# DHP Series axial piston pump

**DHP0.6 ~ 1.0 / DHP1.7 ~ 3.0 / DHP3.5 ~ 4.0 / DHP4.5 ~ 8.2 /**

**DHP11 ~ 15 / DHP16 ~ 22 / DHP24 ~ 46**

Golds Pump

# Table of Contents

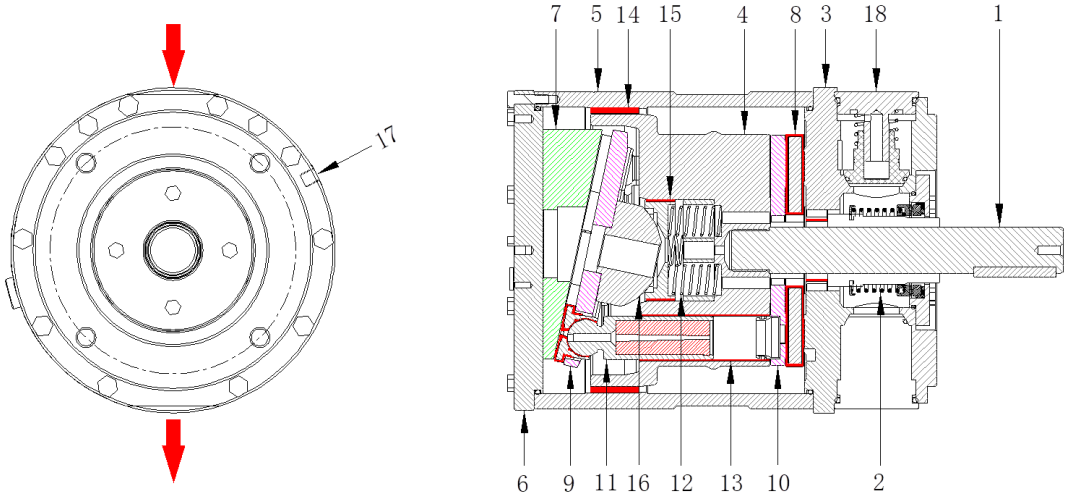
# 1 Introduction

The range of DHP high-pressure pumps is designed according to EN 809 for use in RO applications with low viscosity and corrosive
fluids such as:

- Sea water
- Brackish water
- Waste water (DHP)

DHP pumps are positive displacement pumps with axial pistons that move a fixed amount of water in each cycle Flow is proportional to the number of input shaft revolutions (rpm) Unlike centrifugal pumps, they produce the same flow at a given speed no matter what the discharge pressure.

Below sectional drawing is an example of an DHP pump The sectional drawing for the specific pump sizes are to be found in the pump
instruction.




| | | | |
|---|---|---|---|
| 1. Spindle | 2. Shaft sealing | 3. Port flange | 4. Cylinder barrel |
| 5. Housing | 6. Port plate | 7. Swash plate | 8. Distributor plat |
| 9. Return plate | 10. Seal plate | 11. Piston | 12. Springs |
| 13. shoe | 14. Cylinder liner | 15. Retainer plate | 16. Universal joint |
| 17. Bleeding plug | 18. Flushing valve | | |

# 2 Benefits

• Zero risk of lubricant contamination:

- Oil lubricants are replaced with the pumped medium, water, so there is no contamination risk from the pump

• Low maintenance costs:

- Efficient design and all-stainless steel construction ensure exceptionally long life Whenspecifications are met, service intervals of 8,000 hours can be expected Service is easy, and can be
carried out on-site due to the simple design and few parts.

• Low energy costs:
- The highly efficient axial piston design provides the lowest energy consumption of any comparable pump on the market.

• Easy installation:
- The most compact and lightest design available.
- The pump can be installed vertically and horizontally
- No pulsation dampeners necessary due to extremely low pressure pulsation
- Powered directly by electric motors or combustion engines (with special coupling).
- All pumps are supplied with an integrated flushing valve that allows the fluid to flow from inlet to the outlet, when the pump is not running.

• High reliability:
- All parts are made of high corrosion resistant materials e.g. Duplex (EN1 4462/ UNS S31803) and Super Duplex (EN1 4410/UNS S32750)
stainless steel and carbon reinforced PEEK.

• Certified quality:
- For other certifications, please see data sheets for DHP (all super duplex)
- Positive Material Identification (PMI) report available on request
- ISO 9001, ISO 14001.

# 3 Application examples

DHP pumps are built into a broad range of RO desalination plants around the world:
• Containerized solutions for hotels, resorts and residences on islands and in coastal regions.
• Mobile systems for humanitarian and military organizations.
• Onboard systems for ships and yachts.
• Offshore platforms for the oil and gas industry.
• Municipal and regional waterworks.

# 4 Technical data

## 4.1 DHP0.6～1.0

| Pump size | | DHP0.6 | DHP0.8 | DHP1.0 |
|---|---|---|---|---|
| Geometric displacement | $cm^3/rev$ | 3.62 | 4.82 | 6.06 |
| **Pressure** | | | | |
| Max outlet pressure continuous (1) | barg | 80 | 80 | 80 |
| | psig | 1160 | 1160 | 1160 |
| Min outlet pressure (1) | barg | 20 | 20 | 20 |
| | psig | 290 | 290 | 290 |
| Inlet pressure continuous (2) | barg | 0.5～5 | 0.5～5 | 0.5～5 |
| | psig | 7.3～72.5 | 7.3～72.5 | 7.3～72.5 |
| Max inlet pressure peak | barg | 10 | 10 | 10 |
| | psig | 145 | 145 | 145 |
| **Speed** | | | | |
| Min speed continuous | rpm | 700 | 700 | 700 |
| Max speed continuous (2) | rpm | 3450 | 3450 | 3450 |
| **Typical flow - Flow curves available in item 5** | | | | |
| 3000 rpm at max pressure | $m^3/h$ | 0.6 | 0.8 | 0.94 |
| 1500 rpm at max pressure | $m^3/h$ | 0.3 | 0.4 | 0.47 |
| **Technical specifications** | | | | |
| Media temperature (3) | ° C | 2～50 | 2～50 | 2～50 |
| | ° F | 35.6～122 | 35.6～122 | 35.6～122 |
| Ambient temperature | ° C | 0～50 | 0～50 | 0～50 |
| | ° F | 32～122 | 32～122 | 32～122 |
| Weight (dry) | kg | 3.7 | 3.7 | 3.7 |
| | lb | 8.16 | 8.16 | 8.16 |
| Sound pressure level (4) | dB(A) | ≤74 | ≤74 | ≤74 |
| **Typical motor size** | | | | |
| 3000 rpm at max pressure | kW | 2.2 | 3.0 | 3.0 |
| Torque at max outlet pressure | Nm | 5.8 | 7.2 | 8.9 |
| | lbf-ft | 5.24 | 5.31 | 6.58 |

(1) For lower and higher pressure, please contact golds.

(2) For speeds above 3000 rpm the pump must be boosted at a pressure of 2-5 barg (29- 72.5 psig).

(3) Dependent on the NaCI concentration - see chapter 8.

(4) Max. area covered with recommended motor configuration (excl. of space to service pump).

## 4.2 DHP1.7～3.0

| Pump size | | DHP1.7 | DHP2.1 | DHP2.7 | DHP3.0 |
|---|---|---|---|---|---|
| Geometric displacement | $cm^3/rev$ | 9.6 | 11.8 | 15 | 17 |
| **Pressure** | | | | | |
| Max outlet pressure continuous (1) | barg | 80 | 80 | 80 | 80 |
| | psig | 1160 | 1160 | 1160 | 1160 |
| Min outlet pressure (1) | barg | 20 | 20 | 20 | 20 |
| | psig | 290 | 290 | 290 | 290 |
| Inlet pressure continuous (2) | barg | 0.5～5 | 0.5～5 | 0.5～5 | 0.5～5 |
| | psig | 7.3～72.5 | 7.3～72.5 | 7.3～72.5 | 7.3～72.5 |
| Max inlet pressure peak | barg | 10 | 10 | 10 | 10 |
| | psig | 145 | 145 | 145 | 145 |
| **Speed** | | | | | |
| Min speed continuous | rpm | 700 | 700 | 700 | 700 |
| Max speed continuous (2) | rpm | 3450 | 3450 | 3450 | 3450 |
| **Typical flow - Flow curves available in item 5** | | | | | |
| 3000 rpm at max pressure | $m^3/h$ | 1.7 | 2.1 | 2.7 | 3.0 |
| 1500 rpm at max pressure | $m^3/h$ | 0.85 | 1.05 | 1.35 | 1.5 |
| **Technical specifications** | | | | | |
| Media temperature (3) | ° C | 2～50 | 2～50 | 2～50 | 2～50 |
| | ° F | 35.6～122 | 35.6～122 | 35.6～122 | 35.6～122 |
| Ambient temperature | ° C | 0～50 | 0～50 | 0～50 | 0～50 |
| | ° F | 32～122 | 32～122 | 32～122 | 32～122 |
| Weight (dry) | kg | 7.8 | 7.8 | 7.8 | 7.8 |
| | lb | 17.2 | 17.2 | 17.2 | 17.2 |
| Sound pressure level (4) | dB(A) | ≤77 | ≤77 | ≤77 | ≤77 |
| **Typical motor size** | | | | | |
| 3000 rpm at max pressure | kW | 5.5 | 7.5 | 11.0 | 11.0 |
| Torque at max outlet pressure | Nm | 13.5 | 17 | 22.3 | 24.5 |
| | lbf-ft | 9.96 | 12.54 | 16.45 | 18.07 |

(1) For lower and higher pressure, please contact golds.

(2) For speeds above 3000 rpm the pump must be boosted at a pressure of 2-5 barg (29- 72.5 psig).

(3) Dependent on the NaCI concentration - see chapter 8.

(4) Max. area covered with recommended motor configuration (excl. of space to service pump).

## 4.3 DHP3.5～4.0

| Pump size | | DHP3.5 | DHP4.0 |
|---|---|---|---|
| Geometric displacement | $cm^3/rev$ | 25.0 | 32.0 |
| **Pressure** | | | |
| Max outlet pressure continuous (1) | barg | 80 | 80 |
| | psig | 1160 | 1160 |
| Min outlet pressure (1) | barg | 20 | 20 |
| | psig | 290 | 290 |
| Inlet pressure continuous (2) | barg | 0.5～5 | 0.5～5 |
| | psig | 7.3～72.5 | 7.3～72.5 |
| Max inlet pressure peak | barg | 10 | 10 |
| | psig | 145 | 145 |
| **Speed** | | | |
| Min speed continuous | rpm | 700 | 700 |
| Max speed continuous (2) | rpm | 1650 | 1800 |
| **Typical flow - Flow curves available in item 5** | | | |
| 1650 rpm at max pressure | $m^3/h$ | 3.5 | / |
| 1800 rpm at max pressure | $m^3/h$ | / | 4.0 |
| **Technical specifications** | | | |
| Media temperature (3) | ° C | 2～50 | 2～50 |
| | ° F | 35.6～122 | 35.6～122 |
| Ambient temperature | ° C | 0～50 | 0～50 |
| | ° F | 32～122 | 32～122 |
| Weight (dry) | kg | 18 | 18 |
| | lb | 35.27 | 35.27 |
| Sound pressure level (4) | dB(A) | ≤78 | ≤78 |
| **Typical motor size** | | | |
| 1650/1800 rpm at max pressure | kW | 11.0 | 15.0 |
| Torque at max outlet pressure | Nm | 36.5 | 45.9 |
| | lbf-ft | 26.92 | 33.85 |

(1) For lower and higher pressure, please contact golds.

(2) For speeds above 3000 rpm the pump must be boosted at a pressure of 2-5 barg (29- 72.5 psig).

(3) Dependent on the NaCI concentration - see chapter 8.

(4) Max. area covered with recommended motor configuration (excl. of space to service pump).

