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VERTICAL INLINE CIRCULATION PUMPS

BTD SERIES

60 HZ

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Introduction

BTD pumps are single-stage in-line circulation pumps, equipped with standard motor and mechanical seal. Comparing with other pumps in similar structure, these pumps are less accessible to the impurity in the liquid.

BTD pumps are designed to be pulled out from the top when disassemble. It can be repaired without affecting the pipeline.

The Mechanical seal for BTD200 and above is cartridge mechanical seal. Motor needn't to be disassembled when replace mechanical seal.

Model definition

BTD 50 - 24 G / 2

- Pole of the motor
- New generation
- Rated head(m)
- DN of inlet&outlet
- In-line circulation pump

Motor

2 Pole,4 Pole TEFC motor
Protection level: IP55
Insulation grade: F
Standard power: 50Hz: 1×220-230/240V
3×200-220/346-380V
3×220-240/380-415V
60Hz: 3×200-230/346-400V
3×200-255/380-440V
3×220-277/380-485V

Working conditions

This product is applied for thin, clean, non-flammable, non-explosive,solid free, fiber free, physically and chemically water-like liqiud. The performance curved will descend and energy consumption ill be increased if the liquid viscosity or density is beyond the required level.

Max. working pressure: 12 bar for normal type,16 bar for special type

Liquid temperature: -15℃ to 110℃

Ambient temperature: up to 40℃

Altitude: up to 1000m

Rotation direction: clockwise (looking down from motor fan)

Applications

BTD pump is a versatile product that can transport various media from tap water to industrial liquids,mainly used for liquid conveying, pressurizing and circulating equipment. For example:

District heating system (the water quality in the heating system should meet the recognized water quality standards of that kind of system)

HVAC system
Cooling system
Domestic hot water system
Industrial liquid transportation
Water supply system

Minimum inlet pressure NPSH

In case that the pressure in pump is lower than the steam pressure used to convey liquid,the cavitations will occur.To avoid cavitations, a minimum pressure at the inlet side of the pump shall be guaranteed.The maximum suction can be calculated with the following formula:

H=Pb×10.2-NPSH-Hf-Hv-Hs

H—Maximum suction head(m)

Pb—Atmosphere pressure(bar)

In a closed system,Pb means system pressure(bar)

NPSH—Net positive suction head(m)

It can be read from the point of Max.flow rate shown on NPSH curve.

Hf—Pipeline loss at the inlet(m)

It is in accordance with the pipeline possible Max.flow.

Hv—Steam pressure(m)

It depends on liquid temperature and steam pressure value.

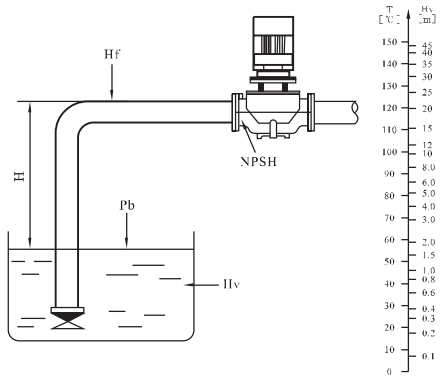
Hs—Safety margin(m)

Minimum 0.5m delivery head.

If the calculated result H is negative ,the pump may run under the Max.suction head H.In case the calculated result H is negative,adelivery head of Min.inlet pressure is necessary.

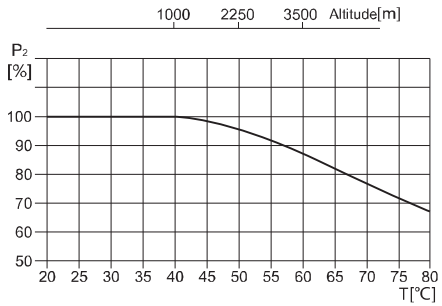
NOTE: Normally, the above calculation will not be done. H is calculated in the following conditions:

1.The liquid temperature is comparatively higher;
2.Liquid flow exceeds rated value;
3.Suction head is comparatively large or inlet pipeline long;
4.System pressure is too low;
5.Bad inlet condition.



