



# Single Stage In-line Centrifugal Pumps Type TK



## Introduction

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

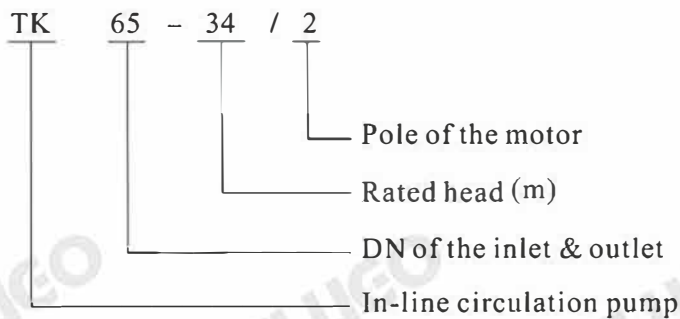
The pump is designed to be pulled out from the top when disassemble. It can be repaired without affecting the pipelines.

The mechanical seal for TK200 and above is cartridge mechanical seal. Motor needn't to be disassembled when replace mechanical seal.

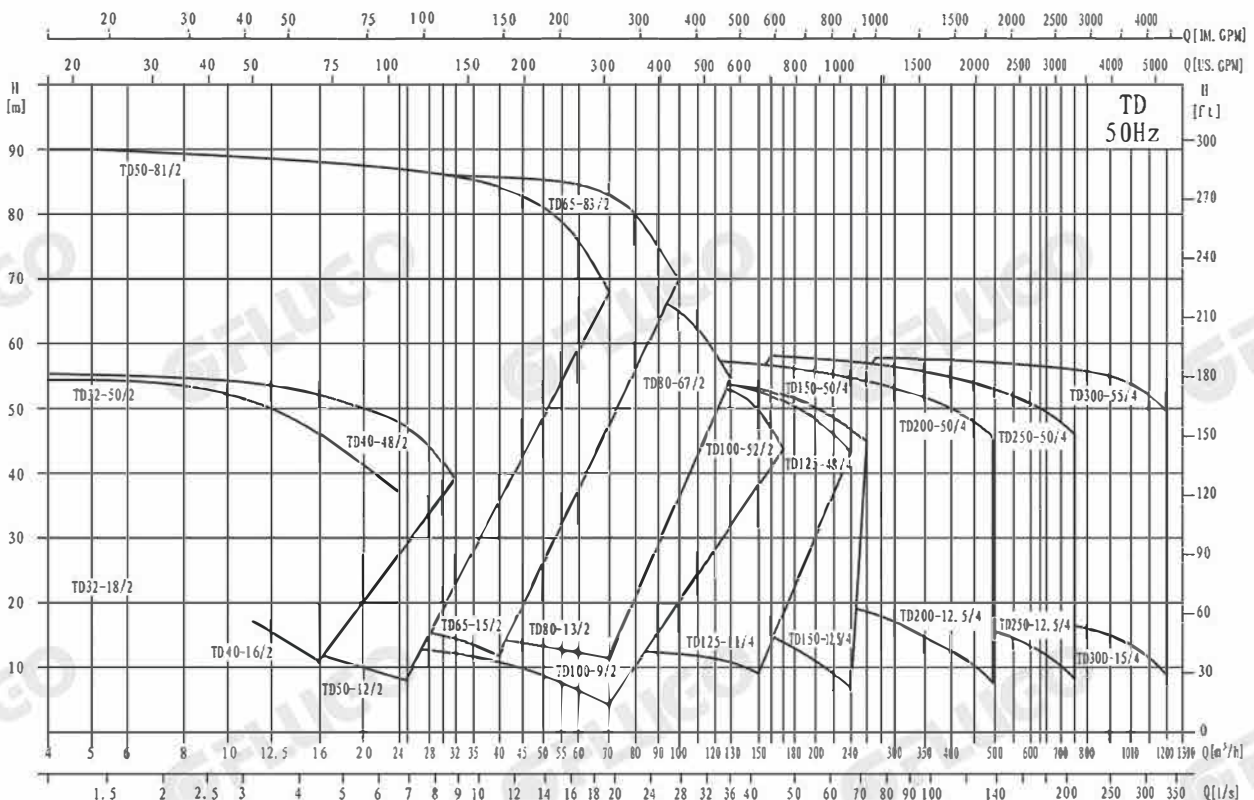
TK125~TK150 products have two structures, one is easy maintenance structure,, using a cartridge mechanical seal, And another is expansion shaft structure.

