Oil storage station

Standard model

Instructions for use

For your records	
Write the model and serial numbers here	
(You can find them on the Serial/	
Model No. Plate mounted at the rear of	
your system on a lower tank frame rail.)	
Model no.	
Serial no.	
Supplier name	
Date purchased	

Read this manual
Inside you will find important information on how to use and maintain your bulk system.

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Original instructions

Explanation of symbols used

This manual contains some common symbols and indications to alert you to specific areas of importance.

Warning:
A situation that, if not avoided, could result in severe property damage, equipment damage, severe injury, or even death. Failure to follow this warning will void your product warranty.

Caution:
A situation that, if not avoided, could result in property damage, equipment damage, or injury. Failure to follow this caution will void your product warranty.

Important:
This text will be used before text that has been designated as important to the proper installation, operation, or maintenance of your system. Failure to read and understand this text may result in improper installation, operation, or maintenance procedures and may void your warranty.

Tip:
This text will be used to highlight text that is helpful in the installation, operation, and maintenance of your system.

Note:
This text will be used to highlight text that is important to read in order to fully understand the terms and procedures used in this manual.

Safety recommendations

- The Oil storage station is designed for the storage of machinery lubricating oils and other non-volatile fluids.
- Storage of fluids with a flashpoint below 65,5 °C (150 °F) is strictly prohibited.
- Components within this system consist of materials that may not be compatible with your fluid. Always consult your supplier and refer to the fluid manufacturer's Material Safety Data Sheet ("MSDS") before introducing a fluid to this system.

Warning:

- Always ensure the main power supply is first locked out and the system depressurized before any service is performed on this system.
- Never connect or disconnect lines or change filter elements or undertake any service work when this system is running or energized. Severe injury or death may occur.

Caution:

- System operating pressure should never exceed 2 MPa (300 PSI). Operating pressures can be regulated by adjusting pump bypass relief valves located on pump heads to suit specific lubricant viscosities and temperatures.

Important:

- Always refer to this manual or consult your supplier for more information.

- Always ensure that you wear appropriate personal protective equipment ("PPE") when operating this system.
- Always ensure that all system hoses, filters and fittings are securely fastened and in good working condition.
- The tank isolation valves (located on the underside of each tank) must be in the open position when operating the system and in the closed position when servicing the system.
- Always ensure that the system pressure return hoses (discharging to the upper port on the rear face of each tank) are never restricted or damaged.

- The bulk tanks must always be vented to atmosphere (preferably utilizing a desiccant air breather).
- When filling bulk tanks from drums or barrels always ensure the grounding cable is connected to the drum or barrel before starting the pump.
- Always ensure the system is appropriately grounded to earth utilizing the grounding jacks provided at the rear base of the system, together with relevant grounding equipment as specified and installed by your authorized electrical personnel in accordance with your local and federal regulations and safety procedures.
- Ambient room temperature where the system is installed should be in the range of 15 °C (60 °F) to 26 °C (80 °F) with optimum room temperature being 21 °C (70 °F). For ambient temperatures below 15 °C (60 °F) consult the manufacturer or your supplier for the supply of electric blanket heaters for oil barrels, pails and bulk tanks to ensure stability of lubricant viscosity, condition and system performance.
  Temperatures less than 15 °C (< 60 °F) can result in lubricant viscosity increasing above the rated ISO Code you specified at the time of order. Such adverse viscosity changes can cause higher system operating pressures than those set at the factory.
  System operating pressure should never exceed 2 MPa (300 PSI) as this can cause a gasket failure on the spin-on filter resulting in a high pressure oil leak. Normal system operating pressure should be less than 1,65 MPa (240 PSI).
  Operating pressures above 1,65 MPa (240 PSI) will necessitate adjustment of the pump pressure relief bypass valve located on the pump head. Contact the manufacturer for more information prior to commissioning the system if the ambient room temperature will ever fall below 15 °C (60 °F).

Warning:

- Failure to follow system installation, safety and operating instructions may result in severe injury or death, damage to plant and equipment and void warranties.

1. Introduction

The system was designed to store and dispense bulk lubricants in the workplace.

The system was designed with quality in mind and is fully modular. The interchangeable series of tanks, frames, pumps, filters, and storage modules have been customized for your application. The installation, operation, and maintenance instructions in this document will provide you with all the information you will need for the lifetime of your system.

The system was specially configured per your specification. It features up to four standard tank sizes mixed and matched to your specifications, and color-coding to prevent cross-contamination and misapplication of fluids. Your system was designed to store and dispense lubricants up to iso 680 (if specified at the time of order).

Throughout this document, we will be referring to each individual frame set (that houses a set of tanks, motors, pumps, spill pan, faucets etc.) as a "Tank pod" (or "Pod-1" in the event you have purchased more than one pod).

Each tank pod can contain many different varieties of tanks including:

- One - 908 litre (240 US gal) tank
- Two - 454 litre (120 US gal) tanks
- Four - 246 litre (65 US gal) tanks (configuration shown in this manual)
- Eight - 113 litre (30 US gal) tanks
- Any combination of these tanks can be configured for your system as desired and any number of pods can be purchased to accommodate the total number of tanks required to meet your applications.

Each dispensing pod can contain up to **4** dispensing faucets.

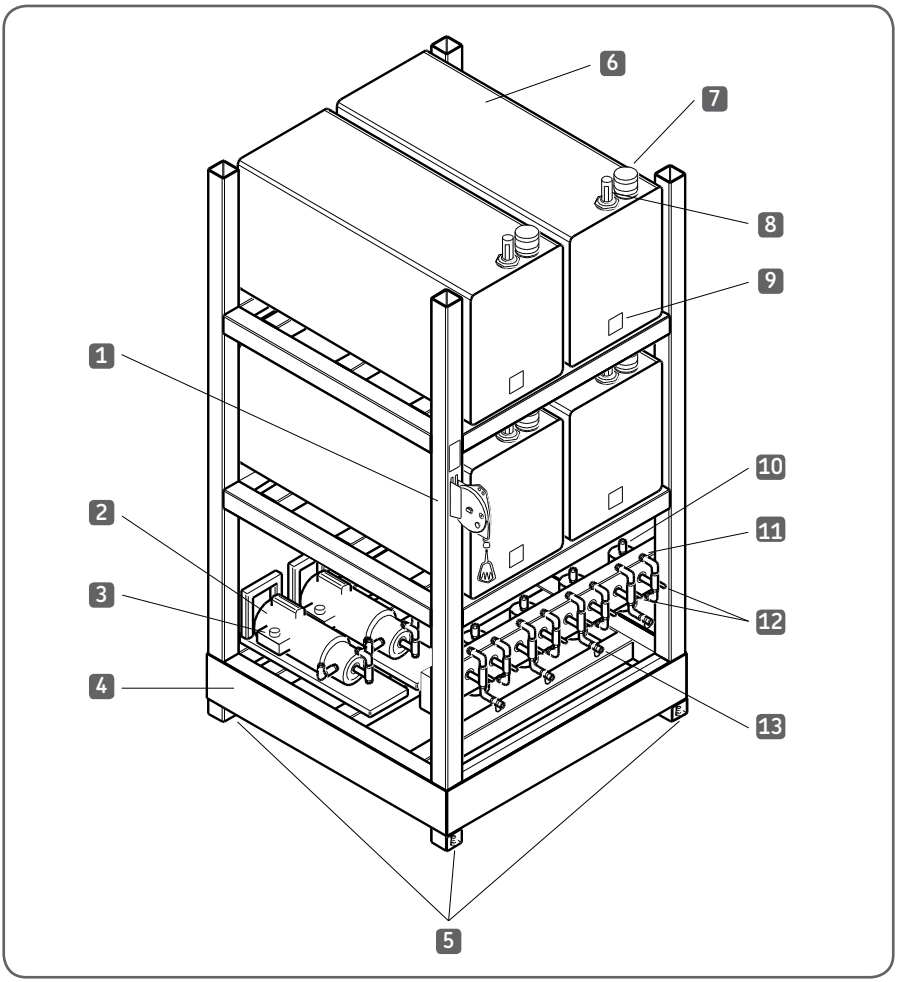


Fig 1 Tank pod (Pod-1)

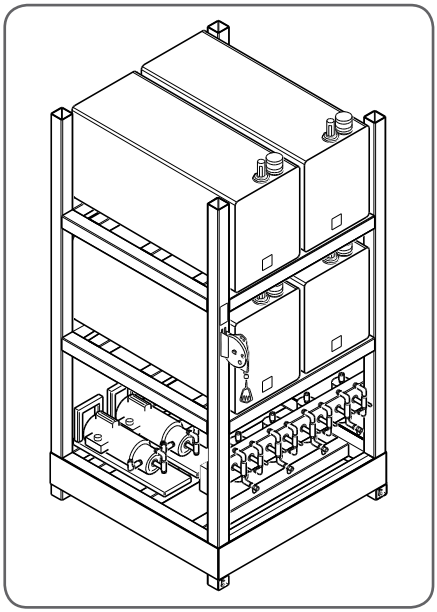
1.	Static discharge grounding reel	8.	Fluid level gauge
2.	Motor	9.	Tank designation label
3.	Motor power in	10.	Filter assembly (spin-on filter attaches behind operating valve manifold)
4.	Spill tray	11.	Fluid outlet to despensing faucet/reel
5.	Leveling bolts	12.	Fluid operating valve handles
6.	Tank	13.	Fluid inlet suction port
7.	Desiccant air breather		

2. Parts and pre-installation check list

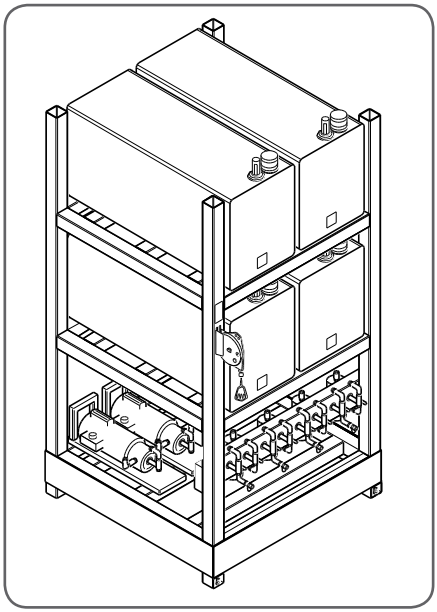
Important:
Check packaging list to ensure you have all applicable parts before continuing.
Contact your supplier if it appears that any parts are missing or damaged.
Refer to the specification sheet for your customized system for detailed system information including electrical requirements, and total weight of system.

Each system section is referred to as a “Pod” in this manual. Check that you have received the appropriate number of pods for your order. The only installation and assembly required after delivery is the placing of the pods, and connecting the pods together.

Note:
For this manual, the tank pod/s will each be shown with four 246 litre (65 US gal) bulk tanks.



Pod-1 – Tank pod



Pod-2 – Tank pod

Fig 2 Pod designations

Each bulk tank has its own piping system designed to keep fluids segregated.

2.1 Bulk tank system

- Bulk tank (113, 246, 454, 908 litre / 30, 65, 120, 240 US gal tank, color-coded per order specifications, pre-installed)
- Motor/pump (pre-installed)
- Dispensing faucet
  (standard style comes with colorcoded ball knob, fire upgrade comes as a brass valve)
- Spin-on filter
- Fluid level gauge
- Desiccant air breather air filter
- Suction hose assembly
- System pressure gauge
- Isolation valve (located on underside of tank)

2.2 Optional equipment

- Fluid level gauge overfill alarm

2.3 Static discharge grounding reel

Static discharge grounding reels are used to ground static charges on service equipment during the transfer of combustible fuel and other flammable liquids. The static discharge grounding reels supplied with your OSS system are spring operated automatic retrieve reels containing standard steel aircraft cable.