Maximum ambient temperature and altitude

When the pump is operating under ambient temperature higher than 40℃ or altitude higher than 1000 m, the motor output power will be reduced due to the low air density and poor cooling effect. Motor power needs to be increased when pump running under the above condition.



Product structure

The design if the pump is pump and motor.Pump part Can be pulled out. BTD series are equipped with standard motor and mechanical seal.Motor is TEFC standard motor. Its major dimensions are in conformity with JB/T8680 standard.

The pump body is equal to a section of pipeline. While in maintenance,blind flange can be used to seal to pump cover which enable to the normal operation of pumps.

The flange connection dimension are in conformity with the related provisions PN16 in GB/T 17241.6 or ISO7005-2/DIN 2501.

The inlet and outlet diameters are in conformity with related standard dimensions.

The pump head is to connect motor and the pump. O ring is used to seal the pump head and the pump.

Installation requirements

BTD Pumps have different installation requirements. The details are as below:

1.if the system pipeline can support the pumps, pumps with 2.2KW motor power(including 2.2KW) can be hung in line;if the system pipeline cannot support the pumps or the pump motor power is higher than 2.2KW, the pump must be installed in brackets or base.

2.Pumps with motor power lower than 2.2KW(including 2.2KW) can be installed horizontally or vertically to the pip-elie.Pumps with motor power higher than 2.2KW, can only be installed vertically to the pipeline.(see Figure 2-A)

3.The pump installation shall not allow the system pipeline tensile force to be transferred to the pump body.

4.The pumps should be installed in the environment with sufficient cooling and the cooling air shall not be above 40℃.

5.If the pumps are installed outdoors,there should be covers to protect electric components from water.

6.For the convenience of maintenance,there should be enough space above and below the pumps.Minimum 300mm shall be kept for pumps with motor power lower than 5.5KW,and minimum 1000mm for pumps with motor power higher than 5.5KW(including 5.5KW) (see Figure 2-B)

7.To prevent noises and vibration and ensure the best operation,anti-vibration base shall be used in installation. Generally,cement base with the weight equal or bigger than 1.5×pump weight shall be adopted. (see Figure 2-C)

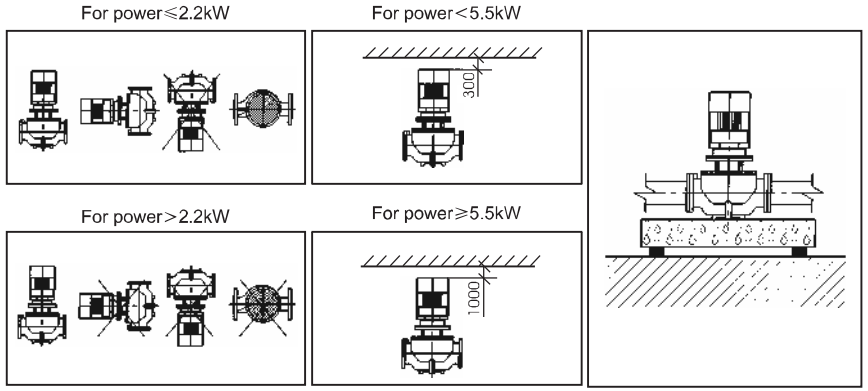
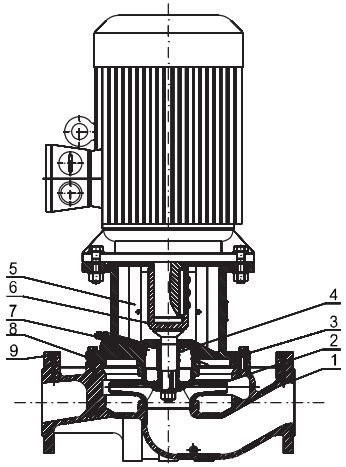
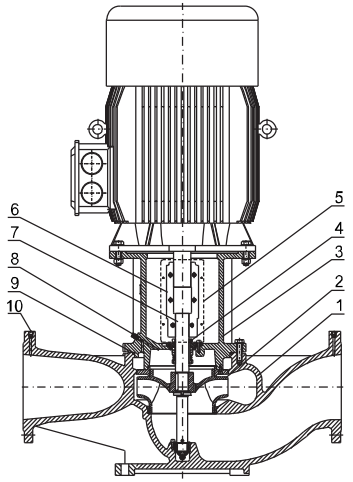


