

Balcrank[®]

IMPULSE METERS

Oil Inventory Control

Models:

| | |
|-------------------|-----------------|
| Liter | 3120-005 |
| Pint | 3120-006 |
| Quart | 3120-007 |
| Gallon | 3120-008 |
| Coolant-Qt | 3120-016 |



OPERATION, INSTALLATION, MAINTENANCE AND REPAIR GUIDE

Thoroughly read and understand this manual before installing, operating or servicing this equipment.

General Safety

Thoroughly read and understand this manual before installing, operating or servicing this equipment.

Terms:

- NOTE: Gives more explanation of a procedure, or a helpful hint.



CAUTION: Alerts user to avoid or correct a condition which may or could cause damage and/or destroy the equipment.



WARNING: Alerts user to avoid or correct conditions which could cause bodily injury.

Always - read and follow the fluid and solvent manufacturers's recommendations regarding the use of protective eye wear, clothing, gloves and other personal equipment.

Never - exceed the maximum working pressure of the meter, or the pressure of the lowest rated component of the system.

Never - alter or modify any part or parts of the Director; doing so could cause it to malfunction causing bodily injury and/or property damage.



WARNING: This product uses electrical energy and requires proper handling at all times. Do not attempt to open or remove the Protective Shroud, or make any adjustments not specified in the instructions.



WARNING: Pressure Relief Valve #3120-019 or 3120-020 is required in your system, This valve will protect the system from possible over pressure damage due to fluid thermal expansion. Excess fluid pressure, above 850 PSI (59 bar) is relieved; relief overflow is directed back to the supply container to reduce the risk of serious bodily injury.

NOTE: Flush all fluid supply lines before connecting Impulse meters, solenoid valves and filters. This will prevent system blockage from foreign materials left in lines during installation.

THREE VERY IMPORTANT THINGS TO REMEMBER:

1. All fluid lines must be clean and free of debris, which could clog solenoid valves or internal screens in control handles and/or meters causing poor system flow rates.
2. The system must be wired properly. Balcrank recommends having a licensed electrician do all wiring. Wiring of the impulse meter must meet or exceed local codes.
3. A pressure relief kit is required on all Balcrank supply systems. *The lack of installing a pressure relief kit will void all product warranties.*



CAUTION: Before servicing reduce fluid supply pressure to zero.

Pressure Relief Procedures:

To reduce the risk of serious bodily injury, including fluid injection or splashing into the eyes and/or onto the skin, follow this procedure below before maintaining and/or repairing the solenoid and/or impulse meter or any part of your system.

1. Disconnect the power source from the pump.
2. Open the dispensing valve into an approved waste container to relieve pressure on the system.
3. Leave any bleed-type drain valves open until you are ready to use the system again.



WARNING

DANGER: Not for use with fluids that have a flash point below 100°F (38°C). Examples: gasoline, alcohol. Sparking could result in an explosion which could result in death.

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Technical Data

| | |
|--------------------------------------|----------|
| Flow (Maximum)..... | 4.0 gpm |
| Flow (Minimum)..... | 0.4 gpm |
| Operating Pressure (Maximum)..... | 1000 psi |
| Operating Temperature (Maximum)..... | 150°F |
| Accuracy..... | +0.65% |
| Weight..... | 3.3 lbs. |
| Inlet and Outlet Ports..... | 1/2" npt |
| Pulses per unit of measure..... | 10 |

