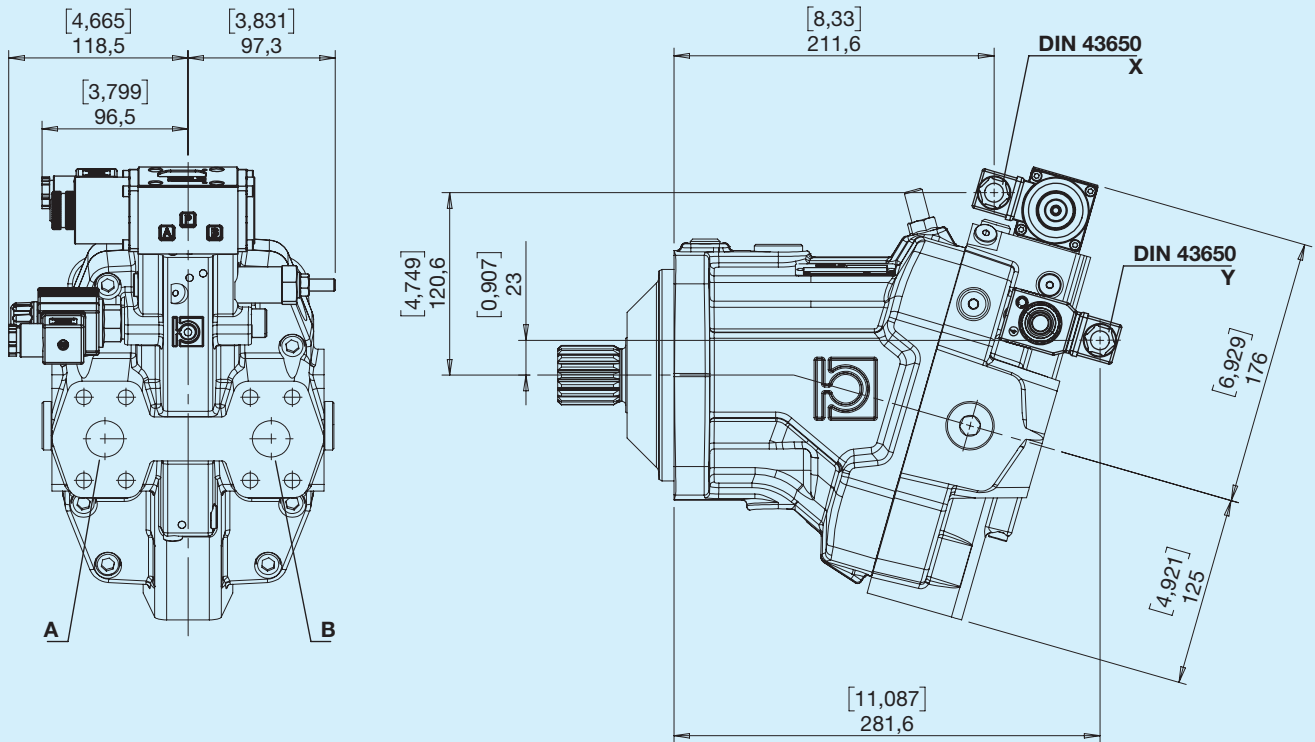
Pilot



Hydraulic diagram

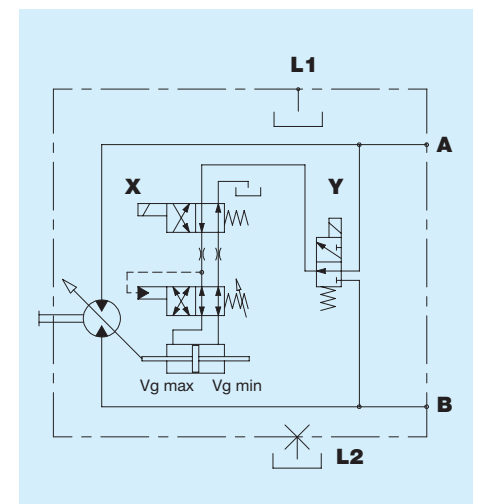


R Electric ON/OFF with pressure override and channel selector

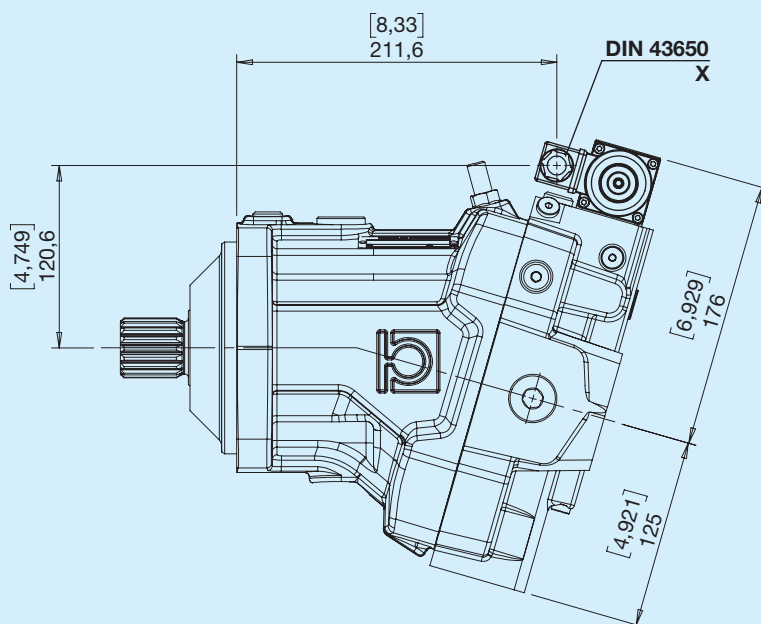
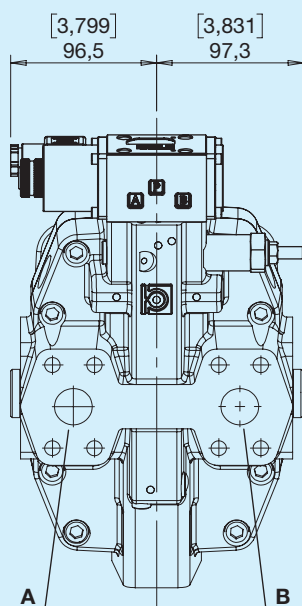


Hydraulic diagram

Inlet	Rotation
Right	Left
Right	Right

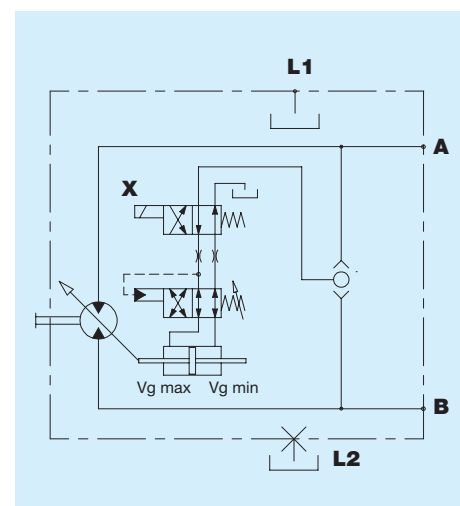


U Electric ON/OFF with pressure override

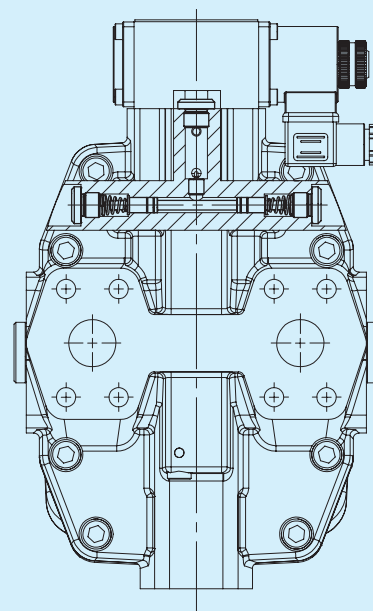
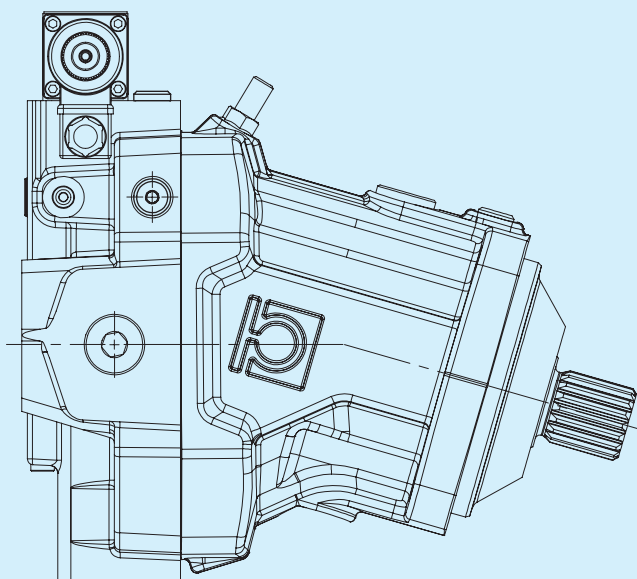


Inlet	Rotation
Right	Left
Right	Right

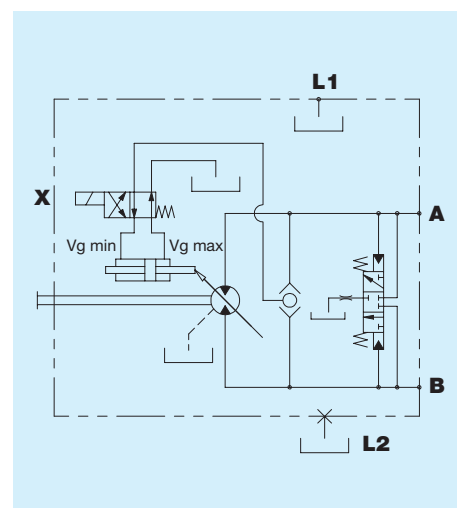
Hydraulic diagram



V Flushing valve (5-7 l/min)

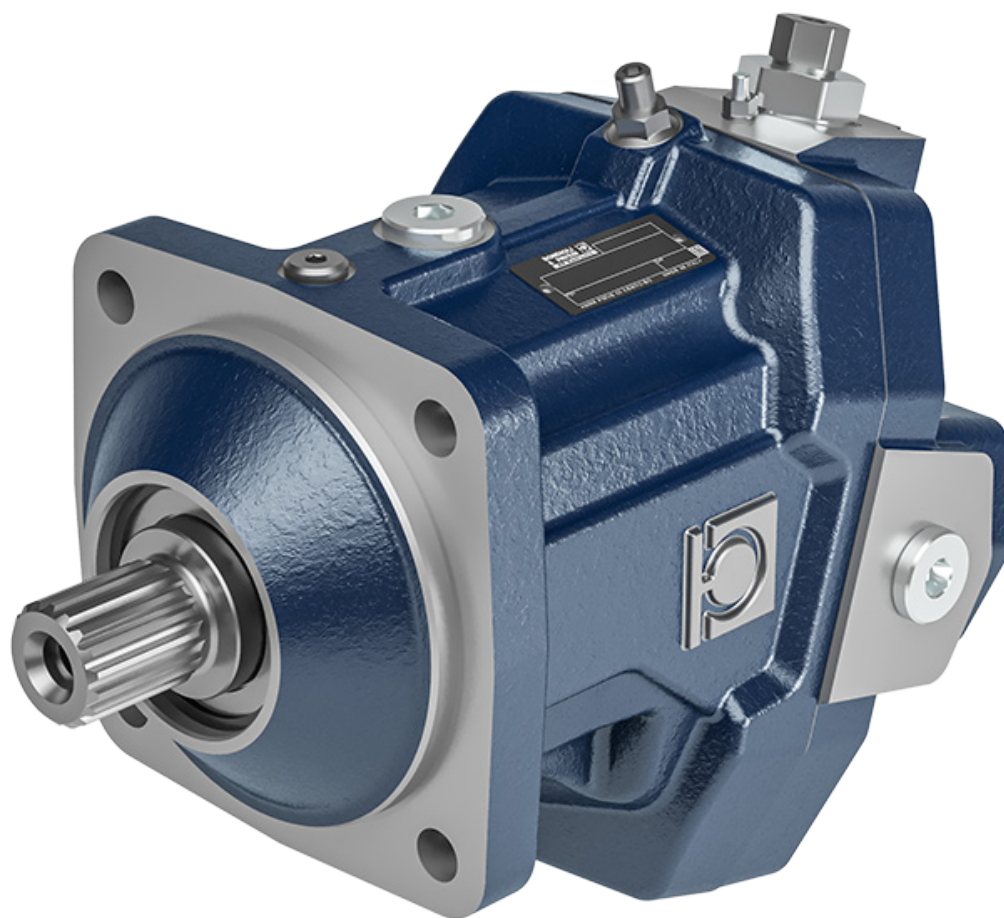


Hydraulic diagram

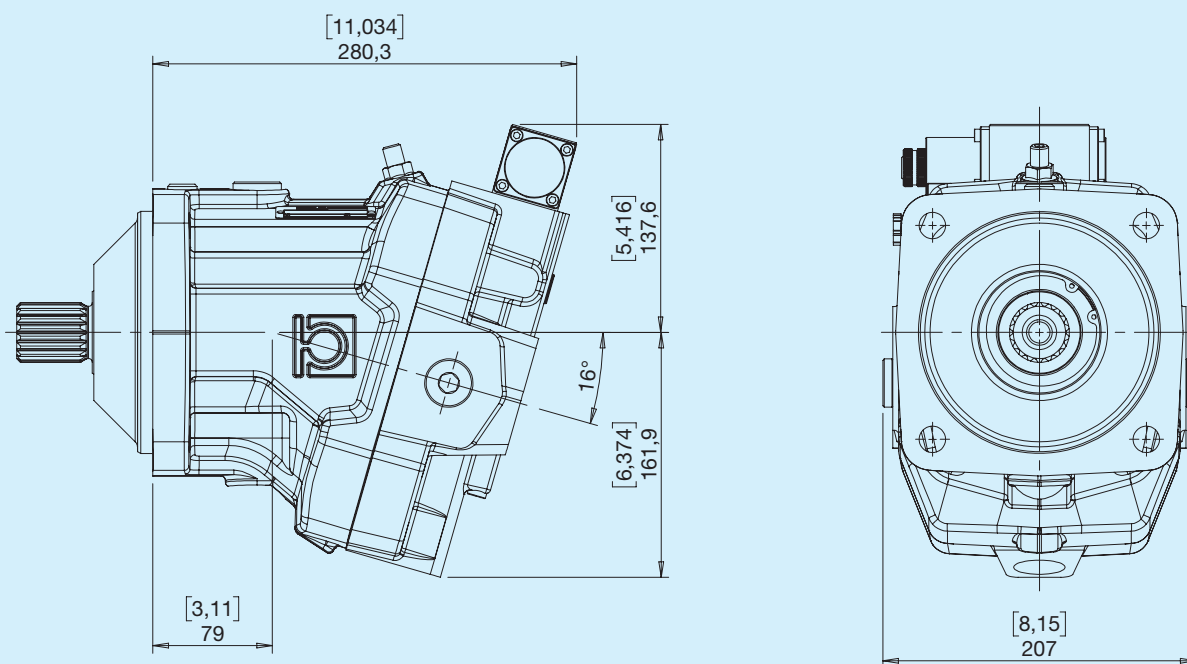


	1	2	3	4	5	6	7	8	9	10	11	12	13	14
HPBA														
1 2 3	Standard displacement													
	080					108								
4 5	Minimum displacement													
	...													
6	Flanges													
	I ISO 4 holes standard					P ISO 2 holes cartridge centring					S SAE C			
7	Shafts													
	B DIN 5480 W40x2x30x18					3 SAE 14T 12/24 DP					Z SAE 17T 12/24 DP			
	C DIN 5480 W35x2x30x16					7 SAE 21T 16/32 DP								
8	Type of ports													
	G Gas					U UNF					N Gas-SAE inlet/outlet			
											M UNF-SAE inlet/outlet			
9	Position of ports													
	P Rear					Y Rear with rotated valve (not available for O - V - G controls)					J Opposite sideways with rotated valve (not available for O - V - G controls)			
	L Opposite sideways													
10	Controls													
	A Hydraulic automatic, ON/OFF					G Proportional hydraulic					O Electronic proportional feedback control 12V			
	E Electric 2-position 12V					H Direct hydraulic, 2-position					V Electronic proportional feedback control 24V			
	F Electric 2-position 24V					K Hydraulic, 2-position, low pressure					R Electric ON/OFF with pressure override and channel selector			
11	Accessories													
	0 No option					C Paint					V Flushing valve			
12 13 14	Special versions													
	...													

Variable-displacement motors HPBA110-130

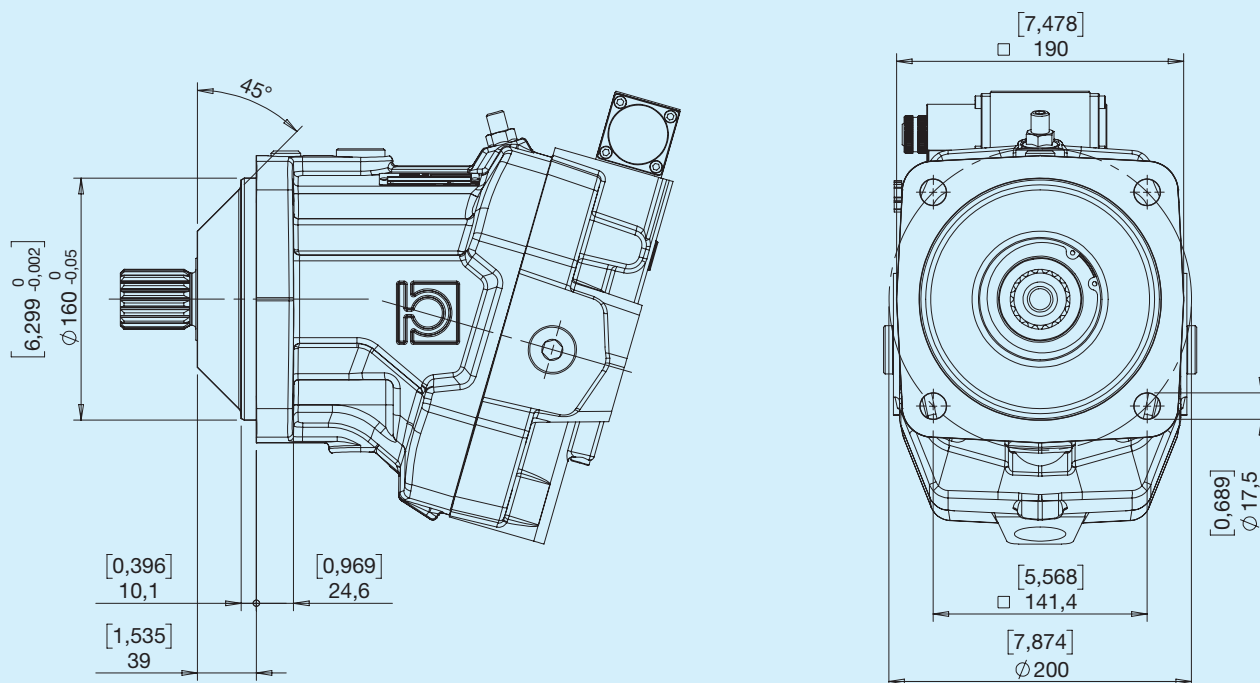


Before use, carefully read the GENERAL INSTRUCTIONS FOR USE OF CLOSED CIRCUIT AXIAL PISTON PUMPS AND MOTORS.