Figure 2-A Figure 2-B Figure 2-C

Sectional drawing of BTD32 - BT150 Extension shaft



Sectional drawing of BTD200-250 easy maintenance structure



Material list of BTD32-BTD150

NO.	Parts	Material
1	Pump body	HT200
2	Impeller	HT200/ZG07Cr19Ni9
3	Pump head	HT200
4	Mechanical seal	Carbon/Silicon Carbide
5	Guard plate	06Cr19Ni10
6	Shaft	20Cr13
7	Air release bolt	06Cr19Ni10
8	O-ring	NBR
9	Plug	06Cr19Ni10

Material list of BTD200 - BTD250

NO.	Parts	Material
1	Pump body	HT200
2	Impeller	HT200/ZG07Cr19Ni9
3	Pump head	HT200
4	Mechanical seal	Carbon/Silicon Carbide
5	Guard plate	06Cr19Ni10
6	Coupling	Cast Steel ZG270-500
7	Shaft	20Cr13
8	Air release bolt	06Cr19Ni10
9	O-ring	NBR
10	Plug	06Cr19Ni10

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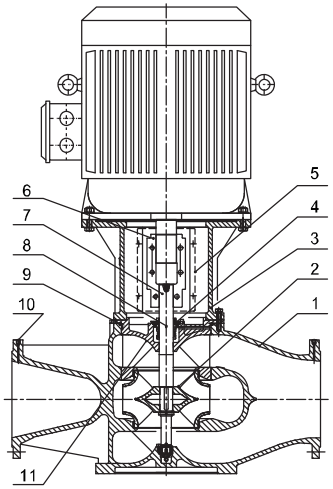
Sectional drawing of BTD300 easy maintenance structure



Material list of BTD300

NO.	Parts	Material
1	Pump body	QT500-7
2	Impeller	HT200/ZG07Cr19Ni9
3	Pump head	HT200
4	Mechanical seal	Carbon/Silicon Carbide
5	Guard plate	06Cr19Ni10
6	Coupling	Cast Steel ZG270-500
7	Shaft	20Cr13
8	Air release bolt	06Cr19Ni10
9	O-ring	NBR
10	Plug	06Cr19Ni10
11	Pump cover	QT500-7

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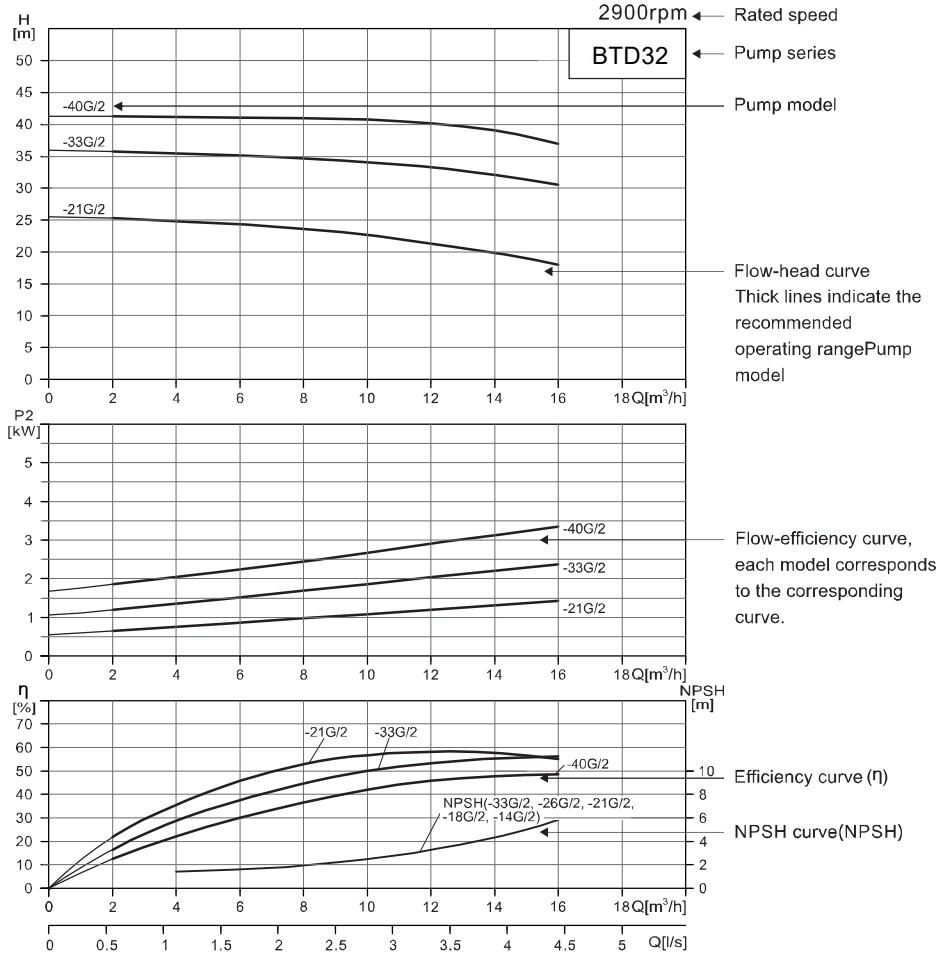
Curve chart