## 4.4 DHP4.5～8.2

| Pump size | | DHP4.5 | DHP5.3 | DHP6.3 | DHP7.2 | DHP8.2 |
|---|---|---|---|---|---|---|
| Geometric displacement | cm³/rev | 50 | 63 | 70 | 80 | 100 |
| **Pressure** | | | | | | |
| Max outlet (1) pressure continuous | barg | 80 | 80 | 80 | 80 | 80 |
| | psig | 1160 | 1160 | 1160 | 1160 | 1160 |
| Min outlet (1) pressure | barg | 20 | 20 | 20 | 20 | 20 |
| | psig | 290 | 290 | 290 | 290 | 290 |
| Inlet pressure continuous (2) | barg | 0.5～5 | 0.5～5 | 0.5～5 | 0.5～5 | 0.5～5 |
| | psig | 7.3～72.5 | 7.3～72.5 | 7.3～72.5 | 7.3～72.5 | 7.3～72.5 |
| Max inlet pressure peak | barg | 10 | 10 | 10 | 10 | 10 |
| | psig | 145 | 145 | 145 | 145 | 145 |
| **Speed** | | | | | | |
| Min speed continuous | rpm | 700 | 700 | 700 | 700 | 700 |
| Max speed continuous (2) | rpm | 1800 | 1800 | 1800 | 1800 | 1800 |
| **Typical flow - Flow curves available in item 5** | | | | | | |
| 1500 rpm at max pressure | m³/h | 4.5 | 5.3 | 6.3 | 7.2 | 8.2 |
| 1000 rpm at max pressure | m³/h | 3.0 | 3.53 | 4.2 | 4.8 | 5.47 |
| **Technical specifications** | | | | | | |
| Media (3) temperature | ° C | 2～50 | 2～50 | 2～50 | 2～50 | 2～50 |
| | ° F | 35.6～122 | 35.6～122 | 35.6～122 | 35.6～122 | 35.6～122 |
| Ambient temperature | ° C | 0～50 | 0～50 | 0～50 | 0～50 | 0～50 |
| | ° F | 32～122 | 32～122 | 32～122 | 32～122 | 32～122 |
| Weight (dry) | kg | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 |
| | lb | 76 | 76 | 76 | 76 | 76 |
| Sound pressure level (4) | dB(A) | ≤78 | ≤78 | ≤78 | ≤78 | ≤78 |
| **Typical motor size** | | | | | | |
| 1500 rpm at max pressure | kW | 15.0 | 15.0 | 18.5 | 22.0 | 30.0 |
| Torque at max outlet pressure | Nm | 70 | 81 | 98 | 112 | 141 |
| | lbf-ft | 51.6 | 59.7 | 72.3 | 82.6 | 104 |

(1) For lower and higher pressure, please contact golds.

(2) For speeds above 3000 rpm the pump must be boosted at a pressure of 2-5 barg (29- 72.5 psig).

(3) Dependent on the NaCI concentration - see chapter 8.

(4) Max. area covered with recommended motor configuration (excl. of space to service pump).

## 4.5 DHP11～15

| Pump size | | DHP11 | DHP13.5 | DHP15 |
|---|---|---|---|---|
| Geometric displacement | $cm^3/rev$ | 133 | 163 | 181 |
| **Pressure** | | | | |
| Max outlet (1) pressure continuous | barg | 80 | 80 | 80 |
| | psig | 1160 | 1160 | 1160 |
| Min outlet (1) pressure | barg | 20 | 20 | 20 |
| | psig | 290 | 290 | 290 |
| Inlet pressure continuous | barg | 2～5 | 2～5 | 2～5 |
| | psig | 29～72.5 | 29～72.5 | 29～72.5 |
| Max inlet pressure peak | barg | 10 | 10 | 10 |
| | psig | 145 | 145 | 145 |
| **Speed** | | | | |
| Min speed continuous | rpm | 700 | 700 | 700 |
| Max speed continuous | rpm | 1500 | 1500 | 1500 |
| **Typical flow - Flow curves available in item 5** | | | | |
| 1500 rpm at max pressure | $m^3/h$ | 11.0 | 13.5 | 15.0 |
| 1000 rpm at max pressure | $m^3/h$ | 7.5 | 9.0 | 10.0 |
| **Technical specifications** | | | | |
| Media (2) temperature | ° C | 2～50 | 2～50 | 2～50 |
| | ° F | 35.6～122 | 35.6～122 | 35.6～122 |
| Ambient temperature | ° C | 0～50 | 0～50 | 0～50 |
| | ° F | 32～122 | 32～122 | 32～122 |
| Weight (dry) | kg | 52.0 | 52.0 | 52.0 |
| | lb | 114.6 | 114.6 | 114.6 |
| Sound pressure level (3) | dB(A) | ≤85 | ≤85 | ≤85 |
| **Typical motor size** | | | | |
| 1500 rpm at max pressure | kW | 30.0 | 37.0 | 45.0 |
| Torque at max outlet pressure | Nm | 166 | 224 | 274 |
| | lbf-ft | 122 | 165 | 202 |

(1) For lower and higher pressure, please contact golds.

(2) Dependent on the NaCI concentration - see chapter 8.

(3) Max. area covered with recommended motor configuration (excl. of space to service pump).

## 4.6 DHP16～22

| Pump size | | DHP16 | DHP17 | DHP19 | DHP22 |
|---|---|---|---|---|---|
| Geometric displacement | $cm^3/rev$ | 188 | 197 | 219 | 253 |
| **Pressure** | | | | | |
| Max outlet pressure continuous (1) | barg | 80 | 80 | 80 | 80 |
| | psig | 1160 | 1160 | 1160 | 1160 |
| Min outlet pressure (1) | barg | 20 | 20 | 20 | 20 |
| | psig | 290 | 290 | 290 | 290 |
| Inlet pressure continuous | barg | 2～5 | 2～5 | 2～5 | 2～5 |
| | psig | 29～72.5 | 29～72.5 | 29～72.5 | 29～72.5 |
| Max inlet pressure peak | barg | 10 | 10 | 10 | 10 |
| | psig | 145 | 145 | 145 | 145 |
| **Speed** | | | | | |
| Min speed continuous | rpm | 700 | 700 | 700 | 700 |
| Max speed continuous | rpm | 1500 | 1500 | 1500 | 1500 |
| **Typical flow - Flow curves available in item 5** | | | | | |
| 1500 rpm at max pressure | $m^3/h$ | 15.8 | 16.9 | 18.8 | 21.8 |
| 1000 rpm at max pressure | $m^3/h$ | 10.53 | 11.27 | 12.53 | 14.53 |
| **Technical specifications** | | | | | |
| Media temperature (2) | ° C | 2～50 | 2～50 | 2～50 | 2～50 |
| | ° F | 35.6～122 | 35.6～122 | 35.6～122 | 35.6～122 |
| Ambient temperature | ° C | 0～50 | 0～50 | 0～50 | 0～50 |
| | ° F | 32～122 | 32～122 | 32～122 | 32～122 |
| Weight (dry) | kg | 78 | 78 | 78 | 78 |
| | lb | 172 | 172 | 172 | 172 |
| Sound pressure level (3) | dB(A) | ≤85 | ≤85 | ≤85 | ≤85 |
| **Typical motor size** | | | | | |
| 1500 rpm at max pressure | kW | 45.0 | 55.0 | 55.0 | 75.0 |
| Torque at max outlet pressure | Nm | 223 | 234 | 263 | 305 |
| | lbf-ft | 164 | 173 | 194 | 225 |

(1) For lower and higher pressure, please contact golds

(2) Dependent on the NaCI concentration - see chapter 8.

(3) Max. area covered with recommended motor configuration (excl. of space to service pump).

## 4.7 DHP24～46

| Pump size | | DHP24 | DHP26 | DHP30 | DHP38 | DHP46 |
|---|---|---|---|---|---|---|
| **Geometric displacement** | $cm^3$ /rev | 282 | 309 | 362 | 444 | 444 |
| **Pressure** | | | | | | |
| Max outlet pressure continuous [1] | barg | 80 | 80 | 80 | 80 | 70 |
| | psig | 1160 | 1160 | 1160 | 1160 | 1015 |
| Min outlet pressure [1] | barg | 20 | 20 | 20 | 20 | 20 |
| | psig | 290 | 290 | 290 | 290 | 290 |
| Inlet pressure continuous | barg | 2～5 | 2～5 | 2～5 | 2～5 | 2～5 |
| | psig | 29～72.5 | 29～72.5 | 29～72.5 | 29～72.5 | 29～72.5 |
| Max inlet pressure peak | barg | 10 | 10 | 10 | 10 | 10 |
| | psig | 145 | 145 | 145 | 145 | 145 |
| **Speed** | | | | | | |
| Min speed continuous | rpm | 700 | 700 | 700 | 700 | 700 |
| Max speed continuous | rpm | 1500 | 1500 | 1500 | 1500 | 1780 |
| **Typical flow - Flow curves available in item 5** | | | | | | |
| 1500 rpm at max pressure | $m^3/h$ | 24.5 | 26.7 | 31.7 | 39.3 | 39.44 |
| 1000 rpm at max pressure | $m^3/h$ | 16.3 | 17.8 | 21.1 | 26.2 | 26.29 |
| **Technical specifications** | | | | | | |
| Media temperature [2] | ° C | 2～50 | 2～50 | 2～50 | 2～50 | 2～50 |
| | ° F | 35.6～122 | 35.6～122 | 35.6～122 | 35.6～122 | 35.6～122 |
| Ambient temperature | ° C | 0～50 | 0～50 | 0～50 | 0～50 | 0～50 |
| | ° F | 32～122 | 32～122 | 32～122 | 32～122 | 32～122 |
| Weight (dry) | kg | 105 | 105 | 105 | 105 | 105 |
| | lb | 232 | 232 | 232 | 232 | 232 |
| Sound pressure level [3] | dB(A) | ≤85 | ≤85 | ≤85 | ≤85 | ≤85 |
| **Typical motor size** | | | | | | |
| 1500 rpm at max pressure | kW | 75.0 | 75.0 | 90.0 | 110.0 | 110.0 |
| Torque at max outlet pressure | Nm | 389 | 427 | 498 | 617 | 547 |
| | lbf-ft | 287 | 315 | 367 | 455 | 403 |

(1) For lower and higher pressure, please contact us

(2) Dependent on the NaCI concentration - see chapter 8.

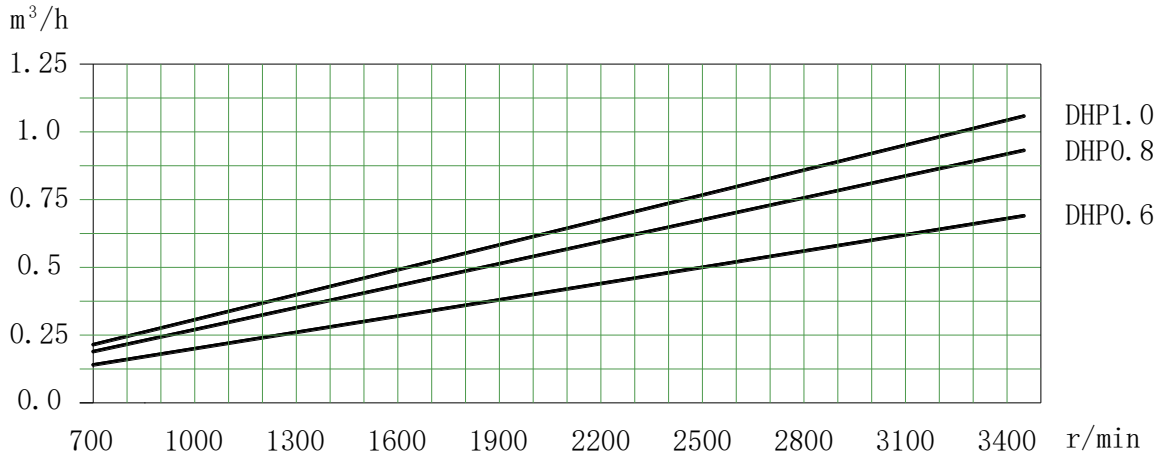
(3) Max. area covered with recommended motor configuration (excl. of space to service pump).

