Limited Warranty

Products manufactured by Walrus Pumps Co (Walrus) are warranted to the first user only to be free of defects in material and workmanship for a period of 12 months from date of installation, but no more than 24 months from date of shipment. Walrus' liability under this warranty shall be limited to repairing or replacing at our election, without charge, FOB Walrus' distribution center or authorized service agent. Walrus will not be liable for any cost of removal, installation, transportation or any other charges that may arise in connection with warranty claim.

The warranty period commences on the date of original purchase of the equipment. Proof of purchase and installation date, failure date, and supporting installation data must be provided when claiming repairs under warranty.

This warranty is subject to due compliance by the original purchaser with all directions and conditions set out in the installation and operating instructions. Failure to comply with these instructions, damage or breakdown caused by fair wear and tear, negligence, misuse, incorrect installation, inappropriate chemicals or additives in the water, inadequate protection against freezing, rain or other adverse weather conditions, corrosive or abrasive water, lightning or high voltage spikes or through unauthorized persons attempting repairs are not covered under warranty.

Walrus will not be liable for any incidental or consequential damages, losses, or expenses, arising from installation, use, or any other causes. There are no express or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above.

Certain states do not permit the exclusion or limitation of incidental or consequential damages or the placing of limitations on the duration of an implied warranty, therefore, the limitations or exclusions herein may not apply. This warranty sets forth specific legal rights and obligations, however, additional rights may exist, which may vary from state to state.

Supersedes all previous publications

WALRUS®

Walrus America Inc

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Web: www.walruspumps.com

C099C008U001-01

WALRUS®

TPHK Series
Immersible Pump
Instruction Manual

CE

C SP® US
234867

ISO 9001 Certified

Walrus America Inc

EC Declaration of Conformity

Manufacturer:

Walrus Pump Co., Ltd.

Address:

No. 83 -14, Dapiantou, Sanjhih Township, Taipei County 252, Taiwan

Declare that the machinery described:

Name : Water Pump

Model : TPHK Series

Conform to the following directive:

98/37/EC-----Machinery directive

2006/95/EC—Low voltage directive

89/336/EEC----EMC (Electromagnetic compatibility) directive

Refer to the following standards:

EN ISO 12100-1:2003	EN ISO 12100-2:2003
EN1050:1996	
EN60335-1:2001	EN 809:1998
EN60335-2-41:2001	
EN61000-6-2	EN61000-6-3

R&D department manager: Kao Tien-chuan

Manager: Kao Tien chuan

Please read this instruction manual carefully before installing your new system as failures caused by incorrect installation and operation are not cover by the warranty.

1. Application

1.1. The TPHK series is multi-stage centrifugal pump designed for industrial use, especially for machine tools.

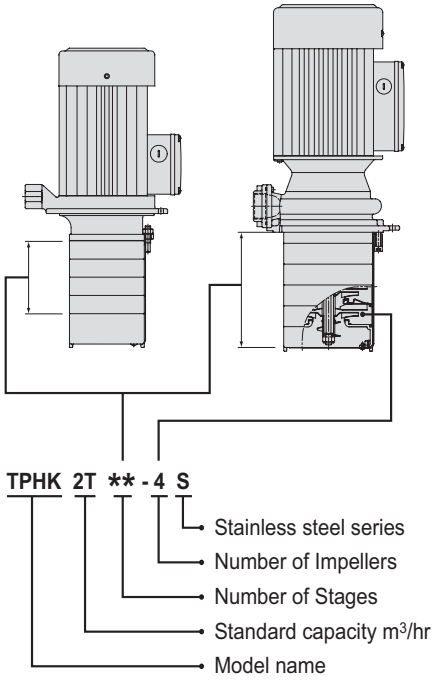
1.2 The pump can not be used to transfer explosive liquids; such as gasoline, diesel oil or similar liquids. It is suitable to carry liquids such as water, coolant, low viscosity or other non-corrosive liquids.

2. Product Code Designation

The standard range of pumps includes complete impeller in chamber combinations. Upon request, a special length can be supplied by fitting empty intermediate chambers instead of standard chambers with impellers. The pump nameplate indicates the number of chambers and impellers fitted to the pump.

3. Operating Limits

1. Ambient temperature : Max. 122°F (50°C)
2. Liquid temperature range : 32°F (0°C) to 194°F (90°C)
3. Flow: 10 GPM to 75 GMP
4. Head: 20ft to 280ft
5. Operating pressure :Max. 142 psi
6. Submerged depth :Min. 2.6"



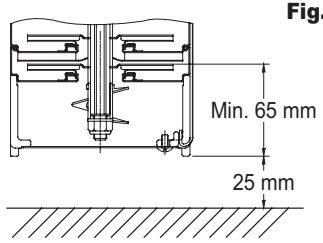
4. Installation

The pump has hot surface on the motor. It must be installed so that persons cannot accidentally come into contact the hot surface.

