Type V30D

Variable displacement axial piston pump

Product documentation

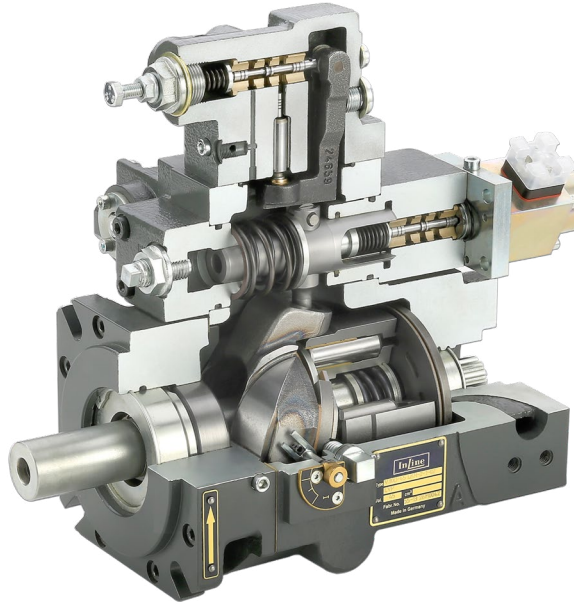
2024-04-01

Open circuit

Nominal pressure $p_{nom\ max}$: 250~350 bar

Peak pressure p_{max}: 350~420 bar

Geometric displacement V_{max}: 45~250 cm^3/rev



V30D-045

Contents

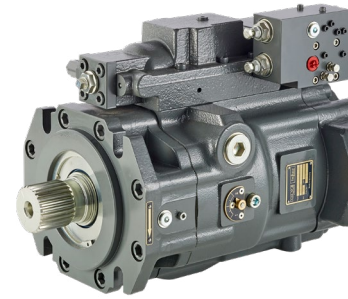
1 Overview: variable displacement axial piston pump types V30D

The axial piston variable displacement pumps of the type V30 of D offer extremely high function safety. Its remarkably low noise levels, the high pressure rating (peak = 420 bar / perm. = 350 bar), optimined power-to-weight-ratio as well as the wide controller range make it possible to employ it for most industrial and mobile applications. The variable displacement pumps work according to the swash plate principal: 9 pistons operate in a rotating cylinder cavities where they fulfill one suction and one pressure stroke per rotation.

Opening and closing of the cylinder cavities is via openings in the control disc. The axial movement of the pistons is provided by an adjustable swash plate. The setting angle (0 - max) can be steplessly varied in proportion to the desired displacement/flow. The setting range can be mechanically limited by setting screws (with V and VH controller only fixed limitation is possible). The position of the swash plate can be controlled via a visual mechanical indicator.
The latest knowledge and experience with regard to noise reduction has been used in the development of this pump design. V30D is therefore rather quiet, even when taken to the limit. All components used in the V30D are manufactured from high grade materials and machined with close tolerances.
The wide range of modular controllers along with a thru-shaft (option for mounting auxiliary pumps or a second V30D) open up a wide range of application possibilities.
Therefore type V30D features a pump design, which ideally suits the special requirements of modern industrial, mobile hydraulic drive systems, marine, offshore, and other industries.

Features and benefits:
- Low-noise emissions
- Wide controller options
- Full torque available at the second pump in tandem pump applications

Intended applications:
- Coal mining
- Concrete pump
- Extruder
- Industrial plants
- Marine cranes and winches
- Pile driving machine
- Power pack assembly
- Presses
- Tunnel boring machine
- Ship engine

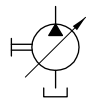


Type V30D-250
Variable displacement axial piston pump

2 Available versions, main data

2.1 Basic version

Circuit symbol:



Order coding example:

V30D	-095	R	D	G	N	-1	0	-XX	/LSN	-2	/190	-400	C411

Flange version
Table 12: Flange versions (output side)

Pressure specification (bar)

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Release
Release

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Table 4: Flange versions (input side)

Shaft version
Table 3: Shaft version

Rotating direction
Table 2: Rotating direction

Nominal size
Table 1: Nominal size

Basic type

2.1 Basic version

Table 1: Nominal size

Coding	Geometric displacement (cm^3/rev.)	Nominal pressure P_{nom} (bar)	Peak pressure P_{max} (bar)
-045	45	350	420
-075	75	350	420
-095	96	350	420
-115	115	250*	300*
-140	142	350	420
-160	164	250*	300*
-250	250	350	420

*Higher pressure is only possible with reduce displacment.

Table 2: Rotating directions

Coding	Description	
L	Anti-clockwise	facing the drive shaft
R	Clockwise	
B*	both directions (begin size -075)	

* Customized application, please ask InLine Hydraulik for information and confirmation.

Table 3: Shaft versions

Coding	Description	Designation/Standard	Max. drive torque (Nm)
D	Spline shaft	W35×2×16×9g DIN5480 (V30D-045)	550 Nm
		W40×2×18×9g DIN5480 (V30D-075/-095/-115)	910 Nm (-075); 1200 Nm (-095/-115)
		W50×2×24×9g DIN5480 (V30D-140/-160)	1700 Nm
		W60×2×28×9g DIN5480 (V30D-250)	3100 Nm
K	Key shaft	AS 10×8×56 DIN6885 (V30D-045)	280 Nm
		AS 12×8×70 DIN6885 (V30D-075)	460 Nm
		AS 12×8×80 DIN6885 (V30D-095/115)	650 Nm
		AS 14×9×80 DIN6885 (V30D-140/160)	850 Nm
		AS 18×11×100 DIN6885 (V30D-250)	1550 Nm
S	Spline shaft	SAE-C 14T-12/24DP (V30D-045/-075)	500 Nm
		SAE-D 13T-8/16DP (V30D-095/-115/-140/-160)	1200 Nm
U	Spline shaft	SAE-D 13T-8/16DP (V30D-250)	1200 Nm

Table 4: Flange versions (input side)

Coding	Description	Designation
G	Flange	125 B4 HW ISO 3019-2 (V30D-045)
		140 B4 HW ISO 3019-2 (V30D-075)
		160 B4 HW ISO 3019-2 (V30D-095/-115)
		180 B4 HW ISO 3019-2 (V30D-140/-160/-250)
F	Flange	SAE-C 4-hole 14T-12/24DP (V30D-045/-075)
		SAE-D 4-hole 13T-8/16 DP (V30D-095/-115/-140/-160)
W	Flange	SAE-D 4-hole 13T-8/16 DP (V30D-250)

2.1 Basic version

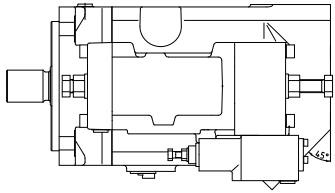
Table 5: Seals

Coding	Description
N	NBR
V	FKM
E	EPDM
C	FKM suitable for HFC

Table 6: Housing versions

Coding	Description
1	No thru-shaft (Suction port 45°)
2	Thru-shaft for tandem pump (Suction port 45°)
3	No thru-shaft (Suction port 90°)
4	Thru-shaft for tandem pump (Suction port 90°)

Suction port 45°(Normal)
Pressure Port radial



Suction and Pressure Port radial

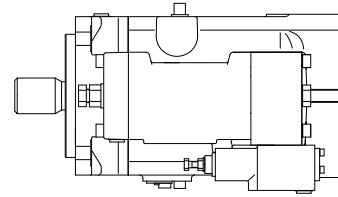


Table 7: Additional functions, pivoting angle indicator

Coding	Description
0	None
1	With indicator
2	With pivoting angle pick-up (Hall sensor)

Table 8: Addition execution / Special versions

Coding	Description
0	Without cover
-1	Prepared for L-controller

Table 9: Option for displacement limitation

Coding	Description
-2	With adjustable stroke limitation
-2/··· *	Stroke limitation fixed with specification of the set geometric displacement V_g (cm^3/rev.)

* If regulation with V or VH only a permanently declined stroke limitation is possible internally!

Table 10: Torque Setting / Power setting

Torque setting in Nm ; alternative power in kW and speed in rpm (min-1)

2.1 Basic version

Table 11: Controller

Coding	Description
-... V	The controller V is used to control flow or speed in electronic or computer controlled systems. The V controller consists of a proportional solenoid acting on a servo valve that determines the position of the pump setting piston. The displacement of the pump is proportional to the current through the 24V DC solenoid (about 250 - 750mA). In order to minimize valve hysteresis, a pulse width modulated control signal of approx. 80-100Hz frequency is recommended.
-... VH	The VH is a flow controller. It is similar to the V controller but the control signal is hydraulic. The required signal range is 7...32bar (215...725psi). The pump displacement is determined by the control signal (refer to the diagram). Pilot pressure can be supplied either from the system through a pressure reducing valve, or from an auxiliary pump. The pump should provide a pulsating flow of about 100Hz; gear pump with 7 teeth and 750 rpm is recommended. If the system pressure is below 40...60bar (580...870psi) (depending on size) a small auxiliary pump is required to secure proper functioning of the controller.
-... N	Pressure controller, adjustable directly at the pump. Pressure controller automatically mainains a constant system pressure independant of the required flow. Therefore it is suited for constant pressure systems, where differing flow is required or as efficient pressure limitation of the hydraulic system.
-... P	Remotely adjustable pressure setting; the pressure is set with a pilot relief valve. The pilot relief can be positioned up to 20m (60 ft) from the pump.
-... Pb	Like coding N, recommended only for systems with tendency to ozcillations (accumulator systems). Exterral lines are necessaery.
-... PD5	In comparison with the remote pressure control, several pumps with parallel pressure control can work parallel at the same pressure and the same displacement.
-... Q	The flow compensator maintains a constant flow, with small power losses, in spite of variations in shaft speed and ressure. The flow is determined by the size of the flow restrictor.
-... Qb	This is a special version of the Q compensator above. It has been developed to meet the accuracy and response requirement of hydrostatic transmission for generator drives and similar applications. The flow restrictor should be installed close to the pump in the main high pressure line. Pressure is sensed before and after the flow restrictor and connected to the compensator with two external lines. This provides increased control accuracy.
-... L	The V30D pump with power controller is used in applications with highly varying pressure demands and where it is important to protect the electric motor (engine) from overload. The controller limits the hydraulic power (at constant shaft speed) according to the ideal curve "pressure × flow = constant". The product of pressure and flow cannot exceed the pre-set power value. If, for example, the pressure doubles (at max power) the flow is automatically reduced by 50%.
-... Lf	Power shift control (positive power characters), the power will increase with the pilot pressure increase. And it could also servo as hydraulic proportional flow controller (the performance curve is not linear), the displacement of the pump will increase with the increase of pilot pressure.
-... Lf1	Power shift control (negative power characters), the power will decrease with the pilot pressure increase. And it could also servo as hydraulic proportional flow controller (the performance curve is not linear), the displacement of the pump will decrease with the increase of pilot pressure.
-... LS	Load-Sensing-Controller. This controller is designed for load sensing systems utilizing a suitable directional control valve.
-... LSN	Like coding LS, but with additional pressure limitation.
-... LSP	Like coding LS, but with additional pressure limitation remote control.
-... LSD	In comparison with standard LS control, several pumps with LSD control can work parallel at the same pressure and the same displacement.