# 5 Flow at different rpm

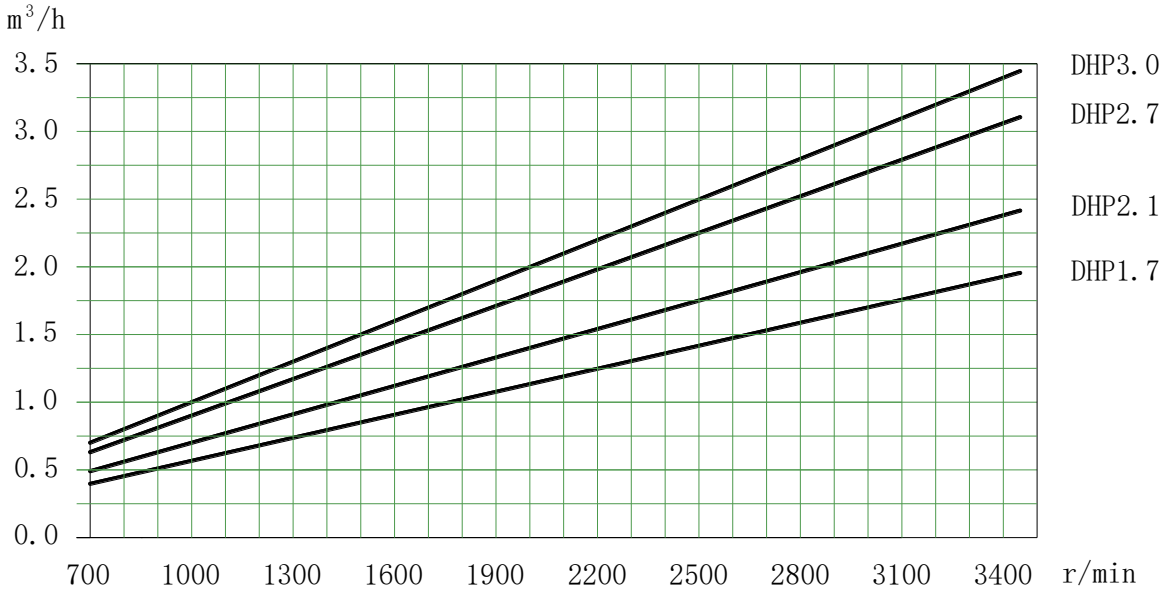
If the flow required and the rotation speed (rpm) of the pump is known, it is easy to select the pump fitting the application best by using the diagrams below. Furthermore, these diagrams shows that the flow can be changed by changing the rotation speed of the pump The flow/rpm ratio is constant, and the "required" flow can be obtained by changing the rotation speed to a corresponding value Thus, the required rpm can be determined as:

$$\text{Required rpm} = \frac{\text{Required flow} \times \text{Rated rpm}}{\text{Rated flow}}$$

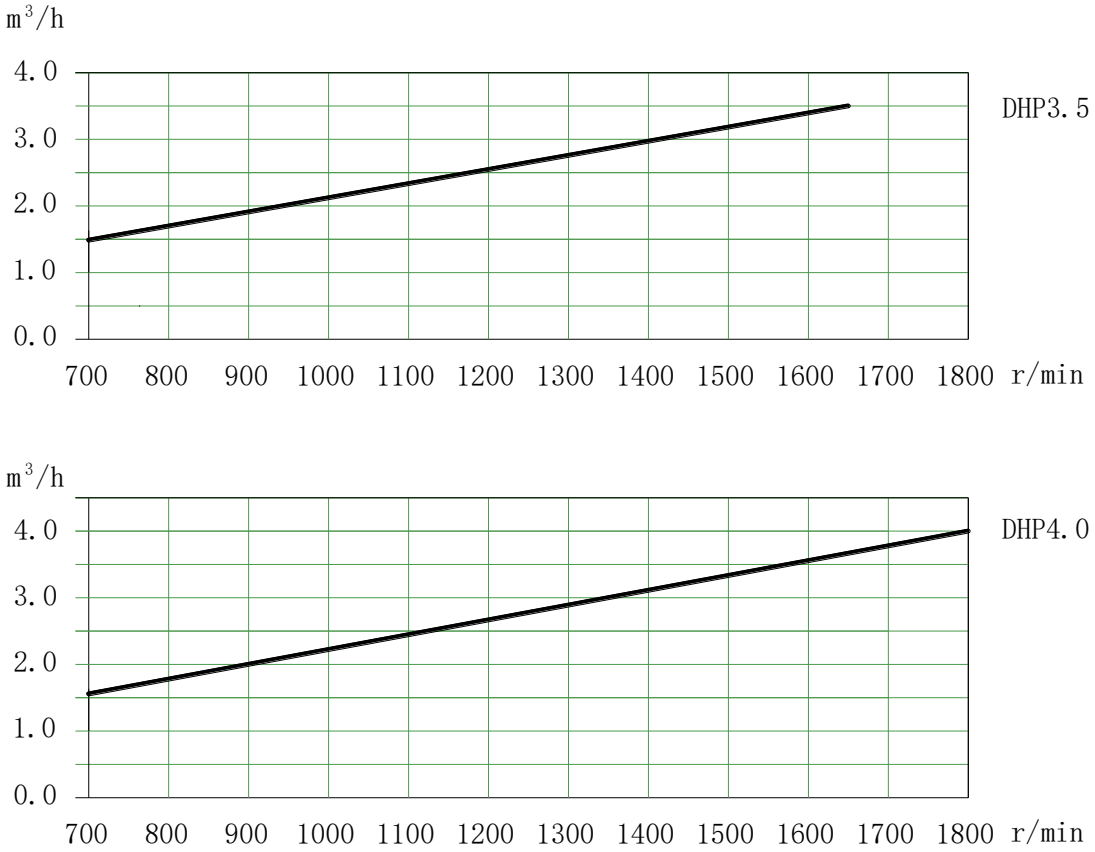
## 5.1 DHP0.6～1.0 flow curves measured at 80 barg



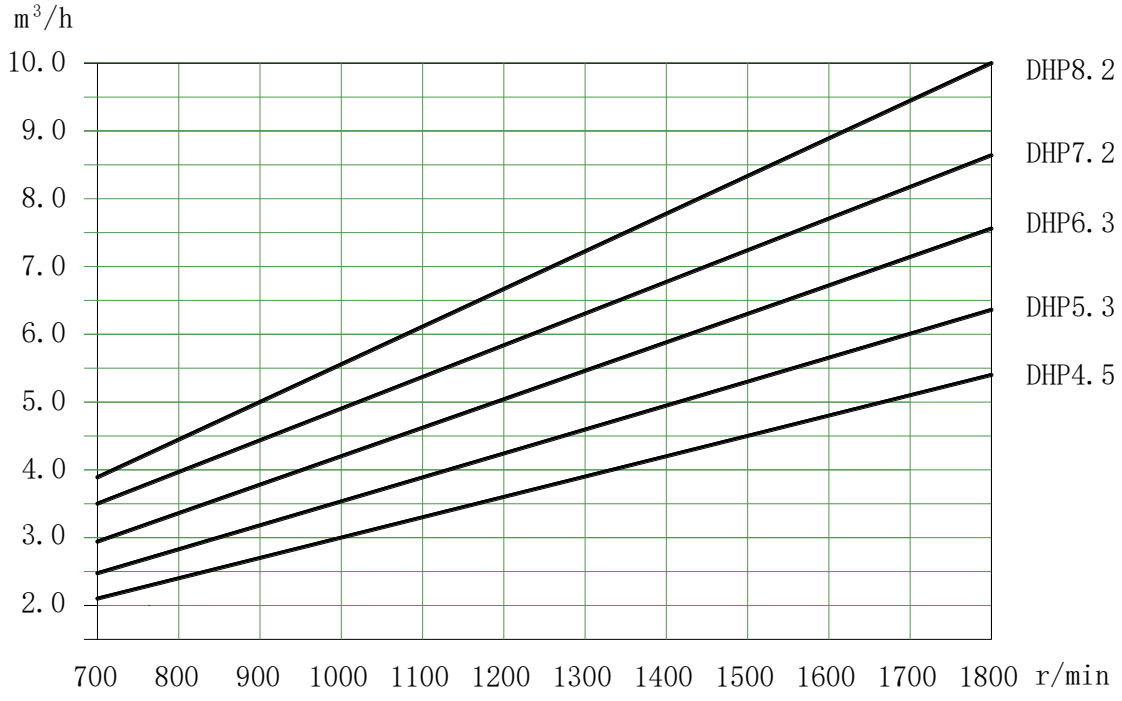

## 5.2 DHP1.7～3.0 flow curves measured at 80 barg



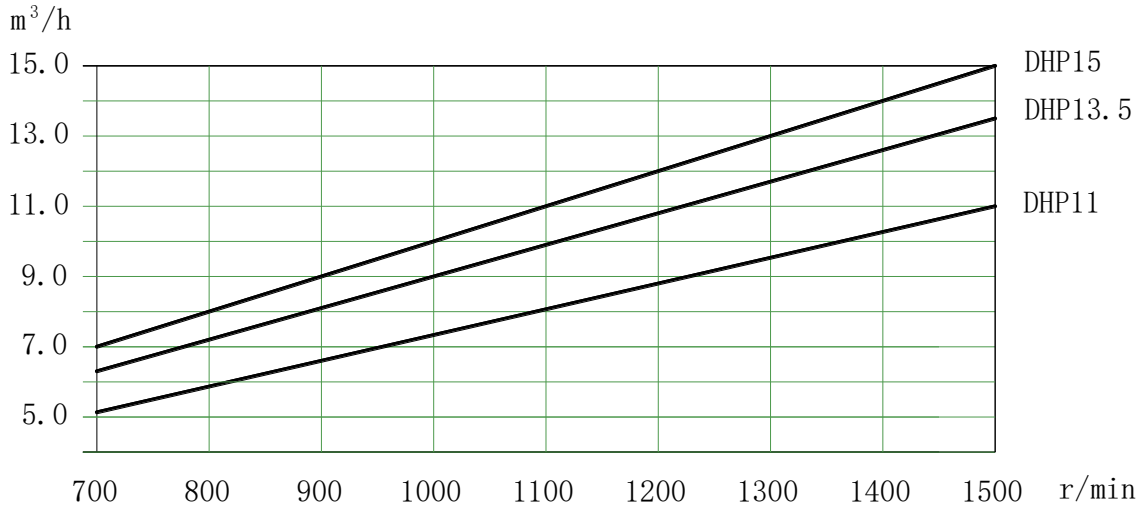
## 5.3 DHP3.5～4.0 flow curves measured at 80 barg