The reel is compact in design, for convenient mounting to your OSS tank frame and provides a light, constant spring tension on the grounding cable, keeping the cable from becoming tangled.

The reels are constructed of steel and are equipped with a 100-ampere ground clamp and rubber covered bumper. An instant-acting lock and release provides operator convenience. Care must be taken when reeling the cable back onto the reel. Do not let go of the cable – walk it back towards the reel, keeping tension on the cable at all times.

The cable stop assembly may be adjusted to any position. The mechanical locking device works positively at all times and in any position, regardless of the cable retraction speed. The lock engages at the desired position by pulling the cable approximately $^1/_2$ inch. The lock release knob completely disengages the lock to constant tension. Care should be taken to mount the reel on the front face of the OSS tank frame where threaded holes have been provided.

For full installation instruction, see page 23.
For instructions for use, see page 29.

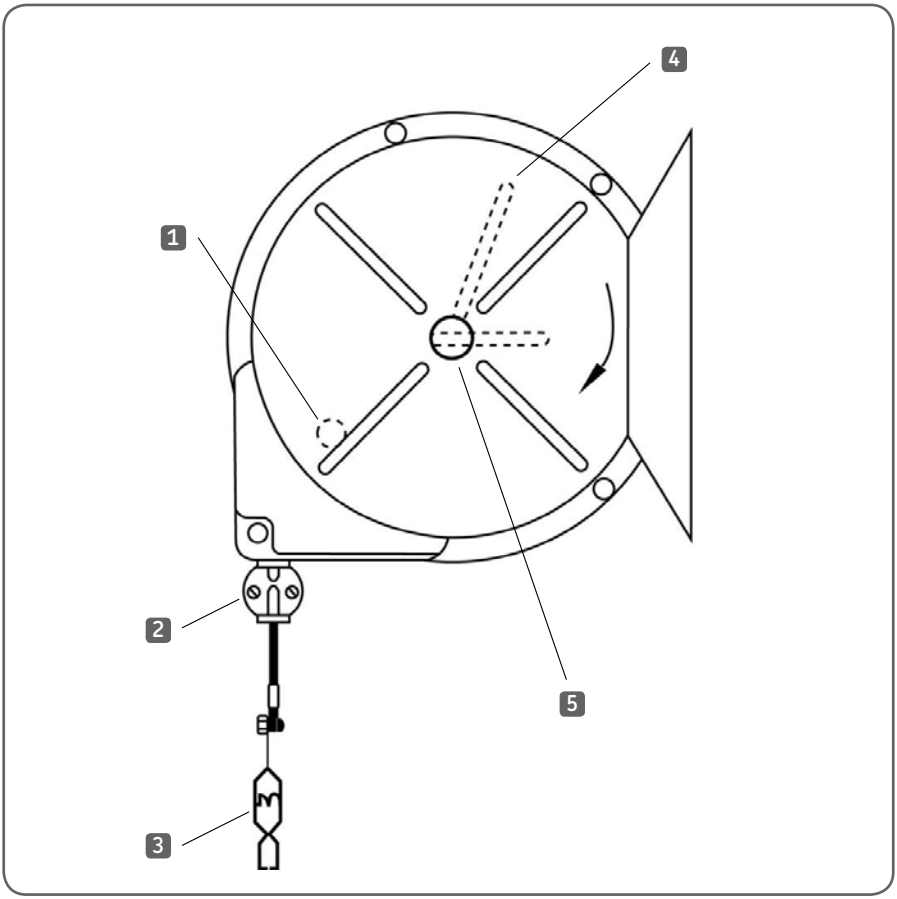


Fig 3 Static discharge grounding reel

1.	Lock release knob	4.	Tension lock spring
2.	Cable stop assembly	5.	Mainspring shaft
3.	Static discharge clip		

3. Installation and set-up

3.1 Tools, materials, and personnel requirements

- A minimum of two people are recommended to complete this install
- Electrical hook-ups and installation should be completed by your authorized electrical personnel in accordance with all local and federal laws and regulations
- A hand pallet truck is required to move each pod into position
- 1-1/2" Wrench for connecting spill pallets
- 3/4" Wrench for system leveling/jacking bolts
- 2-3/8" Wrench to tighten fluid level gauge
- Spin-on filter wrench
- Personal protective equipment ("PPE") should be worn when installing and operating this system

3.2 Determine placement:

1. The system should be installed indoors on a flat, level surface with sufficient load-bearing capacity to support the total system weight. (see specification sheet and data table on page 60).

2. Each electrical motor requires a separate power outlet. See your specification sheet (or system supply quotation) for electrical requirement details. Give consideration to whether more than one pump could be running at the same time, in which case it is recommended that each power outlet be wired with independent circuits. Consult with an authorized and trained electrician.

3. Before beginning installation, determine where your system will be installed and ensure sufficient power outlets have been installed at the rear of the system, positioned behind where the motors will be located. Each power outlet should be equally spaced along the wall and be placed approximately 12" up from floor level.

☞ **Important:**

- It is important to note the effect of the ambient temperature in which the system is placed for operation. System room temperature should be in the range of 15 °C (60 °F) to 26 °C (80 °F) with optimum room temperature being 21 °C (70 °F). For ambient temperatures below 15 °C (60 °F) consult the manufacturer or your supplier for the supply of electric blanket heaters for oil barrels, pails and bulk tanks to ensure stability of lubricant viscosity, condition and system performance.
- Temperatures less than 15 °C (< 60 °F) can result in lubricant viscosity increasing above the rated ISO Code you specified at the time of order. Such adverse viscosity changes can cause higher system operating pressures than those set at the factory.
- System operating pressure should never exceed 2 MPa (300 PSI) as this can cause a gasket failure on the spin-on filter resulting in a high pressure oil leak. Normal system operating pressure should be less than 1,65 MPa (240 PSI). Operating pressures above 1,65 MPa (240 PSI) will necessitate adjustment of the pump pressure relief bypass valve located on the pump head.
- Contact the manufacturer for more information prior to commissioning the system if the ambient room temperature will ever fall below 15 °C (60 °F).

3.3 Installation and set-up

Caution:
Personal protective equipment ("PPE") should be worn when installing and operating this system.

Caution:
System operating pressure should never exceed 2 MPa (300 PSI). System operating pressures can be regulated by adjusting pump bypass relief valves located on pump heads to suit specific lubricant viscosities and temperatures.

Caution:
System should not be operated in a location with an ambient room temperature less than 15 °C (< 60 °F).
Contact the manufacturer for more information relating to service in cold environments.

Step 1
The system is delivered pre-assembled, packaged, and marked "Pod-1", "Pod-2" etc. depending on the specific customized system. This will indicate the respective pod's position within the system from left to right, when viewed from the front.

Step 2
Locate Pod-1 and remove and appropriately dispose of the freight packaging.

Step 3
Using a suitable hand pallet truck, position Pod-1 into its service position, ensuring that there is **at least** 46 cm (18 in.) of free clear space at the rear and 46 cm (18 in.) either end of the system.
This will enable personnel to access the system for service work. See figure 4.

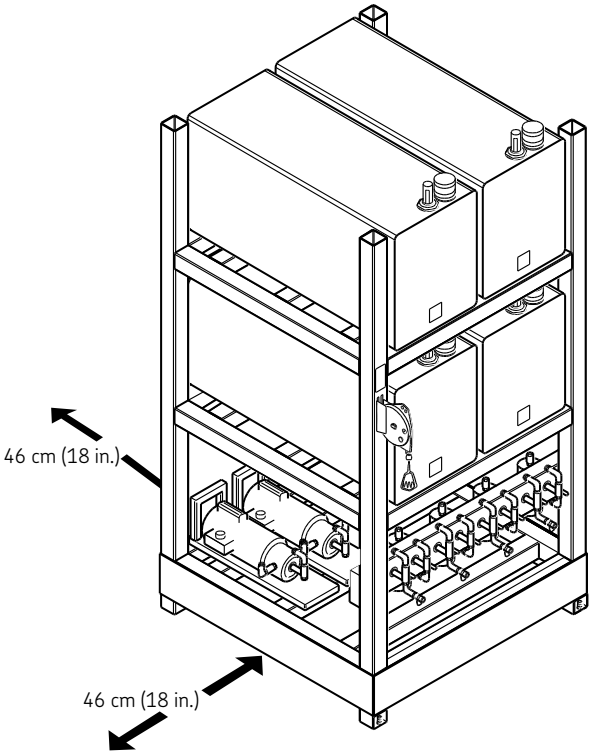


Fig 4 Minimum clearance requirements

Step 4
Using a level and the provided jacking bolts in the base frame, adjust the pod until it is level from front to back, side to side, and top to bottom.
Check to ensure it is square to any adjacent rear or side walls.

Step 5
Locate Pod-2 and remove and appropriately dispose of the freight packaging.

Step 6
Using a suitable hand pallet truck, position Pod-2 to the right of Pod-1 so that the spill transport pallets are square and flush next to one another. See figure 5 and figure 6.

