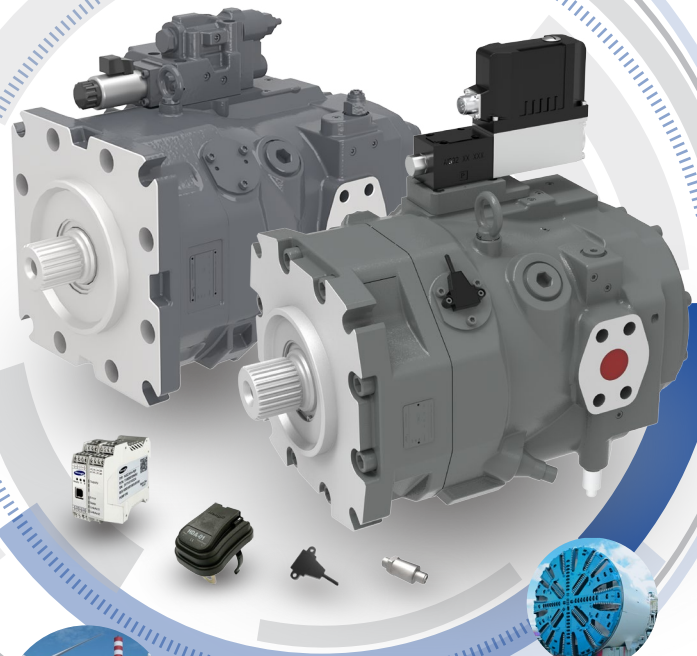
InLine



V32G series

Robust High-pressure Piston Pump

Open circuit

Nominal pressure P_{nom} : 380~420 bar

Peak pressure P_{max} : 420~450 bar

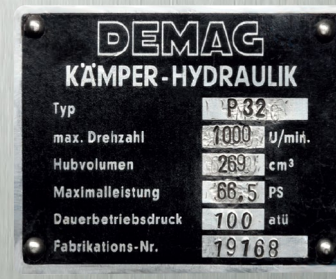
Geometric displacement V_g : 065~300 cm^3/rev

2025-09

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 designing and manufacturing axial piston pumps, and its products are known for their sturdy structure, heavy load, and high reliability. The control methods are diverse and can meet the needs of various application scenarios.
According to the process characteristics, load strength, cycle, and the selection of different control methods and structures based on different application scenarios, they can be widely used in forging machinery, extruders, metallurgical equipment, production lines, ceramic presses, material conveying, mining equipment, port machinery
Marine engineering, mobile cranes, rotary drills, shield tunneling machines, concrete pump trucks and other single machine equipment, production lines, or indoor and outdoor harsh working environments.

Kaemper & Demag

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



Bellows Valvair

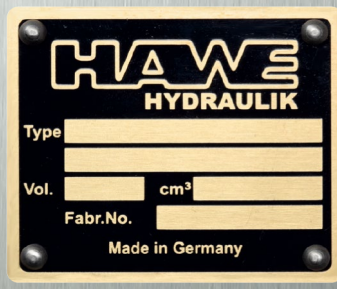
In the 1960s, The American company Bellows Valvair extended its production to focus on successful and innovative axial piston pumps.

VOLVO

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

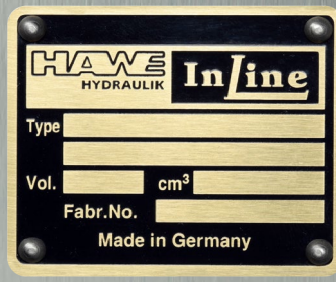
VOAC

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.

Contents

1 Overview: variable displacement axial piston pump types V32G

InLine Hydraulik GmbH has 70 years for heavy-load piston pump in R&D and manufacturing,and based on rich experience in market application, it has developed a new generation of V32G series products, which can help machinery and equipment cope with various harsh conditions.

The V32G series pump has a high working pressure, the nominal pressure can reach 420 bar, and the peak pressure can reach 450 bar.The overall structure adopts a 45 ° oblique design to achieve compact and lightweight purposes.The V32G series pump has higher power density, which is about 5% higher than the previous generation.

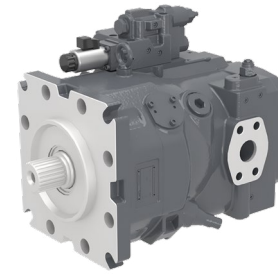
The pumps also have a low outlet standby pressure, which greatly reduces power loss. Moreover, while improving the self-priming performance, the optional built-in booster impeller makes the V32G series pump have a higher speed. In addition, the use of enhanced heavy-duty bearings and spindle design, through the shaft drive, it can adapt to multi-pump series and other large torque and high speed conditions, and has a longer service life.

Adapt to the development of digitalization, The V32G series products can be combined with the pump's own inclined plate swing angle displacement sensor and pressure sensor to achieve integrated control, digital adjustment, and communication of flow, pressure, and power three closed loops, effectively reducing hysteresis and achieving higher control accuracy. In addition, with intelligent control and working condition data analysis and processing, it can achieve monitoring and management of the entire life cycle of hydraulic pumps.

In addition, thanks to the low-noise housing and optimized port plate structure, the V32G improves the noise performance of the entire machine under operating conditions.

Features and benefits:

- High continuous pressure
- Excellent self-priming performance
- Lower oil outlet standby pressure to reduce power loss(10bar)
- Enhanced bearing to improve service life
- Compact design to achieve a breakthrough in higher power density ratio
- Effectively reduce the amount of hysteresis, high control accuracy
- Low noise



V32G

Variable displacement axial piston pump

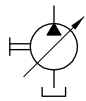
Intended applications:

- Forging machinery, extruders, ceramic presses, mechanical presses
- Metallurgical systems and equipment
- Material conveying, mining equipment, port machinery
- Shield tunneling machine, concrete pump truck, rotary drilling rig, mobile crane
- Ships, maritime engineering, dredgers, drilling platforms, wind power installation ships
- Rubber and plastic machinery, general machinery

2 Available versions, main data

2.1 Basic version

Circuit symbol:



Order coding example:

V32G	L	205	R	D1	F	V	2	PpQ3	C	W	-A1	-XXXX

Internal coding

Through drive
Table 11: Through drive

Controller form
Table 10: Controller form

Controller communication method
Table 9: Controller communication method

Controller
Table 8: Controller

Pivoting angle indicator
Table 7: Pivoting angle indicator

Seal
Table 6: Seal

Flange version
Table 5: Flange version (input side)

Shaft version
Table 4: Shaft version

Rotating direction
Table 3: Rotating direction

Nominal size
Table 2: Nominal size

Charge pump options
Table 1: Charge pump options

Basic type

2.1 Basic version

Table 1: Charge pump options

Code	Description	Product model						
		065	110	145	160	205	280	300
None	Without booster pump	●	●	●	●	●	●	○
L	With booster pump	-	-	●	●	●	●	●

Note: ● = Available ○ = Under development

Table 2: Nominal size

Code	Geometric displacement (cm^3/rev)	Nominal pressure P_{nom} (bar)	Peak pressure P_{max} (bar)
065	65	420	450
110	110	420	450
145	145	420	450
160	160	420	450
205	203	420	450
280	280	420	450
300	300	380	420

Table 3: Rotating direction *1

Code	Description	Product model						
		065	110	145	160	205	280	300
L	Anti-clockwise *2	○	○	●	●	●	●	●
R	Clockwise	●	●	●	●	●	●	●

Note: ● = Available ○ = Under development
"*1" mean is facing the drive shaft.
"*2" mean is the left-hand pump is currently available with a booster option, while a non booster version is under development.

Table 4: Shaft version

Code	Designation/Standard		Max. drive torque (N·m)	Product model						
				065	110	145	160	205	280	300
D1	**"D"** type Splined shaft	DIN5480 W50×2×24×9g	3140		●	●	●	●		
D2		DIN5480 W60×2×28×9g	5780						●	●
D4		DIN5480 W40×2×18×9g	505	●						
D5		DIN5480 W45×2×21×9g	2190							
S5 *	**"S"** type Splined shaft	ANSI B92.1 14T 12/24DP	602	●						
S6 *		ANSI B92.1 13T 8/16DP	1640		●	●	●	●		
S7 *		ANSI B92.1 15T 8/16DP	2670					●	●	●
S9 *		ANSI B92.1 17T 12/24DP	1104	●						
K0	**"K"** type parallel keyed shaft	DIN6885 Ø40 A 12×8×68	700	●						
K1		DIN6885 Ø45 A 14×9×80	1050		●					
K2		DIN6885 Ø50 A 14×9×80	1450			●	●			
K3		DIN6885 Ø55 A 16×10×100	2200					●		
K4		DIN6885 Ø60 A 18×11×100	2750						●	●

Note: "* "mean is unconventional options.

2.1 Basic version

Table 5: Flange version (input side)

Code	Description	Designation/Standard	Product model						
			065	110	145	160	205	280	300
F	Flange	ISO 3019-2 125-4	●						
		SAE J744 152-4		●	●	●			
		SAE J744 165-4					●	●	●

Note: ● = Available ○ = Under development

Table 6: Seal

Code	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)

Table 7: Pivoting angle indicator

Code	Description
0	None
1	With mechanical angle indicator
2 *	With a tilt angle sensor 0.5 - 4.5V
3 *	With a tilt angle sensor of 0.5 - 4.5V and a pressure sensor of 0 -10V
4	With a tilt angle sensor 4 - 20mA
5	With a tilt angle sensor of 4 - 20mA and a pressure sensor of 4 - 20mA

Note: “ * ” mean is priority selection of model.

2.1 Basic version

Table 8: Control module *1*2

Code	Control type	Product model						
		065	110	145	160	205	280	300
L1S0	Electric proportional override, Load sensing		●	●	●	●	●	●
DRS0	Pressure Cut-off, Load sensing	●	●	●	●	●	●	●
LRDS	Fixed setting, Pressure Cut-off, Load sensing	●	●	●	●	●	●	●
LRDG	Fixed setting, Pressure Cut-off, Remote pressure	●	●	●	●	●	●	●
E0	Two point control	○	●	●	●	●	●	●
DRE1	Electric proportional displacement, Pressure Cut-off	●						
LRDRE1	Fixed setting, Electric proportional displacement, Pressure Cut-off		●	●	●	●	●	●
DGE1	Electric proportional displacement, Remote pressure	●						
LRDGE1	Fixed setting, Electric proportional displacement,Remote pressure		●	●	●	●	●	●
EC2	Electric proportional displacement closed-loop control	○	●	●	●	●	●	●
EC3	Electric proportional displacement closed-loop control with displacement feedback for valve core	○	●	●	●	●	●	●
PPQ1	Three loop control of pressure, flow rate, and power (electronic pump)	○	●	●	●	●	●	●
PPQ2		○	●	●	●	●	●	●
PPQ3		○	●	●	●	●	●	●

Note: ● = Available ○ = Under development

" *1 " mean is (For the functional symbols of the control module, please refer to Chapter 2.2" Functional Symbols of Control Modules ").

" *2 " mean is (For the performance parameter of EC2 EC3 PpQ1, PpQ2, and PpQ3, please refer to Chapter 2.4" Comparison of Electronic Pump Control Accuracy ")

Table 9：Controller communication method*1*2

Code	Modality	L1S0	DRS0	LRDS	LRDG	E0	DRE1	LRDRE1	DGE1	LRDGE1	EC2	EC3	PPQ1	PPQ2	PPQ3
	None	●	●	●	●	●	●	●	●	●	-	-	-	-	-
A	Analog quantity	●	-	-	-	-	●	●	●	●	●	●	●	●	●
P	Profinet	-	-	-	-	-	-	-	-	-	-	-	●	●	●
C	Can	-	-	-	-	-	○	○	○	○	○	○	○	○	○

Note: ● = Available ○ = Under development

" *1 " when choosing control module mode EC2 EC3 PpQ1 PpQ2 PpQ3, it is generally necessary to use it together with a controller.
(See Chapter 3.6, "HLEC2414-PQP-PNController").

" *2 " mean is codes A, P, and C are optional when selecting the Hengli controller. If not selected, please skip Tables 9 and 10.

2.1 Basic version

Table 10：Controller form*

Code	Modality	065	110	145	160	205	280	300
N	Internal controller	○	○	○	○	○	○	○
W	External controller	●	●	●	●	●	●	●

Note: ● = Available ○ = Under development

"* "mean is when controller communication methods A, P, and C are selected, they must be selected .

Table 11: Through drive

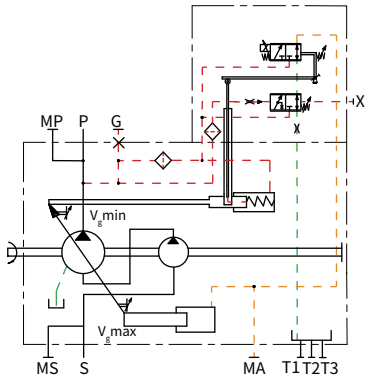
Code	Mounting flange	Hub for splined shaft	065	110	145/160	205	280/300
0	Without through drive		●	●	●	●	●
A1	SAE A 82-2	ANSI B92.1 5/8in 9T 16/32DP	○	●	●	●	●
A2	SAE A 82-2	ANSI B92.1 3/4in 11T 16/32DP	●	○	●	●	○
B1	SAE B 101-2	ANSI B92.1 7/8in 13T 16/32DP	●	●	●	●	●
B2	SAE B 101-2	ANSI B92.1 1in 15T 16/32DP	○	●	●	●	●
C1	SAE C 127-2	ANSI B92.1 1 1/4in 14T 12/24DP	○	●	●	●	○
C3	SAE C 127-2	ANSI B92.1 1 1/4in 17T 12/24DP	○	○	●	○	○
C2	SAE C 127-4	ANIS B92.1 1 1/4in 14T 12/24DP	○	●	●	●	●
C4	SAE C 127-4	ANIS B92.1 1 1/4in 17T 12/24DP	●	○	●	○	○
D1	SAE D 152-4	ANSI B92.1 1 3/4in 13T 8/16DP	○	○	●	●	●
D2	SAE D 152-4	DIN 5480 N45×2×21×9g	○	○	○	○	○
D3	SAE D 152-4	DIN 5480 N50×2×24×9g	○	○	●	●	●
E1	SAE E 165-4	ANSI B92.1 2in 15T 8/16DP	○	○	○	●	○
E2	SAE E 165-4	DIN 5480 N50×2×24×9g	○	○	○	●	●
E3	SAE E 165-4	DIN 5480 N60×2×28×9g	○	○	○	○	●

Note: ● = Available ○ = Under development

2.2 Controller switching symbols

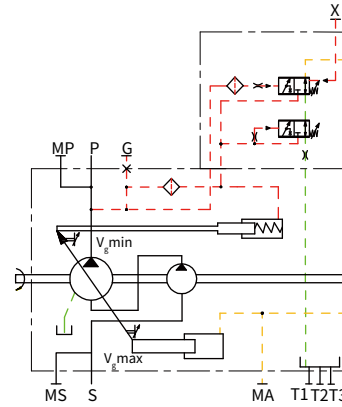
L1S0

Electric proportional override,
Load sensing



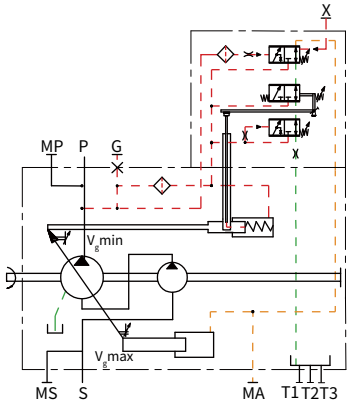
DRS0

Pressure Cut-off, Load sensing



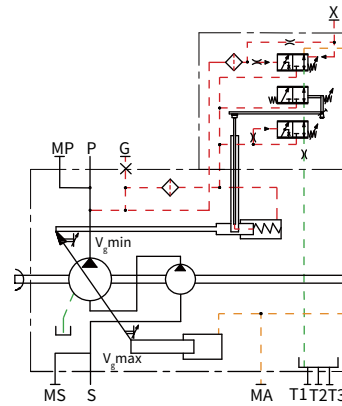
LRDS

Fixed setting, Pressure Cut-off,
Load sensing



LRDG

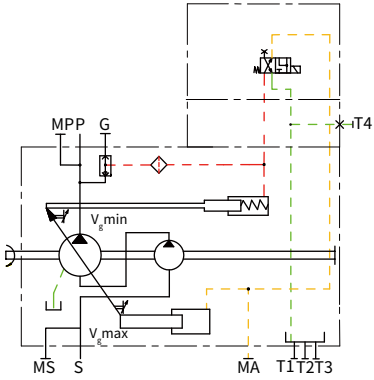
Fixed setting, Pressure Cut-off,
Remote pressure



