InLine

V30G series

Heavy Duty Piston Pump

Open circuit

Nominal pressure p_{nom}: 420 bar

Peak pressure p_{max}: 450 bar

Geometric displacement V_{max}: 110~280 cm^3/rev

2022-04

Hengli InLine Hydraulik GmbH is located in Berlin, Germany. In 2015, Hengli Hydraulics wholly-owned the InLine hydraulic factory, dedicated to providing customers with high-performance heavy-duty piston pumps for various applications.

The company has 70 years of experience in the design and manufacture of axial piston pumps. The products are known for sturdy construction, heavy load capability and high reliability. With wide range of controllers, the InLine products can meet the needs of various applications and are now widely used in mechanical equipment such as mobile cranes, rotary drills, shield machines, concrete pump, dredgers, and industrial hydraulic systems such as forging presses and extrude presses.

Kaemper & Demag

In the 1950s, Kämper began working with the German company DEMAG to manufacture hydraulic products, pumps and valves.

Bellows Valvair

In the 1960s, The American company Bellows Valvair extended its production to focus on successful and innovative axial piston pumps.

VOLVO

In 1973, VOLVO took over the company and with the V30B and V30D set new standards for reliability and service life.

VOAC

In the context of the merger between VOLVO and Atlas Copco, the Berlin company also began supplying its products under the new label VOAC.

HAWE

In 1999, HAWE Hydraulik from Munich takes over the company and immediately begins to expand the product range, including the typical V60N and V30E pumps for mobile applications.

HAWE InLine & Hengli

In 2015, HAWE and Hengli establish worldwide cooperation, under which Hengli takes over management of production in Berlin.

InLine Changzhou

In 2016, Changzhou InLine established a subsidiary in Changzhou, China, focusing on after-sales and application consultant service for customers from Chinese market.

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1 Overview: variable displacement axial piston pump types V30G

InLine Hydraulik GmbH has 70 years for heavy-load piston pump in R&D and manufacturing. Based on the V30D and V30E series of axial piston variable pumps, the new generation of V30G series products developed and can help machinery and equipment cope with various harsh working conditions.

The V30G series pump has a high working pressure, the nominal pressure can reach 420 bar, and the peak pressure can reach 450 bar. The spherical flow distribution built-in booster impeller increases the nominal rotational speed of the pump by 10%, which is very suitable for high rotational speed work.

This series of pumps can integrate an angular displacement sensor, which can monitor the swing angle of the pump in real time, and realize the closed-loop control of the flow through the controller, so as to more accurately control the output flow of the pump to match the system requirements. Use a low-noise shell, and optimize the distribution plate structure at the same time. With the two-pronged approach, the noise of the pump is reduced by an average of 2dB compared with the previous generation, which is more suitable for the low noise requirements of the hydraulic components of the whole machine.

In addition, the heavy-load bearing and main shaft design of the V30G series pumps, through-shaft transmission, can adapt to high torque working conditions such as multiple pumps in series.

Features and benefits:

- High continuous pressure
- Effectively reduce the amount of hysteresis, high control accuracy
- Low noise
- Compact design to achieve a breakthrough in higher power density ratio
- High efficiency

Intended applications:

- Mobile cranes
- Drilling rigs
- Tunnel boring machine
- Concrete pump
- Dredgers
- Forging presses
- Extrude presses

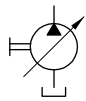
V30G 280

Variable displacement axial piston pump

2 Available versions, main data

2.1 Basic version

Circuit symbol:



Order coding example:

V30G	L	205	R	D1	F	V	2	/LRDRE1	-A1	-XX

Internal coding

Flange version
Table 8: Flange version (output side)

Controller
Table 7: Controller

Additional function
Table 6: Additional functions

Seal
Table 5: Seals

Flange version
Table 4: Flange version (input side)

Shaft version
Table 3: Shaft version

Rotating direction
Table 2: Rotating direction

Nominal size
Table 1: Nominal size

With charge pump

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)
110	110	420	450
145	145	420	450
160	160	420	450
205	205	420	450
280	280	420	450

Table 2: Rotating direction

Coding	Description	Displacement				
		110	145	160	205	280
L	Anti-clockwise *	○	○	○	○	●
R	Clockwise *	●	●	●	●	●

Note: "* "mean is facing the drive shaft. ● = Available ○ = Under development

Table 3: Shaft version

Coding		Designation/Standard	Max. drive torque (Nm)
"D" type spline shaft	D1	W50×2×24×9g DIN5480 (V30G 145, V30G 160, V30G 205)	1500
	D2	W60×2×28×9g DIN5480 (V30G 280)	2800
"S" type spline shaft	S6	13T 8/16DP (V30G 110, V30G 145, V30G 205)	1600
	S7	15T 8/16DP (V30G 145, V30G 205)	2600
"K" type straight shaft	K1	Φ45 A 14×9×80 DIN6885 (V30G 110)	1050
	K2	Φ50 A 14×9×80 DIN6885 (V30G 145, V30G 160)	1450
	K3	Φ55 A 16×10×100 DIN6885 (V30G 205)	2200
	K4	Φ60 A 18×11×110 DIN6885 (V30G 280)	2750

Table 4: Flange version (input side)

Coding	Description	Designation
F	Flange	SAE J744 152-4 (V30G 110, V30G 145, V30G 160)
		SAE J744 165-4 (V30G 205, V30G 280)

Table 5: Seal

Coding	Description
V	FKM, permissible temperature range -25°C ~ 115°C (standard)
N	NBR, including the shaft seal is completely made of nitrile rubber, permissible temperature range -40°C ~ 90°C (optional)

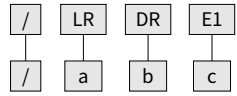
2.1 Basic version

Table 6: Additional functions, pivoting angle indicator

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

Table 7: Controller

Take controller [/LRDRE1] as an example:



Control type			Code	Geometric displacement				
				110	**145**	**160**	**205**	**280**
a	Power control	No power control	None	●	●	●	●	●
		Fixed setting	LR	●	●	●	●	●
		Electric proportional override (Positive electric proportional control, U=24V)	L1	●	●	●	●	●
b	Pressure cut-off	No pressure Cut-off	None	●	●	●	●	●
		Fixed setting	DR	●	●	●	●	●
		Pressure Cut-off + Load sensing	DS	●	●	●	●	●
c	Flow control	No flow control	None	●	●	●	●	●
		Load sensing	S0	●	●	●	●	●
		Electric proportional displacement, U=24V	E1	●	●	●	●	●

※ Priority combination of control modes, see Chapter 2.2 .

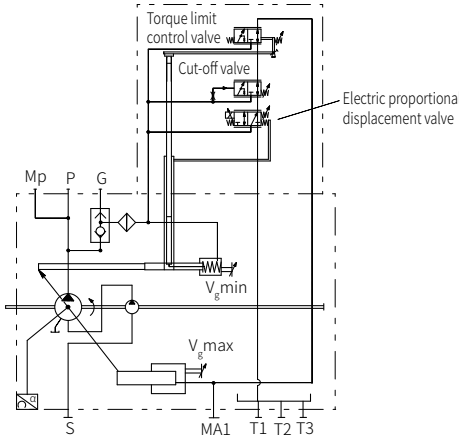
Table 8: Flange version (output side)

Structure type	Flange	Shaft
0	Without through drive	
A1	SAE-A 2-hole J744 82-2 ISO 3019-1	SAE A J744 (16-4 ISO 3019-1) 9T 16/32 DP
A2	SAE-A 2-hole J744 82-2 ISO 3019-1	SAE A-B J744 (19-4 ISO 3019-1) 11T 16/32 DP
B1	SAE-B 2-hole J744 101-2 ISO 3019-1	SAE B J744 (22-4 ISO 3019-1) 13T 16/32 DP
	SAE-B 4-hole J744 101-4 ISO 3019-1	SAE B J744 (22-4 ISO 3019-1) 13T 16/32 DP
B2	SAE-B 2-hole J744 101-2/4 ISO 3019-1	SAE B-B J744 (25-4 ISO 3019-1) 15T 16/32 DP
C1	SAE-C 2-hole J744 127-2 ISO 3019-1	SAE C J744 (32-4 ISO 3019-1) 14T 12/24 DP
C2	SAE-C 4-hole J744 127-4 ISO 3019-1	SAE C J744 (32-4 ISO 3019-1) 14T 12/24 DP
D1	SAE-D 4-hole J744 152-4 ISO 3019-1	SAE D&E J744 (44-4 ISO 3019-1) 13T 8/16 DP
D2	SAE-D 4-hole J744 152-4 ISO 3019-1	W45×2×21×9g DIN 5480
D3	SAE-D 4-hole J744 152-4 ISO 3019-1	W50×2×24×9g DIN 5480
E1	SAE-E 4-hole J744 165-4 ISO 3019-1	SAE F J744 (50-4 ISO 3019-1) 15T 8/16 DP
E2	SAE-E 4-hole J744 165-4 ISO 3019-1	W50×2×24×9g DIN 5480
E3	SAE-E 4-hole J744 165-4 ISO 3019-1	W60×2×28×9g DIN 5480