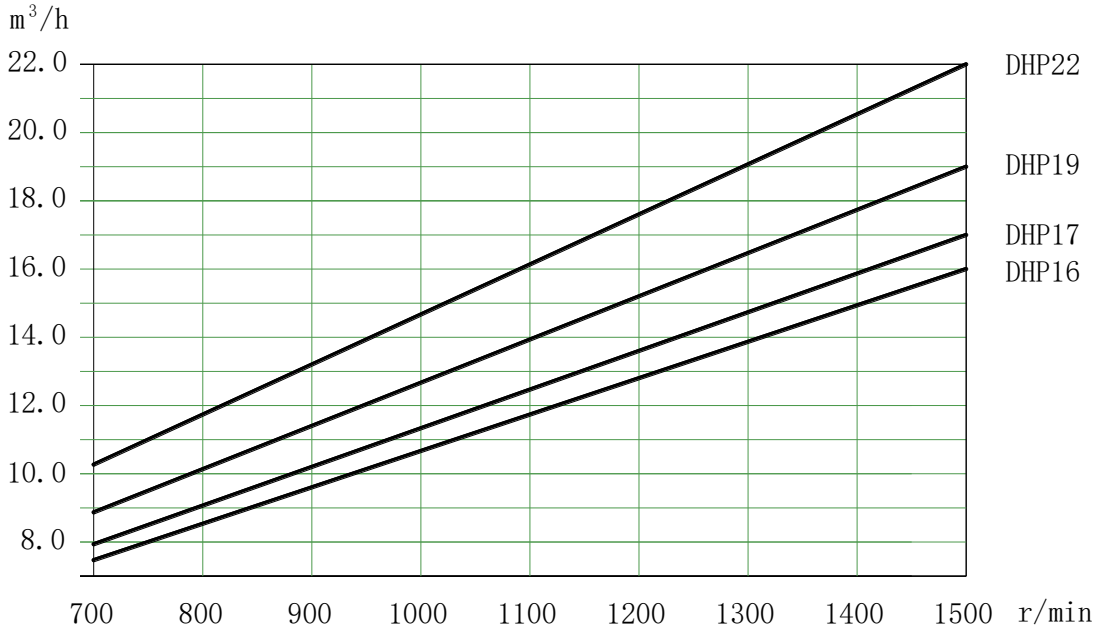

## 5.4 DHP4.5～8.2 flow curves measured at 80 barg



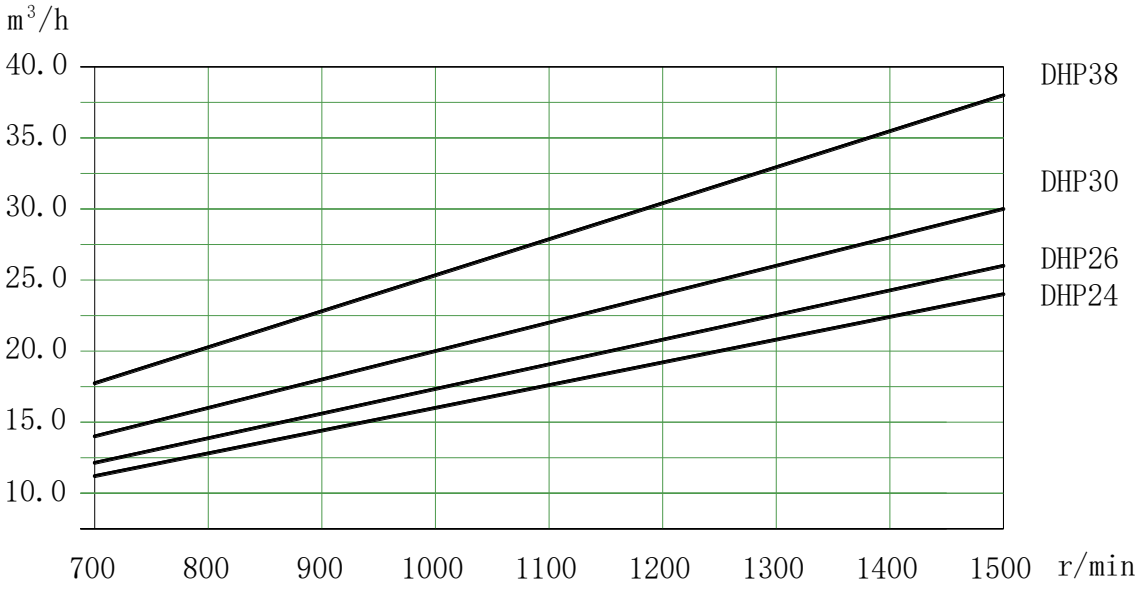
## 5.5 DHP11～15 flow curves measured at 80 barg



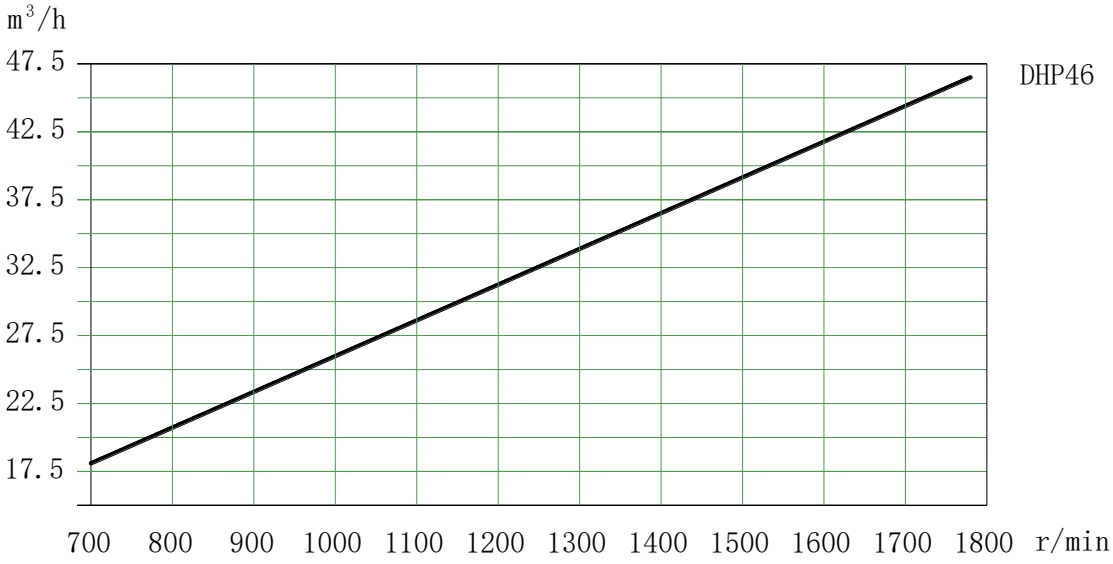

## 5.6 DHP16～22 flow curves measured at 80 barg



## 5.7 DHP24～38 flow curves measured at 80 barg




## 5.8 DHP46 flow curves measured at 70 barg



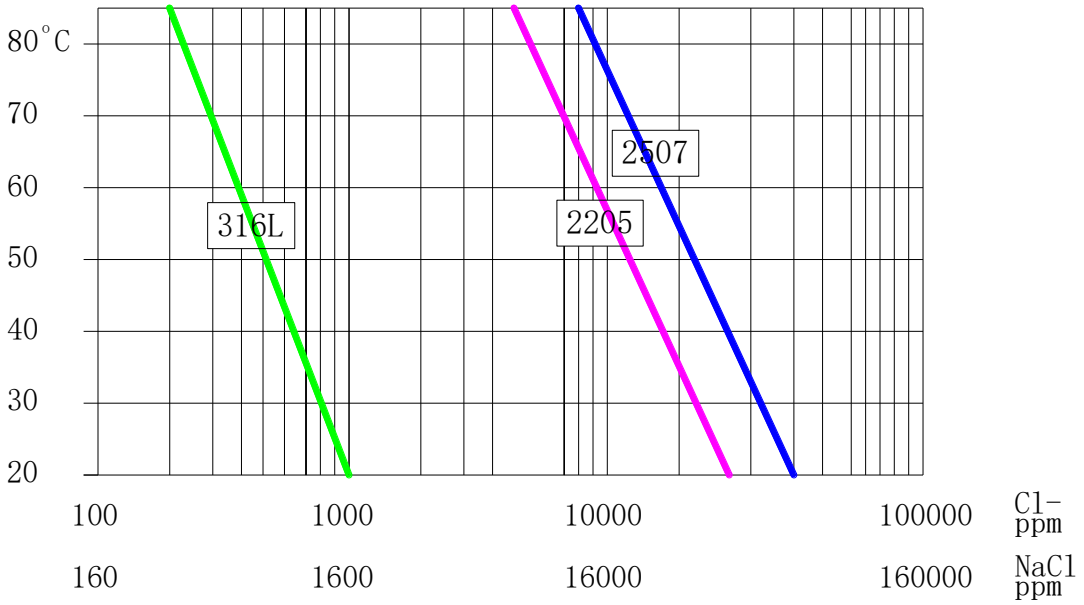
# 6 Temperature

| Fluid temperature: | Ambient temperature: |
|---|---|
| Min. +2° C to max. +50° C<br>(Min. +35.6° F to max. +122° F) | Min. +2° C to max. +50° C<br>(Min. +35.6° F to max. +122° F) |

(1) In case of lower operating temperatures, please contact the High pressure pump manufacturers.

(2) The chart below illustrates the corrosive resistance of different types of stainless steel related to NaCl concentration and temperature.

(3) The DHP water pump is made of Duplex and Super Duplex. If the water pump is operated above the Super Duplex line, always flush water pump with fresh water at operation stop in order to minimize the risk of crevice corrosion.




# 7 Store

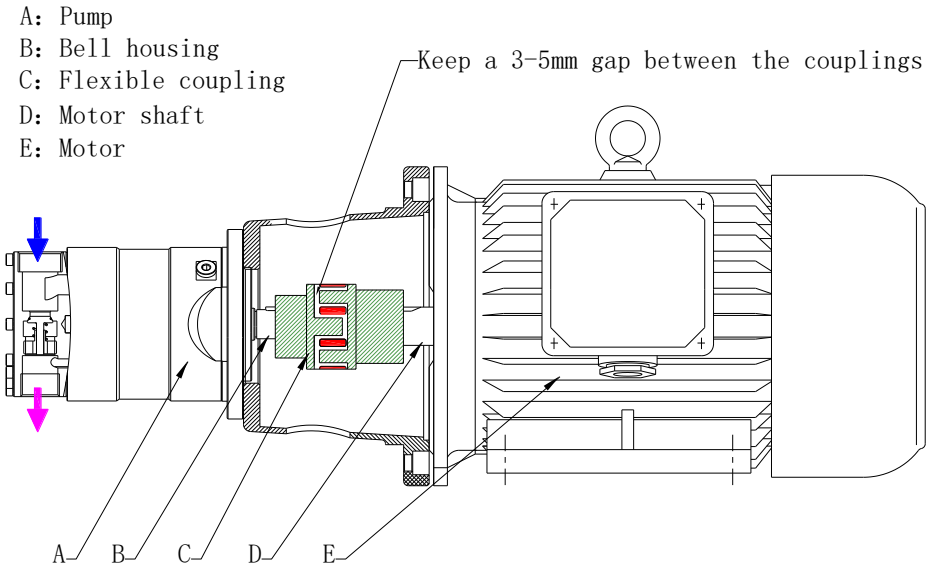
Storage temperature: -40℃ ~ +70℃ (pump has been emptied and sealed for storage).

For temperatures below 2℃, antifreeze is needed, and we recommend using Dowcal-N from DuPont or Chillsafe propylene glycol from Akerman Chemical.

# 8 Installation

See example below on how to mount the pump and connect it to an electric motor or combustion engine (special coupling)
If alternative mounting is required please contact yoursales representative for further information.

Note: Do not add any axial or radial loads to the pump shaft.




## 8.1 Filtration

Proper filtration is crucial for the performance.maintenance and warranty of your pump.

- Protect your pump, and the application in which it is installed, and by always ensuring that all filtration specifications are met, and by always changing filter cartridges according to schedule.
- Since water has very low viscosity,DHP pumps have been designed with very narrow clearances in order to control internal leakage rates and improve component performance.

To minimize wear on the pump, it is therefore essential to filter inlet water properly.

The main filter must have a filtration efficiency of 99.98% at 10μm. We strongly recommend that you always use precision depth filter cartridges rated 10μm abs. ß10≥5000.

- Please note that we do not recommend bag filters or string-wound filter cartridges, which typically have only 50% filtration efficiency This means that out of the 100,000 particles that enter such filters, 50,000 particles pass right through; compare this to precision depth filters that are 99 98% efficient, and only allow 20 of the same 100,000 particles to pass through.
- For more information on the importance of proper filtration, including explanation of filtration principles, definitions and guidance on how to select the right filter for your pump, please consult our Filtration information and specifications.

Noise

- Since the pump unit is typical mounted on a frame or bell housing the overall noise level can only be determined for a complete system.
- To minimize vibrations and noise throughout the system, it is therefore very important to mount the pump unit correctly on a frame with anti-vibration-dampeners, and to use flexible hoses rather than metal pipes where possible.

The noise level is influenced by:

• Pump speed:

High rpm generates more fluid/structure borne pulsations/vibrations than low rpm, because of higher frequency.

• Discharge pressure:

High pressure generates more noise than low pressure.

• Pump mounting:

Rigid mounting generates more noise than flexible mounting, because of structure borne vibrations Be sure to use dampers when mounting.

• Connections to pump:

Pipes connected directly to the pump make more noise than flexible hoses, because of structure-borne vibrations

• Variable frequency drives (VFD):

Motors regulated by VFDs can produce more noise if the VFD does not have the right settings.