4.1. Submerged Depth

To avoid dry running and damage the pump during operation, the minimum pump submerged depth is 65mm (2½") as shown in Fig 1. In addition, the bottom of the pump suction inlet must be at least 25 mm (1") above the bottom of the tank.

Fig.1



5. Electrical Connection

5.1 The electrical connection should be carried out in accordance with local regulations. Never make any connections unless the electricity supply has been switched off.

5.2. The electrical hazard warning mark is placed outside the connection box. Be careful.

5.3. Electrical data (voltage and frequency) are shown on the pump nameplate. Verify if these data match your electricity supply. A circuit breaker should be installed and the grounding be properly connected for your safety.

5.4. Make electrical connection in accordance with connecting diagram located inside the connection box. The motor current must be within the rated amps range indicated on nameplate. Three phase motor requires a magnetic starter for safety.

5.5. For three phase motors, please check the correct direction of rotation of the pump on the motor fan cover. When seen from motor fan cover end, the pump should rotate clockwise. You can reverse the direction of rotation by interchanging any two of the incoming supply wires.

6. Start-up

Before starting the pump, make sure the following:

6.1. For three phase motors, verify if the rotating direction is correct. It should be clockwise viewing from the motor fan cover end.

6.2. All piping joints are completely tight. Leakage in piping may cause the pump hydraulic loss.

6.3. The pump is filled with liquid.

6.4. The suction filter is not blocked by any foreign objects.

7. Operation and Maintenance

It is dangerous to operate the pump against a closed discharge outlet because it will cause extremely high liquid flow temperature and damage the pump in a few minutes.

7.1. Lubrication

The mechanical seal and shaft sleeves are lubricated by the pumped liquid.

7.2. Suction filter

Always keep suction filter clean and make sure it is not blocked by impurities.

7.3. Periodic checks

The following checks should be carried out periodically to ensure the normal operation.

7.3.1. Check the quantity of liquid and operating pressure.

7.3.2. Check there are no leaks on piping joints.

7.3.3. Check the tripping of the motor starter.

7.3.4. Check that all controls are functioned normally.

7.4. The pump must not be used to transfer explosive liquids. In systems with hot liquids (over 140^{O}F), extra caution should be exercised to prevent from personal injury.

7.5. The pump should not be used to transfer toxic or contaminated liquids. Please carefully follow all instructions in the manual as Walrus may refuse to accept the contaminated pump for servicing.

8. Sound pressure level

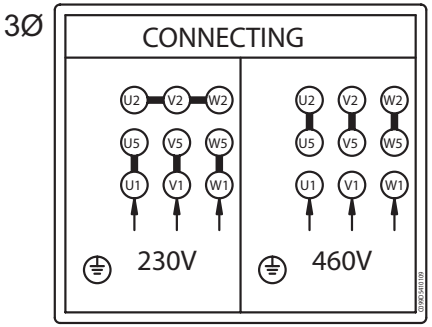
Model	dB(A)
TPHK2T ** - 1	<70
TPHK2T ** - 2	<70
TPHK2T ** - 3	<70
TPHK2T ** - 4	<70
TPHK2T ** - 5	<70
TPHK2T ** - 6	<70
TPHK2T ** - 7	<70

Model	dB(A)
TPHK4T ** - 1	<70
TPHK4T ** - 2	<70
TPHK4T ** - 3	<70
TPHK4T ** - 4	<70
TPHK4T ** - 5	<70
TPHK4T ** - 6	<70
TPHK4T ** - 7	<70

Model	dB(A)
TPHK8T ** - 2	72
TPHK8T ** - 3	72
TPHK8T ** - 4	76
TPHK8T ** - 5	76

Model	dB(A)
TPHK12T ** - 1	72
TPHK12T ** - 2	76

9. Wiring diagram

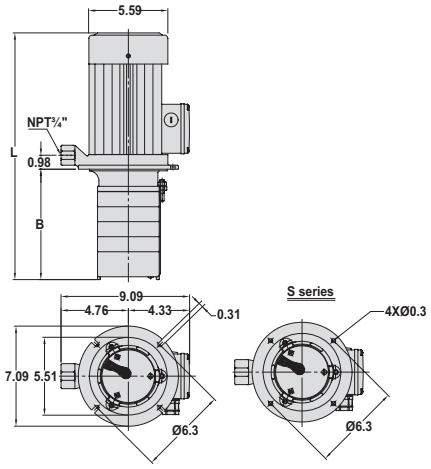


10. Fault Finding

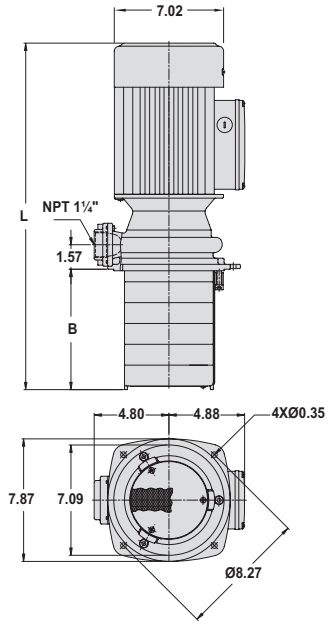
Make sure electricity supply has been switched off before attempting to diagnose any fault