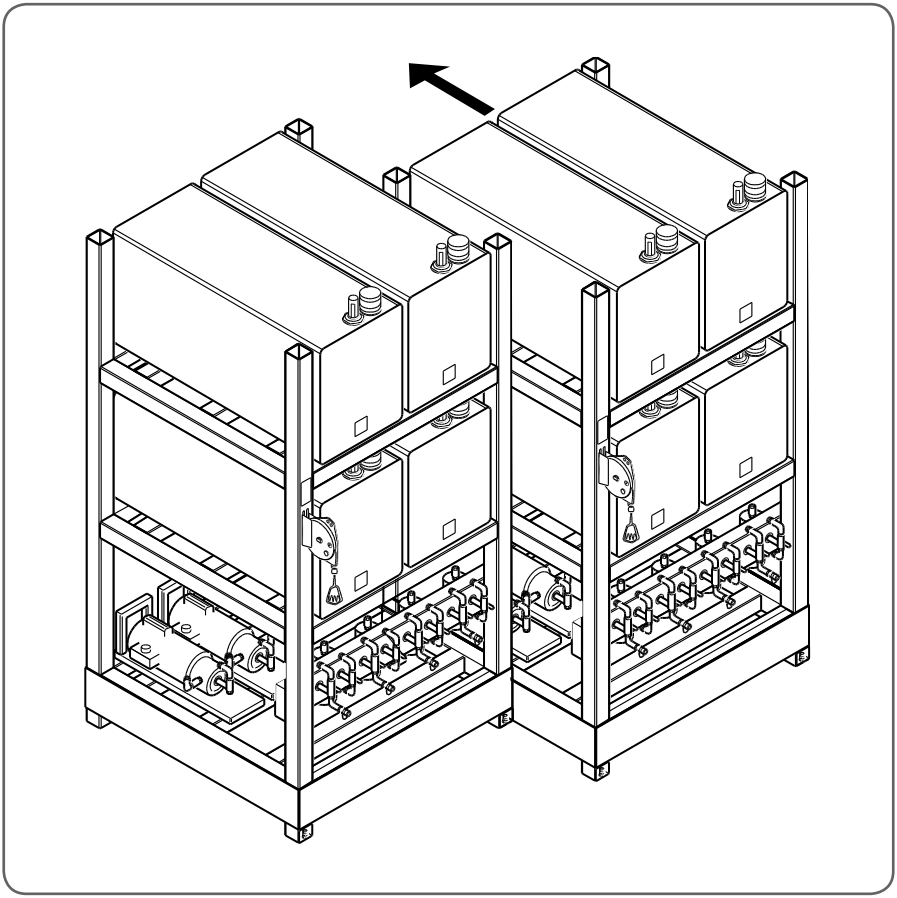


Fig 5 Pod-2 placement

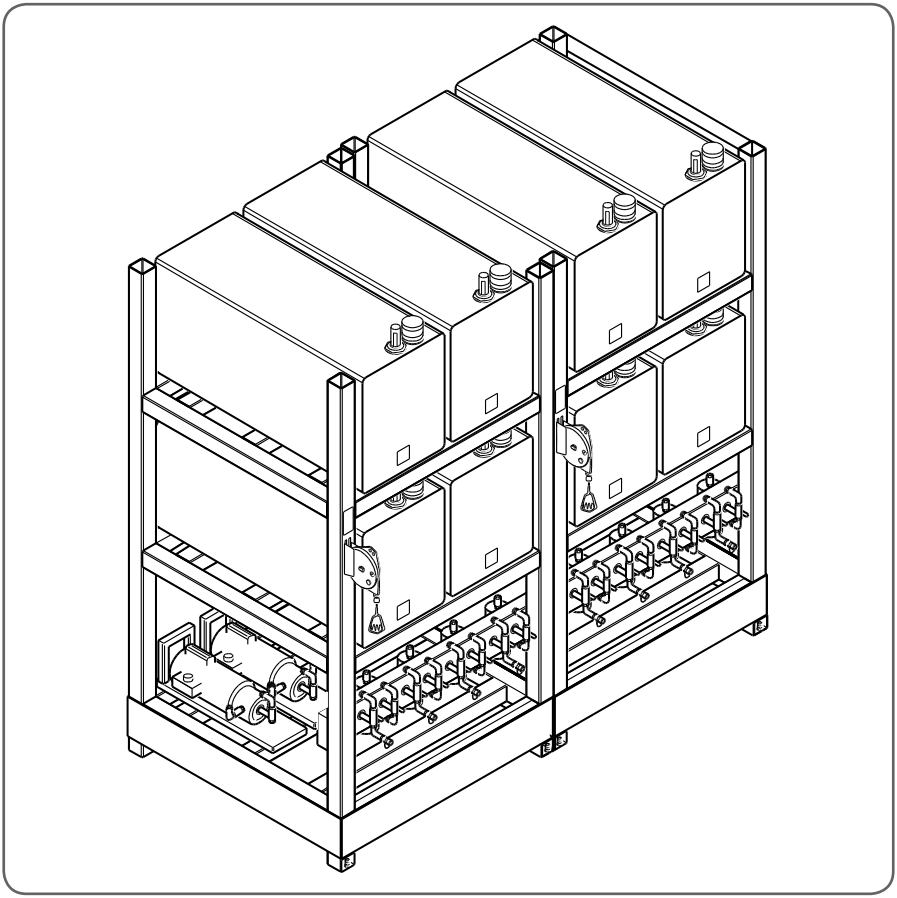


Fig 6 Final pod positioning

Caution:
Keep hands and feet clear of mating and moving parts when moving the pod into position.

Step 7
Using a level and the provided jacking bolts in the base frame, adjust the pod until it is level from front to back, side to side, and top to bottom, and square with the adjacent pod.

Step 8
Connect the adjoining pod spill pan side walls together using the spill pan overfill connectors. See figure 7.

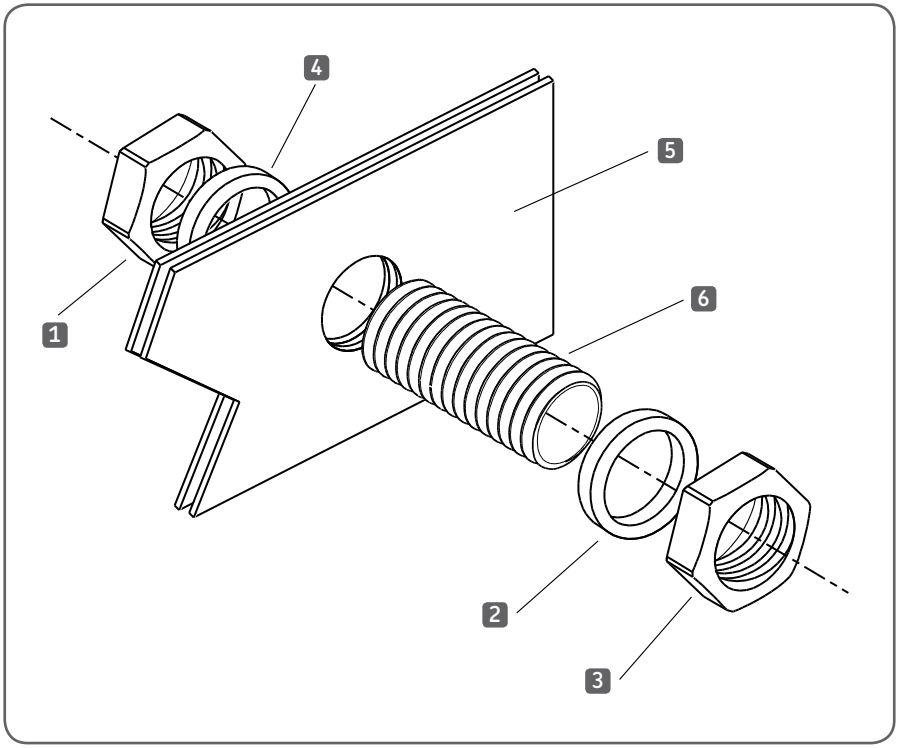


Fig 7 Connecting pods spill pans

1.	Locking nut	4.	Rubber gasket
2.	Rubber gasket	5.	Sidewall of pod spill pan
3.	Locking nut	6.	Threaded pipe socket

A. Align the two mating holes in the sidewalls of the pod spill pan (one near the front of the unit and one near the rear of the unit).
B. Insert the threaded pipe socket and center it between the two pods.
C. Place one of the rubber gaskets over each end of the threaded socket and place it against the respective Spill Pan wall.
D. Screw a locking nut onto each end of the threaded socket and tighten up each locking nut against the mating rubber gasket until tight. Do not over tighten.

Step 9
Repeat steps 5-8 for any additional pods.

Step 10
Install the fluid level gauges for each tank. See figure 8 and figure 9 for gauge details.

A. Unscrew and remove the red locking nut.
B. Remove the calibration.
C. Gently pull up the red indicator.
D. Carefully insert the float assembly into the tank.
E. Screw the aluminum bushing into the tank port until tight and ensure the arrow on the flat side of the hex bushing is pointing toward the rear of the tank.
F. Gently lower red indicator to its resting position and then gently raise and lower it to ensure the float mechanism is free and clear inside the tank.
G. Reinstall the calibration.
H. Fasten the red locking nut (as illustrated).

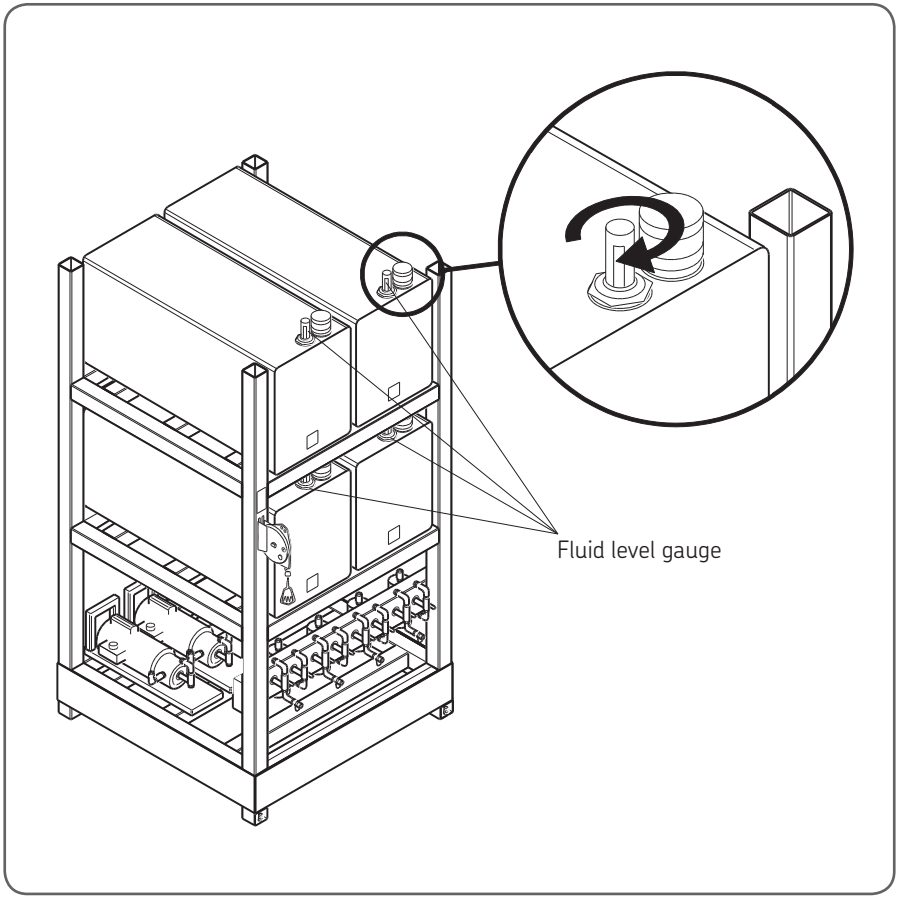


Fig 8 Install fluid level gauge

Note:
For systems that have overfill alarms, follow steps 11 - 14 to install your overfill alarm. If you purchase an overfill alarm at a later date, these instructions will allow you to install the overfill alarm at that time.

Step 11
If this is an initial installation and you ordered your bulk system with an overfill alarm, proceed to step 13.

Step 12
To install the alarm on an existing gauge, first install the magnet (provided) on your gauge. (If you ordered the alarm with a gauge, the magnetized indicator will already be installed, skip to step 13.) See figure 9 for alarm details.

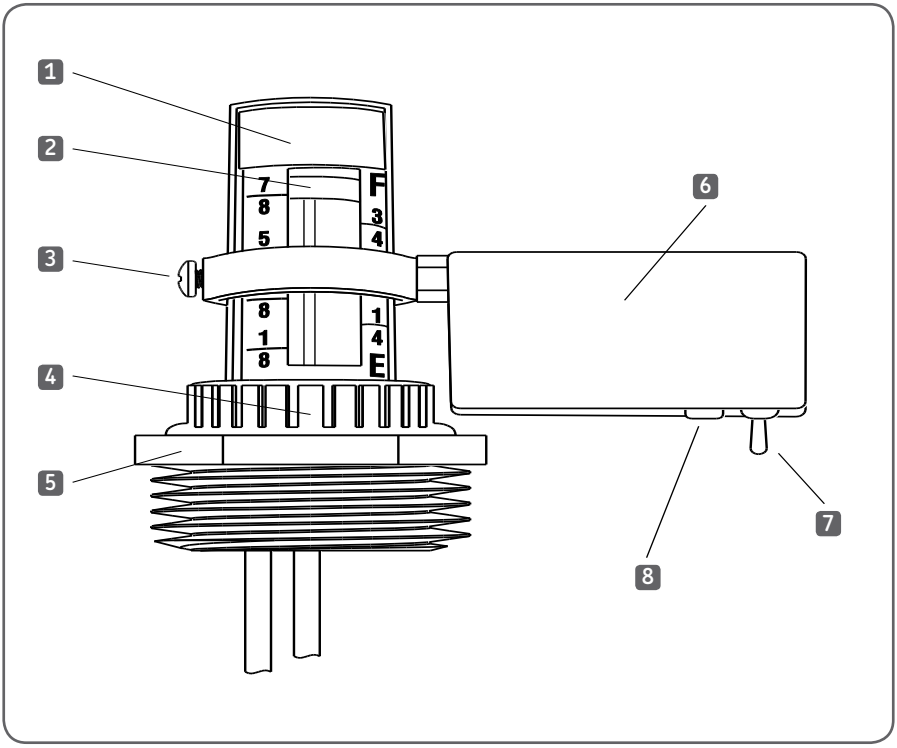


Fig 9 Overfill alarm

1.	Calibration	5.	Aliminum bushing
2.	Red indicator	6.	Alarm box
3.	Sensor center line	7.	Toggle switch
4.	Red locking nut	8.	Visual flashing light (not on all models)

Step 13
Remove the red locking nut that holds the top of the gauge in place. After you remove the nut, you will be able to remove the calibration (the plastic tube that shows your tank level) and you should have access to the red indicator. Pull the indicator off by pulling gently upward.