## 8.2 RO system with direct supply

**Inlet line:**

a) Dimension the inlet line to obtain minimum pressure loss (large flow, minimum pipe length, minimum number of bends/connections, and fittings with low or no pressure losses) If relevant, please-consult “Parallel coupled pumps.

**Inlet filter:**

b) Install an inlet filter (1) in front of the DHP pump (2) Please consult section 10. , “Filtration” for guidance on how to select the right filter Thoroughly clean pipes and flush system prior to start-up.

**Low pressure relief valve:**

c) Install a low pressure relief valve (9) in order to avoid system or pump damage in case the pump stops momentarily or is spinning backwards.

**Monitoring pressure switch:**

d) Install a monitoring pressure switch (3) between the filter (1) and the pump inlet Set the minimum inlet pressure according to specifications described in item 4 about technical data If the inlet pressure is lower than the minimum pressure set, the monitoring pressure switch must prevent the pump from starting or from running.

**Hoses:**

e) Use flexible hoses (4) to minimize vibrations and noise Please consult theHoses and hose fittings data sheet for guidance.

**Inlet pressure:**

f) In order to eliminate the risk of cavitation and other pump damage, pump inlet pressure must always be maintained according to specifications described in item 4 about technical data.

**Flushing valve:**

g) For easy system filling and flushing, an integrated flushing valve (6) is in the DHP pump.

**Non-return valve:**

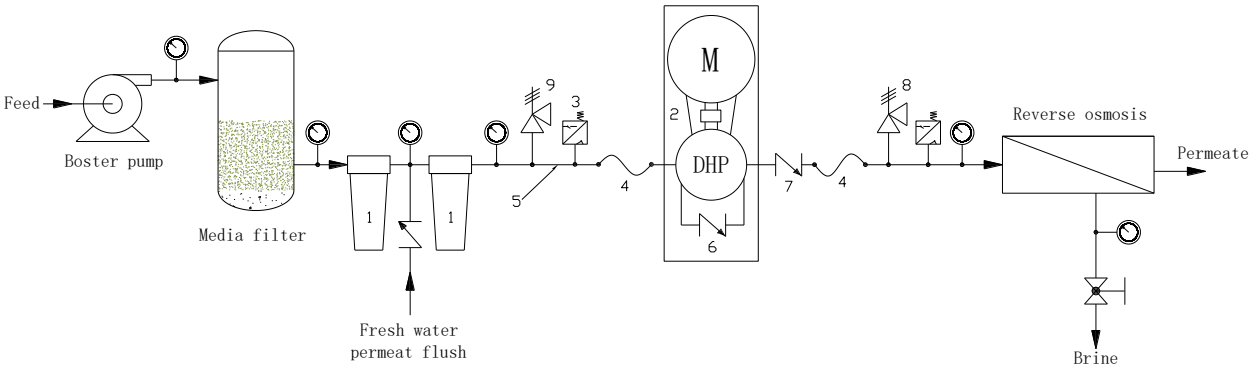
h) A non-return valve (7) in outlet can be installed in order to avoid backspin of the pump The volume of water in the membrane vessel works as an accumulator and will send flow backwards in case of the pump stops momentarily.

**High pressure safety or relief valve:**

i) As theDHP pump begins to create pressure and flow immediately after start-up and regardless of any counter pressure, a safely or pressure relief valve (8) should be installed after the non-return
valve to prevent system damage and to avoid high pressure peaks

- **Note: If a non-return valve is mounted in the inlet line, a low-pressure relief valve is also required between non return valve and pump as protection against high-pressure peaks.**

Preferred design - see section 11



# 9 pump power meter

| Description | Flow rate | | Pressure | | | Speed |
|---|---|---|---|---|---|---|
| | L/min | $m^3/h$ | 60Bar | 70Bar | 80Bar | rpm |
| DHP0.6 | 10 | 0.6 | 1.5kW | 2.2kW | 2.2kW | 3000 |
| DHP0.8 | 13.5 | 0.81 | 2.2kW | 3kW | 3kW | 3000 |
| DHP1.0 | 15.33 | 0.92 | 3kW | 3kW | 3kW | 3000 |
| DHP1.7 | 26 | 1.7 | 4kW | 5.5kW | 5.5kW | 3000 |
| DHP2.1 | 35 | 2.1 | 5.5kW | 5.5kW | 7.5kW | 3000 |
| DHP2.7 | 45 | 2.7 | 7.5kW | 7.5kW | 11kW | 3000 |
| DHP3.0 | 50 | 3.0 | 7.5kW | 7.5kW | 11kW | 3000 |
| DHP3.5 | 58.3 | 3.5 | 7.5kW | 11kW | 11kW | 1800 |
| DHP4.0 | 73.3 | 4.4 | 11kW | 11kW | 15kW | 1800 |
| DHP4.5 | 75 | 4.5 | 11kW | 11kW | 15kW | 1500 |
| DHP5.3 | 88 | 5.3 | 11kW | 15kW | 15kW | 1500 |
| DHP6.3 | 105 | 6.3 | 15kW | 15kW | 18.5kW | 1500 |
| DHP7.2 | 120 | 7.2 | 15kW | 18.5kW | 22kW | 1500 |
| DHP8.2 | 136 | 8.5 | 18.5kW | 22kW | 30kW | 1500 |
| DHP11 | 183 | 11 | 22kW | 30kW | 30kW | 1500 |
| DHP13.5 | 224 | 13.5 | 30kW | 37kW | 37kW | 1500 |
| DHP15 | 250 | 15 | 37kW | 37kW | 45kW | 1500 |
| DHP16 | 263 | 15.8 | 37kW | 45kW | 45kW | 1500 |
| DHP17 | 281 | 16.9 | 37kW | 45kW | 55kW | 1500 |
| DHP19 | 313 | 18.8 | 45kW | 45kW | 55kW | 1500 |
| DHP22 | 366 | 21.8 | 45kW | 55kW | 75kW | 1500 |
| DHP24 | 408 | 24.5 | 55kW | 75kW | 75kW | 1500 |
| DHP26 | 445 | 26.7 | 55kW | 75kW | 75kW | 1500 |
| DHP30 | 526 | 31.6 | 75kW | 75kW | 90kW | 1500 |
| DHP38 | 655 | 39.3 | 90kW | 110kW | 110kW | 1500 |
| DHP46 | 773 | 46.4 | 110kW | 110kW | --- | 1780 |

# 10 Application Areas

Coal mine wastewater

Landfill leachate (Environmental Power Plant)

Seawater desalination

DHP45

Seawater desalination（ Energy recovery booster pump ）

DHP11 + HEX(S)-20

Seawater desalination（ Energy recovery booster pump ）

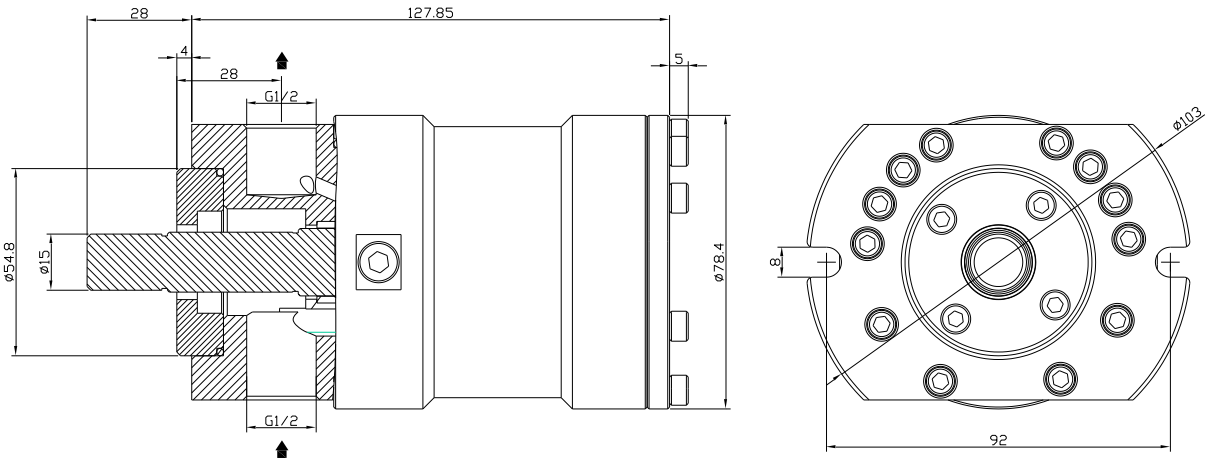
DHP13.5 + HEX(S)-20

Seawater desalination（ Energy recovery booster pump ）

DHP22 + HEX(S)-40

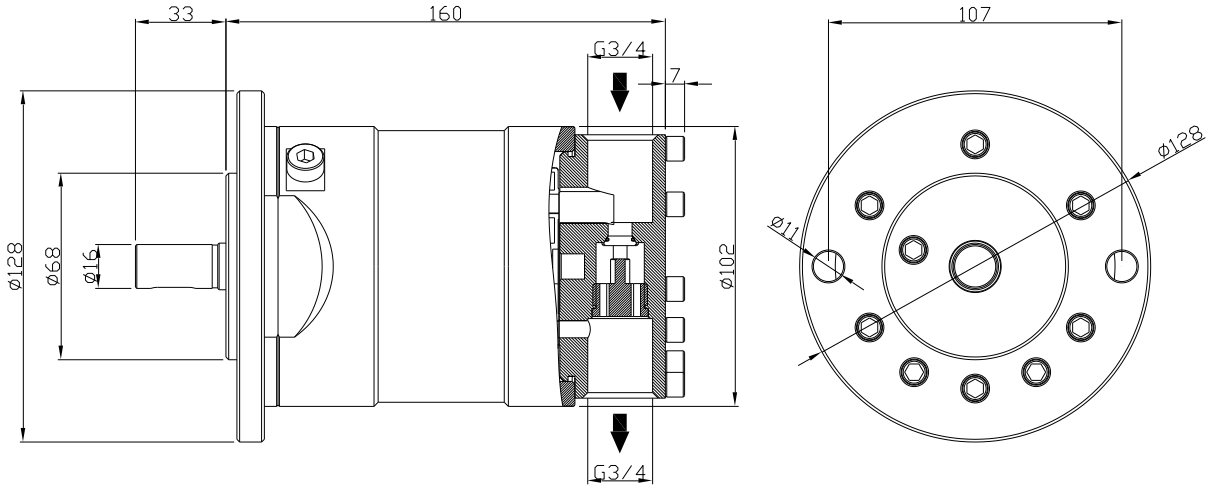
# 11 Dimensions and connections

## 11.1 DHP0.6～1.0



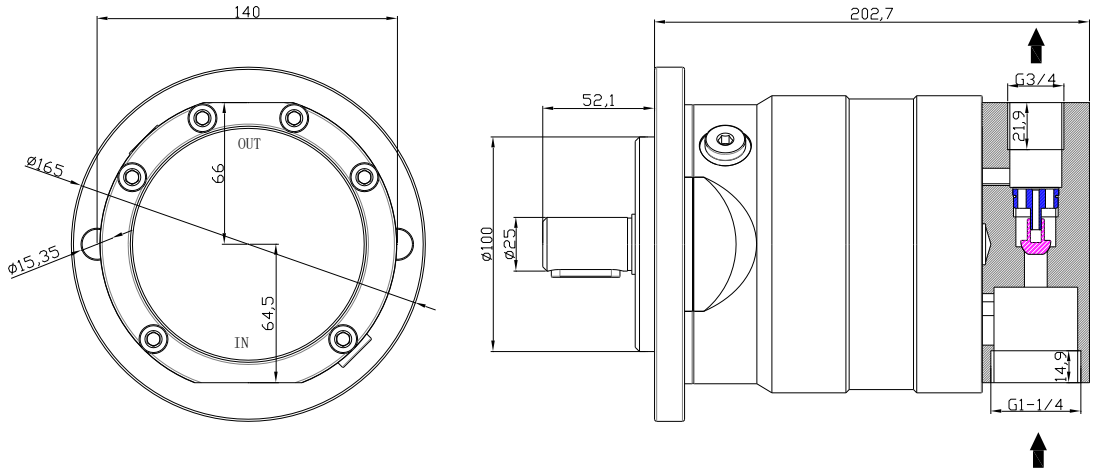

| Description | DHP0.6～1.0 |
|---|---|
| Inlet port | G1/2″ , depth 13 mm |
| Outlet port | G1/2″ , depth 13 mm |

