



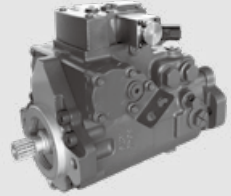
HP3G SERIES

Swash-plate Type Axial Piston Variable Displacement Pump

HP3G series variable axial piston pump with swashplate design for hydrostatic drives in closed circuit, high pressure, high speed, high reliability, low noise, can be applied in engineering machinery and mobile machinery.

Applied in medium pressure closed circuit

| | | | |
|-----------------------|-----|-----|-----|
| Size: | 28 | 32 | 46 |
| Rated pressure (bar): | 345 | 345 | 345 |
| Max. pressure (bar): | 380 | 380 | 385 |



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Features

- Variable axial piston pump of swashplate design for hydrostatic drives in closed circuit.
- The flow is proportional to the drive speed and displacement. The flow increases as the angle of the swashplate is adjusted from zero to its maximum value.
- Flow direction changes smoothly when the swashplate is moved through the neutral position.
- Two pressure-relief valves are provided on the high pressure ports to protect the hydrostatic transmission (pump and motor) from overload.
- The integrated charge pump can provide system replenishing and cooling fluid flow.
- High reliability, long working lifetime
- Compact structure, high power density.

Technical data

| | | | | |
|---|--|--------------------------------|------|------|
| Size | | 28 | 32 | 46 |
| Displacement (cc/rev) | | 28 | 32 | 45.9 |
| Speed | Rated (rpm) | 3400 | 3400 | 3000 |
| | Max. (rpm) | 4000 | 4000 | 4100 |
| | Min. (rpm) | 500 | 500 | 500 |
| Pressure | Rated (bar) (relative to Charge pressure) | 345 | 345 | 345 |
| | Max. (bar) (relative to Charge pressure) | 380 | 380 | 385 |
| | Min. low loop pressure(bar) (relative to Charge pump) | 10 | 10 | 10 |
| Charge pressure (relative to Charge pump) | Min. (bar) | 16 | 16 | 6 |
| | Max. (bar) | 31 | 31 | 31 |
| Control Pressure (relative to Charge pump) | Min. (bar) (EDC control)(bar) | 24 | 24 | 21.5 |
| Charge pump displacement (cc/rev) | | 12 | 12 | 13.9 |
| Casting pressure | Rated (bar) | 3 | 3 | 1.7 |
| | Max. (bar) | 5 | 5 | 5.2 |
| Suction pressure (Absolute pressure) | Rated (bar) | 0.8 | 0.8 | 0.8 |
| | Max. (bar) | 2 | 2 | 6 |
| Oil viscosity (mm ² /s) | | 10~1000, Best range: 16~36 | | |
| Oil Temperature (°C) | | -20~95 | | |
| Oil Cleanliness | | ISO 4406 Class 18/13 or higher | | |
| Weight (w/o auxiliary flange) (Kg) | | 33.3 | 32.3 | 33 |

Type introduction

| | | | | | | | | | | | | | | |
|------|----|---|---|----|---|---|----|----|-----|---|---|---|----|---|
| HP3G | 46 | A | R | A2 | N | F | S2 | B1 | K28 | B | P | J | PN | |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ⑮ |

Product series

| | | |
|---|--|------|
| ① | Variable piston pump of swashplate in closed circuit | HP3G |
|---|--|------|

Displacement

| | | | | |
|---|---------------------|----|----|----|
| ② | Displacement cc/rev | 28 | 32 | 46 |
|---|---------------------|----|----|----|

Product version

| | | |
|---|-------------|---|
| ③ | Series code | A |
|---|-------------|---|

Rotation

| | | |
|---|-------------------------------|---|
| ④ | Right hand (clockwise) | R |
| | Left hand (counter-clockwise) | L |

Control

| ⑤ | | 28 | 32 | 46 | Code |
|---|---|----|----|----|------|
| | High current electric proportional displacement control (HC EDC), oil filled, deutsch DT04-2P, voltage 12V DC, control range: 300mA~950mA | ● | | ● | A2 |
| | High current electric proportional displacement control (HC EDC), oil filled, deutsch DT04-2P, voltage 24V DC, control range: 200mA~500mA | ● | | ● | A4 |
| | Manual displacement control, (control handle) -30° ~+30° | | ● | | A3 |