2.1 Basic version

Order coding example:

V30D	-095	R	D	G	N	-1	0	-XX	/LSN	-2	/190	-400	**C311**

Table 12: Flange versions (output side)

Coding V30D							Flange	Shaft	
045	**075**	**095**	**115**	**140**	**160**	**250**			
C411	**C421**	**C431**	**C441**	**C451**	**C461**	**C471**	SAE-A 2-hole J 744 82-2 ISO 3019-1	SAE-A J 744 (16-4 ISO 3019-1) 9T 16/32 DP	
C412	**C422**	**C432**	**C442**	**C452**	**C462**	**C472**	SAE-A 2-hole J 744 82-2 ISO 3019-1	SAE-A J 744 (16-4 ISO 3019-1) 9T 16/32 DP [1)]	
C413	**C423**	**C433**	**C443**	**C453**	**C463**	**C473**	SAE-A 2-hole J 744 82-2 ISO 3019-1	J 744 (19-4 ISO 3019-1) 11T 16/32 DP	
C414	**C424**	**C434**	**C444**	**C454**	**C464**	**C474**	SAE-B 2-hole J 744 101-2 ISO 3019-1	SAE-B J 744 (22-4 ISO 3019-1) 13T 16/32 DP	
C415	**C425**	**C435**	**C445**	**C455**	**C465**	**C475**	SAE-B 4-hole J 744 101-4 ISO 3019-1	SAE-B J 744 (22-4 ISO 3019-1) 13T 16/32 DP	
C416	**C426**	**C436**	**C446**	**C456**	**C466**	**C476**	SAE-BB 2-hole J 744 101-2 ISO 3019-1	SAE-B J 744 (25-4 ISO 3019-1) 15T 16/32 DP	
C417	**C427**	**C437**	**C447**	**C457**	**C467**	**C477**	SAE-C 2-hole J 744 127-2 ISO 3019-1	SAE-C J 744 (32-4 ISO 3019-1) 14T 12/24 DP	
C418	**C428**	**C438**	**C448**	**C458**	**C468**	**C478**	SAE-C 4-hole J 744 127-4 ISO 3019-1	SAE-C J 744 (32-4 ISO 3019-1) 14T 12/24 DP	
C419	**C429**	**C439**	**C449**	**C459**	**C469**	**C479**	SAE-CC 2-hole J 744 127-2 ISO 3019-1	SAE-C J 744 (38-4 ISO 3019-1) 17T 12/24 DP	
-	-	**C440**	**C450**	**C460**	**C470**	**C480**	SAE-D 4-hole J 744 152-4 ISO 3019-1	SAE-D J 744 (44-4 ISO 3019-1 13T 8/16 DP	
C500	**C501**	**C503**	**C506**	**C510**	C515	**C521**	ISO 3019-2 125-4	D—DIN 5480 W35×2×16×9g	V30D-45
-	**C502**	**C504**	**C507**	**C511**	C516	**C522**	ISO 3019-2 140-4	D—DIN 5480 W40×2×18×9g	V30D-75
-	-	**C505**	**C508**	**C512**	C517	**C523**	ISO 3019-2 160-4	D—DIN 5480 W40×2×18×9g	V30D-95
-	-	-	**C509**	**C513**	C518	**C524**	ISO 3019-2 160-4	D—DIN 5480 W40×2×18×9g	V30D-115
				C514	C519	**C525**	ISO 3019-2 180-4	D—DIN 5480 W50×2×24×9g	V30D-140
				-	C520	**C526**	ISO 3019-2 180-4	D—DIN 5480 W50×2×24×9g	V30D-160
				-	-	**C527**	ISO 3019-2 180-4	D—DIN 5480 W60×2×28×9g	V30D-250

[1)] ANSI B 92.1, FLAT ROOT SIDE FIT, spline width deviating from the standard, s = 2.357-0.03

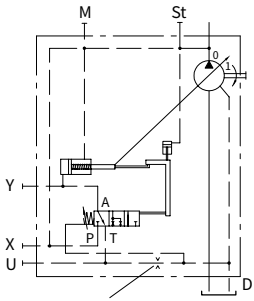
Note:
Pay attention to the maximum permissible drive torque, as the flange or shaft may be damaged otherwise.

Note:
An additional support is to be provided for pump combinations. Other versions on request.

2.2 Controller switching symbols

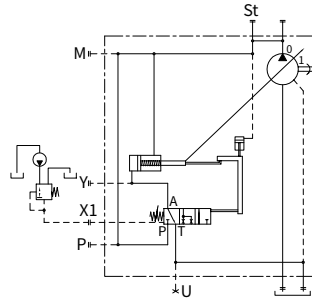
Variable displacement axial piston pump with controller

Coding L

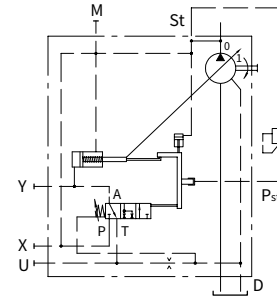


Orifice U
(see Chapter 4.3, “Controller”)

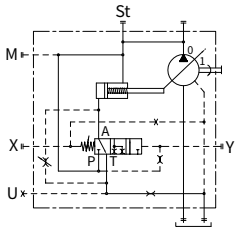
Coding Lf



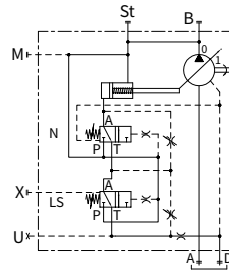
Coding Lf1



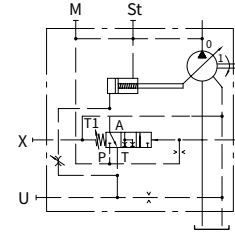
Coding LS [1)]



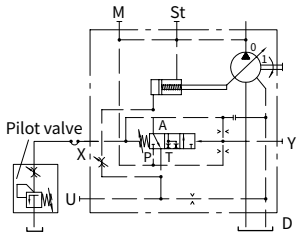
Coding LSN

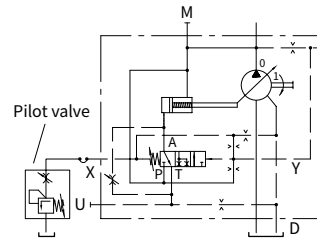


Coding N



Coding P



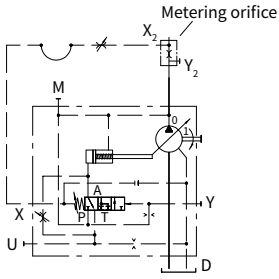


[1)] The pressure limiting valve "N" is not available with type LS (version without pressure cut-off)

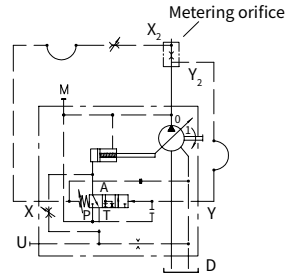
2.2 Controller switching symbols

Variable displacement axial piston pump with controller

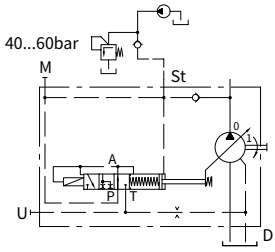
Coding Q



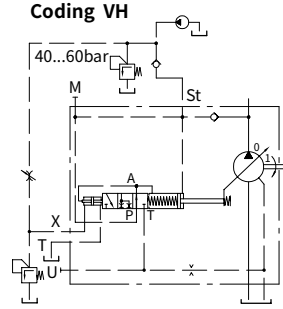
Coding Qb



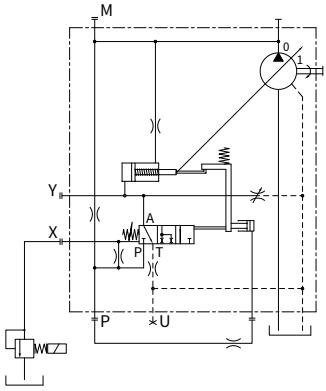
Coding V



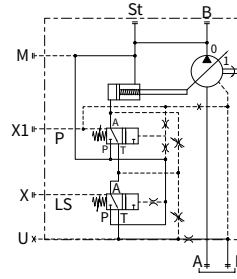
Coding VH



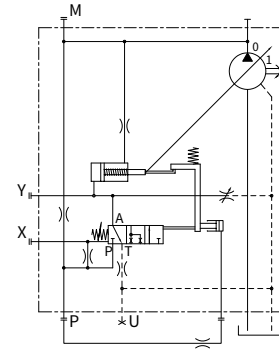
Coding PD5



Coding LSP



Coding LSD



3 Parameters

3.1 General

Description	Variable displacement axial piston pump
Design	Axial piston pump according to the swash plate principle
Mounting	Flange mounting or foot bracket
Surface	Primed
Drive/output torque	See Chapter 3, "Parameters", under "Additional parameters"
Rotating direction	Clockwise, anti-clockwiseor or bidirectional
Ports	· Suction port · Pressure port · Drain port · Pressure gauge connection
Hydraulic fluid	Hydraulic oil: according to DIN 51 524 Part 1 to 3; ISO VG 10 to 68 according to DIN 51 519 Viscosity range: min. approx. 10; max. approx. 1000 mm^2/s Optimal operating range: 16 to 35mm^2/s, when lower than 16mm^2, please contact InLine Hydraulik. Also suitable for biologically degradable pressure fluids type HEPG (polyalkalene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C . HFC pressure fluids (water glycol);
Purity class	19/17/14, ISO 4406
Temperatures	Ambient: approx. -40 to +60°C , oil: -25 to +80°C , pay attention to the viscosity range! Start temperature: down to -40°C is permissible (observe start-viscosity!), as long as the steady-state temperature is at least 20K higher for subsequent operation. Biologically degradable pressure fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C .
Housing pressure	1 bar / dynamic 2 bar The housing pressure is only allowed to be 1 bar higher than the suction pressure.

3.1 General

Pressure and delivery flow

Operating pressure	See Chapter 2, "Available versions, main data"
Geometric displacement	See Chapter 2, "Available versions, main data"

Weight

Type V30D	Without controller (kg)	With controller (kg)
045	40	46
075	60	66
095	70	76
115	70	76
140	85	91
160	85	91
250	130	136

Additional parameters

Description		Nominal size						
		045	**075**	**095**	**115**	**140**	**160**	**250**
Max. swash plate angle	°	17	17.5	17	20	17.5	20	17.5
Min. inlet pressure (absolute) open circuit	bar	0.85	0.85	0.85	0.85	0.85	0.85	0.85
	psi	12	12	12	12	12	12	12
Self-priming speed at max swash plate angle and 1bar (15psi) absolute inlet pressure	rpm	2600	2400	2200	2000	2200	1900	1800
Max. speed (requires increased inlet pressure)	rpm	3600	3200	2900	2800	2600	2500	2000
Min. continuous speed	rpm	500	500	500	500	500	500	500
Torque (theor.) at 100bar(1450psi)	Nm	71	119	153	185	226	261	414
	lbf ft	35	61	78	93	115	132	203
Input power at 250 bar and 1450 rpm	kW	30	50	64	77	95	109	174
at 3000 psi and 1800 rpm	hp	41	68	87	105	129	148	237
Inertia torque	kg m^2	0.0056	0.0124	0.0216	0.0216	0.03	0.03	0.0825
	ft. lbs. sec^2	0.0041	0.0092	0.016	0.016	0.022	0.022	0.061
Noise level at 250 bar and (1450 rpm)	dB(A)	72	74	75	75	76	76	77
or 3600 psi and max. (1800 rpm) displacement (measured in a semianechoic room according to ISO 4412 measuring distance 1m)	dB(A)	75	78	79	79	80	80	82

