



Catálogo de Productos



Fixed Displacement Vane Pumps - PVV / PVQ

Fixed displacement vane pumps

Types PVV and PVQ

Nominal sizes 18 to 193

Series 1X

Maximum operating pressure 210 bar

Maximum displacement 18 to 193 cm³

Features

- Fixed displacement
 - Long bearing life due to hydraulically unloaded shaft
 - Low wear due hydraulically unloaded vanes
 - Low operating noise
 - Easy to service due to exchangeable pump cartridges
 - Good efficiency
 - Optional positioning of the pressure connection
 - Clockwise or anti-clockwise direction of rotation
 - Drive shaft optionally; cylindrical or splined
- Double pump:
- Very compact design
 - The position of the pressure connections can be individually selected

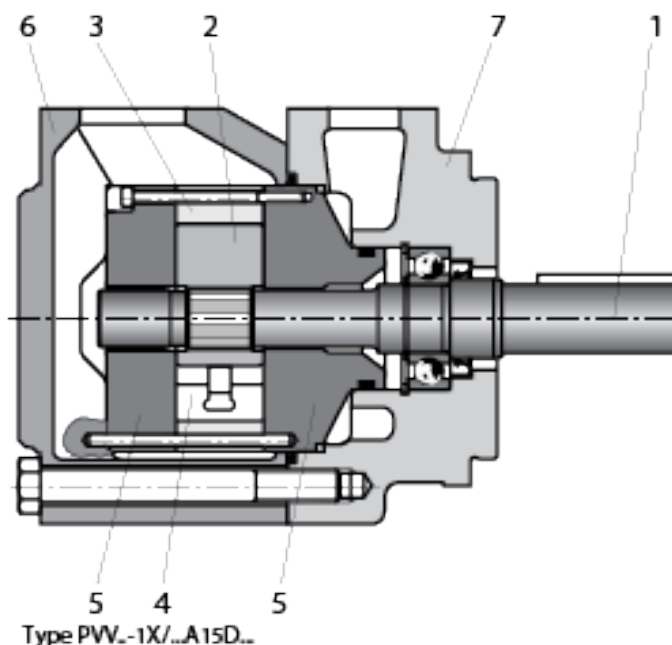
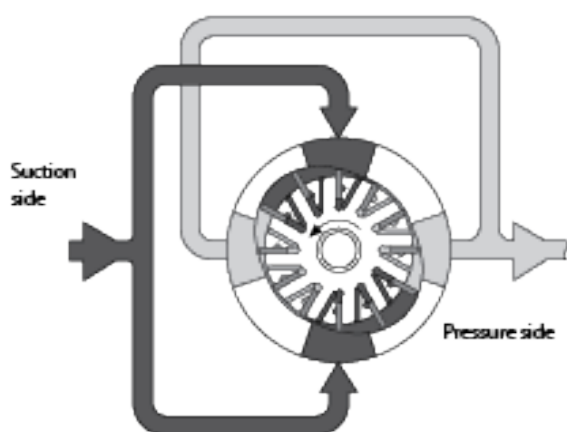
Function, section

The PVV and PVQ hydraulic pumps are fixed displacement vane pumps.

The rotor (2) is fitted onto the splines of the drive shaft (1) which rotates inside the stator ring (3). The vanes (4) are fitted into slots in the rotor and are pressed onto the inner surface of the stator ring by centrifugal force as the rotor turns. The displacement chambers are sealed on the sides by the control plates (5). Due to the double extentric form of the stator ring there are two pressure and two suction chambers opposite to each other. The drive shaft is thereby hydraulically unloaded. It

only has to carry the torque forces. The vanes are partially unloaded as they pass through the suction areas. This unloading results in reduction in wear and makes it possible to obtain a high efficiency.

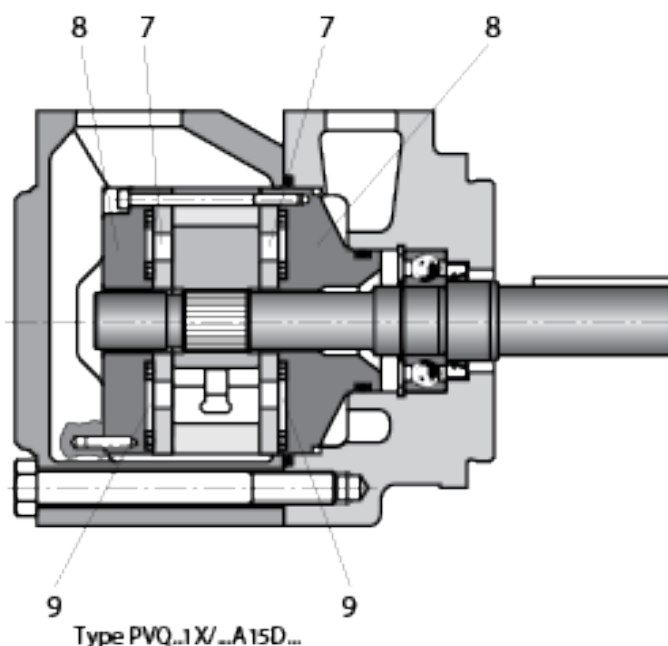
By simply removing the cover (6) it is possible to remove the pump cartridge (comprising of rotor, vanes, stator ring and control plates) without having to remove the housing (7) from the pump mounting bracket. This makes it possible to quickly repair and maintain the pump.



The design of the type PVQ pump makes it particularly suitable for mobile applications.

The special design of the control plates makes it possible to compensate for the heat expansion of the rotor and to act against sudden pressure changes. Due to the division of the control plates (7) into flexible discs and the cover plates (8),

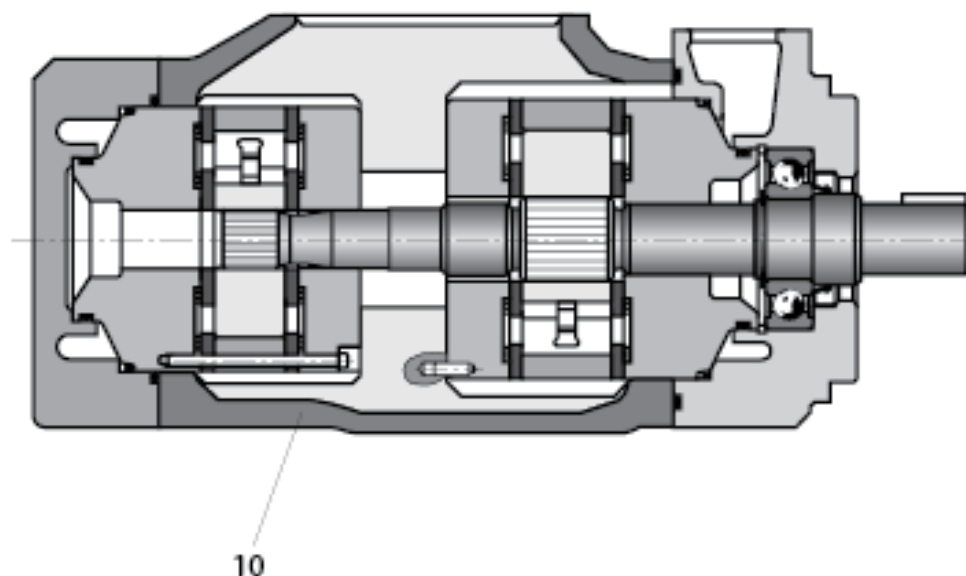
counter pressure chambers (9) are created that are balanced against the pressures that are in the displacement chambers. Due to this, the optimum clearance between the rotor and the flexible discs is guaranteed and thus the best volumetric efficiency is made possible.



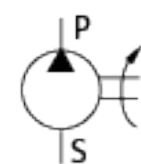
Function, section

The PVV and PVQ double pumps are created by fitting a second pump cartridge onto a mutual shaft. The oil inlet is via a common suction connection in the centre housing (10). The oil outputs is separate via the pump cartridge. The pressure connection for the front pump cartridge is in the flange housing and for the rear pump cartridge in the cover plate.

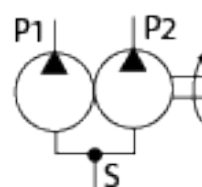
The largest pump cartridge is always fitted at the flange housing end. It is not possible to have identically sized pump cartridges as a double pump.



Symbols



Single pump



Double pump

Pump type Industrial version = V Mobile version = Q		Further details in clear text	
Build size See table on page 5 (e.g. single pump = 2 Double pump = 52)		Through drive No code = W without through drive K01 = 82-2, 16-4 (SAE-A, 9T) K02 = 101-2, 22-4 (SAE-B, 13T) K07 = 127-2, 32-4 (SAE-C, 14T)	
Component series = 1X Component series 10 to 19 (10 to 19, unchanged installation and connection dimensions)		Flange version B = 101-2 (SAE-B); (BS1; 2; 21) C = 127-2 (SAE-C); (BS4; 5 and BS41 to 54)	
Displacement flow See table on page 5 (e.g. $55.2 \text{ cm}^3 = 055$)		Seal material M = NBR seals V = FKM seals	
Direction of rotation (viewed on the shaft end) Clockwise = R Anti-clockwise = L		Only for double pumps Pressure connection location on the cover (viewed on the cover)	
Shaft end Cylindrical drive shaft (standard) = A ¹⁾ Cylindrical drive shaft (strengthened version) only BS2 to BS54 = B Splined drive shaft = J		D = Top (45° to the right of the inlet) R = Right (135° to the right of the inlet) L = Left (45° to the left of the inlet) U = Bottom (135° to the left of the inlet) D = Top (0° from the inlet) R = Right (90° to the right of the inlet) L = Left (90° to the left of the inlet) U = Bottom (180° from the inlet)	
Connections SAE suction and pressure connections, UNC fixing screws = 15		BS 21 to 52 BS 54	
Position of the pressure connection on the flange (when viewed on the cover) Top (0° from the inlet) = D Right (90° to the right of the inlet) = R Left (90° to the left of the inlet) = L Bottom (180° from the inlet) = U			

Single pump: Industrial version (also in mobile version)

PVV 2-1X/055RA15DMB

Doble pump: Mobile version (also in industrial version)