2.2 Controller switching symbols

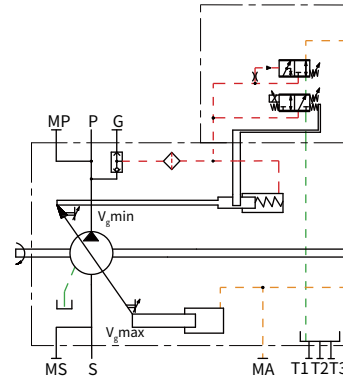
E0

Two point control



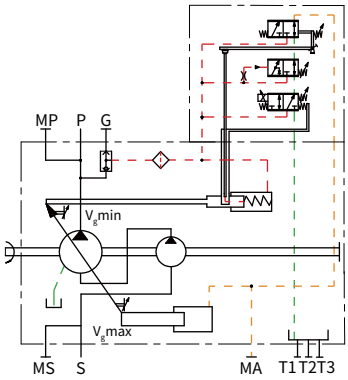
DRE1

Electric proportional displacement, Pressure Cut-off



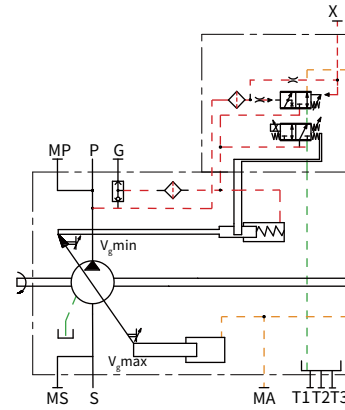
LRDRE1

Fixed setting, Electric proportional displacement, Pressure Cut-off



DGE1

Electric proportional displacement, Remote pressure

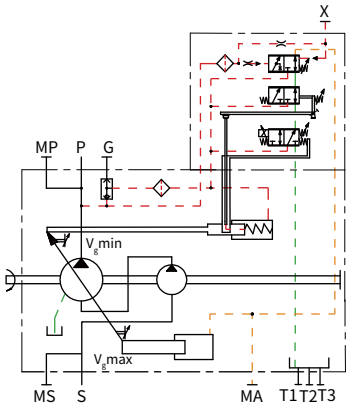


Note: "*1 "mean is when the pump is in the initial position or a power-off state, it is in a full displacement state.
"*2 "mean is when external control leakage control is required, please contact Hengli Hydraulic for specific requirements.

2.2 Controller switching symbols

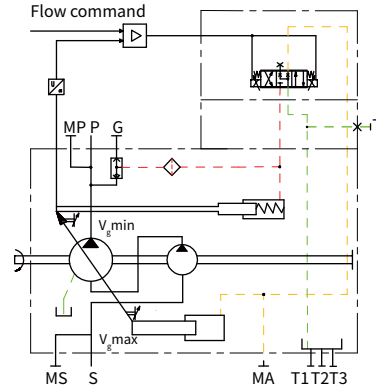
LRDGE1

Fixed setting, Electric proportional displacement, Remote pressure



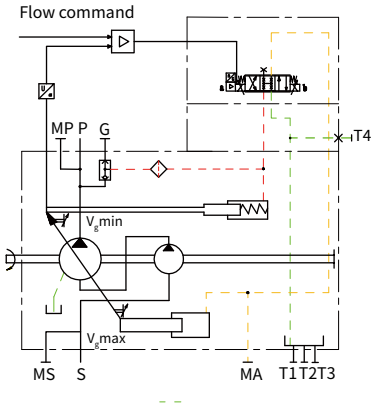
EC2 *1*2

Electric proportional displacement closed-loop control



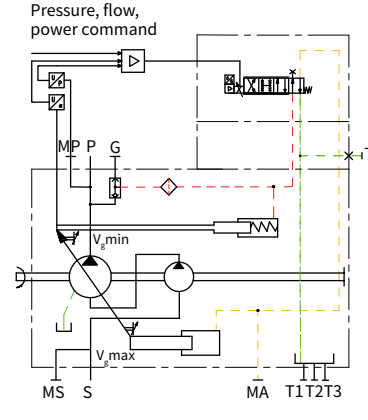
EC3 *2

Electric proportional displacement closed-loop control with displacement feedback for valve core



PPQ *1*2

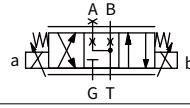
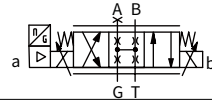
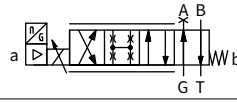
Three loop control of pressure, flow rate, and power (electronic pump)



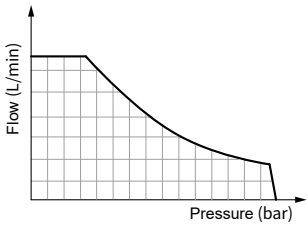
Note: "*1 "mean is an example diagram of PpQ3 control. When the pump is in the initial position or in a power-off state, the pump is in a full displacement state.
"*2 "mean is when external control leakage control is required, please contact Hengli Hydraulic for specific requirements.

2.2 Controller switching symbols

The symbols for the PpQ control module are shown in the table below.

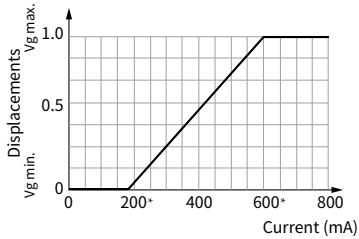
Control module	Control module function symbol	Initial position (power-off state)
PPQ1		$V_g$max
PPQ2		$V_g$min
PPQ3		$V_g$max

2.3 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.



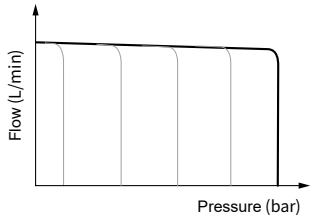
* Due to differences in the mechanical structure of pumps with different displacements, the current may vary slightly.

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

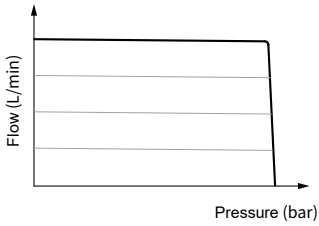
Voltage	24 V （±20 %）
Rated current	650 mA
Maximum current	770mA
Rated resistance	23.5Ω
PWM Recommended frequency	80~150Hz
Duty cycle	100 %
Type of protection	IP69K
Connector for solenoids	-40°C ~120°C



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),
Recommended value: 6100 psi (350 bar).

2.3 Controller characteristic curves



S0 — Load sensing

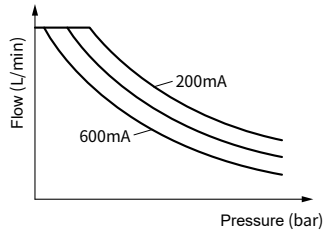
Load sensitive control adjusts the pump displacement to the required size of the load by comparing the pressure difference Δ p between the pump outlet pressure and the load pressure, thereby maintaining a constant pump flow rate. If the pressure difference Δ p increases, the pump displacement decreases; If the pressure difference Δ p decreases, the pump displacement increases while maintaining the pressure difference between the pump outlet and the load unchanged.

When the pressure setting is reached, cut off the pressure, corresponds to adjust the pump displacement back to the minimum pressure control V_{min} .

The Settable Range of Δp:

Setting range for pressure control: 203 psi to 362 psi (14 bar to 25 bar),

Recommended value: 290 psi (20 bar).



L1 — Electric proportional override

A control current acts against the adjustment spring of the power controller via a proportional solenoid.

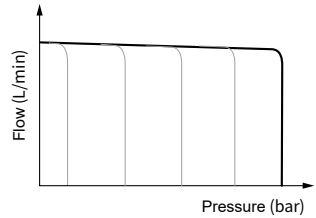
Input different currents through electromagnet to control the corresponding output power of the pump，which means:

Increasing control current = reduced power.

The power requirements of different operation modes can be realized.

Technical data, solenoid

Voltage	24 V（±20 %）
Rated current	650 mA
Maximum current	770mA
Rated resistance	23.5Ω
PWM Recommended frequency	80~150Hz
Duty cycle	100 %
Type of protection	IP69K
Connector for solenoids	-40°C ~120°C

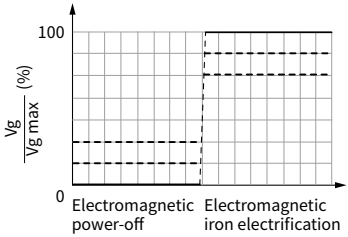


DG— Remote pressur

The remote pressure control port sets the control pressure through external overflow valves and other methods. When the working pressure exceeds the set value, the pump will adjust to a small displacement. Set appropriate remote control pressure based on actual usage.

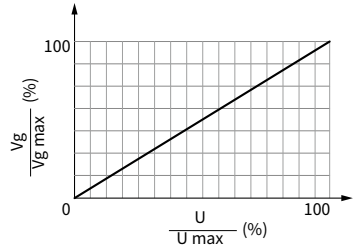
When this function is not required in use, the pressure difference adjustment screw can be locked clockwise to shield the function.Setting range for pressure control: 203 psi to 435 psi (14 bar to 30 bar), Recommended value: 203 psi (14 bar).

2.3 Controller characteristic curves



E0 — Two point control

The tilt angle of the pump's inclined plate can be adjusted through an electromagnetic directional valve, but it can only be in the maximum position
High displacement Vgmax or minimum displacement Vgmin.
When the solenoid valve is powered off, the pump displacement is minimized.
When the solenoid valve is powered on, the pump displacement is at its maximum.
Setting range for pressure control: 580 psi to 2899 psi (40 bar to 200 bar),
Recommended value: 1740 psi (120 bar).



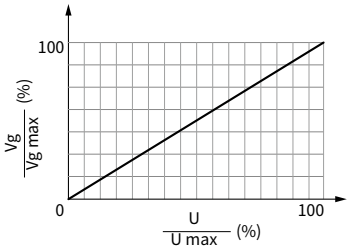
EC2 — Electric proportional displacement closed-loop control

By inputting the control signal of the proportional electromagnet, set the displacement size of the pump Then, the actual position of the pump's inclined plate swing angle is determined through the inclined plate swing angle sensor of the pump Feedback: The displacement of the pump is directly proportional to the magnitude of the input signal, and Unlimited adjustment within the range of 0-100%. When there is no current signal, the pump displacement is at maximum value.
Setting range for pressure control:580 psi to 2899 psi (40 bar to 200 bar),
Recommended value: 1740 psi (120 bar).

Technical data, solenoid

Voltage		24 V
Rated current		2.5 A
Nominal resistance	Cold value	2Ω
	Maximum calorific value	3Ω
Duty cycle		100 %
Type of protection		IP65
Electromagnetic connector		Dechi DT04-2P

2.3 Controller characteristic curves

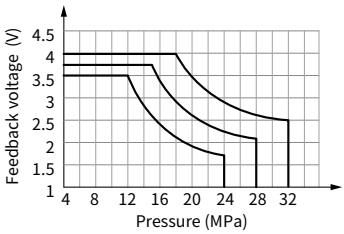


EC3 — Electric proportional displacement closed-loop control with displacement feedback for valve core

By inputting the control signal of the proportional electromagnet, set the displacement size of the pump Then, the actual position of the pump's inclined plate swing angle is determined through the inclined plate swing angle sensor of the pump Feedback: The displacement of the pump is directly proportional to the magnitude of the input signal, and Unlimited adjustment within the range of 0-100%. When there is no current signal, the pump displacement is at maximum value.
Setting range for pressure control: 580 psi to 2899 psi (40 bar to 200 bar),
Recommended value: 1740 psi (120 bar).

Technical data, solenoid

Voltage		24 V
Rated current		2.5 A
Nominal resistance	Cold value	2.7 Ω
	Maximum calorific value	4.05 Ω
Duty cycle		100 %
Type of protection		IP65
Electromagnetic connector		Seven core socket with plug



PpQ — Three loop control of pressure, flow rate, and power (electronic pump)

By inputting the control signal of the proportional electromagnet, the displacement and pressure of the pump can be set separately
The magnitude of force and power is measured by the pump's inclined plate angle sensor and pump outlet during the process
The pressure sensor provides feedback on the actual position of the pump's inclined plate swing angle, as well as the pump's displacement and pressure
The controlled parameters such as force and power are directly proportional to the size of the input signal, and in Adjustable infinitely within the range of 0-100%; Only one of the three parameters is always real
The state of time regulation, whose priority order is defined by the minimum value generator, has no current signal
When the pump is in operation, the displacement is at its maximum value.
Setting range for pressure control: 580 psi to 2899psi (40 bar to 200 bar),
Recommended value: 1740 psi (120 bar).

2.4 Comparison of control accuracy of electronic pumps

EC2

Displacement cc/r	**110**	**145**	**160**	**205**	**280**	**300**
Control pressure bar	120	120	120	120	120	120
Hysteresis %	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Linearity %	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Repetition accuracy %	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
0~100% step corresponding time ms	< 100	< 125	< 125	< 150	< 160	< 160

EC3

Displacement cc/r	**110**	**145**	**160**	**205**	**280**	**300**
Control pressure bar	120	120	120	120	120	120
Hysteresis %	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Linearity %	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Repetition accuracy %	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
0~100% step corresponding time ms	< 90	< 100	< 100	< 120	< 130	< 130

PPQ-1

Displacement cc/r	**110**	**145**	**160**	**205**	**280**	**300**
Control pressure bar	120	120	120	120	120	120
Hysteresis %	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Linearity %	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Repetition accuracy %	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
0~100% step corresponding time ms	< 100	< 125	< 125	< 150	< 160	< 160

PPQ-2

Displacement cc/r	**110**	**145**	**160**	**205**	**280**	**300**
Control pressure bar	120	120	120	120	120	120
Hysteresis %	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Linearity %	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Repetition accuracy %	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
0~100% step corresponding time ms	< 90	< 100	< 100	< 120	< 130	< 130

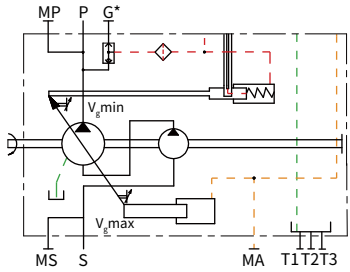
PPQ-3

Displacement cc/r	**110**	**145**	**160**	**205**	**280**	**300**
Control pressure bar	120	120	120	120	120	120
Hysteresis %	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Linearity %	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Repetition accuracy %	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
0~100% step corresponding time ms	< 80	< 90	< 90	< 100	< 120	< 120

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 3.1, "General", under "Max. permissible drive/output torque"
Installation positions	Any (for installation information see Chapter 6, "Installation information")
Rotating direction	Clockwise or anti-clockwise
Ports	·Suction port ·Pressure port ·Drain port ·Pressure gauge connection ·Pilot oil port
Purity class	A cleanliness level of at least 20/18/15 is to be maintained according to ISO 4406. (PpQ3 controls cleanliness to be maintained at least at level 18/16/13).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.
Cold start	Allowable temperature difference during : between axial piston unit and hydraulic oil Δ T ⩽ 25K. Starting temperature: T ⩾ -25 °C (when the temperature is below -25 °C , NBR shaft seal is required).
	Viscosity: v_{max} ⩽ 1600mm²/s， temperature: θ_{st} ⩾ 25°C Remarks: t ⩽ 3 minutes, no load (20bar ⩽ p ⩽ 50bar), n ⩽ 1000r/min。
Optimal hydraulic oil working require	Hydraulic oil: according to DIN 51524 Part 1 to 3; ISO VG 10 to 68 according to DIN 51519 Continuous operation viscosity range: min. 10 mm2/s; max. 400 mm²/s. Optimal working viscosity range: 16 to 36mm²/s, when lower than 16mm², 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 +70°C .