## Definition Of Model

TK 65 - 34 / 2



## Curve Conditions



Product Range

Table 1

50Hz

NO	Model	Q [m <sup>3</sup> /h]	H [m]	n [r/min]	Standard voltage [V]	
					1×220V	3×380V
					P2 [kW]	P2 [kW]
1	TK32-18/2	8	18	2900	1.1	1.1
2	TK32-21/2	12.5	21		1.5	1.5
3	TK32-25/2	12.5	25		2.2	2.2
4	TK32-32/2	12.5	32			3
5	TK32-38/2	12.5	38			4
6	TK32-50/2	12.5	50			5.5
7	TK40-16/2	12.5	16		1.1	1.1
8	TK40-20/2	12.5	20		1.5	1.5
9	TK40-18/2	20	18		2.2	2.2
10	TK40-25/2	20	25			3
11	TK40-30/2	25	30			4
12	TK40-36/2	25	36			5.5
13	TK40-48/2	25	48			7.5
14	TK50-32/2	12.5	32			3
15	TK50-38/2	12.5	38			4
16	TK50-48/2	12.5	48			5.5
17	TK50-12/2	16	12		1.1	1.1
18	TK50-15/2	20	15		1.5	1.5
19	TK50-18/2	25	18		2.2	2.2
20	TK50-24/2	25	24			3
21	TK50-28/2	30	28			4
22	TK50-35/2	30	35			5.5
23	TK50-40/2	35	40			7.5
24	TK50-50/2	40	50			11
25	TK50-60/2	50	60			15
26	TK50-70/2	50	70			18.5
27	TK50-81/2	50	81			22
28	TK65-36/2	25	36			5.5
29	TK65-48/2	25	48			7.5
30	TK65-15/2	30	15		2.2	2.2
31	TK65-19/2	30	19			3
32	TK65-22/2	40	22			4
33	TK65-30/2	40	30			5.5
34	TK65-34/2	50	34			7.5
35	TK65-40/2	50	40			11
36	TK65-50/2	50	50			15
37	TK65-61/2	50	61			18.5
38	TK65-67/2	50	67			22
39	TK65-83/2	50	83			30
40	TK80-13/2	50	13			3
41	TK80-18/2	50	18			4

**Product Range**

**Table 1 (Continued)**

**50Hz**

NO.	Model	Q [m <sup>3</sup> /h]	H [m]	n [r/min]	Standard voltage [V]		
					1×220V	3×380V	
					P2 [kW]	P2 [kW]	
42	TK80-22/2	50	22	2900		5.5	
43	TK80-28/2	50	28			7.5	
44	TK80-40/2	50	40			11	
45	TK80-48/2	50	48			15	
46	TK80-30/2	80	30			11	
47	TK80-38/2	80	38			15	
48	TK80-47/2	80	47			18.5	
49	TK80-54/2	80	54			22	
50	TK80-67/2	80	67			30	
51	TK100-9/2	50	9			2.2	2.2
52	TK100-15/2	60	15				4
53	TK100-17/2	80	17				5.5
54	TK100-22/2	80	22				7.5
55	TK100-27/2	100	27				11
56	TK100-33/2	100	33				15
57	TK100-40/2	100	40				18.5
58	TK100-48/2	100	48				22
59	TK100-52/2	130	52				30
60	TK125-11/4	120	11		1450		5.5
61	TK125-14/4	120	14				7.5
62	TK125-18/4	160	18			11	
63	TK125-22/4	160	22			15	
64	TK125-28/4	160	28			18.5	
65	TK125-32/4	160	32			22	
66	TK125-40/4	160	40			30	
67	TK125-48/4	160	48			37	
68	TK150-12.5/4	200	12.5	1480		11	
69	TK150-17/4	200	17			15	
70	TK150-21/4	200	21			18.5	
71	TK150-25/4	200	25			22	
72	TK150-33/4	200	33			30	
73	TK150-40/4	200	40			37	
74	TK150-50/4	200	50			45	
75	TK200-15/4	300	15			18.5	
76	TK200-18/4	300	18			22	
77	TK200-24/4	300	24			30	
78	TK200-30/4	300	30			37	
79	TK200-35/4	300	35			45	
80	TK200-44/4	300	44			55	
81	TK200-53/4	300	53			75	
82	TK200-12.5/4	400	12.5			22	
83	TK200-20/4	400	20		30		

Product Range

Table 1 (Continued)