Huade Ordering details (build size, displacement flows)

Single pumps	
Build size	Displacement flows
1	18,0 cm ³ = 018
	27,4 cm ³ = 027
	36,4 cm ³ = 036
	39,5 cm ³ = 040
	45,9 cm ³ = 046
2	40,1 cm ³ = 040
	45,4 cm ³ = 045
	55,2 cm ³ = 055
	60,0 cm ³ = 060
	67,5 cm ³ = 068
4	69,0 cm ³ = 069
	81,6 cm ³ = 082
	97,7 cm ³ = 098
	112,7 cm ³ = 113
	121,6 cm ³ = 122
5	138,6 cm ³ = 139
	153,5 cm ³ = 154
	162,2 cm ³ = 162
	183,4 cm ³ = 183
	193,4 cm ³ = 193

Double pumps		
Build size	Flange side	Cover side
	Displacement flows	
21	40,1 cm ³ = 040	18,0 cm ³ = 018
	45,4 cm ³ = 045	27,4 cm ³ = 027
	55,2 cm ³ = 055	36,4 cm ³ = 036
	60,0 cm ³ = 060	39,5 cm ³ = 040
	67,5 cm ³ = 068	45,9 cm ³ = 046
41	69,0 cm ³ = 069	18,0 cm ³ = 018
	81,6 cm ³ = 082	27,4 cm ³ = 027
	97,7 cm ³ = 098	36,4 cm ³ = 036
	112,7 cm ³ = 113	39,5 cm ³ = 040
	121,6 cm ³ = 122	45,9 cm ³ = 046
42	69,0 cm ³ = 069	40,1 cm ³ = 040
	81,6 cm ³ = 082	45,4 cm ³ = 045
	97,7 cm ³ = 098	55,2 cm ³ = 055
	112,7 cm ³ = 113	60,0 cm ³ = 060
	121,6 cm ³ = 122	67,5 cm ³ = 068
51	138,6 cm ³ = 139	18,0 cm ³ = 018
	153,5 cm ³ = 154	27,4 cm ³ = 027
	162,2 cm ³ = 162	36,4 cm ³ = 036
	183,4 cm ³ = 183	39,5 cm ³ = 040
	193,4 cm ³ = 193	45,9 cm ³ = 046
52	138,6 cm ³ = 139	40,1 cm ³ = 040
	153,5 cm ³ = 154	45,4 cm ³ = 045
	162,2 cm ³ = 162	55,2 cm ³ = 055
	183,4 cm ³ = 183	60,0 cm ³ = 060
	193,4 cm ³ = 193	67,5 cm ³ = 068
54	138,6 cm ³ = 139	69,0 cm ³ = 069
	153,5 cm ³ = 154	81,6 cm ³ = 082
	162,2 cm ³ = 162	97,7 cm ³ = 098
	183,4 cm ³ = 183	112,7 cm ³ = 113
	193,4 cm ³ = 193	121,6 cm ³ = 122

Single pumps with through drive	
Build size	Displacement flows
2	40,1 cm ³ = 040
	45,4 cm ³ = 045
	55,2 cm ³ = 055
	60,0 cm ³ = 060
	67,5 cm ³ = 068
4	69,0 cm ³ = 069
	81,6 cm ³ = 082
	97,7 cm ³ = 098
	112,7 cm ³ = 113
	121,6 cm ³ = 122
5	138,6 cm ³ = 139
	153,5 cm ³ = 154
	162,2 cm ³ = 162
	183,4 cm ³ = 183
	193,4 cm ³ = 193

Technical data

General

Mounting style	Flange mounting to SAE J744														
Pipe connections	SAE flange version (fixing threads: UNC)														
Direction of rotation	Clockwise or anti-clockwise														
Direction of flow	Inlet and outlet are independent of the direction of rotation														
Installation	Optional, inlet connection preferably at the top														
Drive	Direct, co-axial drive; radial and axial forces cannot be taken up														
Weight	BS	1	2	2K	4	4K	5	5K	21	41	42	51	52	54	
	kg	12	14,8	19,4	23	28,7	34	38,1	20	34	34,5	43	46	54	

Hydraulic

Build sizes 1 and 2 (pump cartridge)				BS 1					BS 2					
Nominal size ($\approx V$ in cm ³)				NS	18	27	36	40	46	40	45	55	60	68
Max. flow at $n = 1500 \text{ min}^{-1}$, $p = 0,7 \text{ bar}$ and $v = 25 \text{ mm}^2/\text{s}$				q_v l/min	26	39	53	59	70	59	66	80	89	100
Operating pressure, absolute				When using fluids containing water and phosphate ester min. 0,9 bar										
Inlet $p_{\text{min-max}}$ bar				0.83 to 2.4 (recommended 1..1.35)										
Outlet continuous for PVV p_{max} bar				210	210	210	160	140	175	175	175	175	175	175
Outlet continuous for PVQ p_{max} bar				210	210	210	160	140	210	210	210	210	210	210
Peak p_{max}				A max. of 10% continuous output pressure; not longer than 0.5 seconds										
RPM n_{min} min ⁻¹				600					600					
*) At 1 bar n_{max} bei PVV min ⁻¹)				1800					1800					
Inlet pressure n_{max} bei PVQ min ⁻¹)				2700					2700		2500			
Min. drive power required at $\Delta p = 0 \text{ bar}$, $n = 1.450 \text{ min}^{-1}$				kW	1.1	1.5	2,2				3		4	
Pressure fluid For use with the above stated operating data				HLP mineral oil to DIN 51524 part 2										
Only with FKM seals (μV) Perm. p_{max} bar				210	210	210	160	140	175	175	175	175	175	175
Phosphate ester (HFD-R) Perm. n_{max} min ⁻¹				1200										
Build sizes 4 and 5 (pump cartridge)				BS 4					BS 5					
Nominal sizes ($\approx V$ in cm ³)				NS	69	82	98	113	122	139	154	162	183	193
Max. flow at $n = 1500 \text{ min}^{-1}$, $p = 0,7 \text{ bar}$ and $v = 25 \text{ mm}^2/\text{s}$				q_v l/min	101	120	141	167	177	203	223	234	267	285
Operating pressure, absolute				When using fluids containing water and phosphate ester min. 0,9 bar										
Inlet $p_{\text{min-max}}$ bar				0.83 to 2.4 (recommended 1..1.35)										
Outlet continuous for PVV p_{max} bar				175	175	175	175	175	175	175	175	175	175	175
Outlet continuous for PVQ p_{max} bar				210	210	210	210	210	175	175	175	175	175	175
Peak p_{max}				A max. of 10% continuous output pressure; not longer than 0.5 seconds										
RPM n_{min} min ⁻¹				600					600					
*) At 1 bar n_{max} bei PVV min ⁻¹)				1800					1800					
Inlet pressure n_{max} bei PVV min ⁻¹)				2500			2400		2200					
Min. drive power required At $\Delta p = 0 \text{ bar}$, $n = 1.450 \text{ min}^{-1}$				kW	4		5.5		7.5			11		

Technical data

Hydraulic

Build sizes 4 and 5 (pump cartridge)			BS 4					BS 5				
Pressure fluid For use with the operating data shown on page 7			HLP mineral oil DIN 51524 part 2									
Only with FKM seals (V ^{*)}	Perm. p _{max}	bar	175	175	175	175	175	175	175	175	175	175
Phosphate ester (HFD-R)	Perm. n _{max}	min ⁻¹	1200									
Pressure fluid temperature range		°C	- 10 to +70. (recommended: +30 to +60) Take into account the permissible viscosity range									
Viscosity range		mm ² /s	13 to 860 (recommended: 13 to 54)									
Max. permissible degree of pressure fluid contamination Cleanliness class to ISO 4406 (E) /(c)			Class 20/18/15 ¹⁾									
Alternative pressure fluids			HFB					HFC				
Max. permissible operating pressure		bar	70					140				
			Only in conjunction with a return filter with a retention rate of $\beta_{10} \geq 100$ or more. The permissible pressure fluid temperature range is +15 °C to +50 °C. Maximum permissible RPM: 1200 min ⁻¹									

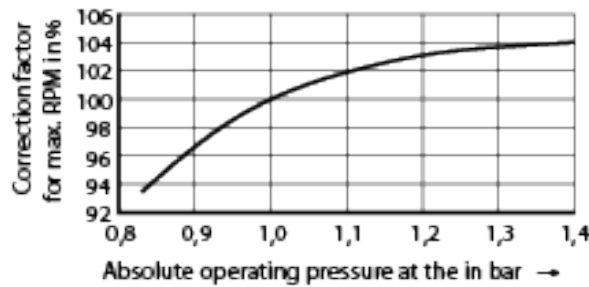
Please consult us before using our fixed displacement vane pumps with these pressure fluids!

¹⁾ The cleanliness class stated for the components must be adhered to in hydraulic systems. Effective filtration prevents faults from occurring and at the same time increases the component service life.

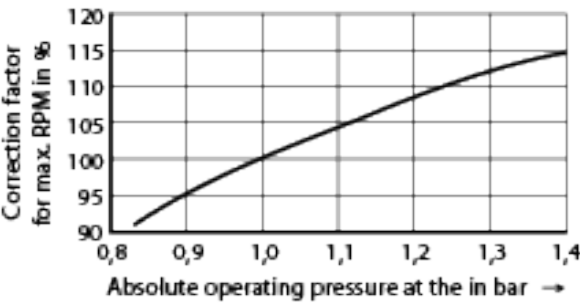
On pages 6 and 7 the stated values for the maximum RPM are valid for an absolute pressure of 1 bar at the inlet.
The maximum permissible RPM has to be corrected in accordance with the following diagrams in relation to the absolute pressure present at the inlet.