Charge pump (impeller)

The booster pump is driven by the main shaft to replenish oil for the V32G 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 V32G oil pump that includes a booster pump, **in most cases** there is no need for additional compulsory oil replenishment.

Note: "* "mean is the internal and external control pilot modes are used here, and the pilot control oil circuit varies when different control modes are selected.

3.1 General

Additional parameters

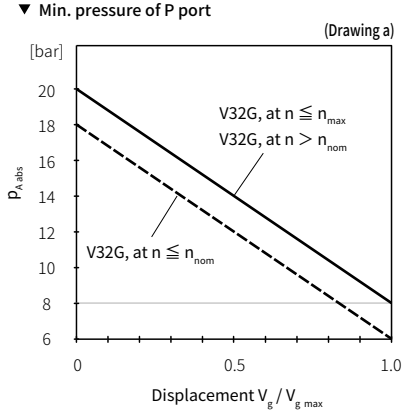
Product model			065	110	145	160	205	280	300
Min. inlet pressure (absolute) open circuit (Please refer to Figure b below for specific requirements)		bar	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Minimum operating pressure		bar	Please refer to Figure a below						
Maximum allowable shell pressure at rated speed (static/dynamic)		bar	2/3	2/3	2/3	2/3	2/3	2/3	2/3
Maximum allowable shell pressure at 1500rpm (static/dynamic)		bar	3/5	3/5	3/5	3/5	3/5	3/5	3/5
Max. permissible inlet pressure (static/dynamic)		bar	20/30	20/30	20/30	20/30	20/30	20/30	20/30
Rated rotation speed, at V_{gmax} *	Without booster pump	rpm	2500	2400	2300	2200	2100	1800	-
	With booster pump		-	-	2600	2500	2400	2150	2000
Max. rotation speed, at $V_g < V_{gmax}$		rpm	Please refer to Figure b below						
Min. rotation speed in continuous operation		rpm	500	500	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)	76	78	80	80	83	85	85
Weight (Without through drive,approximate)	Without booster pump	kg	48.5	74.5	92.7	93.3	111.8	148.7	-
	With booster pump		-	-	94	95.6	115	150.5	149

Note:
"*" mean is a llowable rotational speed when the absolute pressure P at the oil suction port is absolute=1 bar.

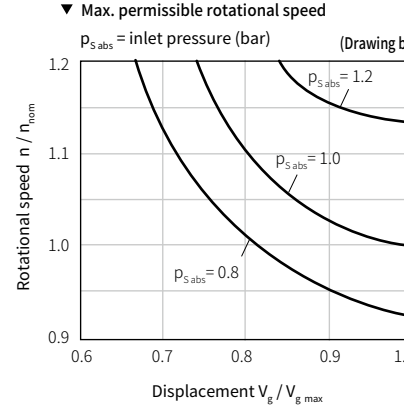
Note:
The minimum operating pressure in the pump line depends on the speed and the swashplate angle;
the pressure must not fall below 10 bar under any circumstances.

Note:
The housing pressure is only allowed to be 1 bar higher than the suction pressure, But it cannot exceed the maximum allowable pressure of the shell.

▼ **Min. pressure of P port**



▼ **Max. permissible rotational speed**



3.1 General

Max. permissible drive/output torque

Product model		065	110	145/160	205	280/300
Max. permissible drive torque	Splined shaft D1	-	3140N·m	3140N·m	3140N·m	-
	Splined shaft D2	-	-	-	-	5780N·m
	Splined shaft D4	505N·m				
	Splined shaft S5	602N·m				
	Splined shaft S6	-	1640N·m	1640N·m	1640N·m	-
	Splined shaft S7	-	-	2670N·m	2670Nm	-
	Splined shaft S9	1104N·m				
	Straight shaft K	700N·m	1050N·m	1450N·m	2200N·m	2750N·m

Max. permissible output torque	505N·m	960N·m	1100N·m	1300N·m	2200N·m

3.2 Planning information for parameters

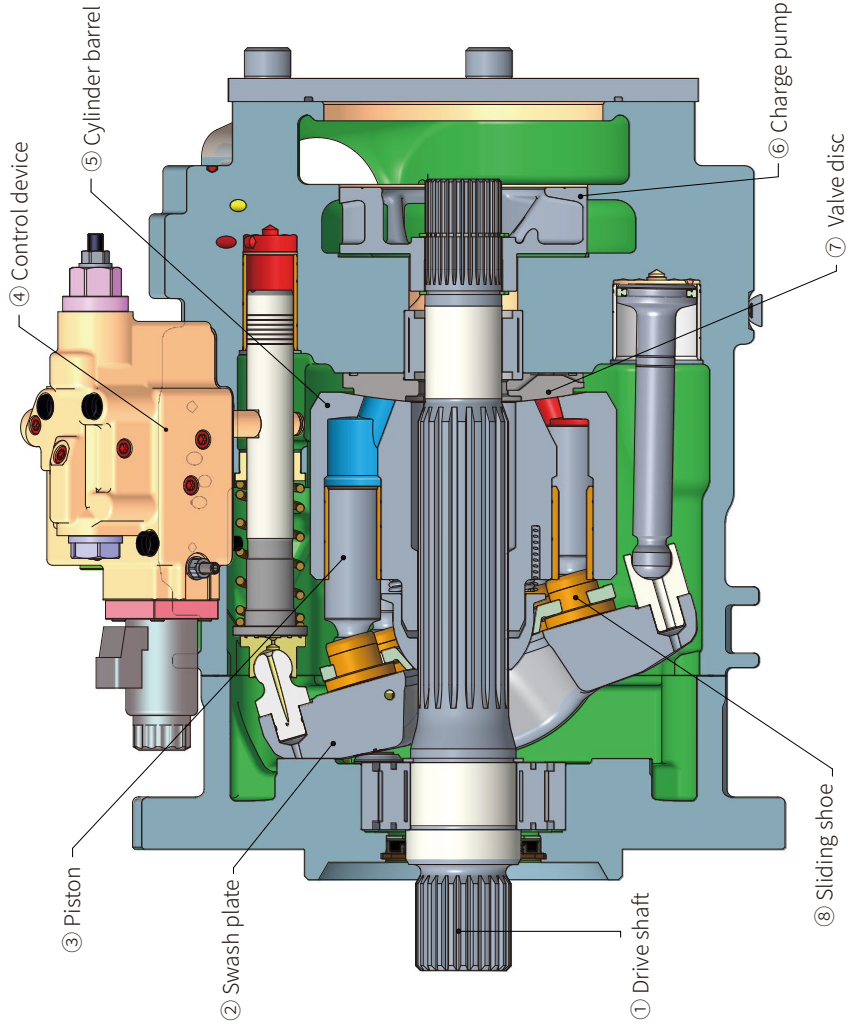
Determination of nominal sizes

Delivery flow	$Q = \frac{V_g \cdot n \cdot \eta_v}{1000}$ (lpm)	V_g	= Geom. output volume (cm^3/rev)
		Δp	= Differential pressure (bar)
Drive torque	$M = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}}$ (N·m)	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 ($\eta_t = \eta_v \cdot \eta_{mh}$)

[Continued from Page 16.]

Through the window on the valve plate ⑦ , 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. 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.

3.3 Section view



V32G205 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 ⑧ rotates on the swash plate, the plunger ③ 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.

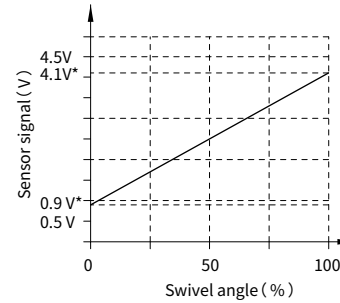
[Continue to Page 15.]

3.4 Sensor

3.4.1 Swash angle pick-up

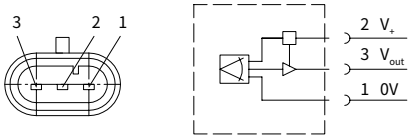
Technical Parameter

Supply Voltage	10 ~ 30 VDC
Output signal	0.5~4.5V/4~20mA
Tested for automotive field	DIN 40839
Electrical connection	3-PIN AMP
Superseal	1.5 plug
Operation temperature	-40 ～ 110°C
Protection grade	IP68



* Due to differences in the mechanical structure of pumps with different displacements, the voltage may vary slightly.

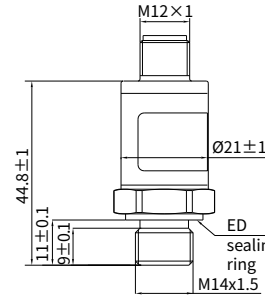
Wiring example



3.4.2 Pressure sensor

Technical Parameter

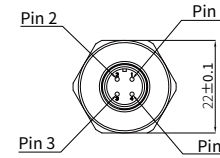
Pressure range	0~60 Mpa
Supply Voltage	8~36 V
Output signal	0~10 V /4~20 mA
Long term stability	±0.2%FS/year
Overload pressure	2.5 times
Response time	⩽ 1ms
Zero temperature drift	±0.1%FS/10°C
Working temperature	-40~125°C
Protection level	IP67
Working medium	Compatible with 17-4 material



*The sensor on the pump is equipped with a 0.5m shielded wire, and there is no plug at the end of the wire.
*The core specification is 4 × 0.25 square millimeters.

Wiring example

Pin 1	V+
Pin 2	N/C
Pin 3	V-
Pin 4	V_{out}

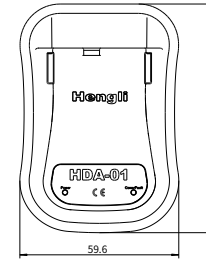


3.5 HDA Amplifier

Can be used for pump and valve control with any single or double electromagnet.

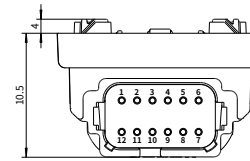
Technical Parameter

Working voltage	9~32VDC (Power anti-reverse function)
Operating current	3A max
Protection grade	IP67
Input signal	HDA-01 single input, HDA-02 double input
PWM output	HDA-01：0-3A/DC(One-way continuous), -40℃ ~+75℃ HDA-02:0-2.7A/DC(Two-way continuous), -40℃ ~+75℃
Current resolution	±1mA (When greater than 35mA)
PWM frequency	33Hz~500Hz
Working temperature	-40℃ ~+85℃

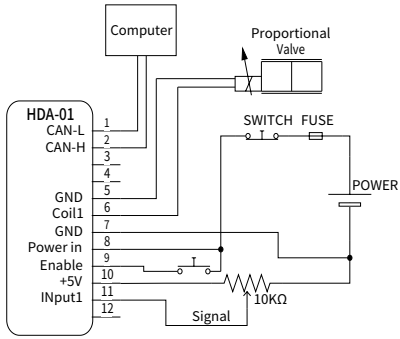


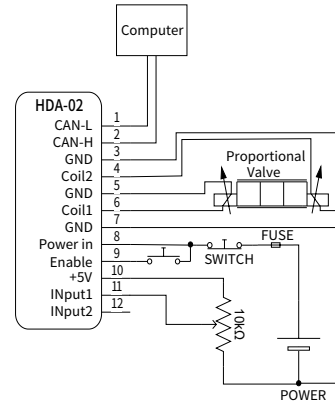
Pin Definition

Pin 1	CAN_L	Pin 7	GND
Pin 2	CAN_H	Pin 8	Power in
Pin 3	Ground (input/output)	Pin 9	Enable
Pin 4	Coil2	Pin 10	+5V
Pin 5	Ground (input/output)	Pin 11	Input 1
Pin 6	Coil1	Pin 12	Input 2



Wiring example



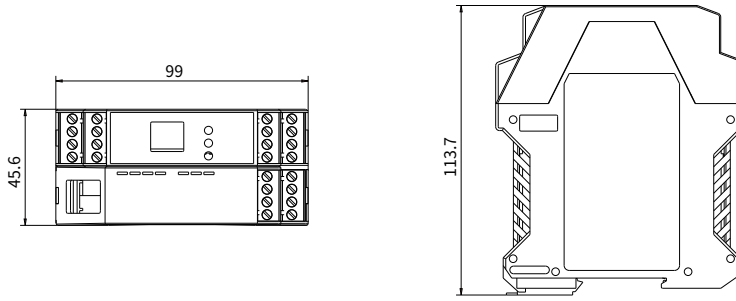


Wiring mode: The foregoing wiring diagram is for reference only.

3.6 HLEC2414-PQP-PN Controller

An electronic pump control module that integrates power and control interfaces, suitable for flow, pressure, and power control of electronic pumps.

External dimensions

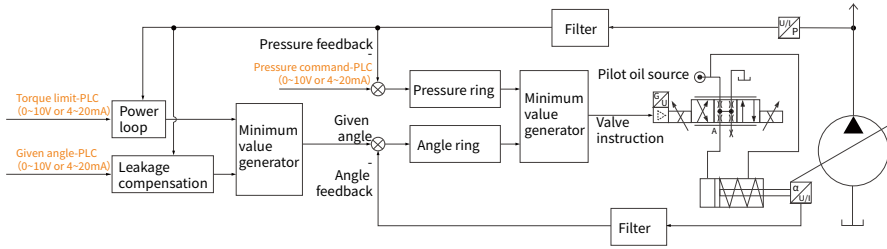


Technical Parameter

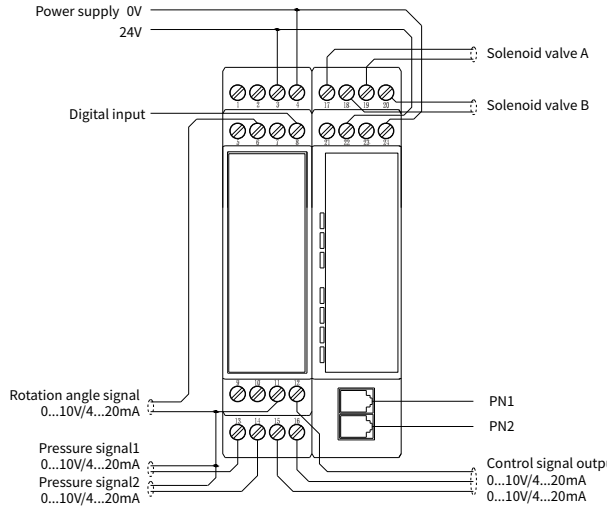
Working voltage	12V ~ 30VDC
Operation temperature	-20°C ~ +60°C
Storage temperature	-20°C ~ +70°C
Relative humidity	40% ~ 90%
Protection grade	IP20
Electrical protection	Power port input anti reverse protection, power output overcurrent short circuit protection, port protection.
	Signal port input/output overvoltage/overcurrent protection, port protection, and fault detection.
Communication model	USB TYPE-B、ProfiNet RJ45
External dimensions	113.7mm*99mm*45.6mm
Digital signal input	Enable input: This application is usually enabled.
Digital signal output	Prepare to output: ON： This module has been enabled with no apparent errors. OFF： Enable unavailable or detected an error.
Analog input	Feedback value rotation angle (XQ), signal range 0~10 V or 4~20mA, expandable and adaptive.
	Feedback value 1, pressure (XP), signal range 0~10 V or 4~20mA, expandable and adaptive.
	Feedback value 2, pressure (XP), signal range 0~10 V or 4~20mA, expandable and adaptive.
Analog output	2 channels, supporting 0... 10 V or 4... 20 mA
Electromagnetic valve output	Electromagnetic valve output * 2/single output MAX 2A or MAX 3.2A, configurable.
Connector	MSTBT2.5/4-ST KMGY，MSTBO2.54-G1L KMGY，MSTBO2.54-G1R KMGY
Product testing types	Functional testing, environmental testing EMC

3.6 HLEC2414-PQP-PN Controller

Control topology block diagram



Wiring example



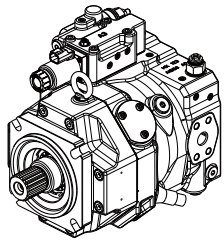
4 Dimensions

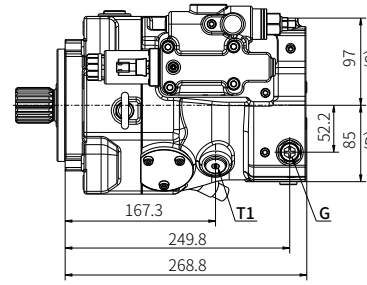
All dimensions in mm, subject to change!