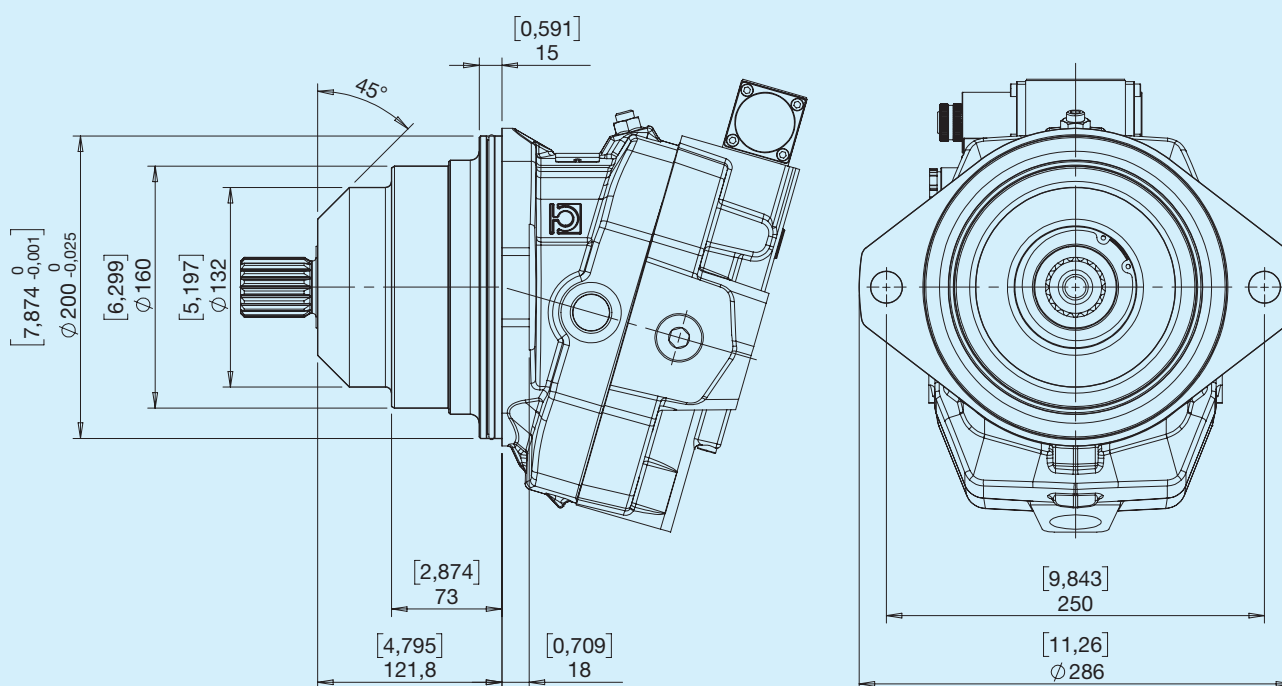


HPBA	Nominal displacement		Swash plate	Continuous pressure		Intermittent pressure		Peak pressure		Rotational speed			Weight	
	cm ³	in ³		bar	psi	bar	psi	bar	psi	MAX (max V) min ⁻¹	MAX (min V) min ⁻¹	MIN min ⁻¹	kg	lbs
110	110	6.65	26	350	5075	400	5800	450	6525	2900	4500	500	45	99
130	130	7,93	25	350	5075	400	5800	450	6525	2900	4500	500	51	112

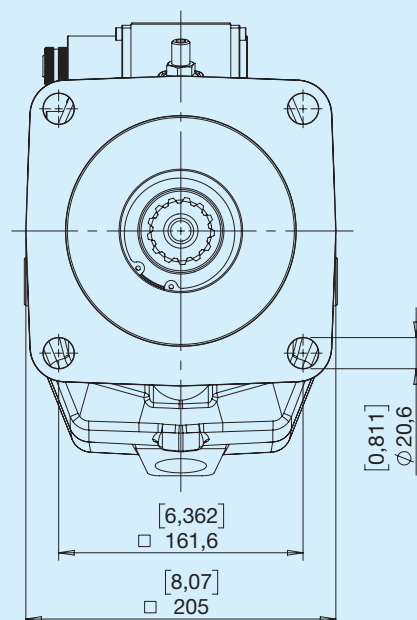
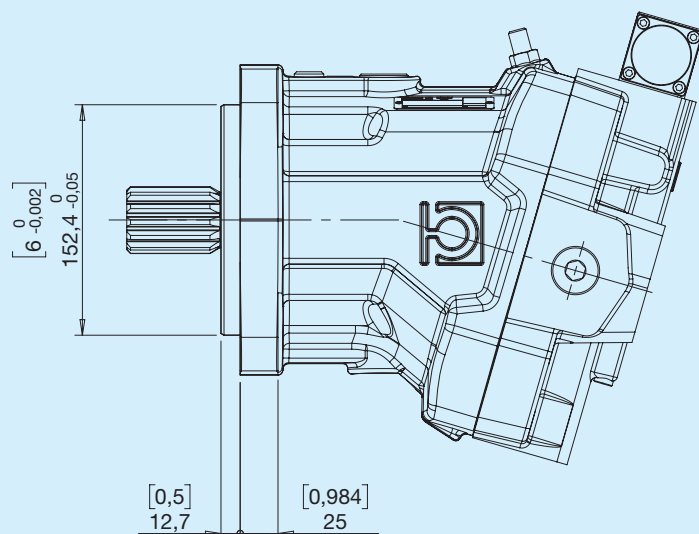
I ISO 4 holes standard



P ISO 2 holes cartridge centring

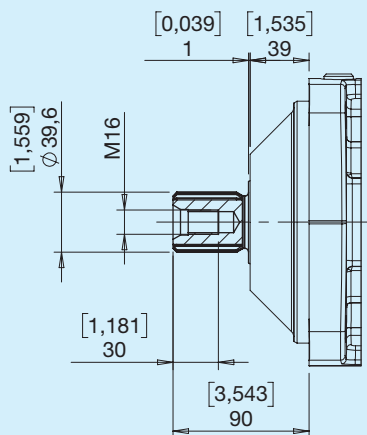


S SAE D



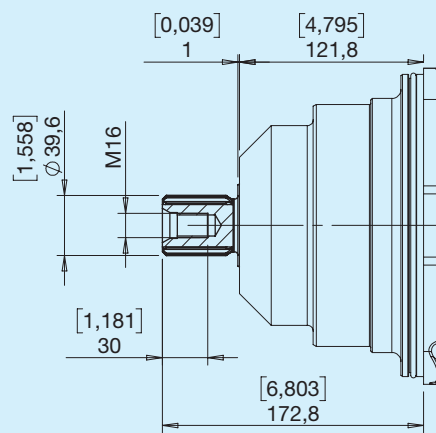
B DIN 5480 W40x2x30x18

ISO 4-hole standard version



Max. torque 1310 Nm

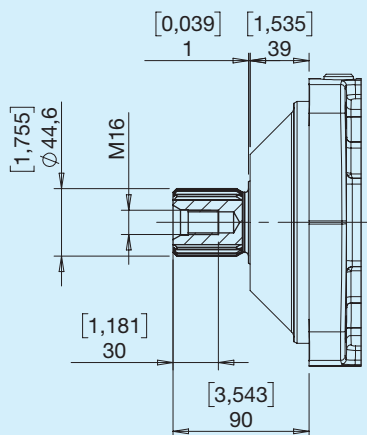
ISO 2-hole cartridge version



Max. torque 1310 Nm

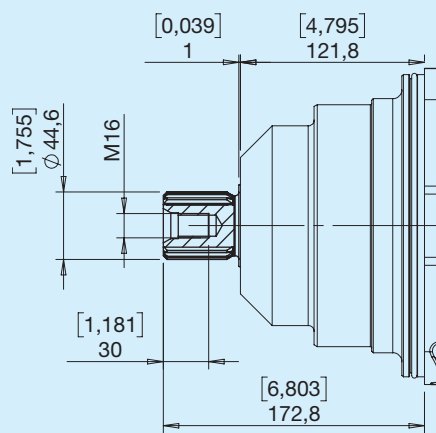
D DIN 5480 W45x2x30x21

ISO 4-hole standard version



Max. torque 1980 Nm

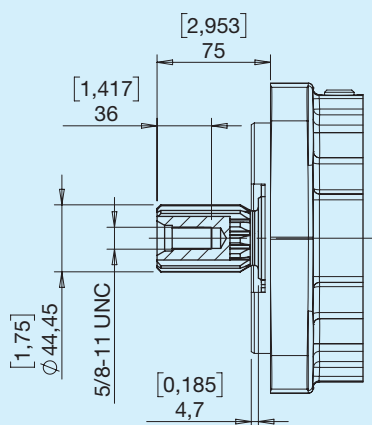
ISO 2-hole cartridge version



Max. torque 1980 Nm

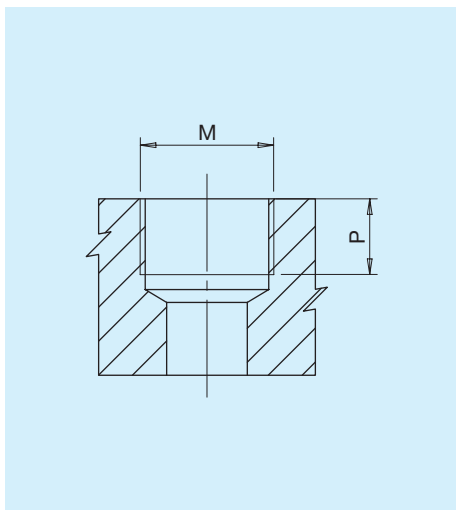
9 13T 8/16 DP

SAE D version



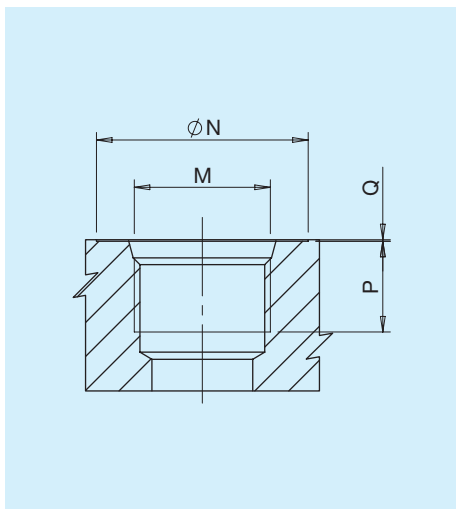
Max. torque 1980 Nm

Type G



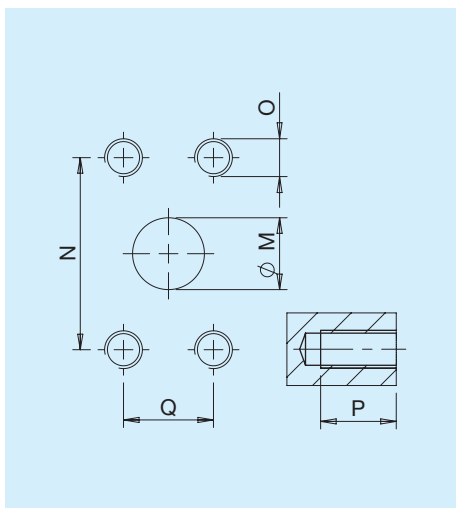
Type	M		P	
		Nm	mm	in
G2	Port ISO 1179-1 - G 1/4	17	8	0.31
G6	Port ISO 1179-1 - G 3/4	90	19	0.75
G7	Port ISO 1179-1 - G 1	160	19	0.75

Type U



Type	Dim.	N		P		Q		M	Nm
		mm	in	mm	in	mm	in		
U2	1/4"	20	0.79	12	0.47	0.3	0.01	Port ISO 11926-1-7/16-20	17
U6	3/4"	41	1.61	20	0.79	0.3	0.01	Port ISO 11926-1-1 1/16-12	90
U7	1"	49	1.93	18	0.70	0.3	0.01	Port ISO 11926-1-1 5/16-12	160

Type N

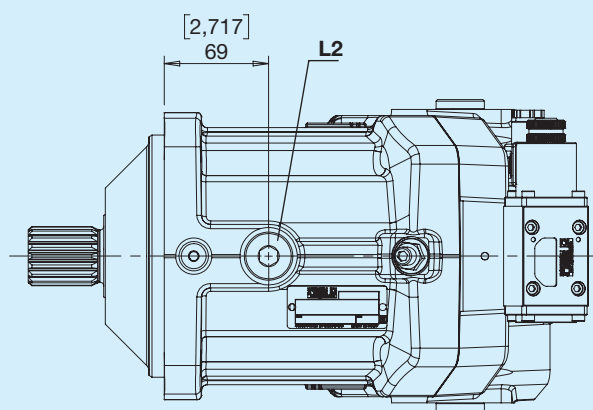
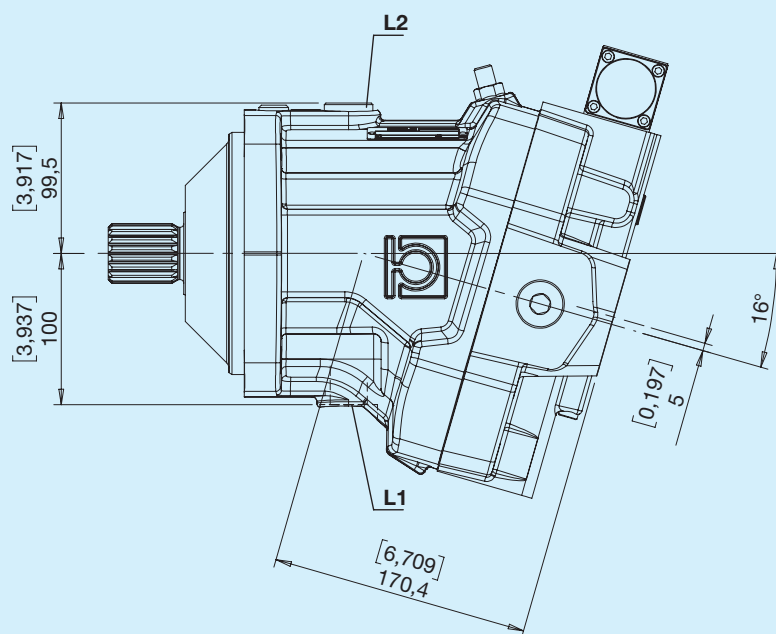
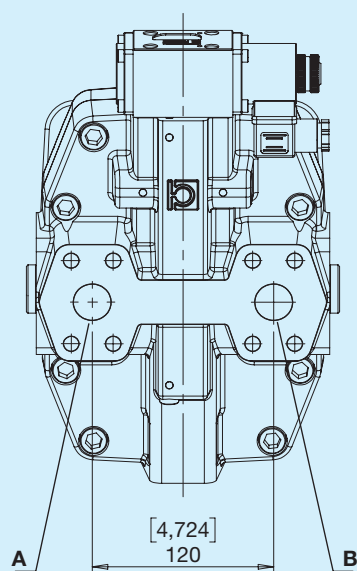


Type	M		N		Q		P		O	Nm
	mm	in	mm	in	mm	in	mm	in		
N7	25	1	57.15	2.25	27.76	1.09	20	0.79	M12	70

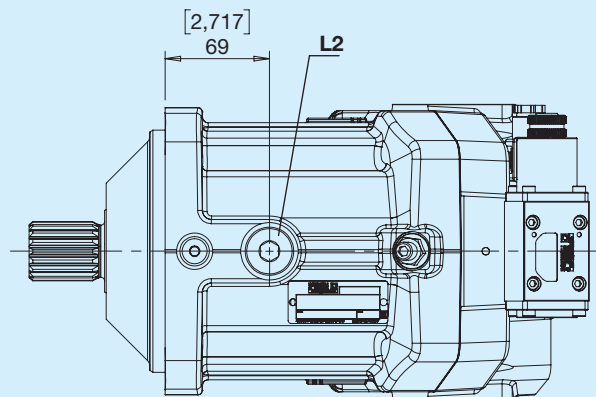
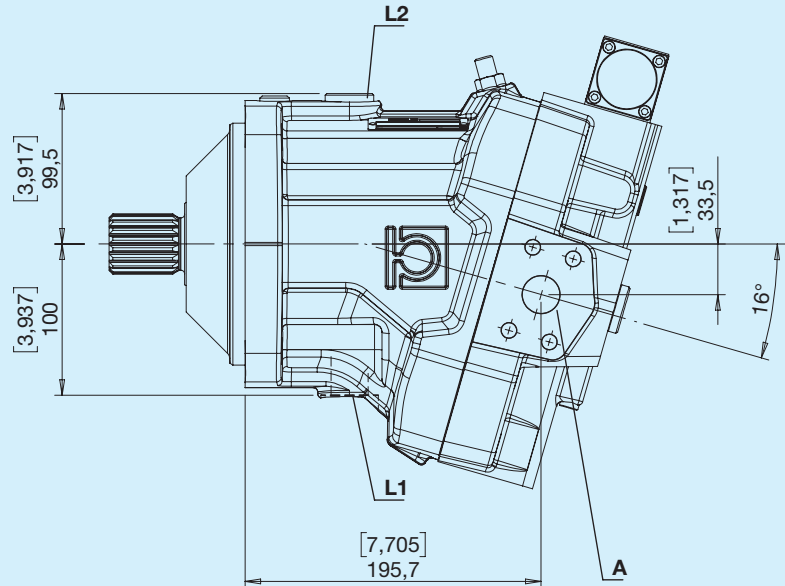
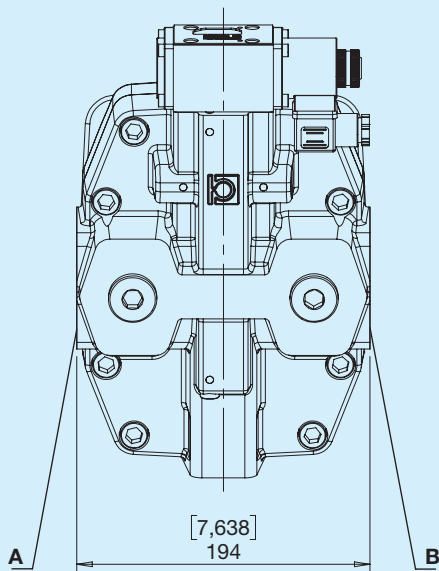
Combinations

Type	Inlet/outlet A-B	Drain port L1-L2	Pilot a-b-x
G	G6	G6	G6
U	U6	U6	U6
N	N7	G6	G2
M	N7	U6	U2

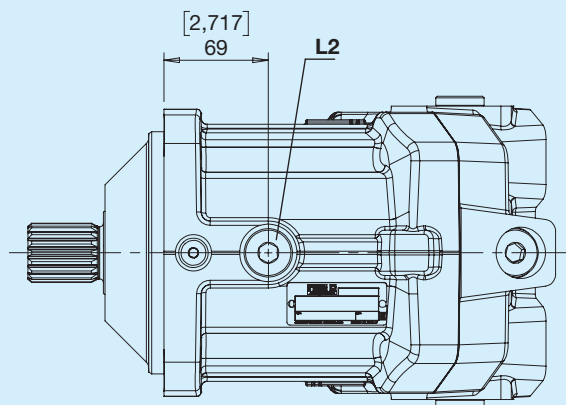
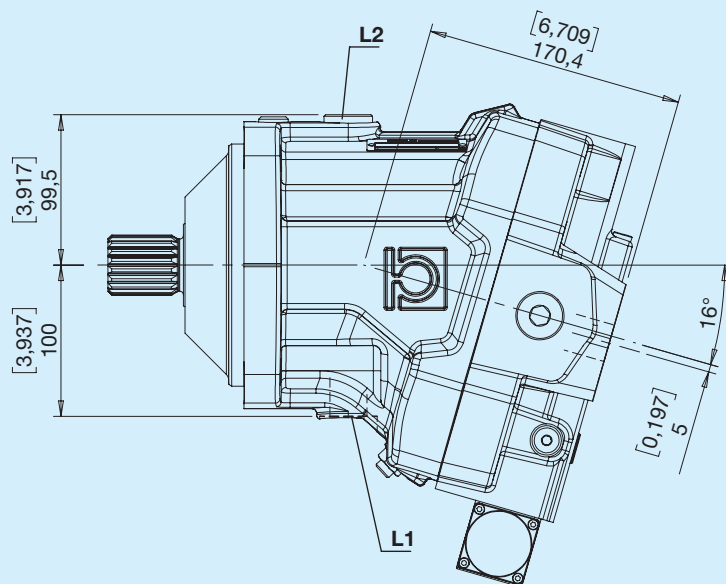
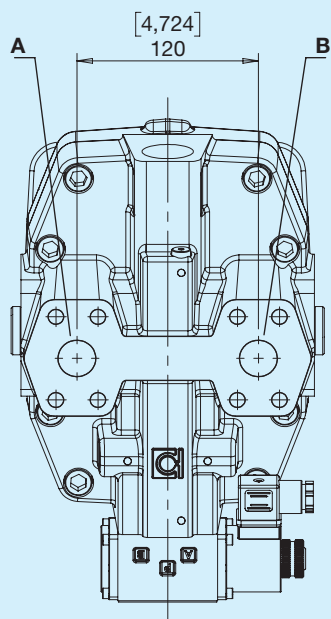
P Rear