3.1 General

Max. permissible drive/output torque

Description		Nominal size						
		045	**075**	**095**	**115**	**140**	**160**	**250**
Spline shaft (D) input	Nm	550	910	1200	1200	1700	1700	3100
	lbf ft	405	670	885	885	1250	1250	2285
Spline shaft (D) output	Nm	275	455	600	600	850	850	1550
	lbf ft	205	333	445	445	625	625	1145
Key shaft (K) input	Nm	280	460	650	650	850	850	1550
	lbf ft	205	340	480	480	630	630	1145
Spline shaft (S) input	Nm	500	500	1200	1200	1200	1200	1200
	lbf ft	370	370	885	885	885	885	885
Spline shaft (S) output [1]	Nm	275	455	600	600	850	850	1000
	lbf ft	205	335	445	445	625	625	740

[1] (theoretical) Drive torque must not be exeeded

3.2 Planning information for parameters

Determination of nominal sizes

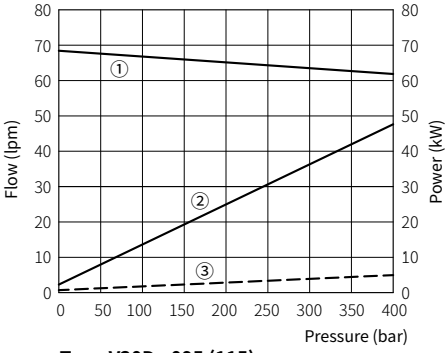
Delivery flow	$Q = \frac{V_g \cdot n \cdot \eta_V}{1000}$ (lpm)	V_g	= Geom. output volume (cm^3/rev.)
		Δp	= Differential pressure
Drive torque	$M = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}}$ (Nm)	n	= Rotation speed (rpm)
		η_V	= Volumetric efficiency
Drive power	$P = \frac{2\pi \cdot M \cdot n}{60000} = \frac{Q \cdot \Delta p}{600 \cdot \eta_t}$ (kw)	η_{mh}	= Mechanical-hydraulic efficiency
		η_t	= Overall efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

3.3 Characteristic curves

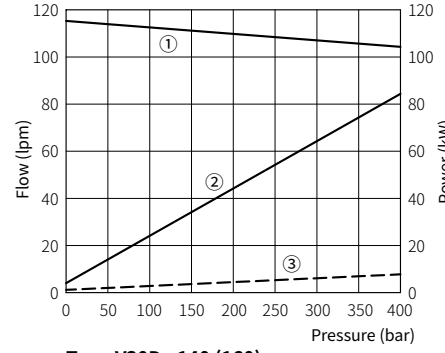
Delivery flow and power (basic pump)

The diagrams illustrate the delivery flow/pressure (without controller).
Required input power at max. swash angle and required input power when the pump is operating at "idling". Shaft speed: 1450 rpm

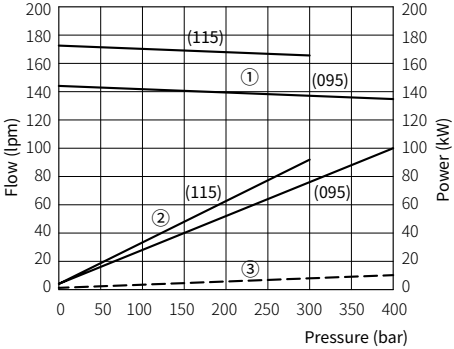
Type V30D - 045



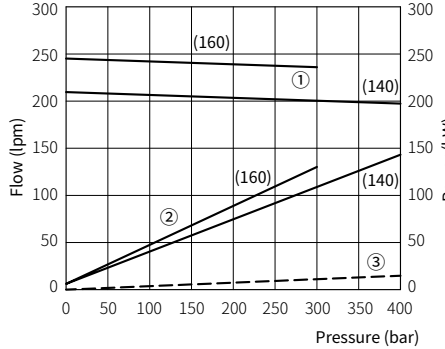
Type V30D - 075



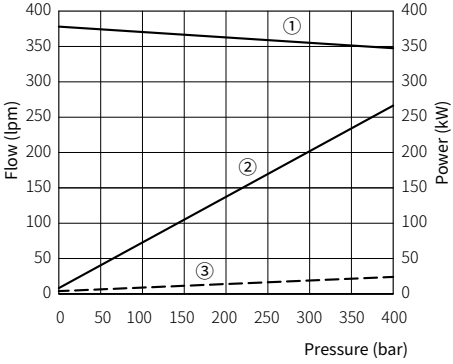
Type V30D - 095 (115)



Type V30D - 140 (160)



Type V30D - 250

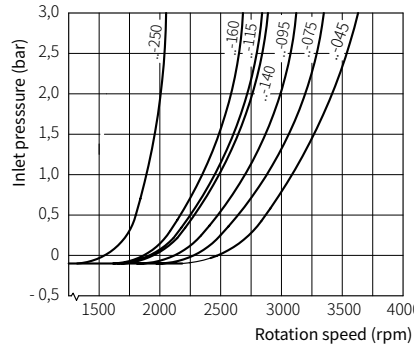


① Delivery flow/pressure
② Drive power/pressure
③ Drive power/pressure (zero stroke)

3.3 Characteristic curves

Inlet pressure and self-suction speed

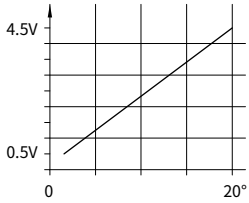
To avoid cavitation, it is essential to ensure that the pump inlet pressure always exceeds the min pressure shown in the diagram above.
The diagrams show the inlet pressure/speed at the max. swash plate angle and an oil viscosity of 75 mm^2/s.

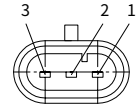


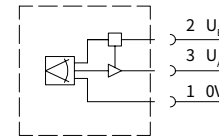
(0 bar relative = 1 bar absolute)

3.4 Swash angle pick-up

Swash angle pick-up (Hall sensor)





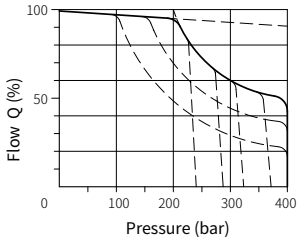


Operating voltage	U_B 10 to 30V DC
Output signal	U_A 0.5 to 4.5V
Tested for automotive field	DIN 40839
Test pulse	1, 2, 3 a/b
Field control	200 V/m
Electrical connection	3-PIN AMP
Superseal	1.5 plug

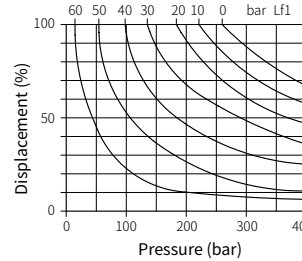
3.5 Controller characteristic curves

Coding L, Lf, Lf1

Pressure / flow



Pilot pressure

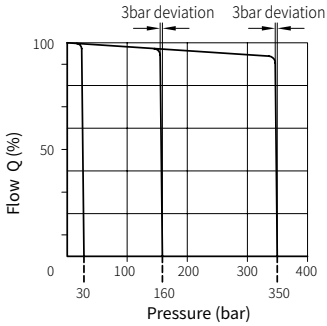


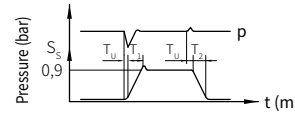
Lowest recommended torque setting: Valid only for version with power controller without additional combination

Coding	Nm (lbf ft)	Power kW/rpm (hp/rpm)
045	40 (29.5)	6 /1500 (10/1800)
075	70 (51.6)	11/1500 (18/1800)
095/115	99 (73.0)	15/1500 (25/1800)
140/160	146 (107.7)	22/1500 (37/1800)
250	271 (199.8)	41/1500 (69/1800)

Coding N, P, Pb

Pressure / flow

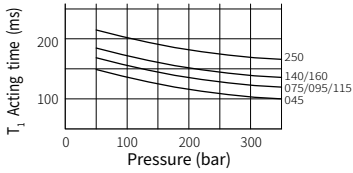




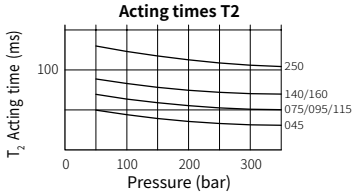
S_S	Positioning travel of actuator
T_U	Delay < 3 ms
T_1	On-stroke time
T_2	Destroke time
P	Pressure for hydraulic

Capacity 0.15 cm^3/bar (1.5 m pipe nom. dia. 20 mm)

Acting times T1

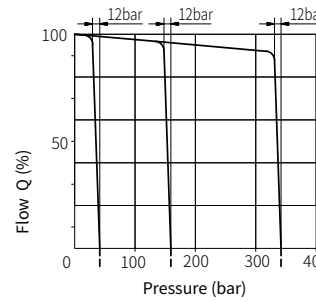


Acting times T2



Coding PD

Parallel pressure



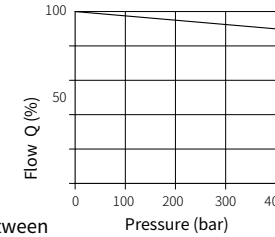
3.5 Controller characteristic curves

Codings Q, Qb, LS

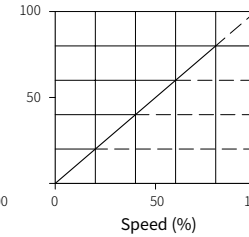
Calculation of flow Q:

Q	$= C \cdot A \sqrt{\Delta P}$ (lpm)
A	= Size of orifice (mm^2)
ΔP	= Pressure drop = 10 bar (LS = 30 bar)
	= 145 psi (LS = 435 psi)
C	= 0.6

Drive rotation speed constant



Speed varying



Caracteristics:

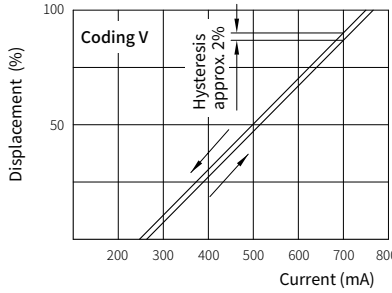
Accuracy with max. flow:

a) Speed "n" constant, pressure varying between 30 and 350 bar, (430 and 3600 psi): (< 3%)

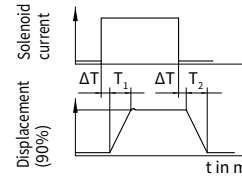
b) Pressure "p" constant, speed varying (< 1%)

Codings V, VH

Solenoid current /displacement

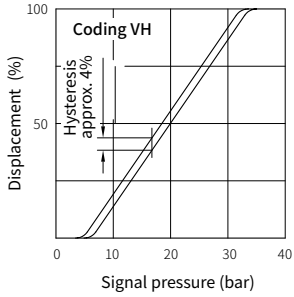


Acting times

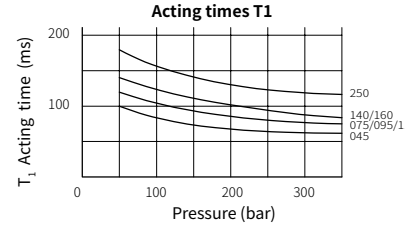


ΔT	Delay
T_1	On-stroke time
T_2	Destroke time

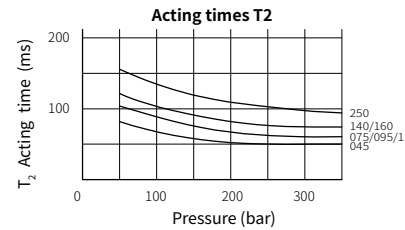
Signal pressure/displacement



Acting times T1



Acting times T2



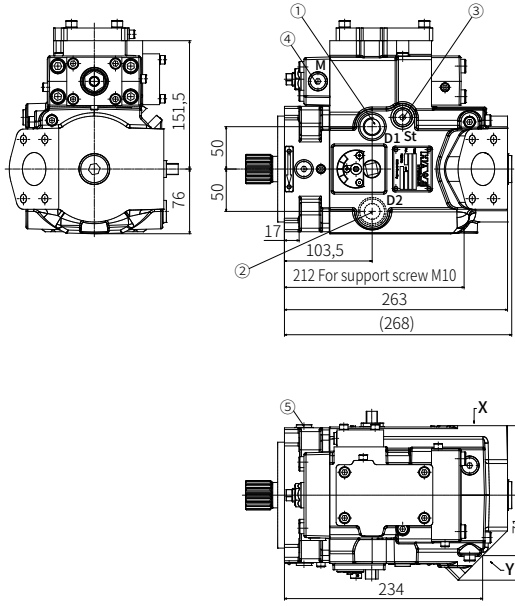
4 Dimensions

All dimensions in mm, subject to change!