Displacement Limiters

| | | |
|---|-------------------------------|---|
| ⑥ | Without displacement limiters | N |
| | With displacement limiters | M |

Mounting flange

| | | |
|---|----------------------------------|---|
| ⑦ | ISO 3019-1, SAE B-2 hole (101-2) | F |
|---|----------------------------------|---|

Input shaft

| | | |
|---|---------------------------|----|
| ⑧ | SAE J744-25-4 15T 16/32DP | S2 |
| | SAE J744-22-4 13T 16/32DP | S1 |

Type introduction

Through drive option

| | | |
|---|---------------------------------------|----|
| ⑨ | No through drive | NN |
| | SAE A 82-2 SAE J744-16-4 9T 16/32DP | A1 |
| | SAE A 82-2 SAE J744-19-4 11T 16/32DP | A2 |
| | SAE B 101-2 SAE J744-22-4 13T 16/32DP | B1 |

Setting pressure of the high pressure relief valve

⑩—Overpressure protection type and setting side "A" and setting side "B"

| | | | |
|---|--|---------|-----|
| ⑩ | High pressure relief valve setting (differential pressure: relative to Charge pressure) | 140 bar | K14 |
| | | 175 bar | K17 |
| | | 190 bar | K19 |
| | | 210 bar | K21 |
| | | 230 bar | K23 |
| | | 250 bar | K25 |
| | | 280 bar | K28 |
| | | 320 bar | K32 |
| | | 345 bar | K35 |

Please contact us for configurations or pressures not shown in above form.

Charge pump

| | | | | | |
|---|-------------------------------|----|----|----|----|
| ⑪ | | 28 | 32 | 46 | 代号 |
| | With charge pump, 13.9 cc/rev | | | ● | B |
| | With charge pump, 12cc/rev | ● | ● | | C |

Filtration Options

| | | |
|---|-----------------------------------|---|
| ⑫ | Remote pressure, with charge pump | P |
| | Suction, with charge pump | L |

Type introduction

Setting pressure of the low pressure relief valve

| | | |
|---|----------|---|
| ⑬ | 21.5 bar | J |
| | 19.5 bar | B |
| | 24 bar | S |
| | 26.9 bar | T |

Control orifice

| | | |
|---|---|----|
| ⑭ | Control orifice of Servo A&B ϕ 0.9mm | PN |
| | Control orifice of Servo A&B ϕ 1.4mm | RN |
| | Without control orifice | NN |

Paint and Nameplate

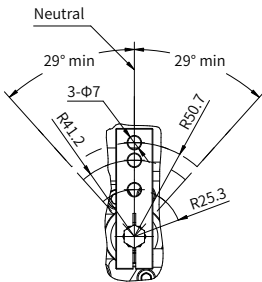
| | | |
|---|----------------------------------|-------|
| ⑮ | Black paint and Hengli nameplate | Blank |
|---|----------------------------------|-------|

Manual displacement control (MDC)

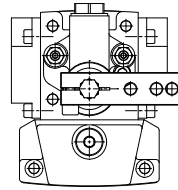
The manual proportional displacement control (MDC) consists of a handle on top of a rotary input shaft.

The shaft provides an eccentric connection to a feedback link. This link is connected on its one end with a porting spool. On its other end the link is connected the pumps swashplate.

The MDC changes the pump displacement between no flow and full flow into opposite directions.



Schematic diagram of control joystick adjustment



Control valve

Electrical displacement control (EDC)

The High Current Electrical Displacement Control (HC EDC) consists of a pair of proportional solenoids on each side of a three-position, four-way porting spool. The proportional solenoid applies a force input to the spool, which ports hydraulic pressure to either side of a double acting servo piston. Differential pressure across the servo piston rotates the swashplate, changing the pump's displacement from full displacement in one direction to full displacement in the opposite direction.

A serviceable 125 µm screen is located in the supply line immediately before the control porting spool.

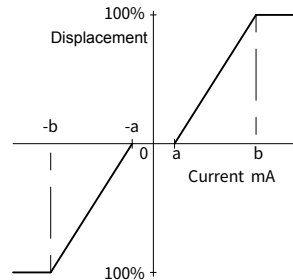
Features:

- Precision parts provide repeatable accurate displacement settings with a given input signal.
- Both ends of the double acting servo piston are drained to case when input signal current is not present. The servo piston is coupled to a spring centering mechanism.