Step 14
Make a mark on the indicator rod 1,27 cm (0.5 in.) from the top. Take the small metal clip (provided) and push it onto the rod down to the mark. Then push the magnet onto the same rod until it is sitting flush on top of the small metal clip (you may have to file off any burrs on the end of the rod in order to fit the magnet onto the rod).

Step 15
Once the clip is installed with the magnet on top of it, you will then reinstall your red indicator. Be sure to use the new red indicator provided with the alarm, and discard the old indicator.

Step 16
Install the 9-volt lithium battery into the alarm box.

Step 17
Loosen the set screw located on the aluminum ring of your alarm. Slide the ring over the calibration down to the center line level where you wish the alarm to activate and tighten the set screw to hold the alarm in place.

Step 18
The switch located on the alarm can be used to silence the audible alarm (where fitted) after it goes off. It will automatically reset to re-alarm when the magnet moves back out of the alarm area. The switch can also be used to test the battery. Toggle it once to activate it and once more to reset it.

Important:
The switch is a toggle switch. It is meant to be moved left and right.

Caution:
Do not push down on the toggle switch.

Step 19
Install the Desiccant Air Breather air filter to each tank by screwing it (clockwise) into the threaded opening on the top right of the bulk tank. Remove the elastic white band on the top of the Desiccant Air Breather to activate the breather. See figure 10.

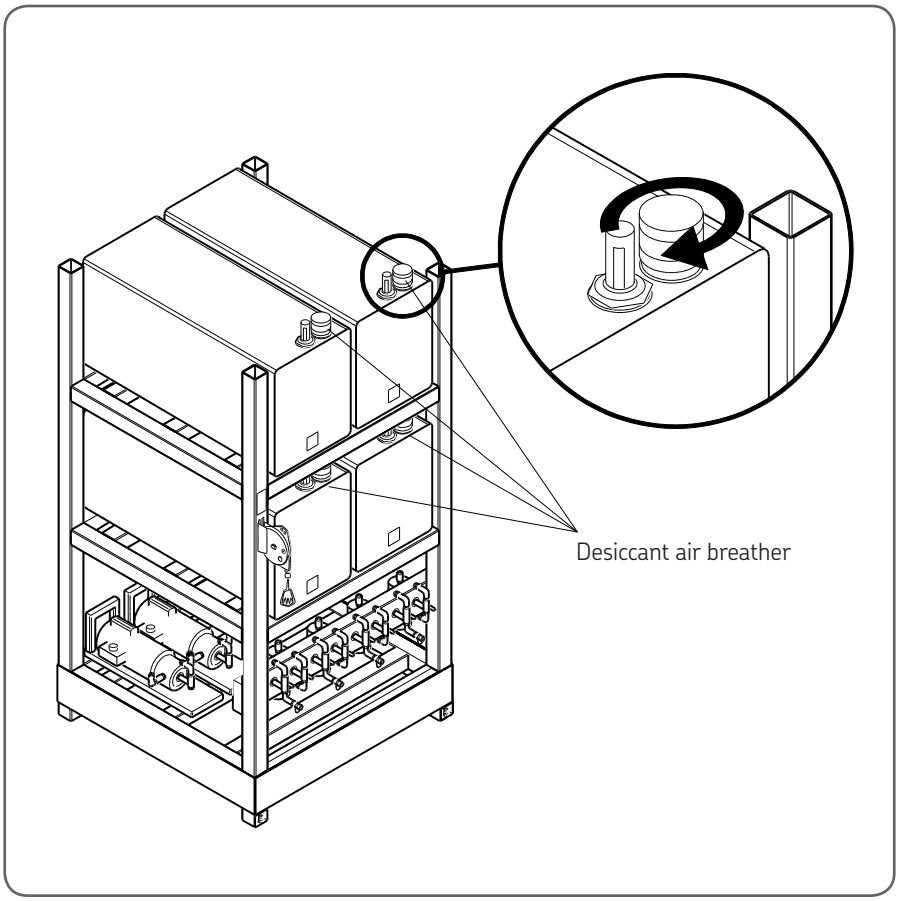


Fig 10 Install desiccant air breather

Step 20
Install the Spin-on Filter as follows (if not already installed);

A. Ensure all sealing surfaces are clean and free of damage.
B. Apply a light film of clean oil to the sealing surfaces of the filter gasket (note – never use grease to lubricate the gasket) and then carefully insert the sealing gasket into the mating female annular seat in the filter head being sure to attain a firm flush seat with the gasket.
C. Screw the new filter element on carefully, avoiding cross-threading. After the sealing gasket contacts the mounting base, tighten the filter with a Spin-on Filter wrench (not provided) per the instructions found on the filter. **Do not overtighten.**

☞ **Important:**
Per the manufacturer's recommendation, write the installation date of the Spin-on Filter on the provided sticker located on the filter. The first filter should be replaced after the first 50 hours of system service. Subsequent filters should be replaced per the instructions in the Maintenance section of this manual. See page 43.

Step 21
Install the static discharge grounding reel securely to the front face of the tank pod (Pod-1) frame using the threaded holes provided in the frame and the mounting bolts supplied with the reel.

Step 22
Pull the grounding cable out to determine if the tension is sufficient for the intended use.

A. If additional tension is needed, apply a wrench to flats on the mainspring shaft, rotating counter-clockwise until the desired tension is reached.
B. If mainspring tension is too high, it may be decreased by depressing the tension lock spring on the opposite side of reel. Do not remove more tension than desired. If too much tension is removed, increase tension as described above.

Step 23
Install the dispensing faucets supplied with your system into the threaded ports provided on the front face of the control panel. Use of appropriate thread sealing paste is recommended on threaded joints.

3.4 Electrical installation warning

Warning:
Failure to follow system installation, safety and operating instructions may result in severe injury or death, damage to plant and equipment and void manufacturer warranties.

Warning:
The following instructions should be carried out by a trained and authorized electrician or electrical personnel in accordance with your local and federal regulations and safety procedures. Always ensure the system is appropriately grounded to earth utilizing the grounding lugs provided at the rear base of the system, together with relevant grounding equipment as specified and installed by your authorized electrical personnel.

The system should be grounded before use. Grounding lugs are provided at the rear base of the system on the inner face of the frame uprights. At the rear of the system, locate the power supply cord(s) coming from the electrical motor/s.

Note:
There will be one power supply cord for each motor and each will be labeled to correspond to its related motor/tank.

Step 24
Plug the power cords into the individual wall outlets as designated in the specification sheet.

4. Initial operation

Follow these steps the very first time you use your system.

Warning:
The tank isolation valves (located on the underside of each tank) must be in the open position when operating the system and in the closed position when servicing the system.

Caution:
Personal protective equipment ("PPE") should be worn when installing and operating this system. Always monitor the system whenever the pump is running or fluid is dispensing.

Caution:
System Operating Pressure should never exceed 2 MPa (300 PSI). Operating pressures can be optimized by adjusting pump bypass relief valves located on pump heads to suit specific lubricant viscosities and temperatures.
Normal operating pressure when filling, dispensing or re-circulating is typically less than 0,2 MPa (30 PSI).
Normal operating pressure when running the pump against a closed dispensing faucet (bypassing) is typically in the range of 0,48 MPa – 1,38 MPa (70 PSI – 200 PSI).
Should the relief valves require adjustment to optimize performance the instructions can be found in the trouble shooting section.

The first time the system is used there will be some air that has been trapped in the hoses. This is normal and will not affect the system. Simply wait for the air to stop coming out of the lines and fluids to dispense normally before continuing. If air continues to come out of the hoses after the initial use, there may be a problem with a seal or a hose.
See the troubleshooting section (page 48) of this manual, or contact your supplier for additional support.

Ensure that the tank isolation valves located on the underside of each tank are in the open position before continuing.

4.1 Using the operating valve handles

Each tank assembly has two operating valve handles located on the front of the tank pod. The position of these handles will determine how your system will pump the fluid. There will be a placard on the front of the tank pod indicating which position the handles will need to be in for each setting.

Operating valve positions		
Fill	**Recirculate**	**Dispense**
Left – up	Left – down	Left – down
Right – up	Right – up	Right – down

To fill the tank(s) – place both valves in the "UP" position, so the handle is parallel to the ground. To re-circulate the fluid in the tank(s), turn the left-side handle (above the inlet valve) so it is perpendicular to the floor, and keep the right-side handle parallel to the floor. To dispense the fluid in the tank(s) (normal operation), turn both handles to be perpendicular to the floor.

4.2 Filling the tank(s)

Important:
If you have not installed your spin-on filter, make sure you do so before proceeding.

1. Locate the suction hose assembly. Each tank will have its own individual suction hose assembly. See figure 11.

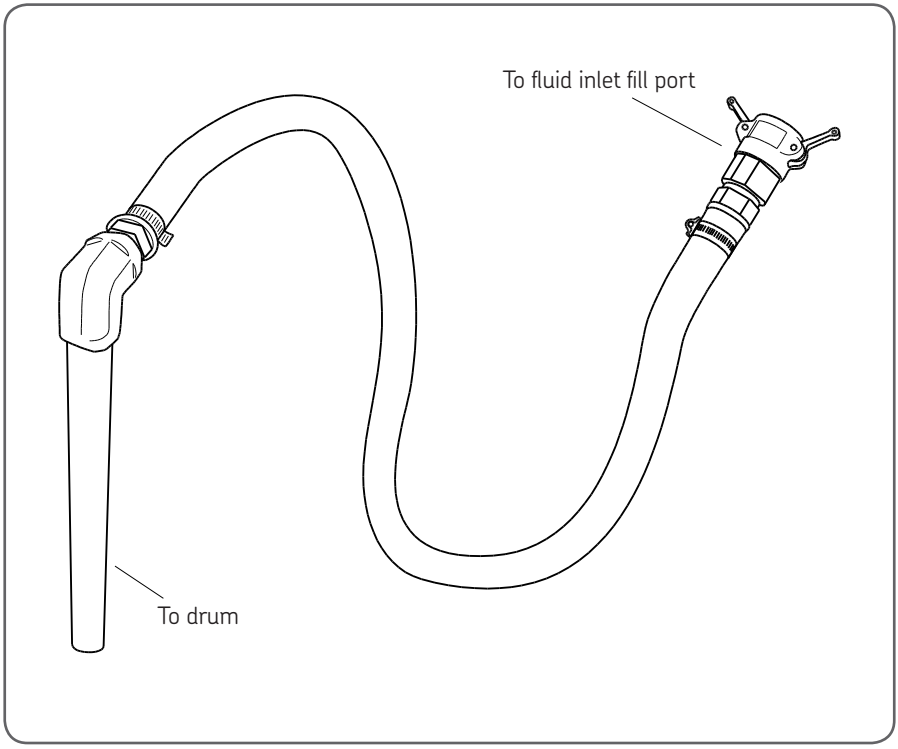


Fig 11 Suction hose assembly

2. Place the tube-end of the suction hose assembly into the oil drum or container (208 litre/55 US gal drum). See figure 12.