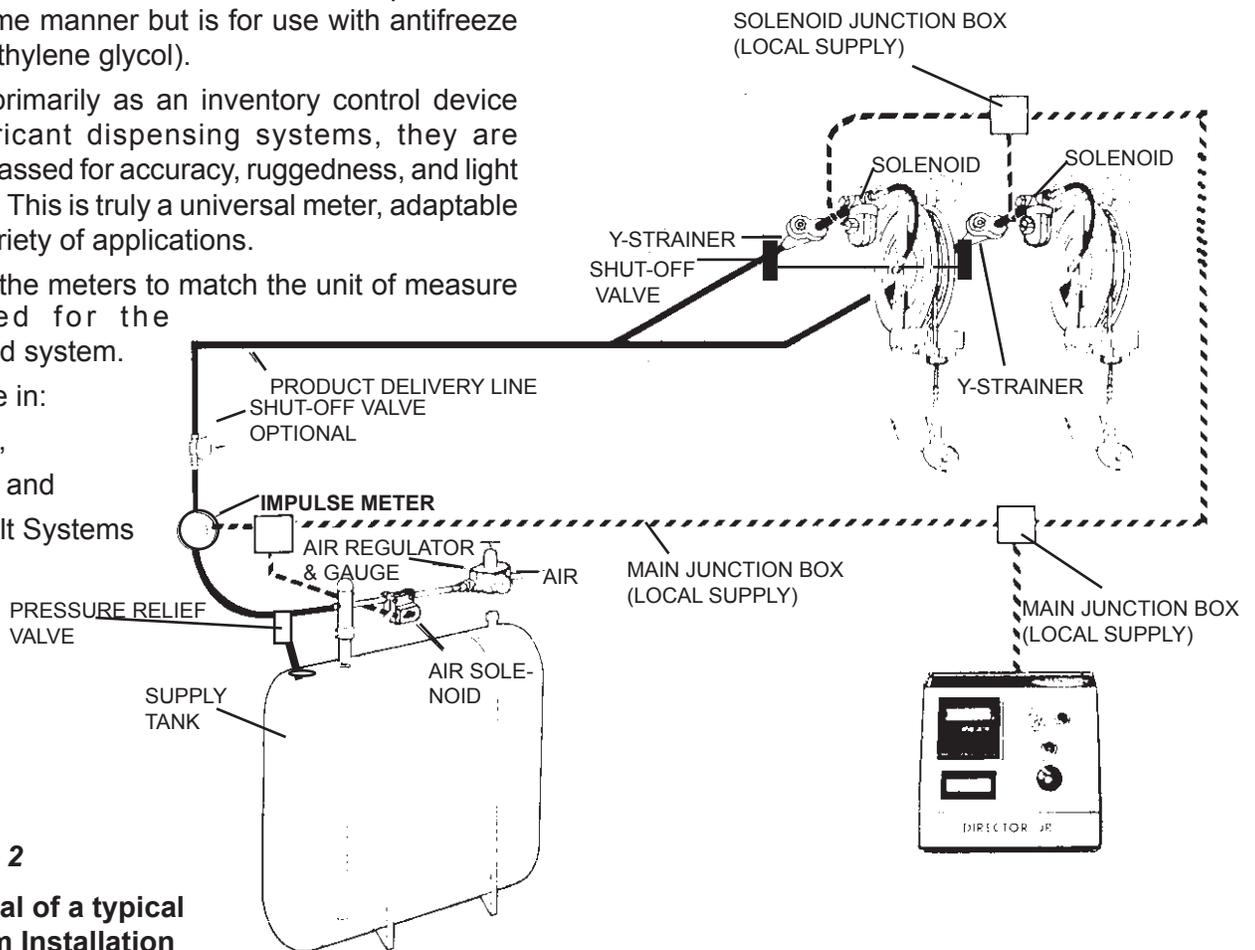
Product Description:

The Impulse Meter utilizes an oscillating piston for measurement that converts fluid movement into pulse count signal proportional to flow of SAE 5 through 50 motor oils, SAE 80 through 240 gear oils. The model 3120-016 operates in the same manner but is for use with antifreeze fluid (ethylene glycol).

Used primarily as an inventory control device in lubricant dispensing systems, they are unsurpassed for accuracy, ruggedness, and light weight. This is truly a universal meter, adaptable to a variety of applications.

Select the meters to match the unit of measure desired for the installed system.