Fault	Cause
10.1. Motor does not start	a. No electricity supply
	b. Fuses are blown.
	c. Motor overheating relay tripped.
	d. Defective magnetic contactors.
	e. Control circuit malfunction.
10.2. Motor cut out during operation.	a. Fuses blown or breakers tripped.
	b. Overheating relay tripped.
	c. Control circuit malfunction.
	d. Pump locked up by foreign objects.
10.3. Pumped capacity is not constant.	a. Pump impeller blocked by impurities.
	b. Insufficient liquid level in the tank. (See Sec. 4.1)
10.4. Pump runs but gives no liquid.	a. Suction filter blocked by impurities.
	b. Liquid level is too low (See Sec. 4.1)
	c. Incorrect rotating direction.

TPHK 2T/4T



TPHK 8T/12T



Dimensions and Weights

Model	B (in.)	L (in.)	N.W.(lbs)
TPHK 2T 3 -1	5.71	13.78	24.0
TPHK 2T 8 -1	9.25	17.32	26.2
TPHK 2T 3 -2	5.71	13.78	24.5
TPHK 2T 5 -2	7.13	15.20	25.4
TPHK 2T 9 -2	9.96	18.03	27.1
TPHK 2T 3 -3	5.71	13.78	24.7
TPHK 2T 4 -3	6.42	14.49	25.1
TPHK 2T 5 -3	7.13	15.20	25.6
TPHK 2T 6 -3	7.83	15.91	26.0
TPHK 2T 8 -3	9.25	17.32	26.9
TPHK 2T11-3	11.38	19.45	27.8
TPHK 2T 4 -4	6.42	14.49	25.4
TPHK 2T 6 -4	7.83	15.91	26.2
TPHK 2T 5 -5	7.13	16.77	28.0
TPHK 2T 6 -5	7.83	17.48	29.3
TPHK 2T 6 -6	7.83	17.80	29.8
TPHK 2T 8 -6	9.25	19.21	30.6
TPHK 2T 9 -6	9.96	19.92	31.1
TPHK 2T10-6	10.67	20.63	31.3
TPHK 2T11-6	11.38	21.34	31.7
TPHK 2T 7 -7	8.54	18.50	28.7
TPHK 4T 2 -1	5.71	13.78	23.8
TPHK 4T 3 -1	6.77	14.84	24.3
TPHK 4T 2 -2	5.71	13.78	24.3
TPHK 4T 3 -2	6.77	14.84	24.7
TPHK 4T 4 -2	7.83	15.91	25.1
TPHK 4T 6 -2	9.96	18.03	25.6
TPHK 4T 3 -3	6.77	16.42	25.8
TPHK 4T 4 -3	7.83	17.48	26.2
TPHK 4T 5 -3	8.90	18.54	26.7
TPHK 4T 6 -3	9.96	19.61	27.1
TPHK 4T 8 -3	12.09	21.73	28.0
TPHK 4T 4 -4	7.83	17.48	29.3
TPHK 4T 5 -4	8.90	18.54	29.8
TPHK 4T 6 -4	9.96	19.61	30.2
TPHK 4T 5 -5	8.90	18.54	30.6
TPHK 4T 8 -5	12.09	21.73	32.0
TPHK 4T 6 -6	9.96	19.92	31.1
TPHK 4T 8 -6	12.09	22.05	32.2
TPHK 4T 7 -7	11.02	20.98	32.2
TPHK 4T 8 -7	12.09	22.05	32.6
TPHK 8T 6 -2	7.83	22.36	52.9
TPHK 8T 9 -2	11.75	26.28	55.8
TPHK 8T 3 -3	3.76	18.29	50.7
TPHK 8T 6 -3	7.83	22.36	53.6
TPHK 8T 9 -3	11.75	26.28	56.4
TPHK 8T 4 -4	5.12	19.65	59.5
TPHK 8T 6 -4	7.83	22.36	61.7
TPHK 8T 5 -5	6.48	21.00	61.7
TPHK12T 6 -1	7.83	22.36	59.5
TPHK12T 6 -2	7.83	22.36	63.9
TPHK12T 9 -2	11.75	26.28	67.2