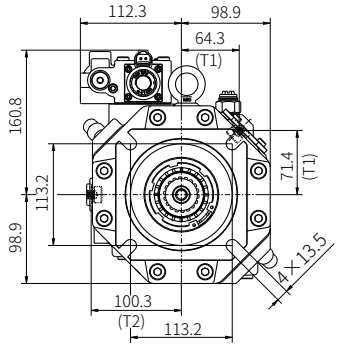
4.1 V32G 065 series

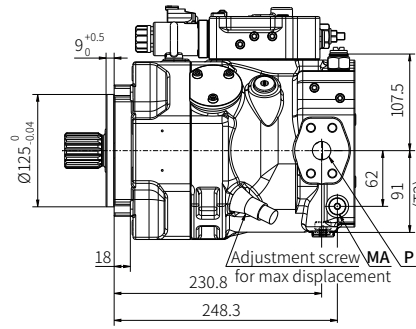
4.1.1 Type V32G 065, clockwise rotation, without booster pump

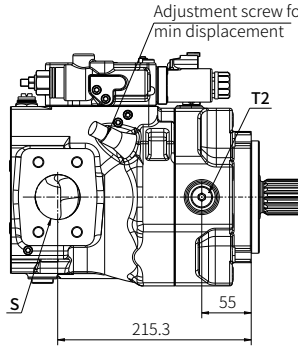
DRE1 — Fixed setting, electric proportional displacement, pressure Cut-off

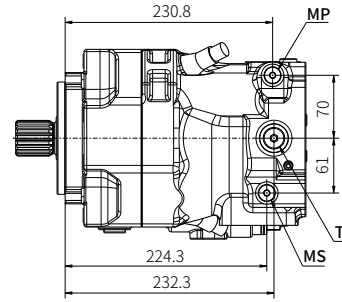






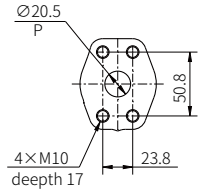




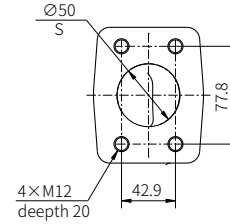


Remarks:
Adjustment screw for min displacement: 0~15 cm^3/rev
Adjustment screw for max displacement: 55~65 cm^3/rev

4.1.1 Type V32G 065, clockwise rotation, without booster pump



Pressure port P

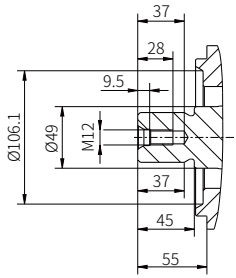


Suction port S

Shaft version

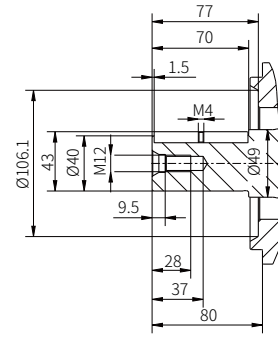
Splined shaft, Coding D4

(DIN 5480 W40×2×18×9g)



Parallel keyed shaft , Coding K0

(DIN 6885 W40 A 12×8×9g)



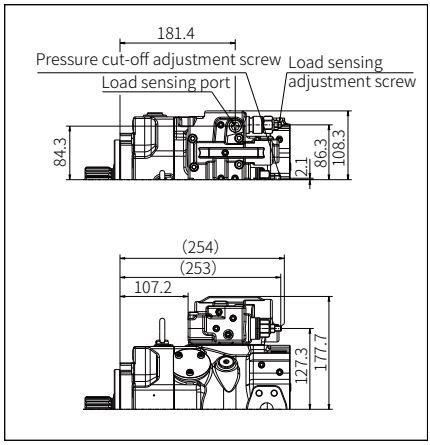
Port details

	Designation	Size	Reference tightening torque (N·m)
P	Output port	SAE J518 3/4 in，DIN 13 M10×1.5, depth 17	60
S	Input port	SAE J518 2in，DIN 13 M12×1.75, depth 20	98
T1, T2, T3	Drain port	DIN 3852，M18×1.5, depth 15	60
MP	Oil outlet pressure measureing	DIN 3852，M14×1.5, depth 12	36
MA	Piston chamber pressure measureing	DIN 3852，M14×1.5, depth 12	36
MS	Suction side pressure measureing	DIN 3852，M14×1.5, depth 12	36
G	External control pressure port	DIN 3852, M14×1.5, depth 12	36

4.1.2 Type V32G 065, clockwise rotation, dimension of control mode

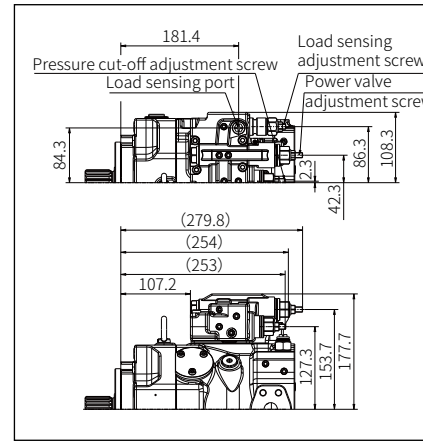
DRS0

Pressure Cut-off, Load sensing



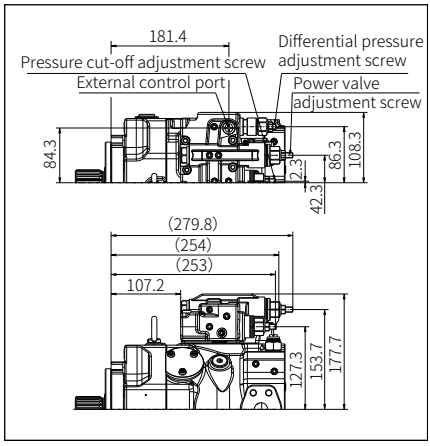
LRDS

Fixed setting, Pressure Cut-off, Load sensing



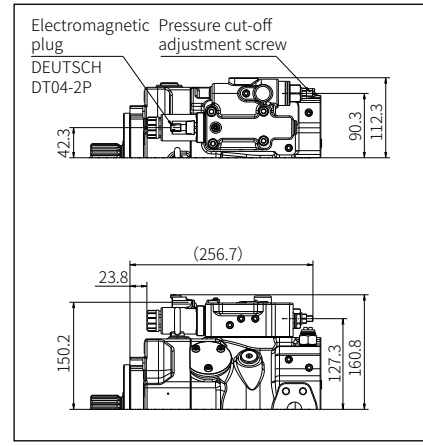
LRDG

Fixed setting, Pressure Cut-off, Remote pressure



DRE1

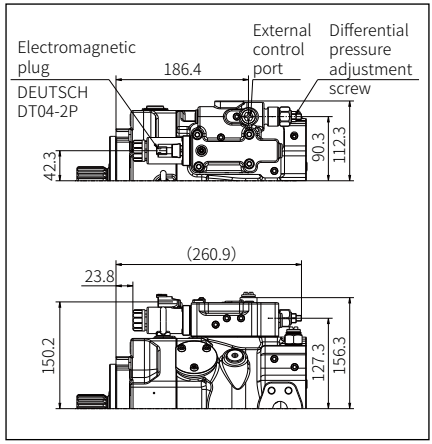
Electric proportional displacement, Pressure Cut-off



4.1.2 Type V32G 065, clockwise rotation, dimension of control mode

DGE1

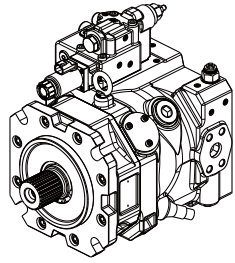
Electric proportional displacement,
Remote pressure

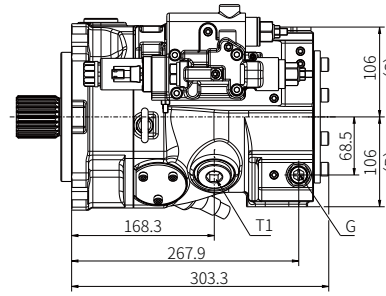


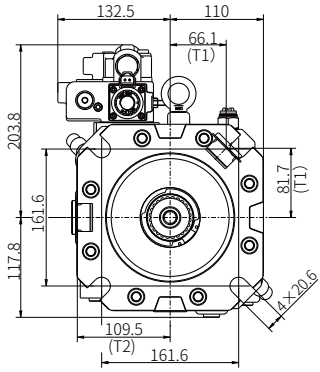
4.2 V32G 110 series

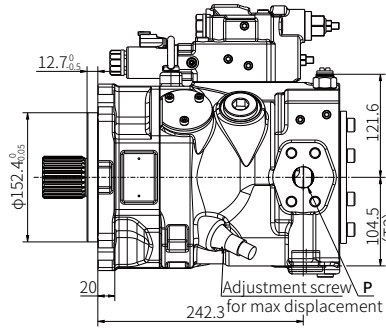
4.2.1 Type V32G 110, clockwise rotation, without booster pump

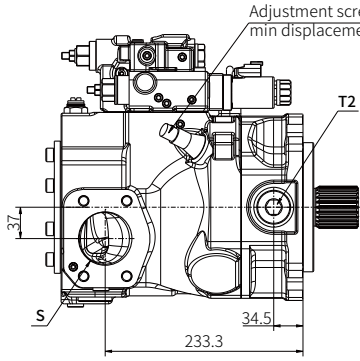
LRDRE1 — Fixed setting, electric proportional displacement, pressure Cut-off

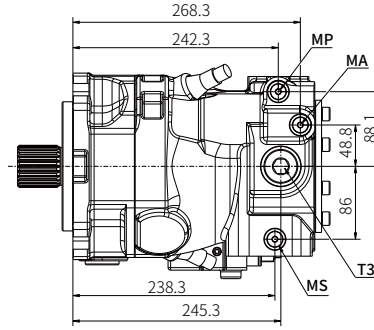






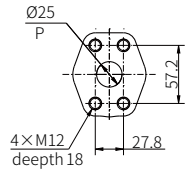




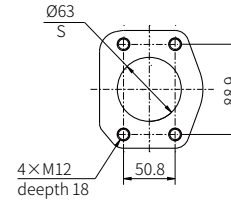


Remarks:
Adjustment screw for min displacement: 0~20 cm^3/rev
Adjustment screw for max displacement: 90~110 cm^3/rev

4.2.1 Type V32G 110, clockwise rotation, without booster pump



Pressure port P

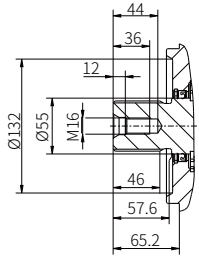


Suction port S

Shaft version

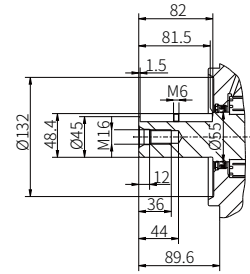
Splined shaft, Coding D1

(DIN 5480 W50×2×24×9g)



Parallel keyed shaft , Coding K1

(DIN6885 Ø45 A 14×9×80)



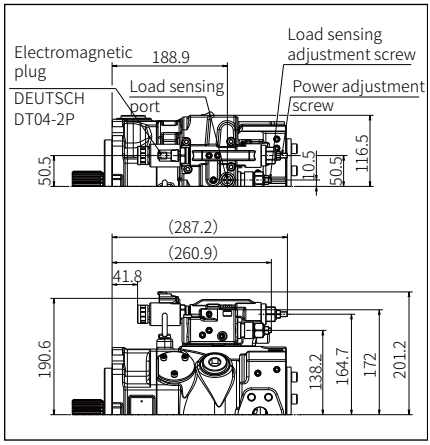
Port details

	Designation	Size	Reference tightening torque (N·m)
P	Output port	SAE J518 1 in, DIN 13 M12×1.75, depth18	98
S	Input port	SAE J518 2 1/2in, DIN 13 M12×1.75, depth 18	98
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 18	220
MP	Oil outlet pressure measureing	DIN 3852, M14×1.5, depth 12	45
MA	Piston chamber pressure measureing	DIN 3852, M14×1.5, depth 12	45
MS	Suction side pressure measureing	DIN 3852, M14×1.5, depth 12	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12	45

4.2.2 Type V32G 110, clockwise rotation, dimension of control mode

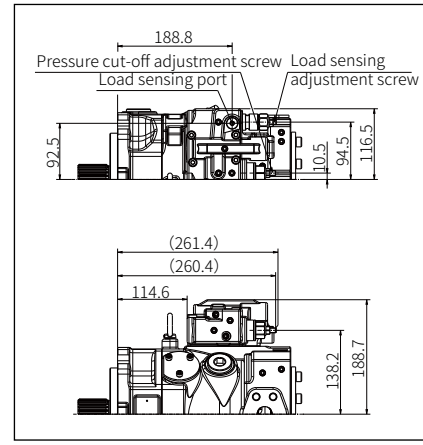
L1S0

Electric proportional override, Load sensing



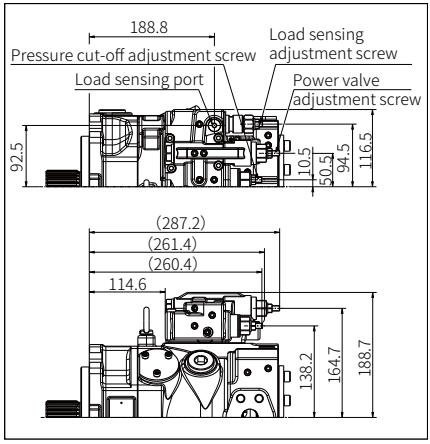
DRS0

Pressure Cut-off, Load sensing



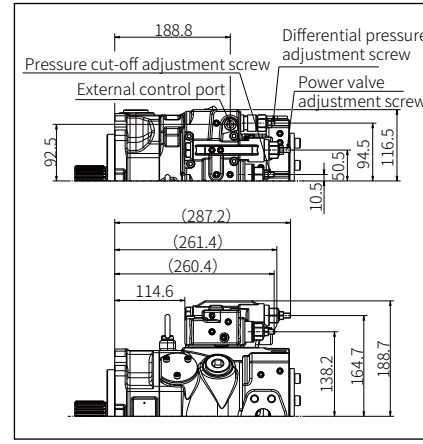
LRDS

Fixed setting, Pressure Cut-off, Load sensing



LRDG

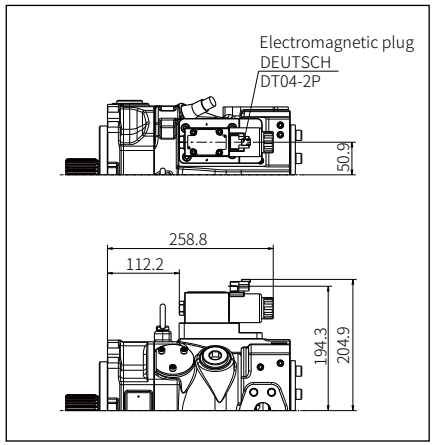
Fixed setting, Pressure Cut-off, Remote pressure