For use in:
 12 Volt,
 24 Volt and
 120 Volt Systems



CAUTION: The meter housing was not intended to tolerate large side loads. When correctly done, mounting on solid piping removes all external loads on the meter leaving the housing to deal with only the hydrostatic loads from the pump. This is the best way to install this meter.

Figure 2
Pictorial of a typical System Installation

Installation

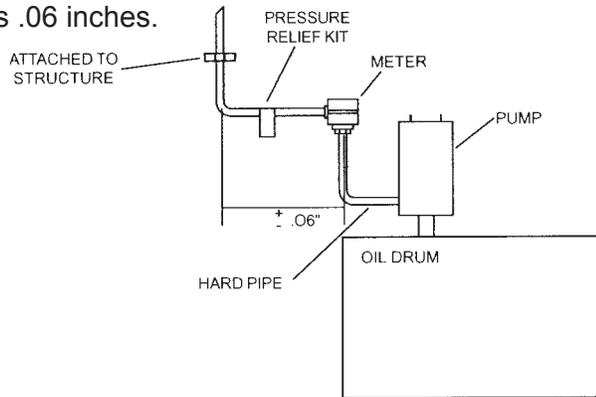
MOUNTING IMPULSE METER:

Plumbing - Our experience has shown that the design of today's lube systems can put undue stress on pulse style meters. The use of flexible lines, which ease installation problems, can also shorten the life of the meter if not installed properly.

The design of the universal meter housing was not intended to tolerate large side loads and was designed to be installed using solid piping. When correctly done, solid mounting will remove any external loads on the meter. Solid piping is still the best way to install the meter.

With the increase use of flexible lines for one or both connections we feel it is important to expand our recommendations on the various ways available to install the meter. The following is a listing of various recommendations:

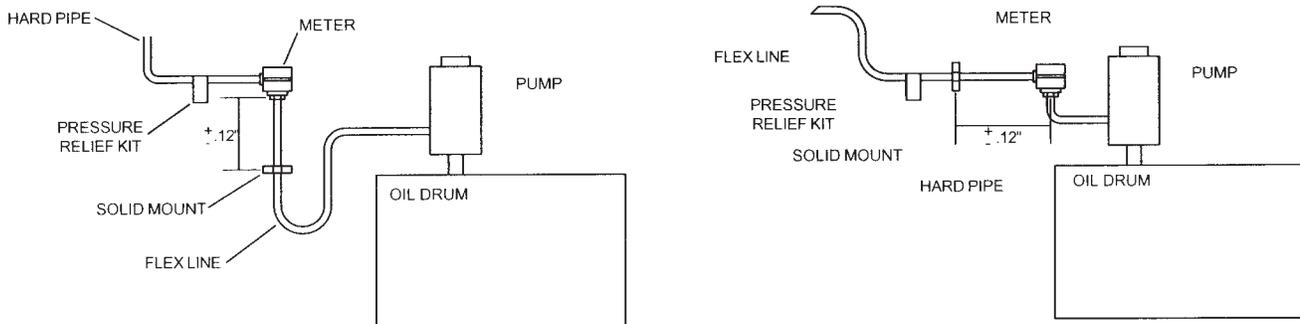
- 1. Hard Piping;** The preferred method for installing this meter. The plumbing must be correctly aligned to within plus or minus .06 inches.



- 2. Combination Hard and Flex Line;** In this case, either the inlet or the outlet can be hard plumbed with a single flex line connecting the meter to either the pump or system manifold. This seems to be the most popular way to install this meter and is acceptable if done correctly.

It is important that the flexible hose not be allowed to put any bending load onto meter housing. As a curved flexible hose is pressurized it tries to straighten out. This motion will be resisted by whatever the hose is attached to and will generally include a meter. The plumbing of any flexible line must take this motion into consideration.