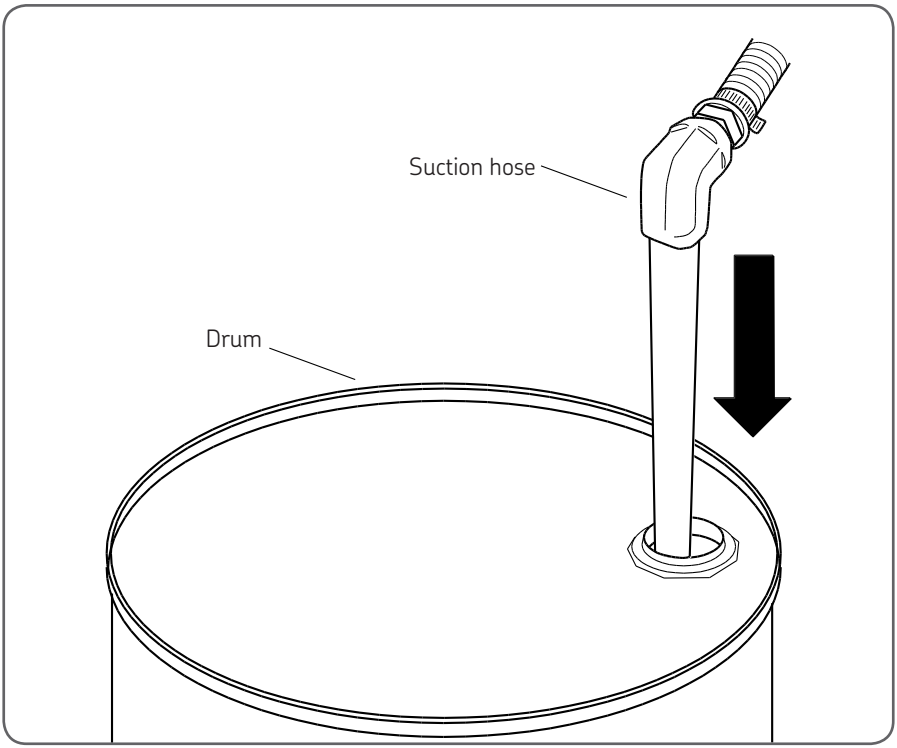


Fig 12 Place suction tube

Caution:
Caution when filling bulk tanks from drums or barrels always ensure the Static Discharge Clip is connected to the drum or barrel before starting the pump.

3. Attach the static discharge cable to the drum.
See figure 13.

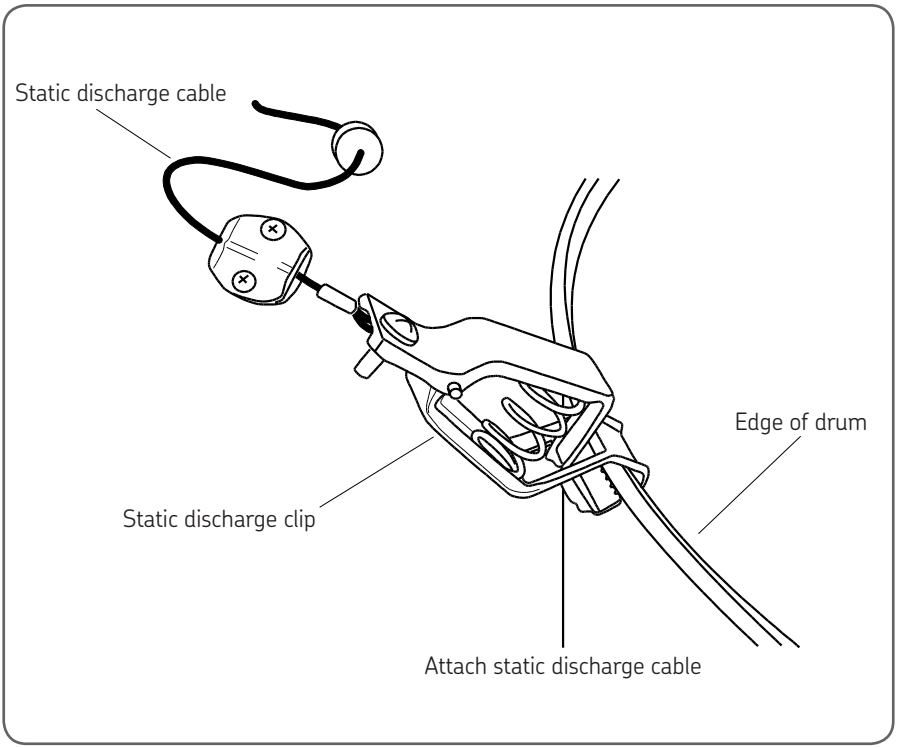


Fig 13 Attach static discharge cable

Caution:
When filling bulk tanks from drums or barrels always ensure the static discharge clip is connected to the drum or barrel before starting the pump.

4. Remove the fill port inlet end cap of the appropriate tank by lifting the tabs and pulling the end cap off. Clean the inlet of any debris before continuing. See figure 14.

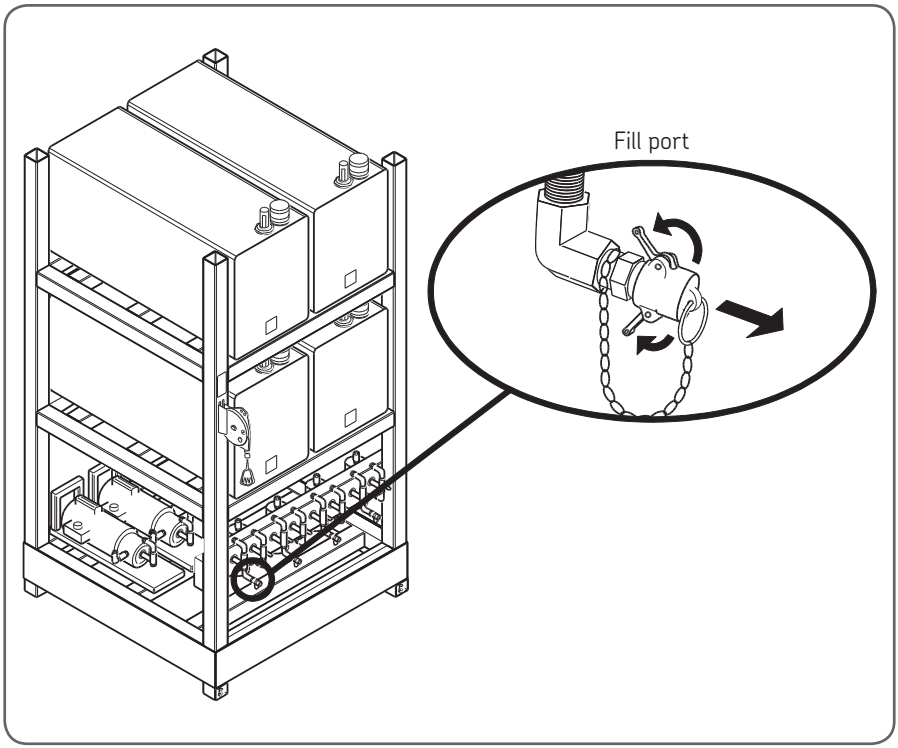


Fig 14 Remove fill port inlet end cap

5. Attach the coupling-end of the suction hose assembly to the front of the unit. See figure 15.

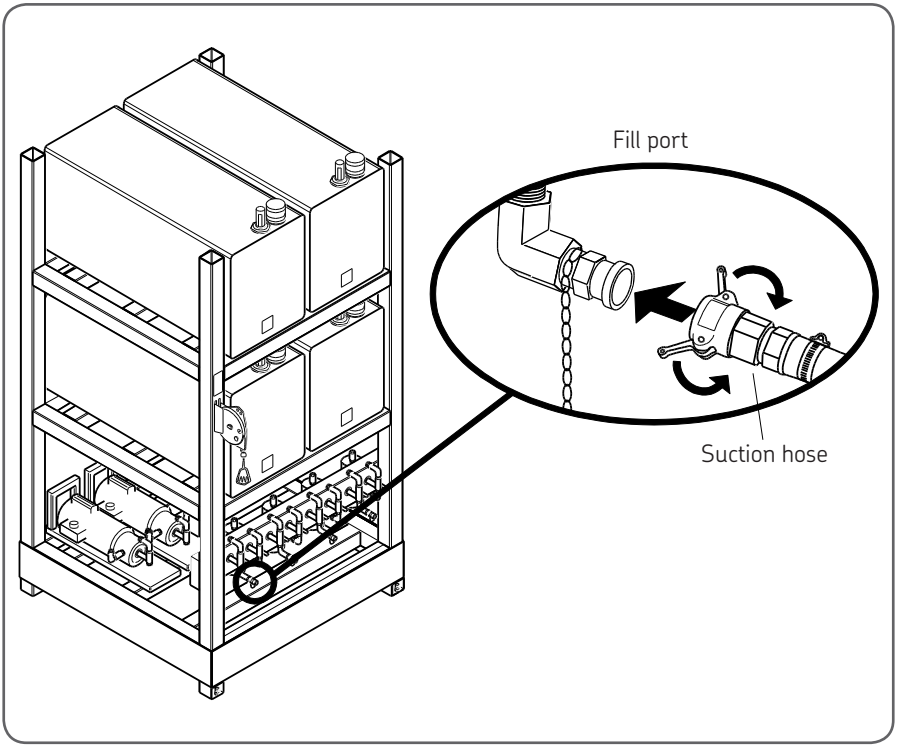


Fig 15 Attach suction hose assembly to fill port inlet

6. Put the operating valve handles for the tank in the “Fill” position (up and up) and also ensure the dispensing faucets are in the closed position.

7. Press the START button above the corresponding dispensing faucet to begin loading the bulk tank.

8. Monitor the bulk tank fluid level gauge to avoid over-flow situations.

9. When the tank is full, raise the suction tube vertically out of the oil drum and allow the pump to pull through any residual oil remaining in the suction hose assembly then press the STOP button above the dispensing faucet to turn off the pump.

10. Remove the hose from the fill port inlet, replace the inlet end cap and then store the suction hose assembly for future use.

11. Remove the static discharge clip.

Caution:
Care must be taken when reeling cable back onto the reel. DO NOT let go of the cable – walk it back towards the reel, keeping tension on cable at all times.

4.3 Re-circulation (“Kidney-loop”) cycle

Note:
SKF recommends an initial re-circulation (“Kidney-loop”) of the fluid at the first fill. Refer to re-circulation (“Kidney-loop”) cycle time guide in the data tables section (page 59) for approximate run times to complete single pass filtration of each tank.

12. Put the operating valves in the “Re-circulate” configuration – (left DOWN, right UP).

13. Run each filled bulk tank for the approximate times set out in the re-circulation (“Kidney-loop”) cycle time guide table in the data tables section (page 59).

4.4 Dispenser faucets

1. Press START to start the pump.

2. Place a clean fluid transfer or storage container under the tap (approximately 19 litre / 5 US gal) capacity.
3. Lift up on the handle, see figure 16 (standard faucet style illustrated) – or depress handle if brass fire upgrade faucets have been ordered.