4.2.2 Type V32G 110, clockwise rotation, dimension of control mode

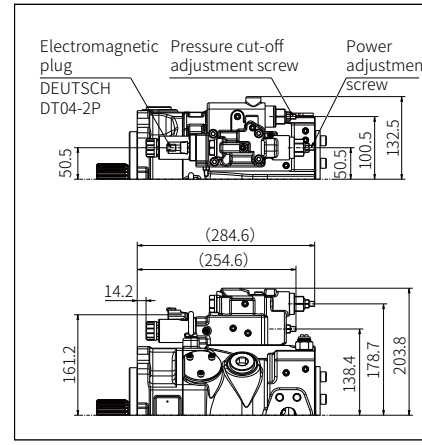
E0

Two point control



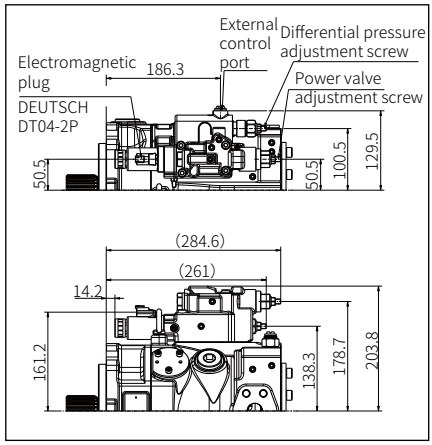
LRDRE1

Fixed setting, Electric proportional displacement, Pressure Cut-off



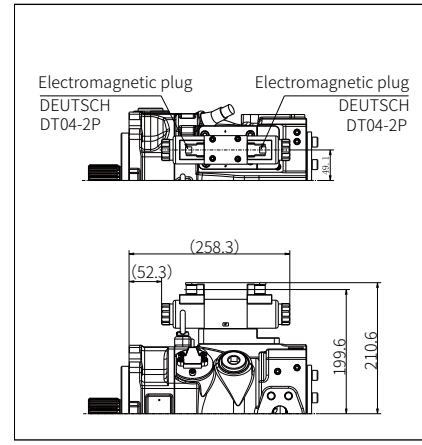
LRDGE1

Fixed setting, Electric proportional displacement, Remote pressure



EC2/PpQ1

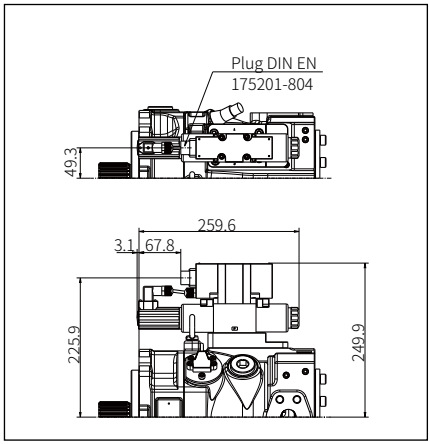
Electric proportional displacement closed-loop control/Three loop control of pressure, flow rate, and power (electronic pump)



4.2.2 Type V32G 110, clockwise rotation, dimension of control mode

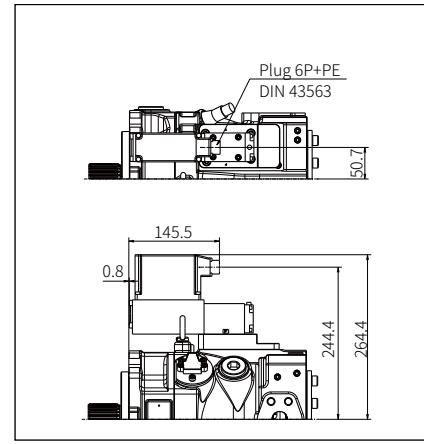
EC3/PpQ2

Electric proportional displacement closed-loop control with displacement feedback for valve core / Three loop control of pressure, flow rate, and power (electronic pump)



PpQ3

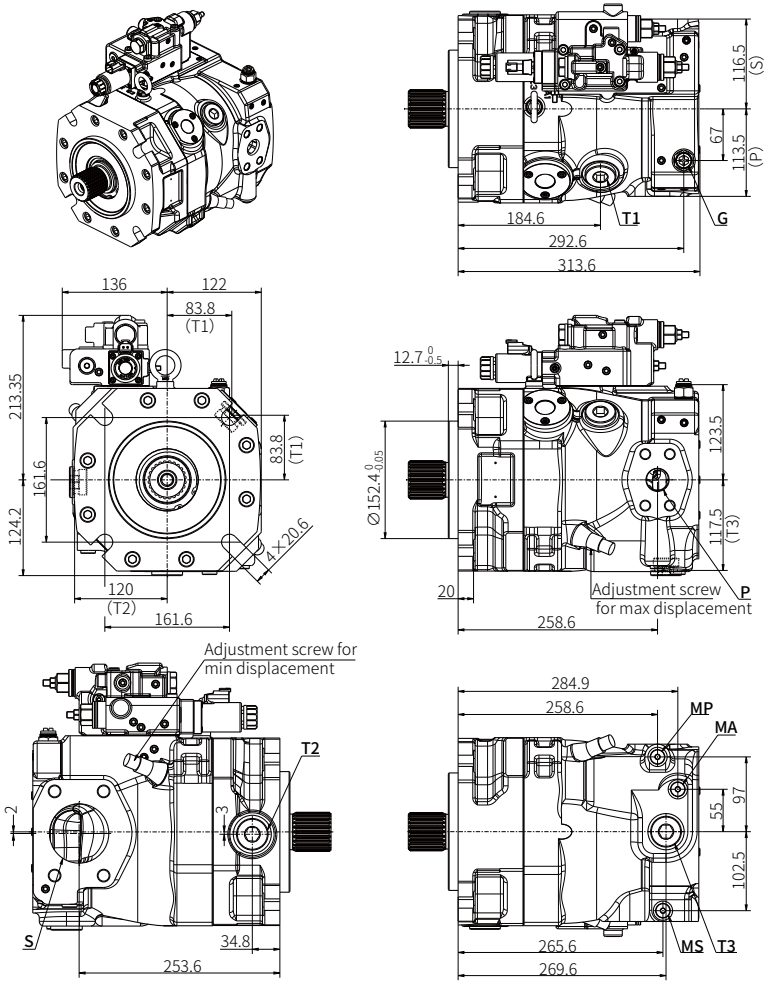
Three loop control of pressure, flow rate, and power (electronic pump)



4.3 V32G 145/160 series

4.3.1 Type V32G 145/160, clockwise rotation, without booster pump

LRDRE1 — Fixed setting, pressure Cut-off, load sensing



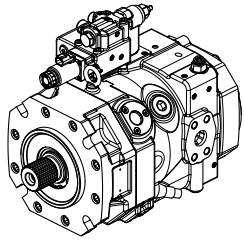
Remarks:

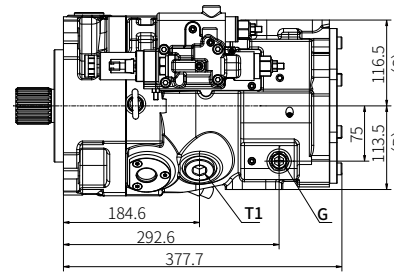
V32G145 series Adjustment screw for min displacement: 0~25 cm^3/rev
Adjustment screw for max displacement: 120~145 cm^3/rev

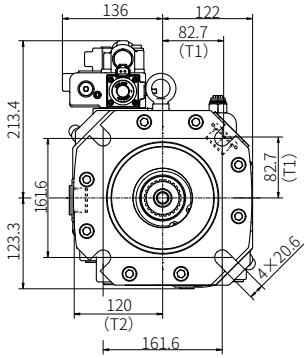
V32G160 series Adjustment screw for min displacement: 0~25 cm^3/rev
Adjustment screw for max displacement: 135~160 cm^3/rev

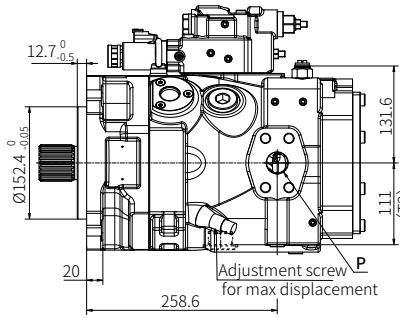
4.3.2 Type V32GL 145/160, clockwise rotation, with charge pump

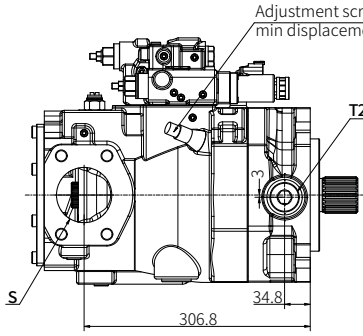
LRDRE1 — Fixed setting, pressure Cut-off, load sensing

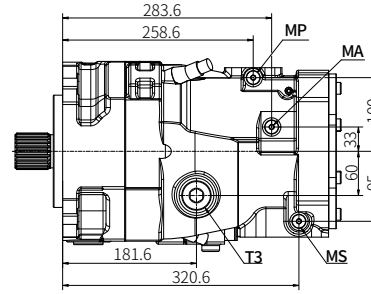










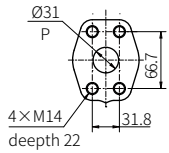


Remarks:

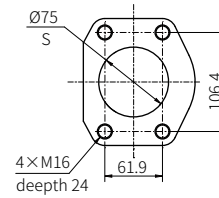
V32G145 series Adjustment screw for min displacement: 0~25 cm^3/rev
Adjustment screw for max displacement: 120~145 cm^3/rev

V32G160 series Adjustment screw for min displacement: 0~25 cm^3/rev
Adjustment screw for max displacement: 135~160 cm^3/rev

4.3.3 Type V32G(L) 145/160, clockwise rotation



Pressure port P

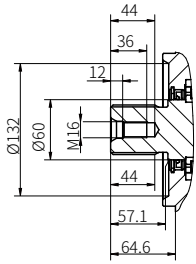


Suction port S

Shaft version

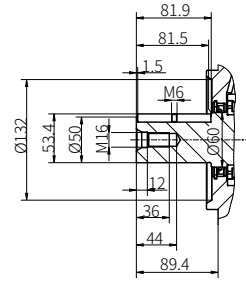
Splined shaft, Coding D1

(DIN 5480 W50×2×24×9g)



Parallel keyed shaft , Coding K2

(DIN6885 Ø50 A 14×9×80)



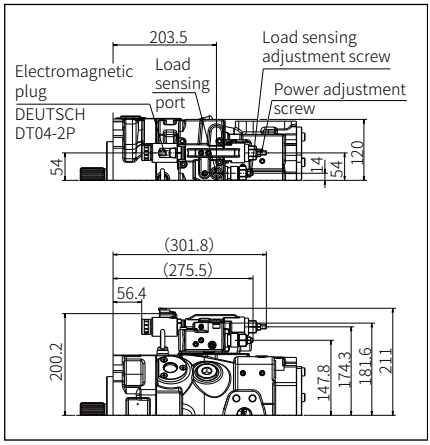
Port details

	Designation	Size	Reference tightening torque（N·m)
P	Output port	SAE J518 1 1/4in, DIN 13 M14×2, depth 22	160
S	Input port	SAE J518 3in, DIN 13 M16×2, depth 24	240
T1, T2, T3	Drain port	DIN 3852, M33×2, depth 19mm	220
MP	Oil outlet pressure measureing	DIN 3852, M14×1.5, depth 12mm	45
MA	Piston chamber pressure measureing	DIN 3852, M14×1.5, depth 12mm	45
MS	Suction side 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

4.3.4 Type V32G(L) 145/160, clockwise rotation, dimension of control mode

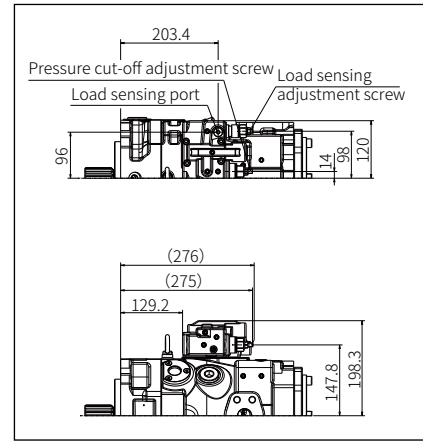
L1S0

Electric proportional override, Load sensing



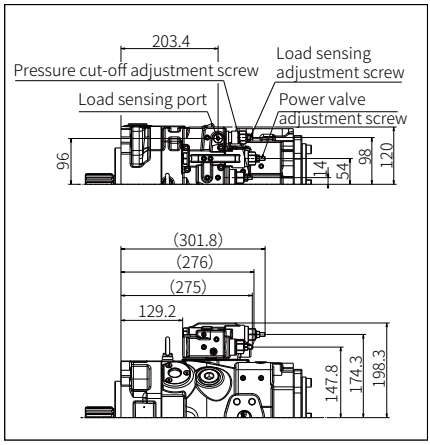
DRS0

Pressure Cut-off, Load sensing



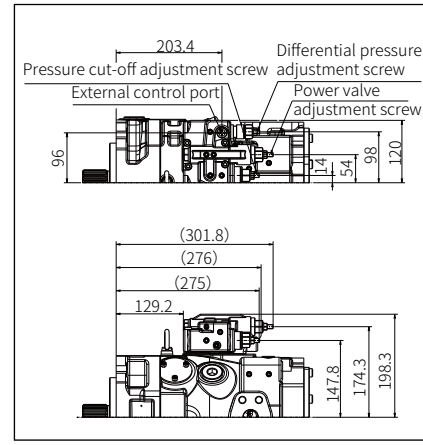
LRDS

Fixed setting, Pressure Cut-off, Load sensing



LRDG

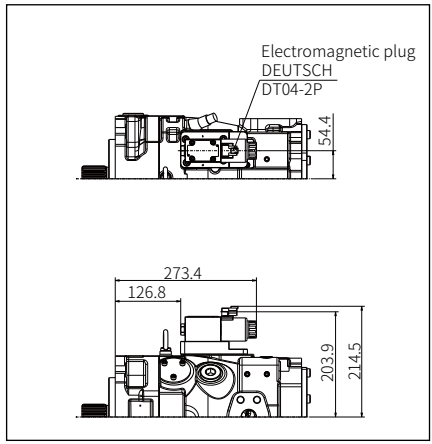
Fixed setting, Pressure Cut-off, Remote pressure