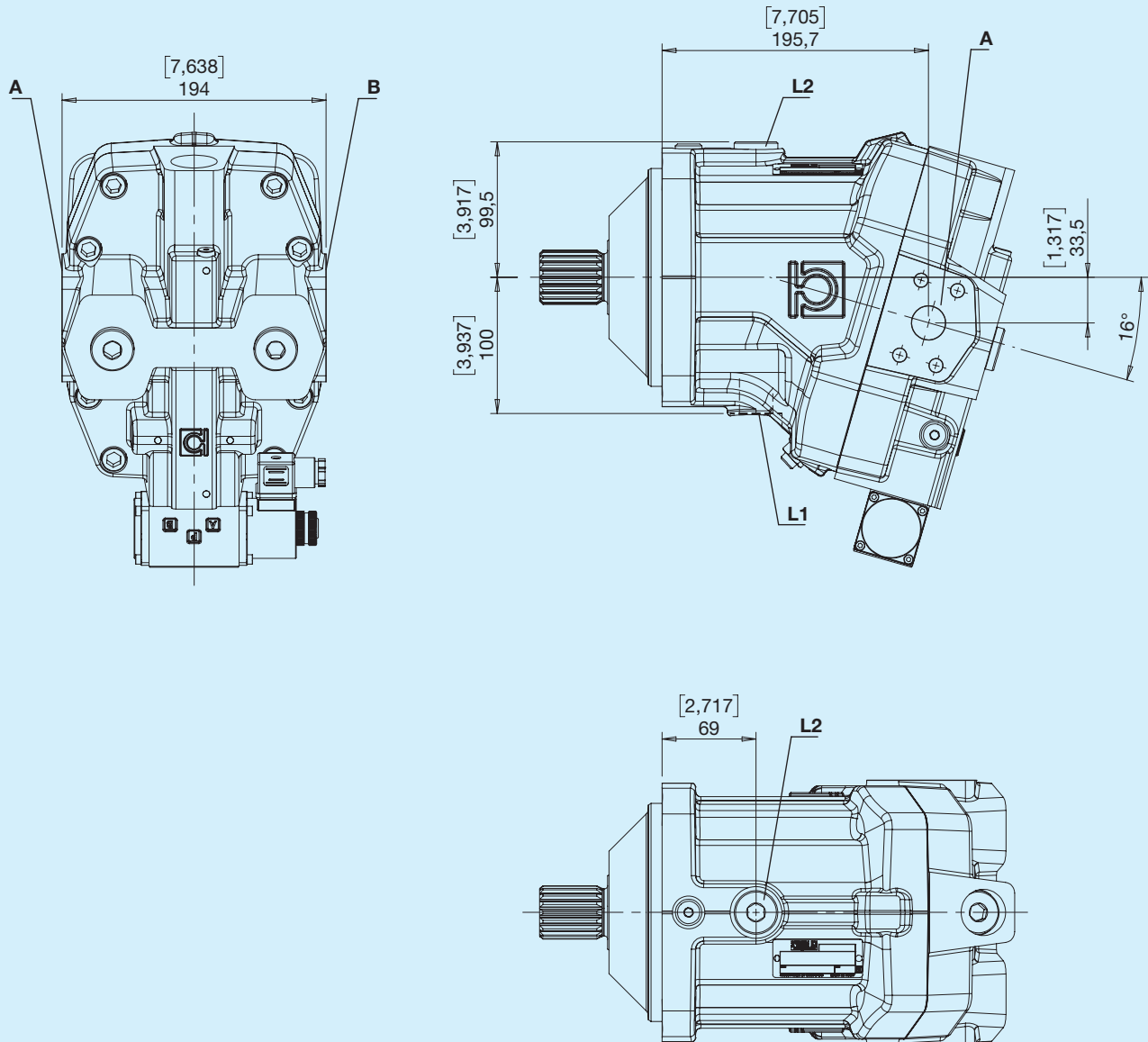
L Opposite sideways



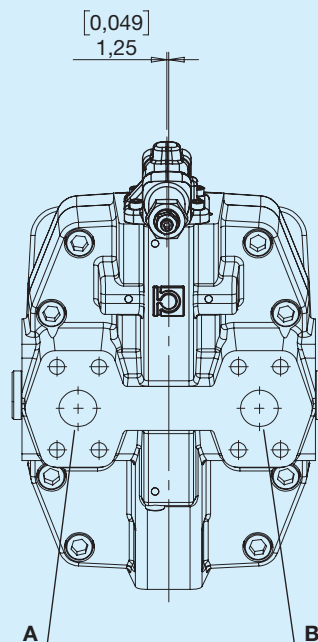
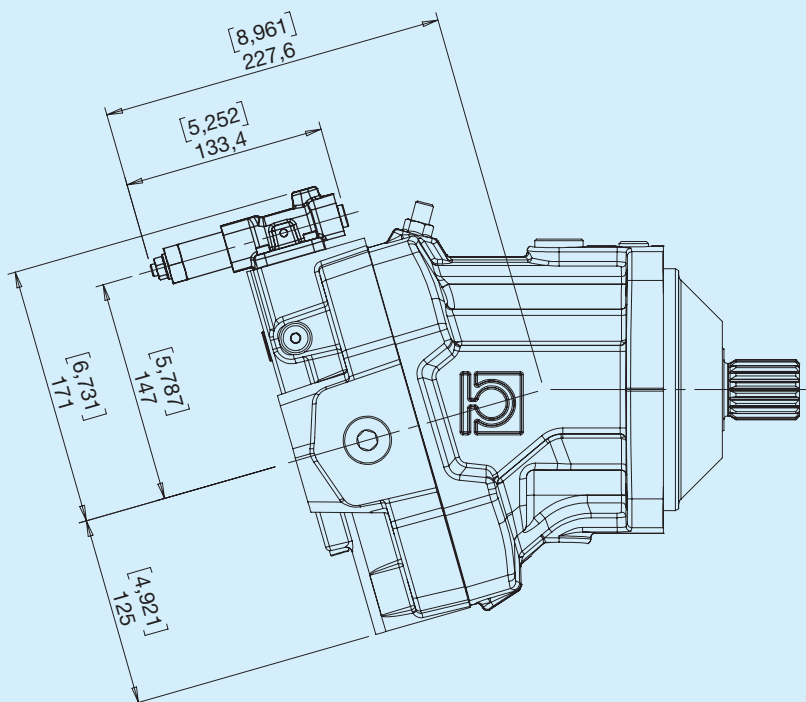
Y Rear with rotated valve



J Opposite sideways with rotated valve

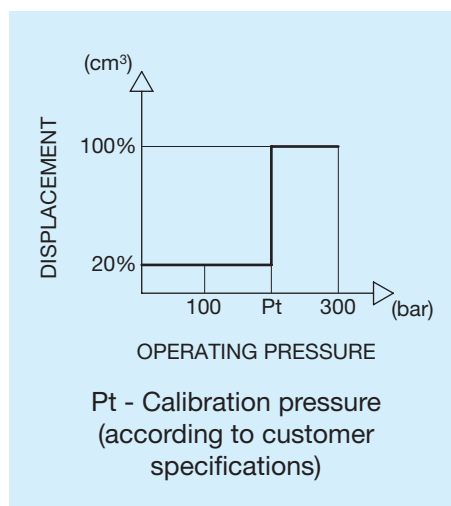


A Hydraulic automatic, ON/OFF

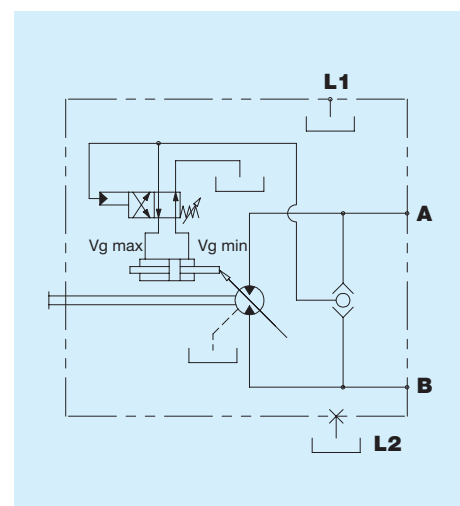


Inlet	Rotation
Right	Left
Right	Right

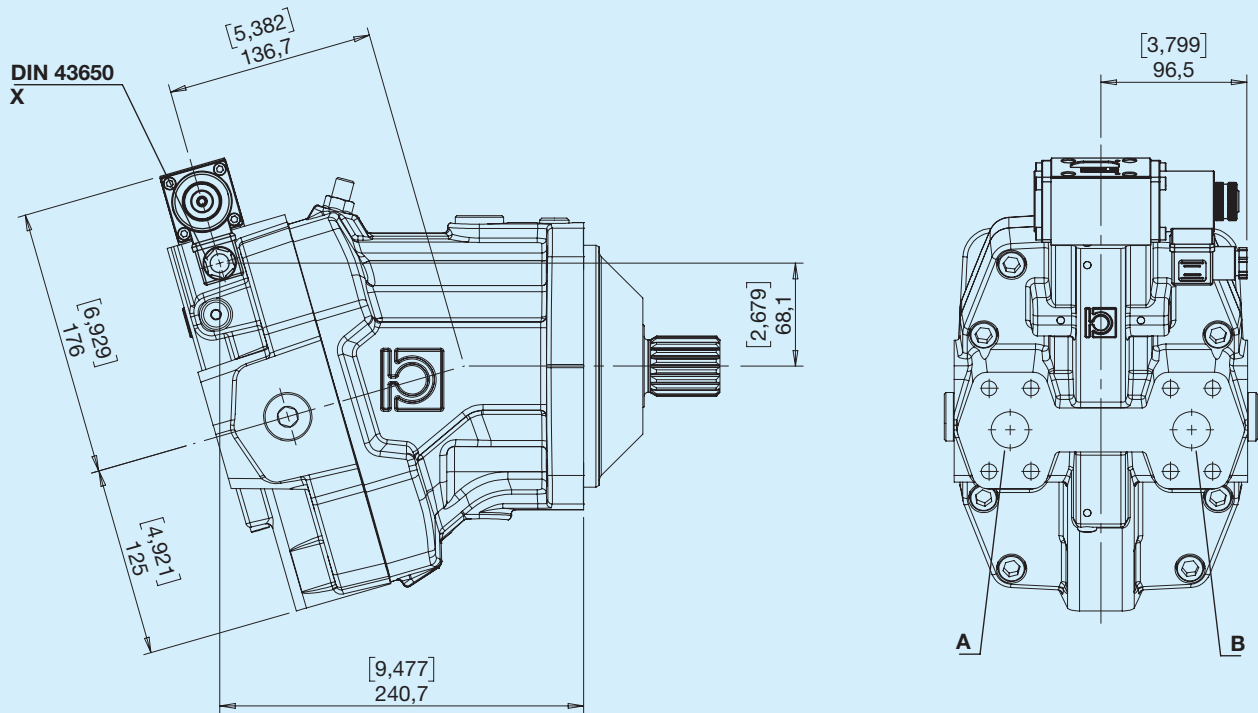
Pilot



Hydraulic diagram



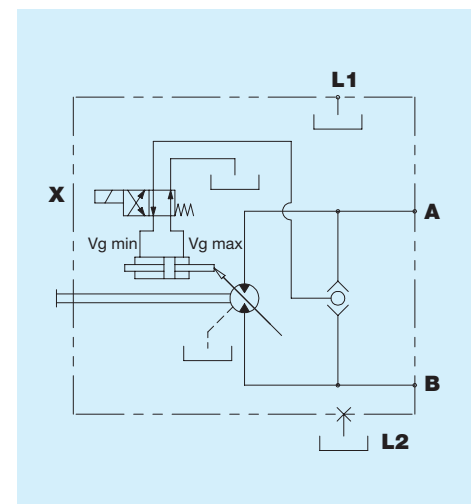
E Electric 2-position 12V



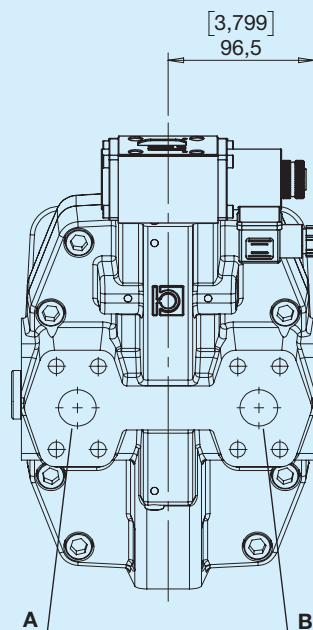
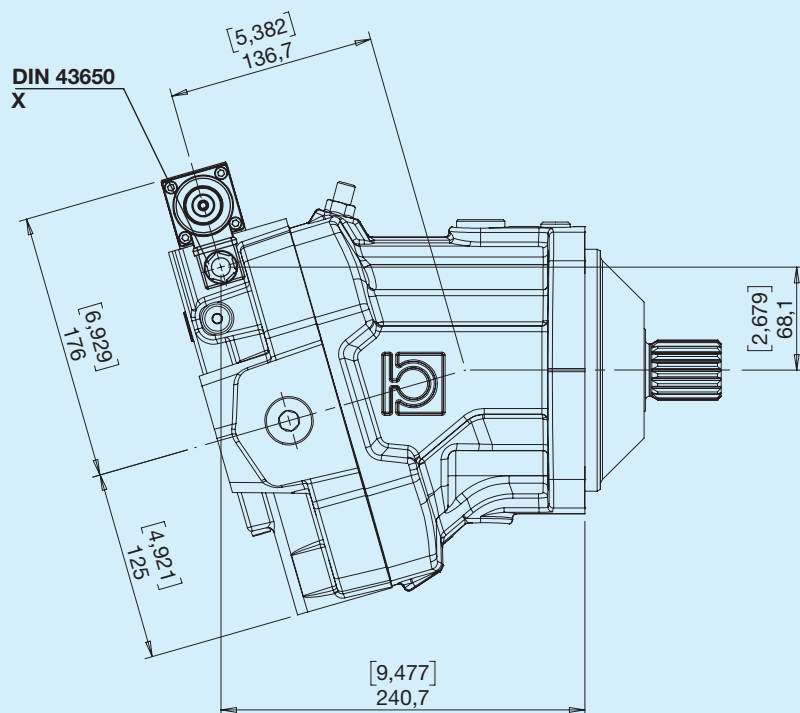
X - Solenoid valve available on request with DEUTSCH DT04-2P connectors

Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram



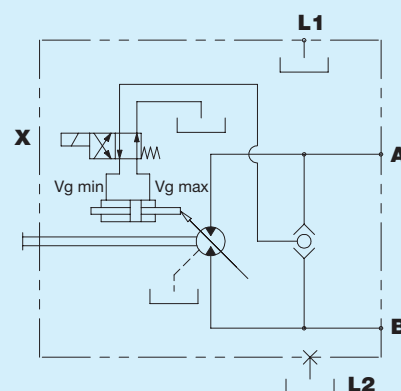
F Electric 2-position 24V



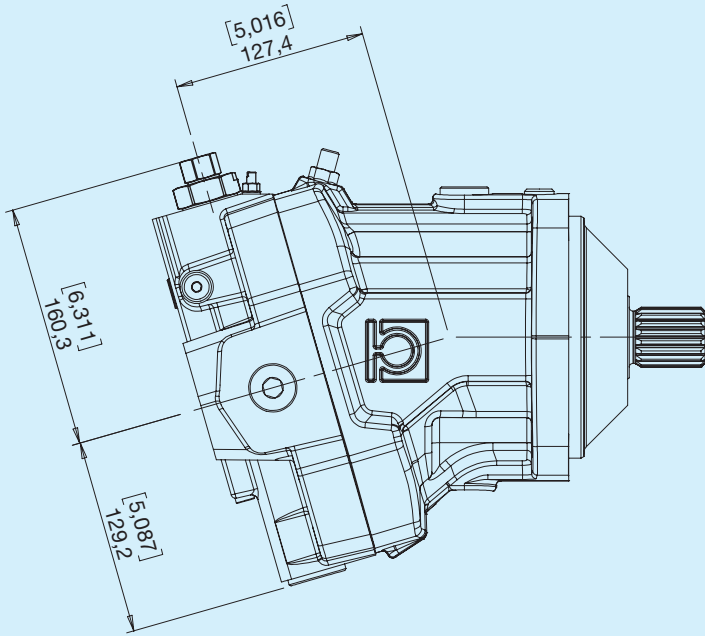
X - Solenoid valve available on request with DEUTSCH DT04-2P connectors

Inlet	Rotation
Right	Left
Right	Right

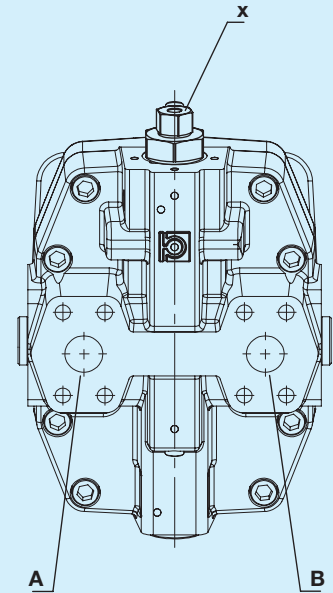
Hydraulic diagram



G Proportional hydraulic

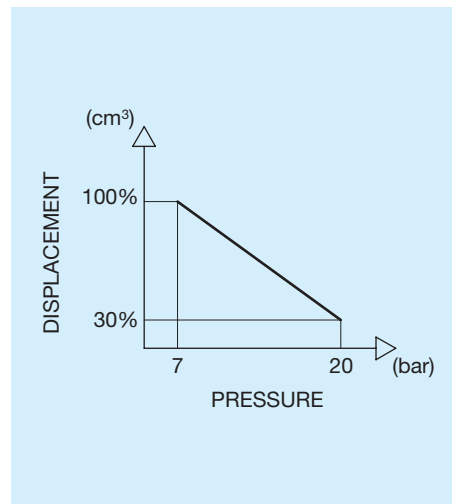


X - Pilot G1/8

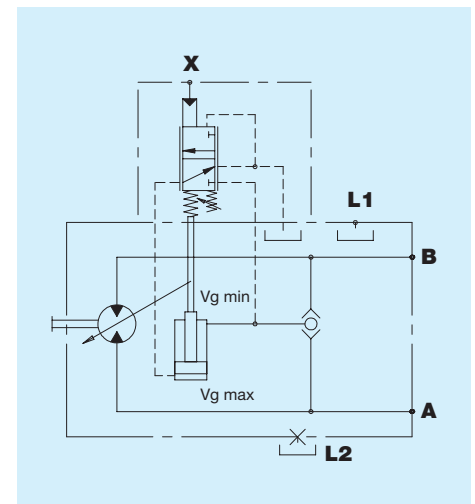


Pilot

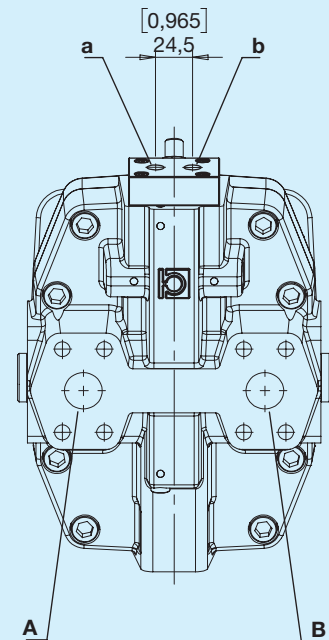
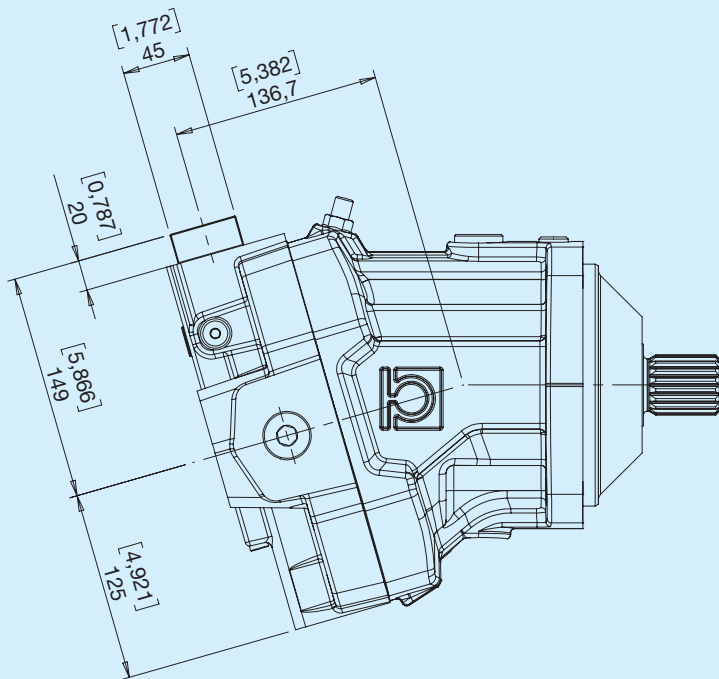
Inlet	Rotation
Right	Left
Right	Right



Hydraulic diagram

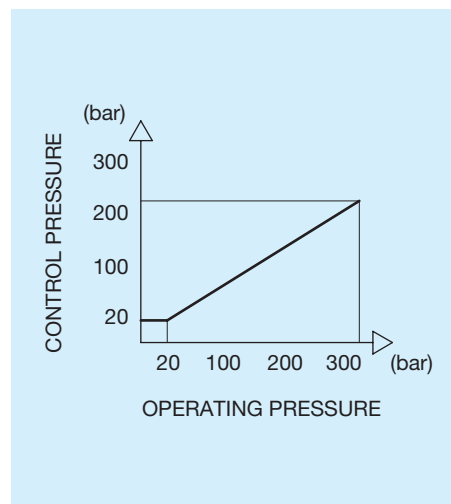


H Direct hydraulic, 2-position

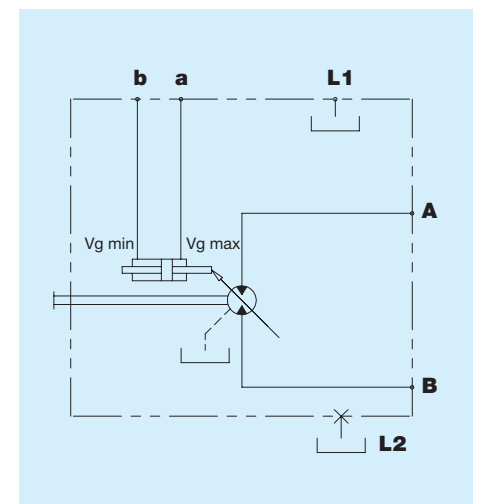


Inlet	Rotation
Right	Left
Right	Right

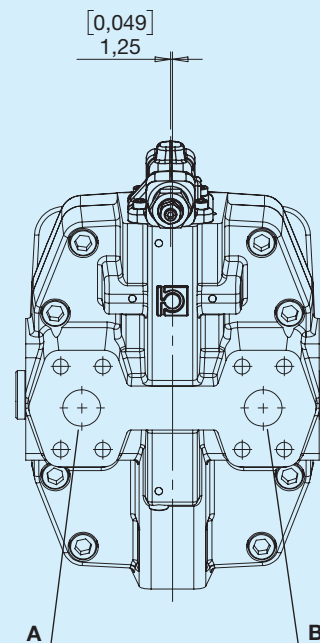
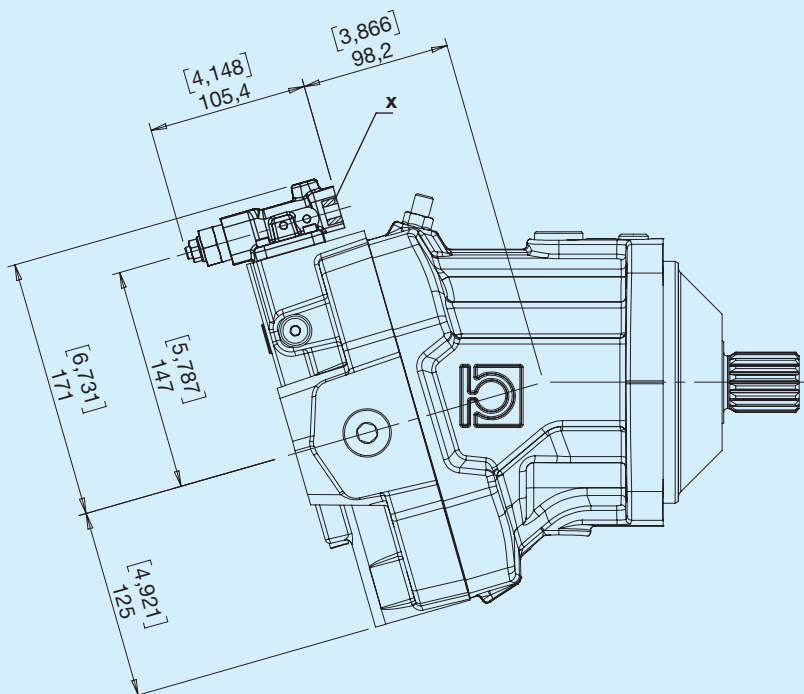
Pilot



