

# TP Series

## Installation, Operation & Maintenance Manual

**Project:** \_\_\_\_\_

**Installation:** \_\_\_\_\_

**Pump Model:** \_\_\_\_\_ **Serial Number:** \_\_\_\_\_

PN# TPIOM REV. 6/14

**HOMA Pump Technology, Inc.**  
390 Birmingham Boulevard • Ansonia, CT 06401

## GENERAL INSTRUCTIONS:

This manual is intended to provide basic installation and start-up guidance. It is to be read and thoroughly studied prior to attempting to install or operate any of the equipment supplied.

*Equipment damage, which occurs by not following these instructions will void the warranty.*

## SAFETY PRECAUTIONS:

*Only trained, qualified personnel shall be utilized for installation and start-up.*

The following is a general list of safety precautions that should be followed when installing, starting-up or servicing the pump.

**The pump station owner or operator is ultimately responsible for ensuring that all equipment is installed, started up and operated in a safe manner.**

- Do not work alone.
- Double check to make sure that all lifting equipment is in good working order and that it has adequate lifting capacity for the weight that it will handle.
- Wear safety helmet, goggles and protective shoes, or appropriate safety materials required.
- Before working on the pump make sure that the power is disconnected and cannot be energized by others. Lockout and tag the control panel circuit breaker.
- Do not stand under suspended loads!
- Never enter or work within a wet well without first checking to make sure sufficient oxygen is present and that there are no explosive or poisonous gases present.
- All personnel, who work with sewage pumping equipment and systems shall be vaccinated against diseases that can occur. If there are any questions or doubts in this area it is strongly suggested that the local health agency be contacted.
- For Hazardous Area Classifications, only use pumps with suitable Explosion Proof Rating.

## EQUIPMENT INVENTORY AND INSPECTION:

Upon arrival of pump shipment carefully unpack all components and compare with shipping and purchase order documents to ensure that the order is complete. Also inspect equipment for any damage that might have occurred in shipment. *If any problems are detected contact an authorized HOMA Pump Technology Representative immediately.*

## TRANSPORTATION AND STORAGE PROCEDURE:

Always lift the pump by its lifting bail or eye bolt. **Never lift the pump by its power cable!** Pumps should be stored in an upright position, taking extreme care to protect the power cable and control cables from crushing, nicks or tears which would permit water intrusion. Power cable ends must be protected from immersion in water as well as moisture intrusion. The cable will wick water into the pump if it is not protected properly. Power cable leads should be covered with shrink tubing or suitable sealing material during storage.

**Short Term Storage:** Short term storage is defined as any time less than six months. We recommend that pump and accessories be stored in its original shipping container in a dry, temperature controlled area. If climate controlled storage is not possible, all exposed parts should be inspected before storage and all surfaces that have the paint scratched, damaged or worn should be re-coated with air dry enamel paint. The pump should be stored in an upright position.

**Long Term Storage:** Any storage time exceeding six months is considered long term. In addition to the safeguards specified above, the impeller should be rotated once a month to prevent the mechanical seals from being damaged, and the pump should be inspected. The seal chamber oil should be drained and replaced prior to commissioning. The pump should be stored in an upright position.

## **ELECTRICAL INSTALLATION:**

### **GENERAL GUIDELINES**

All electrical work shall be carried out under the supervision of an authorized, licensed electrician.

**The present state adopted edition of the National Electrical Code as well as all local codes and regulations shall be complied with.**

### **VERIFICATION OF POWER SUPPLY**

Prior to making any electrical connections or applying power to the pump, compare the power supply available at the pump station to the data on the unit's nameplate. *Confirm that both voltage and phase match between pump and control panel.* The voltage supplied at the pump shall be +5 / -10% of the nameplate value, frequency shall be + / - 1% of the nameplate value, the voltage phase balance shall be within 1% and the maximum corrected power factor shall be 1.0.

**Voltage Change:** For instructions on changing the voltage of your stator, please consult the Technical Pages in the Downloads section of the HOMA website: [www.homapump.com](http://www.homapump.com).

### **POWER LEAD WIRING**

HOMA TP Series pumps may be provided with 1 or more cables, depending on motor horsepower and operating voltage. Power leads L1, L2, & L3 may be provided as single conductor, or as twin conductor. Twin conductor configuration may use leads from separate cables, or may use two conductors within one cable. Please refer to wiring diagram enclosed for specific connection details.