## 11.2 DHP1.7～3.0



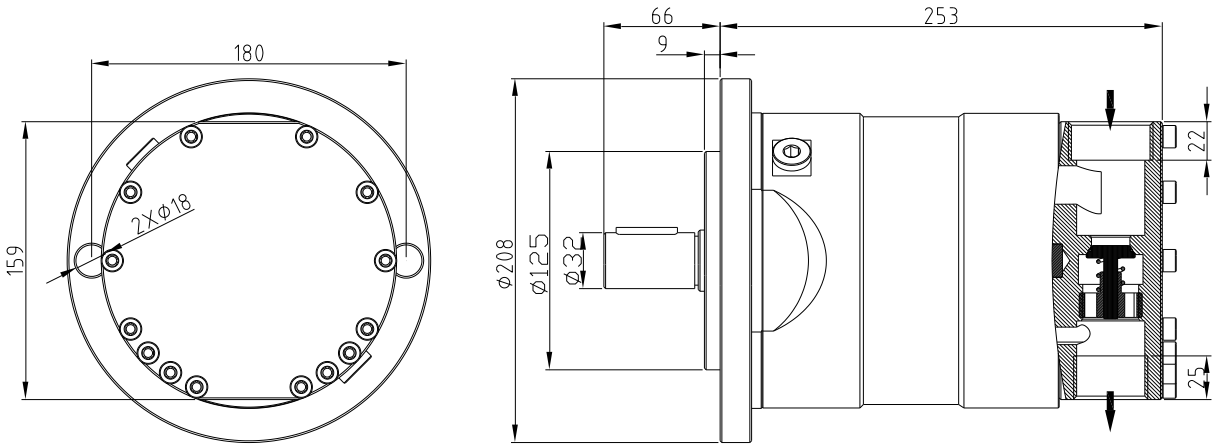

| Description | DHP1.7～3.0 |
|---|---|
| Inlet port | G3/4″ , depth 18 mm |
| Outlet port | G3/4″ , depth 18 mm |

## 11.3 DHP3.5～4.0



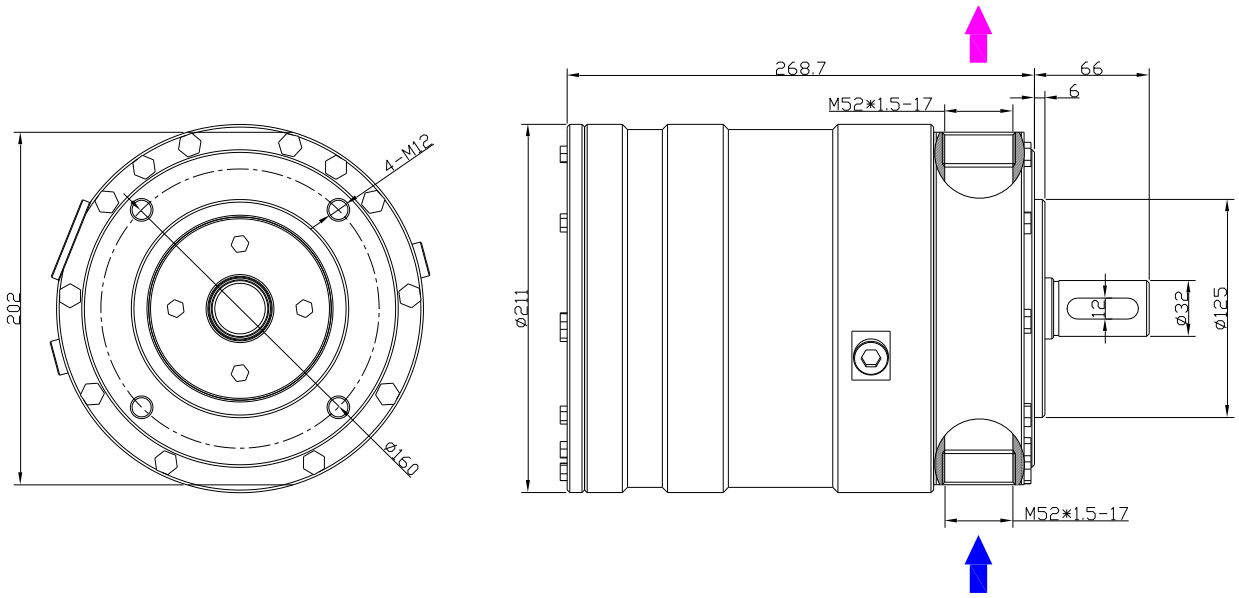

| Description | DHP3.5～4.0 |
|---|---|
| Inlet port | G1 " , depth 20 mm |
| Outlet port | G3/4 " , depth 20 mm |

## 11.4 DHP4.5～8.2



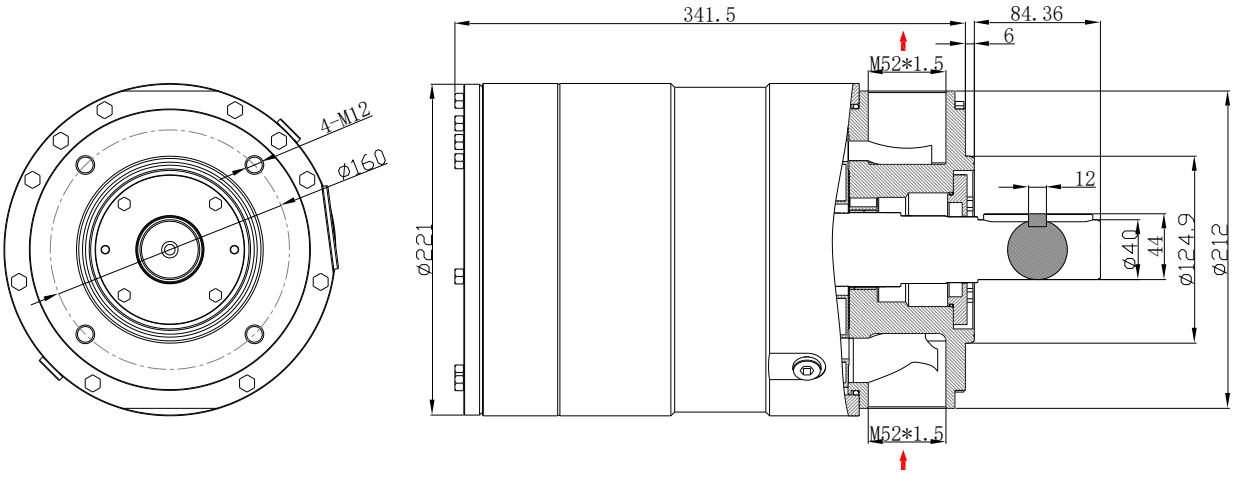

| Description | DHP4.5～8.2 |
|---|---|
| Inlet port | M42×1.5 , depth 22 mm |
| Outlet port | M42×1.5 , depth 22 mm |

## 11.5 DHP11～15



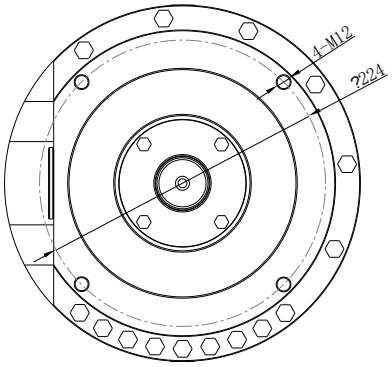

| Description | DHP11～15 |
|---|---|
| Inlet port | M52×1.5，depth 17 mm |
| Outlet port | M52×1.5，depth 17 mm |

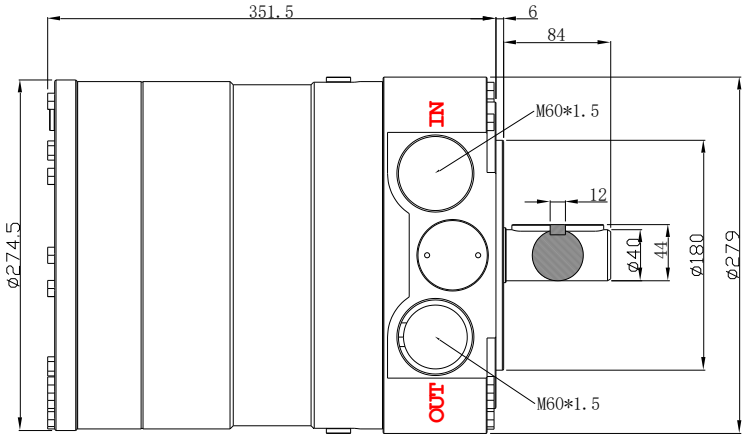
## 11.6 DHP16～22




| Description | DHP16～22 |
|---|---|
| Inlet port | M52×1.5，depth 21 mm |
| Outlet port | M52×1.5，depth 21 mm |

## 11.7 DHP24～46

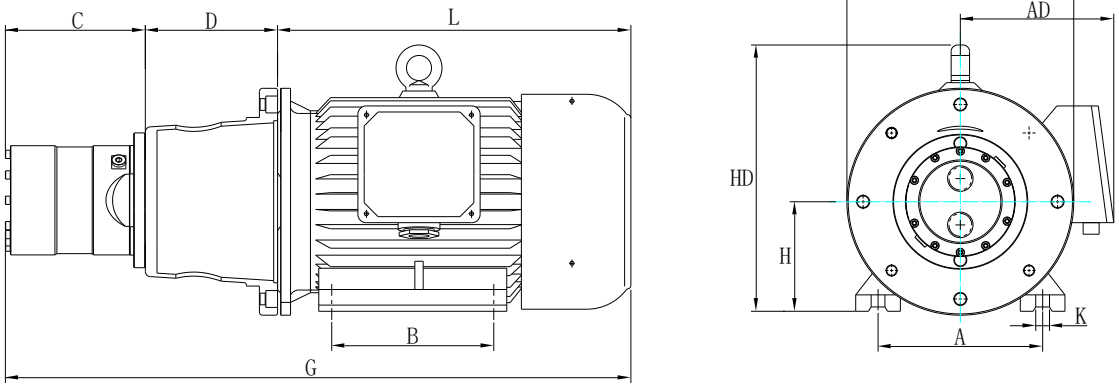



| Description | DHP24～46 |
|---|---|
| Inlet port | M60×1.5，depth 23 mm |
| Outlet port | M60×1.5，depth 23 mm |

# 12 Dimensions with motor unit

## 12.1 DHP0.6～1.0



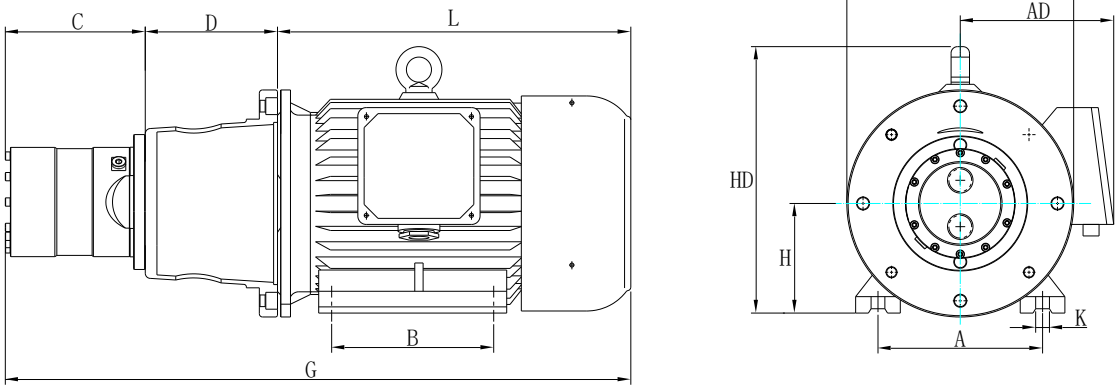

Complete set of equipment (for General Motors) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP0.6～1.0 | 125 | 100 | 80 | 10 | 200 | 145 | 225 | 133 | 100 | 255 | 488 | 1.1kW-2P |
| | 140 | 100 | 90 | 10 | 200 | 165 | 255 | 133 | 100 | 295 | 528 | 1.5kW-2P |
| | 140 | 125 | 90 | 10 | 200 | 165 | 255 | 133 | 100 | 335 | 568 | 2.2kW-2P |
| | 160 | 140 | 100 | 12 | 250 | 175 | 275 | 133 | 120 | 330 | 583 | 3.0kW-2P |