PVV/PVQ

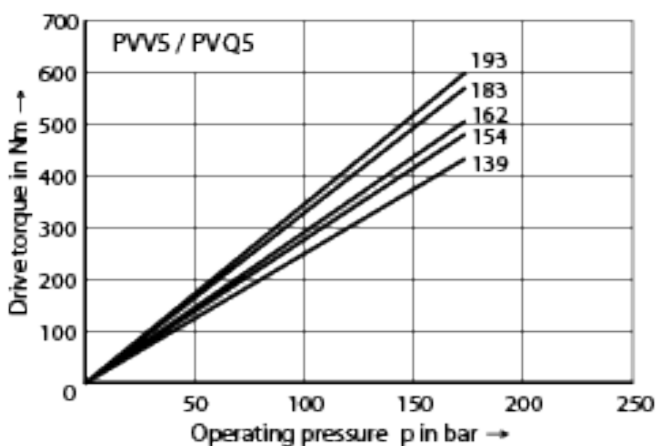
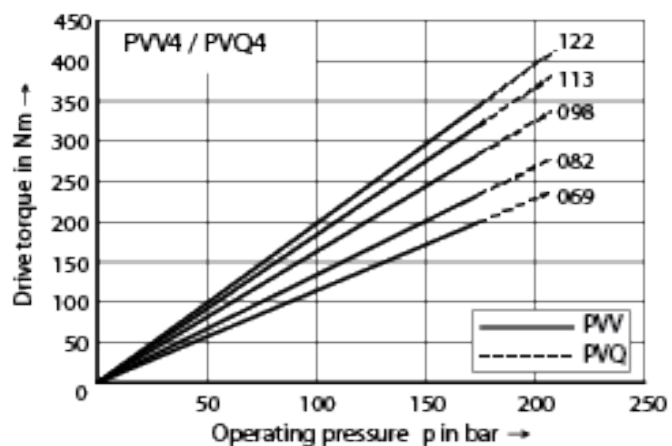
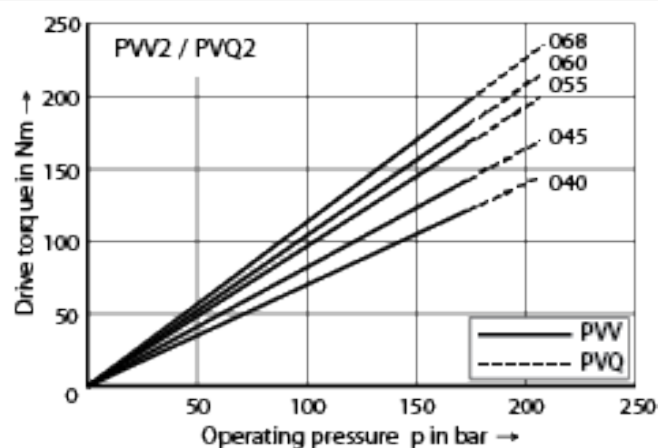
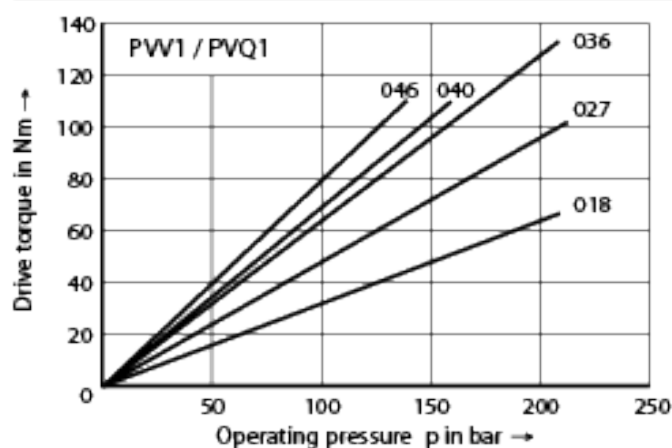
BS1; BS2; BS4; BS21; BS41; BS42



BS5; BS51; BS52; BS54

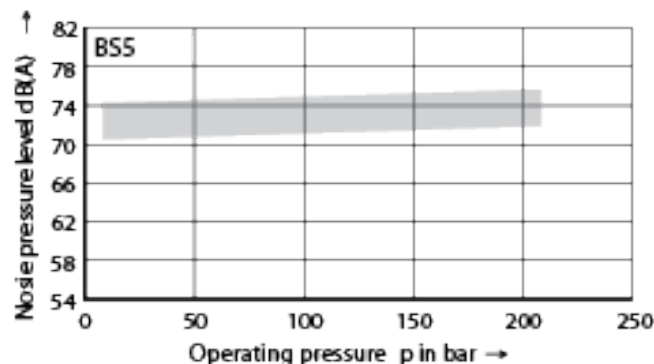
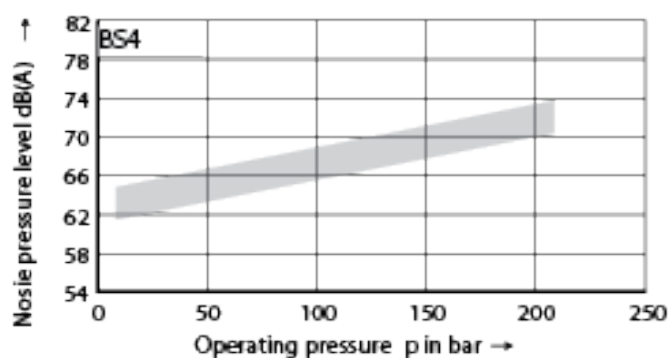
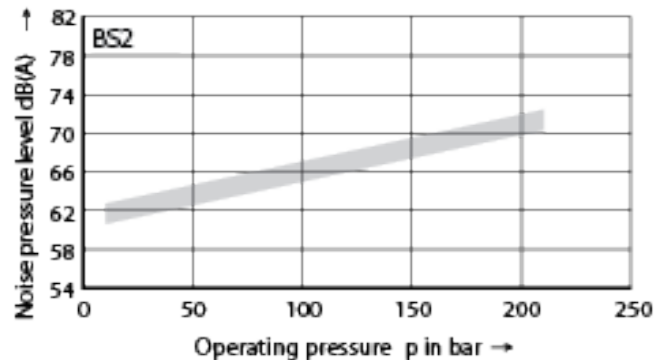
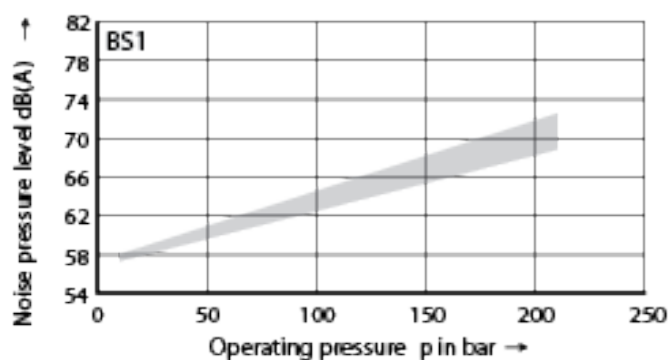


Drive torque (measured with $v = 41 \text{ mm}^2/\text{s}$; $\vartheta = 50^\circ\text{C}$)



Noise pressure level measured in a low noise room to DIN 45635 part 26.

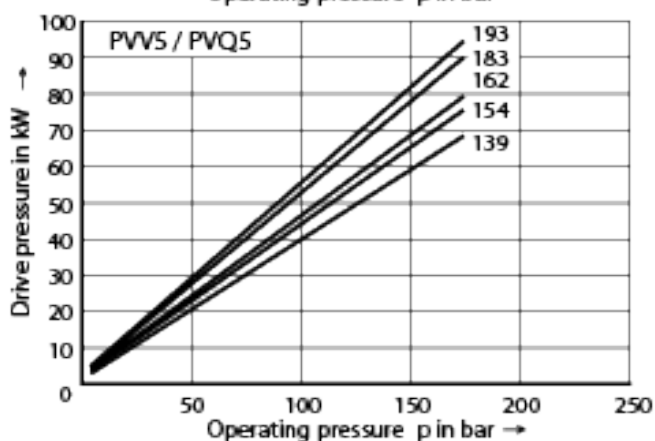
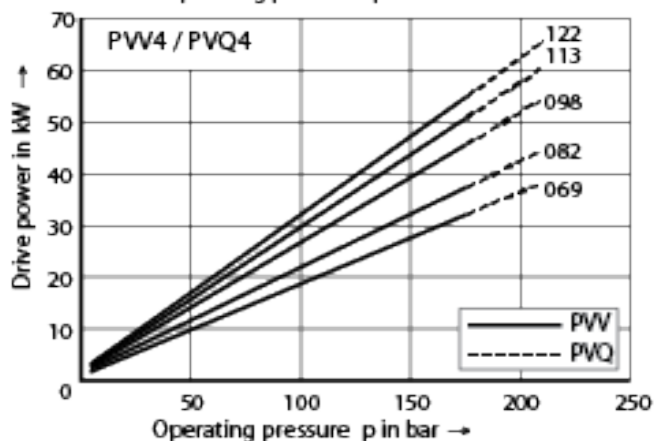
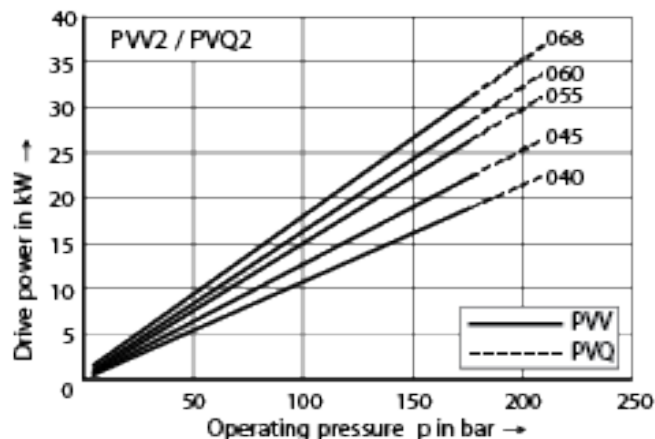
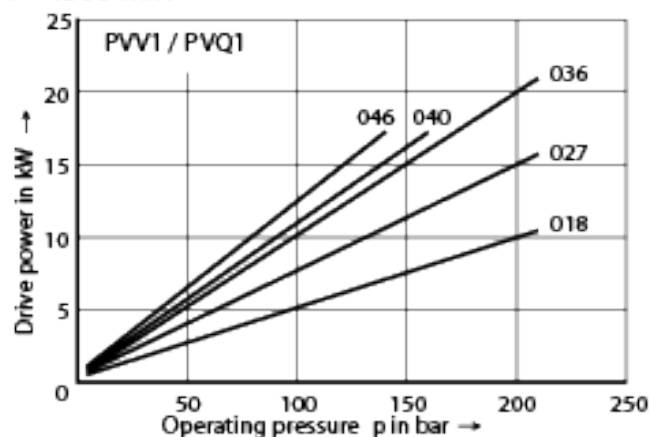
Distance of noise sensor to pump = 1 m. $v = 41 \text{ mm}^2/\text{s}$; $n = 1500$ and $\vartheta = 50^\circ\text{C}$