2.2 Controller switching symbols

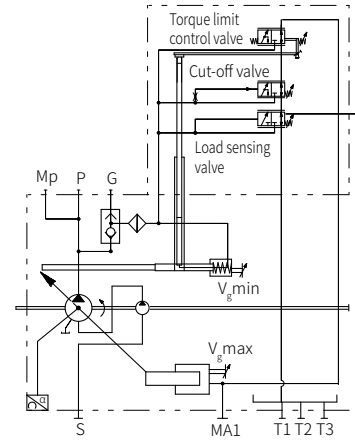
LRDRE1

Fixed setting, Electric proportional displacement,
Pressure Cut-off



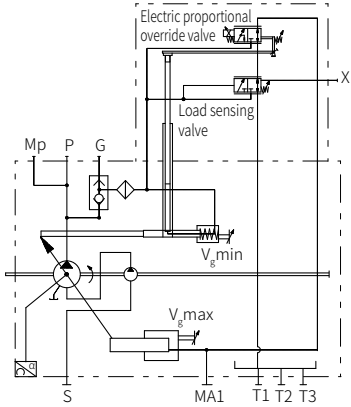
LRDS

Fixed setting, Pressure Cut-off,
Load sensing



L1S0

Electric proportional override,
Load sensing



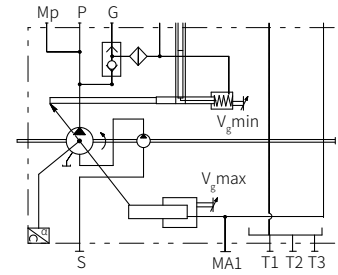
3 Parameters

3.1 General

Designation	Variable displacement axial piston pump
Design	The swash plate principle
Mounting	Flange mounting or foot bracket
Surface	Temporarily protected
Drive/output torque	See Chapter 3, "Parameters", under "Additional parameters"
Installation positions	Any (for installation information see Chapter 5, "Installation information")
Rotating direction	Clockwise or anti-clockwise
Ports	·Suction port ·Pressure port ·Drain port ·Pressure gauge connection
Hydraulic fluid	Hydraulic oil: according to DIN 51524 Part 1 to 3; ISO VG 10 to 68 according to DIN 51519 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 GmbH. Also suitable for biologically degradable pressure fluids type HEPG (polyalkalene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C .
Purity class	A cleanliness level of at least 20/18/15 is to be maintained according to ISO 4406. When the hydraulic fluid temperature is very high (90 °C to 115 °C maximum) at the drain port, a cleanliness level of at least 19/17/14 according to ISO 4406 is required.
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 .
Cold start	Viscosity: $v_{max} \leqslant 1600mm^2/s$, temperature: $\theta_{st} \geqslant 25°C$ Remarks: t ⩽ 3 minutes, no load (20bar ⩽ p ⩽ 50bar), n ⩽ 1000r/min。

Charge pump (impeller)

The booster pump is driven by the main shaft to replenish oil for the V30G pump, which can achieve a high operating speed, it is also suitable for cold start during low-temperatures and high-viscosity hydraulic oil. For the V30G oil pump that includes a booster pump, in most cases there is no need for additional compulsory oil replenishment (it is strictly forbidden to fill the oil tank with compressed air).



3.1 General

Additional parameters

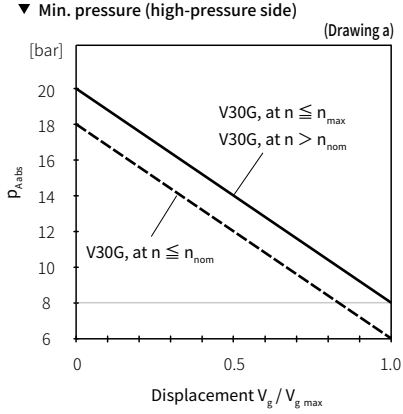
Designation			**110**	**145**	**160**	**205**	**280**
Max. swash plate angle		°	16	16	16.5	17	16.1
Min. inlet pressure (absolute) open circuit		bar	0.8	0.8	0.8	0.8	0.8
Minimum operating pressure		bar	Please see Drawing a				
Max. permissible housing pressure (static/dynamic)		bar	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3
Max. permissible inlet pressure (static/dynamic)		bar	20 / 30	20 / 30	20 / 30	20 / 30	20 / 30
Max. rotation speed, at V_{gmax} *	Without impeller	rpm	2400	2300	2200	2100	1800
	With impeller		—	2600	2500	2500	2150
Max. rotation speed, at $V_g < V_{gmax}$		rpm	Please see Drawing b				
Min. rotation speed in continuous operation		rpm	500	500	500	500	500
Noise level at 250 bar, 1450 rpm and max. swash plate angle (measured in acoustic measurement chamber according to DIN ISO 4412, measurement distance 1m)		dB(A)	78	80	80	83	85
Weight (Without through drive, approximate)	Without impeller	kg	64	80	80	115	143
	With impeller		—	95	95	119	148

Note: "*" indicates the absolute pressure at the suction port = 1 bar.

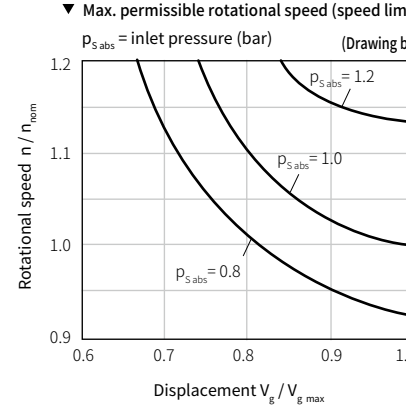
Note:
The minimum operating pressure in the pump line depends on the speed and the pivoting angle; the pressure must not fall below 15 bar under any circumstances.

Note:
The housing pressure is only allowed to be 1 bar higher than the suction pressure.

▼ Min. pressure (high-pressure side)



▼ Max. permissible rotational speed (speed limit)



3.1 General

Max. permissible drive/output torque

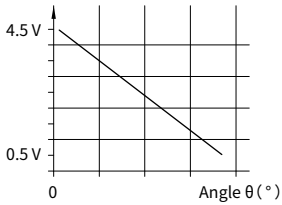
Designation		Nominal size			
		110	**145/160**	**205**	**280**
Max. permissible drive torque	Spline shaft D1	-	1500Nm	1500Nm	-
	Spline shaft D2	-	-	-	2800Nm
	Spline shaft S6	1600Nm	1600Nm	1600Nm	-
	Spline shaft S7	-	2600Nm	2600Nm	-
	Straight shaft K	1050Nm	1450Nm	2200Nm	2750Nm
Max. permissible output torque		960Nm	1100Nm	1300Nm	2200Nm

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 Swash angle pick-up

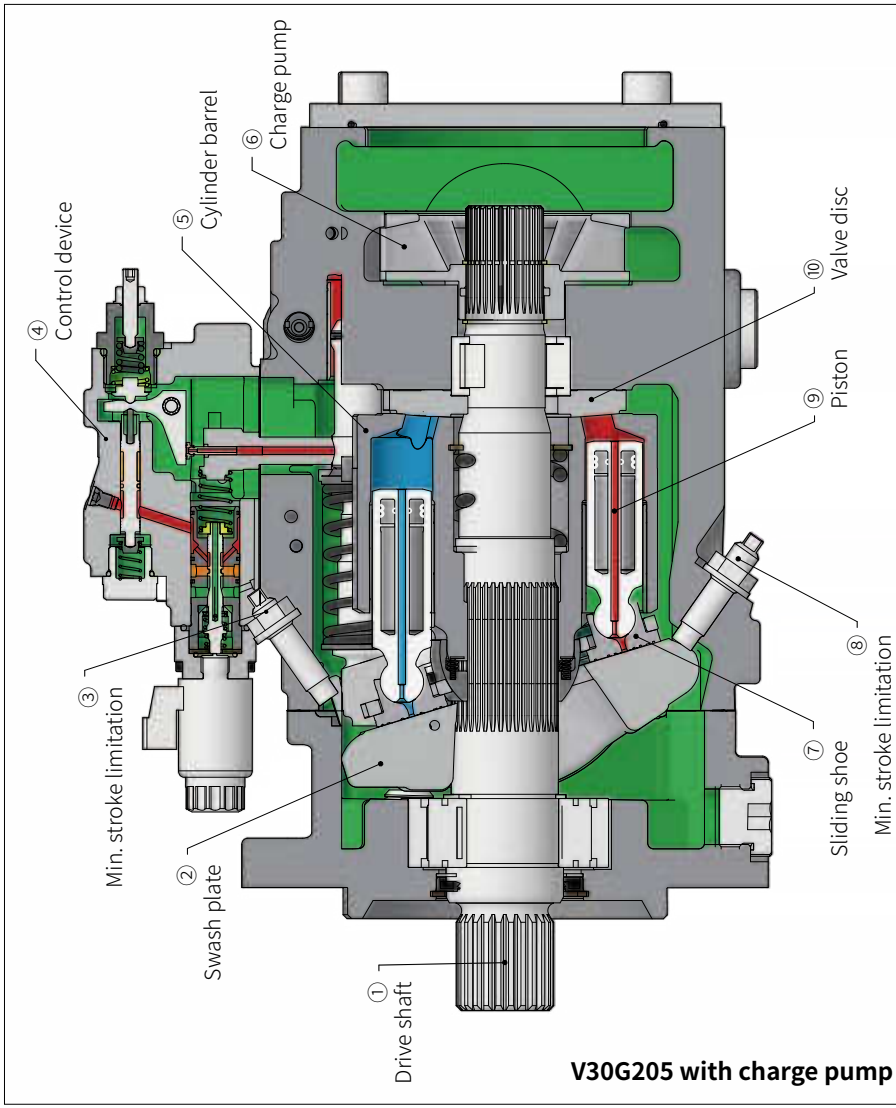


Operating voltage	U_B 10 to 30V DC
Output signal	U_A 0.5 to 4.5V
Tested for automotive field	DIN 40839
Test pulse	1, 2, 3 a/b
Field control	200 V/m
Electrical connection	3-PIN AMP
Superseal	1.5 plug

[Continued from Page 13.]

Through the window on the valve plate ⑩ , oil suction and pressure can be realized. The control module ④ changes the angle of the swash plate ② by adjusting the control pressure, thereby changing the pump displacement. The minimum displacement limit screw ③ and the maximum displacement limit screw ⑧ can adjust the minimum and maximum displacement of the pump. ⑥ It is an impeller booster pump, which can improve the oil absorption capacity of the pump and allow the pump to operate at a higher speed.

3.4 Section view

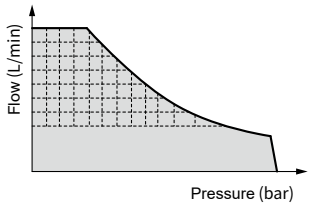


V30G205 with charge pump

The main shaft ① drives the cylinder block assembly to rotate at a high speed, because the swash plate ② and the cylinder block have a certain angle, while the sliding shoe ⑦ rotates on the swash plate, the plunger ⑨ reciprocates in the hole of the cylinder block ⑤ , so that the plunger is in the cylinder block. The sealing volume in the hole continuously increases and decreases.