*The pump must be connected electrically through a motor starter with proper circuit breaker protection in order to validate warranty. Do not splice cables.*

### **THERMAL SWITCH WIRING :**

Pumps are equipped with thermal switches embedded in the stator windings which are normally closed, automatically resetting switches. Switches will open when the internal temperature rises above the design temperature, and will close when the temperature returns to normal. Some non explosion proof, single phase TP pumps have internally connected thermals which shut the pump down in the event of over temperature condition and do not require any external connection. Explosion proof pumps and pumps with 7 lead cable have thermal switches which must be wired into the over temperature circuit of the control panel.

**Note: All sizes of Class 1, Div. 1 pumps for hazardous service will have externally wired thermal switches. Thermal switch leads must be connected to a current regulated control circuit in accordance with NEC.**

*Thermal switch leads must be connected to validate warranty.*

Identify thermal switch leads marked T1 and T3 in the power or control cable. The resistance across these leads will be .5 Ohm. These leads must be connected to the thermal overload relay such as the HOMA Go switch seal fail / thermal relay (option) or other current regulated power supply / controller.

### **SEAL PROBE WIRING**

The mechanical seal leak detector probe utilized in the pump is a conductive probe which is normally open. The intrusion of water into the seal chamber completes the electrical circuit. Control panel provisions will sense this circuit closure, and will provide indication or alarm functions depending on the panel design. Either single or dual wire systems may be provided. Single wire systems utilize one energizing conductor, and the pump casing and neutral lead as the ground or return portion of the circuit. The dual wire systems utilize two separate conductors for each leg of the circuit. With either system, the seal probe leads must be wired into a control circuit provided in the control panel. This control circuit must energize the probe with a regulated power source, and sense the closed circuit in event of water intrusion. Indication and alarm functions must also be provided in the control circuit. Please see control panel wiring diagram (by others) for seal probe connection points. **IMPORTANT:** *For Hazardous Area Classification Pumps, leak detector circuit must be in conformance with applicable NEC codes and regulations.*

### **START / RUN CAPACITORS AND RELAYS:**

All single phase motors require start and/or run capacitors to operate. Refer to the enclosed wiring diagrams. *Capacitors and relays must be sized for the specific motor.* Capacitors are sized based on ideal conditions. The run capacitor may need to be resized to match the available field voltage. Each cap kit shipped is supplied with a wiring diagram and start up procedure.

## MECHANICAL INSTALLATION: PUMPS WITH AUTOCOUPLING SYSTEMS

The HOMA Auto-Coupling is a quick removal system used in keeping personnel from having to enter the wet well. The pump mounts on a stationary base and operates completely or partially submerged (minimum 8" over volute) in the pumping media.

The HOMA Auto-Coupling kit consists of a base elbow, guide claw flange, and upper guide rail bracket. The kit also includes a profile seal.

**TP Series** pumps with horizontal threaded discharge, attach the guide claw flange to the pump discharge flange as follows:

1. Inspect threaded assemblies for damage.
2. Clean threaded portions of pump discharge flange and guide claw flange and locate set screw location.
3. Install profile seal (if not already installed at factory) into the guide claw with large diameter fitted into groove inside of claw.
4. Apply pipe sealant to the threads of the discharge.

When installing the pump onto a larger auto-coupling an increaser bushing will be included with the pump. Use a thread locking compound such as blue #242. Apply thread locking compound to the discharge threads. Thread the bushing onto the discharge and tighten.

5. Thread guide claw flange on to pump discharge fully. **DISCHARGE THREADS ARE NOT NPT. DO NOT OVER TIGHTEN.**
6. Tighten guide claw flange until the claw is in upright (horizontal) position.
7. Apply thread locker to the set screw included with the guide claw and tighten set screw.

For flanged discharge pumps, attach the guide claw with the fasteners and gasket provided. Flanges are raised face type, improper tightening will damage the flanges. Tighten the bolts in a crosswise fashion evenly and in steps. Do not tighten one side and then the other or the flanges will break.

Do not over tighten the bolts or the flanges will break.