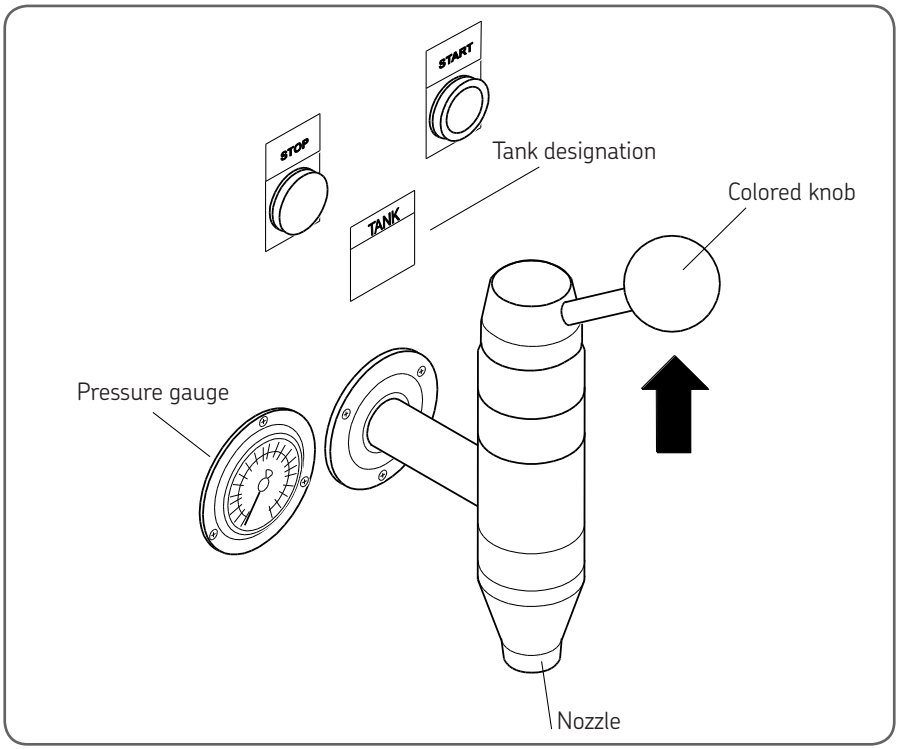


Fig 16 Operating the standard dispensing faucet

Note:
Due to the air that has been trapped in the hoses during assembly, air will come out of the faucet initially. Keep the faucet in the open position until fluid is flowing at a steady pace.

Caution:
Do not wedge anything under the handle to force it to stay open.

4. Release the handle and the flow will stop.

5. Press STOP to stop the pump.

Note:
Leaving the pump running against a closed dispensing faucet will not cause a pressure problem with the system provided the pump pressure bypass relief valves on each pump have first been set to suit the particular oil viscosity and ambient room temperature as the fluid will bypass back to the corresponding bulk tank via the pump bypass pressure return hose. Normal system operating pressure should be less than 1,65 MPa (240 PSI) when pumping against a closed faucet and should never exceed 2 MPa (300 PSI).
Refer to the trouble shooting section at the rear of this manual for the bypass valve pressure setting procedure should your system operating pressure require adjustment.

Note:
When the system is running, it should be monitored at all times.

5. Normal operation

These instructions should be used during normal operation of your system.


Warning:
The tank isolation valves (located on the underside of each tank) must be in the open position when operating the system and in the closed position when servicing the system.


Caution:
Personal protective equipment (“PPE”) should be worn when installing and operating this system.

5.1 Filling the tank(s)

Important:
Use the same tank-specific suction hose assembly every time you fill a tank.
This will prevent crosscontamination of fluids.

1. Locate the suction hose assembly.
Each tank will have its own individual suction hose assembly. See figure 17.

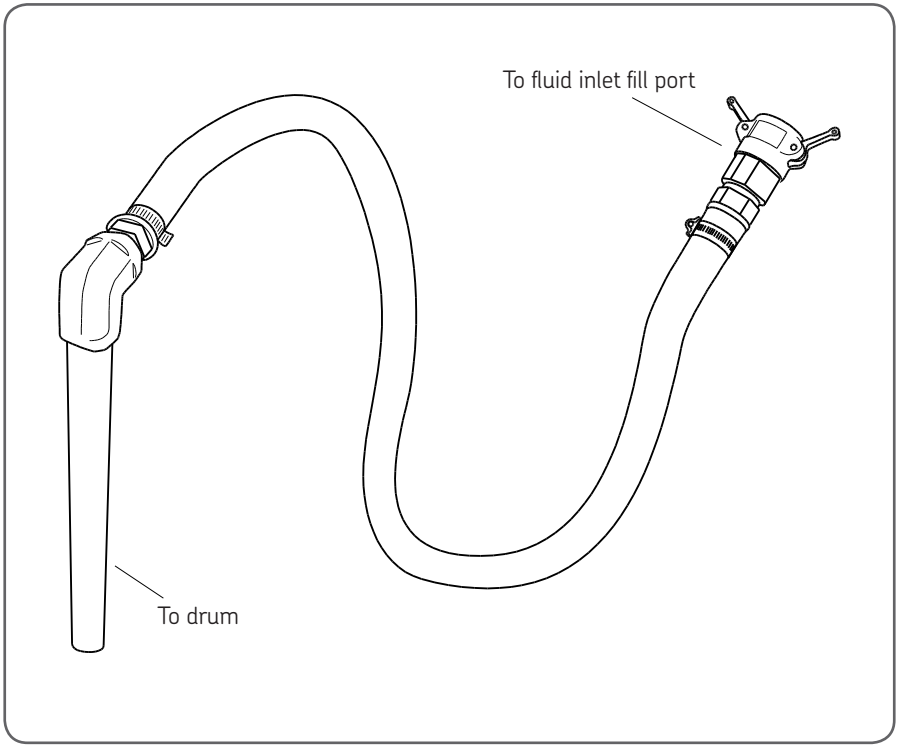


Fig 17 Suction hose assembly

2. Place the tube-end of the loading hose into the oil drum or container (208 litre/55 US gal drum). See figure 18.

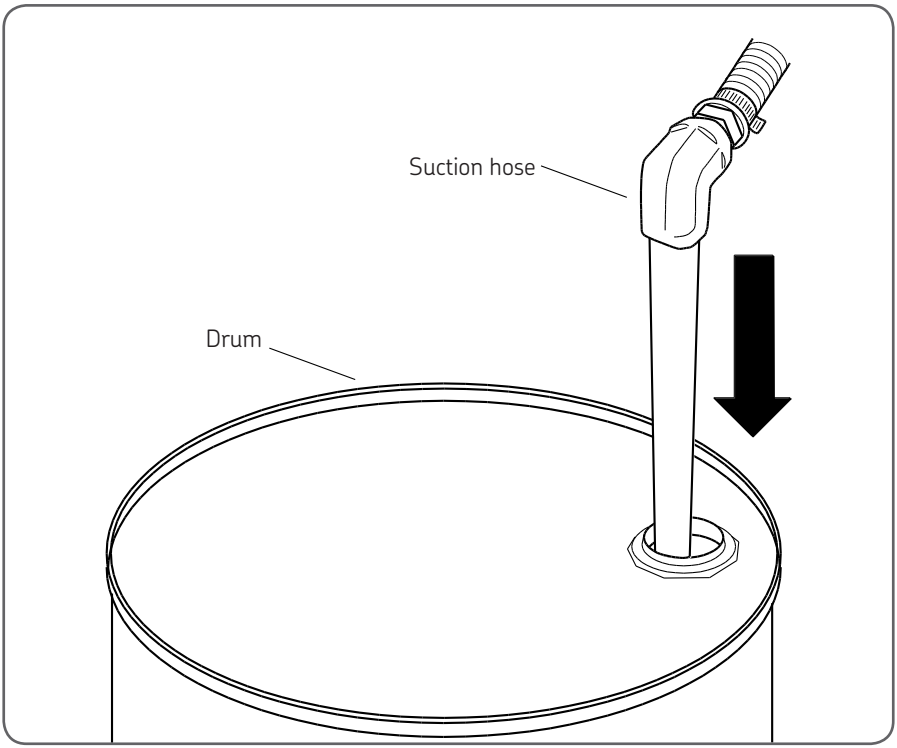


Fig 18 Place suction tube

Caution:
When filling bulk tanks from drums or barrels always ensure the static discharge clip is connected to the drum or barrel before starting the pump.

3. Attach the static discharge cable to the container.
See figure 19.

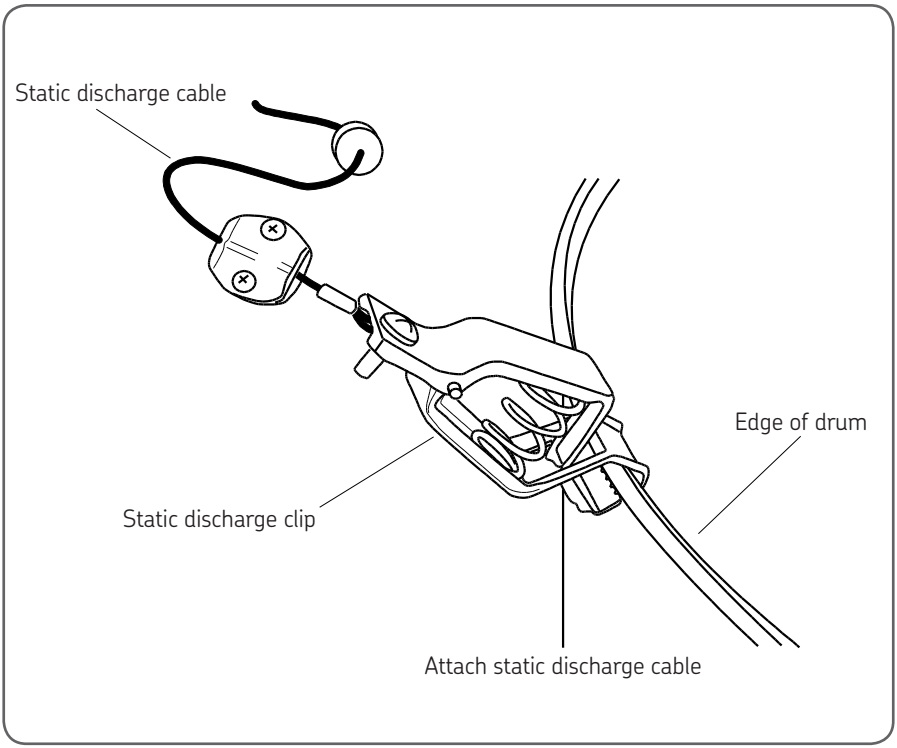


Fig 19 Attach static discharge cable

Caution:
When filling bulk tanks from drums or barrels always ensure the static discharge clip is connected to the drum or barrel before starting the pump.

Remove the fill port inlet end cap of the appropriate tank by lifting the tabs and pulling the end cap off. Clean the inlet of any debris before continuing. See figure 20.