Complete set of equipment (Frequency conversion moto) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP0.6～1.0 | 125 | 100 | 80 | 10 | 200 | 145 | 225 | 133 | 100 | 325 | 558 | 1.1kW-2P |
| | 140 | 100 | 90 | 10 | 200 | 165 | 255 | 133 | 100 | 340 | 573 | 1.5kW-2P |
| | 140 | 125 | 90 | 10 | 200 | 165 | 255 | 133 | 100 | 365 | 598 | 2.2kW-2P |
| | 160 | 140 | 100 | 12 | 250 | 175 | 275 | 133 | 120 | 405 | 658 | 3.0kW-2P |

## 12.2 DHP1.7～3.0



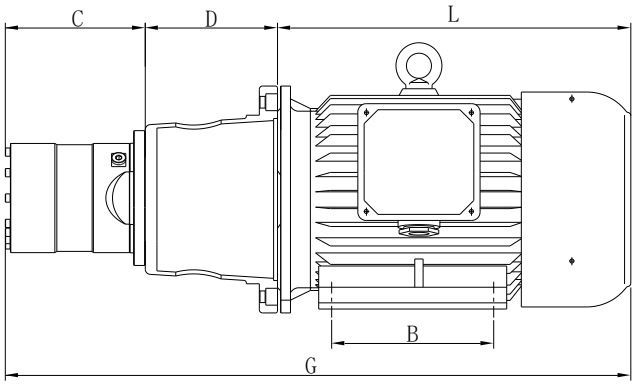

Complete set of equipment (for General Motors) Unit: mm

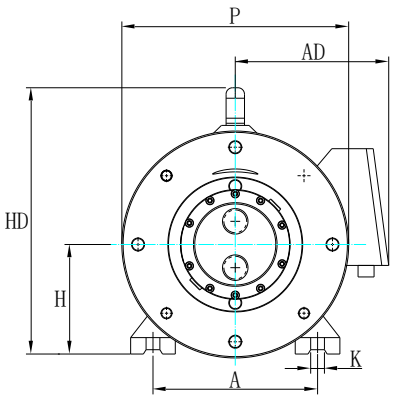
| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP1.7～3.0 | 160 | 140 | 100 | 12 | 250 | 175 | 275 | 165 | 120 | 330 | 615 | 3.0kW-2P |
| | 190 | 140 | 112 | 12 | 250 | 190 | 300 | 165 | 120 | 365 | 650 | 4.0kW-2P |
| | 216 | 140 | 132 | 12 | 300 | 220 | 350 | 165 | 155 | 395 | 715 | 5.5kW-2P |
| | 216 | 140 | 132 | 12 | 300 | 220 | 350 | 165 | 155 | 430 | 750 | 7.5kW-2P |

Complete set of equipment (Frequency conversion moto) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP1.7～3.0 | 160 | 140 | 100 | 12 | 250 | 175 | 275 | 165 | 120 | 405 | 690 | 3.0kW-2P |
| | 190 | 140 | 112 | 12 | 250 | 190 | 300 | 165 | 120 | 430 | 715 | 4.0kW-2P |
| | 216 | 140 | 132 | 12 | 300 | 220 | 350 | 165 | 155 | 520 | 840 | 5.5kW-2P |
| | 216 | 140 | 132 | 12 | 300 | 220 | 350 | 165 | 155 | 560 | 880 | 7.5kW-2P |

## 12.3 DHP3.5～4.0



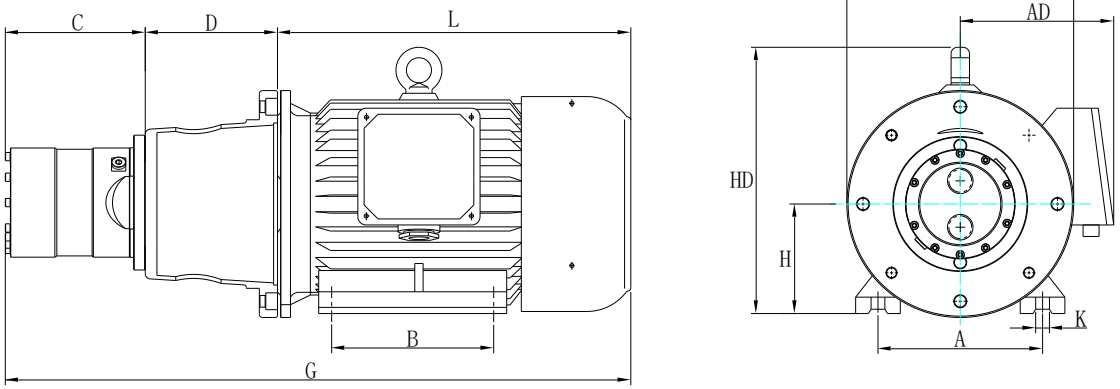

Complete set of equipment (for General Motors) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP3.5～4.4 | 216 | 140 | 132 | 12 | 300 | 220 | 350 | 187 | 155 | 395 | 737 | 5.5kW-2P |
| | 216 | 140 | 132 | 12 | 300 | 220 | 350 | 187 | 155 | 430 | 772 | 7.5kW-2P |
| | 254 | 210 | 160 | 15 | 350 | 260 | 420 | 187 | 204 | 500 | 891 | 11kW-2P |
| | 254 | 254 | 160 | 15 | 350 | 260 | 420 | 187 | 204 | 545 | 936 | 15kW-2P |

Complete set of equipment (Frequency conversion moto) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP3.5～4.4 | 216 | 140 | 132 | 12 | 300 | 220 | 350 | 187 | 155 | 520 | 862 | 5.5kW-2P |
| | 216 | 140 | 132 | 12 | 300 | 220 | 350 | 187 | 155 | 560 | 902 | 7.5kW-2P |
| | 254 | 210 | 160 | 15 | 350 | 260 | 420 | 187 | 204 | 605 | 996 | 11kW-2P |
| | 254 | 254 | 160 | 15 | 350 | 260 | 420 | 187 | 204 | 645 | 1036 | 15kW-2P |

## 12.4 DHP4.5～8.2



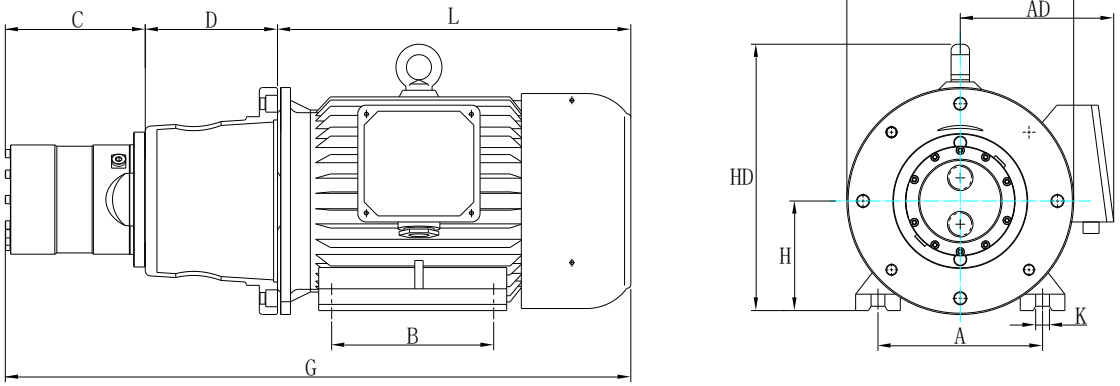

Complete set of equipment (for General Motors) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP4.5～8.2 | 254 | 210 | 160 | 15 | 350 | 260 | 420 | 260 | 204 | 500 | 964 | 11kW-4P |
| | 254 | 254 | 160 | 15 | 350 | 265 | 420 | 260 | 204 | 545 | 1009 | 15kW-4P |
| | 279 | 241 | 180 | 15 | 350 | 265 | 445 | 260 | 204 | 570 | 1034 | 18.5kW-4P |
| | 279 | 279 | 180 | 15 | 350 | 265 | 445 | 260 | 204 | 605 | 1069 | 22kW-4P |

Complete set of equipment (Frequency conversion moto) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP4.5～8.2 | 254 | 210 | 160 | 15 | 350 | 260 | 420 | 260 | 204 | 605 | 1069 | 11kW-4P |
| | 254 | 254 | 160 | 15 | 350 | 265 | 420 | 260 | 204 | 645 | 1109 | 15kW-4P |
| | 279 | 241 | 180 | 15 | 350 | 265 | 445 | 260 | 204 | 695 | 1159 | 18.5kW-4P |
| | 279 | 279 | 180 | 15 | 350 | 265 | 445 | 260 | 204 | 735 | 1199 | 22kW-4P |

## 12.5 DHP11～15



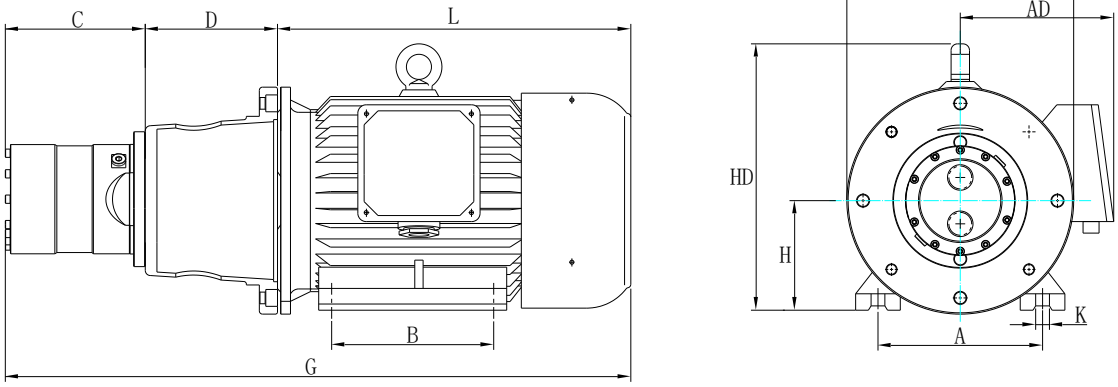

Complete set of equipment (for General Motors) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP11～15 | 279 | 279 | 180 | 15 | 350 | 265 | 445 | 275 | 204 | 605 | 1084 | 22kW-4P |
| | 318 | 305 | 200 | 19 | 400 | 305 | 505 | 275 | 204 | 660 | 1139 | 30kW-4P |
| | 356 | 286 | 225 | 19 | 450 | 325 | 550 | 275 | 234 | 655 | 1164 | 37kW-4P |
| | 356 | 311 | 225 | 19 | 450 | 325 | 550 | 275 | 234 | 685 | 1194 | 45kW-4P |

Complete set of equipment (Frequency conversion moto) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP11～15 | 279 | 279 | 180 | 15 | 350 | 265 | 445 | 275 | 204 | 735 | 1214 | 22kW-4P |
| | 318 | 305 | 200 | 19 | 400 | 305 | 505 | 275 | 204 | 765 | 1244 | 30kW-4P |
| | 356 | 286 | 225 | 19 | 450 | 325 | 550 | 275 | 234 | 760 | 1269 | 37kW-4P |
| | 356 | 311 | 225 | 19 | 450 | 325 | 550 | 275 | 234 | 785 | 1294 | 45kW-4P |