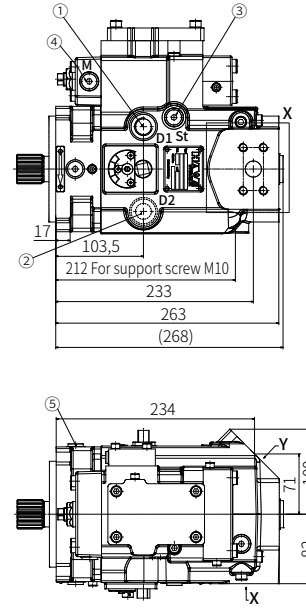
4.1 Basic pump

4.1.1 Type V30D-045

Rotating direction **clockwise**
(viewed from shaft journal)

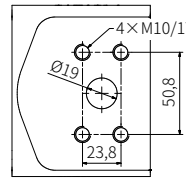


Rotating direction **anti-clockwise**
(viewed from shaft journal)

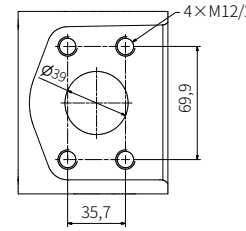


1, 2 Drain Port G1/2 (D1 / D2)
3 Auxilary pump conn. G 1/4 (St))
4 Measuring port G 1/4 (M)
5 Breather G 1/4

Pressure Port X
SAE 3/4" (6000 psi)



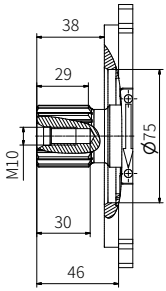
Suction Port Y
SAE 1 1/2" (3000 psi)



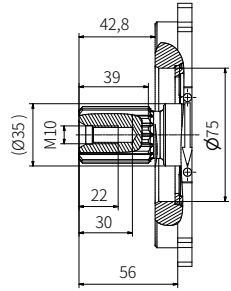
4.1.1 Type V30D-045

Shaft versions

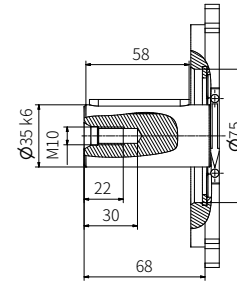
Spline shaft
Coding D
(DIN 5480 35×2×16×9g)



Spline shaft
Coding S
(SAE-C 14T - 12/24DP)

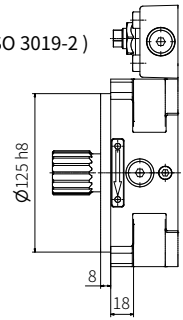


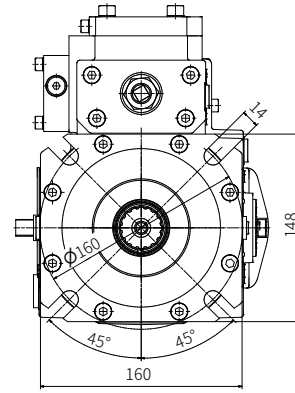
Key shaft
Coding K
(DIN 6885 Ø35 - 10×8×56)



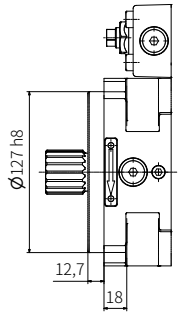
Flange versions

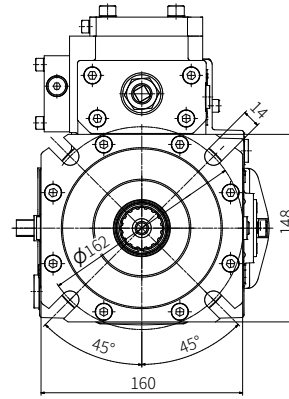
Coding G
(Flange ISO 3019-2)





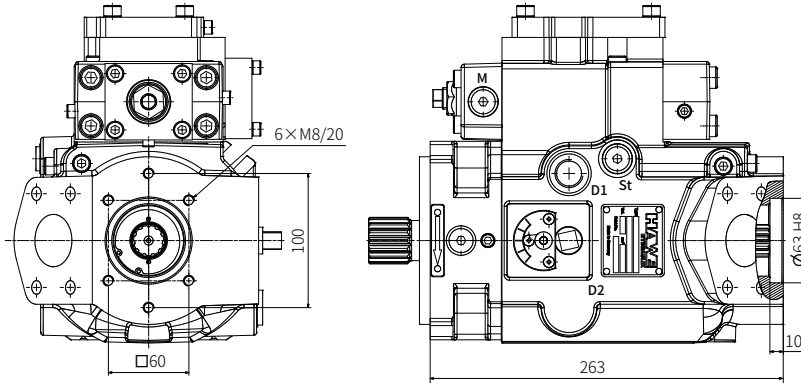
Coding F
(Flange SAE-C 4-hole 14T-12/24 DP)





4.1.1 Type V30D-045

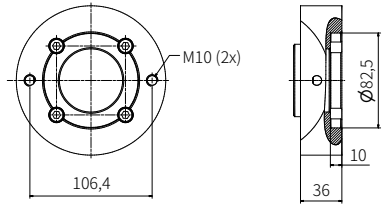
Housing version -2 (radial ports, with thru-shaft)



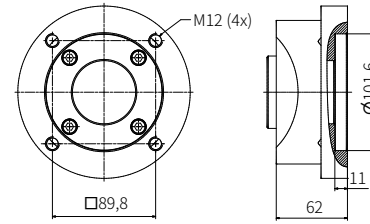
4.1.1 Type V30D-045

Flange version (output side)

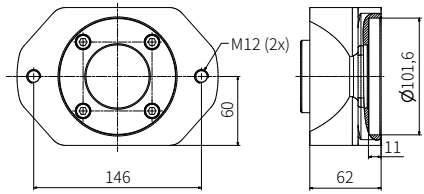
Coding C411; C412; C413
(SAE-A 2-hole)



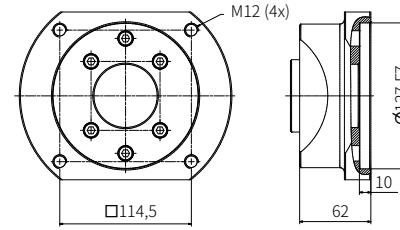
Coding C415
(SAE-B 4-hole)



Coding C414 and C416
(SAE-B 2-hole / SAE-BB 2-hole)

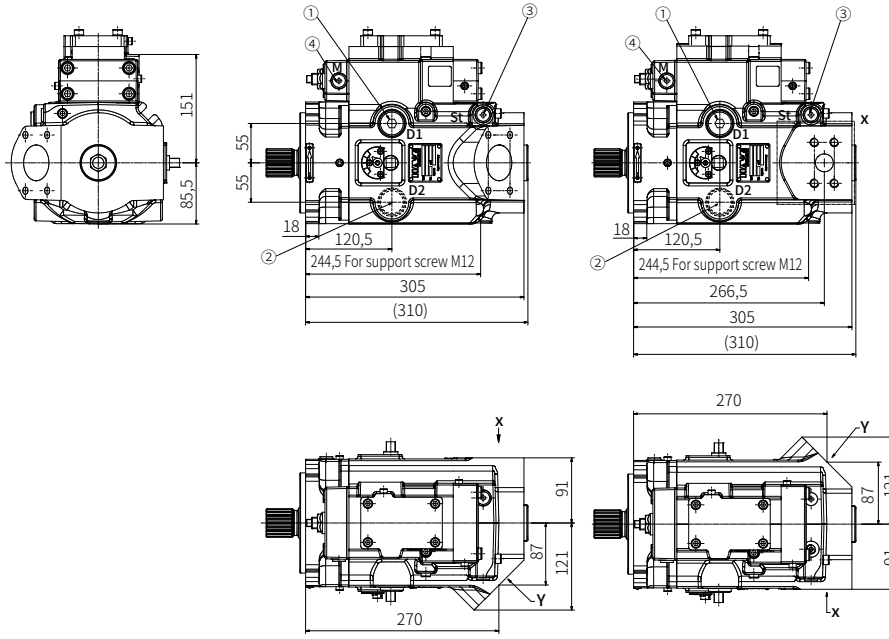


Coding C418
(SAE-C 4-hole)



4.1.2 Type V30D-075

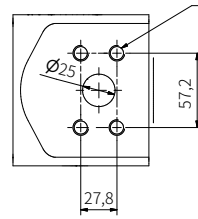
Rotating direction **clockwise**
(viewed from shaft journal)



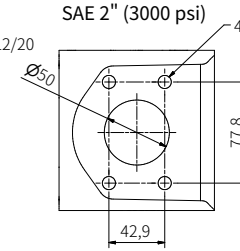
Rotating direction **anti-clockwise**
(viewed from shaft journal)

1, 2 Drain Port G1/2 (D1 / D2)
3 Auxilary pump conn. G 1/4 (St))
4 Measuring port G 1/4 (M)
5 Breather G 1/4

Pressure Port X
SAE 1" (6000 psi)



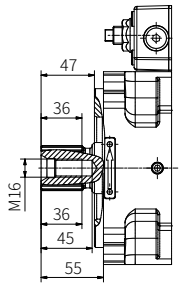
Suction Port Y
SAE 2" (3000 psi)



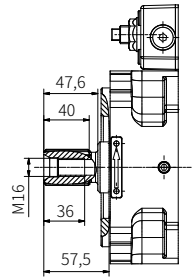
4.1.2 Type V30D-075

Shaft versions

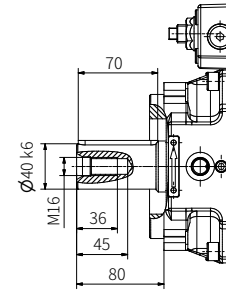
Spline shaft
Coding D
(DIN 5480 W40×2×18×9g)



Spline shaft
Coding S
(SAE-C 14T - 12/24 DP)

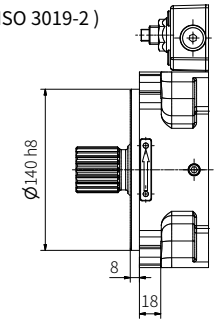


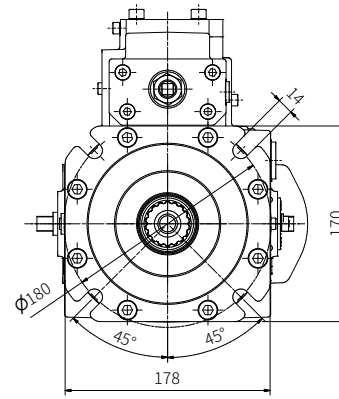
Key shaft
Coding K
(DIN 6885 Ø40 - 12×8×70)



