

hydroo®

TDROO SERIES

TF, TX

Vertical in-line circulation pump

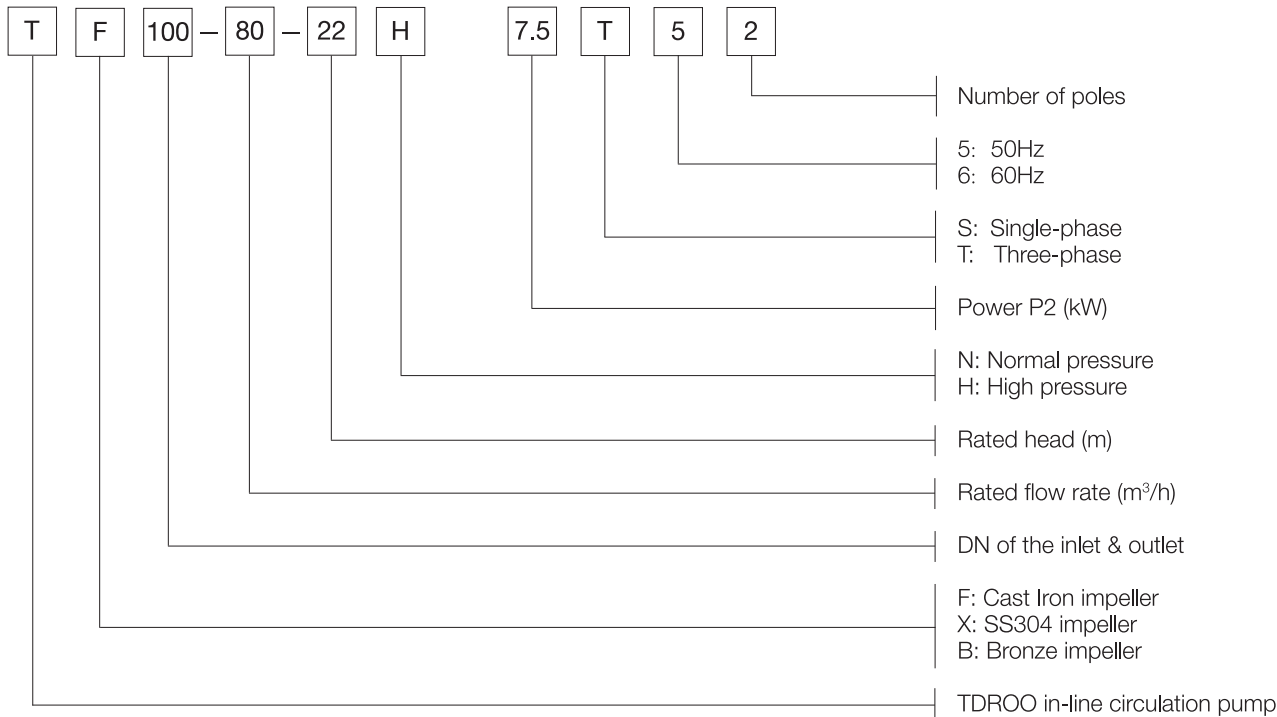
立式管道泵

50Hz



Definition of model

TF TX 100-80-22



Introduction

TDROO Series are single stage in-line centrifugal pumps, equipped with stand-ard motor and mechanical seal. Compar-ing with other pumps in similar structure, these pumps are less accessible to the impurity in the liquid.

The pump is designed to be pulled out from the top when disassemble.It can be repaired without affecting the pipelines.

The mechanical seal for TF, TX200 and above is cartridge mechanical seal. Motor needn't to be disassembled when replace mechanical seal.

Curve conditions

Following conditions are suitable for the performance curves shown above.

1. All curves are based on the measured value of motor 3 X380V, 50Hz: under the constant speed of 2950rpm, 2900rpm or 1480rpm;
2. Curve tolerance in conformity with ISO9906 Annex A.
3. Measurement is done with 20 °C 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.

Applications

The pumped liquid is clean, thin, non-corrosive, non-flammable, and non-explosive liquid which shall not contain any solid grain and fibre that might damage the pump mechanically or chemically.

The detailed requirements on the liquid is in Table 1. If the liquid viscosity or density is beyond the required level, the performance curves will descend and energy consumption will be increased.