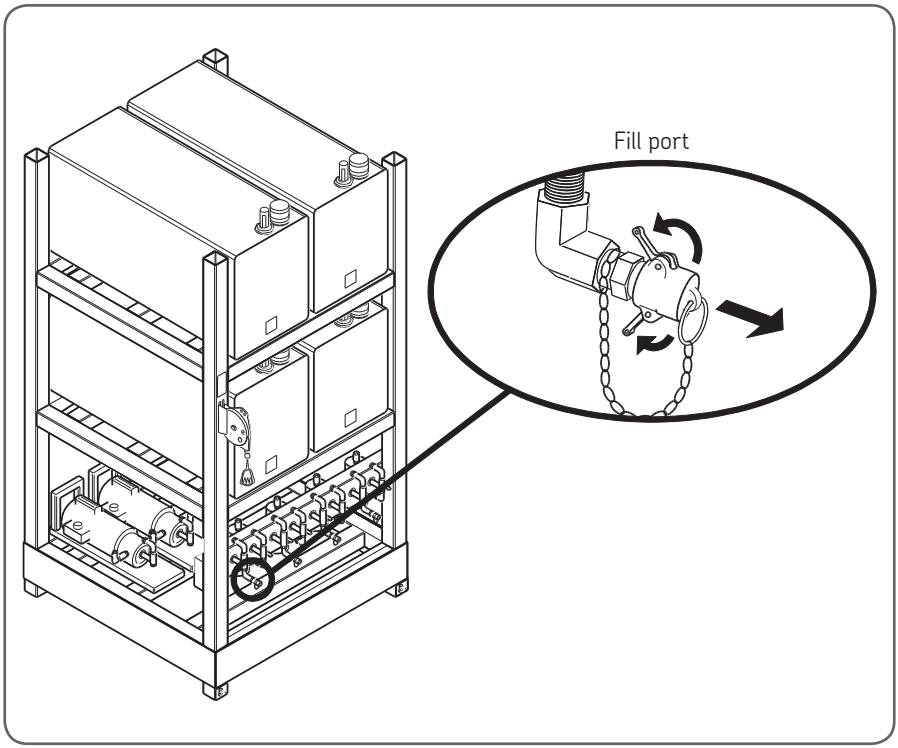


Fig 20 Remove fill port inlet end cap

4. Attach the coupling-end of the suction hose assembly to the front of the unit. See figure 21.

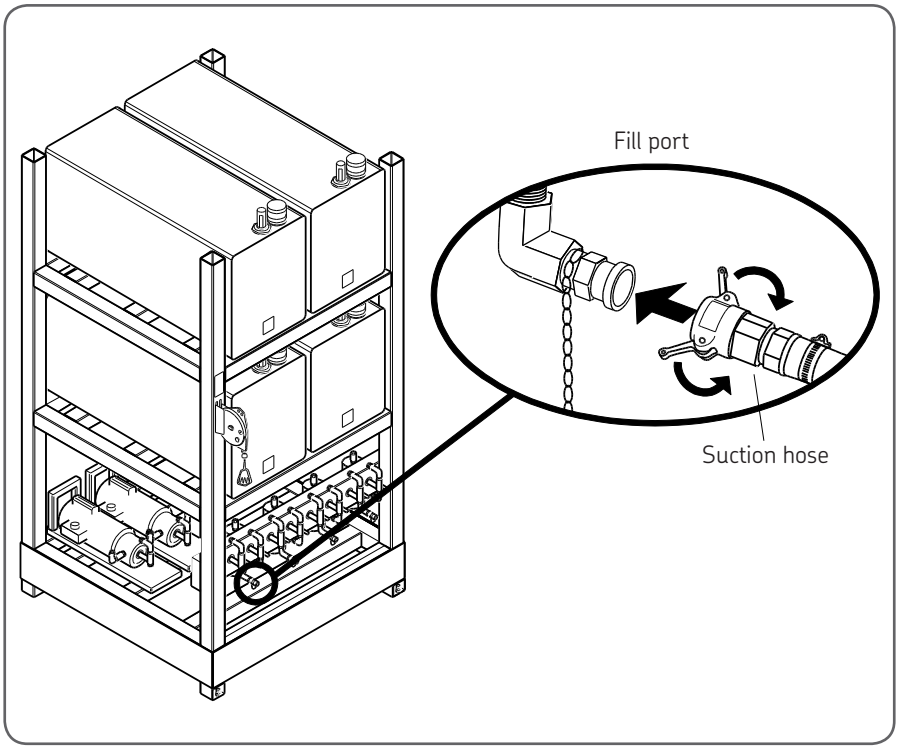


Fig 21 Attach suction hose assembly to fill port inlet

5. Put the operating valve handles for the tank in the “fill” position (up and up).

6. Press the START button above the dispensing faucet to begin loading the tank.

7. Monitor the bulk tank fluid level gauge to avoid over-flow situations.

8. When the tank is full, press the STOP button above the dispensing faucet to turn off the pump.

9. Remove the hose, and replace the fill port inlet end cap.

10. Remove the static discharge clip.

Caution:
Care must be taken when reeling cable back onto the reel. DO NOT let go of the cable – walk it back towards the reel, keeping tension on cable at all times.

5.2 Dispenser faucets

1. Press START to start the pump.
2. Place a container under the tap.
3. Lift up on the handle (if standard faucet). See figure 22 – or depress handle if brass fire upgrade faucet.

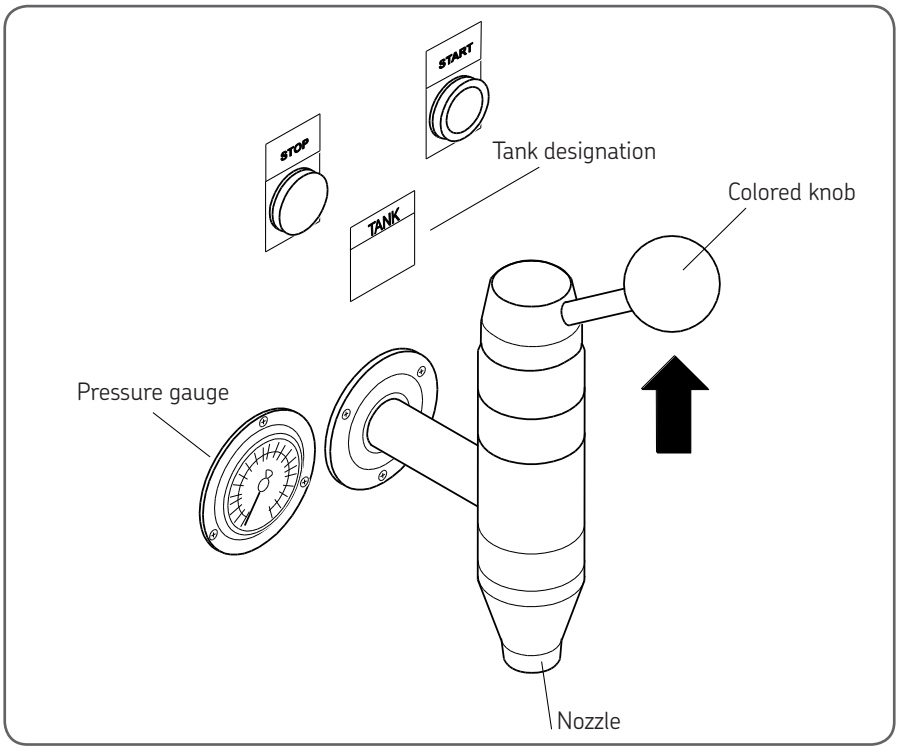


Fig 22 Operating the standard dispensing faucet

Caution:
Do not wedge anything under the handle to force it to stay open.

4. Release the handle and the flow will stop.

5. Press STOP to stop the pump.

6. **Note:**
   Leaving the pump running against a closed dispensing faucet will not cause a pressure problem with the system provided the pump pressure bypass relief valves on each pump have first been set to suit the particular oil viscosity and ambient room temperature as the fluid will bypass back to the corresponding bulk tank via the pump bypass pressure return hose. Normal system operating pressure should be less than 1,65 MPa (240 PSI) when pumping against a closed faucet and should never exceed 2 MPa (300 PSI). Refer to the trouble shooting section at the rear of this manual for the bypass valve pressure setting procedure should your system operating pressure require adjustment.

7. **Note:**
   When the system is running, it should be monitored at all times.

6. Maintenance

Periodic maintenance should be scheduled and performed on your system every three months after your initial installation.

6.1 Requirements prior to maintenance


Warning:
Always ensure the main power supply is first locked out and the system depressurized before any service is performed on this system. Never connect or disconnect lines, change filter elements, or undertake any service work when this system is running or energized. Severe injury or death may occur.


Warning:
The tank isolation valves (located on the underside of each tank) must be in the open position when operating the system and in the closed position when servicing the system.


Caution:
Personal protective equipment (“PPE”) should be worn when installing and operating this system.

Before performing any maintenance on the system, the bulk tanks should be isolated by using the tank isolation valves located on the underside of the tank. The tank isolation valves should be closed in the following situations:

- Maintenance is to be performed on the system.
- The system needs to be moved.
- In the event of a fire, disaster, or other emergency situations.

Tank isolation valves

Your system will contain either a normal t-ball valve as the tank isolation valve, or it may include a fusible link fire safe valve ("fire safe valve"). To isolate the system with the normal t-ball valve, simply move the handle of the valve such that it finishes perpendicular (90°) to the valve body. The valves are located on the underside of the tank. See figure 23 for a normal t-ball tank isolation valve that is in the open position.

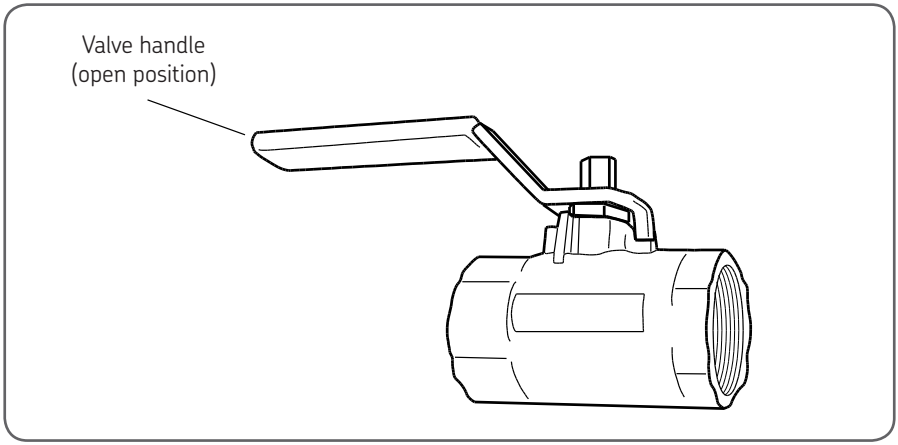


Fig 23 Normal t-ball tank isolation valve in the open position

If your system contains a fire safe valve (see your specification sheet for details), the valve can be closed by releasing the fusible link lead clip on the top of the valve. In the event of a fire, the lead clip will melt, forcing the valve to automatically close and secure your fluid. See figure 24.

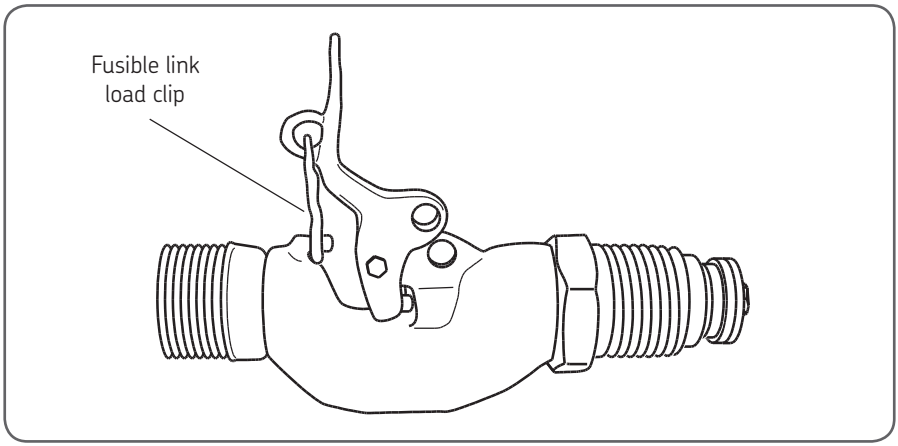


Fig 24 Fire safe isolation valve in the open position

6.2 Maintenance checklist

Every 3 months:

- Check spin-on filters.
- Check desiccant air breathers.
- Confirm with your fluid supplier how frequently your fluid should be re-circulated to maximize fluid life. Should a re-circulation ("Kidney-loop") cycle be recommended, run a recirculation cycle for the suggested times set out in the tank re-circulation ("Kidney-loop") cycle time guide in the data tables section (page 59).
    - Put the valves in the "Re-circulate" configuration (left DOWN, right UP).
    - Run each filled bulk tank for suggested time.