**For all pumps**, properly locate the base and, with suitably sized anchor bolts, fasten it to the floor of the pump station. Make sure when locating and securing the anchor bolts that the base will align properly with the access cover at the top elevation of the station. Level the base before completely tightening the anchor bolts. *If base is not level, proper sealing of the pump to base may not occur!*

Place the guide rail pipes (supplied by others), cut to length into the rings of the base. The rails will be secured at the top of the pump station with the upper guide bar bracket and to extend down to the sump floor.

*For stations exceeding 10 feet in depth intermediate guide bar brackets are recommended. One bracket is recommended for each additional 10 feet of station depth.*

Install the upper guide bar bracket to maintain vertical orientation of the guide rails. Do not tighten mounting bolts completely at this point. Check that the guide system is properly installed in the vertical orientation by using levels and a plumb line. Then tighten upper guide anchor bolts. Connect the station riser piping to the outlet flange of the base.

## INSTALLATION OF PUMPS WITH RING STANDS:

The ring stand design allows for simple, economical installation and can be transported from one installation to another.

For pump models without integral support feet, install the ring stand to the underside of the volute with the supplied fasteners. Apply a thread locking compound to threads before installing, such as blue #242 thread locking compound.

Install lifting chain or cable of adequate size and load rating of the unit. Allow for proper length to permit proper lowering and raising of the pump. Properly position power cables and lifting device over the load and keep them from entering the pump suction.

**Prior To Installation:**

Before lowering the pump into position check the direction of rotation. The impeller will rotate clockwise as viewed from the top. Therefore the pump will try to move in the counter clockwise direction as the impeller rotates (known as start reaction). "Bump the Motor" by closing the pump circuit breaker and push the pump start button and look for the direction of movement specified above. For three phase motors, if the starting jerk is in the clockwise direction, open the circuit breaker to isolate power and interchange two of the three phase leads inside the control panel.

**Make sure to use lifting equipment that has adequate capacity for the pump that will be handled.** Before installing pump, check to be certain the profile seal is properly positioned in the guide claw flange. Position pump so the guide ears on the discharge flange engage the rails. Slowly lower the pump along the guide rails, once the pump reaches its bottom location it will automatically connect to the base.

PUMP MODEL	Bolts Anchors	SIZE	TORQUE
2" TP SERIES AUTOCOUPLING	4	M12mm	37 ft/ #
2-21/2 " TP-SERIES AUTOCOUPLING	4	M12mm	37 ft/ #
3" TP-SERIES AUTOCOUPLING	4	M12mm	74 ft/#

Notes:

1. Flange bolts must be tightened in cross pattern to avoid damage to the raise face flanges.
2. Standard Anchors are Plated Steel

**START-UP**

**Prior To Applying Power**

Prior to applying power to the pump; double check all wiring and verify that the power (Voltage, Phase) that will be supplied to the unit matches the nameplate specified values. Measure resistance of cable and pump motor resistance of ground circuit between control panel and outside of pump. Perform MEG ohm check of motor insulation. Record all data on start-up checklist which is included with this manual.

**Minimum Submergence**

For optimal cooling, motor should be completely submerged at all times. In pump-down systems, level should not fall below one discharge diameter above the top of the volute. For continuous operation with a VFD, level should not be maintained below the top of the motor for sustained periods. For specific inquiries, please contact factory for assistance.

**Wet Well Applications**

If the above checks prove satisfactory the pump is ready for operation. Lower the pump into position. (Refer to Mechanical installation section of this manual.) Open discharge valve, and verify that all check valves operate freely. It is very common for discharge check valves to be jammed shut (or open) after sitting for a period of time. Once all valves are open and free, start the pump and allow it to stabilize for several minutes prior to recording any test data. Listen for any unusual noise and be on the lookout for unusual vibration. This is generally detectable on guide rails for Auto Coupling installations and on discharge piping for ring stand installations. Also for Auto Coupling installations, look for any blow by from the discharge connection. Perform all remaining electrical, operational, and performance tests specified on the start-up report at the back of this manual. Record and provide details on the checklist to validate warranty.