Curve conditions

Following conditions are suitable for the performance curves shown above.

1.All curves are based on the measured values of motor 3×380V. 50Hz: under the constant speed of 2900rpm, 1450rpm or 1480rpm; 60Hz: under the constant speed of 3500rpm, 1750rpm.

2.Curve tolerance in conformity with ISO9906:2012, Grade 3B.

3.Measurement is done with 20℃ air-free water, without impurities.

4.The operation of pump shall refer to the performance region indicated by the thickened curve to prevent overheating due to too small flow rate or overload of motor due to too large flow rate.

5.If the thickness and density of the pumped liquid is different from water ,the motor power should be adjusted.

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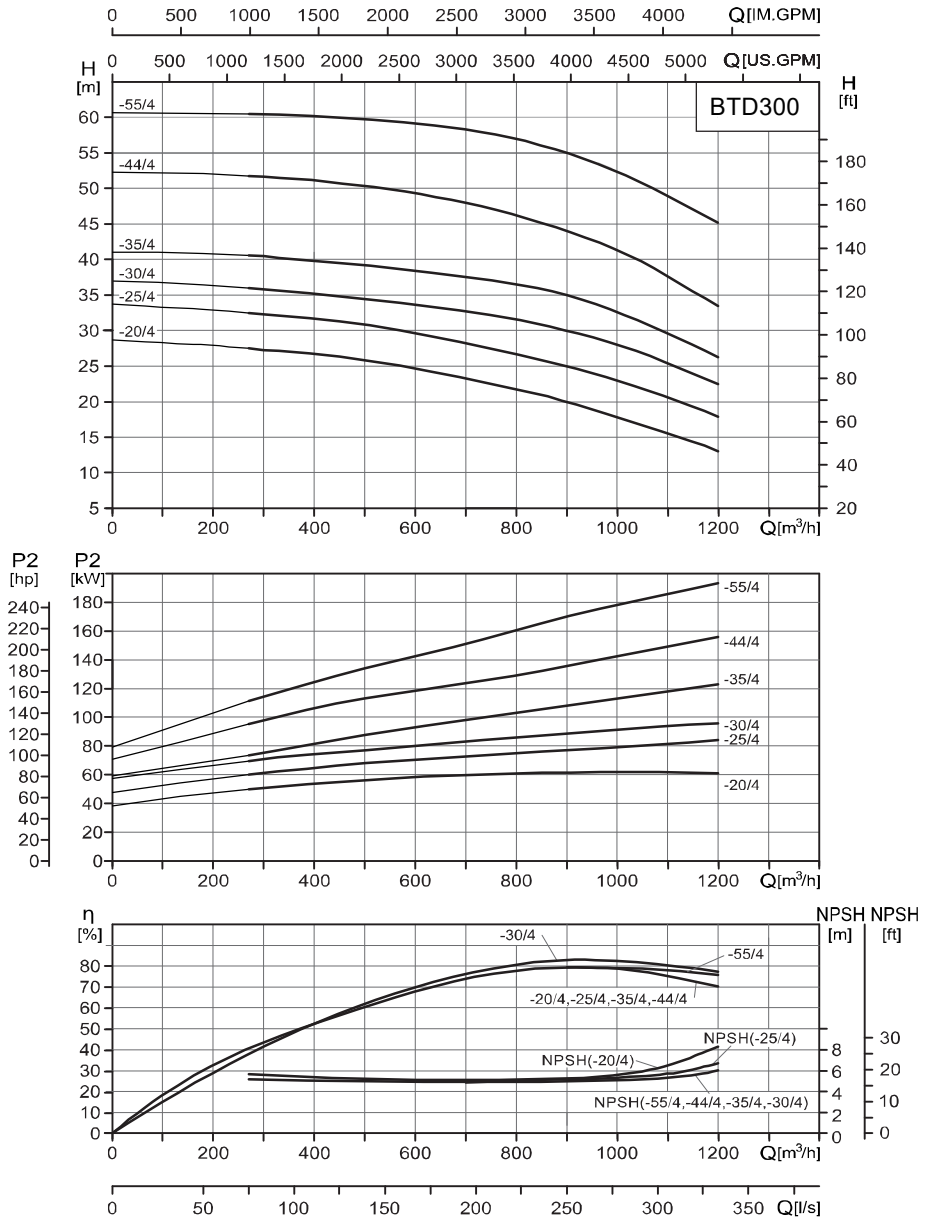
Performance curve