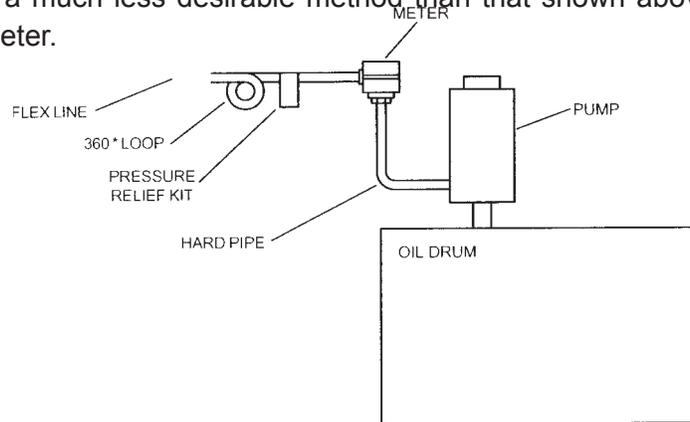
The best way to accommodate this loading is to solidly mount the hose to a structural part of the system near the meter. The portion of the hose between this mounting and the meter should be straight and no longer than 12". Any bends in this area will translate to a side force on the meter housing as it is pressurized. Beyond the fixed section, the hose can be bent or looped in whatever fashion is necessary.



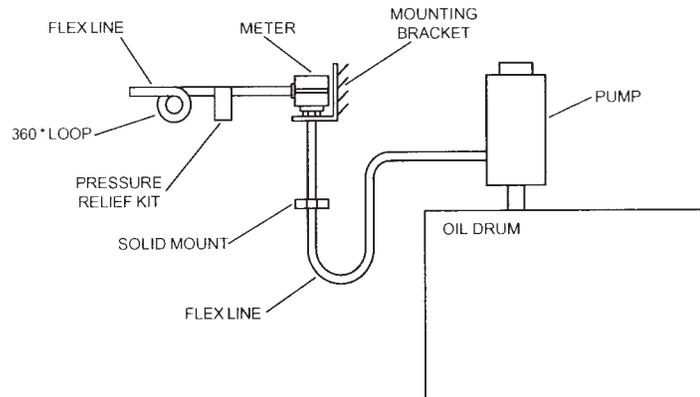
Installation

MOUNTING IMPULSE METER:

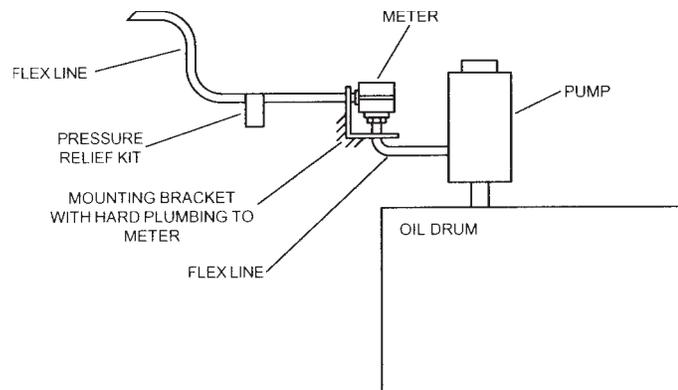
If it is impossible to solidly mount the flex line near the meter, the hose should be made long enough that a complete 360 degree loop can be put between the meter and the solidly mounted end of the hose. This is a much less desirable method than that shown above, but it will offer some protection to the meter.



- 3. Total Flexible Hose Mount;** Occasionally, a meter is mounted using a flexible line on both ports. Presumably, in order to do this the meter must be attached to a panel or wall to somehow support its weight. If this is the case, the flexible lines must be supported or looped in exactly the same manner described in example #2 Combination Mounting.



- 4. Bracket Mount;** It is possible that some applications are plumbing this meter by using a bracket to receive the bending loads caused by the flexible lines. If done correctly, this is comparable to the *Solid Mount* described above and an excellent way to deal with the problem.