4.3.4 Type V32G(L) 145/160, clockwise rotation, dimension of control mode

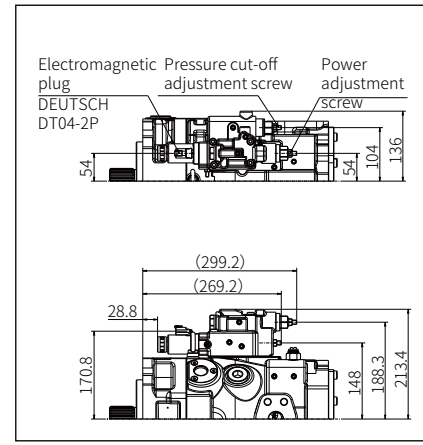
E0

Two point control



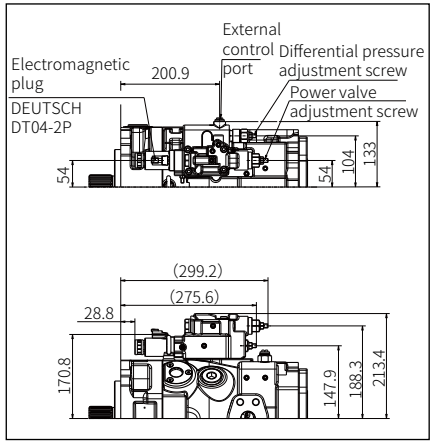
LRDRE1

Fixed setting, Electric proportional displacement, Pressure Cut-off



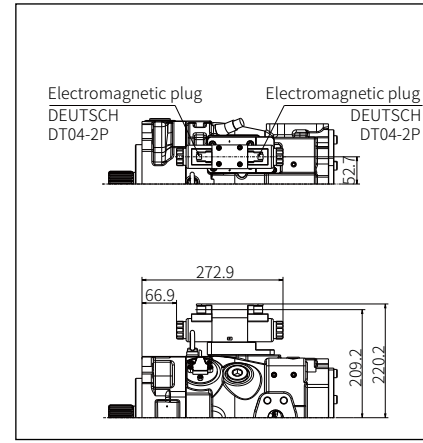
LRDGE1

Fixed setting, Electric proportional displacement, Remote pressure



EC2/PpQ1

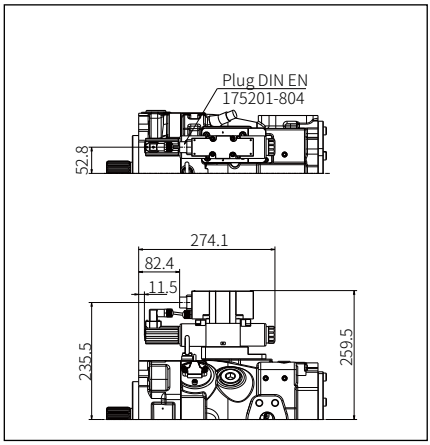
Electric proportional displacement closed-loop control/Three loop control of pressure, flow rate, and power (electronic pump)



4.3.4 Type V32G(L) 145/160, clockwise rotation, dimension of control mode

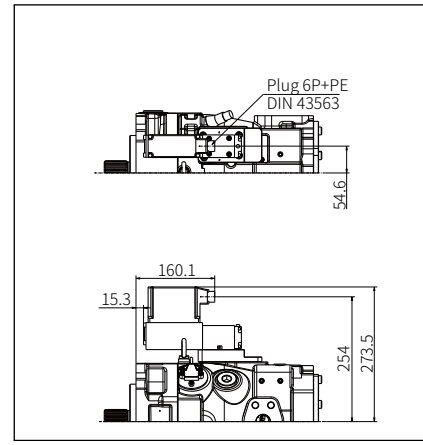
EC3/PpQ2

Electric proportional displacement closed-loop control with displacement feedback for valve core / Three loop control of pressure, flow rate, and power (electronic pump)



PpQ3

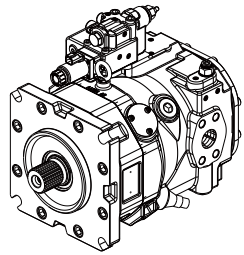
Three loop control of pressure, flow rate, and power (electronic pump)

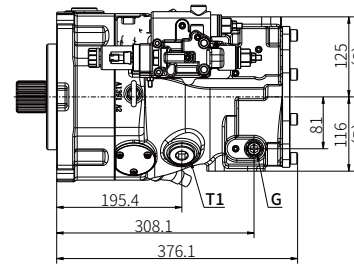


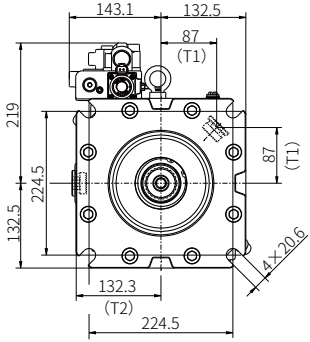
4.4 V32G 205 series

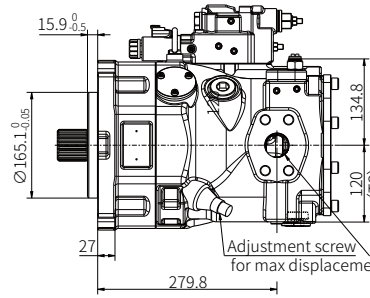
4.4.1 Type V32G 205, clockwise rotation, without booster pump

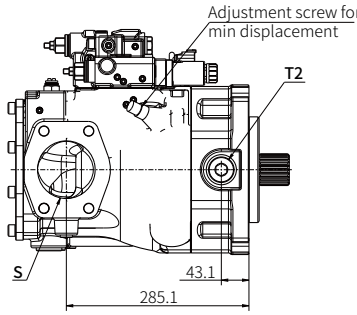
LRDRE1 — Fixed setting, electric proportional displacement, pressure Cut-off

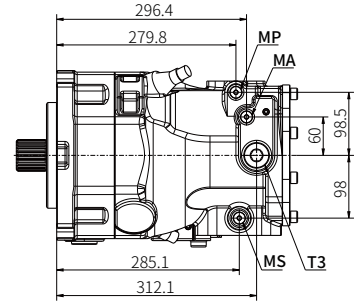








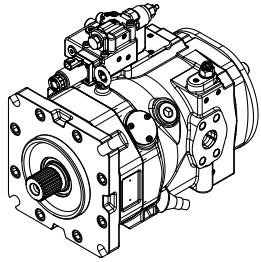


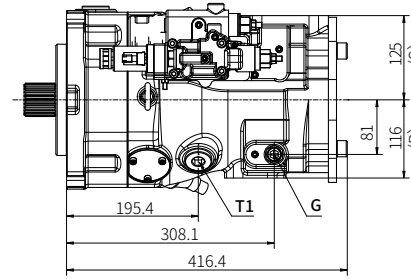


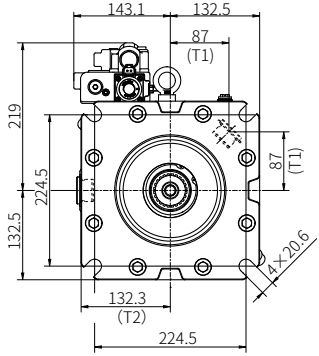
Remarks:
Adjustment screw for min displacement: 0~30 cm^3/rev
Adjustment screw for max displacement: 180~200 cm^3/rev

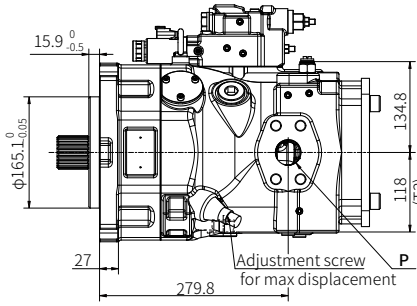
4.4.2 Type V32GL 205, clockwise rotation, with charge pump

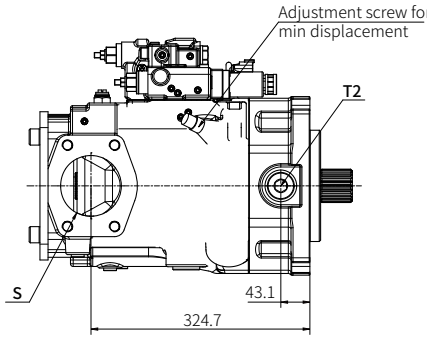
LRDRE1 — Fixed setting, electric proportional displacement, pressure Cut-off

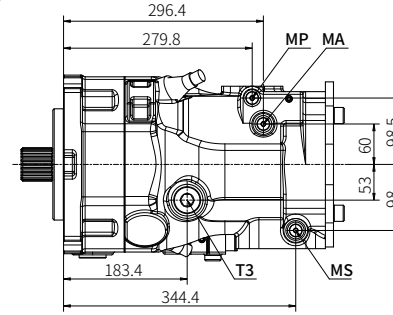






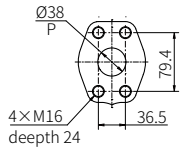




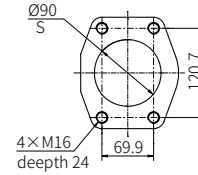


Remarks:
Adjustment screw for min displacement: 0~30 cm^3/rev
Adjustment screw for max displacement: 180~200 cm^3/rev

4.4.3 Type V32G(L) 205, clockwise rotation



Pressure port P

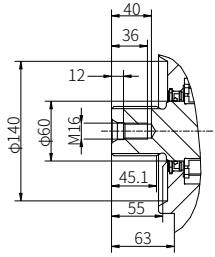


Suction port S

Shaft version

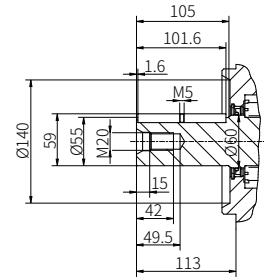
Splined shaft, Coding D1

(DIN 5480 W50×2×24×9g)



Parallel keyed shaft , Coding K3

(DIN6885 Ø55 A 16×10×100)



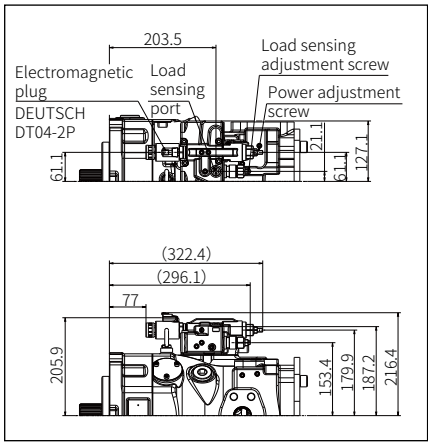
Port details

	Designation	Size	Reference 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	Oil outlet pressure measureing	DIN 3852, M14×1.5, depth 12	45
MA	Piston chamber pressure measureing	DIN 3852, M14×1.5, depth 12	45
MS	Suction side pressure measureing	DIN 3852, M14×1.5, depth 12	45
X	LS External controlpressure port	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 V32G(L) 205, clockwise rotation, dimension of control mode

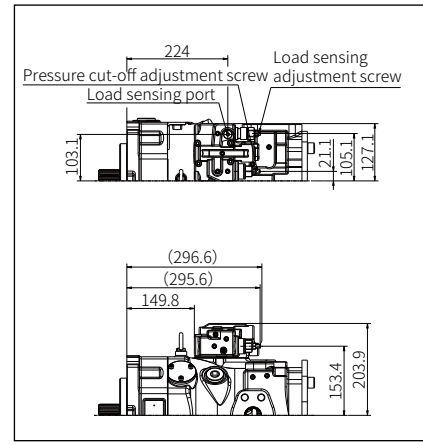
L1S0

Electric proportional override, Load sensing



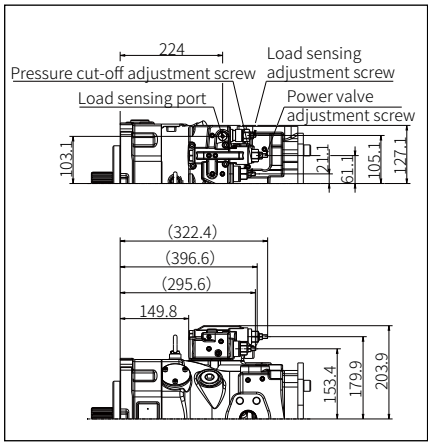
DRS0

Pressure Cut-off, Load sensing



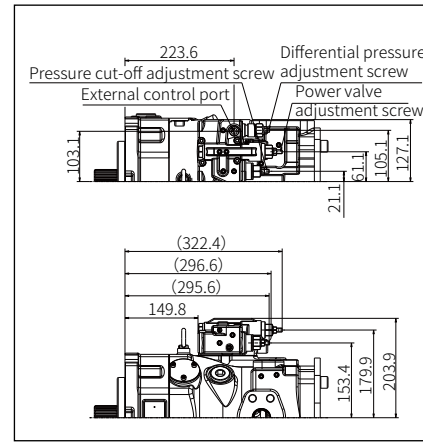
LRDS

Fixed setting, Pressure Cut-off, Load sensing



LRDG

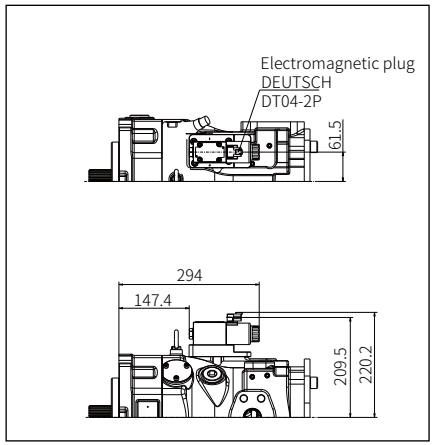
Fixed setting, Pressure Cut-off, Remote pressure



4.4.4 Type V32G(L) 205, clockwise rotation, dimension of control mode

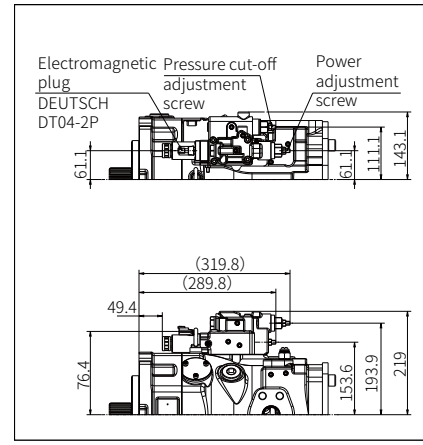
E0

Two point control



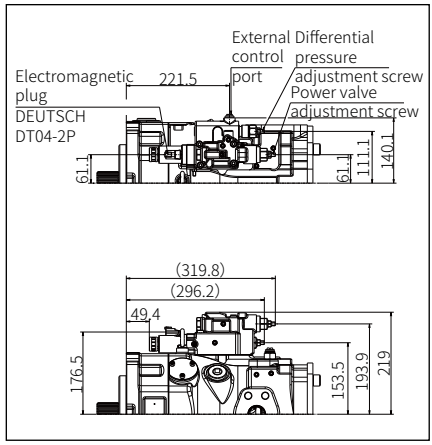
LRDRE1

Fixed setting, Electric proportional displacement, Pressure Cut-off



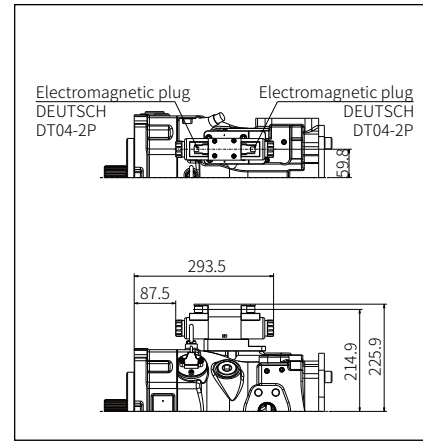
LRDGE1

Fixed setting, Electric proportional displacement, Remote pressure



EC2/PpQ1

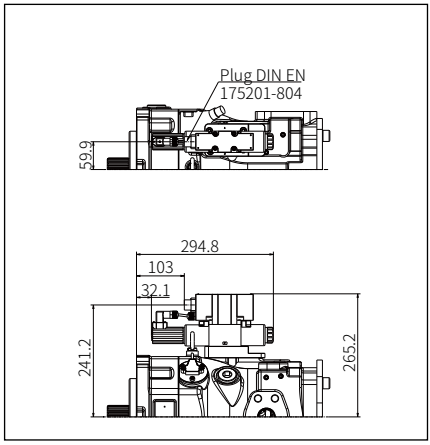
Electric proportional displacement closed-loop control/Three loop control of pressure, flow rate, and power (electronic pump)