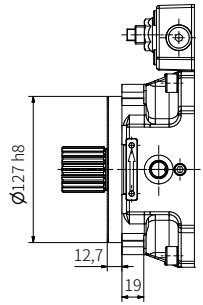
Flange versions

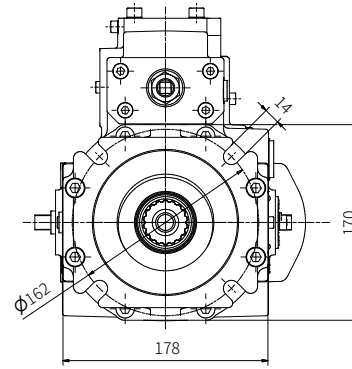
Coding G
(Flange ISO 3019-2)





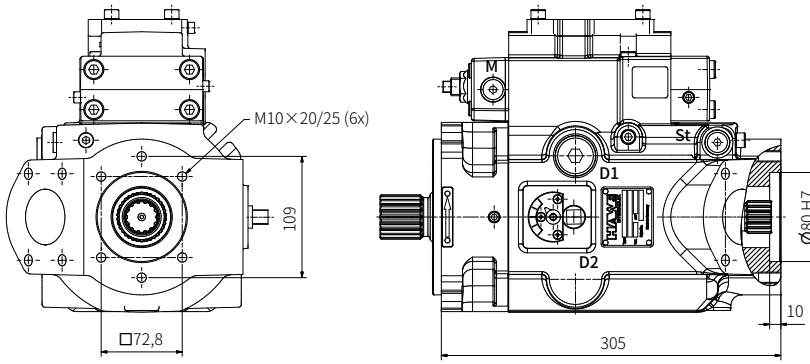
Coding F
(Flange SAE-C 4-hole 14T-12/24 DP)





4.1.2 Type V30D-075

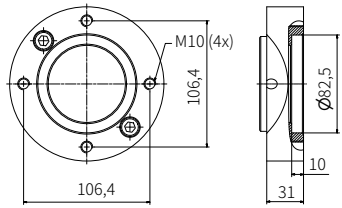
Housing version -2 (radial ports, with thru-shaft)



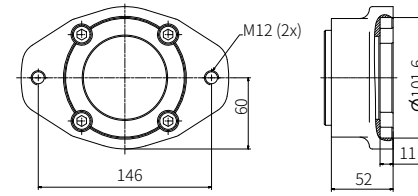
4.1.2 Type V30D-075

Flange version (output side)

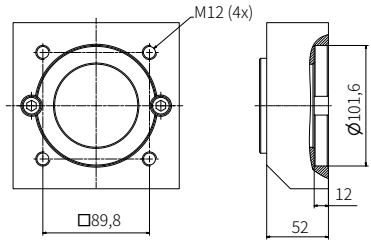
Coding C421; C4422; C423
(SAE-A 2 hole)



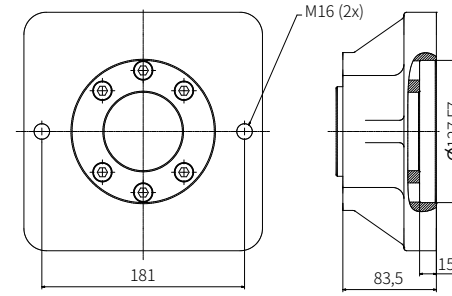
Coding C424 and C426
(SAE-B 2 hole / SAE-BB 2 hole)



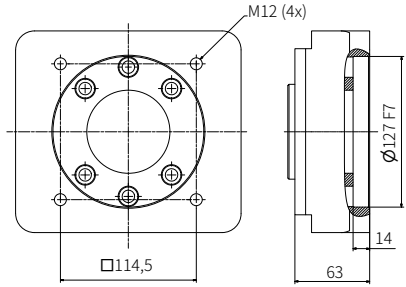
Coding C425
(SAE-B 4 hole)



Coding C427
(SAE-C 2 hole)

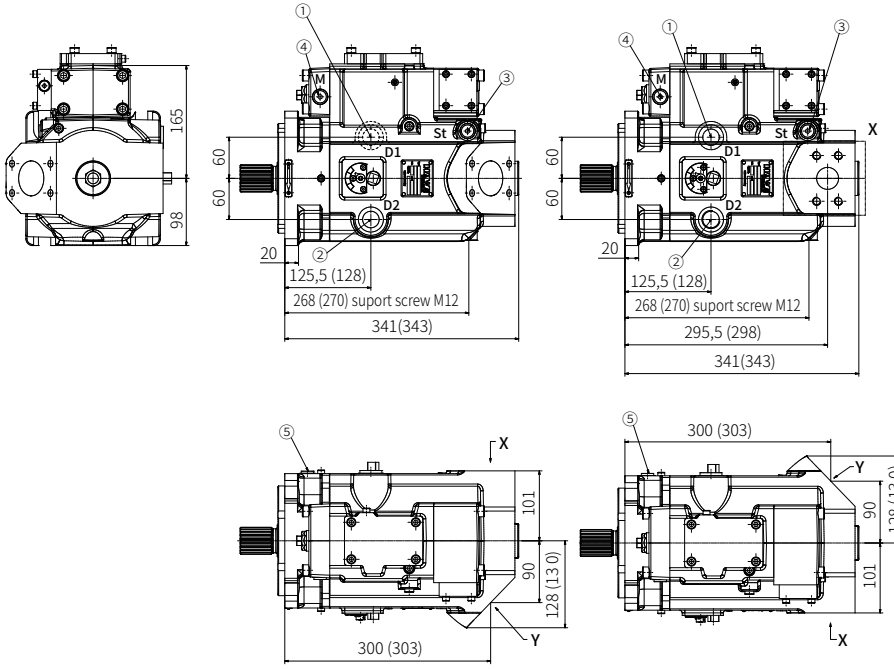


Coding C428
(SAE-C 4 hole)



4.1.3 Type V30D-095 (115)

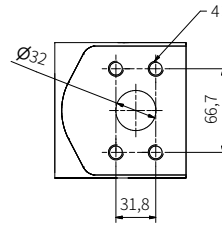
Rotating direction **clockwise**
(viewed from shaft journal)



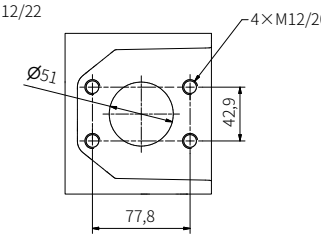
Rotating direction **anti-clockwise**
(viewed from shaft journal)

1，2 Drain Port G3/4" (D1 / D2)
3 Auxilary pump conn. G 1/4 (St))
4 Measuring port G 1/4" (M)
5 Breather G 1/4

Pressure Port X
SAE 1 1/4" (6000psi)



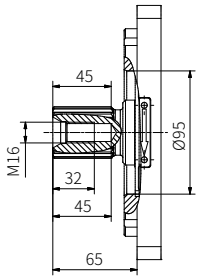
Suction Port Y
SAE 2" (3000psi)



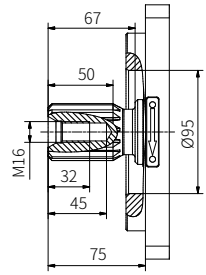
4.1.3 Type V30D-095 (115)

Shaft versions

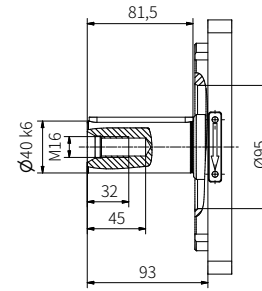
Spline shaft
Coding D
(DIN 5480 W40×2×18×9g)



Spline shaft
Coding S
(SAE-D 13T-8/16 DP)

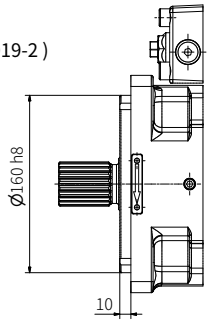


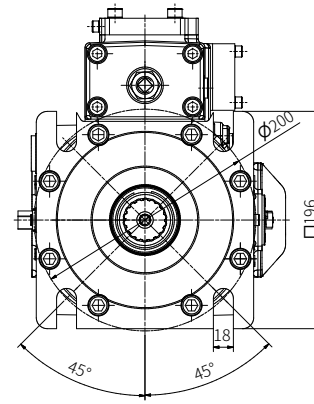
Key shaft
Coding K
(DIN 6885 12×8×80)



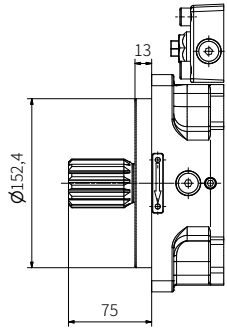
Flange versions

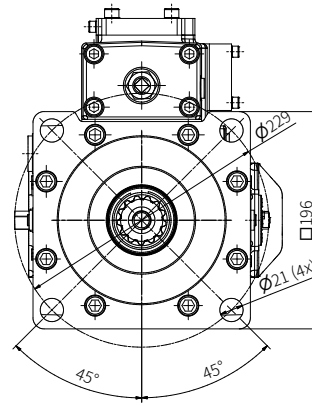
Coding G
(Flange ISO 3019-2)





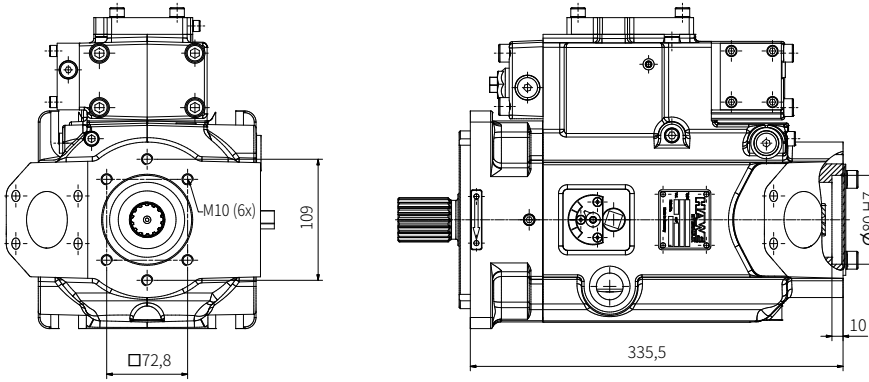
Coding F
(Flange SAE-D 4-hole 13T - 8/16 DP)





4.1.3 Type V30D-095 (115)

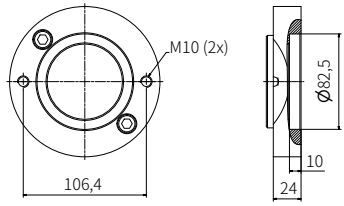
Housing version -2 (radial ports, with thru-shaft)



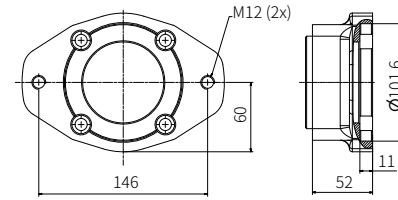
4.1.3 Type V30D-095 (115)

Flange version (output side)

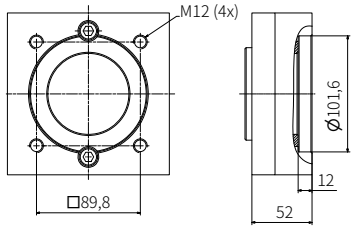
Coding C431 (C441) ; C432 (C442); C433 (C443)
(SAE-A 2-hole)