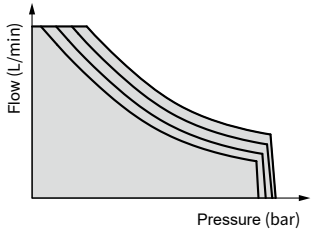
[Continue to Page 12.]

3.5 Controller characteristic curves



LR — Power control, fixed setting

The power controller regulates the displacement of the pump depending on the working pressure so that a given drive power is not exceeded at constant drive speed.
The power valve adopts Leverage structure, and the output hyperbolic characteristics can accurately control the power, that means :
$P_B \times V_g$ = constant; P_B = working pressure; V_g = displacement.
The hydraulic output power is influenced by the efficiency of the pump.
Setting range for pressure control: 725 psi to 6100psi (50 bar to 420 bar).

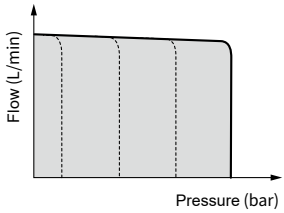


L1 — Electric proportional override

A control current acts against the adjustment spring of the power controller via a proportional solenoid.
Input different currents through electromagnet to control the corresponding output power of the pump，which means:
Increasing control current = reduced power.
The power requirements of different operation modes can be realized.

Technical data, solenoid

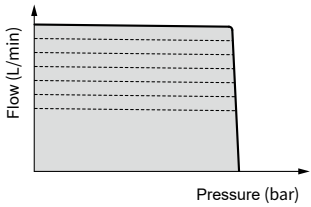
Voltage		24 V （±20 %）
Control current	Start of control	200 mA
	End of control	600 mA
Current limit		0.75 A
Nominal resistance		19Ω
Dither frequency		120 Hz
Duty cycle		100 %
Type of protection		IP69
Connector for solenoids		DT04-2P



DR — Pressure controller, fixed setting

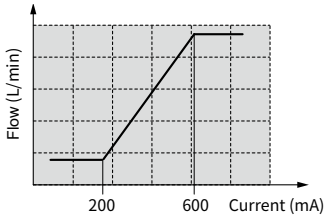
The pressure controller limits the maximum pressure at the pump outlet within the control range of the variable pump.
The variable pump only supplies as much hydraulic fluid as is required by the consumers. If the working pressure exceeds the pressure command value at the pressure valve, the pump will regulate to a smaller displacement to reduce the control diff erential.
Basic position in depressurized state: $V_{g\,max}$
Setting range for pressure control: 725 psi to 6100psi (50 bar to 420 bar),
Standard: 6100 psi (420 bar).

3.5 Controller characteristic curves



S0 — Load sensing

The load-sensing controller works as a load-pressure controlled flow controller and adjusts the displacement of the pump to the requirements of the actuator.
The load sensing controller compares pressure before and after the metering orifice and keeps the pressure drop (differential pressure Δp) across the orifice – and therefore the flow – constant.
If the differential pressure Δp at the metering orifice rises, the pump displacement reduces. If the differential pressure Δp drops, the pump displacement increases until differential pressure at the metering orifice is restored.
Δp=Pp-Pa
When the pressure setting is reached, cut off the pressure, corresponds to adjust the pump displacement back to the minimum pressure control V_{min} .



E1 — Electric proportional displacement

Through the proportional electromagnet, the displacement of the pump is in direct proportion (Stepless adjustment) to the current. When there is no current signal, the pump displacement is at the minimum value. As the current increases, the pump displacement becomes larger until it reaches the maximum displacement.
If the pump is to be adjusted from the basic position $V_{g\ min}$ or from a low working pressure, port G must be supplied with an external control pressure of at least 435 psi (30 bar), maximum 725 psi (50 bar).

Technical data, solenoid

Voltage		24 V （±20 %）
Control current	Start of control	200 mA
	End of control	600 mA
Current limit		0.75 A
Nominal resistance		19Ω
Dither frequency		120 Hz
Duty cycle		100 %
Type of protection		IP69
Connector for solenoids		DT04-2P

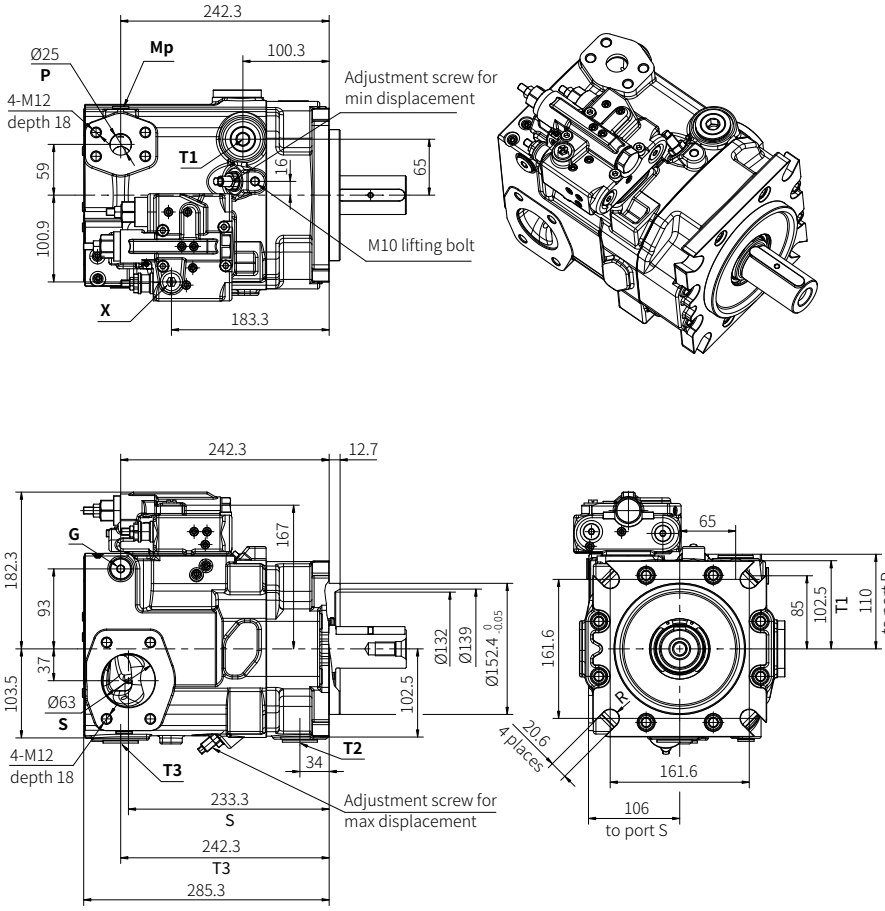
4 Dimensions

All dimensions in mm, subject to change!

4.1 V30G 110 series

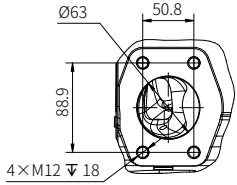
4.1.1 Type V30G 110, clockwise rotation, without charge pump

LRDS — Fixed setting, pressure Cut-off, load sensing

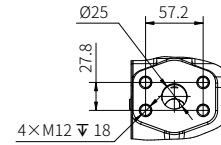


Remarks:
Adjustment screw for min displacement: 0~30 cm^3/rev
Adjustment screw for max displacement: 80~110 cm^3/rev

4.1.1 Type V30G 110, clockwise rotation, without charge pump



Suction port S

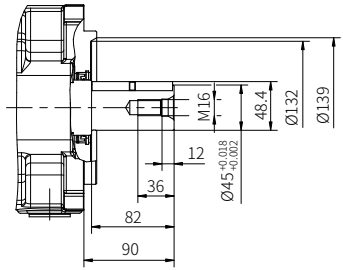


Pressure port P

Shaft version

Straight shaft, Coding K1

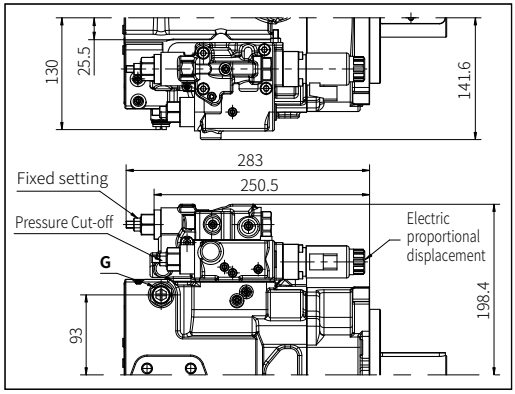
(DIN 6885 Ø45 A 14×9×80)



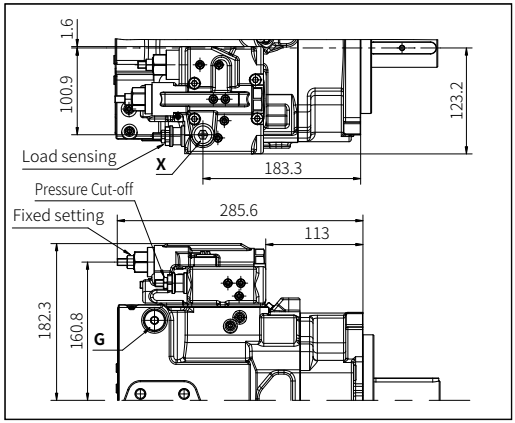
Port details

	Designation	Size	Tightening torque（N.m)
P	Output port	SAE J518 1 1/4in, DIN 13 M12×4, depth 18	98
S	Input port	SAE J518 2 1/2in, DIN 13 M12×4, depth 18	98
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 19mm	220
Mp	Pressure measureing	DIN 3852, M14×1.5, depth 12mm	45
X	LS Control port	DIN 3852, M14×1.5, depth 12mm	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12mm	45

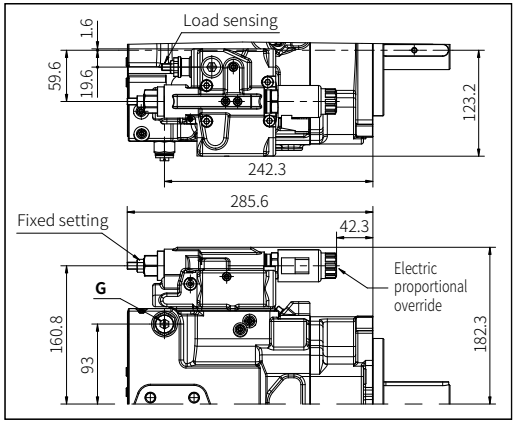
4.1.2 Type V30G 110, dimension of control mode



LRDRE1
Fixed setting,
Electric proportional displacement,
Pressure Cut-off.