Hydraulic diagram



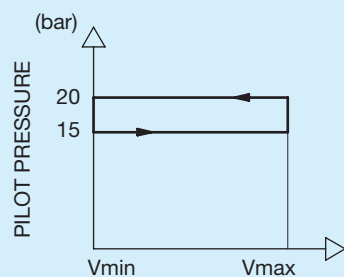
K Hydraulic, 2-position, low pressure



X - Pilot G1/8

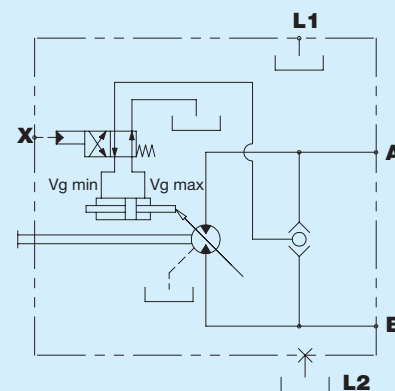
Inlet	Rotation
Right	Left
Right	Right

Diagram

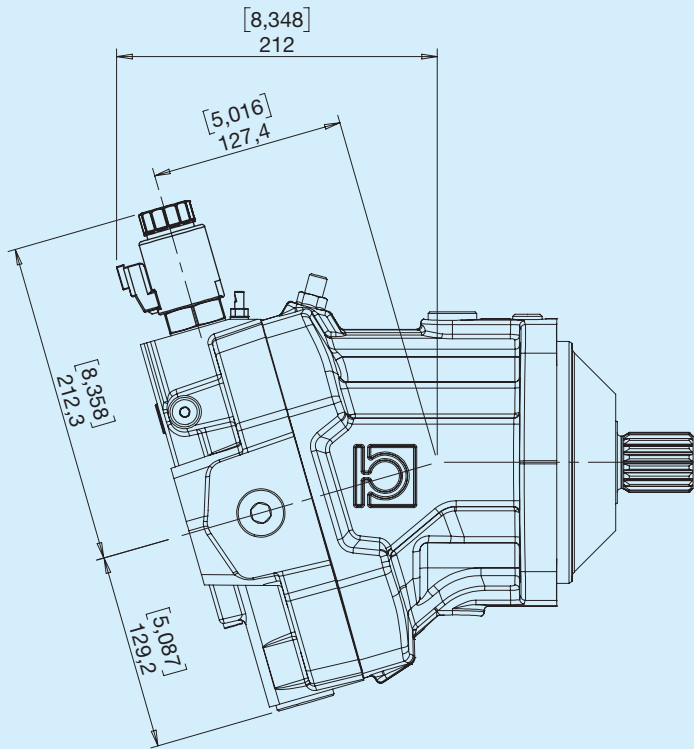


The motor is normally at maximum displacement. By applying external pressure to the pilot valve, the motor switches to minimum displacement. For correct displacement variation, observe the pilot pressure values shown in the diagram.

Hydraulic diagram

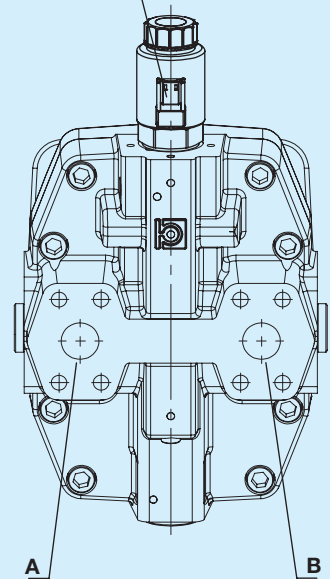


O Electronic proportional feedback control 12V



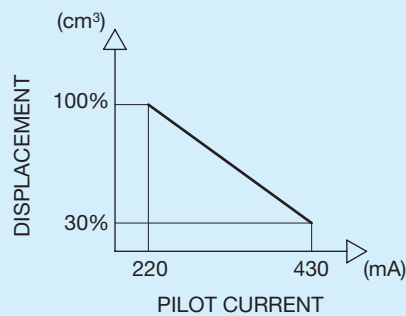
X - Solenoid valve

DEUTSCH DT04-2P
X

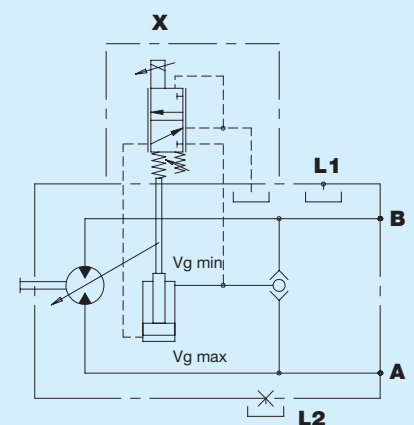


Inlet	Rotation
Right	Left
Right	Right

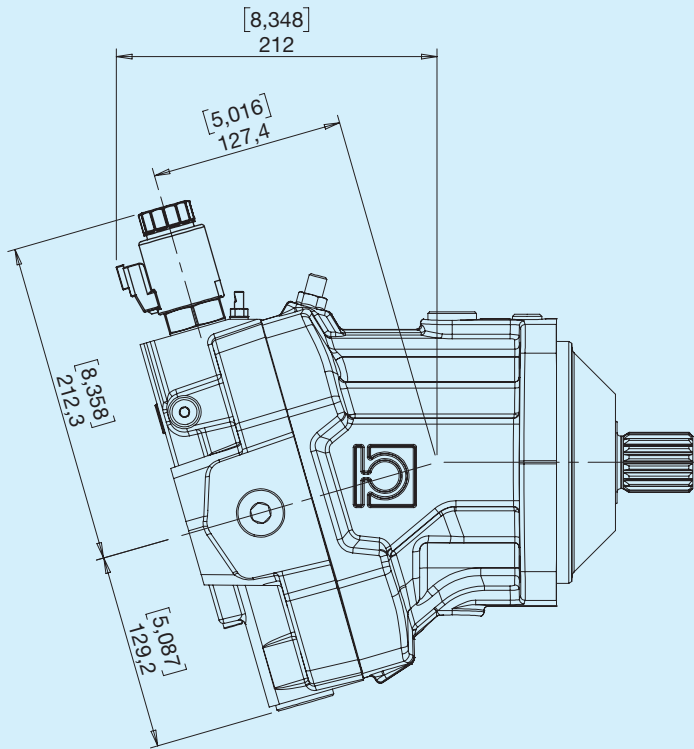
Pilot



Hydraulic diagram

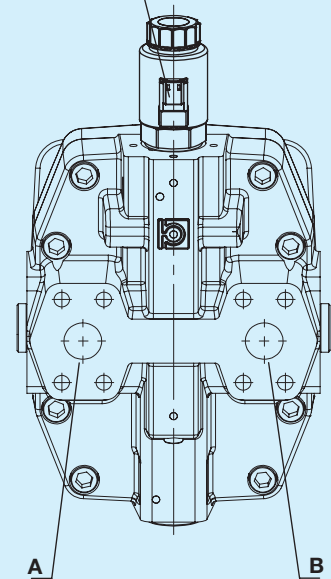


V Electronic proportional feedback control 24V



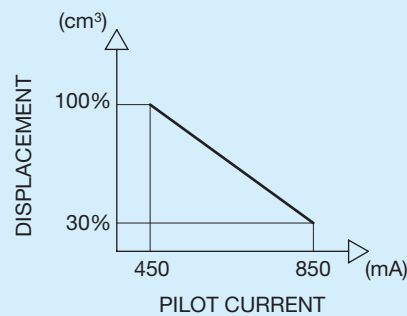
X - Solenoid valve

DEUTSCH DT04-2P
X

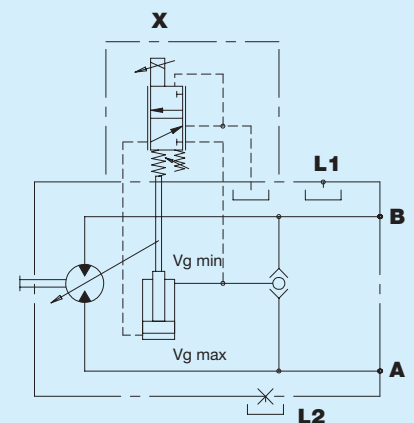


Pilot

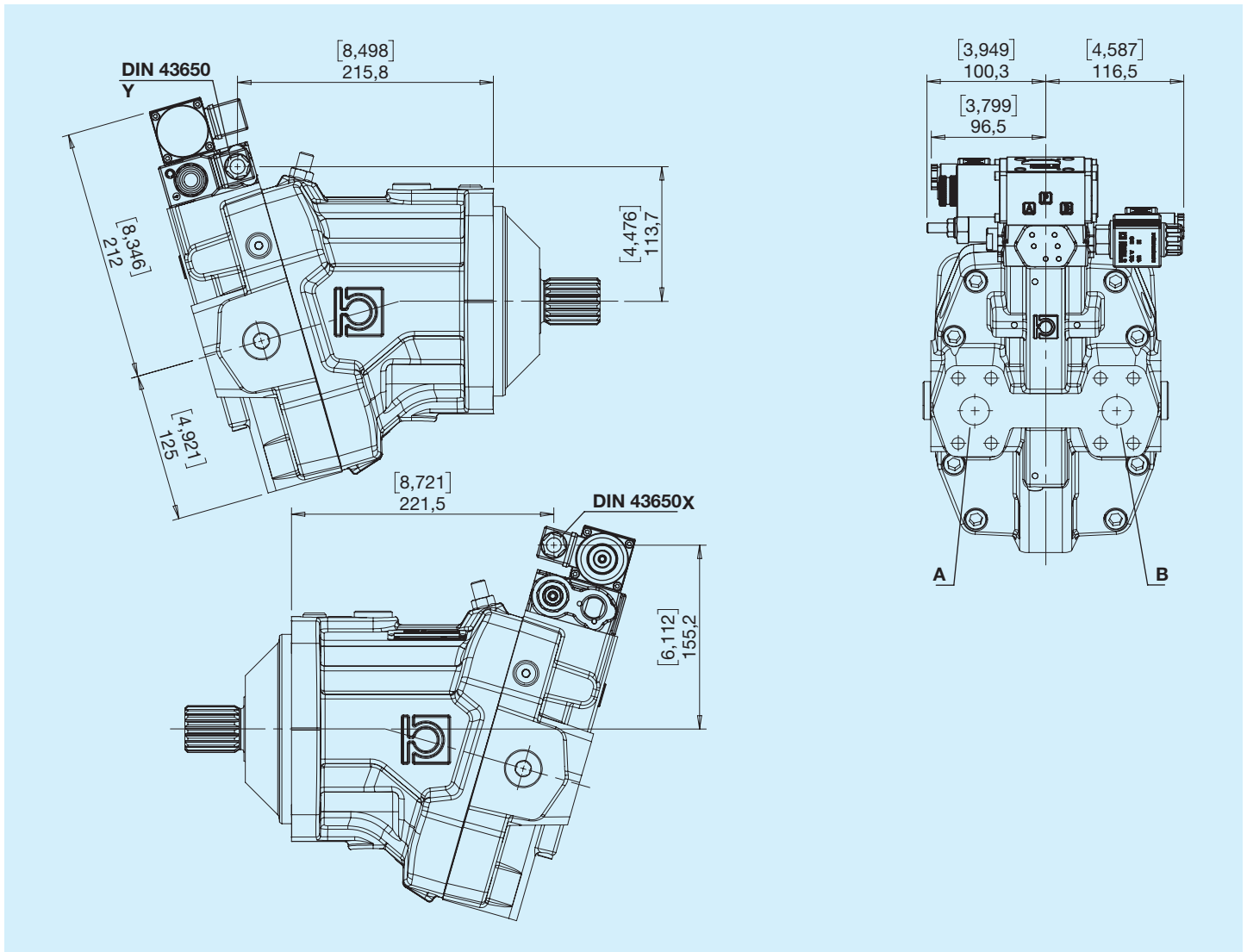
Inlet	Rotation
Right	Left
Right	Right



Hydraulic diagram

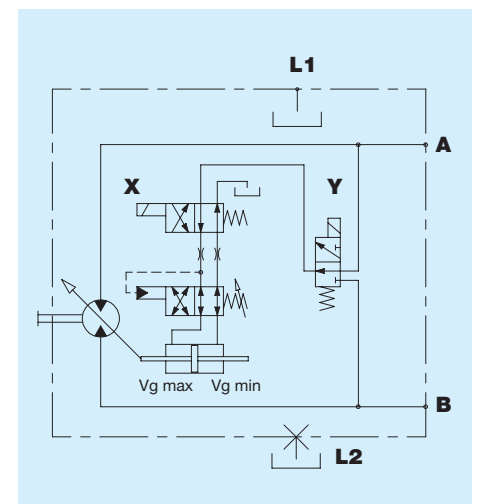


R Electric ON/OFF with pressure override and channel selector

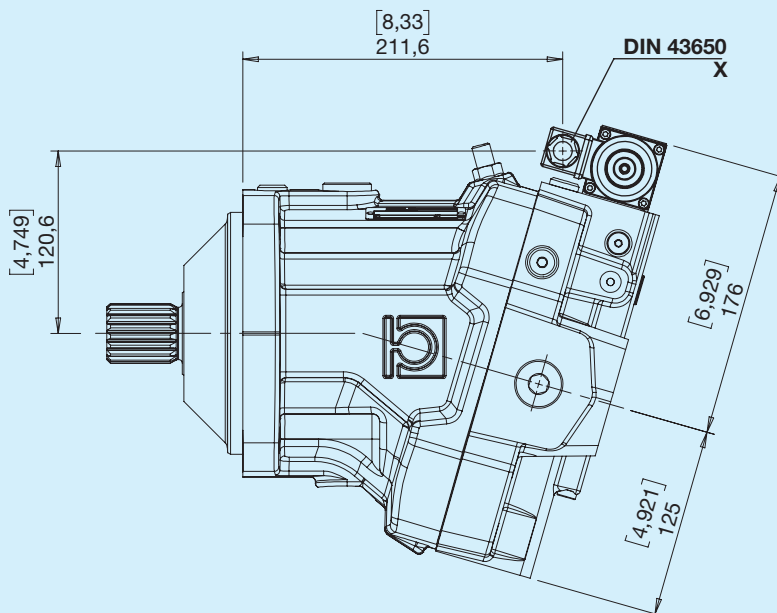
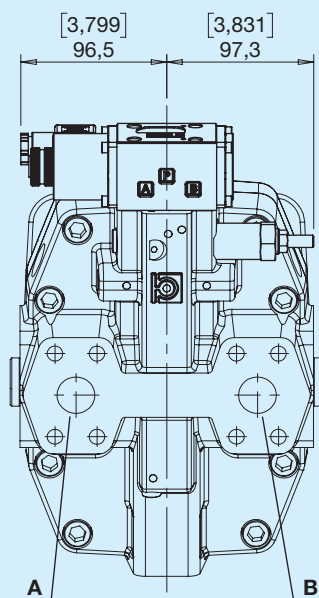


Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram

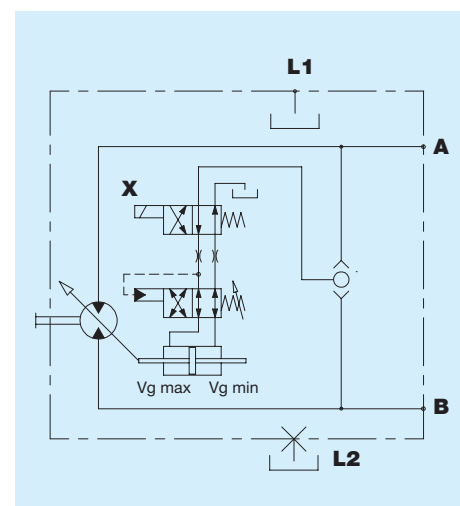


U Electric ON/OFF with pressure override

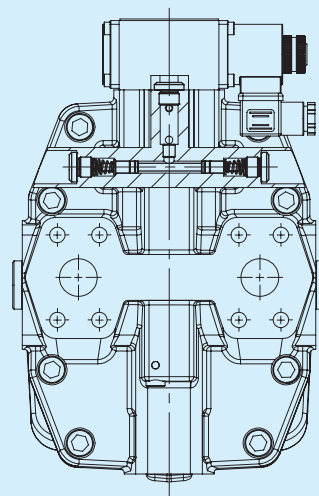
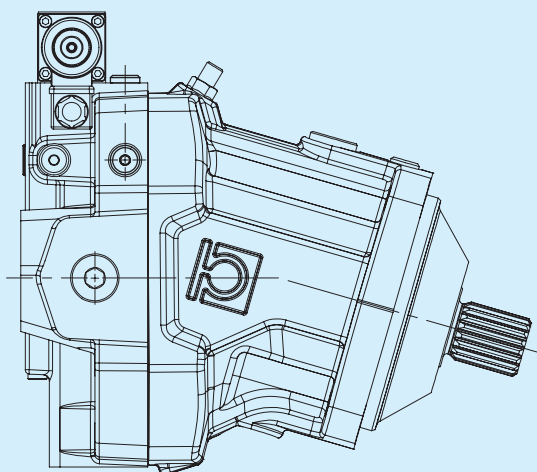


Inlet	Rotation
Right	Left
Right	Right

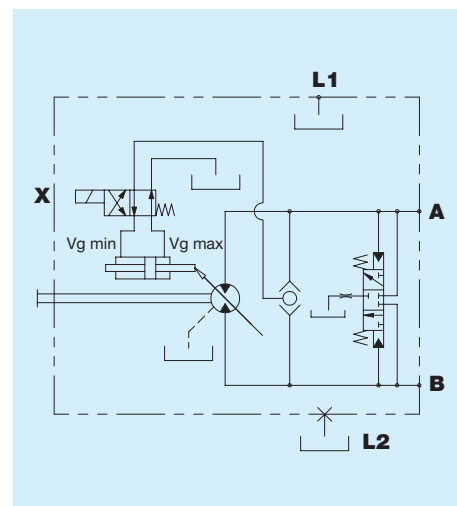
Hydraulic diagram



V Flushing valve (5-7 l/min)