Benefits:

- Simple, low-cost design.
- Pump will return to neutral after prime mover shuts down.
- Pump will return to neutral if external electrical input signal fails or if there is a loss of charge pressure

• Pump displacement – control current

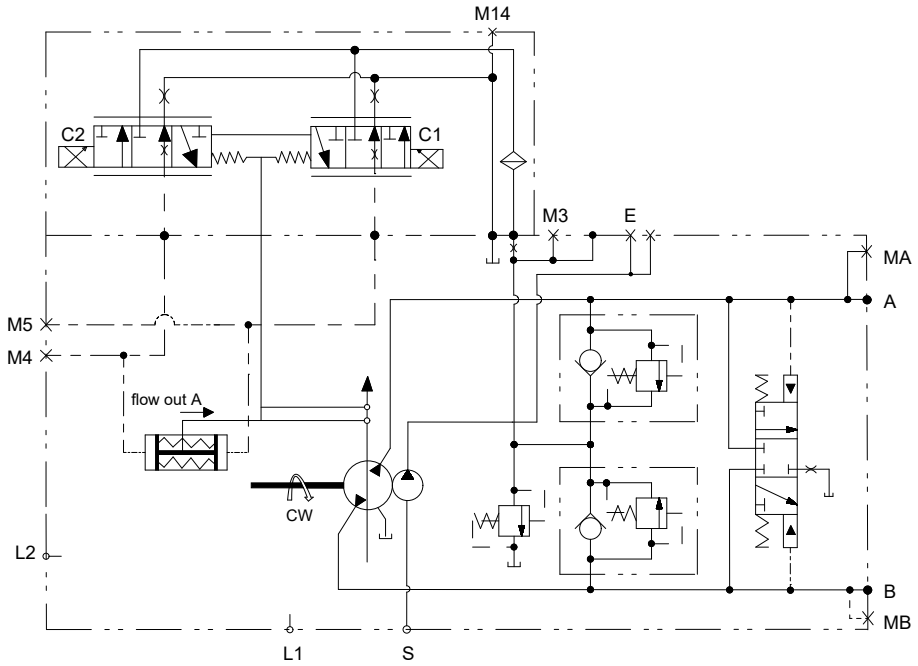


• EDC Response time

| Orifice diameter* mm [in] | Average response time [seconds] | |
|---------------------------|---------------------------------|--------------|
| | Acceleration | Deceleration |
| 1.2 [0.046] | 2.0 | 1.6 |
| None | 0.9 | 1.0 |

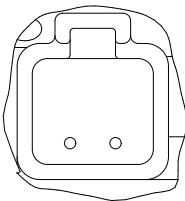
*Contact Hengli for special orifice combinations.

HP3G28 Pump principle



| Input shaft rotation | CW | | CCW | |
|--------------------------------|-----|-----|-----|-----|
| | C2 | C1 | C2 | C1 |
| Energized coil | C2 | C1 | C2 | C1 |
| Oil port A | In | Out | Out | In |
| Oil port B | Out | In | In | Out |
| Servo pressure acting oil port | M5 | M4 | M5 | M4 |

Connector:

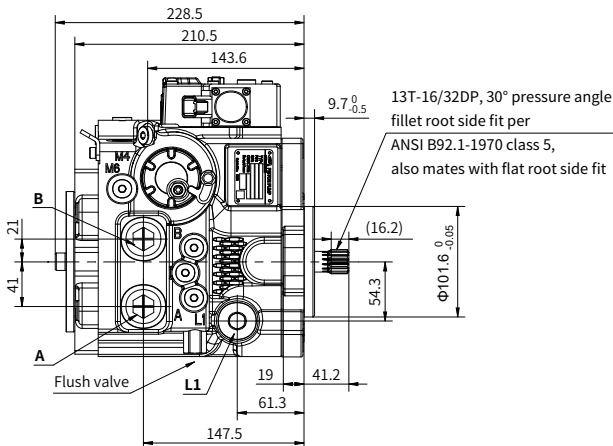
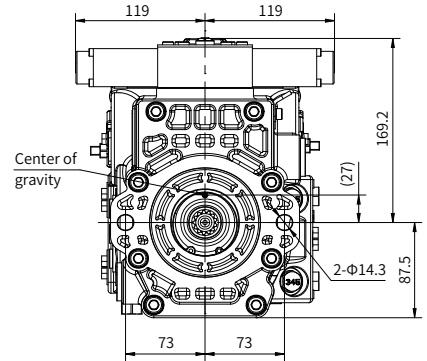
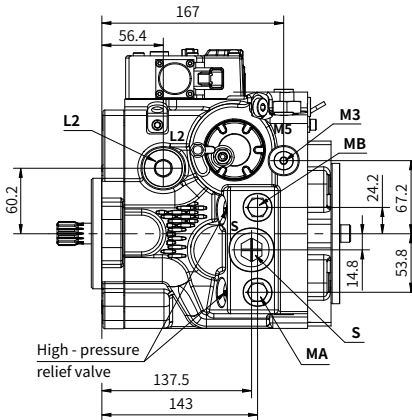
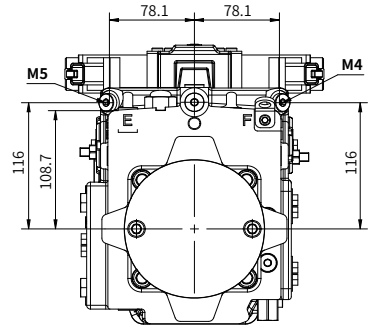
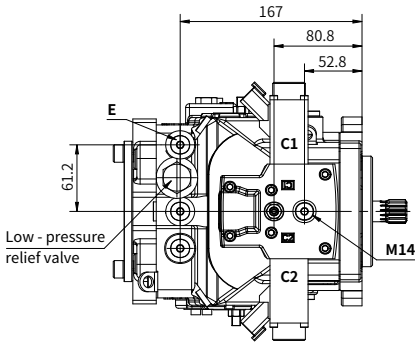


Deutsch DT04-2P
Voltage: 12V
V View

Refer to pump installation drawing for port locations.

Installation size

HP3G28 installation size



HP3G

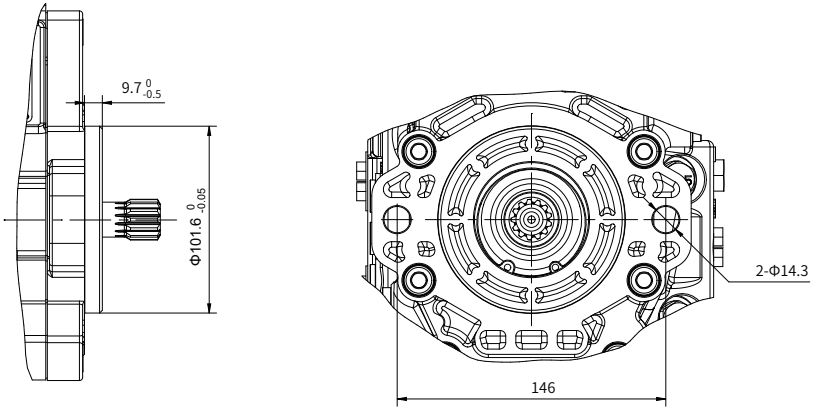
Installation size

• HP3G28Port details

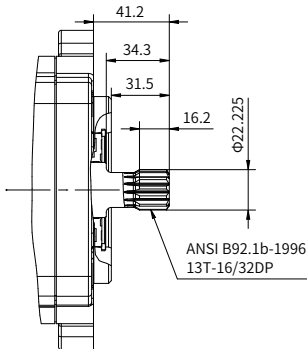
| | Port Name | Port Size and Description | Tightening Torque(N.m) |
|--------|----------------------------|-----------------------------|------------------------|
| S | Suction port | ISO 11926-1 (1 1/16-12UN) | 101 |
| A, B | Working port | ISO 11926-1 (1 1/16-12UN) | 101 |
| L1, L2 | Drain port | ISO 11926-1 (1 1/16-12UN) | 101 |
| MA, MB | Port "A" and "B" gage port | ISO 11926-1 (9/16-18UNF) | 25 |
| M3 | Gauge port of charge pump | ISO 11926-1 (9/16-18UNF) | 25 |
| E | External control port | ISO 11926-1 (9/16-18UNF) | 25 |
| M4, M5 | Servo gage port | ISO 11926-1 (7/16-20UNF) | 15 |
| M14 | Air bleed port | ISO 11926-1 (7/16-20UNF) | 15 |