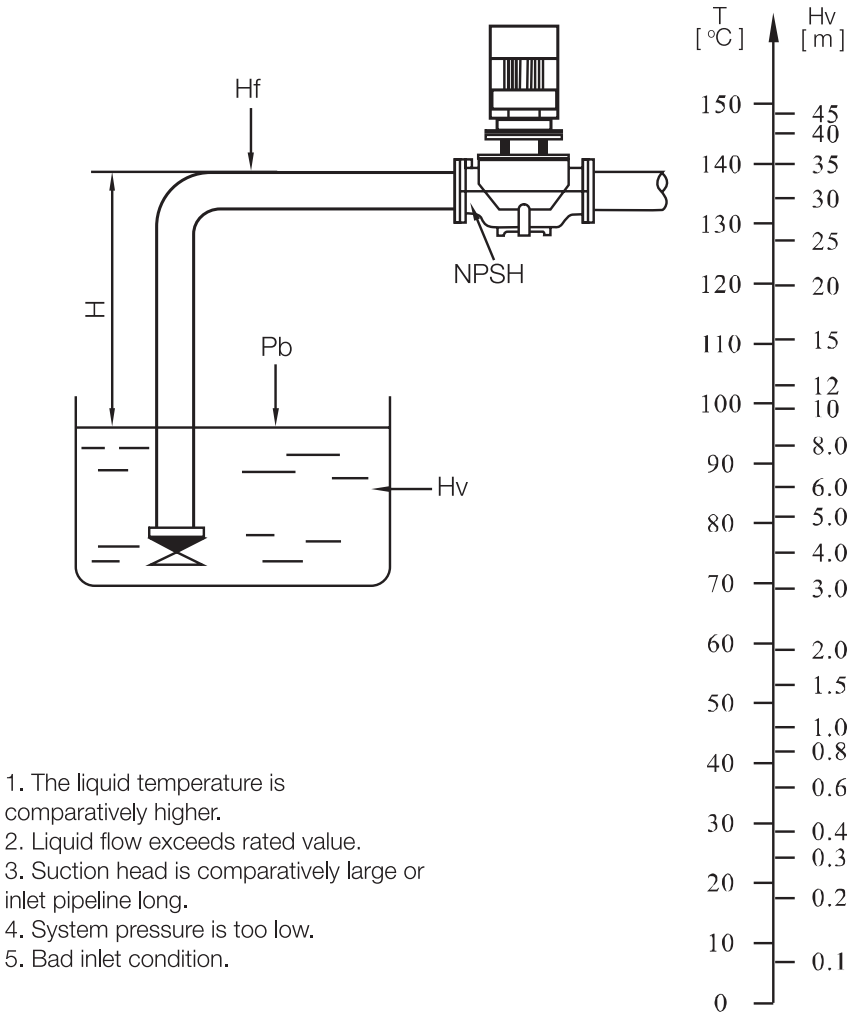
Liquid temperature:-15 °C ~110 °C
Max. Working pressure: Normal type: PN12 bar; special type: PN 16 bar.

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 following formula:
 $H=P_b \times 10.2 - NPSH - H_f - H_v - H_s$
H—Maximum suction head (m)

P_b —Atmosphere pressure (bar)
In a closed system, P_b 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.
 H_f —Pipeline loss at the inlet (m)
It is in accordance with pipeline possible Max. flow.
 H_v —Steam pressure (m)
It depends on liquid temperature and steam pressure value.
 H_s —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 headof Min. inlet pressure is necessary.

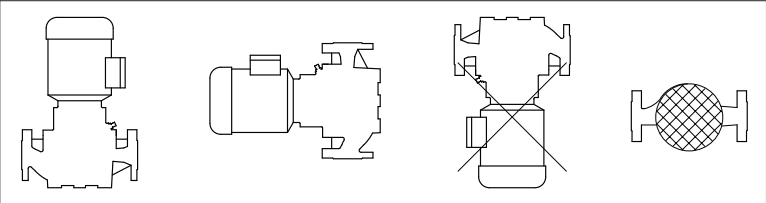
Note: Normally, the above calculation will not be done. H is calculated in the following conditions:



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.