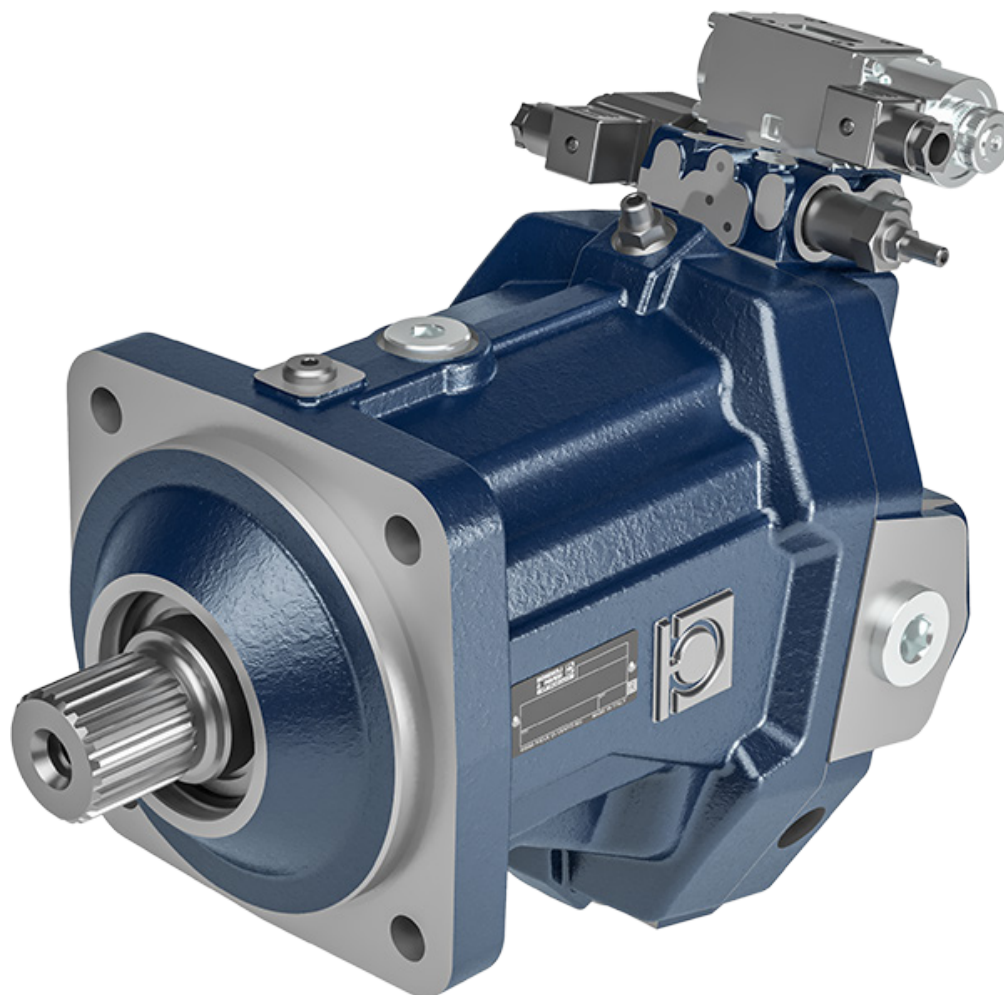


Hydraulic diagram

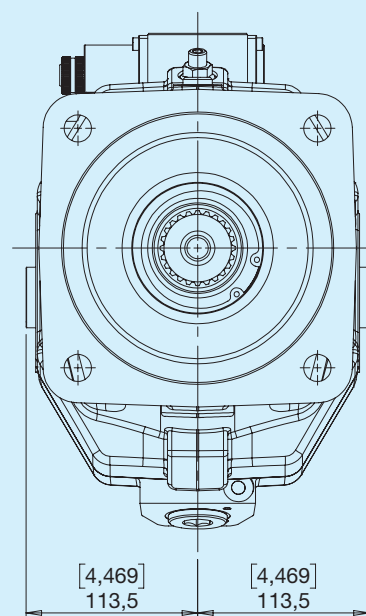
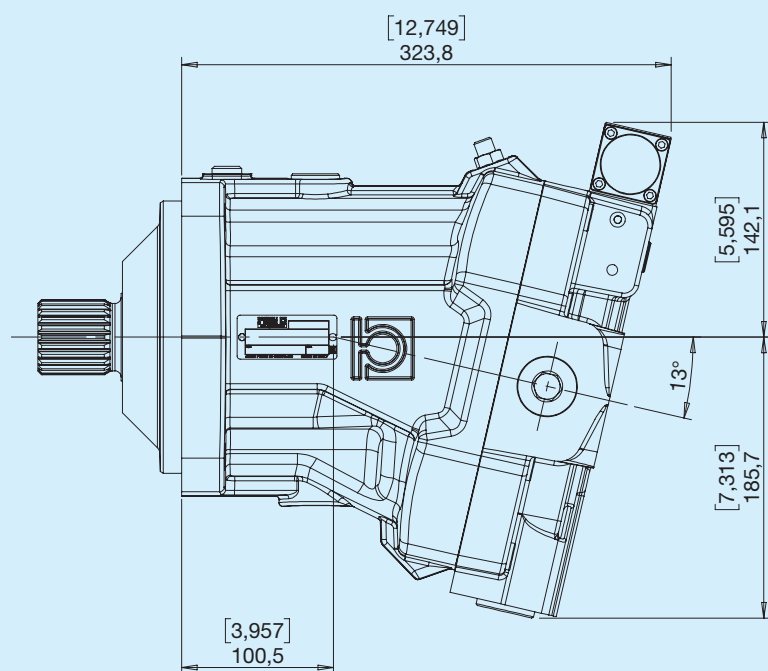


	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
HPBA																		
1 2 3	Standard displacement																	
	110					130												
4 5	Minimum displacement																	
	...																	
6	Flanges																	
	I ISO 4 holes standard					P ISO 2 holes cartridge centring					S SAE D							
7	Shafts																	
	B DIN 5480 W40x2x30x18					D DIN 5480 W45x2x30x21					9 SAE 13T 8/16 DP							
8	Type of ports																	
	G Gas					U UNF					N Gas-SAE inlet/outlet				M UNF-SAE inlet/outlet			
9	Position of ports																	
	P Rear					Y Rear with rotated valve (not available for O - V - G controls)					J Opposite sideways with rotated valve (not available for O - V - G controls)				L Opposite sideways			
10	Controls																	
	A Hydraulic automatic, ON/OFF					G Proportional hydraulic					O Electronic proportional feedback control 12V				U Electric ON/OFF with pressure override			
	E Electric 2-position 12V					H Direct hydraulic, 2-position					V Electronic proportional feedback control 24V							
	F Electric 2-position 24V					K Hydraulic, 2-position, low pressure					R Electric ON/OFF with pressure override and channel selector							
11	Accessories																	
	0 No option					C Paint					V Flushing valve							
12 13 14	Special versions																	
	...																	

Variable-displacement motors HPBA 160-200

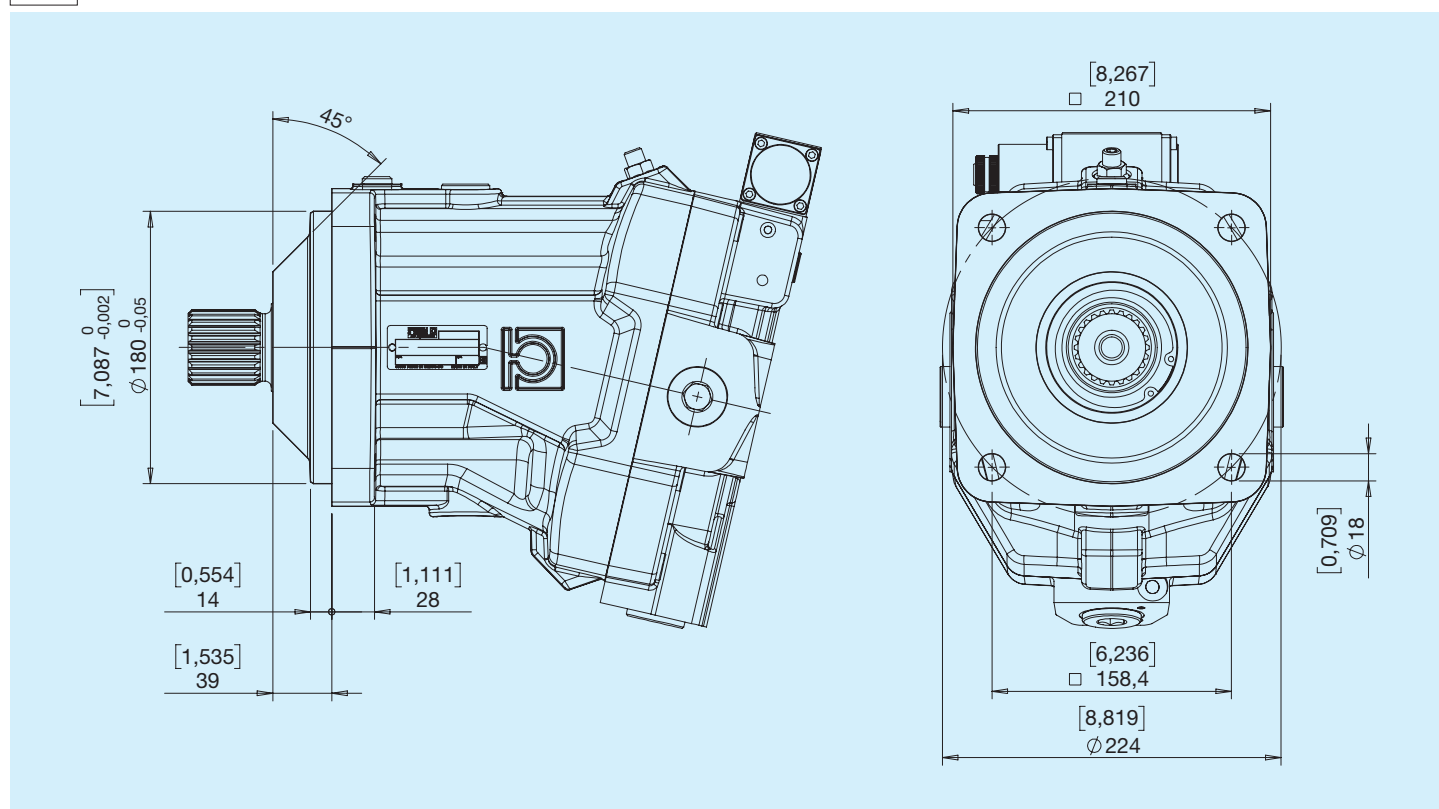


Before use, carefully read the GENERAL INSTRUCTIONS FOR USE OF CLOSED CIRCUIT AXIAL PISTON PUMPS AND MOTORS.

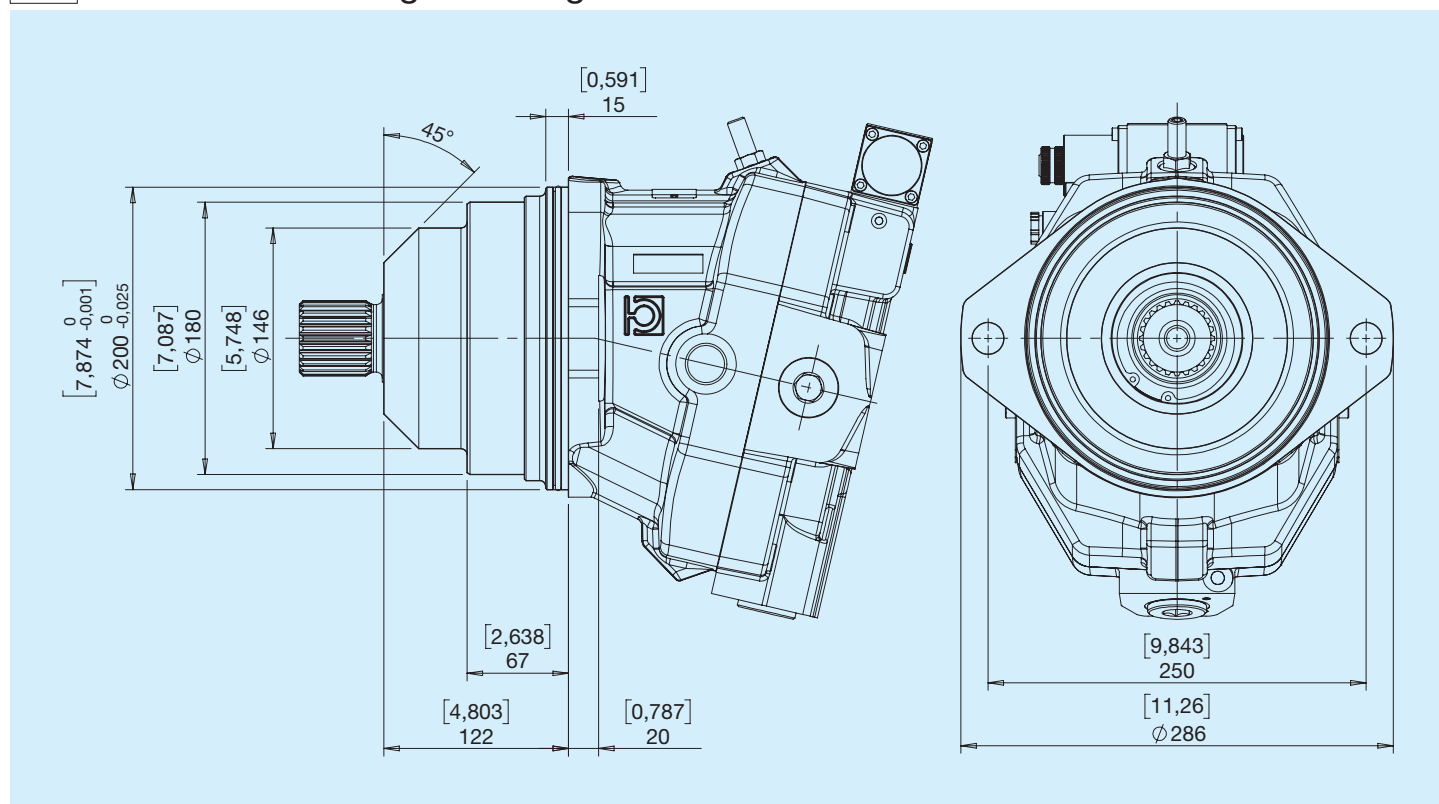


HPBA	Nominal displacement		Swash plate	Continuous pressure		Intermittent pressure		Peak pressure		Rotational speed			Weight	
	cm ³	in ³		bar	psi	bar	psi	bar	psi	MAX (max V) min ⁻¹	MAX (min V) min ⁻¹	MIN min ⁻¹	kg	lbs
160	160	9.77	25	380	5510	400	5800	450	6525	3100	4000	500	80	176
200	200	12.20	25	350	5075	380	5510	420	6090	2800	4000	500	81.7	180

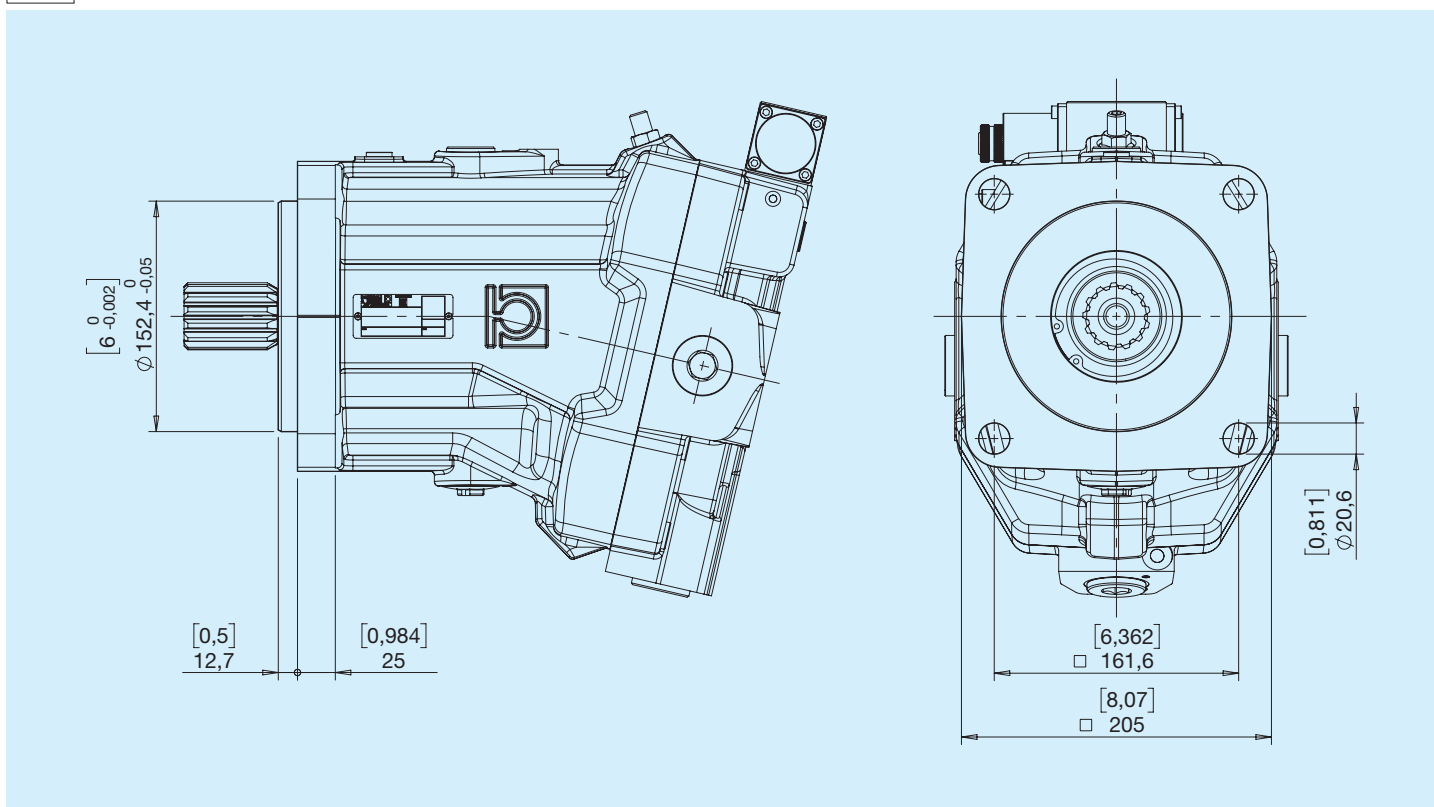
I ISO 4 holes standard



P ISO 2 holes cartridge centring

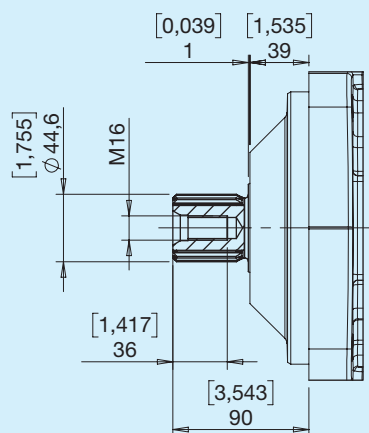


S SAE D



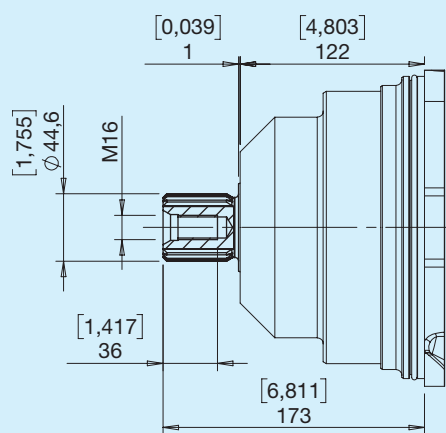
D DIN 5480 W45x2x30x21

ISO 4-hole standard version



Max. torque 1980 Nm

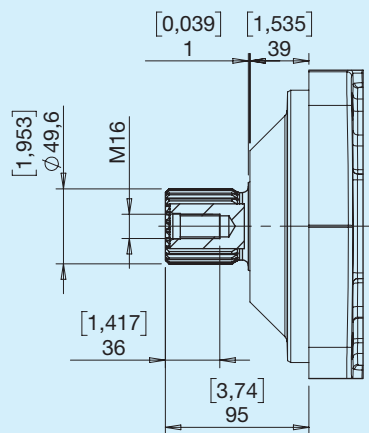
ISO 2-hole cartridge version



Max. torque 1980 Nm

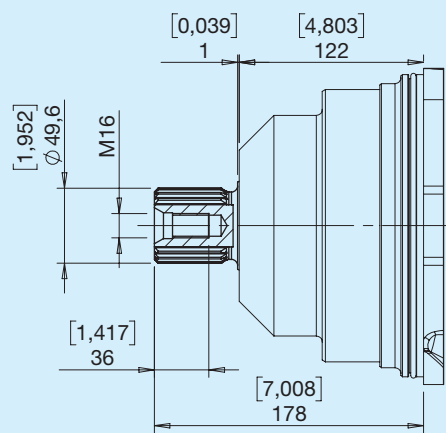
E DIN 5480 W50x2x30x24

ISO 4-hole standard version



Max. torque 2860 Nm

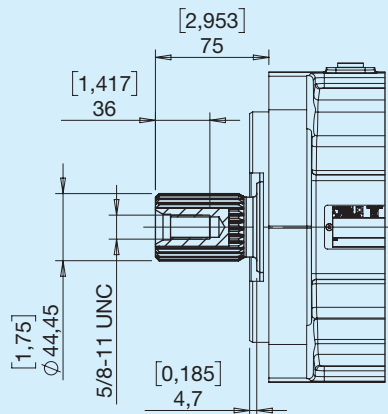
ISO 2-hole cartridge version



Max. torque 2860 Nm

N DIN 5480 W45x2x30x21

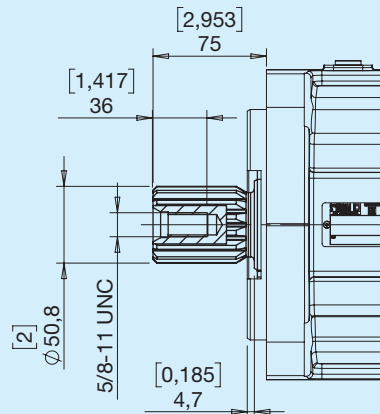
SAE D version



Max. torque 1980 Nm

X DIN 5480 W45x2x30x21

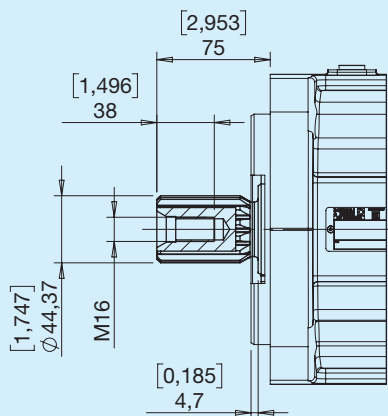
SAE D version



Max. torque 1980 Nm

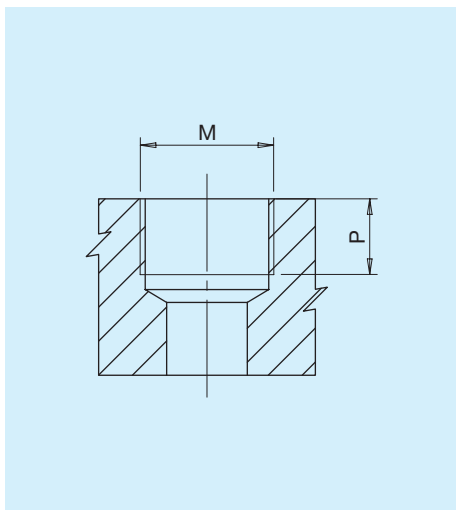
9 13T 8/16 DP

SAE D version



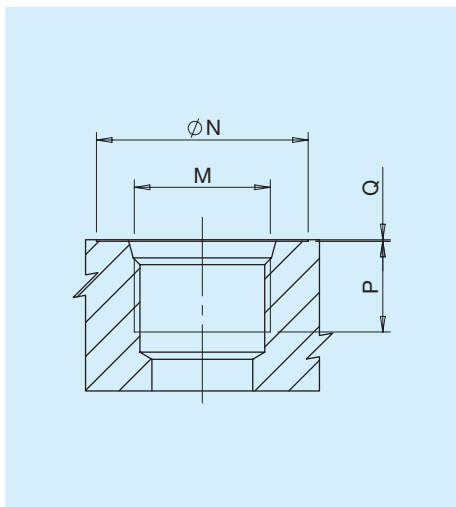
Max. torque 1980 Nm

Type G



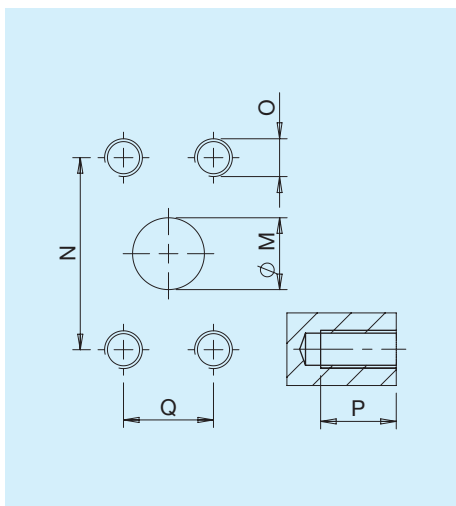
Type	M		P	
		Nm	mm	in
G2	Port ISO 1179-1 - G 1/4	17	8	0.31
G6	Port ISO 1179-1 - G 3/4	90	19	0.75
G7	Port ISO 1179-1 - G 1	160	19	0.75