Installation size

HP3G28 Mounting Flange

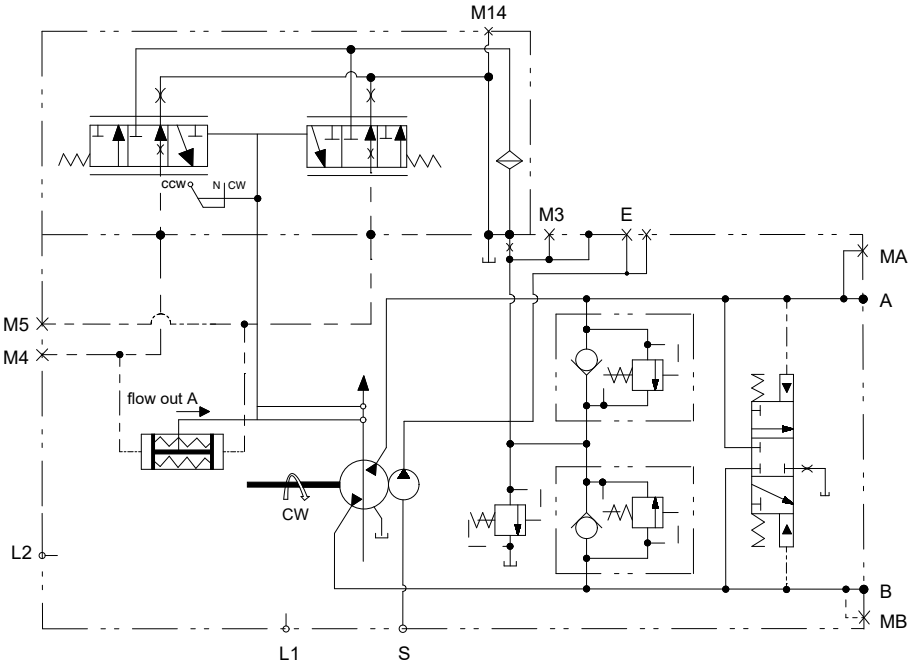


HP3G28 Input Shaft type



"S1" type spline shaft

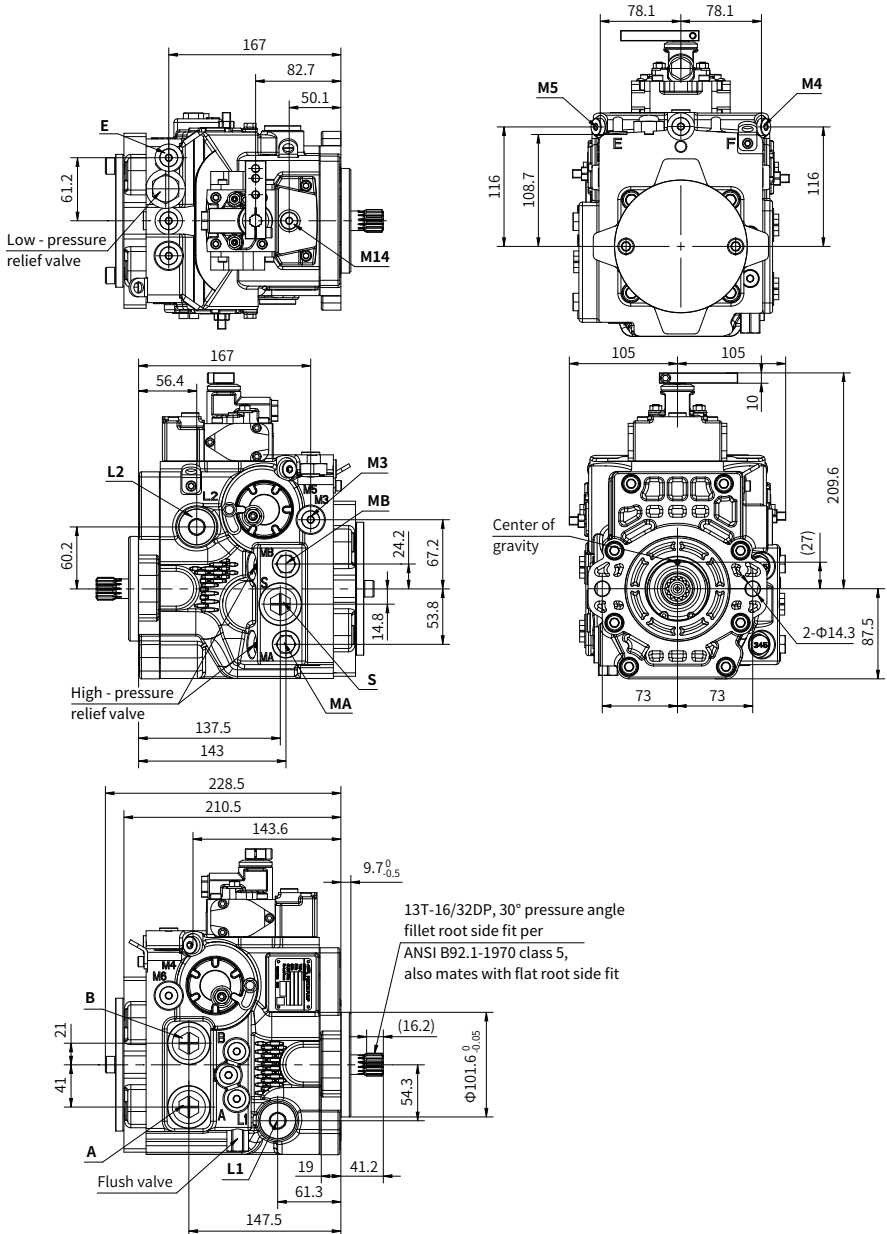
HP3G32 Pump principle



| Input shaft rotation | CW | | CCW | |
|--------------------------------|-----|-----|-----|-----|
| Energized coil | C2 | C1 | C2 | C1 |
| Oil port A | In | Out | Out | In |
| Oil port B | Out | In | In | Out |
| Servo pressure acting oil port | M5 | M4 | M5 | M4 |

Installation size

HP3G32 Installation size



HP3G

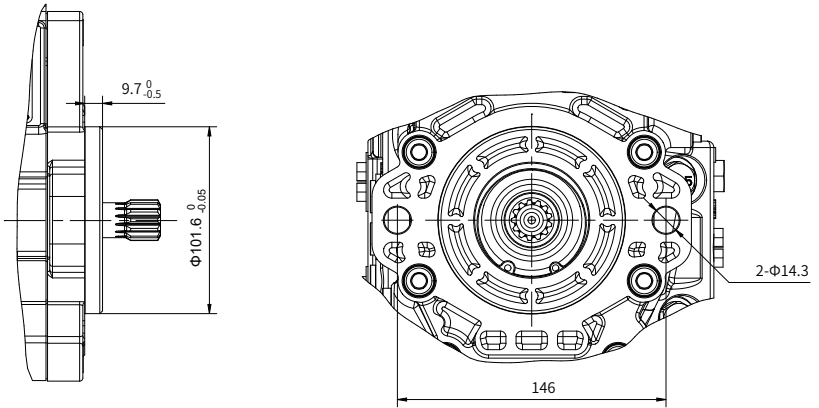
Installation size

• HP3G32 Port details

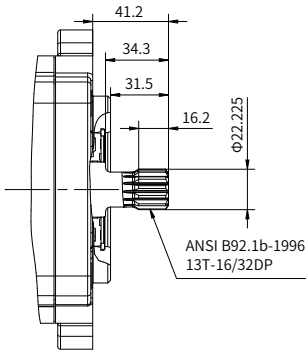
| | Port Name | Port Size and Description | Tightening Torque(N.m) |
|--------|----------------------------|-----------------------------|------------------------|
| S | Suction port | ISO 11926-1 (1 1/16-12UN) | 101 |
| A, B | Working port | ISO 11926-1 (1 1/16-12UN) | 101 |
| L1, L2 | Drain port | ISO 11926-1 (1 1/16-12UN) | 101 |
| MA, MB | Port "A" and "B" gage port | ISO 11926-1 (9/16-18UNF) | 25 |
| M3 | Gauge port of charge pump | ISO 11926-1 (9/16-18UNF) | 25 |
| E | External control port | ISO 11926-1 (9/16-18UNF) | 25 |
| M4, M5 | Servo gage port | ISO 11926-1 (7/16-20UNF) | 15 |
| M14 | Air bleed port | ISO 11926-1 (7/16-20UNF) | 15 |