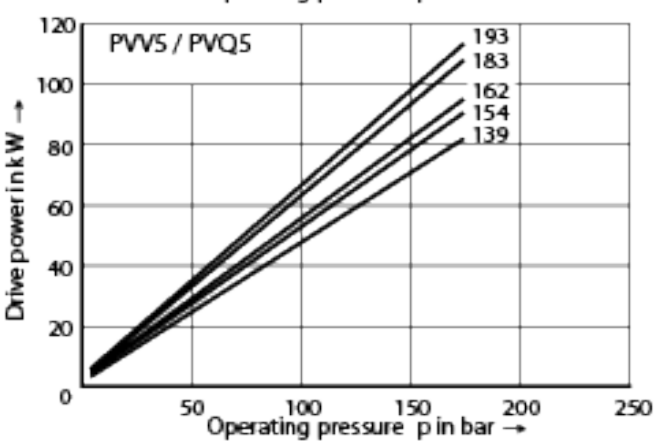
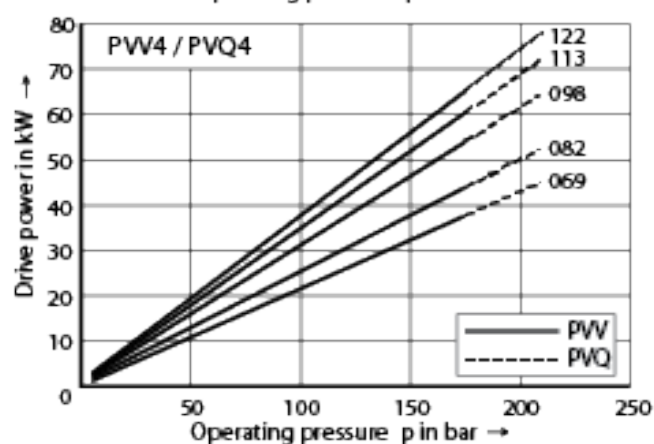
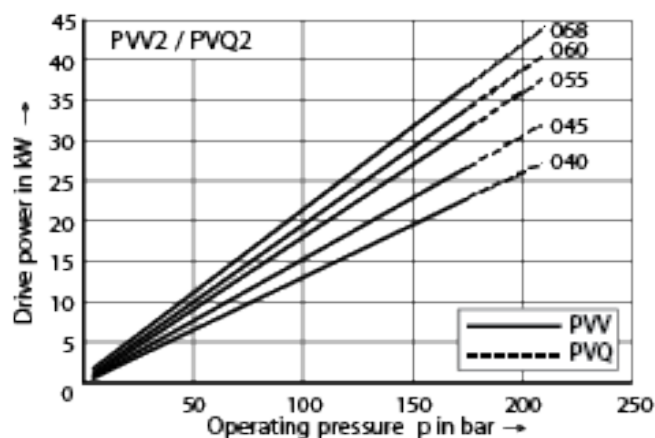
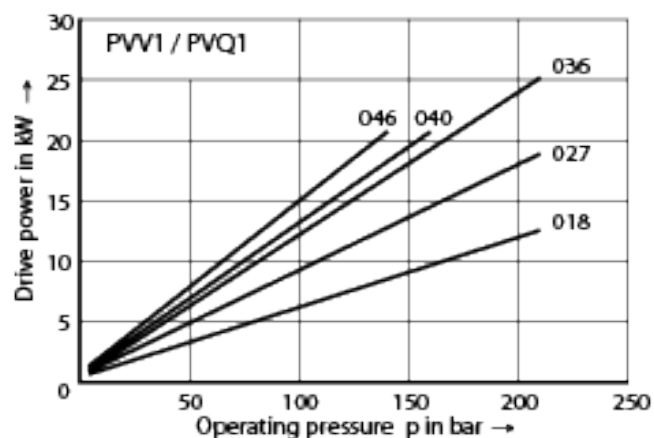
The noise pressure levels for double pumps lie on average 1 to 3 dB(A) above the values for single pumps.

Drive power (measured at $v = 41 \text{ mm}^2/\text{s}$; $\vartheta = 50^\circ\text{C}$)

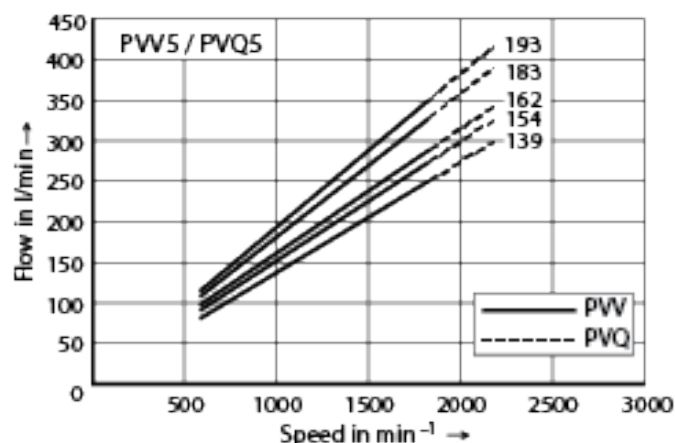
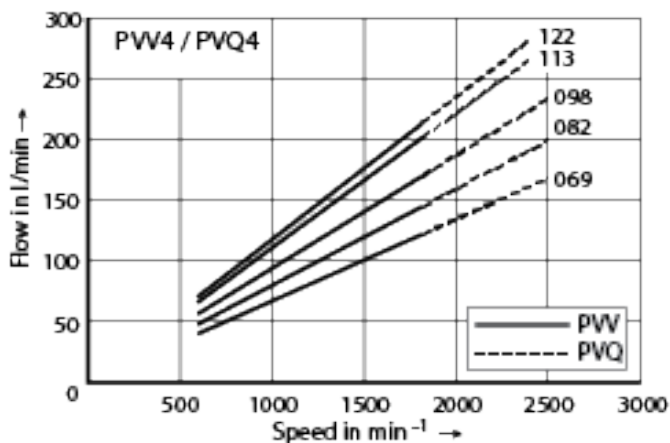
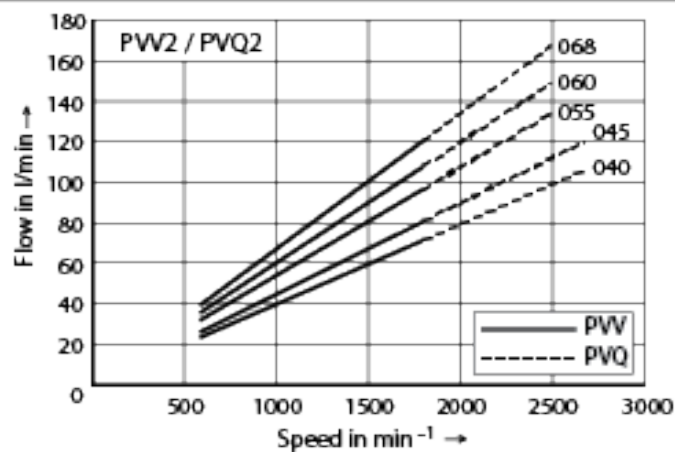
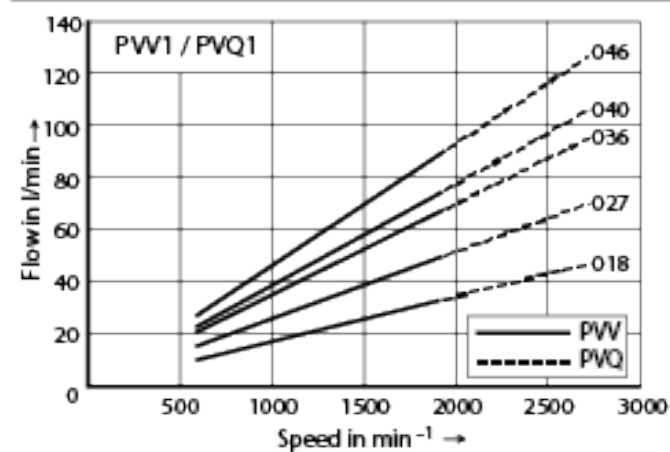
$n = 1500 \text{ min}^{-1}$