**NOTE: Do not install more than one (1) check valve into any pump discharge piping system or problems will occur.**

## Installation / Startup Troubleshooting:

*Only authorized service personnel who are trained professionals shall troubleshoot and repair pumps that are experiencing operational or performance difficulties.*

**All HOMA pumps are factory tested, yet startup difficulties can occur with any mechanical equipment. Please note that our technical support staff stands ready to assist you with any problem or difficulty you might encounter with our equipment.**

**The following is a tabulation of common start-up problems and possible causes.**

### Symptom

Possible Causes

#### Pump will not start

1, 2, 3, 4, 27, 29, 31, 32

#### Little or zero discharge

5, 6, 7, 8, 16, 30, 32

#### Insufficient discharge flow/pressure

5, 6, 9, 10, 11, 12, 26, 30

#### Excessive power consumption

6, 9, 13, 28, 30

#### Excessive current draw

6, 13, 14, 15, 19, 21, 26, 30

#### Excessive pump vibration/noise

5, 7, 9, 10, 12, 13, 15, 16, 17, 25, 26, 30, 31

#### Pump runs & motor protection trips

17, 18, 19, 20, 21, 28

#### Pump runs manually, but not automatically

22, 23, 24

#### Pump runs hot

7, 13, 18, 19, 25, 26, 28

## Listing of Possible Causes:

1. Incorrect or no power supplied to motor.
2. Power cable cut.
3. Short to ground in cable or motor winding.
4. Control panel circuit breaker open.
5. Actual system head is higher than calculated or specified.
6. Incorrect impeller rotation direction.
7. Sump liquid level is below pump's minimum submergence requirement.
8. Closed discharge valve or jammed check valve.
9. Wear ring(s) worn. (If Applicable).
10. Vortex at pump's suction.
11. Discharge valve partially closed.
12. Insufficient NPSHA (Dry Pit Application).
13. Actual system head is lower than specified resulting in over pumping condition.
14. Voltage supply to motor is lower than required by motor.
15. Damaged bearings.
16. High system head causing pump to operate at extremely reduced capacity.
17. Object stuck inside impeller.
18. Motor not receiving proper voltage on all three phases.
19. Phase/currents unbalanced or too high.
20. Insulation between phases and earth ground, <1M-ohm.
21. Density of the pumping media too high.
22. Defective level sensor.
23. Hand/Off/Auto switch not in Auto Position.
24. Defective H/O/A switch, relay or contactor coil.
25. Air Captured in Cooling Jacket.
26. Pump not properly seated on Auto Coupling.
27. Water intrusion through junction box.
28. Run capacitor size too large (1ph).
29. Start capacitor size too small (1ph).
30. Profile seal not sealing or missing.
31. VFD or Soft Start not functioning properly.
32. Start relay or capacitor damaged (1ph).

Please note that some possible causes may not relate to your particular model.

**If you need additional help, please contact your local distributor or e-mail [service@homapump.com](mailto:service@homapump.com)**

## **PREVENTIVE MAINTENANCE**

Regular preventive maintenance will help ensure longer pump life and more reliable operation. It is recommended that pumps in intermittent operation be inspected twice a year and pumps in continuous operation be inspected every 1,000 hours. The following is a listing of required inspection and maintenance items.

**If any of the problems described in the following list exists stop operating the pump to avoid damage or personal injury.**

### **1. CABLE ENTRY**

Make sure that the cable entry flange and strain relief clamp are tight. If the cable entry is showing signs of leakage remove cable from entry, remove grommet, cut a piece of cable off so that the grommet seats on a new portion of the cable, replace grommet, and reinstall cable assembly, into the top of the motor.

*Note: Explosion Proof cables are sealed with a Factory Mutual Approved potting compound. Please consult factory for instruction.*

### **2. CABLES**

Inspect the cable for cuts, scrapes or sharp bends. If the outer jacket is damaged, replace the cable. Do not attempt splices within wet wells.

### **3. MOTOR INSULATION RESISTANCE**

Megger the insulation between the phases and between any phase and ground. Resistance values should be greater than 1 M ohm. If abnormal readings are obtained, contact authorized service center immediately.

### **4. EXTERNAL PARTS ON PUMP**

Make sure that all screws, bolts and nuts are tight. Check the condition of pump lifting eyes and replace if damaged or worn. Replace any external part that appears worn or damaged.