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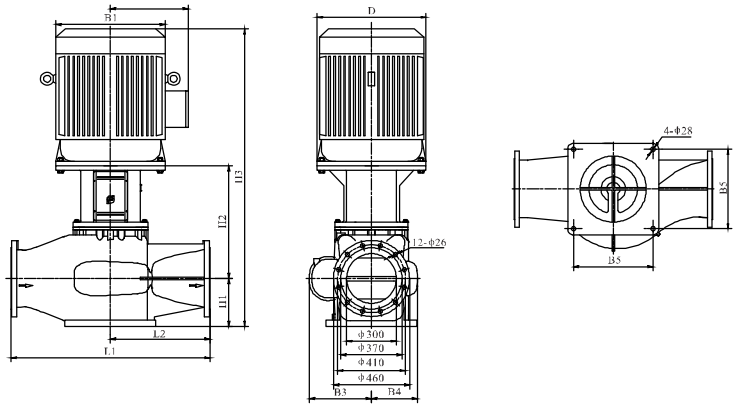
BTD300 Performance Table

60Hz

Model	Motor (kW)	Motor (hp)	Q (m³/h)	270	360	450	630	750	900	1080	1200
BTD300-20/4	75	100	H (m)	27.5	27	26.3	24.3	22.5	20	16	13
BTD300-25/4	90	120		32.5	32	31.3	29.3	27.6	25	21.1	17.9
BTD300-30/4	110	150		36	35.4	34.8	33.4	32.1	30	26	22.4
BTD300-35/4	132	180		40.6	40	39.6	38.2	37	35	30.2	26.3
BTD300-44/4	160	215		51.8	51.3	50.7	49	47.1	44	38.5	33.5
BTD300-55/4	200	270		60.5	60.3	60	58.9	57.7	55	49.6	45

Installation sketch



Dimensions and weights

Model	Dimension(mm) D	B1	B2	B3	B4	B5	H1	H2	H3	L1	L2	Weight (kg)
BTD300-20/4	550	550	400	345	250	440	290	649	1770	1200	600	1070
BTD300-25/4	550	550	400	345	250	440	290	649	1820	1200	600	1120
BTD300-30/4	660	625	555	345	250	440	290	679	2200	1200	600	1460
BTD300-35/4	660	625	555	345	250	440	290	679	2150	1200	600	1540
BTD300-44/4	660	625	550	380	295	480	290	702	2150	1200	600	1780
BTD300-55/4	660	625	550	380	295	480	290	702	2150	1200	600	1900

Note: The dimension of single-phase motor and explosion-proof motor will change. Please consult our company for more details.