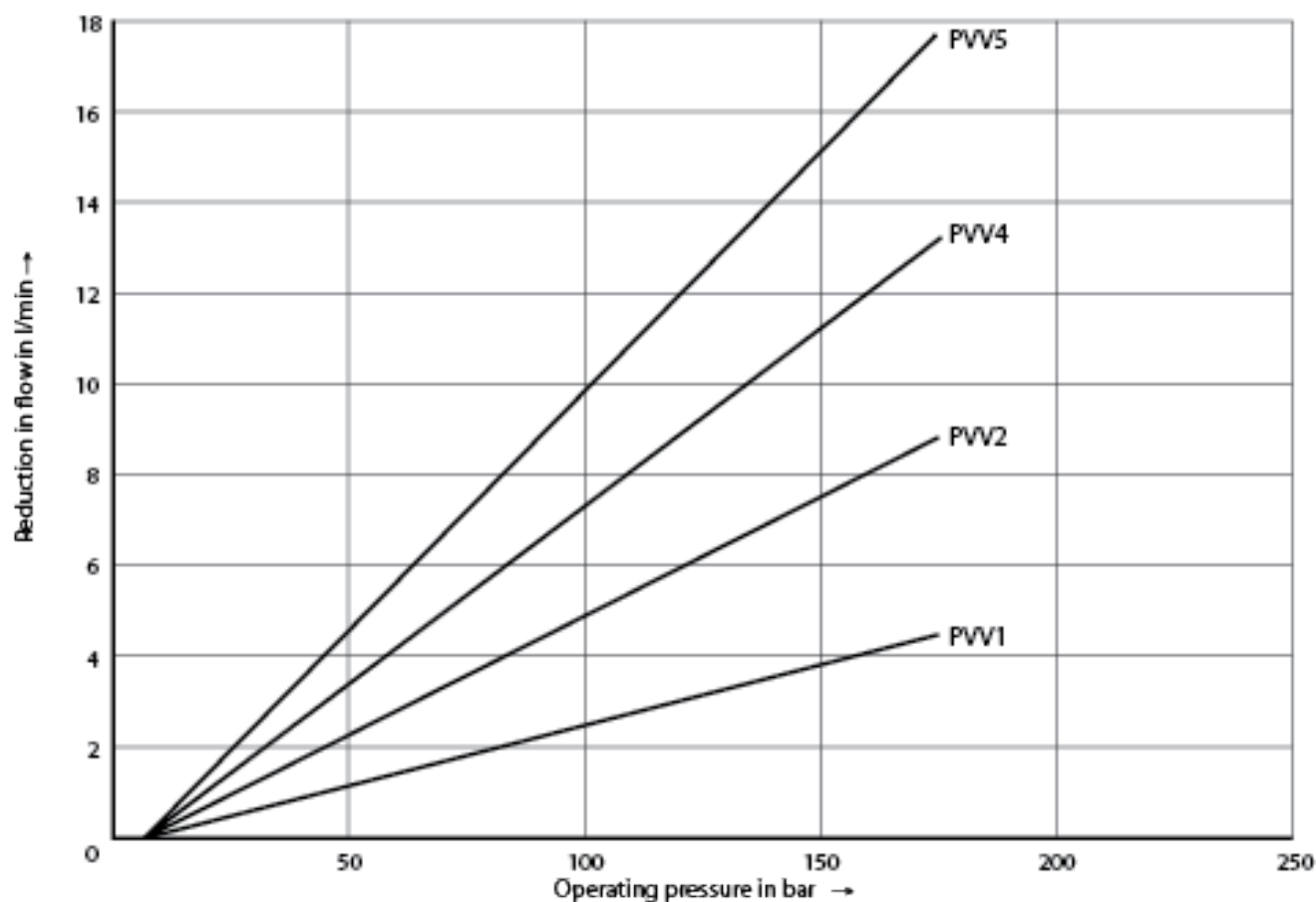
$n = 1800 \text{ min}^{-1}$

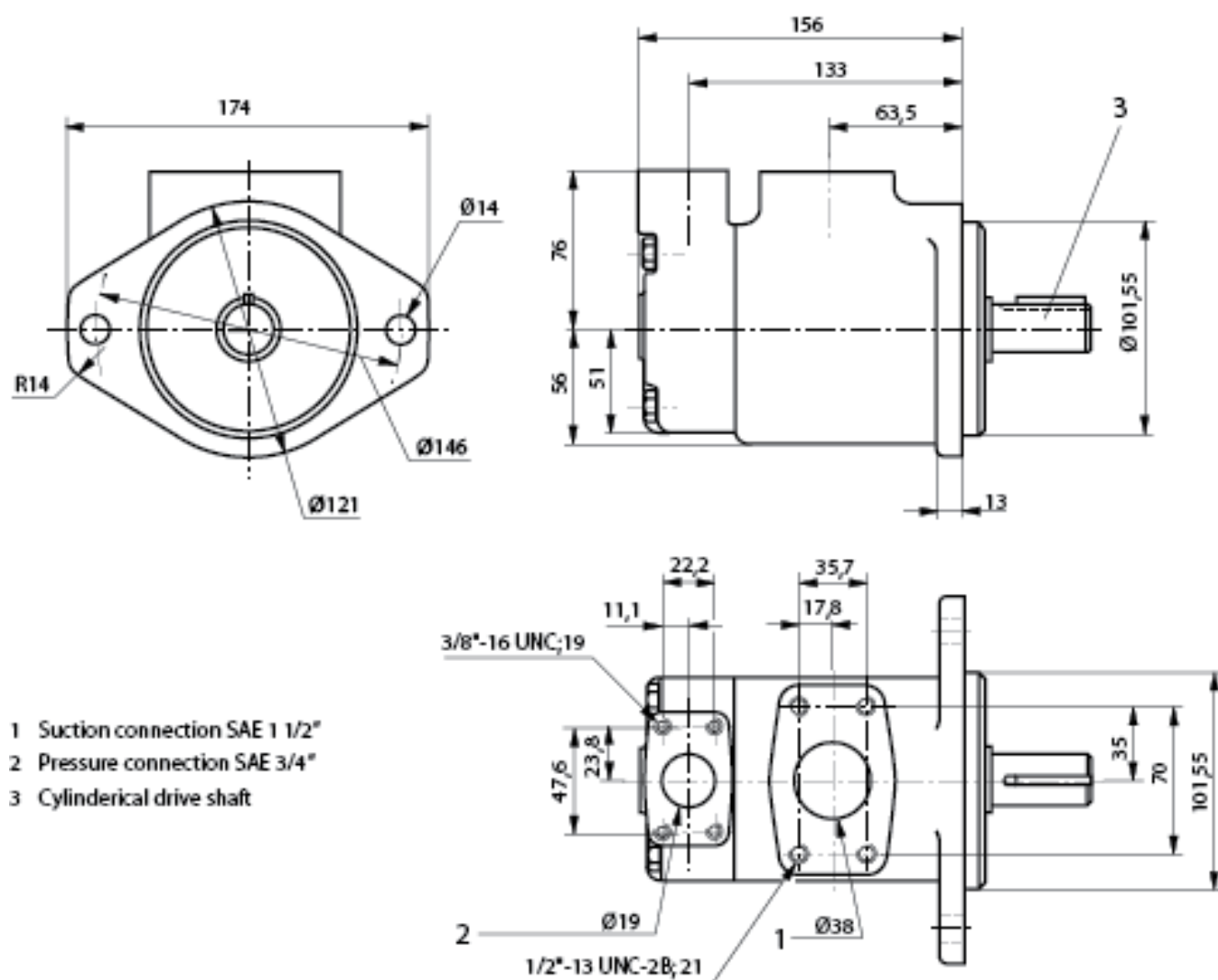


Flow, speed dependent (measured at $v = 41 \text{ mm}^2/\text{s}$; $\vartheta = 50 \text{ }^\circ\text{C}$; $p = 7 \text{ bar}$)



Flow losses, pressure dependent (measured at $v = 41 \text{ mm}^2/\text{s}$; $\vartheta = 50 \text{ }^\circ\text{C}$)



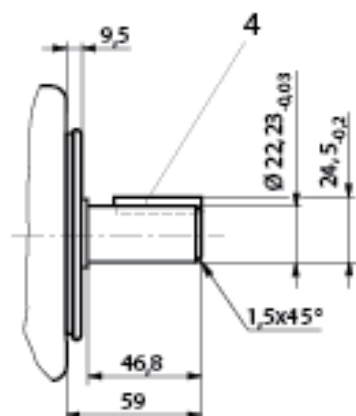


Shaft for BS1

Version A

Cylindrical drive shaft
(standard)

4 Key □ 4.76 x 31.8



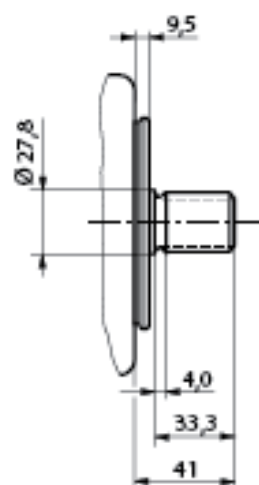
Permissible torque 250 Nm

Version J

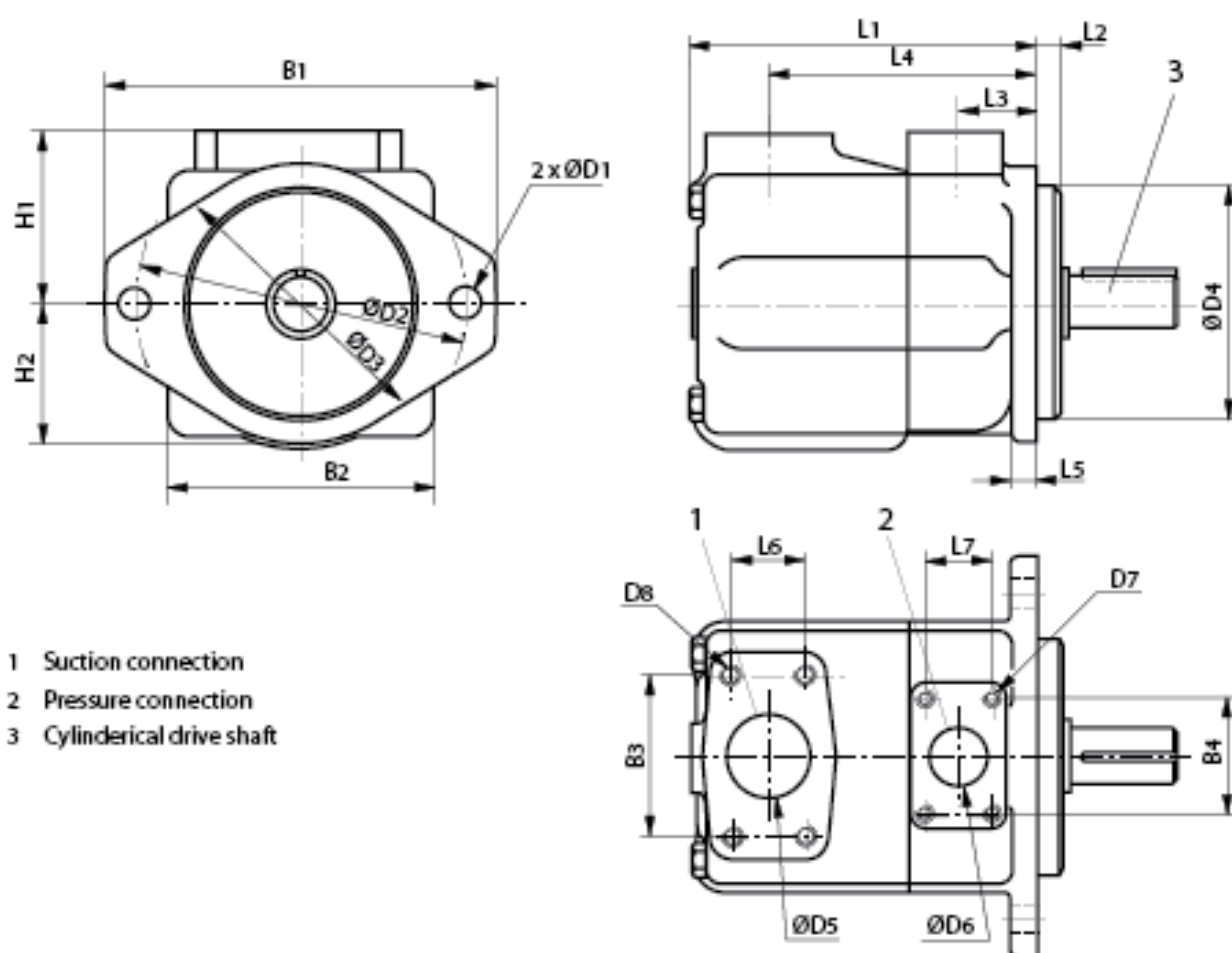
Splined drive shaft SAE-B 7/8"