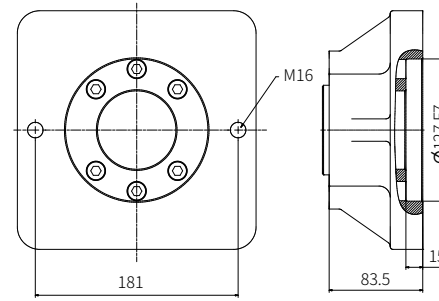
Coding C434 (C444) and C436 (C446)
(SAE-B 2 hole / SAE-BB-2 hole)



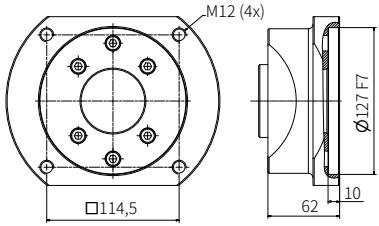
Coding C435 (C445)
(SAE-B 4-hole)



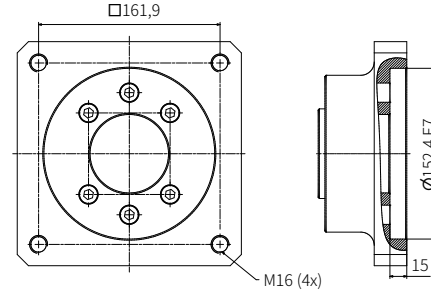
Coding C437 (C447)
(SAE-C 2-hole)



Coding C438 (C448)
(SAE-C 4-hole)

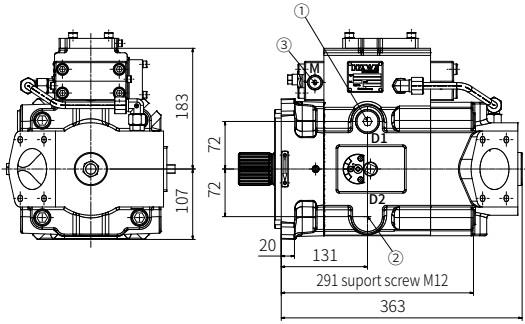


Coding C440 (C450)
(SAE-D)

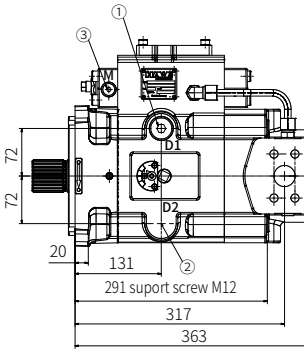


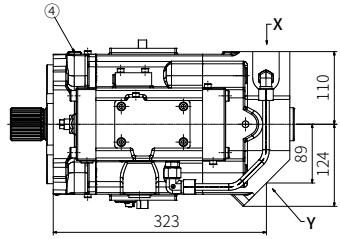
4.1.4 Type V30D-140 (160)

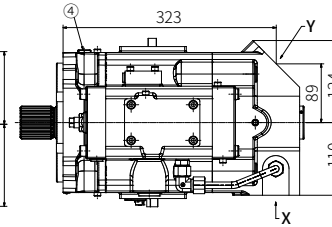
Rotating direction **clockwise**
(viewed from shaft journal)



Rotating direction **anti-clockwise**
(viewed from shaft journal)

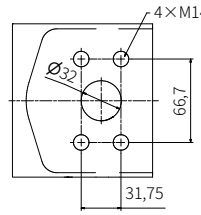




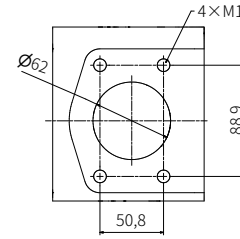


1，2 Drain Port G3/4" (D1 / D2)
3 Measuring port G 1/4" (M)
4 Breather G 1/4

Pressure Port X
SAE 1 1/4" (6000psi)



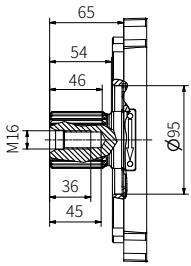
Suction Port Y
SAE 2 1/2" (3000psi)



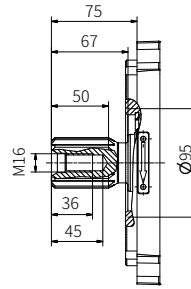
4.1.4 Type V30D-140 (160)

Shaft versions

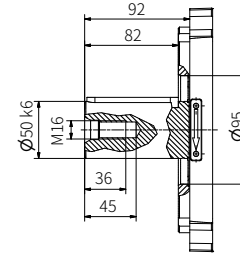
Spline shaft
Coding D
(DIN 5480 W50×2×24×9g)



Spline shaft
Coding S
(SAE-D 13T - 8/16 DP)

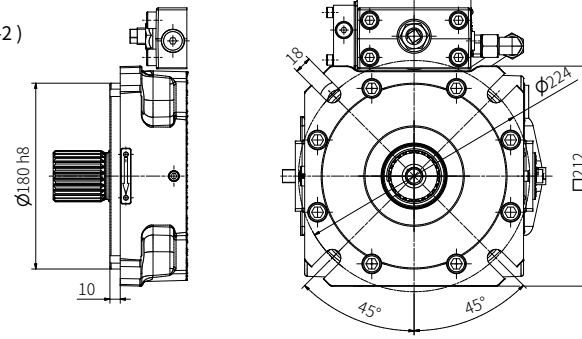


Key shaft
Coding K
(DIN 6885 14×9×80)

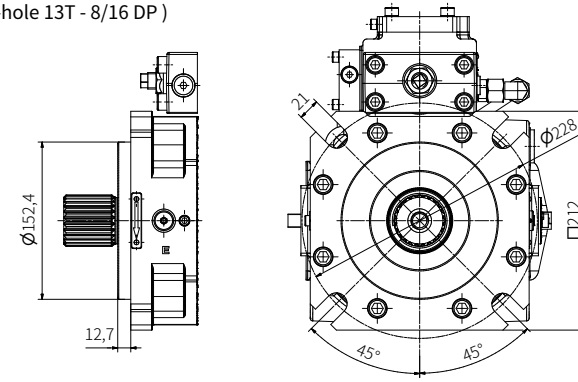


Flange versions

Coding G
(Flange ISO 3019-2)

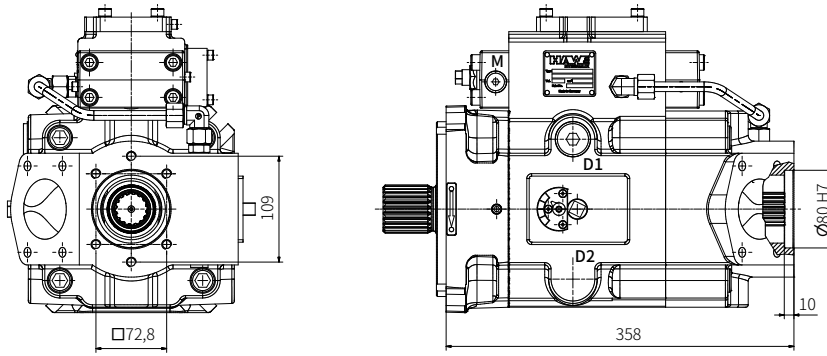


Coding F
(Flange SAE-D 4-hole 13T - 8/16 DP)



4.1.4 Type V30D-140 (160)

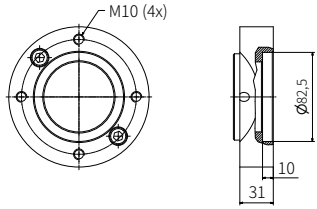
Housing version -2 (radial ports, with thru-shaft)



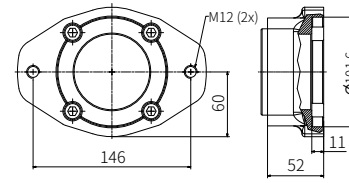
4.1.4 Type V30D-140 (160)

Flange version (output side)

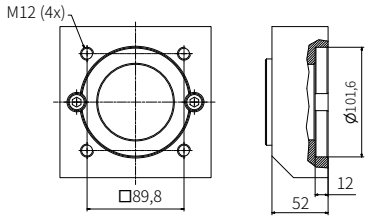
Coding C451 (C461) ; C452 (C462); C453 (C463)
(SAE-A 2-hole)



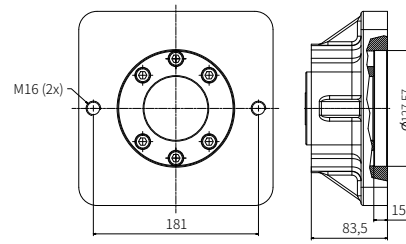
Coding C454 (C464) and C456 (C466)
(SAE-B - 2hole / SAE-BB - 2hole)



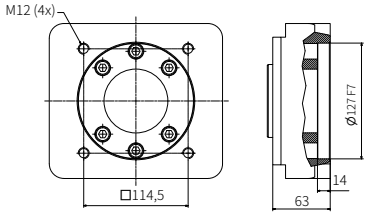
Coding C455 (C465)
(SAE-B 4-hole)



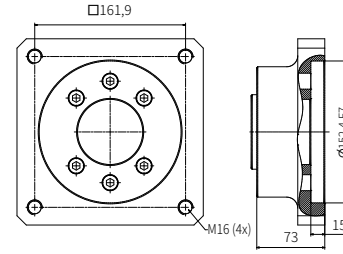
Coding C457 / C459 (C467 / C469)
(SAE-C 2-hole / SAE-CC 2-hole)



Coding C458 (C468)
(SAE-C 4-hole)

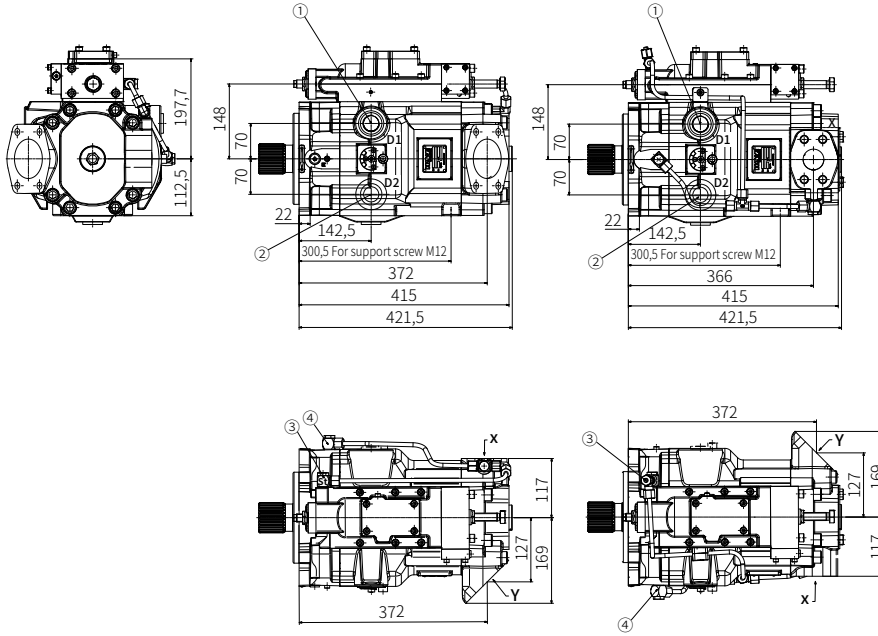


Coding C460 (C470)
(SAE-D)