LRDS
Fixed setting,
Pressure Cut-off,
Load sensing.

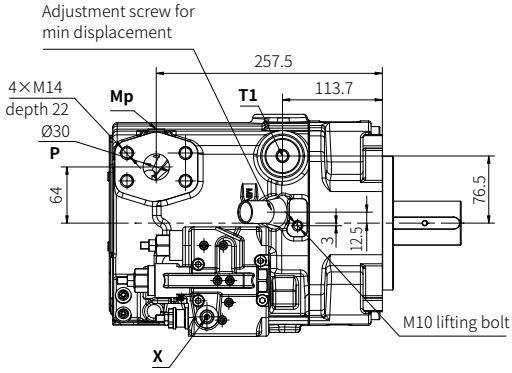


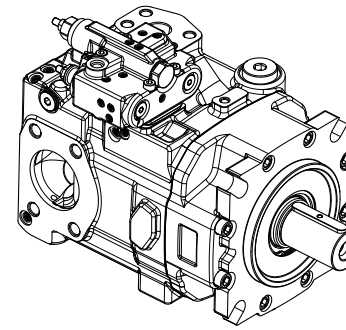
L1S0
Electric proportional override.
Load sensing

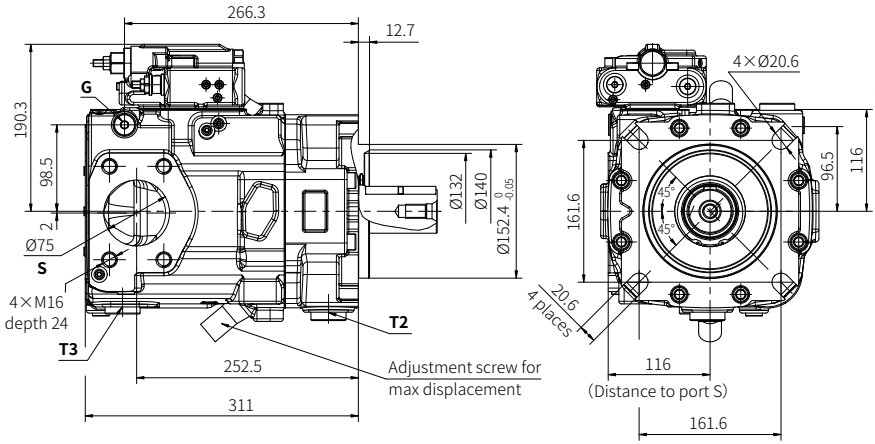
4.2 V30G 145/160 series

4.2.1 Type V30G 145/160, clockwise rotation, without charge pump

LRDS — Fixed setting, pressure Cut-off, load sensing

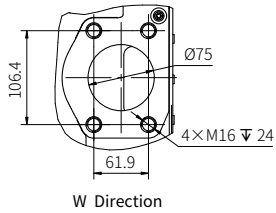




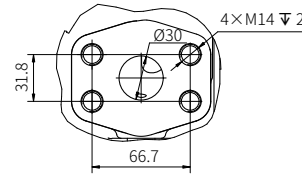


Remarks:
Adjustment screw for min displacement: 0~22 cm^3/rev
Adjustment screw for max displacement: 110~145 cm^3/rev

4.2.1 Type V30G 145/160, clockwise rotation, without charge pump



Suction port S

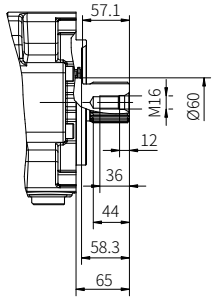


Pressure port P

Shaft version

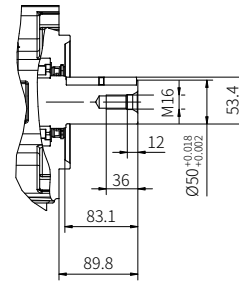
Spline shaft, Coding D1

(DIN 5480 W50×2×24×9g)



Straight shaft, Coding K2

(DIN 6885 Ø50 A 14×9×80)

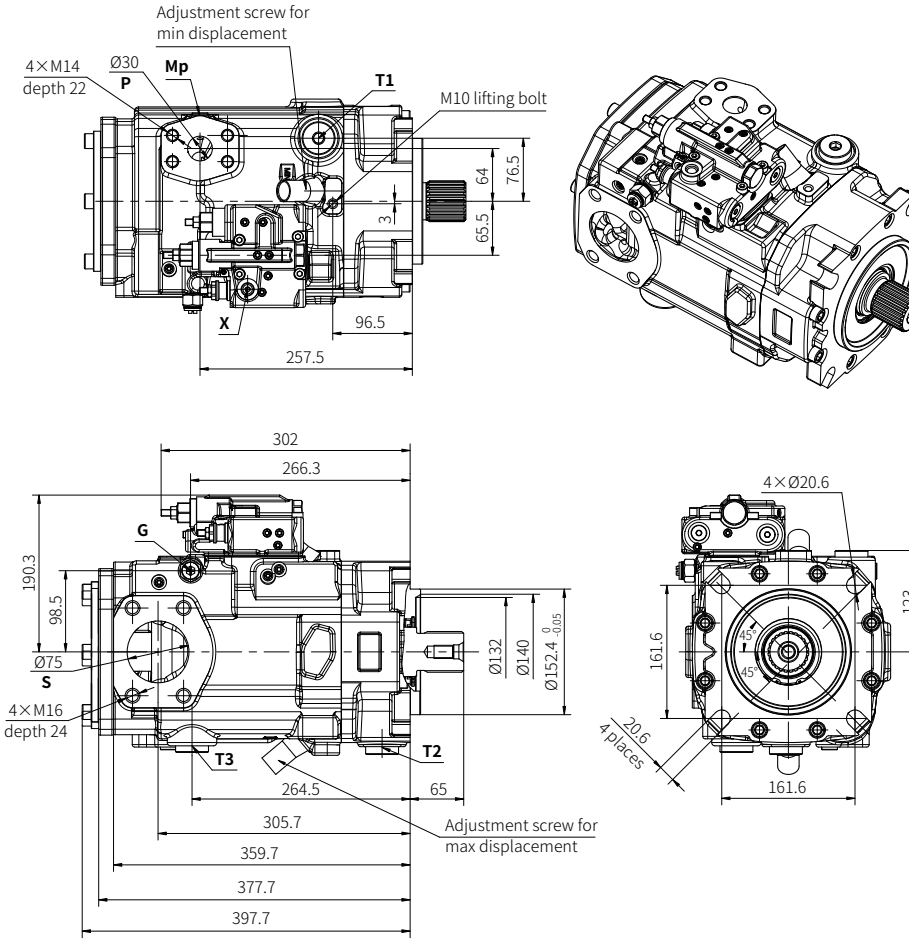


Port details

	Designation	Size	Tightening torque (N.m)
P	Output port	SAE J518 1 1/4in, DIN 13 M14×2, depth 22	157
S	Input port	SAE J518 3in, DIN 13 M16×2, depth 24	246
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 19mm	220
Mp	Pressure measureing	DIN 3852, M14×1.5, depth 12mm	45
X	LS Control port	DIN 3852, M14×1.5, depth 12mm	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12mm	45

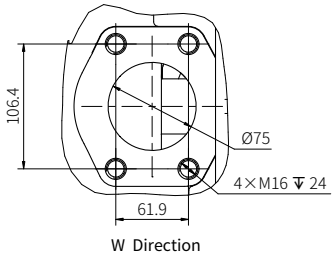
4.2.2 Type V30GL 145/160, clockwise rotation, with charge pump

LRDS — Fixed setting, pressure Cut-off, load sensing

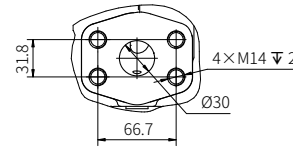


Remarks:
Adjustment screw for min displacement: 0~22 cm^3/rev
Adjustment screw for max displacement: 110~145(160) cm^3/rev

4.2.2 Type V30GL 145/160, clockwise rotation, with charge pump



Suction port S

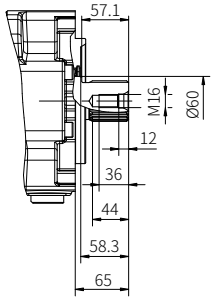


Pressure port P

Shaft version

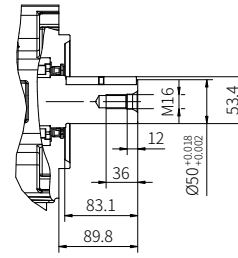
Spline shaft, Coding D1

(DIN 5480 W50×2×24×9g)



Straight shaft, Coding K2

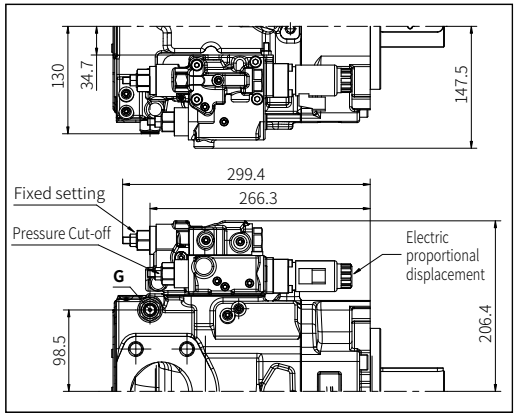
(DIN 6885 Ø50 A 14×9×80)