Installation requirements

For power ≤2.2kW



For power >2.2kW

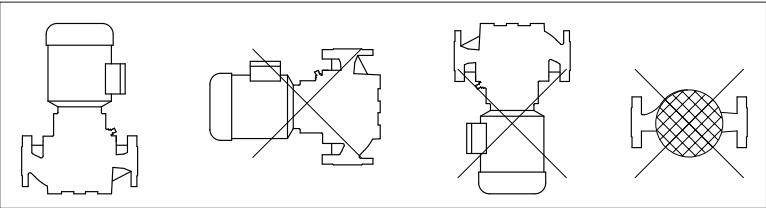
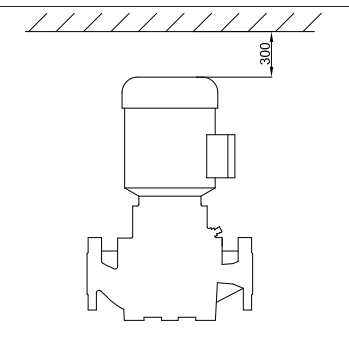


Figure A

For power <5.5kW



For power ≥5.5kW

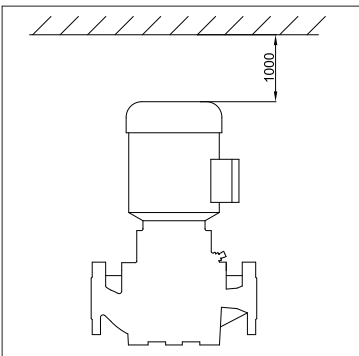


Figure B

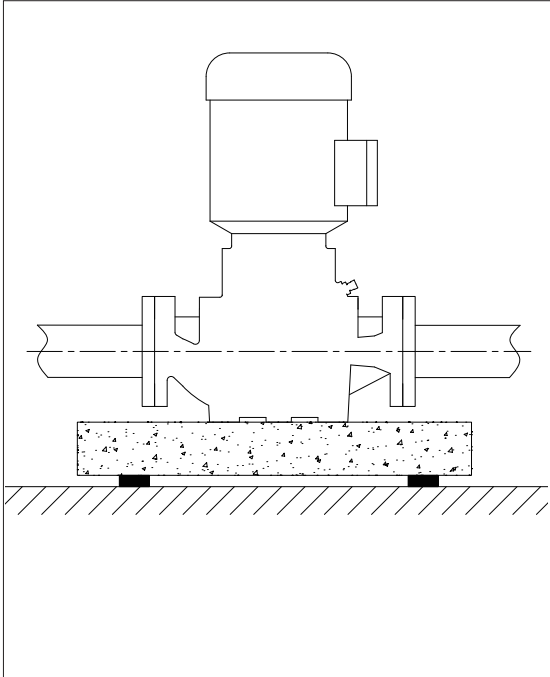


Figure C

Some detailed requirement of installation is as below, The concrete request is as following:

1. If the system pipeline can support the pumps, pumps with 2.2kW motor (including 2.2kW) can be hung in line; if the system pipeline can not support the pumps or the motor's power is higher than 2.2kW, the pumps 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 pipeline. Pumps with motor power higher than 2.2kW, can only be installed vertically to

the pipeline (see figure-A).

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

4. The pump should be installed in the environment with sufficient cooling and the cooling air shall not be above 40°C.

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-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 X pump weight shall be adopted. (See figure-C).

8. For TDROO200 to TDROO300, the base plate is integrated with the pump body. For TDROO32 to TDROO 150, an additional base plate is offered. (See appendix base plate list).

Product structure and component material

TDROO pump is composed of pump and motor. The pump part can be pulled out. The TDROO 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 the normal operation of pumps.