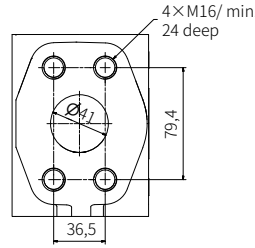
4.1.5 Type V30D-250

Rotating direction **clockwise** (viewed from shaft journal)

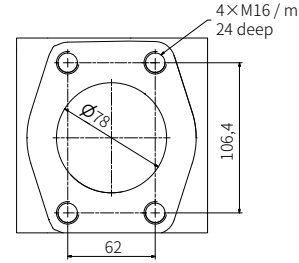


1，2 Drain Port M33×2 (D1 / D2)
3 Auxilary pump conn. Pipe 8 (St)
4 Breather G 1/4

Pressure Port X
SAE1 1/2" (6000 psi)



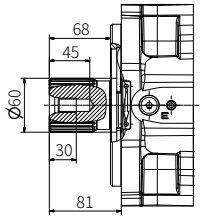
Suction Port Y
SAE 3" (3000 psi)



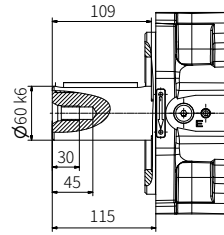
4.1.5 Type V30D-250

Shaft versions

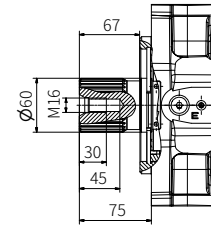
Spline shaft
Coding D
(DIN 5480 W60×2×28×9g)



Key shaft
Coding K
(DIN 6885 18×11×100)

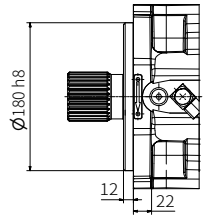


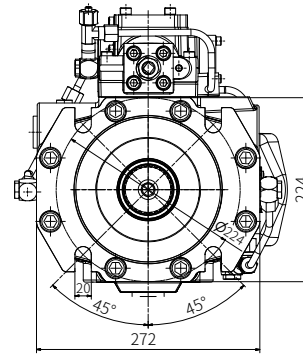
Spline shaft SAE
Coding U
(SAE-D 13T - 8/16 DP)



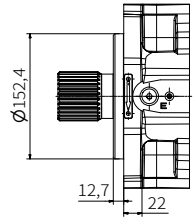
Flange versions

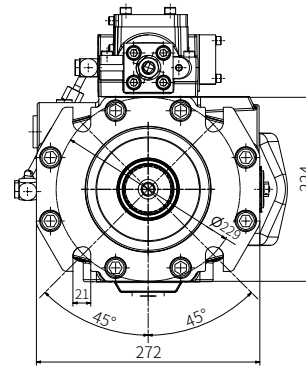
Coding G
(Flange ISO 3019-2)





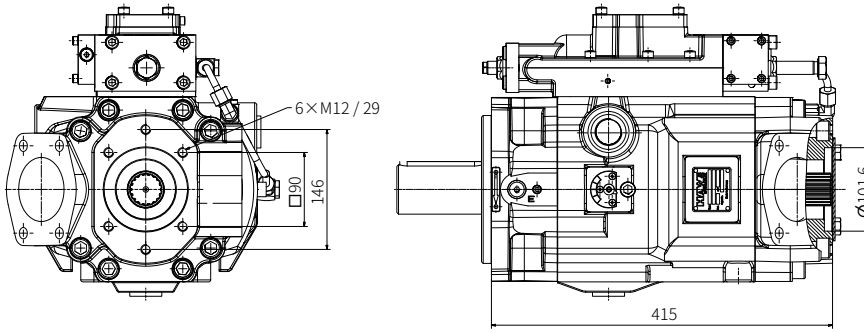
Coding W
(Flange SAE-D 13T - 8/16 DP)





4.1.5 Type V30D-250

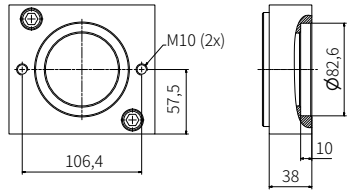
Housing version -2 (radial ports, with thru-shaft)



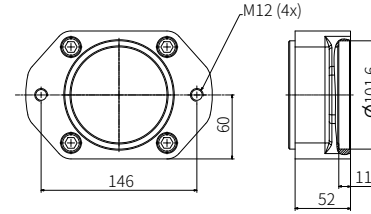
4.1.5 Type V30D-250

Flange version (output side)

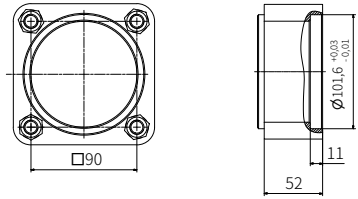
Coding C471; C472; C473
(SAE-A 2 hole)



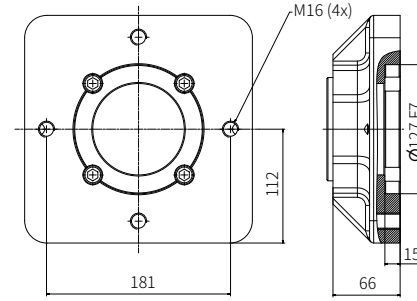
Coding C474; C476
(SAE-B 2 hole / SAE-BB 2 hole)



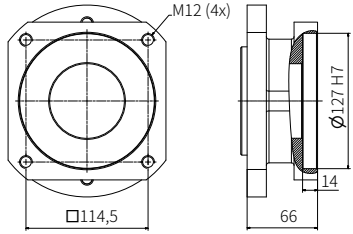
Coding C475
(SAE-B 4-hole)



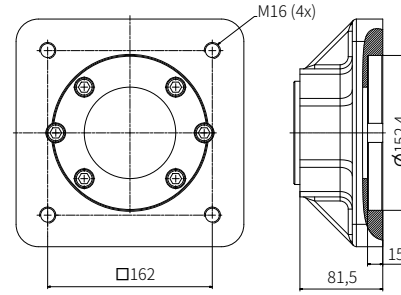
Coding C477,479
(SAE-C 2 hole / SAE-CC 2 hole)



Coding C478
(SAE-C 4-hole)

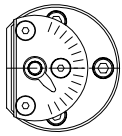


Coding C480
(SAE-D)

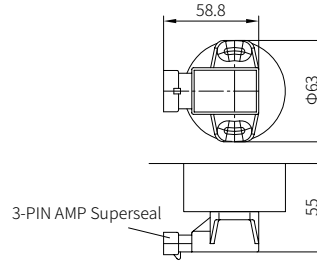


4.2 Pivoting angle indicator

Pivoting angle indicator

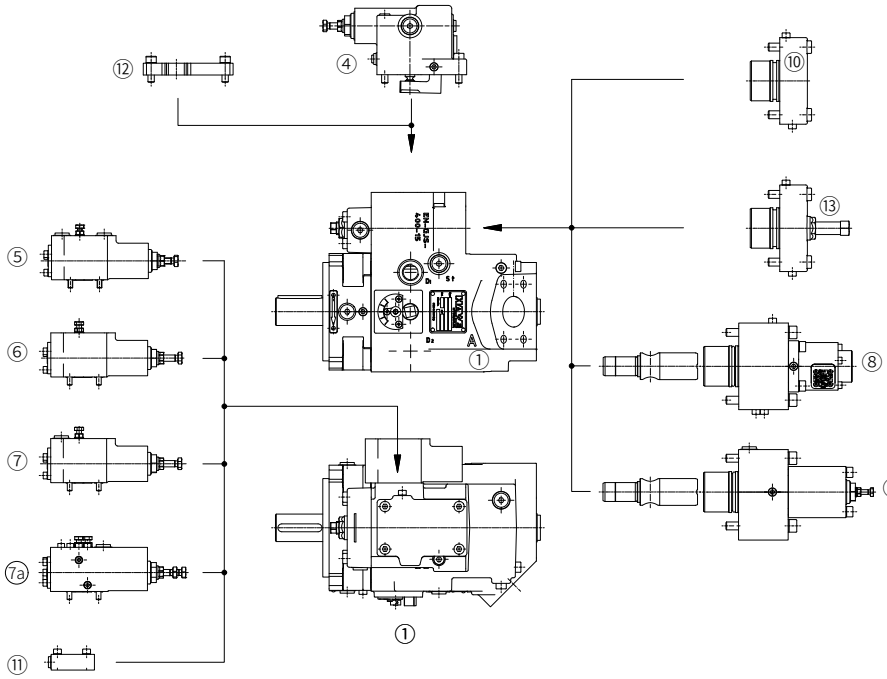


With pivoting angle pick-up (Hall sensor)



4.3 Controller

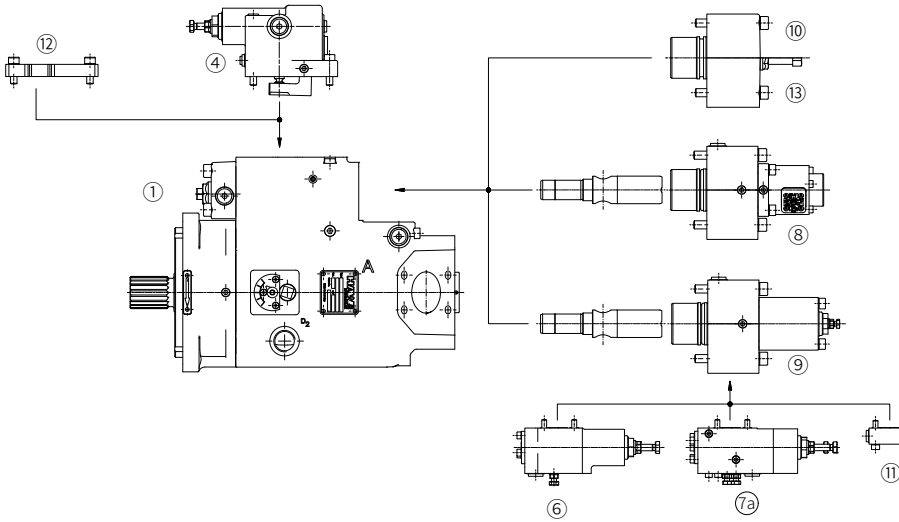
V30D-045/-075/-140/-160



1 Pump
2 Adaptor for controller L
3 Adaptor for all other controllers (standard)
4 Controller L, LF1
5 Controller N
6 Controller Qb
7 Controller Q, P, LS
7a Controller LSN
8 Controller V
9 Controller VH
10 Blanking, when without V or VH
11 Blanking, when without N, P, Q, Qb, LS, LSN
12 Blanking, when without L
13 Blanking, when without V or VH but with stroke limitation