13 teeth 16/32DP

Tooth thickness $t = 2.261$



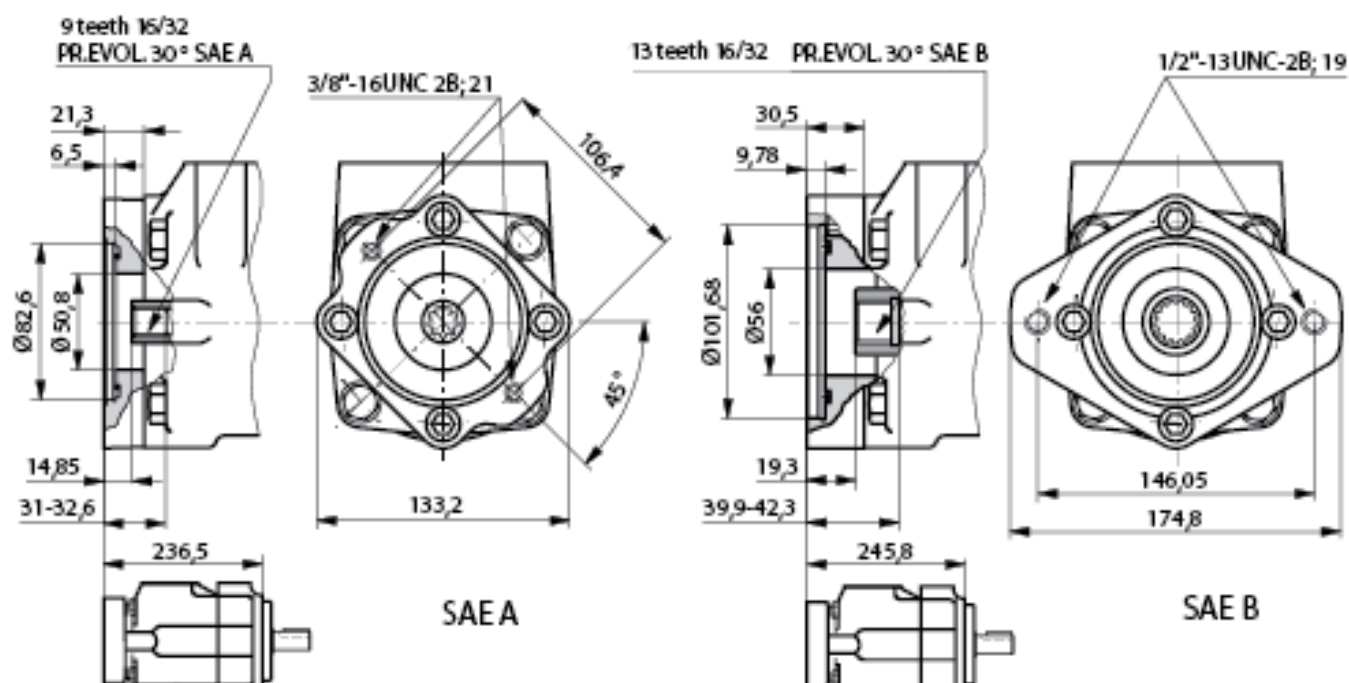
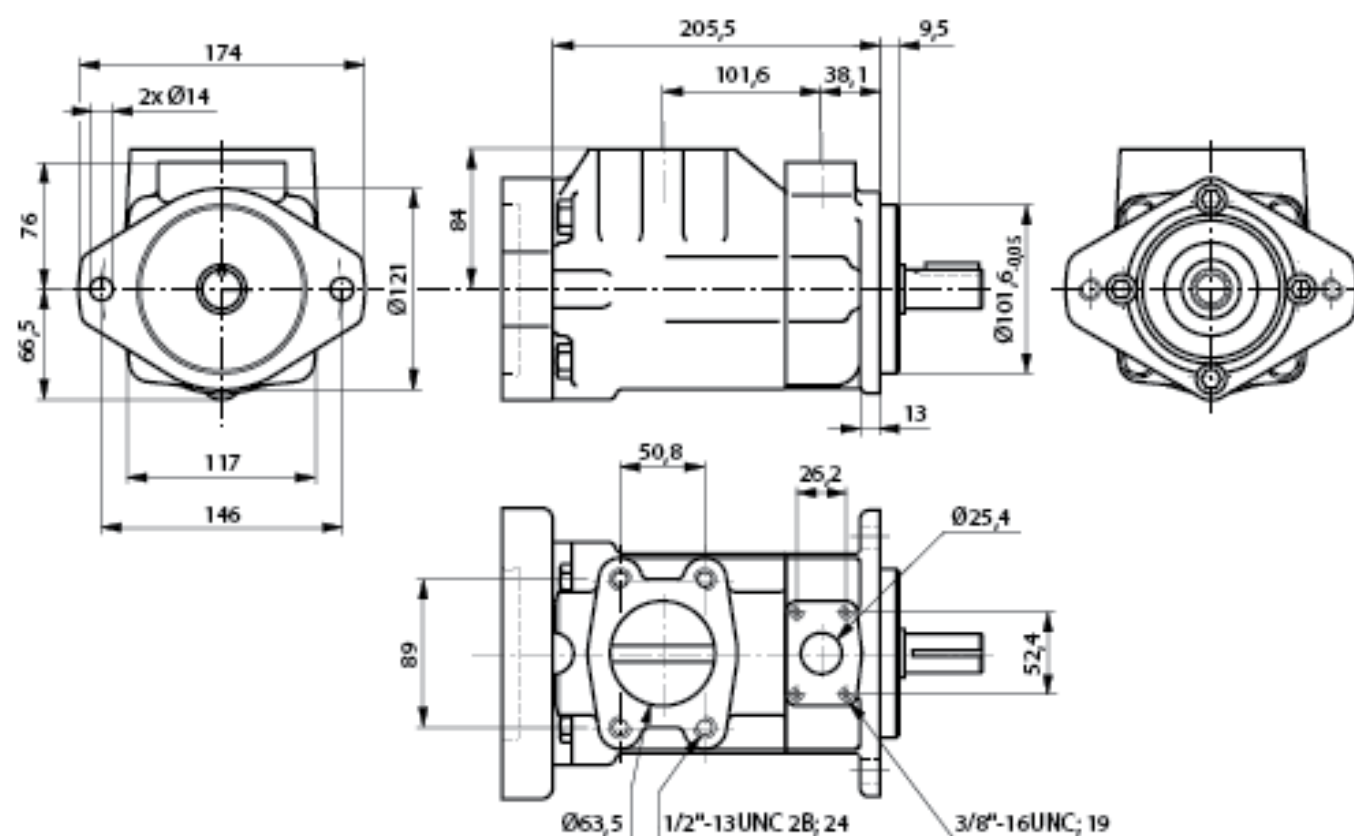
Permissible torque 316 Nm