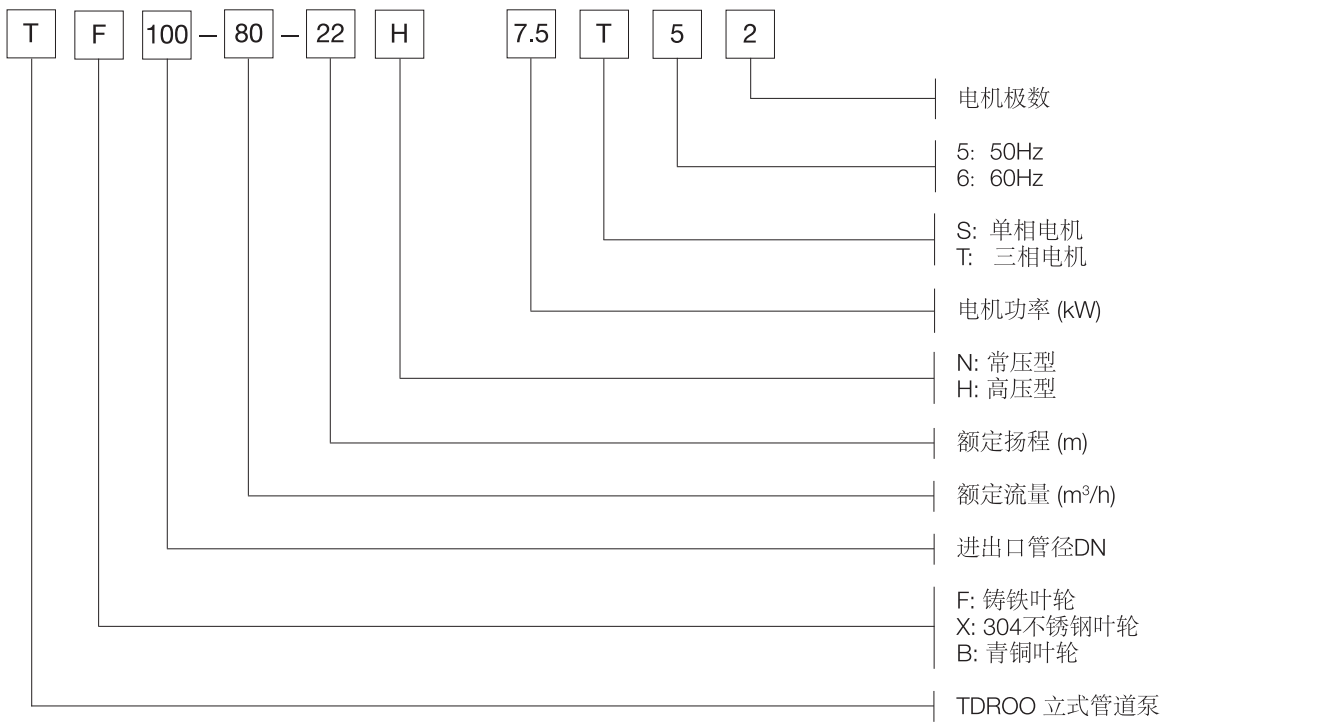
The flange connection dimension are in conformity with the related provisions PN16 in GB/T 17241.6 orISO7005-2/ DIN2501.

The inlet and outlet diameters are inconformity with related standard dimensions.

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

See Table 4 for component materials.

型号说明



介绍

TDROO 系列为单级立式管道泵，配有标准电机和机械密封。与其他类似类型的产品相比，该产品的结构使水泵更不易受到被输送介质中杂质的影响。

产品的结构为顶部可拉出的拆装形式，可以在不影响管路系统的情况下对泵进行维修。

其中 TDROO32-150口径为长轴式结构，TDROO200 及以上口径的产品为便拆式结构，采用集装式机械密封，无需拆卸电机即可完成机械密封的更换及维修。

性能曲线

下述原则适用于后页所示的所有性能曲线：

1. 所有曲线适用于：
50Hz，额定转速为2950rpm或2900rpm或1480rpm。
2. 曲线容差符合ISO9906 Annex A.
3. 测试用水为 20℃，无空气清水，运动粘度1mm²/s.
4. 为防止因流量过小引起过热或流量过大引起过载，推荐在曲线粗线范围内使用水泵。
5. 如果泵送的介质的粘度或密度不同于水，需根据实际情况对电机功率进行调整。

应用

水泵适宜输送清洁、稀薄、非易燃易爆、不含固体颗粒或纤维的液体，且介质不能对泵材料产生化学腐蚀。

对介质的具体要求及应用见下表1。如果介质粘度和密度大于清水，会造成泵性能的下降及能耗的上升，需要根据实际情况选择电机功率。

液体温度：-15℃ ~110℃

最大工作压力:
常规型为 PN12 bar;
特殊型为 PN16 bar。

最小进口压力 NPSH

如果水泵内压力低于输送介质的汽化压力，就可能发生汽蚀，为避免汽蚀，必须保证泵进口侧有一最小压力，最大吸程可按下式计算：

$$H = P_b \times 10.2 - NPSH - H_f - H_v - H_s$$

Pb=大气压力 [bar]
(大气压力可设定为1bar)

在闭式系统中，Pb为系统压力[bar]

NPSH=净正吸头 [m]
(可从NPSH曲线上泵可能的最大流量处读取)

Hf=入口的管路损失 [m]
(在泵将输送的最大流量下)

Hv=汽化压力 [m]
(汽化压力由液体温度决定，可从右侧附图中汽化压力尺中读取)
Hs=安全余量=最小 0.5m 水头

如计算所得H为正值，泵可在最大吸程为H的情况下运行。

如计算所得 H 为负值，必须有一最小进口压力为H 的水头。

注： 一般情况下不进行以上计算。