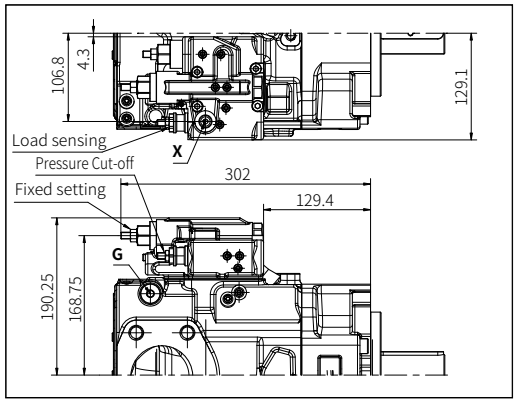
Port details

	Designation	Size	Tightening torque（N.m)
P	Output port	SAE J518 1 1/4in, DIN 13 M14×2, depth 22	157
S	Input port	SAE J518 3in, DIN 13 M16×2, depth 24	246
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 19mm	220
Mp	Pressure measureing	DIN 3852, M14×1.5, depth 12mm	45
X	LS Control port	DIN 3852, M14×1.5, depth 12mm	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12mm	45

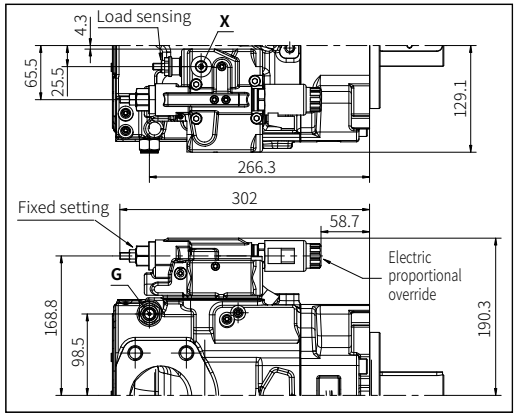
4.2.3 Type V30G 145/160, dimension of control mode



LRDRE1
Fixed setting,
Electric proportional displacement,
Pressure Cut-off.



LRDS
Fixed setting,
Pressure Cut-off,
Load sensing.

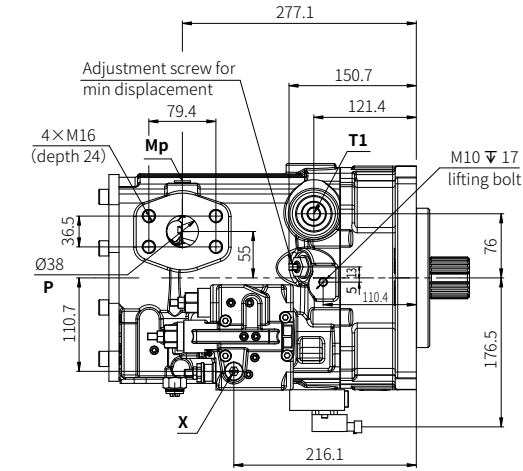


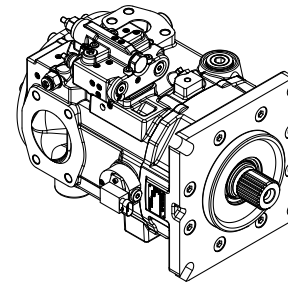
L1S0
Electric proportional override.
Load sensing

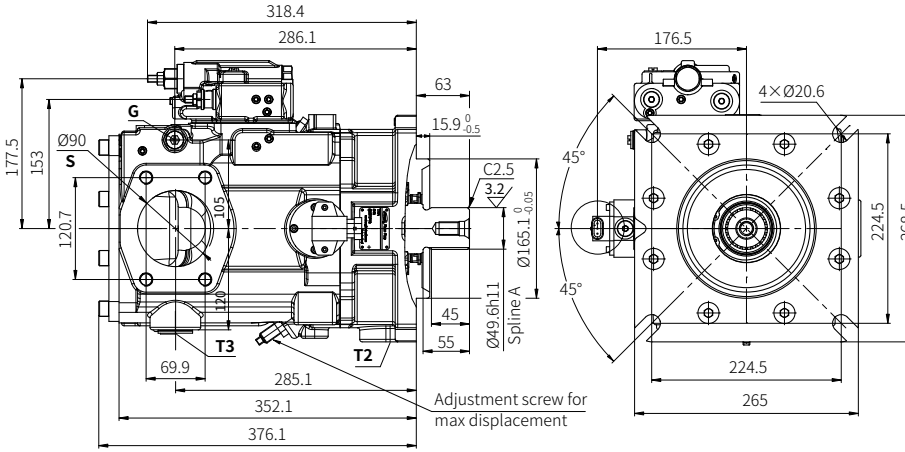
4.3 V30G 205 series

4.3.1 Type V30G 205, clockwise rotation, without charge pump

LRDS — Fixed setting, pressure Cut-off, load sensing

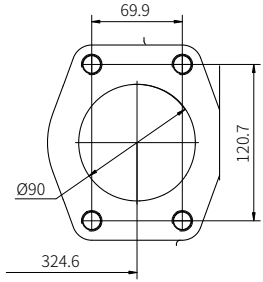




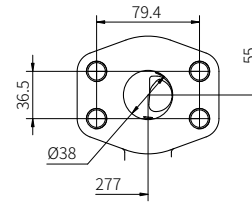


Remarks:
Adjustment screw for min displacement: 0~30 cm^3/rev
Adjustment screw for max displacement: 175~205 cm^3/rev

4.3.1 Type V30G 205, clockwise rotation, without charge pump



Suction port S

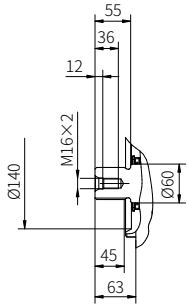


Pressure port P

Shaft version

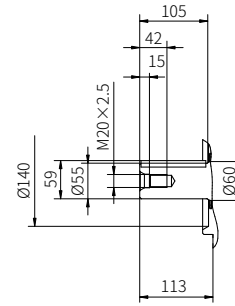
Spline shaft, Coding D1

(DIN 5480 W50×2×24×9g)



Straight shaft, Coding K3

(Ø55 A 16×10×100)

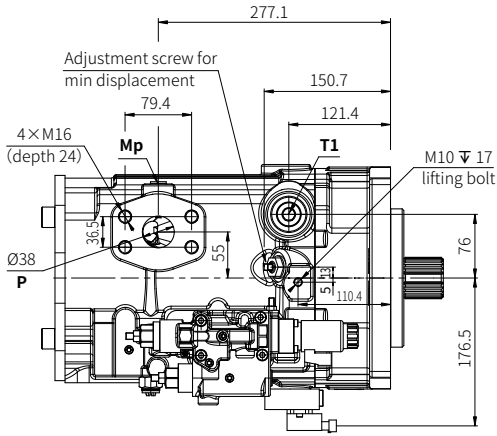


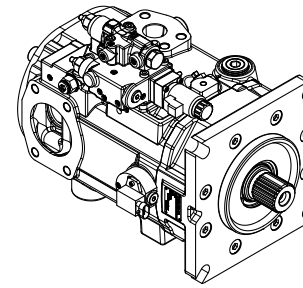
Port details

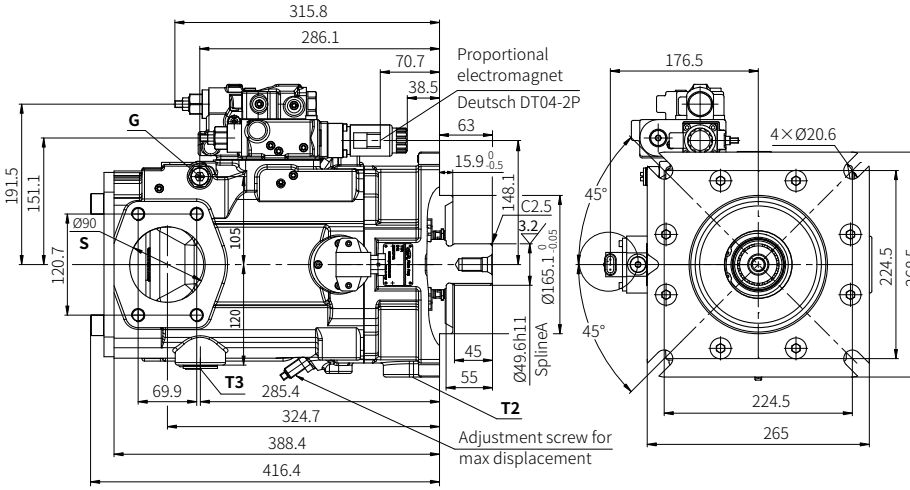
	Designation	Size	Tightening torque（N.m)
P	Output port	SAE J518C 1 1/2in, DIN 13 M16×2, depth 30	160
S	Input port	SAE J518C 3 1/2in, DIN 13 M16×2, depth 24	240
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 19	220
Mp	Pressure measureing	DIN 3852, M14×1.5, depth 12	45
X	LS External control pressure port	DIN 3852, M14×1.5, depth 12	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12	45

4.3.2 Type V30GL 205, clockwise rotation, with charge pump

LRDRE1 — Fixed setting, electric proportional displacement, pressure Cut-off

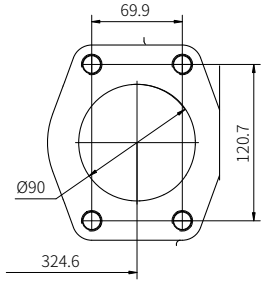




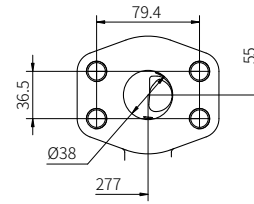


Remarks:
Adjustment screw for min displacement: 0~30 cm^3/rev
Adjustment screw for max displacement: 175~205 cm^3/rev