MAINTENANCE:

To Inspect and/or Replace Cam; Remove plastic cover, pull up on cam to see if it is loose, tighten if necessary. Inspect cam for damage or wear. Loosen setscrew and replace with new cam if damaged. Adjust micro-switch and install cover.

NOTE: The micro-switch is normally open, the switch must close each time its roller rides over cam lobes.

To check for a Faulty Micro-Switch, push switch roller arm in all the way and use an ohmmeter or other suitable instrument on soldered terminals of switch to see if closed. If not closed, remove switch and install new switch and adjust.

To Adjust Micro-Switch, loosen cam wheel setscrew and rotate cam until switch roller rests on top of a lobe and use an ohmmeter to see if switch is closed. If not closed, loosen switch mounting screws, move switch in until it closes. Rotate cam wheel until roller rests on cam between two lobes, check switch with ohmmeter again to see if switch is open. Tighten switch mounting screws and replace plastic cover.

NOTE: Be careful not to bend micro-switch roller arm. If roller arm becomes bent replace complete micro-switch.

To clean the internal screen and fluid piston assembly, proceed as follows:

1. Stop pump, dispense fluid at a station supplied by this pump to relieve line pressure, close gate valve downstream of meter and disconnect power supply from Director Module.
2. Disconnect fluid hose from meter and meter from pump.
3. Remove plastic shroud from meter body and place meter body securely in a vise. Unscrew housing cap and carefully remove o-ring packing by using a small standard screwdriver

4. Remove internal screen, chamber housing and gear train assembly, insert small standard screwdriver into notch on side of chamber housing, pry off top and remove inner parts.
5. Clean all parts, including meter housing, thoroughly in solvent and blow dry. Inspect all parts for wear and/or damage and replace if pitting and/or scoring is present.

NOTE: Be careful not to damage cam wheel or electrical switch, or get solvent in switch when servicing fluid piston.

6. To assemble, insert piston into chamber housing bottom so the divider plate is centered in slot of piston and slot in housing bottom. Place top of housing chamber so that slot on underside fits over divider plate, the two pieces will snap together. Turn gear train assembly so the notch in large disk falls into notch in chamber housing.
7. Place chamber assembly with gear train first, into meter housing and turning it to be sure gears mesh properly with spindle gear. When properly engaged, meter spindle will turn as chamber and piston assembly turns.
8. Insert inlet screen and place o-ring packing against screen to form seal for housing cap. Screw cap tightly (30-40 ft-lbs) into meter housing and reinstall meter.
9. Start pump and dispense fluid to test meter and system operation. Repeat system start-up steps to purge air from system.