Type U



Type	Dim.	N		P		Q		M	Nm
		mm	in	mm	in	mm	in		
U2	1/4"	20	0.79	12	0.47	0.3	0.01	Port ISO 11926-1-7/16-20	17
U6	3/4"	41	1.61	20	0.79	0.3	0.01	Port ISO 11926-1-1 1/16-12	90
U7	1"	49	1.93	18	0.70	0.3	0.01	Port ISO 11926-1-1 5/16-12	160

Type N

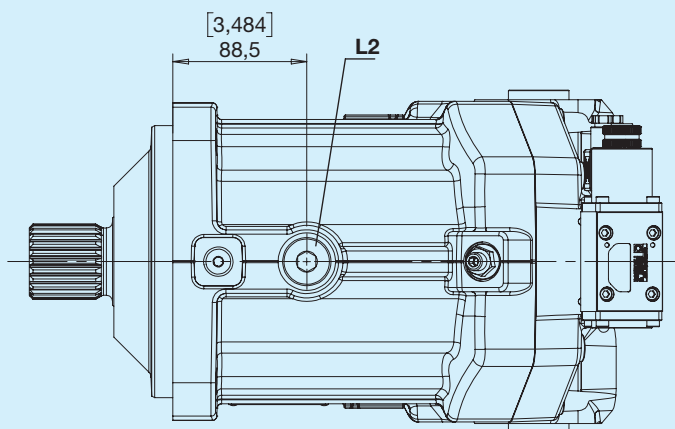
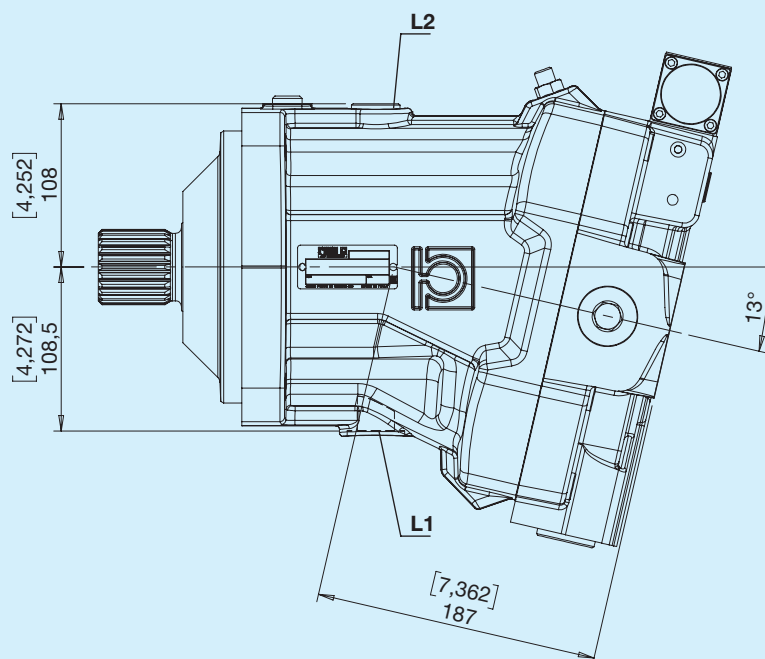
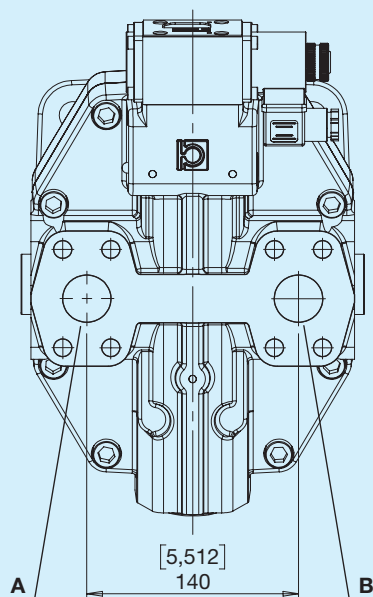


Type	M		N		Q		P		O	Nm
	mm	in	mm	in	mm	in	mm	in		
N8	32	1.26	66.7	2.62	31.8	1.25	20	0.79	M12	70

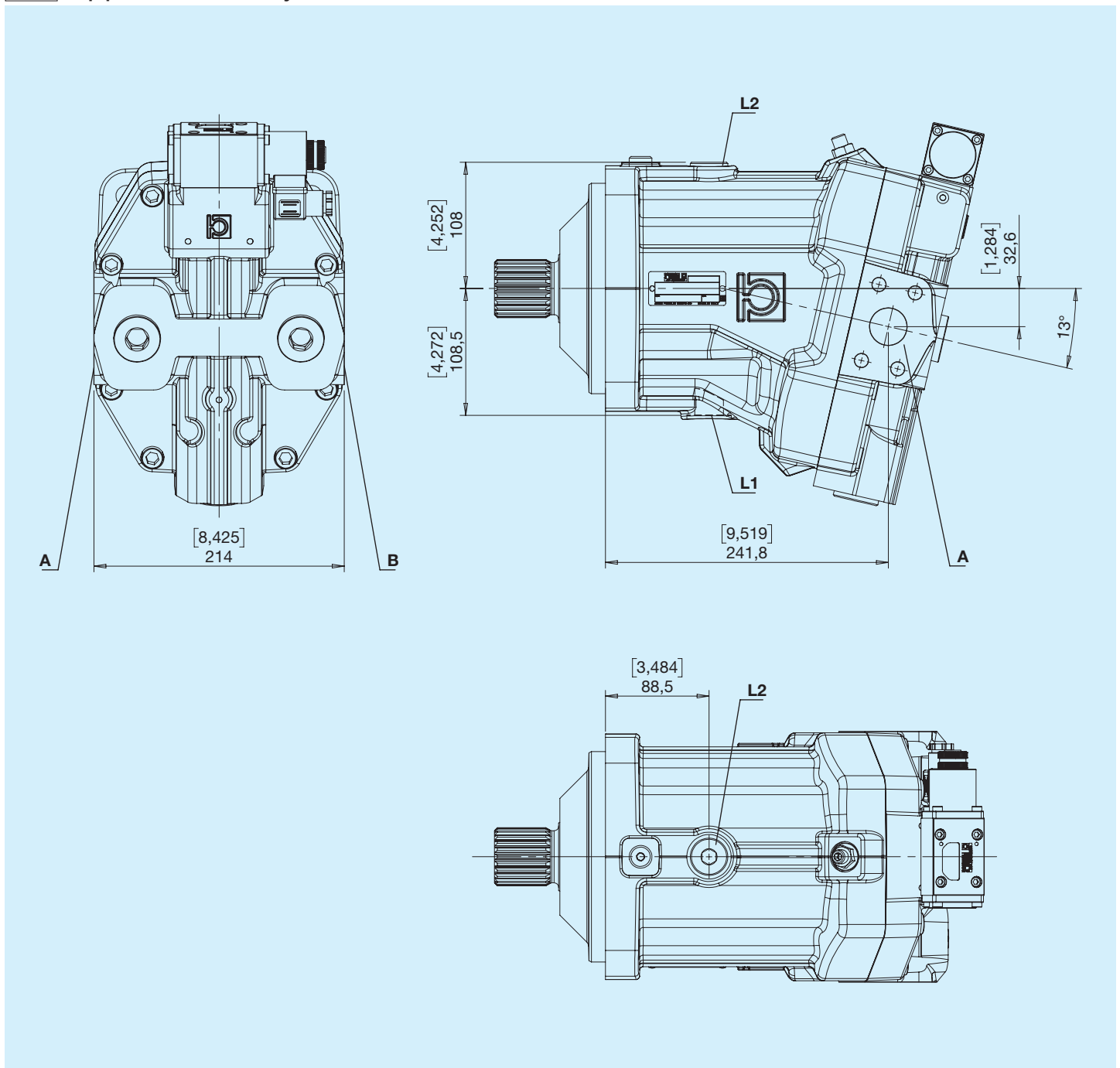
Combinations

Type	Inlet/outlet A-B	Drain port L1-L2	Pilot a-b-x
G	G6	G6	G6
U	U6	U6	U6
N	N8	G6	G2
M	N8	U6	U2

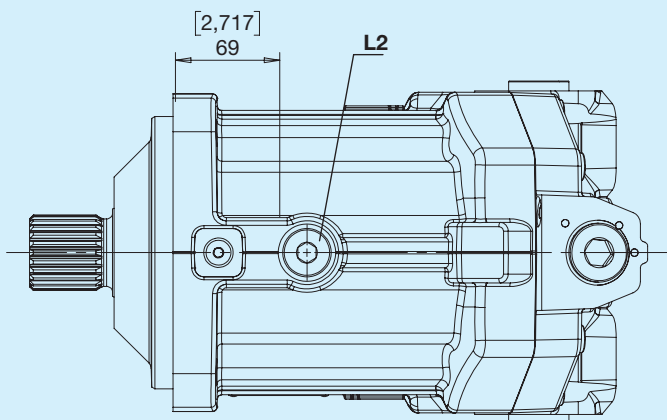
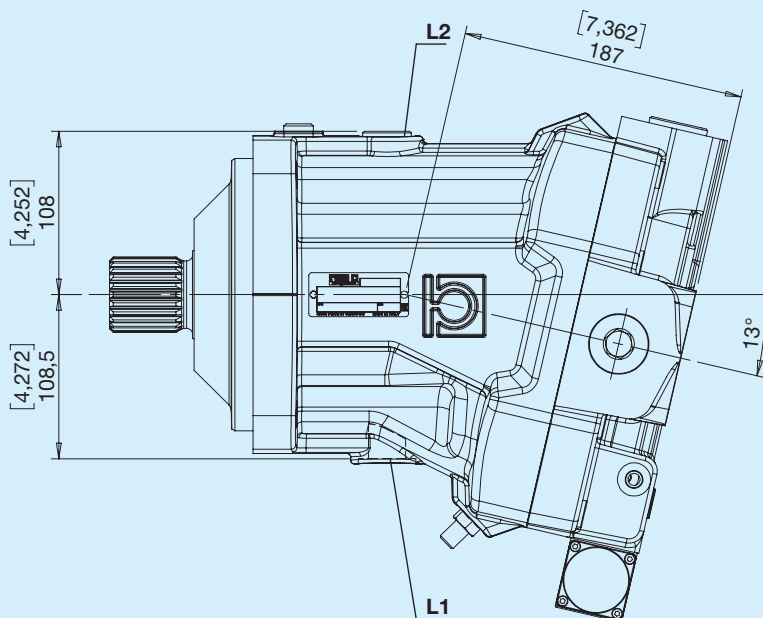
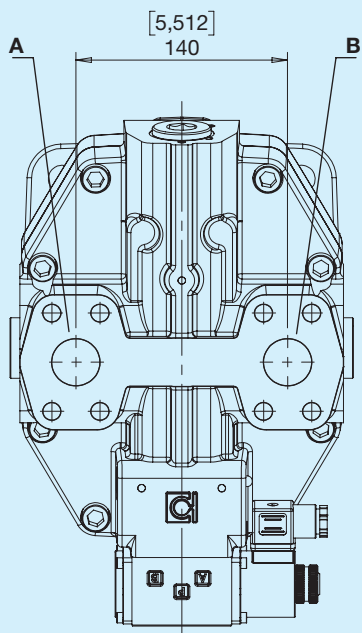
P Rear



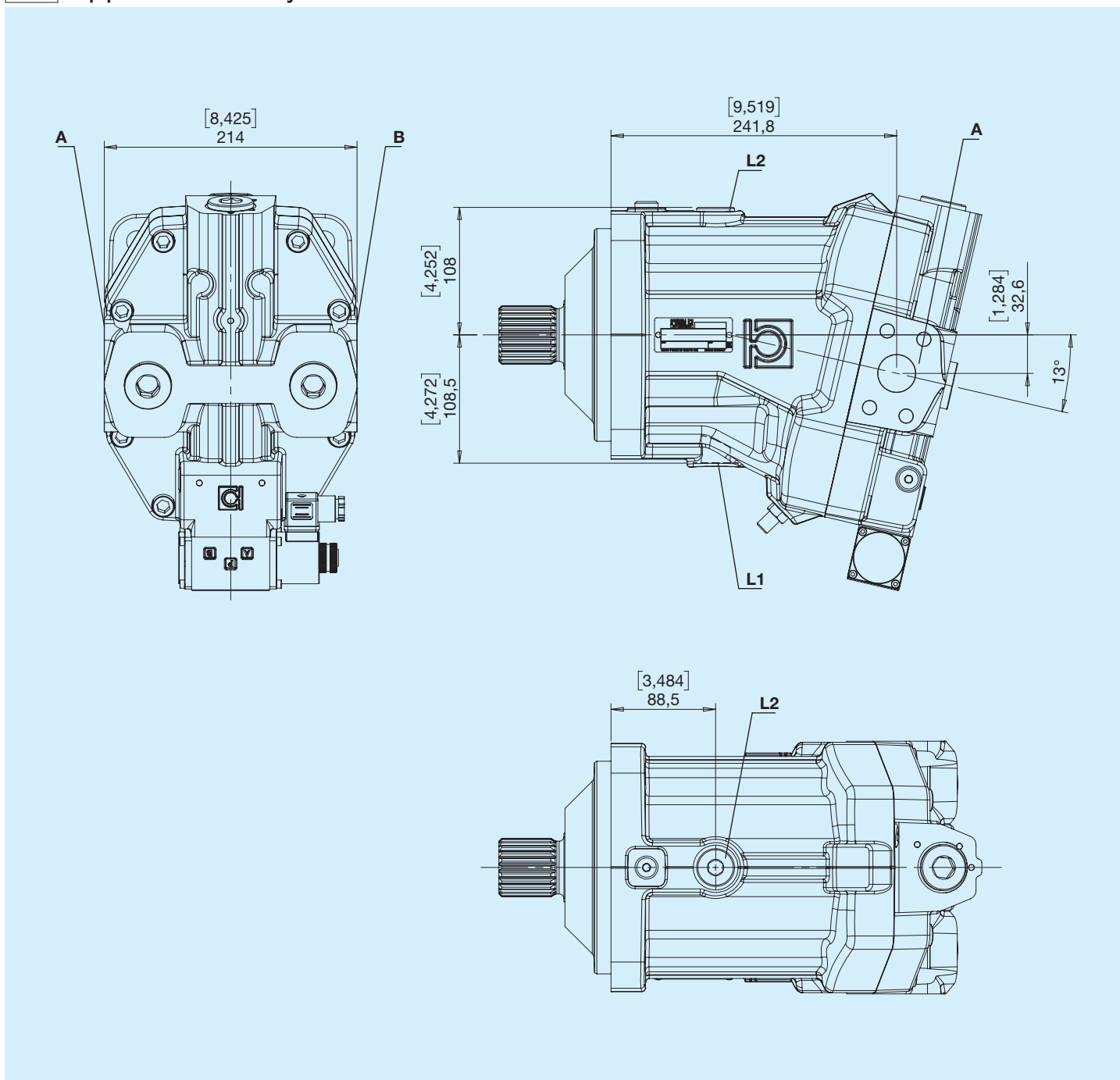
L Opposite sideways



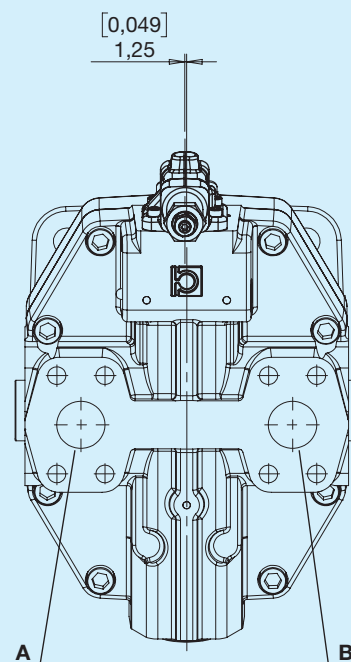
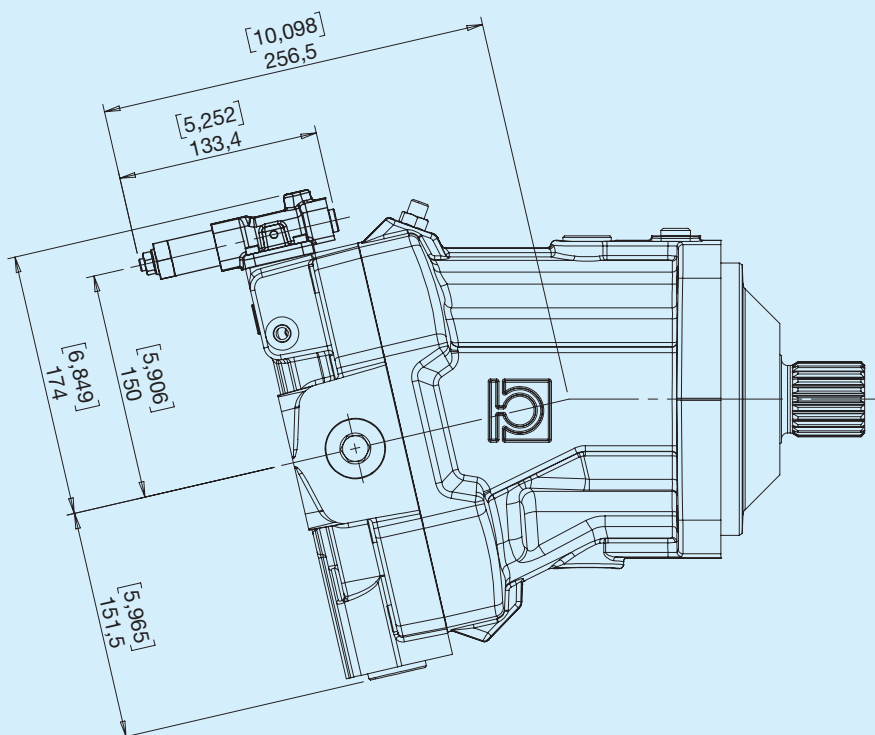
Y Rear with rotated valve