### **5. SEAL CHAMBER OIL**

#### **Caution seal chamber may be pressurized**

*Note: Use extreme care when removing the seal chamber plug, as the chamber may become pressurized if seal failure has occurred.* Check the condition of the oil to see if any water leakage has occurred. Lay the pump on its side with the plug facing upward and remove the oil fill plug. Drain the oil from the seal chamber into a transparent container. Check for impurities and emulsification (oil is cream-like). If water intrusion has occurred check lower mechanical seal and replace if necessary. Refill seal chamber with fresh oil. Refer to shop manual for type and quantity of oil.

### **6. IMPELLER**

Periodically inspect impeller by turning pump on its side, remove suction strainer nuts and strainer to expose impeller and relocate position of adjusting plate (suction cover) as needed. Replace the impeller if it is damaged or worn.

### **7. PROFILE SEAL**

When pump is removed for any service, carefully inspect the profile seal for signs of damage or improper sealing. Be sure the contact patch is fully around seal face.

### **SPARE PARTS**

In order to obtain spare parts contact an authorized HOMA PUMP TECHNOLOGY representative with the parts required and the pump serial number. Authentic Homa Pump Technology parts shall be used to maintain warranty.

*Note: Explosion Proof pumps must be identified as such, and the pump serial number must be referenced for proper parts identification.*

### **RECOMMENDED TOOLS AND SUPPLIES**

In addition to ordinary, standard tools and lifting devices, ensure that complete set of metric Allen wrenches, dead blow hammer, impeller puller, Loctite 242 (Blue) thread locking compound, petroleum jelly and Anti-seize compound are on hand.

## PROFILE SEAL INSTALLATION

When installing a profile seal, one side of the seal has a larger diameter ridge on the outside edge. This side goes to the inside of the guide claw as seen below.



Press the seal into its seat starting on one side and work the rest of the seal into the same position. When finished, it should look as below.



When properly installed, the profile seal will stay in place when pulled straight outwards.

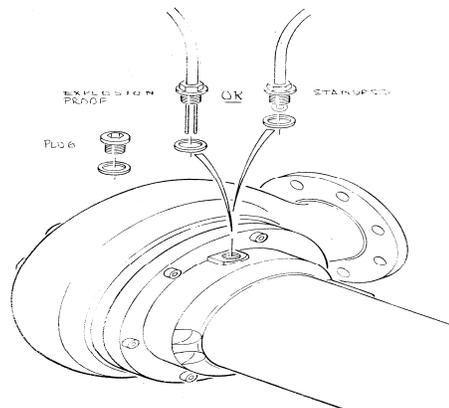
It is recommended that 3M Weather Stripping be applied to the surface touching the claw if possible for added adhesion.

**REMEMBER:** the larger diameter always goes to the inside.

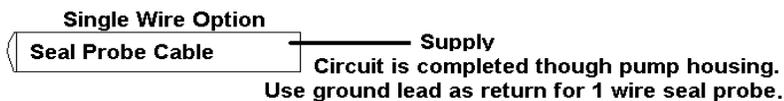
## SEAL PROBE INSTALLATION PROCEDURE

Mechanical Seal Leak Detection probe has been loose to protect from shipping damage. Please follow this procedure to install the probe.

- 1) Lay pump on its side with the plug on the seal chamber facing upwards as indicated.
- 2) Unscrew the plug with the proper wrench, taking care not to damage the sealing surface.
- 3) Verify that seal chamber oil level is within  $\frac{1}{4}$ " of the indicated value. Measurement is from oil level to the top of hole. See IOM Manual for seal chamber oil volume, if required.
- 4) Remove the new sealing gasket from package and install it onto the seal probe plug.
- 5) Install the seal probe with gasket into the opening, taking care not to damage the cable. Then tighten the seal probe with the proper wrench until snug. Do not overtighten. Once tight, verify the seal gasket is properly seated and the cable is not pinched or twisted. *NOTE: At installation of the seal probe be careful not to bind the seal probe cord as it is being installed into the pump.*
- 6) Lift pump into a vertical position and inspect for any leaks.
- 7) Secure seal probe cable to pump body and power cable with tyrapts before installing pump.