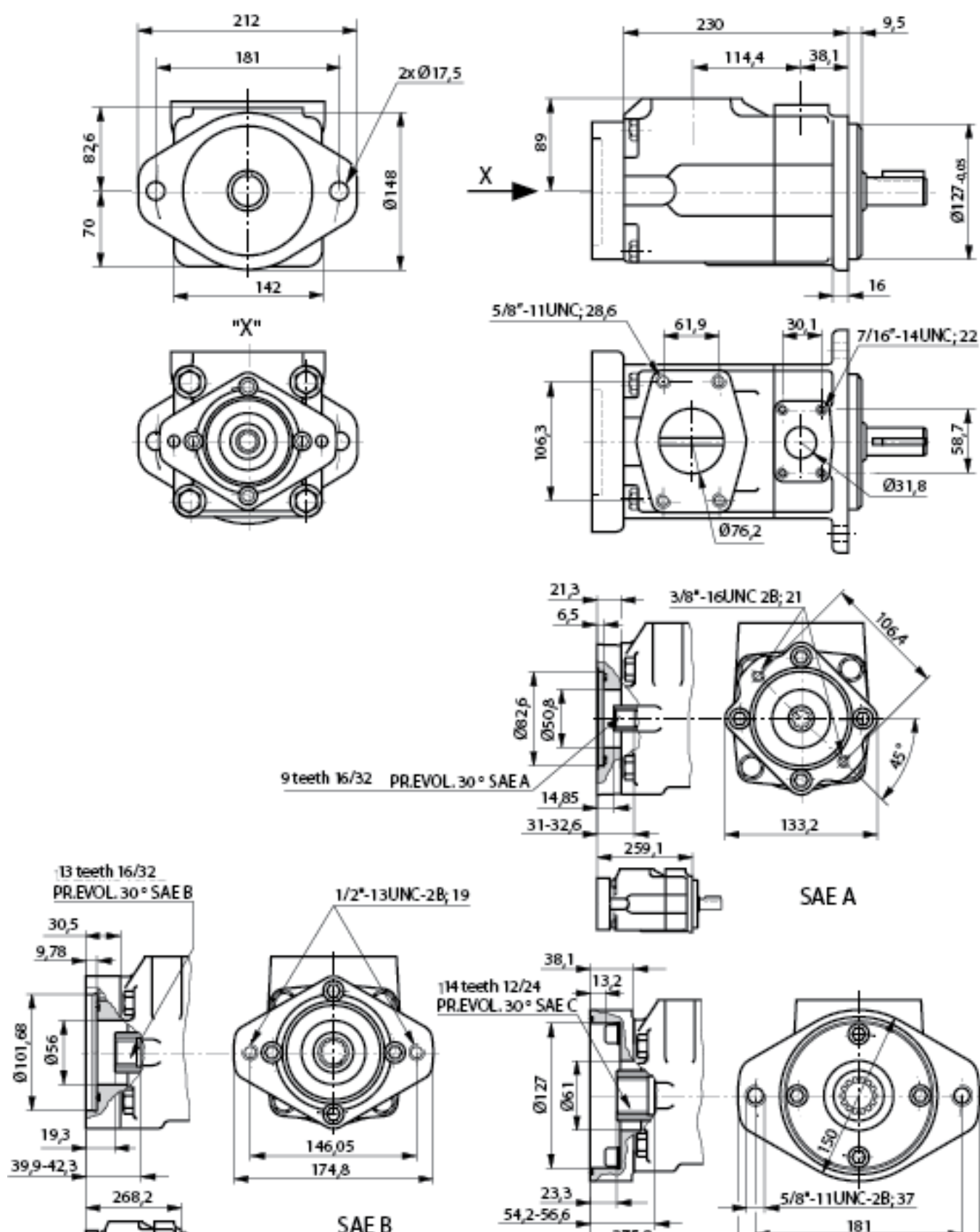


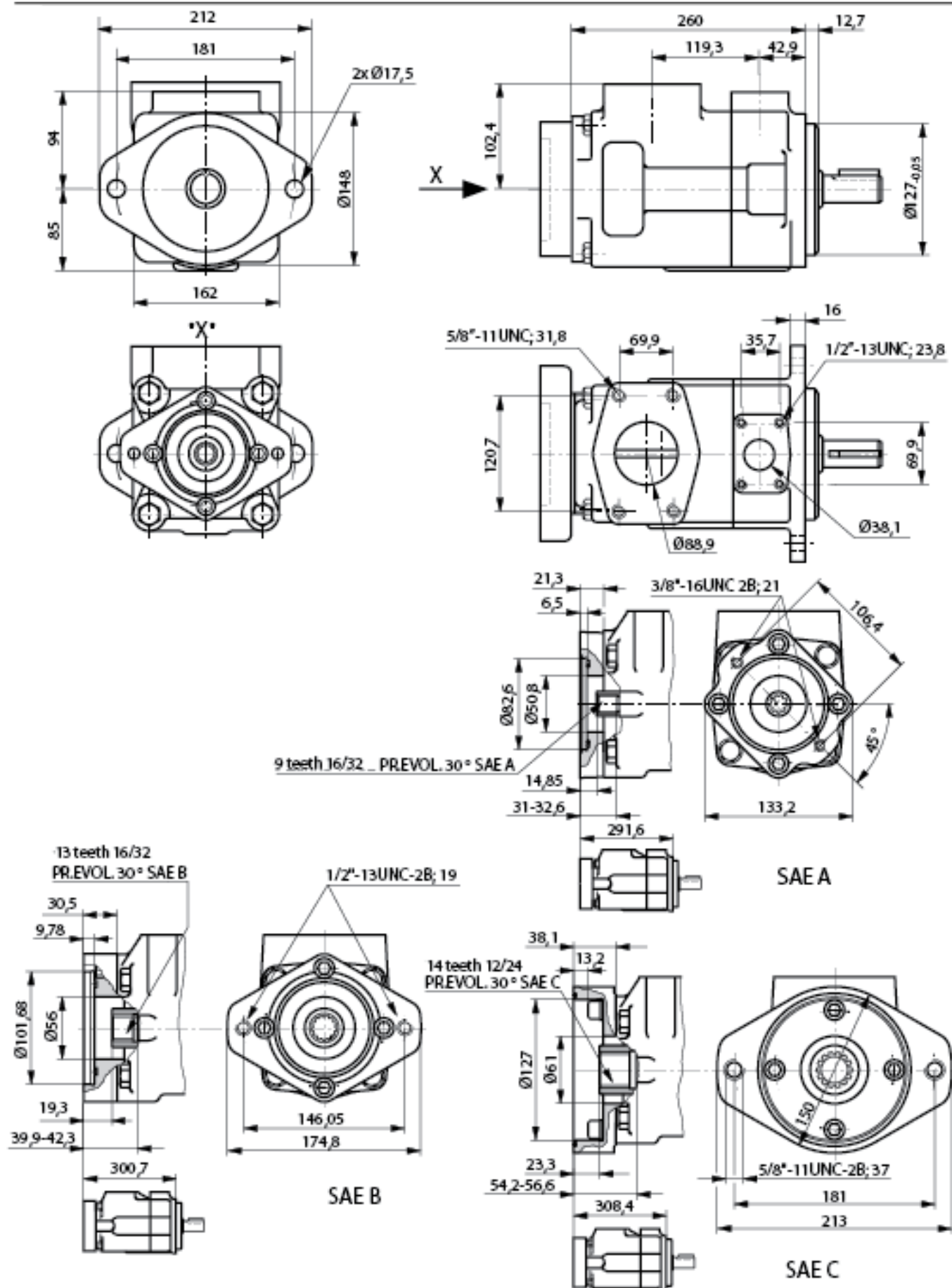
BS	Suction connection						
		ØD5	D8 ₋₂₈	B3	L6	L4	H1
2	SAE 1 1/2"	38	1/2"-13UNC; 22	69,9	35,7	120,6	76,2
4	SAE 2"	50,8	1/2"-13UNC; 23,8	77,7	42,8	125,5	82,6
5	SAE 3"	76,2	5/8"-11UNC; 28,6	106,3	61,9	153,2	93,6

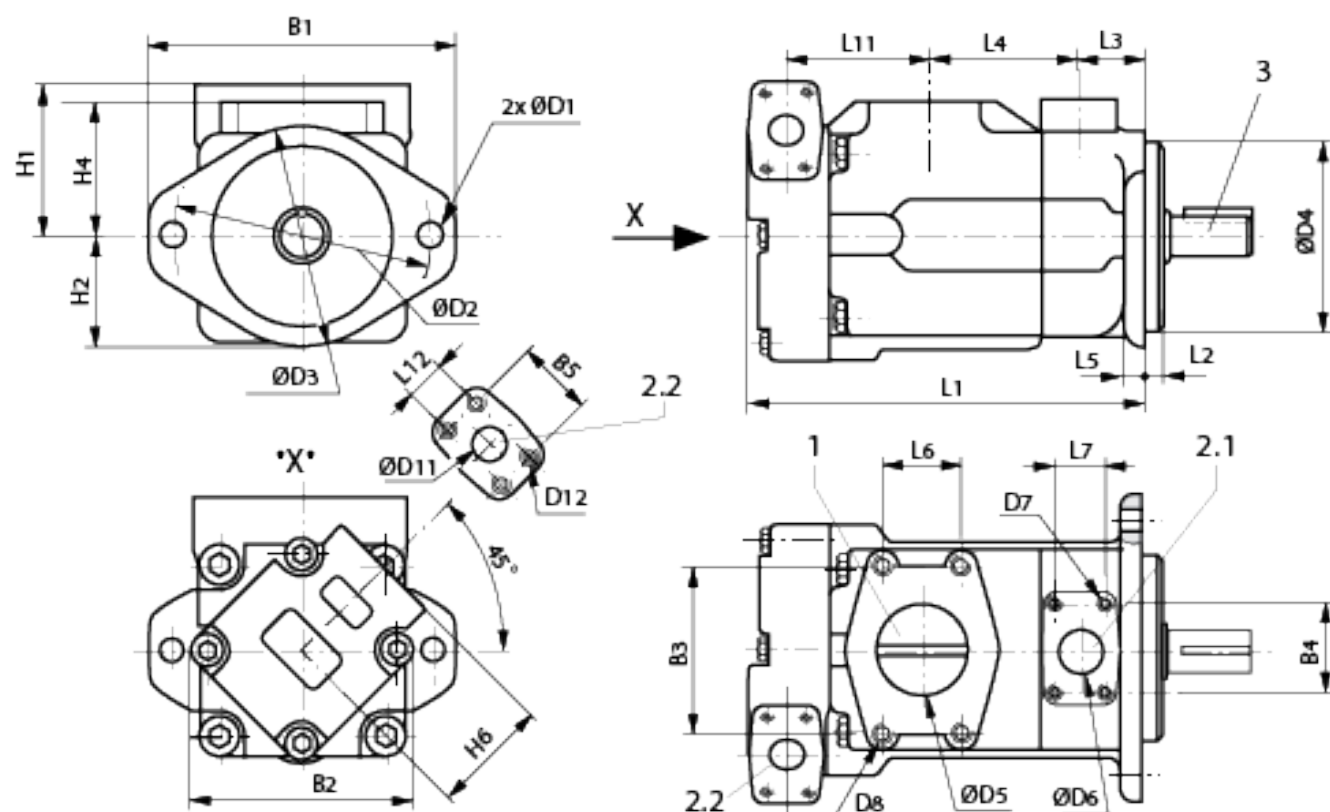
BS	Pressure connection					
		ØD6	D7 ₋₂₈	B4	L7	L3
2	SAE 1"	25,4	3/8"-16UNC; 19	52,4	26,2	38,1
4	SAE 1 1/4"	31,8	7/16"-14UNC; 22	58,7	30,1	38,1
5	SAE 1 1/2"	38,1	1/2"-13UNC; 23,8	69,9	35,7	42,9

BS	Mounting flange										
		B1	ØD1	ØD2	ØD3	ØD4 _{-0,05}	L2	L5	B2	L1	H2
2	SAE-B	174	14	146	121	101,6	9,5	13	117	163	64