4.3 Controller

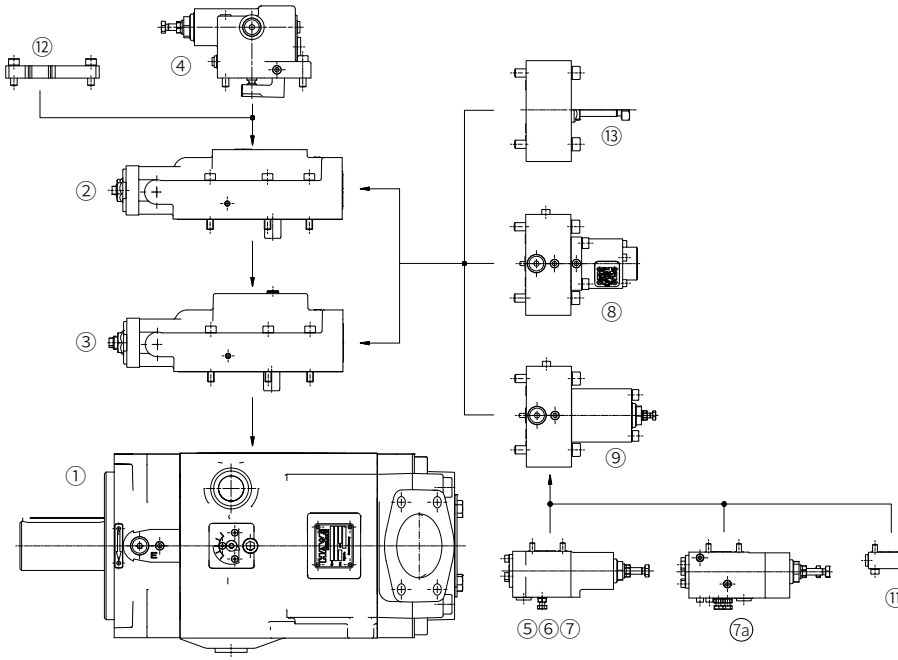
V30D-095



1 Pump
2 Adaptor for controller L
3 Adaptor for all other controllers (standard)
4 Controller L, LF1
5 Controller N
6 Controller Qb
7 Controller Q, P, LS
7a Controller LSN
8 Controller V
9 Controller VH
10 Blanking, when without V or VH
11 Blanking, when without N, P, Q, Qb, LS, LSN
12 Blanking, when without L
13 Blanking, when without V or VH but with stroke limitation

4.3 Controller

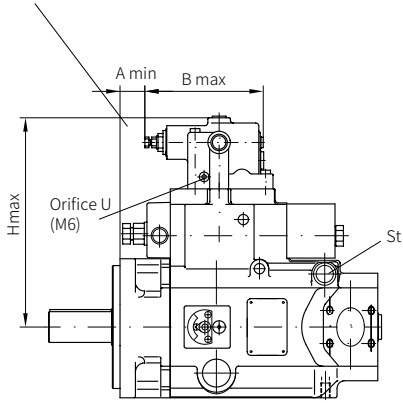
V30D-250



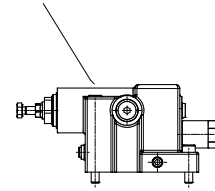
1 Pump
2 Adaptor for controller L
3 Adaptor for all other controllers (standard)
4 Controller L, LF1
5 Controller N
6 Controller Qb
7 Controller Q, P, LS
7a Controller LSN
8 Controller V
9 Controller VH
10 Blanking, when without V or VH
11 Blanking, when without N, P, Q, Qb, LS, LSN
12 Blanking, when without L
13 Blanking, when without V or VH but with stroke limitation

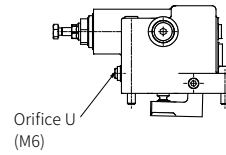
4.3 Controller

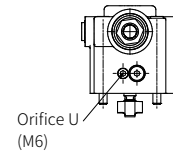
Coding L

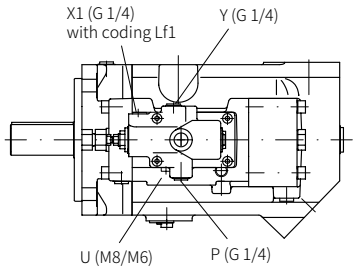


Coding Lf1









(G = BSPP)

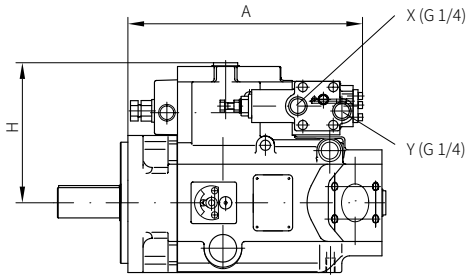
For missing dimensions, see basic pump Chapter 4.1!

Basic type	A mm(in)	B mm(in)	H mm(in)
045	3.5 (0.14)	159 (6.26)	247 (9.7)
075	14.5 (0.57)	169 (6.65)	258 (10.2)
095/115	18.5 (0.73)	169 (6.65)	262 (10.3)
140/160	24.5 (0.96)	169 (6.65)	278 (10.9)
250	55.5 (2.19)	169 (6.65)	293 (11.5)

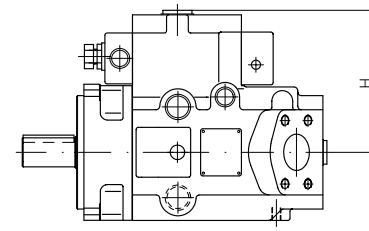
4.3 Controller

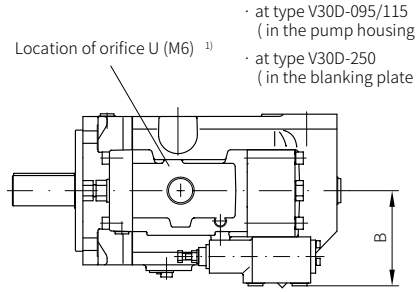
Coding N, P, Pb, Q, Qb, LS and LSN

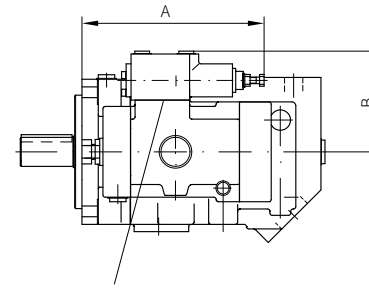
Type V30D-095/115
Type V30D-250



Type V30D - 045
Type V30D - 075
Type V30D - 140/160







(G = BSPP)

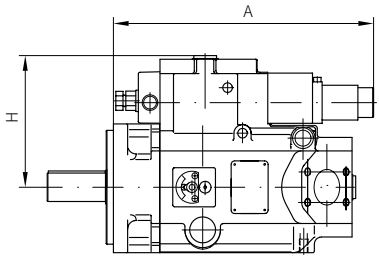
For missing dimensions, see basic pump Chapter 4.1!

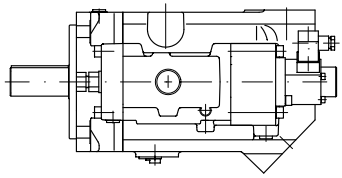
1) at version without power controller

Basic type	A mm(in)	H mm(in)	B mm(in)
045	208 (8.19)	157 (6.18)	117 (4.60)
075	224 (8.82)	171 (6.73)	117 (4.60)
095/115	307 (12.1)	185 (7.28)	120 (4.72)
140/160	240 (9.44)	191 (7.52)	118 (4.64)
250	365 (14.4)	209 (8.23)	122 (4.80)

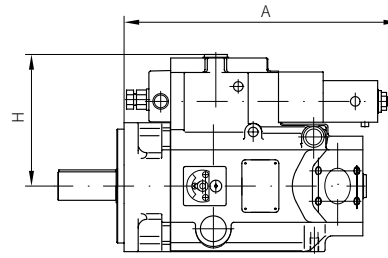
4.3 Controller

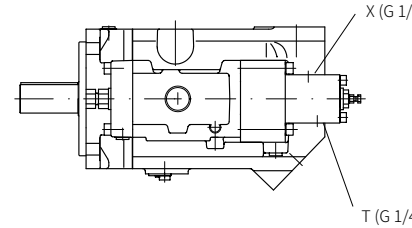
Coding V





Coding VH





(G = BSPP)

For missing dimensions, see basic pump Chapter 4.1!

Basic type	A mm(in)	H mm(in)
045	319 (12.56)	157 (6.18)
075	351 (13.82)	171 (6.73)
095/115	362 (14.25)	185 (7.28)
140/160	371 (14.61)	191 (7.52)
250	419 (16.49)	209 (8.22)

Basic type	A mm(in)	H mm(in)
045	338 (13.31)	157 (6.18)
075	371 (14.65)	171 (6.73)
095/115	381 (15.00)	185 (7.28)
140/160	390 (15.35)	191 (7.52)
250	438 (17.24)	209 (8.22)

4.4 Pump combinations

4.4.1 Tandem pumps

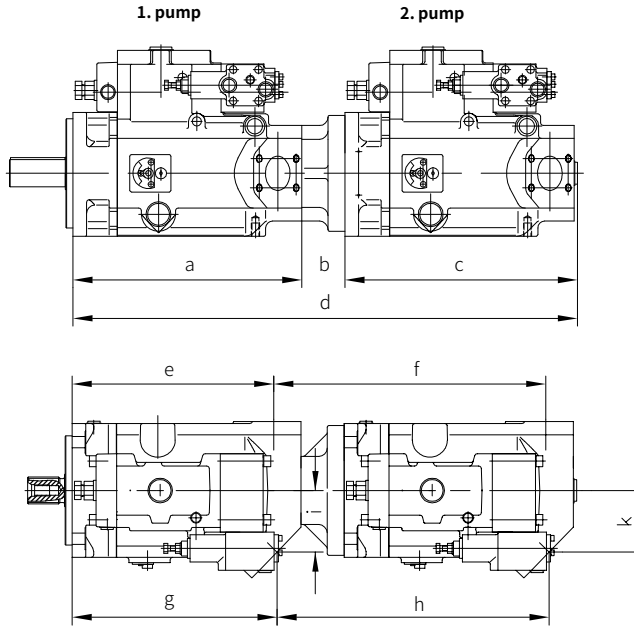
Two variable displacement axial piston pumps can be linked via an intermediate flange.
Available are shaft design "D" and "S".
Same controller range as for individual pumps.

Order coding example

V30D-140RDGN-2-1-XX/LLSN-2/120Nm-200bar-C514 ① : **1st pump**

V30D-140RDGN-2-1-XX/LLSN-2/120Nm-200bar ② : **2nd pump**

For type coding key, see Chapter 2



4.4 Tandem pumps

Table of dimensions

1st pump	**V30D-045**									
2nd pump	a	b	c	d	e	f	g	h	i	k
V30D-045	263	62	268	593	233	325	234	325	71	71

1st pump	**V30D-075**									
2nd pump	a	b	c	d	e	f	g	h	i	k
V30D-045	305	63	268	636	267	334	270	332	87	71
V30D-075	305	63	310	676	267	368	270	368	87	87

1st pump	**V30D-140 (160)**									
2nd pump	a	b	c	d	e	f	g	h	i	k
V30D-045	358	63	268	689	317	337	323	332	89	71
V30D-075	358	63	310	731	317	371	323	368	89	87
V30D-095 (115)	358	63	341	762	317	400	323	398	89	90
V30D-140 (160)	358	84	363	805	317	442	323	442	89	89

1st pump	V30D-095 (115)									
2nd pump	a	b	c	d	e	f	g	h	i	k
V30D-045	336	63	268	667	296	336	300	333	90	71
V30D-075	336	63	310	709	296	369	300	369	90	87
V30D-095 (115)	336	63	341	740	296	399	300	399	90	90

1st pump	**V30D-250**									
2nd pump	a	b	c	d	e	f	g	h	i	k
V30D-045	415	60	268	743	366	342	372	337	127	71
V30D-075	415	60	310	785	366	376	372	373	127	87
V30D-095 (115)	415	75	341	831	366	420	372	418	127	90
V30D-140 (160)	415	87	363	865	366	453	372	453	127	89
V30D-250	415	87	431	933	366	502	372	502	127	127

There are additionally several other combination possibilities via the SAE-flange. This enables direct connection of an auxiliary pump (e.g. gear pump).