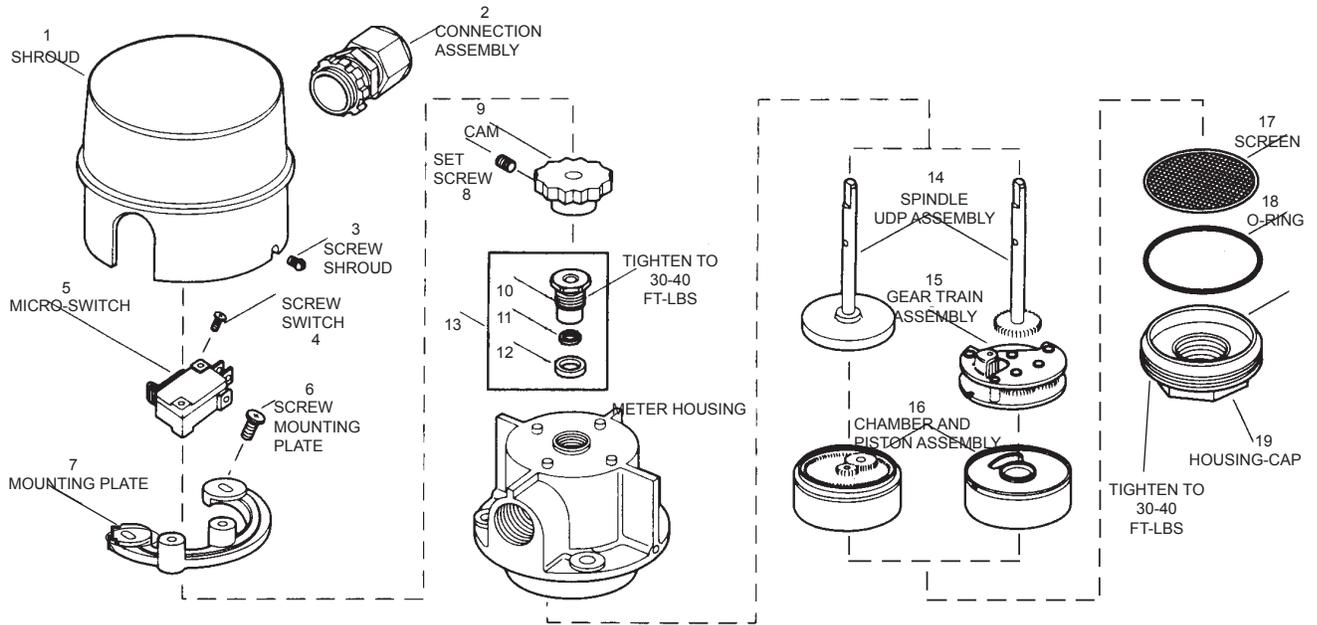


Figure 9 Impulse Meter Assembly

| ITEM | DESCRIPTION | UNITS PER CAM REVOLUTION | | | |
|------|-----------------------------|--------------------------|--------------|--------------|--------------|
| | | 1 PINT | 1 QUART | 1 LITER | 1 GALLON |
| 1 | Shroud | 825501 | 825501 | 825501 | 825501 |
| 2 | Connection Assembly | 825502 | 825502 | 825502 | 825502 |
| 3 | Screw - Shroud | 820753 | 820753 | 820753 | 820753 |
| 4 | Screw - Switch | 825503 | 825503 | 825503 | 825503 |
| 5 | Switch | 825504 | 825504 | 825504 | 825504 |
| 6 | Screw - Mounting Plate | 820753 | 820753 | 820753 | 820753 |
| 7 | Mounting Plate | 825506 | 825506 | 825506 | 825506 |
| 8 | Set Screw - Cam | 825507 | 825507 | 825507 | 825507 |
| 9 | Cam - 10 Lobe | 825508 | 825508 | 825508 | 825508 |
| 10 | Nut - Packing Gland | Kit - 800145 | Kit - 800145 | Kit - 800145 | Kit - 800145 |
| 11 | O-Ring - Buna-N | Kit - 800145 | Kit - 800145 | Kit - 800145 | Kit - 800145 |
| 12 | Washer - Buna-N | Kit - 800145 | Kit - 800145 | Kit - 800145 | Kit - 800145 |
| 13 | Packing Gland "Kit" | 800145 | 800145 | 800145 | 800145 |
| 14 | Spindle - UDP Assembly | 820747 | 820747 | 820747 | 825509 |
| 15 | Gear Train Assembly | 820718 | 800112 | 825510 | ----- |
| 16 | Chamber and Piston Assembly | 825511 | 825511 | 825512 | 825512 |
| 17 | Screen | 825514 | 825514 | 825514 | 825514 |
| 18 | O-Ring - Buna-N | 820754 | 820754 | 820754 | 820754 |
| 19 | Flanged Housing Cap - NPT | 825515 | 825515 | 825515 | 825515 |

Balcrank Lubrication Equipment Warranty Statement

All Balcrank equipment sold by authorized Balcrank distributors is warranted to their original customer to be free from defects in materials and workmanship for a period of one year from the date of sale to that customer. Selected Balcrank equipment carries warranty terms for a more extended period as defined in the Balcrank Lubrication Equipment & Accessories User Price List, wherein a "lifetime" warranty represents a warranty period of thirty years. Within the initial one-year warranty period, Balcrank will repair or replace all Balcrank equipment determined by Balcrank to have defective materials or workmanship. For equipment carrying more extended warranties, Balcrank will repair or replace the product including parts and labor during the first full year and will provide parts only for the remainder of the warranty period.