## External Seal Probe Connections



# TP Series

## Capacitor Sizing Chart

Model	Volts	Capacitor	Part #	Model	Volts	Capacitor	Part #
TP28	115V	80µf @ 370V	8856080	TP49/24	115V	80µf @ 370V	8856080
TP28	230V	25µf @ 370V	8856025	TP49/24	230V	25µf @ 370V	8856025
TP30/16	115V	80µf @ 370V	8856080	TP50-53/16	115V	80µf @ 370V	8856080
TP30/16	230V	20µf @ 370V	8856020	TP50-53/16	230V	20µf @ 370V	8856020
TP30/24	115V	80µf @ 370V	8856080	TP50-53/24	115V	80µf @ 370V	8856080
TP30/24	230V	25µf @ 370V	8856025	TP50-53/24	230V	25µf @ 370V	8856025

TP50-53/38/2/1 40µf @ 370V Run Capacitor - 80µf @ 330V Start Capacitor PN#8857010  
 TP50-53/54/2/1 50µf @ 370V Run Capacitor - 150µf @ 330V Start Capacitor PN#8857015  
 TP70/24/1 40µf @ 370V Run Capacitor - 80µf @ 330V Start Capacitor PN#8857010

Note: See Three Phase Wiring Diagram for Seal Probe wiring

## Single Phase Pump Start-Up Procedure

Run Capacitor sizing can vary depending on the incoming supply voltage provided. HOMA Single Phase pumps are provided with Start and Run Capacitor(s) sized for 220-230V under load. Frequently, the available line voltage is considerably different than indicated, and the Run capacitor(s) may need to be resized to match the available field voltage. The following procedure will allow you to verify proper operation of your single phase pump, and/or make necessary changes to your capacitors to correct for your power supply.

After verifying wiring is in accordance with your pump requirements, start pump and record the following readings from each of the (3) pump cable leads.

### Current under load:

U1 \_\_\_\_\_ Amps, > U2 \_\_\_\_\_ Amps, > Z2 \_\_\_\_\_ Amps  
 Should be (highest reading) (middle reading) (lowest reading)

Lead U1 (common) should have the highest current reading. Lead Z2 (start) should have the lowest reading.

If Z2 current draw is greater than the current draw of either U1 or U2, a smaller size Run capacitor (lower microfarad rating) is required to correct the condition. Example: If a 60 µf Run capacitor was supplied, change to a 50 µf Run capacitor and check current readings. Typically, only one step down in capacitor size is required, but in certain instances 2 steps may be required.

( ) The standard capacitor kit provided includes: \_\_\_\_\_µf start capacitor  
 \_\_\_\_\_µf run capacitor

( ) Additional run capacitors have been included for use in tuning the pump to match available line voltages for optimum performance.

\_\_\_\_\_µf run capacitor  
 \_\_\_\_\_µf run capacitor  
 \_\_\_\_\_µf run capacitor

This form is provided for your use in optimizing the performance and service life of your single phase pumps, and is applicable to most Capacitor Start and Run motors. Please contact our Technical Service Dept. @ (203)-736-8890 with any questions, additional information, or assistance.

## START-UP REPORT

To validate warranty, please answer the following questions during start-up as completely and as accurately as possible and mail this form to:

**HOMA PUMP TECHNOLOGY INC.  
390 BIRMINGHAM BOULEVARD  
ANSONIA, CT 06401  
ATTN: SERVICE MANAGER**

**Receipt of completed report will initiate operational warranty.  
Reports that are not returned can delay or void warranty.**

- 1.) Pump User's Name: \_\_\_\_\_  
Site Location: \_\_\_\_\_  
Site Contract: \_\_\_\_\_  
Unit Supplied By: \_\_\_\_\_
  
- 2.) HOMA Pumps Model \_\_\_\_\_ Serial No. \_\_\_\_\_  
Voltage \_\_\_\_\_ Phase \_\_\_\_\_ Hertz \_\_\_\_\_ Horsepower \_\_\_\_\_  
Method Used to Check Rotation (viewed from bottom) \_\_\_\_\_  
Does Impeller Turn Freely By Hand: YES \_\_\_\_\_ NO \_\_\_\_\_
  