## 12.6 DHP16～22



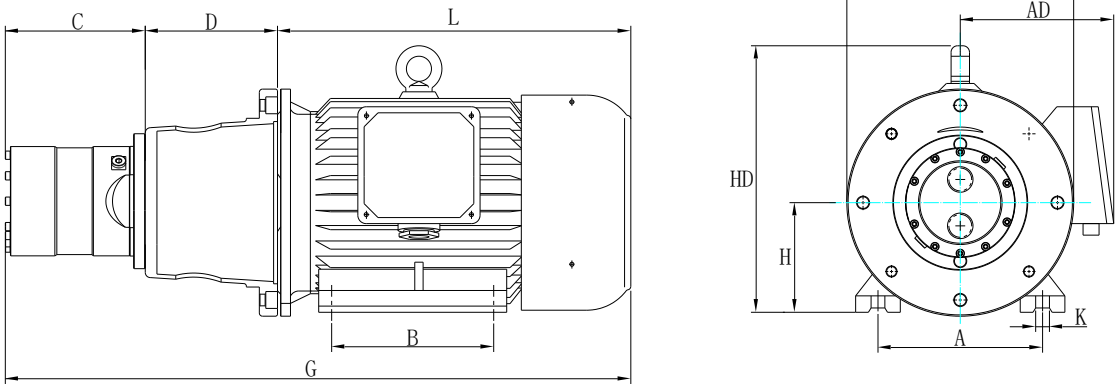

Complete set of equipment (for General Motors) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP16～22 | 318 | 305 | 200 | 19 | 400 | 305 | 505 | 342 | 234 | 660 | 1236 | 30kW-4P |
| | 356 | 286 | 225 | 19 | 450 | 325 | 550 | 342 | 234 | 655 | 1231 | 37kW-4P |
| | 356 | 311 | 225 | 19 | 450 | 325 | 550 | 342 | 275 | 685 | 1302 | 45kW-4P |
| | 406 | 349 | 250 | 24 | 550 | 380 | 630 | 342 | 275 | 750 | 1367 | 55kW-4P |

Complete set of equipment (Frequency conversion moto) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP16～22 | 318 | 305 | 200 | 19 | 400 | 305 | 505 | 342 | 234 | 765 | 1341 | 30kW-4P |
| | 356 | 286 | 225 | 19 | 450 | 325 | 550 | 342 | 234 | 760 | 1336 | 37kW-4P |
| | 356 | 311 | 225 | 19 | 450 | 325 | 550 | 342 | 275 | 785 | 1402 | 45kW-4P |
| | 406 | 349 | 250 | 24 | 550 | 380 | 630 | 342 | 275 | 865 | 1482 | 55kW-4P |

## 12.7 DHP24～46




Complete set of equipment (for General Motors) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP24～46 | 406 | 349 | 250 | 24 | 550 | 380 | 630 | 342 | 275 | 750 | 1367 | 55kW-4P |
| | 457 | 368 | 280 | 24 | 550 | 395 | 675 | 342 | 275 | 835 | 1452 | 75kW-4P |
| | 457 | 419 | 280 | 24 | 550 | 395 | 675 | 342 | 275 | 885 | 1502 | 90kW-4P |
| | 508 | 406 | 315 | 28 | 660 | 540 | 855 | 342 | 275 | 1040 | 1657 | 110kW-4P |

Complete set of equipment (Frequency conversion moto) Unit: mm

| Pump | A | B | H | K | P | AD | HD | C | D | L | G | IEC motor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DHP24～46 | 406 | 349 | 250 | 24 | 550 | 380 | 630 | 342 | 275 | 865 | 1482 | 55kW-4P |
| | 457 | 368 | 280 | 24 | 550 | 395 | 675 | 342 | 275 | 945 | 1562 | 75kW-4P |
| | 457 | 419 | 280 | 24 | 550 | 395 | 675 | 342 | 275 | 995 | 1612 | 90kW-4P |
| | 508 | 406 | 315 | 28 | 660 | 540 | 855 | 342 | 275 | 1130 | 1747 | 110kW-4P |

# 13 High pressure piston pump Non-return valve

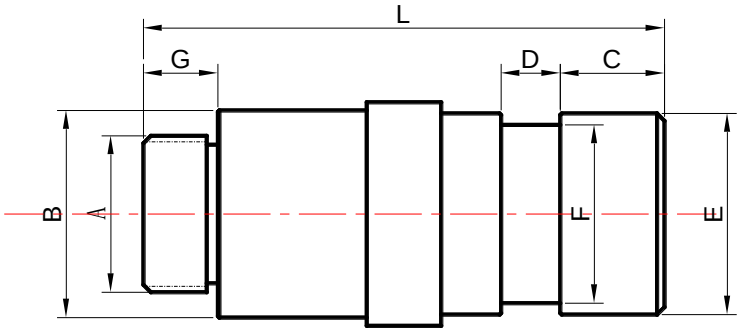
The Non-return valve is that the fluid can only flow along the valve inlet, and the outlet medium can not return, commonly known as the Non-return valve. Non-return valve is also called Non-return valve or Non-return valve. Used to prevent the reverse flow of liquids in hydraulic systems, or to prevent the reverse flow of gases in pneumatic systems.


## Technical parameter

| | |
|---|---|
| Water inlet （thread） | G1/2”、G3/4”、M42、M52、M60 |
| Water outlet (Kaubeling) | DN20、DN40、DN50、DN65 |
| Valve body material | 2205 Duplex stainless steel |
| Pressure | 8～12MPa |

Note: Can be customized according to customer needs.

Dimension drawing

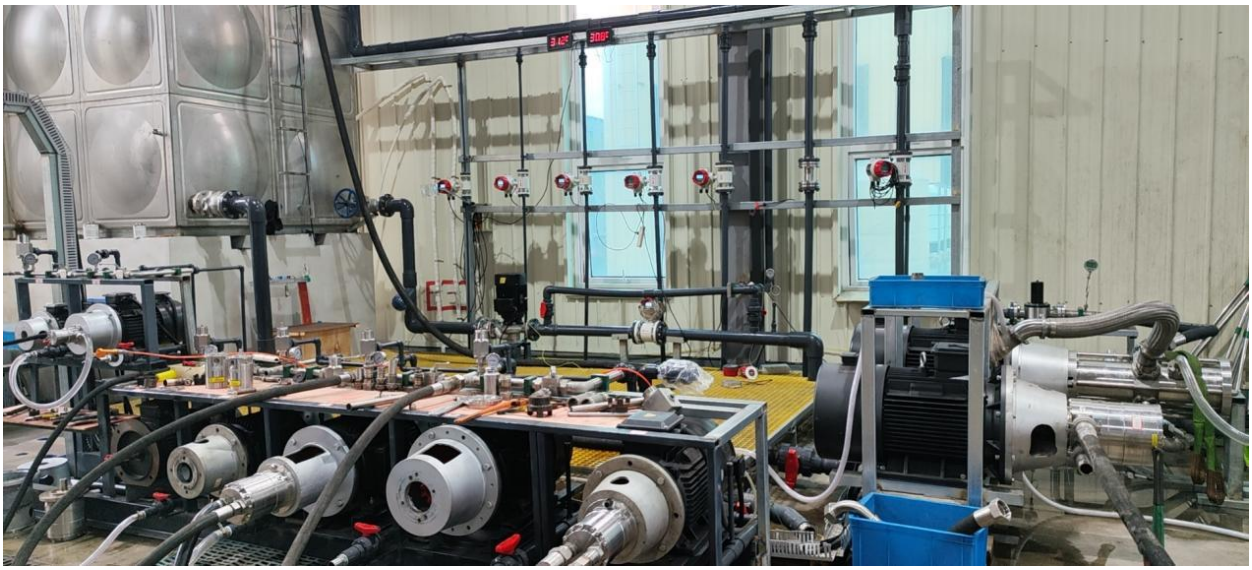



| Type | A | B | C | D | G | ⌀F | L | ⌀E |
|---|---|---|---|---|---|---|---|---|
| SFZ-V20L-G1/2-8H | G ½″ | 27.8 | 15.88 | 7.95 | 10 | 23.83 | 70 | 26.7 |
| SFZ-V20-G3/4-8H | G ¾″ | 27.8 | 15.88 | 7.95 | 10 | 23.83 | 70 | 26.7 |
| SFZ-V40-M42-8H | M42*1.5 | 50 | 15.88 | 7.95 | 13 | 45.09 | 80 | 48.3 |
| SFZ-V40L-M52-8H | M52*1.5 | 60.3 | 15.88 | 7.95 | 16 | 45.09 | 120 | 48.3 |
| SFZ-V50-M52-8H | M52*1.5 | 60.3 | 15.88 | 7.95 | 16 | 57.15 | 120 | 60.3 |
| SFZ-V65-M60-8H | M60*1.5 | 76.1 | 15.88 | 7.95 | 21 | 72.04 | 136 | 76.1 |

# 13 Test procedure and sample test report

## 13.1 Test and inspection equipment

Stainless steel water tank 20 tons, 3 water pumps, 9 test motors;
7 electromagnetic flowmeters, import and export high pressure hose 10 sets;
2 hand-held vibration meters, 8 pressure sensors;
Electrical control box 2.



### 13.2 Test and inspection equipment

After the manufacture of RO concentrated water high pressure pump is completed, it enters the test and inspection workshop, and runs the test on the test platform. The inlet and outlet of the pump are connected to the pipeline, and the inlet pressure of the pump is 0.2-0.5MPa; The operation time of the pump is 4 hours, and the operating pressure is 6MPa and 8MPa. The flow rate, pressure and motor current of the pump are detected, and the vibration value of the pump head is checked.

Test point: factory test, so as to achieve a high level of fault detection and isolation;

Maintenance capabilities: Provide installation audio and video documentation to improve the skills of maintenance personnel and to align remediation and preventive maintenance requirements;

Standardization: The use of standardized structure, easy to detect faults and maintenance, so as to improve the efficiency of detection and fault isolation.

## 14 Manufacturing capacity & Quality assurance

### 14.1 Productive capacity

10 CNC machine tools, 8 machining centers;
2 flat grinding machines, 1 round grinding machine;
30 sets of molds;
All kinds of testing equipment 10 sets.

### 14.2 Manufacturing quality

The equipment is manufactured in strict accordance with the design drawings and technical documents, and the processes from the incoming inspection of materials, production process control, debugging, test and acceptance are carried out in strict accordance with the requirements of the quality system to ensure that the manufacturing quality meets the requirements of the drawings and technical documents.

The quality assurance system established ensures the quality of all aspects of design and manufacturing according to the quality assurance outline of the system. Manufactured according to approved technical documents, the quality shall meet the requirements of relevant drawings and technical documents.

The quality assurance system established in the design and manufacturing process of the equipment guarantees the quality of the design and manufacturing links according to the formulated quality assurance outline.

# 15 Service

**Warranty**

golds DHP pumps are designed for long operation, low maintenance and reduced life-cycle costs.

Provided that the pump has been running according to thespecifications,guarantees 8,000 hours service-free operation,
however, max 18 months from date of production.

Ifrecommendations concerning system-design are not followed, it will strongly influence the life of the DHP pumps.
Other factors that affect pump performance and lifetime include:

- Running the pump at speed outside specifications.
- Supplying the pump with water at temperature higher than recommended.
- Running the pump at inlet pressure outside specifications.
- Running the pump at outlet pressure outside the specifications.

**Maintenance**

Periodic inspections are required to ensure worn parts (if any), are replaced in due time Operational conditions such as water quality should be taken into consideration when determining the frequency of the inspectionsrecommends yearly inspections.
It is recommended to order the purpose-designed tool kit.

**Pump shutdown:**

The DHP pumps are made of Duplex/Super Duplex materials with excellent corrosion properties It is, however, always recommended to flush the pump with freshwater when the system is shut down.

When stopping the pump for more than 1 day flush the pump with permeate by rotating the pump for 10 sec Flushing through the flushing valve of the pump without rotating the pump is not enough for cleaning the inside of the pump.

The pump can be flushed with biocide like the membranes The biocide must be compatible with the materials used in our pumps.

## Repair assistance

In case of irregular function of the DHP pump, please contactHigh Pressure Pumps.

We always follow the "quality first, integrity-based, customer satisfaction" purpose, will continue to enhance the core competitive advantage.

In the future, we will continue to focus on customer needs, focus on the research and development and innovation of core fluid equipment, and create more value for customers