50Hz

NO.	Model	Q [m <sup>3</sup> /h]	H [m]	n [r/min]	Standard voltage [V]	
					1×220V	3×380V
					P2 [kW]	P2 [kW]
84	TK200-23/4	400	23	1480		37
85	TK200-27/4	400	27			45
86	TK200-32/4	400	32			55
87	TK200-43/4	400	43			75
88	TK200-50/4	400	50			90
89	TK250-15/4	500	15			30
90	TK250-18/4	500	18			37
91	TK250-21/4	500	21			45
92	TK250-27/4	500	27			55
93	TK250-36/4	500	36			75
94	TK250-44/4	500	44			90
95	TK250-53/4	500	53			110
96	TK250-12.5/4	630	12.5			30
97	TK250-14/4	630	14			37
98	TK250-17/4	630	17			45
99	TK250-20/4	630	20			55
100	TK250-26/4	630	26			75
101	TK250-32/4	630	32			90
102	TK250-40/4	630	40			110
103	TK250-50/4	630	50			132
104	TK300-15/4	900	15			55
105	TK300-20/4	900	20			75
106	TK300-25/4	900	25		90	
107	TK300-30/4	900	30		110	
108	TK300-35/4	900	35		132	
109	TK300-44/4	900	44		160	
110	TK300-55/4	900	55		200	

## 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 :

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

**H** - Maximum Suction Head (m)

**P<sub>b</sub>** - Atmosphere Pressure (bar), *In a closed system, P<sub>b</sub> 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<sub>f</sub>** - Pipeline loss at the inlet (m), *it is in accordance with pipeline possible Max. flow.*

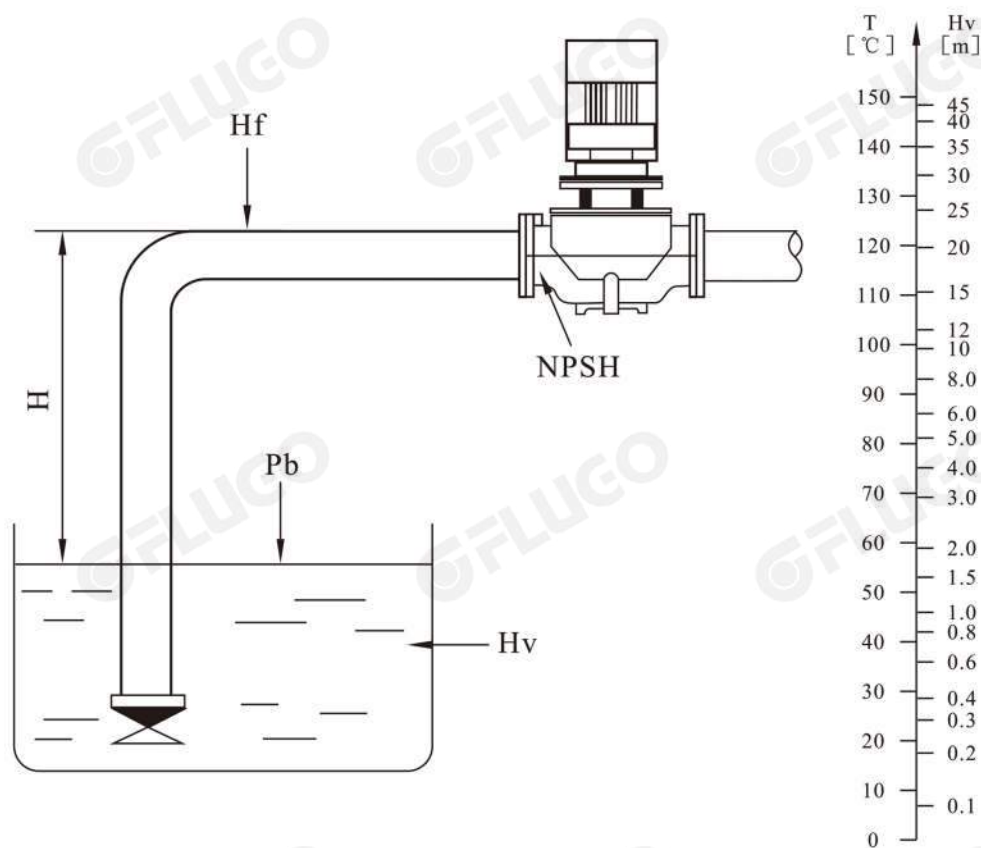
**H<sub>v</sub>** - Steam Pressure (m), *it depends on liquid temperature and steam pressure value.*

**H<sub>s</sub>** - 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, a delivery 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.



## 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 2. 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 ; Special Type : PN 16 bar.