J Opposite sideways with rotated valve

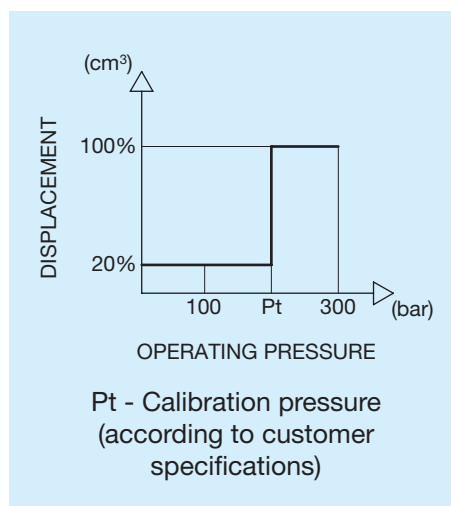


A Hydraulic automatic, ON/OFF

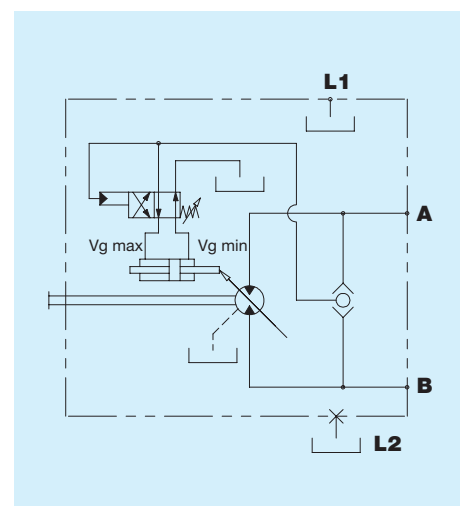


Inlet	Rotation
Right	Left
Right	Right

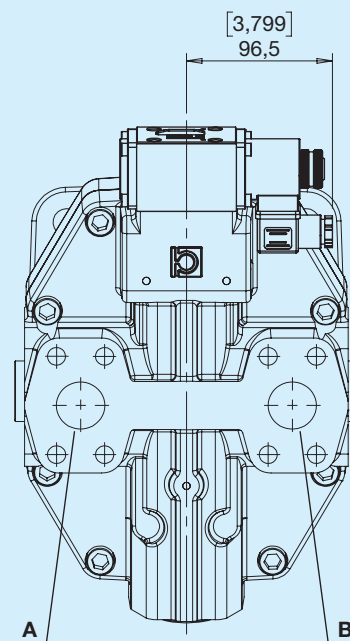
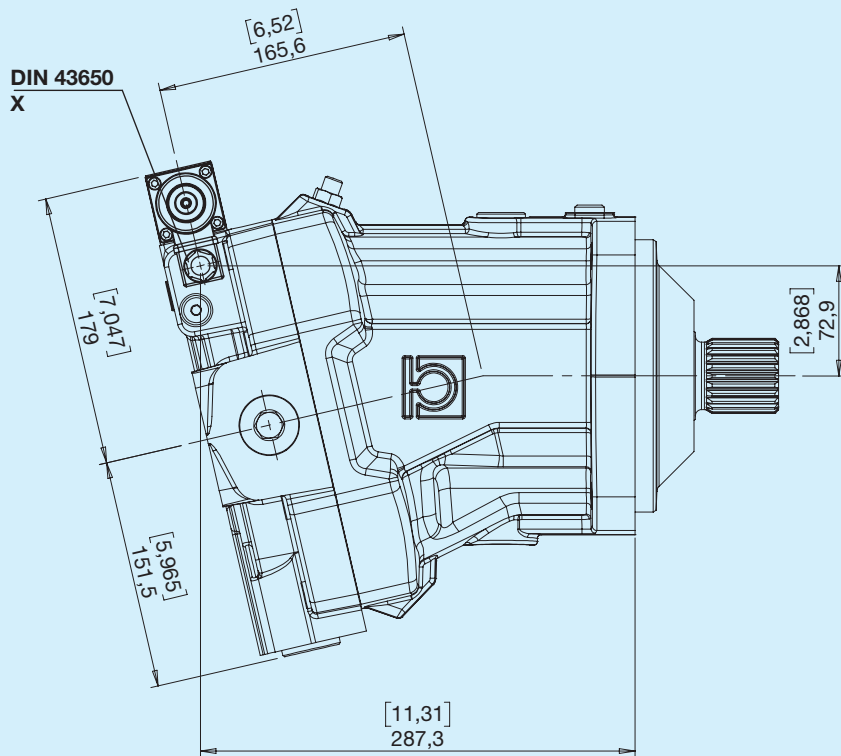
Pilot



Hydraulic diagram



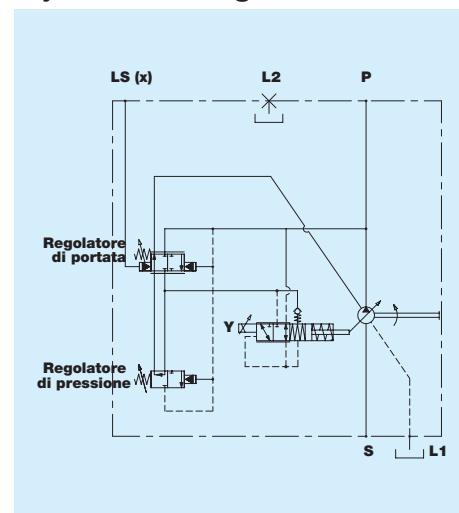
E Electric 2-position 12V



X - Solenoid valve available on request with DEUTSCH DT04-2P connectors

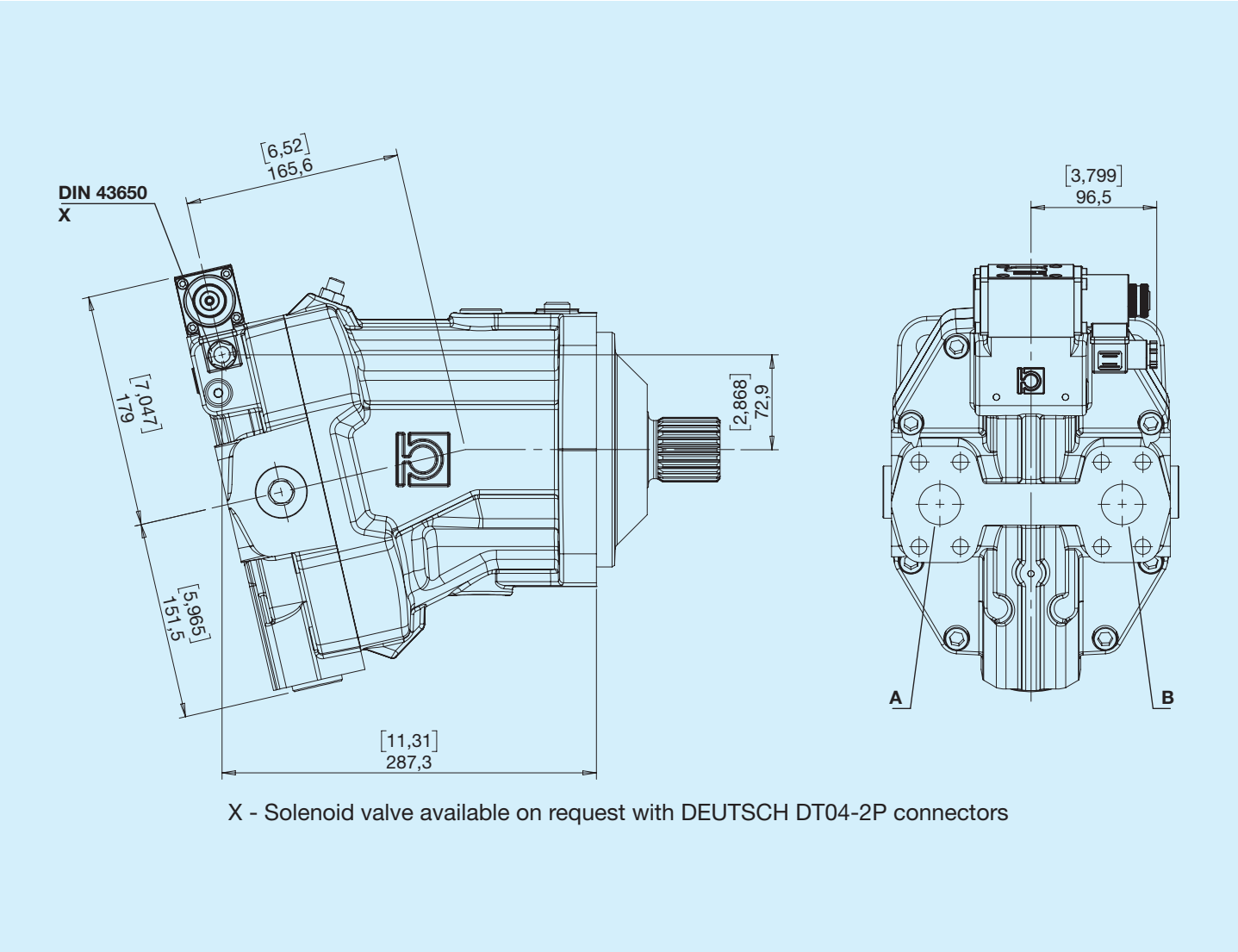
Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram



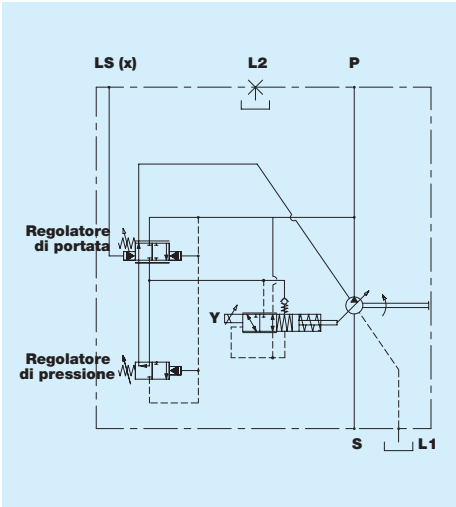
F

Electric 2-position 24V

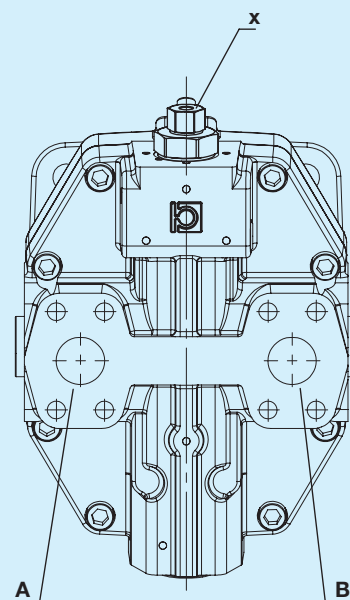
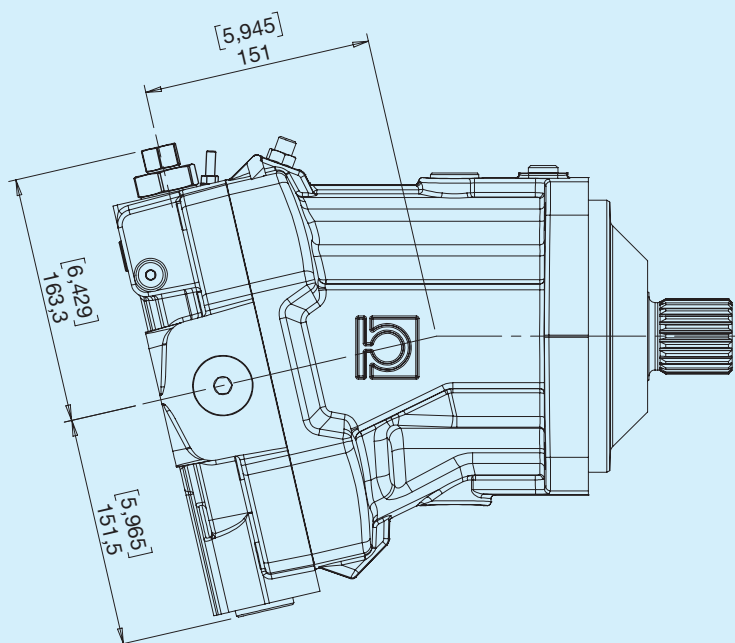


Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram



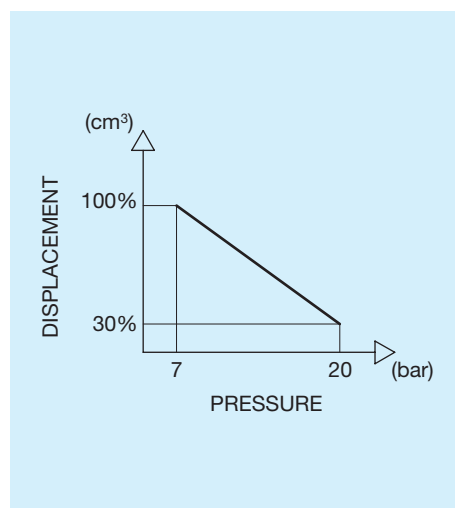
G Proportional hydraulic



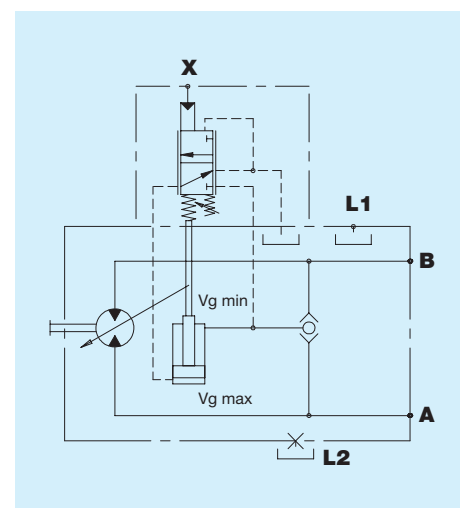
X - Pilot G1/8

Pilot

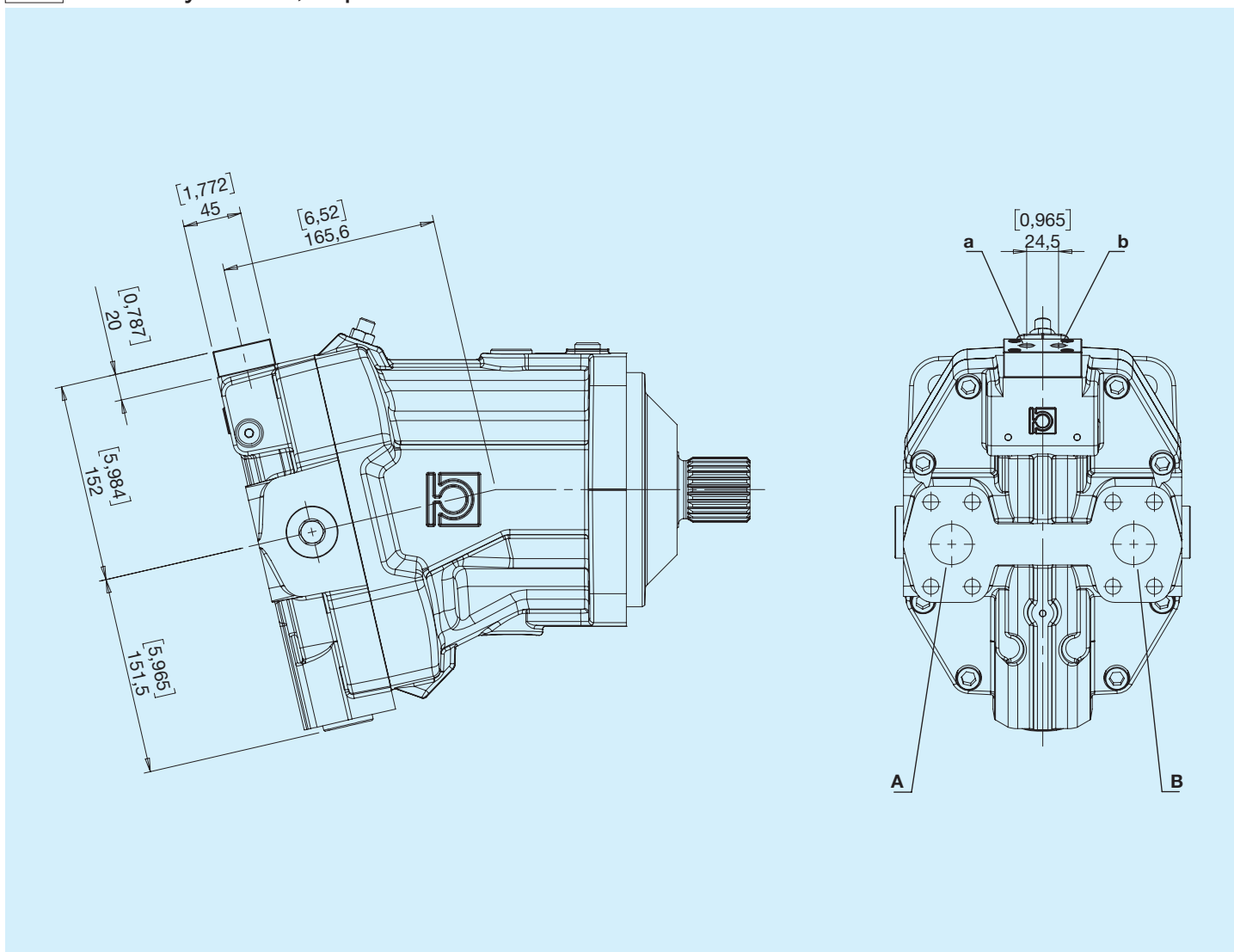
Inlet	Rotation
Right	Left
Right	Right



Hydraulic diagram

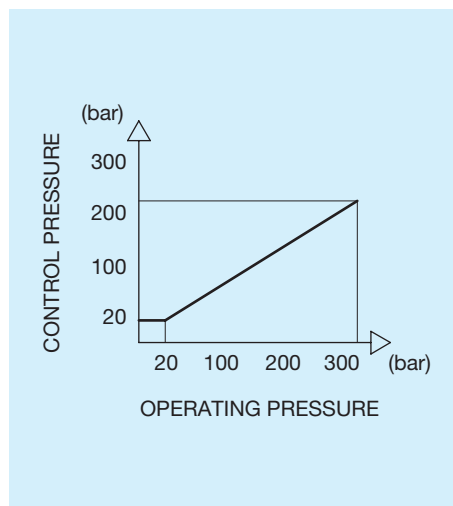


H Direct hydraulic, 2-position

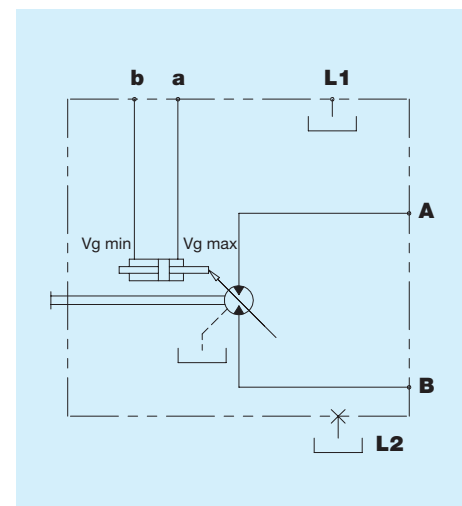


Pilot

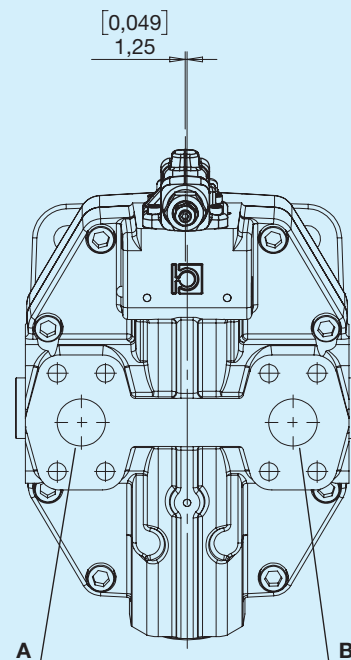
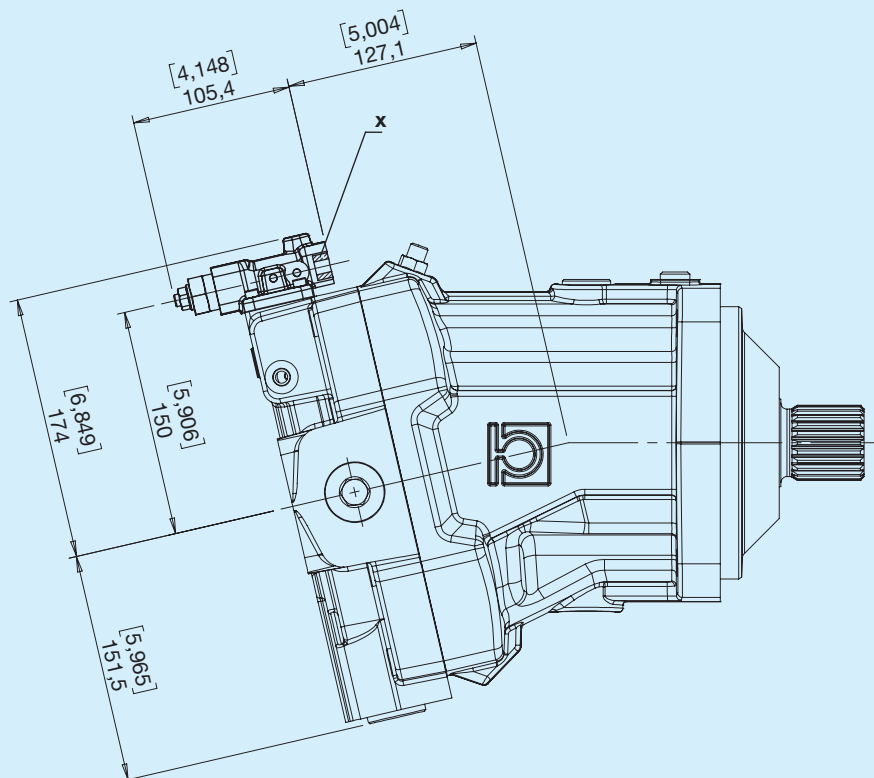
Inlet	Rotation
Right	Left
Right	Right



Hydraulic diagram



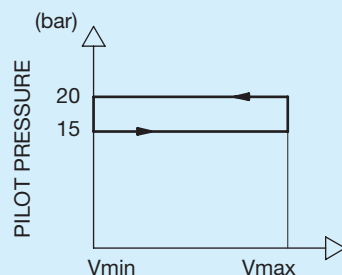
K Hydraulic, 2-position, low pressure



X - Pilot G1/8

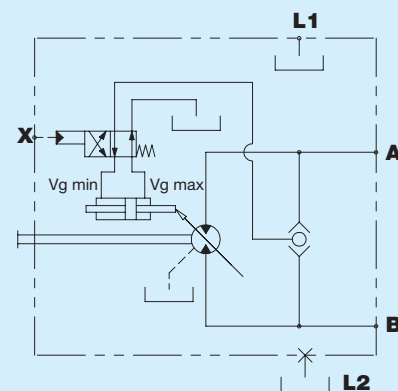
Inlet	Rotation
Right	Left
Right	Right

Diagram

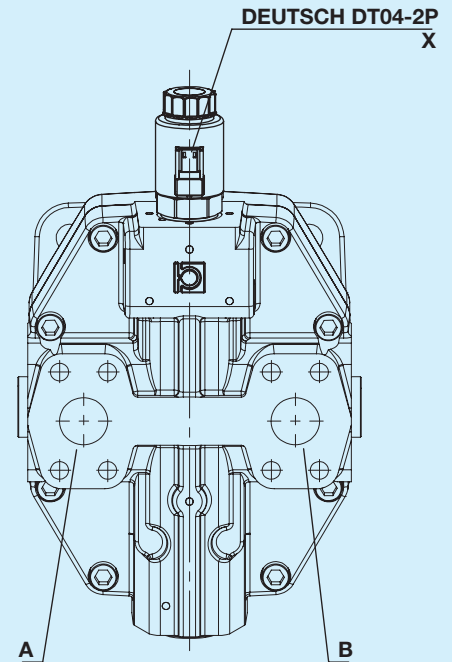
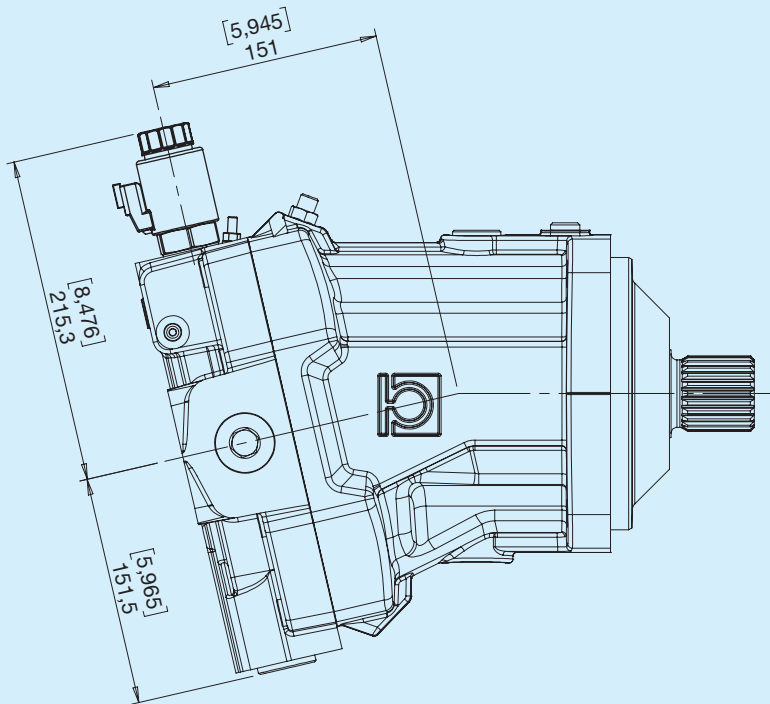


The motor is normally at maximum displacement. By applying external pressure to the pilot valve, the motor switches to minimum displacement. For correct displacement variation, observe the pilot pressure values shown in the diagram.

