

## Installation, Operation, Safety & Warranty Information

1. Gear pumps can produce high differential pressures that may cause system damage and expose personnel to hazards associated with an unintentional release of fluid. Exceeding design limits may cause pump to burst and may cause pump and/or motor to fail.
2. Pump-Head and motor & drive are designed to be operated together. Before any disassembly, disconnect power to motor and do not allow pump-head to be pressurized.
3. Do not pressurize or operate pump unless the pump/motor assembly contains a complete set of correctly installed fasteners in good condition. Each threaded hole must contain a fastener.
4. Do not operate pump/motor unless it is secured in its desired location.
5. Do not modify any part of pump/motor assembly. Modification may weaken pressure-containing parts and create hazards to personnel. Use only factory-authorized replacement or repair parts.
6. Do not allow pump to be subjected to an internal pressure approaching its burst pressure of 1500 psig at room temperature. Internal pressure (measured at either suction or discharge ports) should not exceed 500 psig (safety factor of 3.0). Specific codes, standards, operating practices and conditions may dictate a lower internal pressure (higher safety factor). Verify leak-tight installation of fluid connections prior to operation where leakage could be hazardous.
7. Do not exceed a fluid temperature of 350°F. Fluid temperatures above 100°F reduce the strength of pressure-containing parts. At 350°F pump burst pressure is 1000 psig.
8. The pump should not be used where the pumped fluid causes corrosion to metal pressure-containing parts or attacks the pump seals or plastic body. These conditions will cause a significant reduction in the ability of the pump to contain pressurized fluid and may cause hazardous leakage.

## Motor & Drive Assemblies

1. In normal operation electric motors may develop surface temperatures that will burn the skin.
2. Electric motors produce waste heat that must not be allowed to accumulate in the surrounding air. Unless otherwise specified, an electric motor will operate continuously without overheating at its published performance limit at an ambient (air) temperature not exceeding 40°C (104°F).
3. Electric motors are not liquid tight and should not be exposed to sprays, splashes, drips or immersion, nor should they be exposed to the weather.
4. Do not block motor ventilation openings (if present). Do not allow objects to enter motor openings.
5. Motor must be disconnected from power supply immediately if any condition prevents motor rotation.

## AC Motors

1. AC motors must be operated only from the power source(s) (voltage and frequency) specified on the motor nameplate.
2. Connect dual voltage motors to power source according to connection diagram on motor nameplate.
3. Thermally protected motors (see motor nameplate) automatically turn themselves off when winding temperature exceeds allowable limits; however, motor will restart without warning when winding temperature drops, unless power source is disconnected from motor. Thermal overload protection must not be relied upon to control motor under any but abnormal or unexpected conditions.

## Brush-Type Permanent Magnet DC Motors (PMDC) - Including AC/DC Series - Wound Universal Motors

1. PMDC motors are designed to operate over a range of speeds by varying the input voltage; unless otherwise specified, a PMDC motor may be operated at input voltage in the range specified by the motor rating (see nameplate).
2. Regardless of input voltage, motor current may exceed the motor rating only for intermittent duty applications. Operation with excessive motor current may result in motor overheating.
3. Continuous duty current limits for PMDC motors are based upon a power supply form factor of 1.0 (ripple free).
4. PMDC motors are not thermally protected (motor will not automatically turn itself off when overheated).

## Brushless DC (BLDC) Motors

1. BLDC motors are designed to operate over a range of speeds by varying the input voltage; do not operate motor beyond input voltage range of motor (see nameplate).
2. Regardless of input voltage, motor current must never exceed the value specified for the motor; even momentary operation with excessive motor current may cause permanent damage to motor.
3. Power supply ripple and noise (peak-to-peak) must never exceed 10% of the input voltage supplied; otherwise, permanent damage to motor will result.

## Installation

- **Pump Installation & Plumbing** - Locate the pump as close and below the liquid source as possible. Suction and Discharge lines should be as large as the pump ports and as short as possible. If long suction runs are required, use larger tubing. Avoid any restrictions; valves, elbows or sharp turns whenever possible to avoid loss of flow or performance.
- **Fitting Installation** - Apply a paste-type thread sealant or Teflon® tape (two wraps maximum) no more than 3 threads from the end of the fitting before assembling to pump ports. Tighten fittings no more than 5 total turns and no more than 2 turns beyond finger-tight, whichever is less. Take care not to damage or misalign the pump-head when installing the fittings. Hold the pump-head, not the motor, to resist the wrenching torque.
- **Filters** - On the suction side a filter of 25 microns or less is desirable. If the system is closed loop recirculating the filter may be placed on the discharge side. The smallest micron filter should be used without restricting flow or performance.

## Operation

### Magnetic Coupling

Magnetic coupling makes the “zero leak” feature possible. It also offers protection from damage caused by excessive pressures or foreign particles wedged in the gear teeth. Decoupling occurs when the two magnets are forced out of pole-to-pole alignment.

- If the pump decouples, the motor will continue to operate at no load speed but the gears in the pump will stop rotating.
- To recouple, stop the motor completely and restart.
- If decoupling persists, check system for excessive pump pressure. If problem persists, the pump will have to be disassembled, check for foreign particles wedged in the gear teeth. Disassemble and clean parts thoroughly following repair procedure. After reassembly, rotate motor fan (Pump and motor should rotate freely with no magnet rub or internal friction).
- Operating pressure – The differential pressure across the pump should be set well below the decoupling pressure (See catalog for decoupling pressures). This will prevent inadvertent decoupling caused by transient pressure surges.

### Internal Bypass

Adjustment may be made while the pump is operating. With a screwdriver the bypass pressure is adjusted higher by turning the adjusting screw clockwise, and lowered by turning counter-clockwise. Bypass pressure should be set below normal decoupling pressure and above the operating pressure. See catalog for factory set bypass pressure. (Some models not available with internal bypass.)

## Self-Priming

Tuthill pumps are capable of self-priming, make certain the gears are “wetted” with the pumping fluid.

## Running Dry

Dry running will cause permanent damage; make certain there is fluid in the pump while in operation.

## Running in Reverse

The inherent design of these gear pumps require that the pump be run in clockwise rotation. Intermittent reverse rotation for purging may be acceptable. Continuous reverse rotation (counter-clockwise) is not recommended and premature failure will occur.

## Product Warranty

Tuthill Pump Group warrants its products against defective material and workmanship for one year from date of shipment from its Alsip plant. This warranty does not include products damaged by wear, tampering, improper installation, or abuse. Nor does it cover consequential damages or other losses due to pump failure.

Due to the unpredictable nature of the fluids process pumps encounter, pumps are not warranted for any specific life.

## Important Information

For your protection, please read and observe the following instructions. Transportation companies assume all liability from the time of shipment is received by them until the time it is delivered to the consumer. Our liability ceases at the time of shipment. All shipments leaving our plant have been carefully inspected. If a shipment arrives with the crating or packaging damaged, have the carrier note the condition on the receipt. Check as soon as possible for concealed damage. If it is found that the shipment has been damaged in transit, please Do Not return to us, but notify and file a claim with the carrier at once.

FAILURE TO FOLLOW THIS PROCEDURE WILL RESULT IN THE REFUSAL BY THE CARRIER TO HONOR ANY CLAIMS WITH A CONSEQUENT LOSS TO THE CONSUMER.

If UPS or Parcel Post has been damaged, retain the damaged material and notify us at once. We will file a claim. Goods may not be returned for credit unless authorized by our sales department.