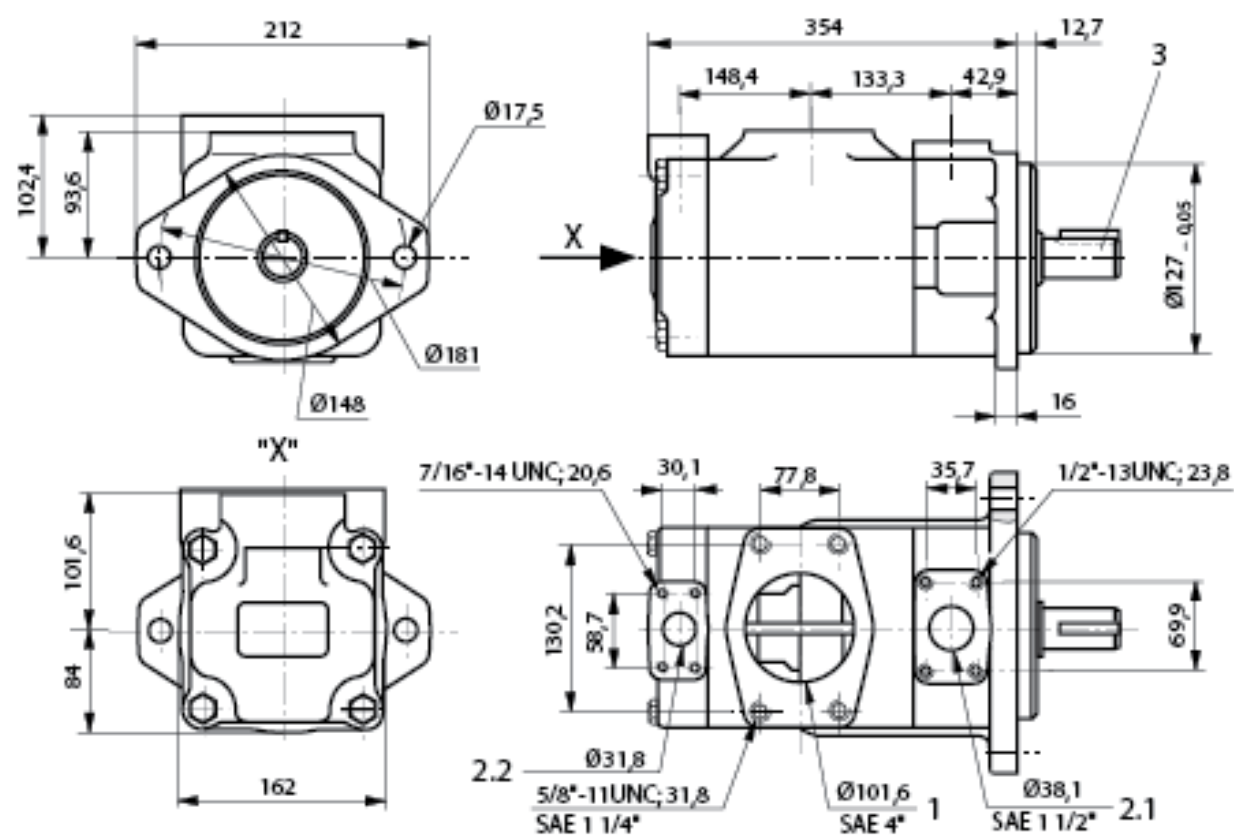
BS	Mounting flange								
		B1	ØD1	ØD2	ØD3	ØD4	_{-0,05}	L2	L5
21	SAE-B	174	14	146	121	101,6		9,5	13
41; 42	SAE-C	212	17,5	181	148	127		9,5	16
51; 52	SAE-C	212	17,5	181	148	127		12.7	16

BS	Suction connection						
		ØD5	D8 ₋₂₈	B3	L6	L4	H1
21	SAE 2 1/2"	63,5	1/2"-13UNC; 23,8	88,5	50,8	101,6	84,1
41; 42	SAE 3"	76,2	5/8"-11UNC; 28,6	106,3	61,9	114,4	88,9
51; 52	SAE 3 1/2"	88,9	5/8"-11UNC; 31,8	120,7	69,9	119,3	102,4

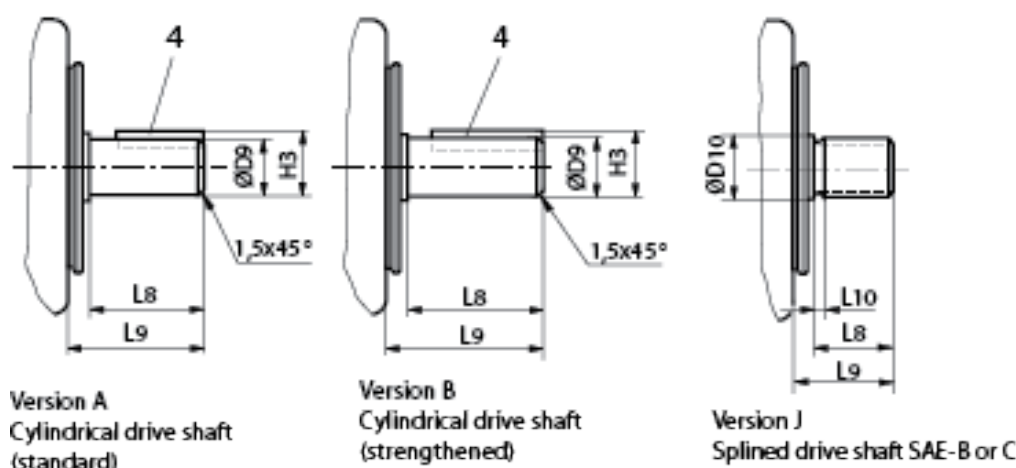
BS	Pressure connection - flange side						
		ØD6	D7 ₋₂₈	B4	L7	L3	H4
21	SAE 1"	25,4	3/8"-16UNC; 19,1	52,4	26,2	38,1	76,2
41; 42	SAE 1 1/4"	31,8	7/16"-14UNC; 21,6	58,7	30,1	38,1	82,6
51; 52	SAE 1 1/2"	38,1	1/2"-13UNC; 23,8	69,9	35,7	42,9	93,6

BS	Pressure connection - cover side							B2	L1	H2
		ØD11	D12 ₋₂₈	B5	L12	L11	H6			
21	SAE 3/4"	19,1	3/8"-16UNC; 19,1	47,6	22,2	88	76,2	132	252	64
41	SAE 3/4"	19,1	3/8"-16UNC; 19,1	47,6	22,2	99,5	74,7	140	275	70

- 1 Suction connection
- 2.1 Pressure connection, flange side
- 2.2 Pressure connection, cover side
- 3 Cylindrical drive shaft



- 1 Suction connection
- 2.1 Pressure connection, flange side
- 2.2 Pressure connection, cover side
- 3 Cylindrical drive shaft
(for drive shaft dimensions
see table)
- 4 Key (for dimensions see table)



Drive shaft version A							Drive shaft version B						
BS	L8	L9	H3	ØD9	Key	T _{max} in Nm	L8	L9	H3	ØD9	Key	T _{max} in Nm	
2; 21	46,8	59	24,5 _{-0,2}	22,23 _{-0,03}	□ 4,76 x 31,8	250	64	78	28,3 _{-0,2}	25,37 _{-0,02}	□ 6,36 x 50,8	400	
4; 41; 42	61,9	73,2	35,2 _{-0,3}	31,75 _{-0,03}	□ 7,9 x 38,1	407	74,6	86	38,6 _{-0,3}	34,9 _{-0,03}	□ 7,9 x 54,6	600	
5; 51; 52; 54	47,8	62	35,2 _{-0,3}	31,75 _{-0,03}	□ 7,9 x 28,4	610	73	88	42,37 _{-0,23}	38,07 _{-0,02}	□ 9,5 x 54,6	810	

Drive shaft version J						
BS	L8	L9	L10	ØD10	T _{max} in Nm	Teeth details
2; 21	33,3	41	4,0	27,8	316	SAE-B 7/8", 13 teeth, 16/32 DP
4; 41; 42	42,1	56	3,04	35,05	580	SAE-C 1 1/4", 14 teeth, 12/24 DP
5; 51; 52; 54	46,6	56	9,7	41,28	818	SAE-C 1 1/4", 14 teeth, 12/24 DP

Maximum permissible through drive torques in Nm

BS	Through drive		
	K01 (SAE-A, 9T)	K02 (SAE-B, 13T)	K07 (SAE-C, 14T)
2	131	316	—
4	131	316	437
5	131	384	702

Pump cartridges for PW / PVQ

Features

- Service friendly due to exchangeable pump cartridges
- Within a build size it is possible to change the flow by exchanging the pump cartridges
- The pump can be changed from type PVV to PVQ or PVQ to PVV by changing the cartridges.



Type: CARTRIDGE PW1-1X

Ordering details

CARTRIDGE		PV		-1X	/		
Pump type							No code = Cartridge for single pumps or flange size for double pumps
Industril version		= V					D = Cartridge for cover side installation for double pumps
Mobile version		= Q					
Build size 1			= 1				
Build size 2			= 2				
Build size 4			= 4				
Build size 5			= 5				
Component series							Direction of rotation
Component series 10 to 19 (10 to 19: unchanged installation and connection dimensions)			= 1X				R = Clockwise L = Anti-clockwise
							Nominal size / displacement flow
						018 =	18,0 cm ³
						027 =	27,4 cm ³
						036 =	Build size 1 45,4 cm ³
						040 =	39,5 cm ³
						046 =	45,9 cm ³
						040 =	40,1 cm ³
						045 =	45,4 cm ³
						055 =	Build size 2 55,2 cm ³
						060 =	60,0 cm ³
						068 =	67,5 cm ³
						069 =	69,0 cm ³
						082 =	81,6 cm ³
						098 =	Build size 4 97,7 cm ³
						113 =	112,7 cm ³
						122 =	121,6 cm ³
						139 =	138,6 cm ³
						154 =	153,5 cm ³
						162 =	Build size 5 162,2 cm ³
						183 =	183,4 cm ³
						193 =	193,4 cm ³

ANNOTATIONS :

HUADE AMÉRICA – HAL AUTOMATION

CEP : 03162-020

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