- 3.) Condition of Equipment: EXCELLENT \_\_\_\_\_ GOOD \_\_\_\_\_ AVERAGE \_\_\_\_\_  
Condition of Cable Jacket : EXCELLENT \_\_\_\_\_ GOOD \_\_\_\_\_ AVERAGE \_\_\_\_\_  
Resistance of Cable and Pump Motor (measured at pump control)  
1 Phase: U1 – U2 \_\_\_\_\_ Ohms; U1 - Z2 \_\_\_\_\_ Ohms; U2 – Z2 \_\_\_\_\_ Ohms; T1 – T2 \_\_\_\_\_ Ohms  
3 Phase: U - V \_\_\_\_\_ Ohms; V - W \_\_\_\_\_ Ohms; U -W \_\_\_\_\_ Ohms, T1 – T2 \_\_\_\_\_ Ohms  
  
Resistance of Ground Circuit Between Control Panel and Outside of Pump \_\_\_\_\_ Ohms  
MEG Ohm Check of Insulation:  
U to Ground \_\_\_\_\_ V to Ground \_\_\_\_\_ W to Ground \_\_\_\_\_
  
- 4.) Condition of Equipment at Start-Up: Dry \_\_\_\_\_ Wet \_\_\_\_\_ Muddy \_\_\_\_\_  
Was Equipment Stored: \_\_\_\_\_ Length of Storage \_\_\_\_\_  
Describe Station Layout \_\_\_\_\_
  
- 5.) Liquid Level Controls: Model \_\_\_\_\_ Type \_\_\_\_\_  
Is Control Installed Away From Turbulence? \_\_\_\_\_  
Operation Check: ( IF FLOAT SWITCHES SUPPLIED).  
Tip lowest float (stop float), all pumps should remain off.  
Tip second float (and stop float), one pump comes on.  
Tip third float (and stop float), both pumps on (alarm on simplex).  
Tip fourth float (and stop float), high level alarm on (omit on simplex).
  
- 6.) Electrical Readings:  
**Single Phase:**  
Voltage Supply at Panel Line Connection, **Pump Off**, L1- L2 \_\_\_\_\_ L1-Ground \_\_\_\_\_ L2-Ground \_\_\_\_\_  
Voltage Supply at Panel Line Connection, **Pump On**, L1- L2 \_\_\_\_\_ L1-Ground \_\_\_\_\_ L2-Ground \_\_\_\_\_  
Amperage: Load Connection, **Pump On**, U1 \_\_\_\_\_ U2 \_\_\_\_\_ Z2 \_\_\_\_\_  
Resistance Across Thermal Switch leads T1-T2 \_\_\_\_\_ ohms  
  
**Three Phase:**  
Voltage Supply at Panel Line Connection, **Pump Off**, L1-L2 \_\_\_\_\_ L2-L3 \_\_\_\_\_ L3-L1 \_\_\_\_\_  
Voltage Supply at Panel Line Connection, **Pump On**, L1-L2 \_\_\_\_\_ L2-L3 \_\_\_\_\_ L3-L1 \_\_\_\_\_  
Amperage Load Connection, **Pump On**, L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_  
Resistance Across Thermal Switch leads T1-T2 \_\_\_\_\_ ohms

7.) Starting Devices

Are pumps being started DOL, or with Soft Start device. Indicate manufacturer of Soft Starter. \_\_\_\_\_  
Are any vibrations evident while pump is being controller by the soft starter? \_\_\_\_\_  
Are pumps being operated with VFD (Variable Frequency Drive)? \_\_\_\_\_  
Please indicate brand and model VFD: \_\_\_\_\_  
Are load reactors being used between VFD output and pump? \_\_\_\_\_ Please indicate size \_\_\_\_\_  
What ramp up and decel time is the VFD set for? Accel \_\_\_\_\_ seconds, Decel: \_\_\_\_\_ seconds  
What is the minimum frequency the pump can operate at in this system? \_\_\_\_\_ Hz. Is low speed limit set? \_\_\_\_\_

8.) Final Check:

Are Thermal Switches properly wired? \_\_\_\_\_ What Over-temperature Relay is being used? \_\_\_\_\_  
Is Pump Seated On Discharge Properly? \_\_\_\_\_ Check For Leaks? \_\_\_\_\_  
Do Check Valves Operate Properly? \_\_\_\_\_  
Flow: Does Station Appear To Operate At Proper Rate \_\_\_\_\_  
Vibration Level: Measured \_\_\_\_\_ Observed \_\_\_\_\_  
Has the cooling jacket been vented? \_\_\_\_\_ Is a permanent cooling jacket vent installed? \_\_\_\_\_

COMMENTS: \_\_\_\_\_

9.) Equipment Difficulties During Start-Up: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10.) I Certify this Report to be accurate.  
Authorized Homa Service Representative:

\_\_\_\_\_  
(Signature) Phone # \_\_\_\_\_

DATE \_\_\_\_\_

Pump Station Owner/ Operator

\_\_\_\_\_  
(Signature) Phone # \_\_\_\_\_

DATE \_\_\_\_\_

## Technical Details

The following is offered as a general guide to values and capacities commonly used.

Model	HP/poles	Resistance Readings (ohms)			Pump Weight Approx. (Lbs.)	
		230V		460V		
		1 Phase U1 - U2 / U1 - Z2	3 Phase * U-V-W	3 Phase * U-V-W		
TP28	0.9/1	<u>2.0</u>	<u>7.8</u>	<u>3.8</u>	<u>14.6</u>	<u>45 #</u>
TP30/50/53	1.6/2	<u>1.9</u>	<u>6.3</u>	<u>4.1</u>	<u>14.5</u>	<u>75 #</u>
TP30/49/50/53	2.4/2	<u>1.9</u>	<u>5.8</u>	<u>3.1</u>	<u>11.3</u>	<u>75 #</u>
TP50/53	2.3/4	<u>1.9</u>	<u>5.9</u>	<u>3.2</u>	<u>13.6</u>	<u>100 #</u>
TP50/53	3.8/2	<u>1.7</u>	<u>3.5</u>	<u>2.1</u>	<u>7.9</u>	<u>99 #</u>
TP50/53	3.5/4	<u>0.3</u>	<u>0.4</u>	<u>1.7</u>	<u>5.7</u>	<u>99 #</u>
TP50/53	5.4/2	<u>0.9</u>	<u>2.2</u>	<u>1.2</u>	<u>3.8</u>	<u>99 #</u>
TP70	2.2/4	<u>2.6</u>	<u>5.0</u>	<u>7.5</u>	<u>14.2</u>	<u>88 #</u>

\*Values should be as indicated between any 2 power leads.

Note: Resistance values include 30' cable, and should be within +/- 10% of above value.

Impeller Nuts	<u>10mm 13.6 Ft. Lbs.</u>	<u>12mm 45 Ft. Lbs.</u>
<u>Pump model:</u>	TP30/16	TP28
	TP30-49/24	TP50-53/23
	TP50-53/16	TP50-53/35
	TP50-53/24	TP50-53/38
	TP50-53/54	TP70

**Pump Rotation** Right hand (CW) looking down from top of motor, CCW looking at bottom of suction.

**Seal Probes:** TP pumps use a 12mm seal probe. Single wire probes are for non classified areas, and 2 wire probes are for Hazardous areas.

**Seal Chamber Oil: White Mineral Oil (Chevron Lubricating Oil FM 32, 46, 68)**

Seal Oil Volume			Minimum Distance between 2 pumps	
TP 30/49/50/53	1.6/2 & 2.4/2	<u>.01L (.3L FM)</u>	TP 28, 30	<u>6"</u>
TP 50/53	2.4/4 & 3.5/4	<u>1.2L</u>	TP 50/53	<u>8"</u>
TP 50/53	3.8/2 & 5.4/2	<u>1.2L</u>	TP 70	<u>6"</u>
TP 70		<u>.6L</u>		

**Note:** TP28 does not have a separate oil chamber, but does use .5L inside of the motor housing.

### Seal Oil Level

With pump lying on its side and oil port at 12:00, measure from the top of housing with gasket in place, to the oil level.

TP 30/49/50/53	1.6/2 & 2.4/2	1" from top of housing to oil level
TP 50/53	2.4/4 & 3.5/4	1 ½" from top of housing to oil level
TP 50/53	3.8/2 & 5.4/2	1 ½" from top of housing to oil level
TP 70		1 ½" from top of housing to oil level