4.3.2 Type V30GL 205, clockwise rotation, with charge pump



Suction port S

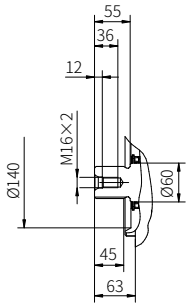


Pressure port P

Shaft version

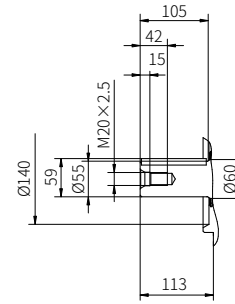
Spline shaft, Coding D1

(DIN 5480 W50×2×24×9g)



Straight shaft, Coding K3

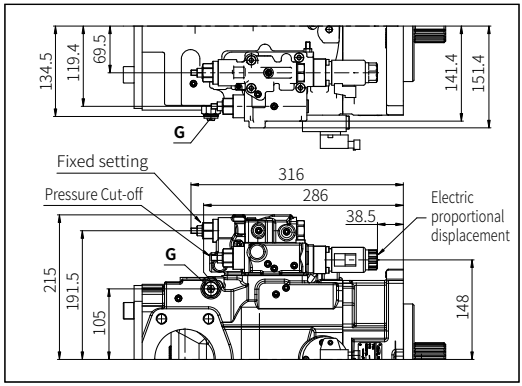
(Ø55 A 16×10×100)



Port details

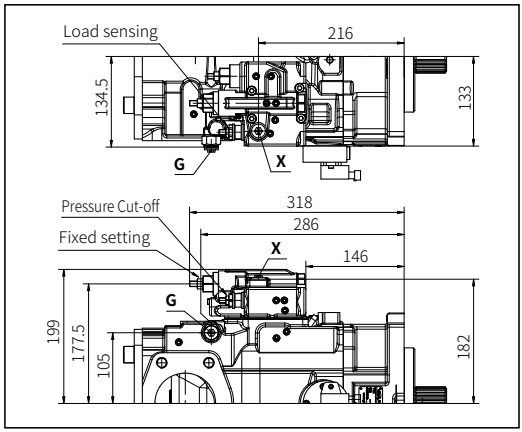
	Designation	Size	Tightening torque（N.m)
P	Output port	SAE J518C 1 1/2in, DIN 13 M16×2, depth 30	160
S	Input port	SAE J518C 3 1/2in, DIN 13 M16×2, depth 24	240
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 19	220
Mp	Pressure measureing	DIN 3852, M14×1.5, depth 12	45
X	LS External control pressure port	DIN 3852, M14×1.5, depth 12	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12	45

4.3.3 Type V30G 205, dimension of control mode



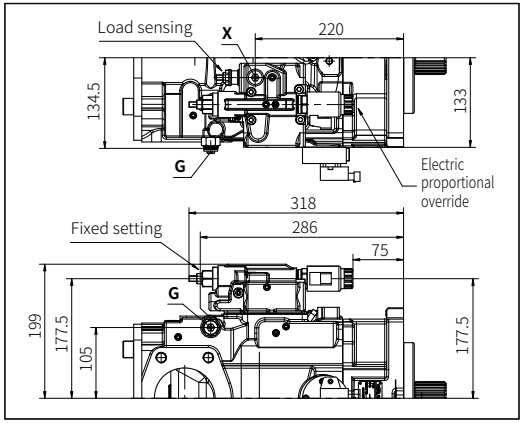
LRDRE1

Fixed setting,
Electric proportional displacement,
Pressure Cut-off.



LRDS

Fixed setting,
Pressure Cut-off,
Load sensing.



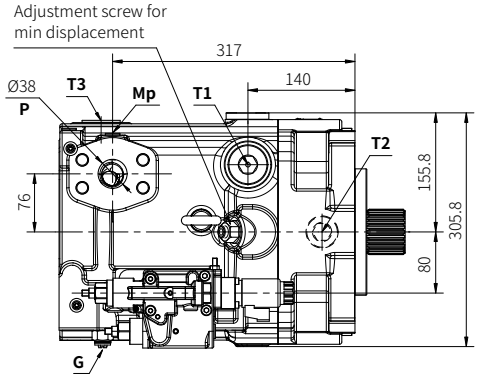
L1S0

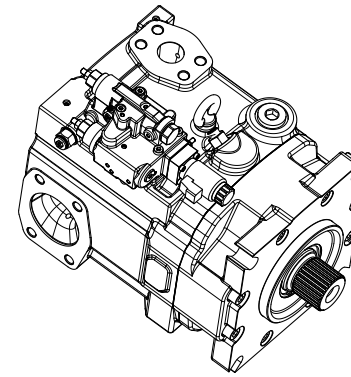
Electric proportional override.
Load sensing

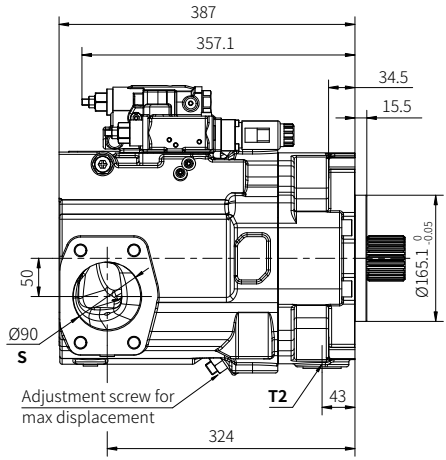
4.4 V30G 280 series

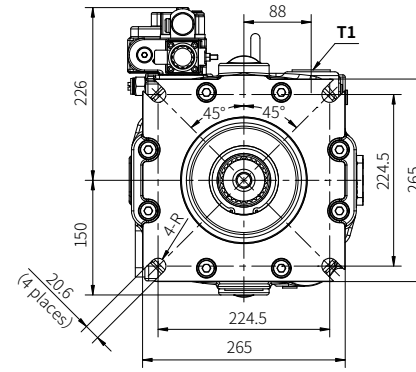
4.4.1 Type V30G 280, clockwise rotation, without charge pump

LRDRE1 — Fixed setting, electric proportional displacement, pressure Cut-off



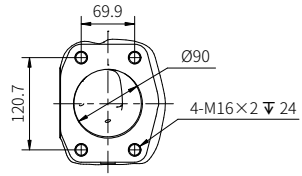




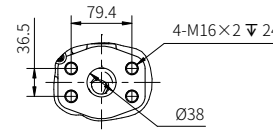


Remarks:
Adjustment screw for min displacement: 0~50 cm^3/rev
Adjustment screw for max displacement: 240~280 cm^3/rev

4.4.1 Type V30G 280, clockwise rotation, without charge pump



Suction port S

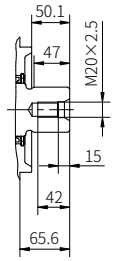


Pressure port P

Shaft version

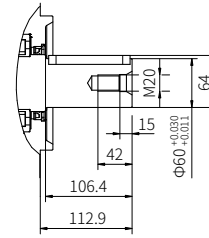
Spline shaft, Coding D2

(DIN 5480 W60×2×28×9g)



Straight shaft, Coding K4

(DIN 6885 Φ60 A 18×11×100)

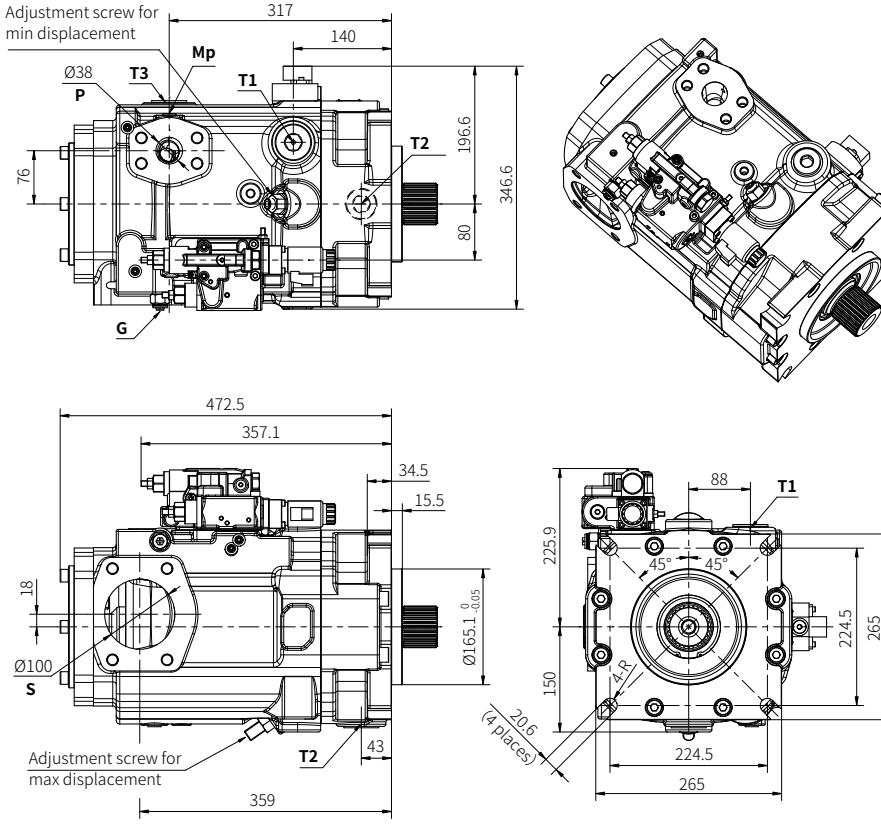


Port details

	Designation	Size	Tightening torque（N.m)
P	Output port	SAE J518 1 1/2in, DIN 13 M16×2, depth 24	240
S	Input port	SAE J518 3-1/2in, DIN 13 M16×2, depth 24	240
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 19	220
Mp	Pressure measureing	DIN 3852, M14×1.5, depth 12	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12	45