4.4.4 Type V32G(L) 205, clockwise rotation, dimension of control mode

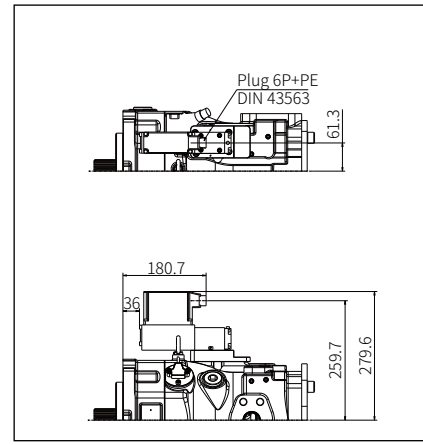
EC3/PpQ2

Electric proportional displacement closed-loop control with displacement feedback for valve core / Three loop control of pressure, flow rate, and power (electronic pump)



PpQ3

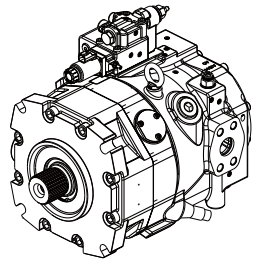
Three loop control of pressure, flow rate, and power (electronic pump)

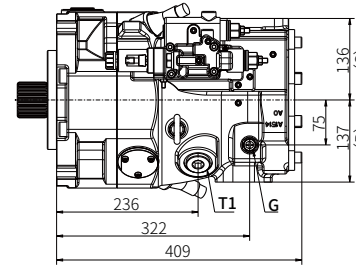


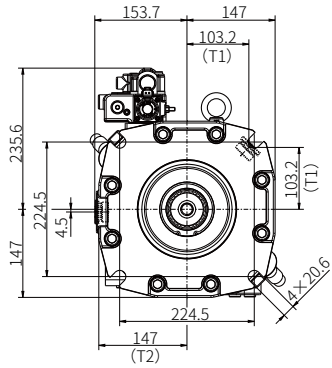
4.5 V32G 300 series

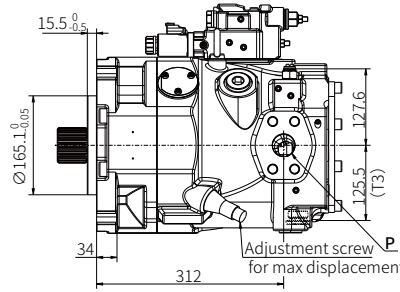
4.5.1 Type V32G 280/300, clockwise rotation, without booster pump

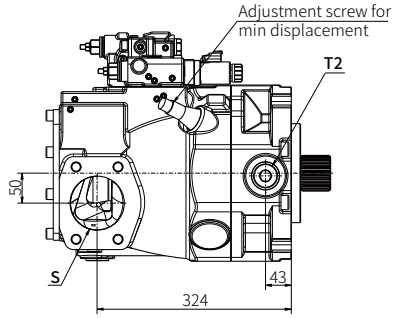
LRDRE1 — Fixed setting, electric proportional displacement, pressure Cut-off

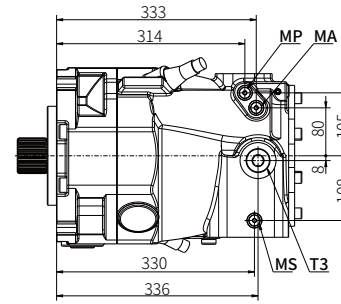










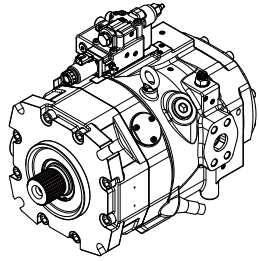


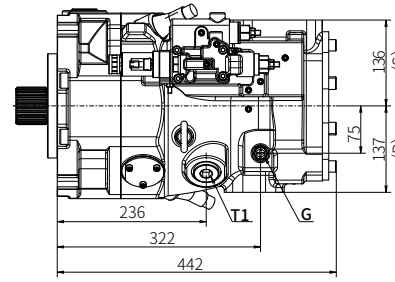
Remarks:

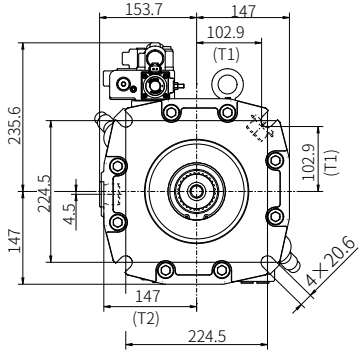
V32G 280 series	Adjustment screw for min displacement: 0~40 cm^3/rev
	Adjustment screw for max displacement: 250~280 cm^3/rev
V32G 300 series	Adjustment screw for min displacement: 0~40 cm^3/rev
	Adjustment screw for max displacement: 250~300 cm^3/rev

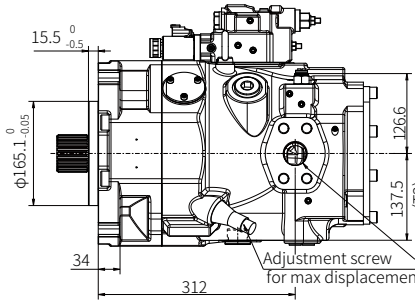
4.5.2 Type V32GL 280/300, clockwise rotation, with charge pump

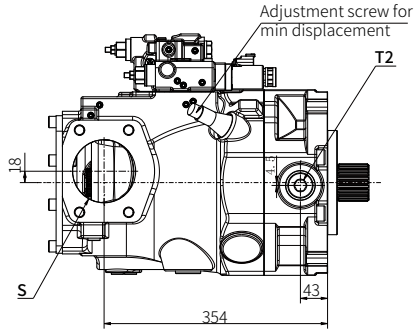
LRDRE1 — Fixed setting, electric proportional displacement, pressure Cut-off

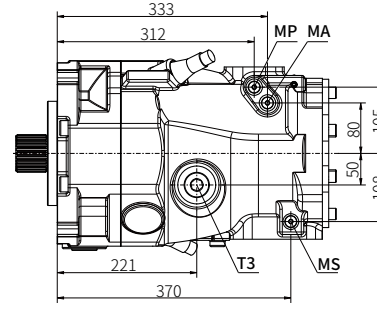










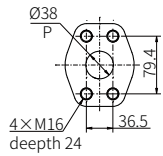


Remarks:

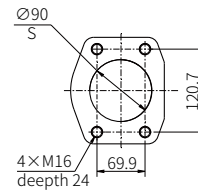
V32G 280 series Adjustment screw for min displacement: 0~40 cm^3/rev
Adjustment screw for max displacement: 250~280 cm^3/rev

V32G 300 series Adjustment screw for min displacement: 0~40 cm^3/rev
Adjustment screw for max displacement: 250~300 cm^3/rev

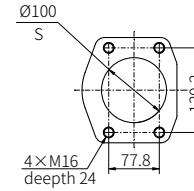
4.5.3 Type V32G(L) 280/300, clockwise rotation, with charge pump



Pressure port P



V32G280/300



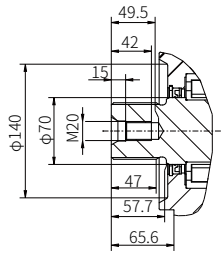
V32GL280/300

Suction port S

Shaft version

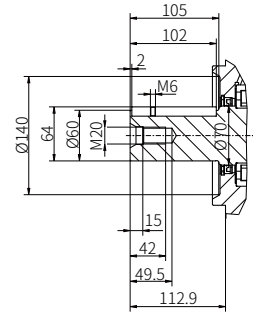
Splined shaft, Coding D2

(DIN 5480 W60×2×28×9g)



Parallel keyed shaft , Coding K4

(DIN6885 Ø60 A 18×11×100)



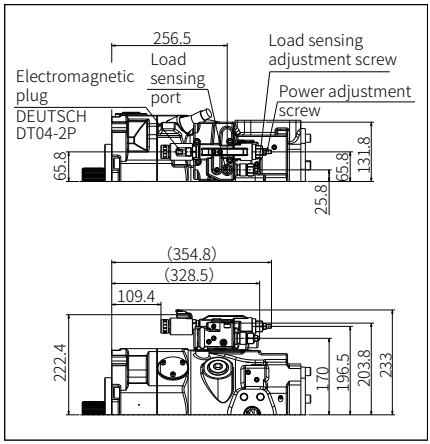
Port details

	Designation	Size	Reference 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	Oil outlet pressure measureing	DIN 3852, M14×1.5, depth 12	45
MA	Piston chamber pressure measureing	DIN 3852, M14×1.5, depth 12	45
MS	Suction side pressure measureing	DIN 3852, M14×1.5, depth 12	45
G	External control pressure port	DIN 3852, M14×1.5, depth 12	45

4.5.4 Type V32G(L) 280/300, clockwise rotation, dimension of control mode

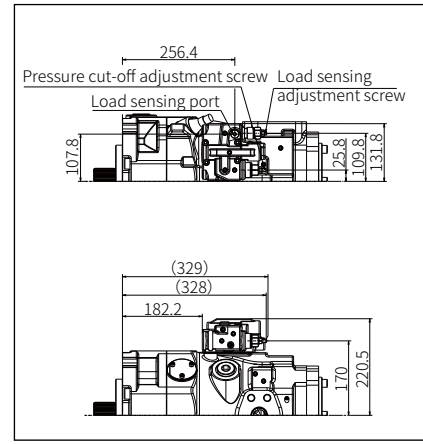
L1S0

Electric proportional override, Load sensing



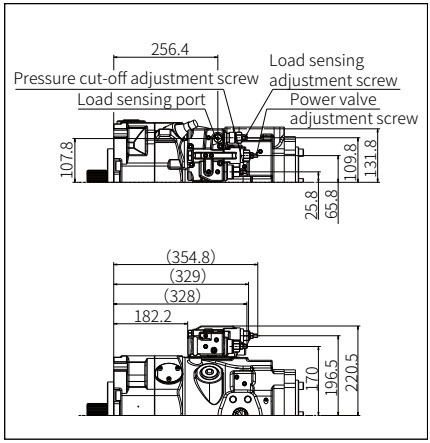
DRS0

Pressure Cut-off, Load sensing



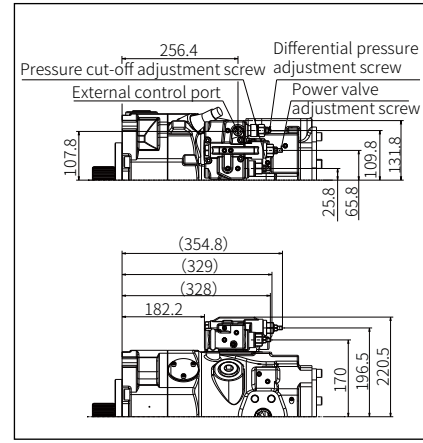
LRDS

Fixed setting, Pressure Cut-off, Load sensing



LRDG

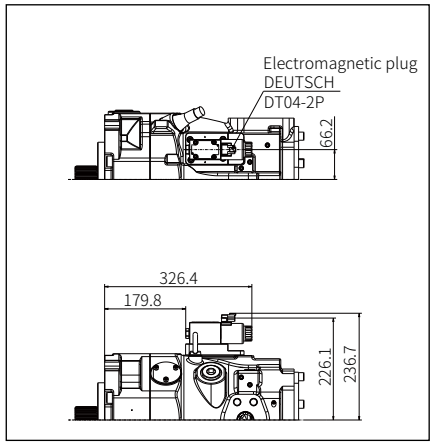
Fixed setting, Pressure Cut-off, Remote pressure



4.5.4 Type V32G(L) 280/300, clockwise rotation, dimension of control mode

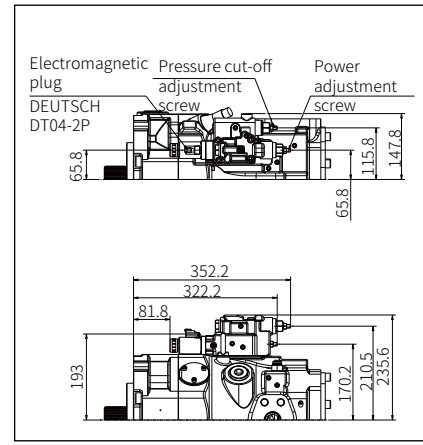
E0

Two point control



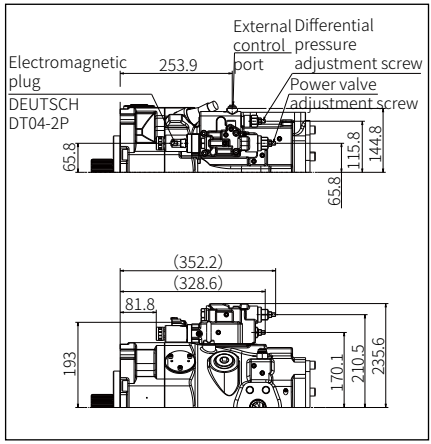
LRDRE1

Fixed setting, Electric proportional displacement, Pressure Cut-off



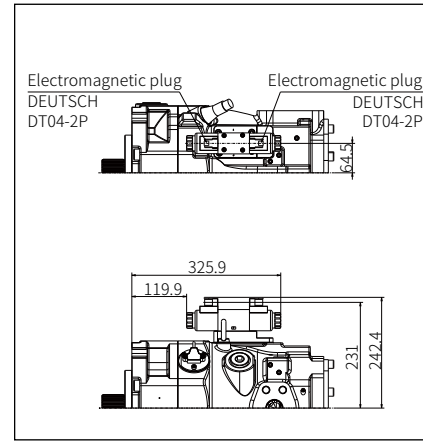
LRDGE1

Fixed setting, Electric proportional displacement, Remote pressure



EC2/PpQ1

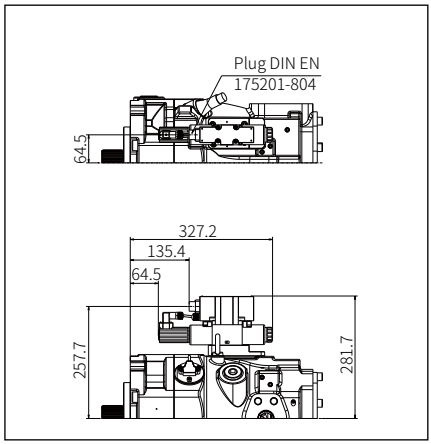
Electric proportional displacement closed-loop control/Three loop control of pressure, flow rate, and power (electronic pump)



4.5.4 Type V32G(L) 280/300, clockwise rotation, dimension of control mode

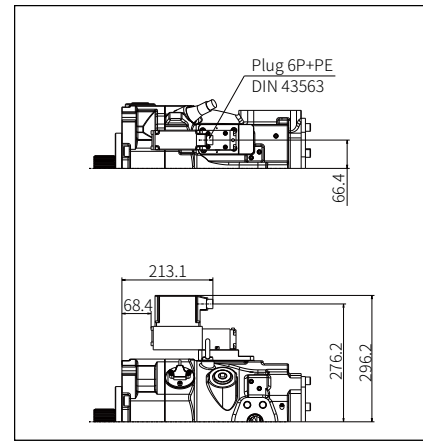
EC3/PpQ2

Electric proportional displacement closed-loop control with displacement feedback for valve core / Three loop control of pressure, flow rate, and power (electronic pump)



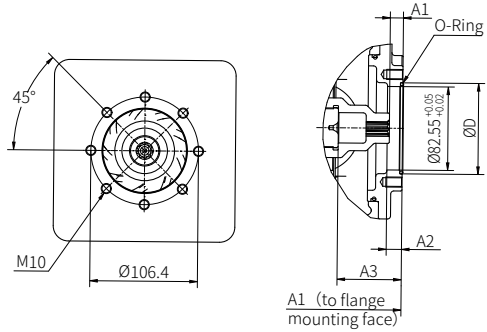
PpQ3

Three loop control of pressure, flow rate, and power (electronic pump)