Table 1

	Liquid	Max. temperature	Liquid requirement	Application
Water	Groundwater	<90°C		TK pumps are applicable for urban water supply, industrial water, cooling system, and cold & hot water for regional heat supply system: 1) main circulation pump 2) mixed circuit pump 3) boiler mixed-flow pump 4) gas-fired freezer pump 5) filter pump 6) constant pressure system pump 7) urban hot water circulation
	Boiler feed water	<110°C		
	District feed water	<110°C		
	Condensate	<90°C		
	Softened water	-15°C~110°C		
	Alkalescent water		Weak alkalescence	
	Cooling and cutting lubricant		Additive and little impurity may damage the shaft seal	
Coolants	Hydrocarbon based antifreeze	<50°C	Little rime may damage the shaft seal	TK pumps can be used in chemical industry, pharmaceutical industry, food processing and so on. 1) liquid feeding 2) system pressure boosting 3) mixed circuit circulation pump
	Alcoholised compound	<50°C 50%		
	30% brine(NaCl, CaCl <sub>2</sub> solution, etc)	<50°C	Little rime may damage the shaft seal	
Organic solvents	Isopropyl alcohol	≤60°C	Flammable liquid	
	Propyl alcohol	≤60°C		
Oxidants	Hydrogen peroxide	≤60°C 20%		

## Installation Requirements

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 2.2 kW motor power (including 2.2 kW) can be hung in line; if the system pipeline cannot support the pumps or the pump motor power is higher than 2.2 kW, the pumps must be installed in brackets or base.
2. Pumps with motor power lower than 2.2 kW (including 2.2 kW) can be installed horizontally or vertically to the pipeline. Pumps with motor power higher than 2.2 kW, can only be installed vertically to the pipeline (see. 2-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 5.5 kW, and minimum 1000mm for pumps with motor power higher than 5.5 kW (including 5.5 kW). (See. 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 1.5Xpump weight shall be adopted. (See. 2-C).
8. For TK32 to TK150, pumps with bases or without bases are both available for customers requirements. (See. appendix TD32-TD150 for base dimensions).

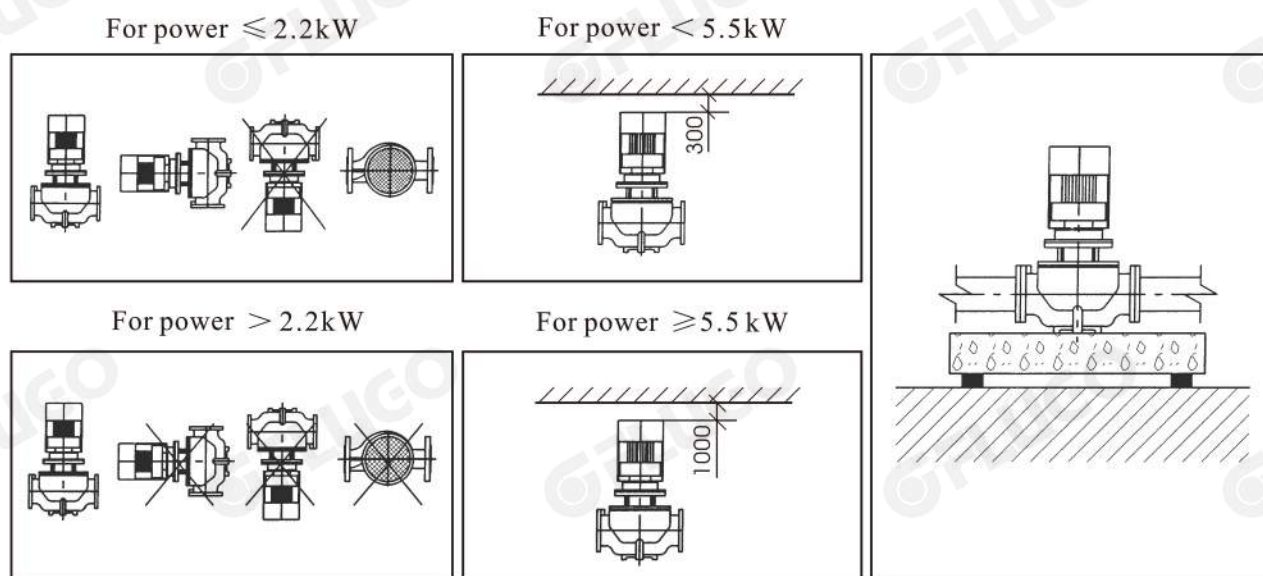


Figure 2-A

Figure 2-B

Figure 2-C

## Product Structure and Component Material

The design of the pump is pump and motor. Pump part can be pulled out. The TD 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 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.

See Table 3 for component materials.