This warranty applies only to equipment installed and operated according to applicable Balcrank Service Bulletins and Installation Instructions.

Any equipment claimed to be defective must be returned, freight prepaid, to an Authorized Balcrank Service Center (ASC). Upon receiving candidate warranty equipment from a customer, ASC will: 1) diagnose to determine the warrantable condition of the equipment, 2) submit, prior to repair or replacement, a request to Balcrank for warranty authorization, then 3) in cooperation with Balcrank, proceed with repair locally or forward the equipment to Balcrank and obtain replacement. If the part(s) or equipment items are found defective upon inspection by Balcrank, they will be repaired or replaced, and then will be returned to the ASC. If Balcrank finds the claimed part(s) or equipment not to be defective, the ASC will receive written authorization from the original customer, and then repair them for a reasonable charge to the customer, which will include all applicable parts, labor, and return transportation costs.

Optionally, the customer may submit certain eligible products directly to Balcrank for warranty return by using Balcrank Lubrication Equipment Direct Service Warranty Procedure. Eligible products are defined in the Balcrank Lubrication Equipment & Accessories User Price List. Refer to the Balcrank web site www.balcrank.com for a copy.

Any equipment returned to Balcrank must have the Warranty Service Claim number (WSC#) clearly marked on the outside of the carton. Balcrank's sole responsibility is for defects in material and workmanship, and Buyer's sole and exclusive remedy hereunder, shall be limited to repair or replacement of the defective part or equipment.

This warranty does not cover, nor shall Balcrank be liable for repair or replacement of parts or equipment resulting from general wear and tear through use, or damage or failure caused by improper installation, abuse, misapplication, abrasion, corrosion, insufficient or improper maintenance, negligence, accident, alteration, or substitution of non-Balcrank parts.

Furthermore, the Warranty for Lubrication Equipment and Accessories does not cover the following specific conditions:

- Failure or damage to equipment caused by dirt or debris in compressed air lines and fluid lines. This includes, but is not limited to, clogged inlet filters, strainers, or regulators; fluid meters; control handles; fluid tips; and valves.
- Failure of normal wear parts including but not limited to: o-rings, packings, seals and valves unless originally improperly installed by the factory.
- Products placed in applications for which their use was not intended. Examples include but are not limited to Lubricant pump being used to pump solvents, or placing equipment intended strictly for indoor use outdoors
- Damage to equipment resulting from operation above and beyond Balcrank's recommendations.
- Leaks at air and fluid fittings and connections.
- Damage caused by thermal expansion whenever adequate pressure relief was not included in the system.
- Loose suction tubes on pumps.
- Incorrect hose reel spring tension, requiring adjustment.

THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL BALCRANK BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, OR OTHER DAMAGES OF SIMILAR NATURE, INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOST PRODUCTION, PROPERTY DAMAGE, PERSONAL INJURY, WHETHER SUFFERED BY BUYER OR ANY THIRD PARTY, IRRESPECTIVE OF WHETHER CLAIMS OR ACTIONS, LEGAL OR EQUITABLE, FOR SUCH DAMAGES ARE BASED UPON CONTRACTS, WARRANTY, NEGLIGENCE, STRICT LIABILITY, OR OTHERWISE. ANY CLAIM OR ACTION FOR BREACH OF WARRANTY MUST BE BROUGHT WITHIN TWO (2) YEARS FROM THE DATE OF SALE TO THE ORIGINAL CUSTOMER.

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