4.6 Through drive

Flange SAE J744 82-2 (A)



Specification of Splined shaft :

A1: ANSI B92.1 5/8in 9T 16/32DP

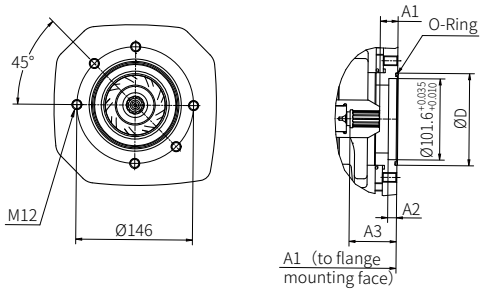
A2: ANSI B92.1 3/4in 11T 16/32DP

Code	A1（ANIS B92.1 5/8in 9T 16/32DP）							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	13	12.4	-	7.6	12.5	12.9	13.4
A2	-	8	30.1	-	12.6	34.1	15.1	12.6
A3	-	44	49.9	-	45.6	59.8	63.4	51.4
A4	-	303.8	355.2	-	400.6	383.9	41.5	433.6
D	-	90	90	-	90	90	90	90
M (Depth)	-	M10 depth 18.5	M10 depth 12.5	-	M10 depth 13	M10 depth 12.5	M10 depth 16	M10 depth 13

Code	A2（ANIS B92.1 3/4in 11T 16/32DP）							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	12.4	-	12.4	18	-	12.5	-	-
A2	12	-	30.1	13.7	-	34.1	-	-
A3	40.8	-	49.9	62.2	-	59.8	-	-
A4	291.8	-	355.2	380.3	-	383.9	-	-
D	90	-	90	90	-	90	-	-
M (Depth)	M10 depth 16.5	-	M10 depth 12.5	M10 depth 16	-	M10 depth 12.5	-	-

4.6 Through drive

Flange SAE J744 101-2(B)



Specification of Splined shaft :

B1: ANSI B92.1 7/8in 13T 16/32DP

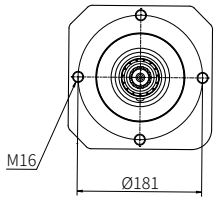
B2: ANSI B92.1 1in 15T 16/32DP

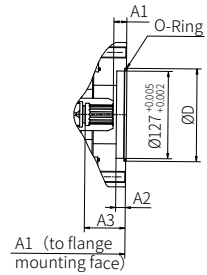
Code	B1 (ANIS B92.1 7/8in 13T 16/32DP)							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	11.3	14	13.8	-	16.5	13.2	11.6	22.3
A2	11	11	11	-	11.3	11	15.3	11.3
A3	50.8	53	50.7	-	49.5	50	71.4	65.3
A4	301.8	313.8	342.6	-	414.5	378.8	411.5	447.5
D	110	110	115	-	115	115.3	110	115
M (Depth)	M12 depth 18	M12 depth 17.5	M12 depth 16	-	M12 depth 16	M12 depth 18	M12 depth 16	M12 depth 16

Code	B2 (ANIS B92.1 1in 15T 16/32DP)							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	10	13.8	-	16.5	13.2	11.6	22.3
A2	-	11	11	-	11.3	11	15.3	11.3
A3	-	45	48.8	-	48.5	48.2	71.4	49
A4	-	313.8	342.6	-	414.5	378.8	411.5	447.5
D	-	110	115	-	115	115.3	110	115
M (Depth)	-	M12 depth 17.5	M12 depth 16	-	M12 depth 16	M12 depth 16	M12 depth 16	M12 depth 16

4.6 Through drive

Flange SAE J744 127-2(C)





Specification of Splined shaft :

C1: ANSI B92.1 1 1/4in 14T 12/24DP

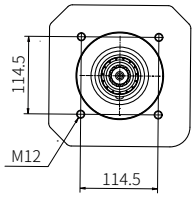
C3: ANSI B92.1 1 1/4in 17T 12/24DP

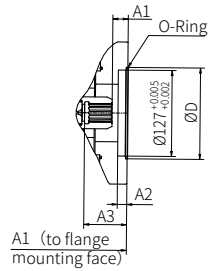
Code	**C1（ANIS B92.1 1 1/4in 14T 12/24DP）**							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	15.5	18.9	11.5	-	20.2	13	-
A2	-	13.4	14	14	-	14	11	-
A3	-	61.5	59.3	59.5	-	60.7	65.5	-
A4	-	322.3	352.6	381.6	-	388.8	415.4	-
D	-	135	135	135	-	135	135	-
M (Depth)	-	M16 depth 24	M16 depth 40	M16 depth 29.5	-	M16 depth 28	M16 depth 27	-

Code	**C3（ANIS B92.1 1 1/4in 17T 12/24DP）**							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	-	11.3	-	-	15.5	-	-
A2	-	-	14	-	-	14	-	-
A3	-	-	67.2	-	-	64.7	-	-
A4	-	-	352.3	-	-	388.8	-	-
D	-	-	135	-	-	135	-	-
M (Depth)	-	-	M16 depth 40	-	-	M16 depth 28	-	-

4.6 Through drive

Flange SAE J744 127-4(C)





Specification of Splined shaft :

C2: ANSI B92.1 1 1/4in 14T 12/24DP

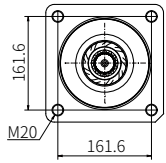
C4: ANSI B92.1 1 1/4in 17T 12/24DP

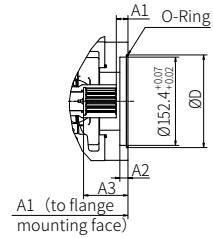
Code	C2 (ANIS B92.1 1 1/4in 14T 12/24DP)							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	15.5	18.9	11.6	11	20.2	11	16.8
A2	-	13.4	14	14	18	14	13	18
A3	-	61.5	59.3	59.6	58	60.7	65.5	58
A4	-	322.3	352.6	381.6	430	388.8	415.4	463
D	-	135	135	135	140	135	135	140
M (Depth)	-	M12 depth 24	M12 depth 40	M12 depth 16	M12 depth 18	M12 depth 28	M12 depth 16	M12 depth 18

Code	C4 (ANIS B92.1 1 1/4in 17T 12/24DP)							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	22.9	-	11.3	-	-	15.5	-	-
A2	14	-	14	-	-	14	-	-
A3	64.8	-	67.2	-	-	64.7	-	-
A4	315.8	-	352.3	-	-	388.8	-	-
D	135	-	135	-	-	135	-	-
M (Depth)	M12 depth 25	-	M12 depth 40	-	-	M12 depth 28	-	-

4.6 Through drive

Flange SAE J744 152-4(D)





Specification of Splined shaft :

D1: ANSI B92.1 1 3/4in 13T 8/16DP

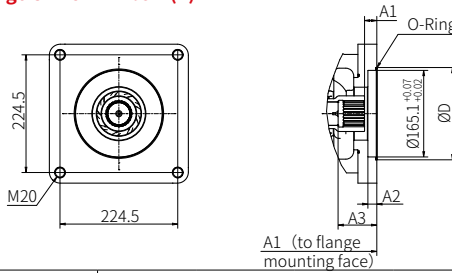
D3: DIN 5480 N50×2×24×9g

Code	D1（ANIS B92.1 1 3/4in 13T 8/16DP）							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	-	-	-	-	20.5	21.5	31.8
A2	-	-	-	-	-	14	14	17
A3	-	-	-	-	-	76.7	77.5	77.3
A4	-	-	-	-	-	400.8	436.4	463
D	-	-	-	-	-	160	160	160
M (Depth)	-	-	-	-	-	M20 depth 40	M20 depth 24	M20 depth 43

Code	D3（DIN 5480 N50×2×24×9g）							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	-	10.9	-	17.5	11.5	11.5	23.3/23.9
A2	-	-	14	-	17	14	14	17
A3	-	-	68	-	68	76.5	86.5	73.8
A4	-	-	356.1	-	423	400.8	436.4	456
D	-	-	160	-	160	160	160	160
M (Depth)	-	-	M20 depth 44	-	M20 depth 36	M20 depth 40	M20 depth 24	M20 depth 36

4.6 Through drive

Flange SAE J744 165-4(E)



Specification of Splined shaft :

E1: ANSI B92.1 2in 15T 8/16DP

E2: DIN 5480 N50×2×24×9g

E3: DIN 5480 N60×2×28×9g

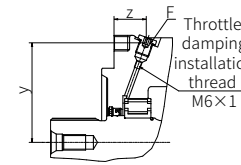
Code	E1 (ANIS B92.1 2in 15T 8/16DP)							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	-	-	-	-	-	26	-
A2	-	-	-	-	-	-	19	-
A3	-	-	-	-	-	-	94	-
A4	-	-	-	-	-	-	444.4	-
D	-	-	-	-	-	-	172	-
M (Depth)	-	-	-	-	-	-	M20 depth 56	-

Code	E2 (DIN 5480 N50×2×24×9g)							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	-	-	17.5	17.5	-	17.5	23.4
A2	-	-	-	19	17	-	19	17
A3	-	-	-	65.5	68	-	65.5	73.8
A4	-	-	-	388.6	423	-	416.4	456
D	-	-	-	171	176	-	172	176
M (Depth)	-	-	-	M20 depth 36.5	M20 depth 36	-	M20 depth 28	M20 depth 36

Code	E3 (DIN 5480 N60×2×28×9g)							
	Without booster pump					With booster pump		
Size	065	110	145/160	205	280	145/160	205	280/300
A1	-	-	-	-	14	-	-	19.8
A2	-	-	-	-	17	-	-	17
A3	-	-	-	-	68	-	-	73.8
A4	-	-	-	-	423	-	-	456
D	-	-	-	-	176	-	-	176
M (Depth)	-	-	-	-	M20 depth 36	-	-	M20 depth 36

5 Flush

1. In situations where the oil temperature is too high (Oil temperature exceeds 75 °C) , such as under high pressure, heavy load, or harsh working conditions, it is recommended to add a front bearing flushing circuit. Typically, the F port is used to flush the front bearing, which can help protect the shaft seal and improve the service life of the bearing.
2. When installing the transmission shaft vertically upwards, external flushing must be added.
3. When the F port is used for flushing, the throttling damping hole is used to adjust the flushing flow rate to ensure that the housing pressure is within the allowable range (⩽ 2 bar). The flushing oil flows through the front bearing and is discharged through the pump's drain port. When in use, the throttle damping of the F port must be tightened, and if necessary, thread glue should be applied.
4. Depending on the pump displacement, the specifications, position dimensions, and recommended flushing flow rate of the F-port plug are as follows:



V32G flushsectional view

Displacement (cc/r)	065	110	145/160	205	280/300
z (mm)	40	33	29	46	48
y (mm)	101	102	113	125	142
Rinse port plug F	M14×1.5	M14×1.5	M14×1.5	M14×1.5	M14×1.5
Flushing flow rate Q_F (L/min)	4	5	6.5	8.5	12.5

6 Installation information

6.1 General

6.1.1 Precautions for pump installation and use

- 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 6.3, "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.

6.1 General

6.1.1 Precautions for pump installation and use

- 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.

6.1.2 Precautions for Controller Installation and Use

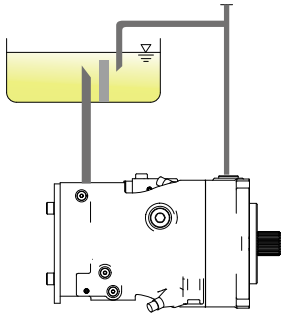
- Before debugging, please check that all seals and plugs for plug-in connections are installed correctly to ensure that no liquid or solid foreign objects enter the product.
- This module is designed to be installed in a shielded EMC enclosure (control cabinet). The distance from overhead power lines, wireless power sources, radar, mobile phones and other equipment should be at least 1m. Avoid installing the controller near strong electromagnetic interference sources. The installation location should not be chosen near power electronic equipment (such as frequency converters), while avoiding prolonged exposure of the equipment to ultraviolet radiation.
- Ensure that the installation location is easy to maintain, allowing unobstructed access to the connecting wires and parts.
- The controller HLEC2414-PQP-PN and power supply device should be installed as close as possible to ensure that the connecting wires are as short as possible.
- For signal cables, please only use low capacitance cables with copper braided shielding layers and connect them extensively to one side of the cable shielding layer using grounding strips. Do not pass signal cables through strong magnetic fields, try to install signal cables continuously as much as possible. If intermediate terminals are required, please use wiring terminals with shielded busbars. Do not lay signal cables near power lines.
- Before carrying out any installation work or unplugging connection wires from the product, please disconnect the power supply of the device. Please ensure that the product is only used within the IP20 protection level to avoid short circuits and malfunctions.
- Maintenance: When the controller HLEC2414-PQP-PN is working, please follow strict cleanliness requirements. To prevent moisture and dirt from entering the casing, only use a dry and dust-free cloth for cleaning, and do not use solvents or corrosive cleaning agents. At least once a year, check whether all plug-in connections and clamping connections of the controller are correctly installed or damaged. Check all cables for breakage or compression.
- If you need volumetric efficiency compensation function and synchronous control function, please contact us.

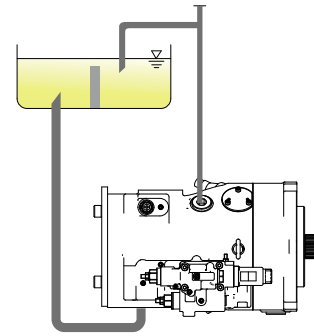
6.2 Installation positions

The variable displacement axial piston pump V32G can be installed as follows:

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

For horizontal installation, use the uppermost drain port.

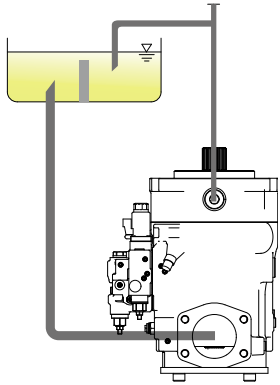




Vertical installation: (pump below the min. fill level)

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

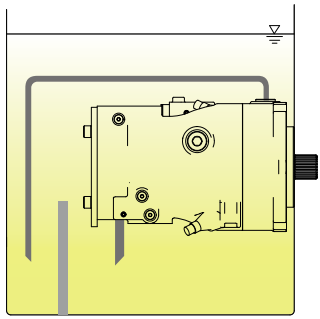
For vertical installation, use the uppermost drain port.

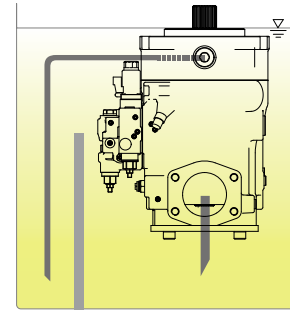


6.3 Tank installation

Tank installation (pump below the min. fill level)

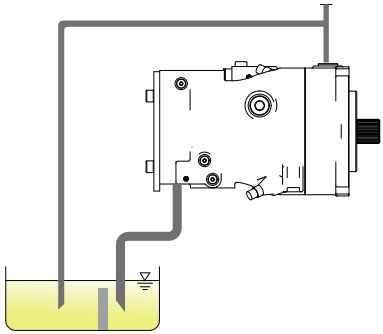
The pump can be operated either with or without a suction tube. Using a short suction intake is recommended.

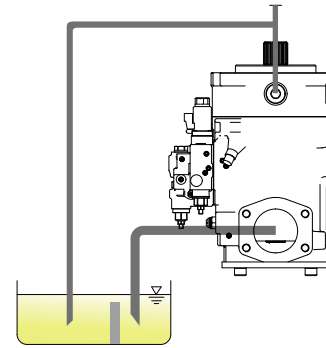




Additional notes regarding installation above the fill level

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.





7 Installation, operation and maintenance information

7.1 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.

7.2 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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