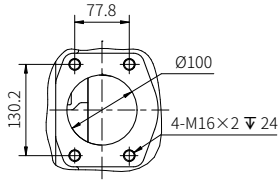
4.4.2 Type V30GL 280, clockwise rotation, with charge pump

LRDRE1 — Fixed setting, electric proportional displacement, pressure Cut-off

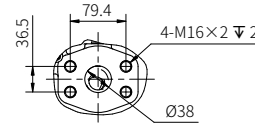


Remarks:
Adjustment screw for min displacement: 0~50 cm^3/rev
Adjustment screw for max displacement: 240~280 cm^3/rev

4.4.2 Type V30GL 280, clockwise rotation, with charge pump



Suction port S

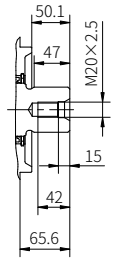


Pressure port P

Shaft version

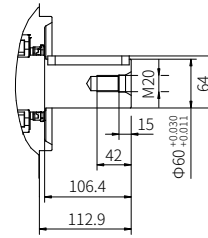
Spline shaft, Coding D2

(DIN 5480 W60×2×28×9g)



Straight shaft, Coding K4

(DIN 6885 Φ60 A 18×11×100)

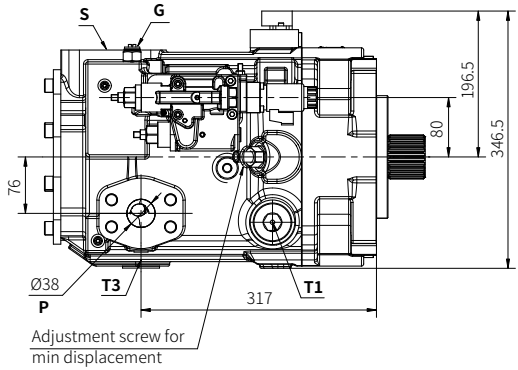


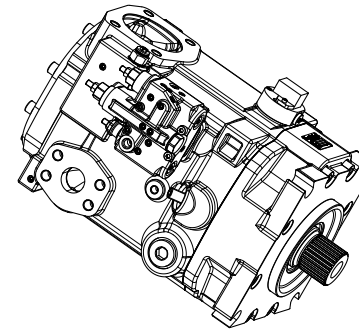
Port details

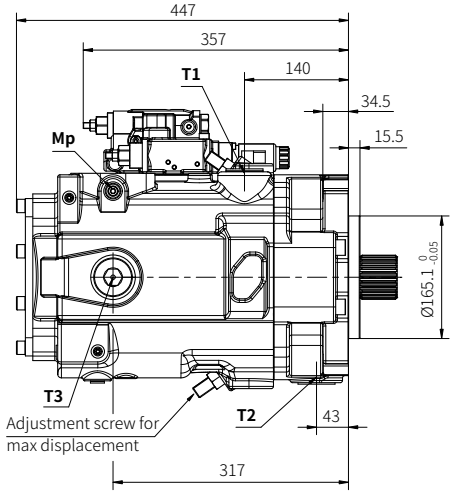
	Designation	Size	Tightening torque（N.m)
P	Output port	SAE J518 1 1/2in, DIN 13 M16×2, depth 24	240
S	Input port	SAE J518 4in, DIN 13 M16×2, depth 24	240
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 19	220
Mp	Pressure measureing	DIN 3852, M14×1.5, depth 12	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12	45

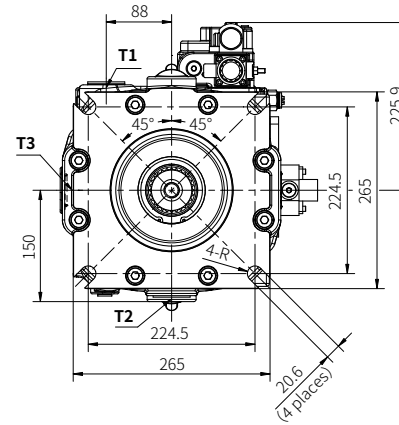
4.4.3 Type V30GL 280, anti-clockwise rotation, with charge pump

LRDRE1 — Fixed setting, electric proportional displacement, pressure Cut-off



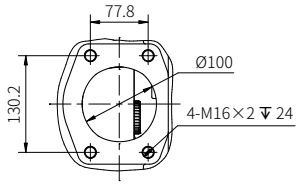




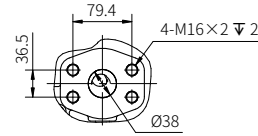


Remarks:
Adjustment screw for min displacement: 0~50 cm^3/rev
Adjustment screw for max displacement: 240~280 cm^3/rev

4.4.3 Type V30GL 280, anti-clockwise rotation, with charge pump



Suction port S

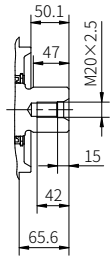


Pressure port P

Shaft version

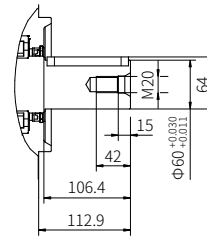
Spline shaft, Coding D2

(DIN 5480 W60×2×28×9g)



Straight shaft, Coding K4

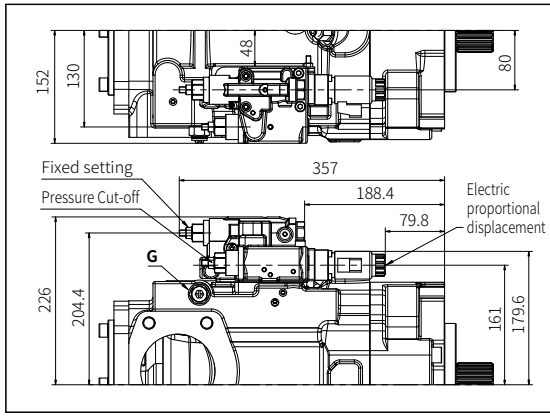
(DIN 6885 Φ60 A 18×11×100)



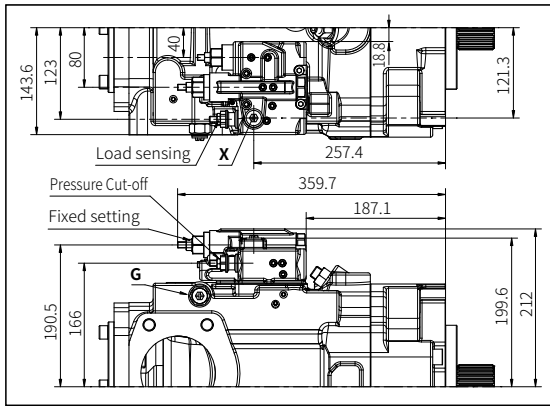
Port details

	Designation	Size	Tightening torque（N.m)
P	Output port	SAE J518 1 1/2in, DIN 13 M16×2, depth 24	240
S	Input port	SAE J518 4in, DIN 13 M16×2, depth 24	240
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 19	220
Mp	Pressure measureing	DIN 3852, M14×1.5, depth 12	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12	45

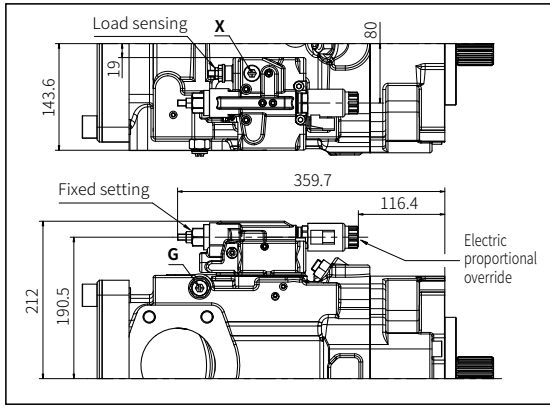
4.4.4 Type V30G 280, dimension of control mode



LRDRE1
Fixed setting,
Electric proportional displacement,
Pressure Cut-off.



LRDS
Fixed setting,
Pressure Cut-off,
Load sensing.



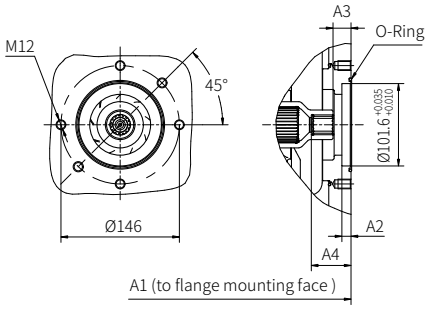
L1S0
Electric proportional override.
Load sensing

4.5 Through drive

Code	Flange SAE J744	Hub for splined shaft	110	145	160	205	280
A1	82-2 A	5/8in 9T 16/32DP	-	-	-	-	-
A2	82-2 A	3/4in 11T 16/32DP	-	-	-	-	-
B1	101-2 B	7/8in 13T 16/32DP	-	●	●	●	-
	101-4 B	7/8in 13T 16/32DP	-	-	-	-	-
B2	101-2 B	1in 15T 16/32DP	-	-	-	-	●
C1	127-2 C	1 1/4in 14T 12/24DP	-	-	-	-	●
C2	127-4 C	1 1/4in 14T 12/24DP	-	●	●	-	-
D1	152-4 D	1 3/4in 13T 8/16DP	-	-	-	-	-
D2	152-4 D	W45×2×21×9g	-	-	-	-	-
D3	152-4 D	W50×2×24×9g	-	-	-	●	-
E1	165-4 E	2in 15T 8/16DP	-	-	-	-	-
E2	165-4 E	W50×2×24×9g	-	-	-	●	●
E3	165-4 E	W60×2×28×9g	-	-	-	-	●

Note: ● = Available — = Under development

Flange SAE J744 101-2/4(B)



Specification of Spline shaft :

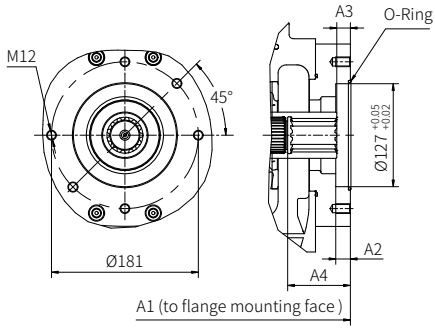
B1: 7/8 in 13T 16/32DP, SAEJ744 22-4(B)