Installation size

HP3G32 Mounting Flange

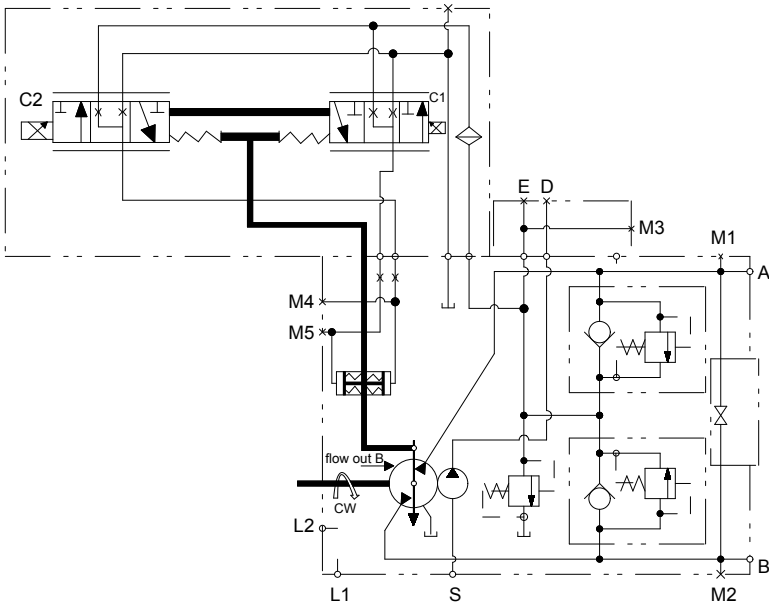


HP3G32 Input Shaft type



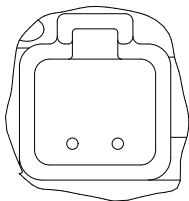
"S1" type spline shaft

HP3G46 Pump principle



| Input shaft rotation | CW | | CCW | |
|--------------------------------|-----|-----|-----|-----|
| Energized coil | C2 | C1 | C2 | C1 |
| Oil port A | In | Out | Out | In |
| Oil port B | Out | In | In | Out |
| Servo pressure acting oil port | M5 | M4 | M5 | M4 |

Connector:

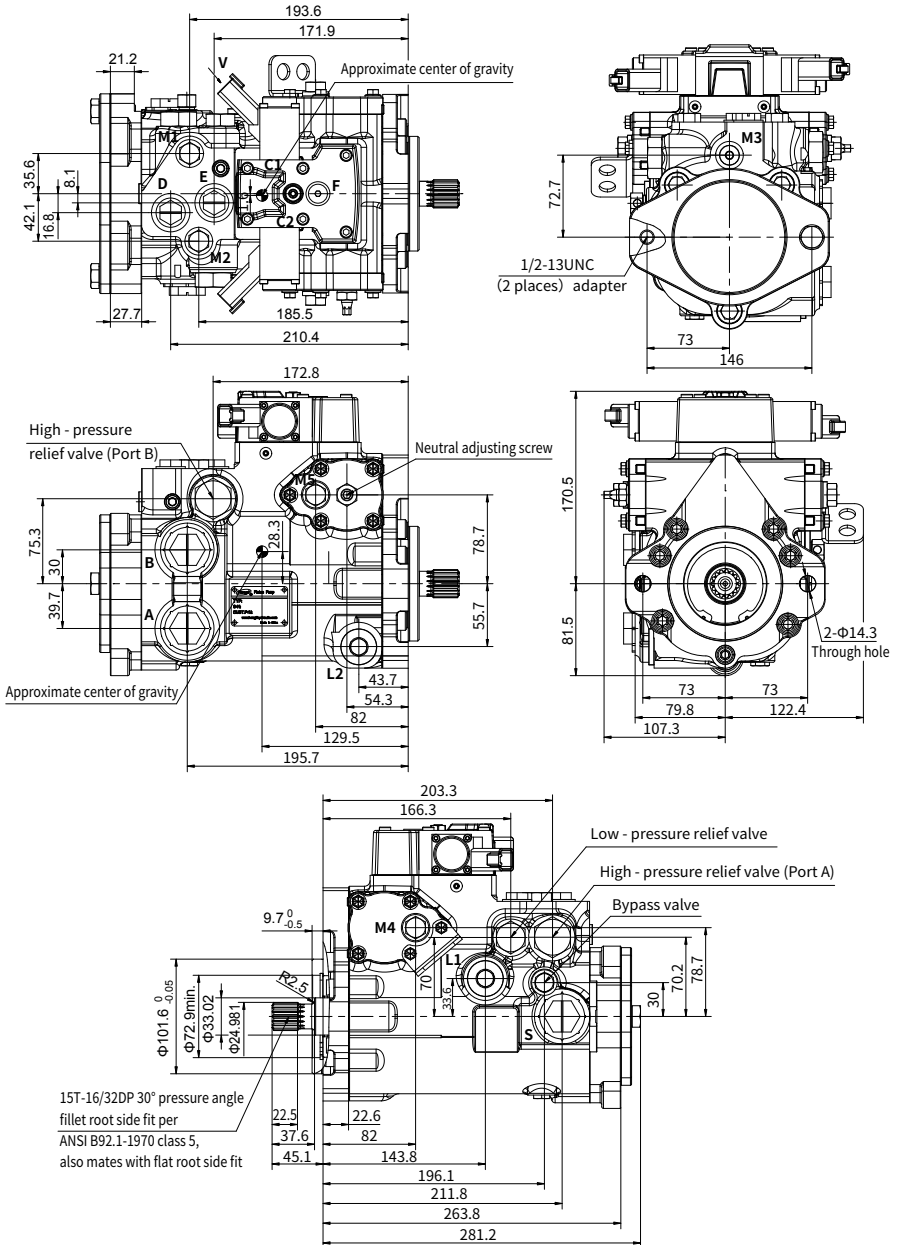


Deutsch DT04-2P
 Voltage: 12V
 V View

Refer to pump installation drawing for port locations.

Installation size

HP3G46 installation size



HP3G

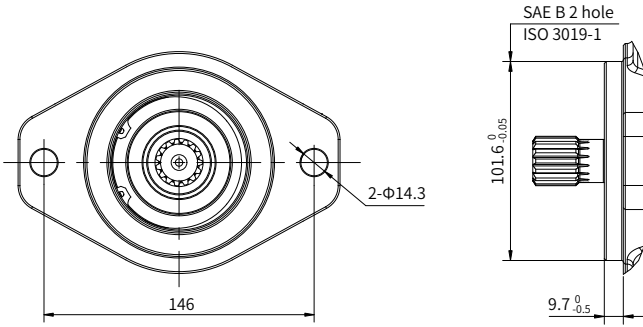
Installation size

• HP3G46 Port details

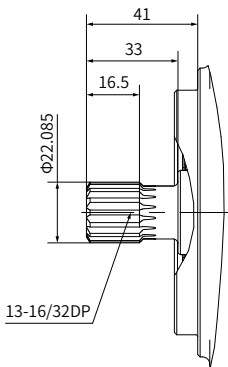
| | Port Name | Port Size and Description | Tightening Torque(N.m) |
|--------|---|--------------------------------|------------------------|
| S | Suction port | SAE J1926/1 (1 5/16-12UN-2B) | 134 |
| A, B | Working port | SAE J1926/1 (1 5/16-12UN-2B) | 134 |
| L1, L2 | Drain port | SAE J1926/1 (1 1/16-12UN-2B) | 101 |
| M1, M2 | Port "A" and "B" gage port | SAE J1926/1 (9/16-18UNF-2B) | 25 |
| M3 | Gauge port of charge pump | SAE J1926/1(9/16-18UNF-2B) | 25 |
| M4, M5 | Servo gage port | SAE J1926/1 (9/16-18UNF-2B) | 25 |
| D | Charge filtration port D (To remote filter ISO 11926-1 7/8-14 Charge filtration port D charge gauge port for remote filtration with charge pump option) | SAE J1926/1 (7/8-14UNF-2B) | 73 |
| E | Charge filtration port E (From remote filter charge gauge port for remote filtration with or w/o charge pump option) | SAE J1926/1 (7/8-14UNF-2B) | 73 |
| F | Air bleed port | SAE J1926/1(7/16-20UNF-2B) | 15 |

Installation size

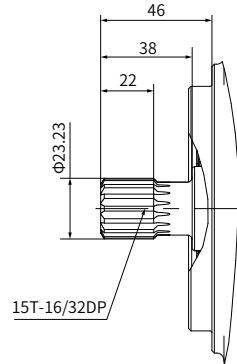
HP3G46 Mounting Flange



HP3G46 Input Shaft type



"S1" type spline shaft



"S2" type spline shaft

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