Hydraulic diagram



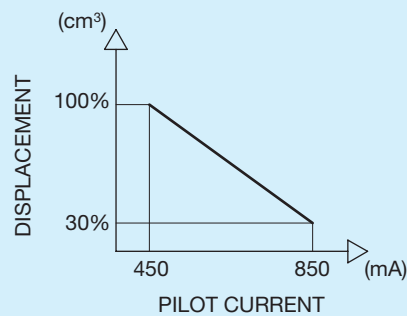
O Electronic proportional feedback control 12V



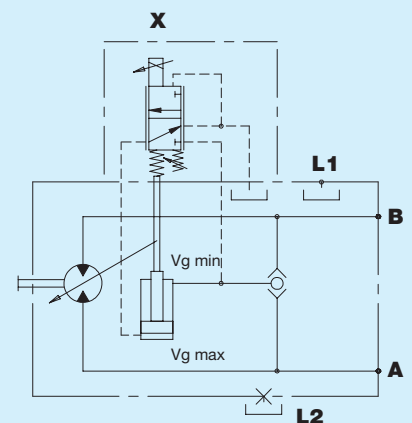
X - Solenoid valve

Inlet	Rotation
Right	Left
Right	Right

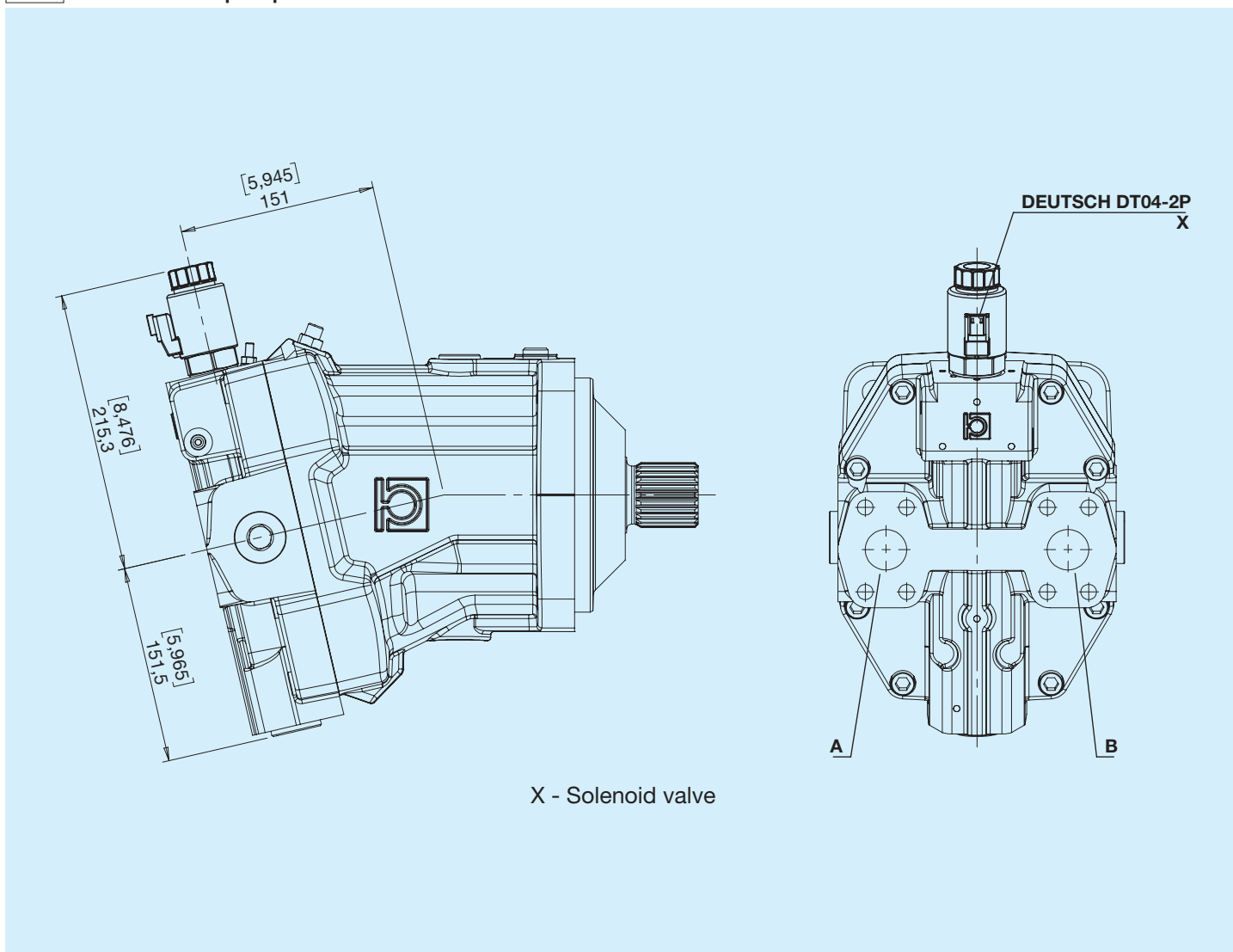
Pilot



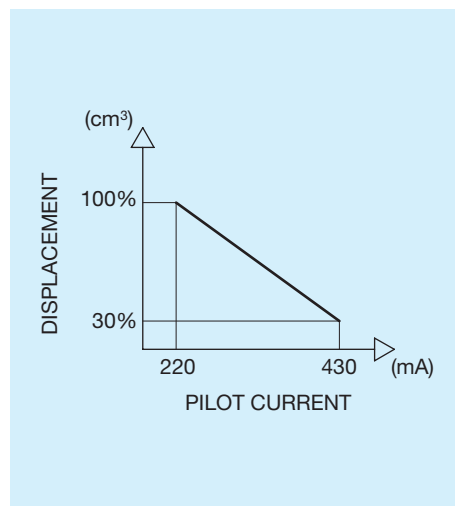
Hydraulic diagram



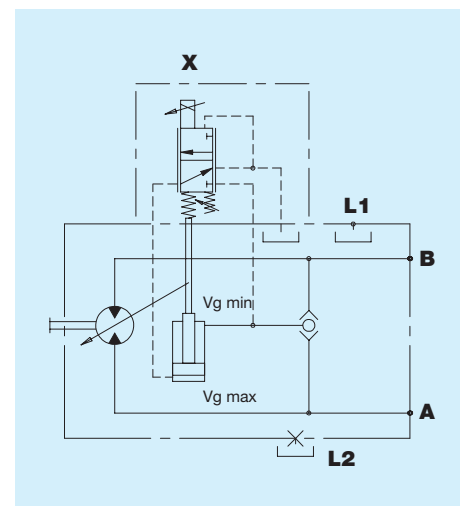
V Electronic proportional feedback control 24V



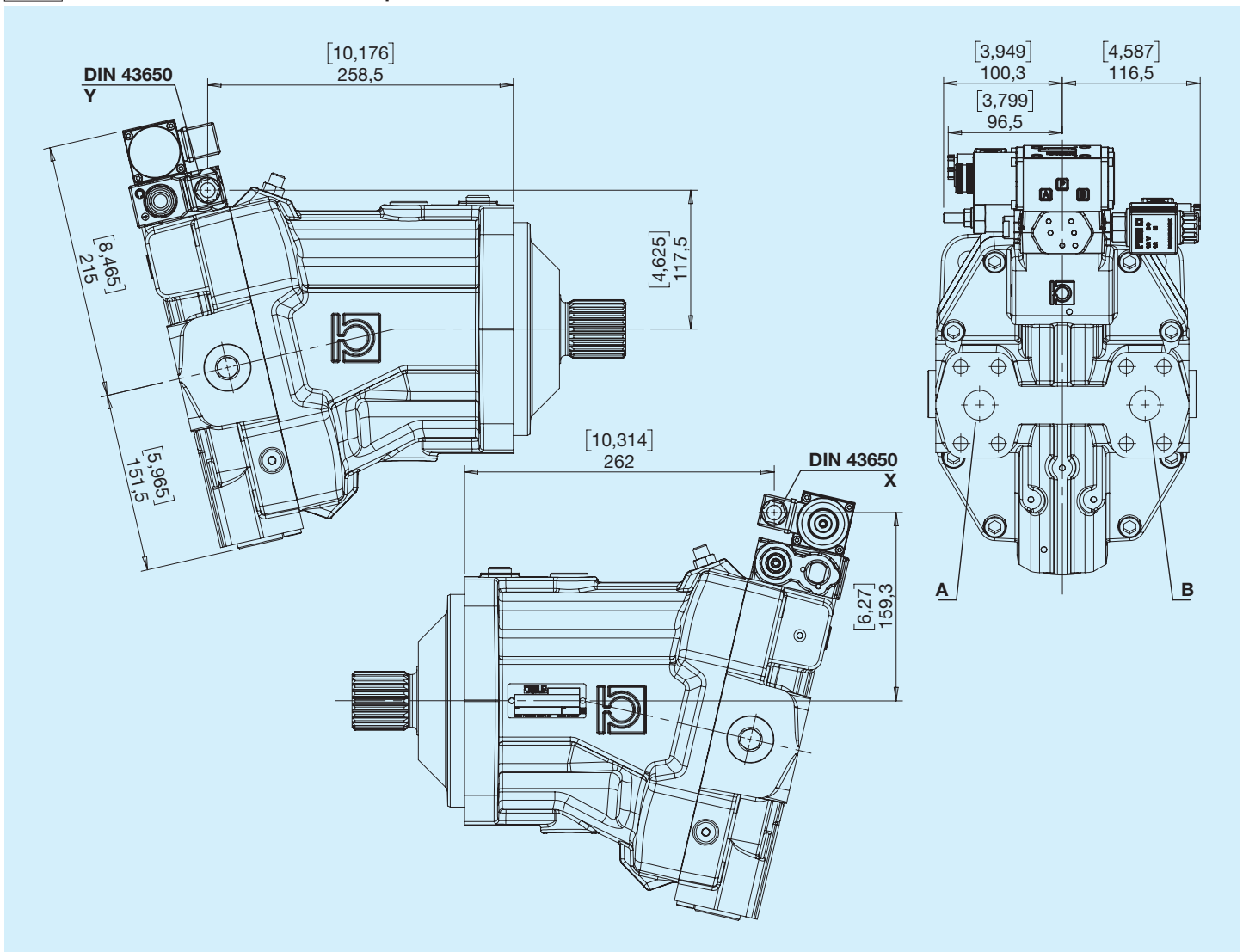
Pilot



Hydraulic diagram

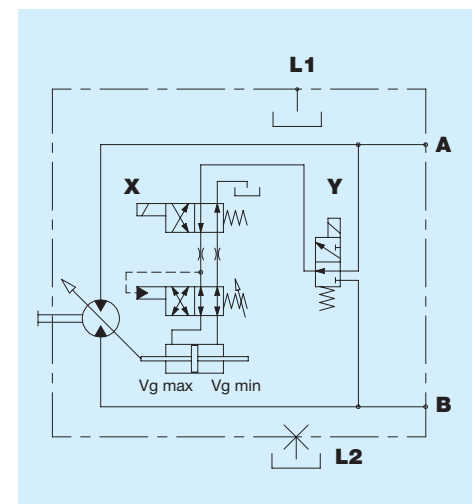


R Electric ON/OFF with pressure override and channel selector

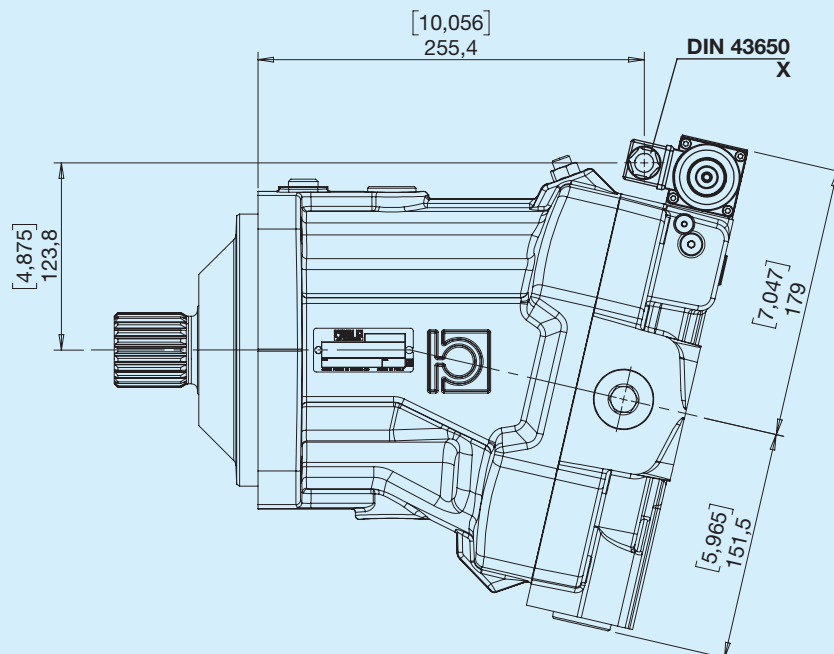
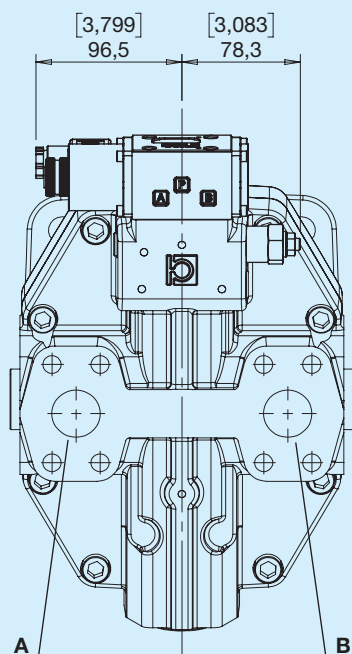


Inlet	Rotation
Right	Left
Right	Right

Hydraulic diagram

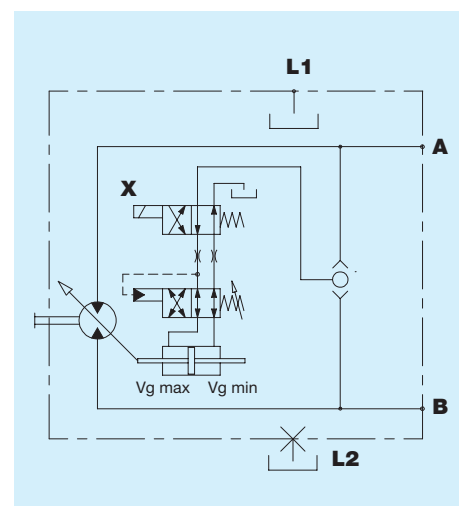


U Electric ON/OFF with pressure override

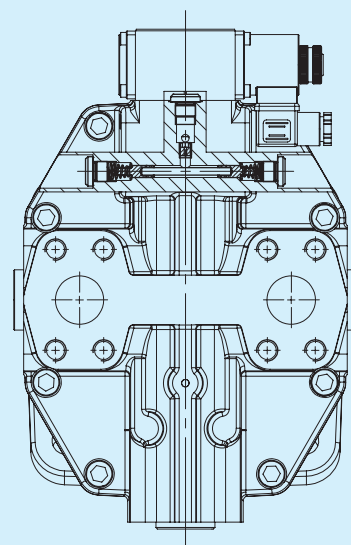
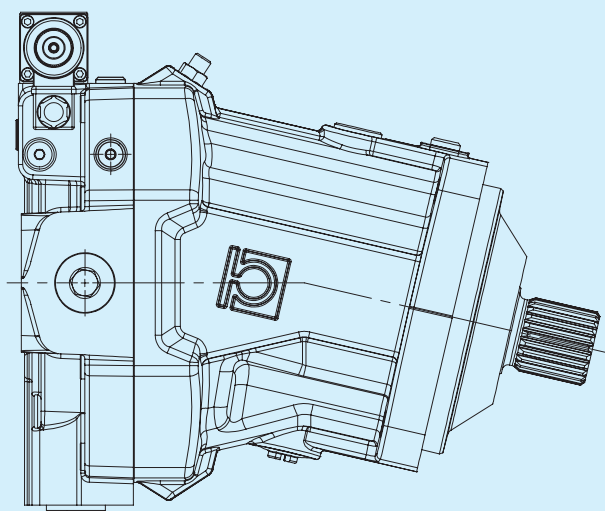


Inlet	Rotation
Right	Left
Right	Right

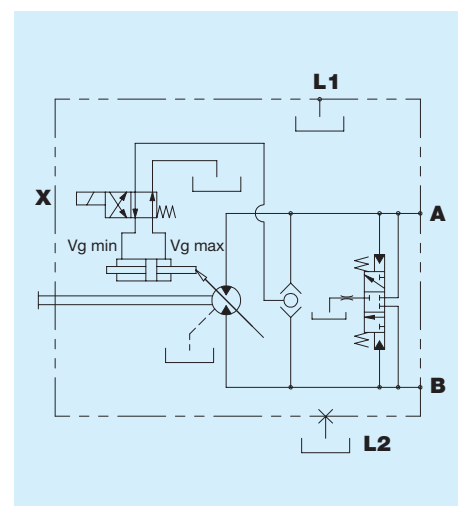
Hydraulic diagram



V Flushing valve (5-7 l/min)



Hydraulic diagram



HPBA			1	2	3	4	5	6	7	8	9	10	11	12	13	14										
1 2 3			Standard displacement																							
160														200												
4 5			Minimum displacement																							
...																										
6			Flanges																							
I			ISO 4 holes standard				P				ISO 2 holes cartridge centring				S				SAE D							
7			Shafts																							
D			DIN 5480 W45x2x30x21				N				SAE 27T 16/32 DP				9				SAE 13T 8/16 DP							
E			DIN 5480 W50x2x30x24				X				SAE 15T 8/16 DP															
8			Type of ports																							
G			Gas				U				UNF				N				Gas-SAE inlet/outlet				M		UNF-SAE inlet/outlet	
9			Position of ports																							
P			Rear				Y				Rear with rotated valve (not available for O - V - G controls)				J				Opposite sideways with rotated valve (not available for O - V - G controls)							
L			Opposite sideways																							
10			Controls																							
A			Hydraulic automatic, ON/OFF				G				Proportional hydraulic				O				Electronic proportional feedback control 12V				U		Electric ON/OFF with pressure override	
E			Electric 2-position 12V				H				Direct hydraulic, 2-position				V				Electronic proportional feedback control 24V							
F			Electric 2-position 24V				K				Hydraulic, 2-position, low pressure				R				Electric ON/OFF with pressure override and channel selector							
11			Accessories																							
0			No option				C				Paint				V				Flushing valve							
12 13 14			Special versions																							
...																										