B2: 1 in 15T 16/32DP, SAEJ744 25-4(B-B)

B1					
With charge pump	110	145	160	205	280
A1	0	377.7	377.7	411.5	-
A2	-	11	11	11.6	-
A3	-	12.5	12.5	63.4	-
A4	-	42.5	42.5		-
M (Depth)	-	M12 depth 18	M12 depth 18	M12 depth 16	-
B2					
With charge pump	110	145	160	205	280
A1	-	-	-	-	452.45
A2	-	-	-	-	11.3
A3	-	-	-	-	22.5
A4	-	-	-	-	49
M (Depth)	-	-	-	-	M12 depth 16

4.5 Through drive

Flange SAE J744 127-2/4(C)

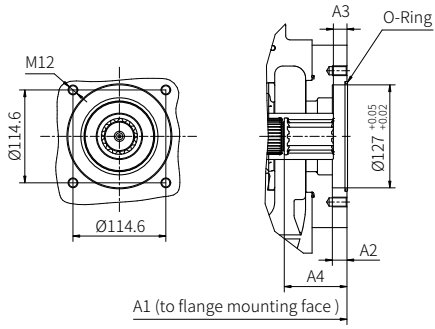


C1					
With charge pump	110	145	160	205	280
A1	-	-	-	-	467.95
A2	-	-	-	-	18
A3	-	-	-	-	16.75
A4	-	-	-	-	77.25
M (Depth)	-	-	-	-	M12 depth 18

Specification of Splined shaft :

C1: 1 1/4in 14T 12/24DP, SAE J744 32-4(C)

Flange SAE J744 127-4(C)



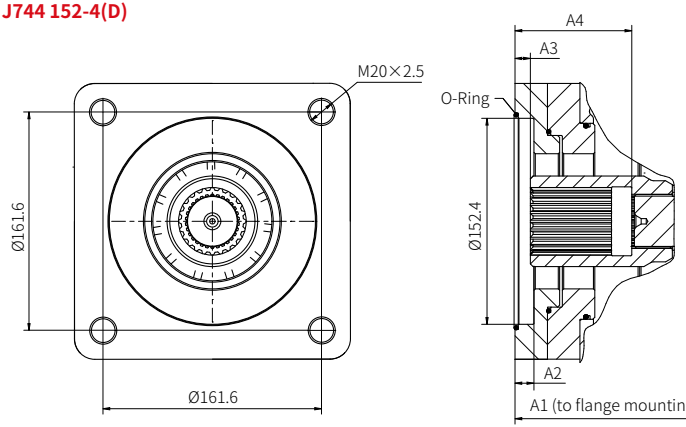
C2					
With charge pump	110	145	160	205	280
A1	-	387.7	387.7	-	-
A2	-	14	14	-	-
A3	-	17.5	17.5	-	-
A4	-	58	58	-	-
M (Depth)	-	M12 depth 28	M12 depth 28	-	-

Specification of Splined shaft :

C2: 1 1/4in 14T 12/24DP, SAEJ744 32-4(C)

4.5 Through drive

Flange SAE J744 152-4(D)

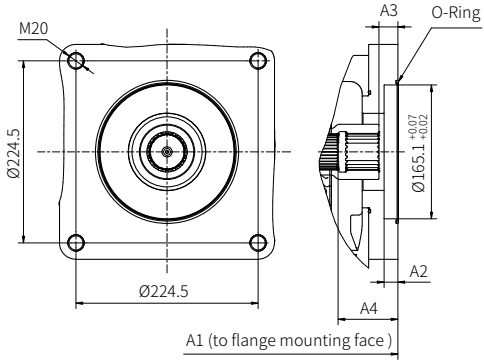


D3					
With charge pump	110	145	160	205	280
A1	-	-	-	436.5	-
A2	-	-	-	11	-
A3	-	-	-	11.4	-
A4	-	-	-	86.4	-
M (Depth)	-	-	-	M20 (depth 24)	-

Specification of Splined shaft :

D3: W50×2×24×9g DIN5480

Flange SAE J744-165-4(E)



E2 / E3					
With charge pump	110	145	160	205	280
A1	-	-	-	416.4	460.95
A2	-	-	-	19	17
A3	-	-	-	17.4	23.35
A4	-	-	-	65.4	73.75
M (Depth)	-	-	-	M20 depth 28	M20 depth 36

Specification of Splined shaft :

E2: W50×2×24×9g DIN5480

E3: W60×2×28×9g DIN5480

5 Installation information

5.1 General

The V30G variable displacement axial piston pump is designed for use in an open circuit.

The following essential points must be noted when installing the pump:
Mounting and removal of the pump and attached components may be performed by trained persons only. Ensure absolute cleanliness during all work. Contamination may have an adverse effect on the function and service life of the pump.

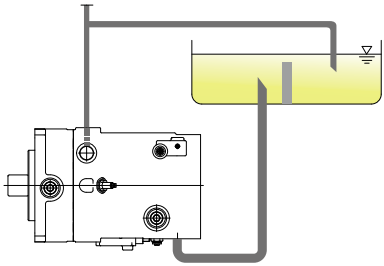
- Remove all plastic plugs prior to initial operation.
- Avoid installing the motor above the tank (see Chapter 5.3, "Installation positions").
- Observe the reference values in Section .
- Prior to initial operation, fill the pump with oil and bleed.
  Automatic pump filling via the suction line by opening the drain ports is not possible.
- Prevent the pump and suction line from running dry.
- Always ensure a constant supply of oil.
  Even a brief shortage in the supply of hydraulic fluid to the pump may damage internal parts.
  This may not be immediately evident after initial operation.
- The hydraulic oil returning to the tank from the system must not be sucked back in immediately (baffles).
- Run the pump for approx. 10 minutes at max. 50 bar after initial operation.
- Thorough bleeding/flushing of the entire system is recommended before the full pressure range is used.
- Observe the max. permissible operating range temperatures (see Chapter 3, "Parameters") at all times.
- Always comply with the specified oil purity classes (see Chapter 3, "Parameters");
  provide appropriate hydraulic fluid filtering.
- Use of a filter in the suction line must be approved by InLine Hydraulik.
- Include a main pressure-limiting valve in the pressure line to limit the max. system pressure.

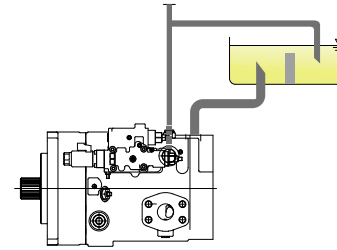
5.2 Installation positions

The variable displacement axial piston pump V30G can be installed as follows:

Horizontal installation: (pump below the min. fill level)

For horizontal installation, use the uppermost drain port.

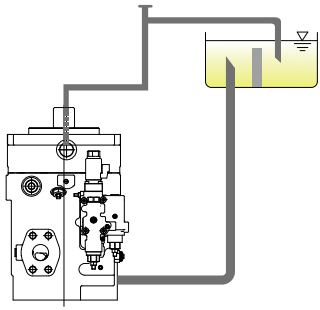




Vertical installation: (pump below the min. fill level)

Mount the pump so that the pump mounting flange is facing upwards.

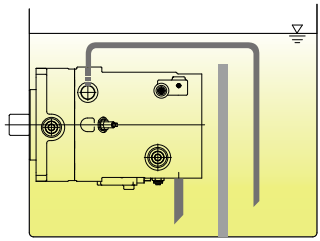
For vertical installation, use the uppermost drain port.

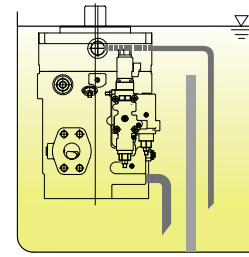


5.3 Tank installation

Tank installation (pump below the min. fill level)

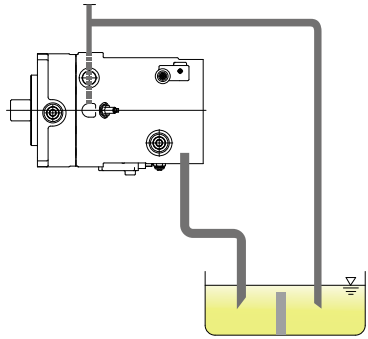
The pump can be operated either with or without a suction tube. Using a short suction intake is recommended.

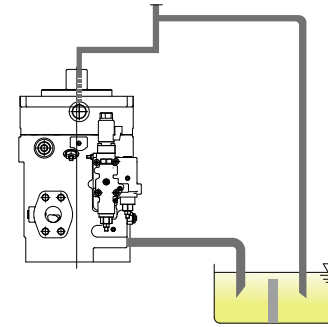




Additional notes regarding installation above the fill level

Special measures are required if the pump is installed above the fill level. The pump must not run dry via the pressure, intake, drain, bleed or control lines. This applies in particular to long periods of downtime.





6 Installation, operation and maintenance information

6.1 Designated use

This fluid-power product has been designed, manufactured and tested acc. to standards and regulations generally applicable in the European Union and left the plant in a safe and fault-free condition.
To maintain this condition and ensure safe operation, operators must observe the information and warnings in this documentation.
This fluid-power product must be installed and integrated in a hydraulic system by a qualified specialist who is familiar with and adheres to general engineering principles and relevant applicable regulations and standards.
In addition, application-specific features of the system or installation location must be taken into account if relevant.
This product may only be used as a flow control valveas a pump within oil-hydraulic systems.
The product must be operated within the specified data. This documentation contains the technical parameters for various product versions.

Note:
Non-compliance will void any warranty claims made against InLine Hydraulik GmbH.

6.2 Assembly information

The hydraulic accumulator must be integrated in the system via state of the art connection components (screw fittings, hoses, pipes, etc.). The hydraulic system must be shut down as a precautionary measure prior to dismounting; this applies in particular to systems with hydraulic accumulators.

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