Every 6 months:

- Replace spin-on filters as required.
- Replace desiccant air breathers as required (orange beads will turn dark green indicating the filter is used).
- Check the batteries on any installed over-fill alarms. Batteries should be changed once per year.
- Inspections:
    - Inspect all hoses for cracks or kinks.
    - Inspect all hose fittings for cracks or leaks.
    - Inspect and tighten all bolts.
- Clean external surfaces: (use an environmentally friendly cleaning/degreasing fluid and warm water. Rinse completely before replacing.)
    - Remove drip-pans from beneath the faucets, clean the entire grate and flush the pan.
    - Remove faucet nozzles by unscrewing, clean heads and o-rings. See figure 25 (for standard faucets).

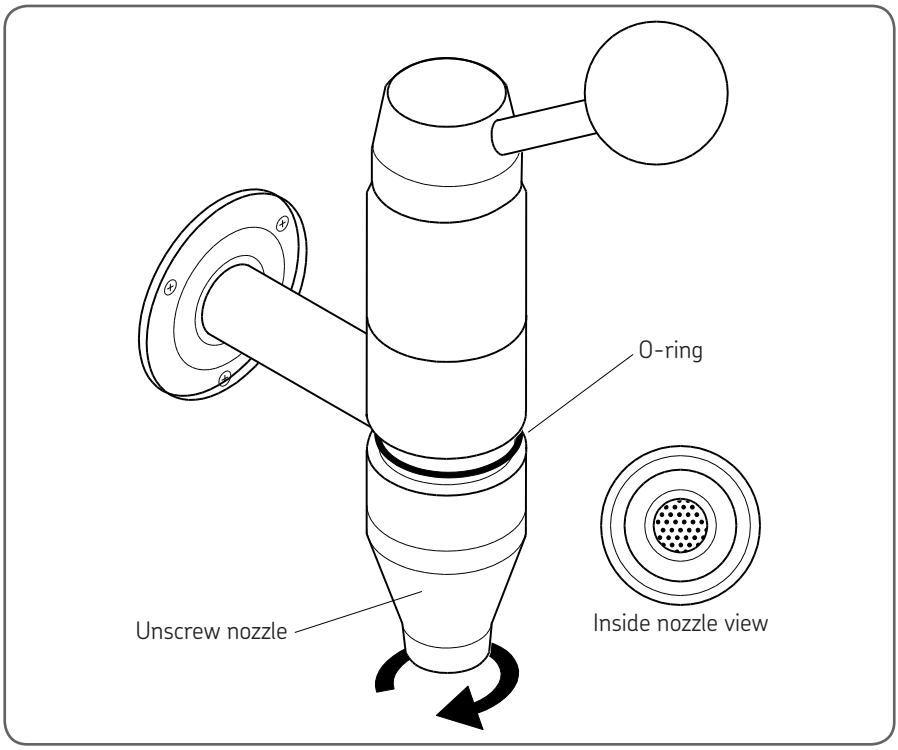


Fig 25 Removing faucet nozzle

- Flush out the spill transport pallet (bottom of the pods) with hot water and cleaner/ degreasing fluid.
- Use a clean and damp rag and wipe down the motor and all painted surface areas.
- Polish all stainless steel areas with stainless steel cleaner.
- Dust the motor fan.
- Check tension on static discharge reel.
    - If additional tension is needed, apply a wrench to the flats on the mainspring shaft, rotating counterclockwise until the desired tension is reached.
    - If mainspring tension is too high, it may be decreased by depressing tension lock spring on the opposite side of the reel. Do not remove more tension than desired. If too much tension is removed, increase tension as described above.
- Inspect the static discharge cable for fraying. Lubrication is not required for the reel.

6.3 Moving your system

If your system needs to be moved from its previously installed location for any reason, use the following procedure to secure your system prior to moving.

1. Pump all bulk tanks empty.

2. Depressurize the system by opening each faucet without the pumps running

3. Lock out the main power supply.

4. Close the tank isolation valve on the bottom of all tanks.

5. Flush out the spill transport pallet (bottom of the pods) with hot water and cleaner/degreasing fluid.

6. Disconnect the following for each tank assembly:
   A. Power cord from wall outlet.
   B. Faucets from control panel – if these will interfere with packing/transport.
   C. Tank level gauge and desiccant breather from any upper tanks.
   D. Place the hoses and cords in the spill pan at the bottom of the pod.

7. Where there are two pods joined together, at the two mating holes in the sidewalls of the pod spill pan:
   A. Unscrew the locking nut from each end of the threaded sockets.
   B. Remove the rubber gasket on each end of the threaded socket.
   C. Remove the threaded pipe socket.

8. Repeat all steps until each pod is isolated similar to how it was delivered initially.

9. Using a hand pallet truck, position the tank pod (Pod-1) into its new service position, ensuring that there is at least 46 cm (18 in.) of free clear space at the rear and each end of the system.

10. Continue to follow the normal installation steps for the system.

Warning:
Each system is custom-built to customer specifications including the type of fluid stored. Contact your supplier if your fluid storage needs change to remove the possibility of cross-contamination and incompatibility of system materials or components with a new fluid. Also be aware of any change in ambient room temperature in the new location. Ambient room temperature should not be less than 15 °C (60 °F).

7. Troubleshooting

Warning:
Always ensure the main power supply is first locked out and the system depressurized before any service is performed on this system. Never connect or disconnect lines or change filter elements or undertake any service work when this system is running or energized. Severe injury or death may occur.

Warning:
The tank isolation valves (located on the underside of each tank) must be in the open position when operating the system and in the closed position when servicing the system.

The following troubleshooting procedures will help you identify and correct problems with your system. Every part of the system has been designed per your specifications and should not require maintenance, repair, or calibration beyond what was described in the maintenance section of this document.

If any of these troubleshooting procedures do not solve the issue, contact your supplier for additional support.

Issue	Steps to resolve
Fluid level gauge is not reading correctly	1. Remove the gauge 2. Wipe the gauge and float assembly with a lint free cloth to remove any excess fluid 3. Ensure all hinged joints and fittings are in good condition and moving freely and reinstall 4. If the gauge is still not working correctly, remove it and contact your supplier for a replacement
Note: Overfilling the tanks may cause damage to the fluid level gauge and cause it to read incorrectly	
The tank is not filling correctly	1. Check to ensure the valves on the front of the unit are in the correct position 2. Check all fittings for cracks or leaks 3. Check all hydraulic hoses for cracks or leaks 4. Check the motor to ensure it is rotating in the correct direction. If not, contact your authorized electrician 5. Check the tank isolation valves and ensure they are in the open position 6. Check the pressure gauge to make sure that the pressure level is registering when the motor is running 7. If the pressure gauge is running above its normal range, it is time to replace your spin-on filter. Replace and check your pressure gauge again 8. Check the seals on the suction hose assembly coupling to ensure they are not cracked or damaged. Replace if necessary 9. Ensure the desiccant air breather has had the white rubber band removed (if factory supplied breather)
The tank is not dispensing liquid correctly	1. Check to ensure the valves on the front of the unit are in the correct position 2. Check all fittings for cracks or leaks 3. Check all hydraulic hoses for cracks or leaks 4. Check the motor to ensure it is rotating in the correct direction 5. Check the tank isolation valves and ensure they are in the open position 6. Check the pressure gauge to make sure that the pressure level is registering when the motor is running 7. If the pressure gauge is running above its normal range, it is time to replace your spin-on filter. Replace and check your pressure gauge again 8. Check and clean the dispensing faucet to remove dirt, debris, or clogs 9. Check the o-ring on the dispensing faucet. Replace if necessary

Issue	Steps to resolve
The motor stops working	1. Check electrical enclosure to ensure power is applied to the pump 2. Check all circuit breakers to ensure power is available. Check the power cord from the electrical enclosure to the motor for cracks or problems 3. Check the power cord connector at the motor to ensure all the pins are seated correctly and that the connector is clean of dirt and debris 4. Check that the emergency system STOP button is not set to the off position 5. Have an electrician consult the electrical system specification to troubleshoot the system
The STOP or START buttons do not light up correctly	1. Ensure the power supply to the motor set is on 2. Have an electrician consult the electrical system specification to troubleshoot the system
The pump system pressure is above 1,65 MPa (240 PSI)	1. Locate the pump bypass pressure relief valve on the side of the pump head 2. Using a wrench, loosen the lock nut on the valve spindle by turning it counter clock wise 3. Turn the **valve spindle** counter clock wise until it comes to a stop. This will result in the pressure relief valve now being in the lowest possible pressure setting 4. Position the operating valves (at the front of the system) for the pump in question into the dispense position (down and down) 5. Have an additional operator stand at the control panel and start the pump and have them monitor the pump pressure gauge. Normal system pressure when running the pump in dispense mode **(with the dispensing faucet in the closed position)** should be in the range of 1 MPa – 1,65 MPa (150 PSI – 240 PSI) 6. To increase the pressure back up to be within the normal 1 MPa – 1,65 MPa (150 PSI – 240 PSI) range, carefully adjust the bypass pressure relief valve spindle (with the pump running) by slowly turning the valve spindle clock wise while the operator monitors the pressure gauge. This pressure setting re-adjustment will likely take 1,5 to 2,5 turns of the valve spindle depending on oil viscosity and operating temperature 7. Once the desired pressure has been achieved, re-tighten the valve spindle **lock nut** by turning the nut clock wise

Issue	Steps to resolve
The pump system pressure is above 1,65 MPa (240 PSI) and the system is operating in a cold environment (less than 15 °C / 60 °F)	1. Ambient room temperature where the system is installed should be in the range of 15 °C (60 °F) to 26 °C (80 °F) with optimum room temperature being 21 °C (70 °F). For ambient temperatures below 15 °C (60 °F) consult the manufacturer or your supplier for the supply of electric blanket heaters for oil barrels, pails and bulk tanks to ensure stability of lubricant viscosity, condition and system performance 2. Temperatures less than < 15 °C (60 °F) may result in lubricant viscosity increasing above the rated ISO code you specified at the time of order. Such adverse viscosity changes can cause higher system operating pressures than those set at the factory. System operating pressure should never exceed 2 MPa (300 PSI) as this can cause a gasket failure on the spin-on filter resulting in a high pressure oil leak 3. If pump system pressure is above 1,65 MPa (240 PSI), adjust the pump bypass pressure relief valve as set out above
High pressure oil leak from spin-on filter (blown gasket) – likely caused by system overpressure above 2 MPa (300 PSI)	1. Remove spin on filter, clean sealing faces and re-install with new gasket 2. Check that the ambient room / oil temperature is above 15 °C (60 °F) 3. Follow the pump bypass pressure relief valve re-adjustment procedure set out above in the issue titled *"the pump system pressure is above 1,65 MPa (240 PSI)"*

8. Repair and replacement procedures

Warning:
Always ensure the main power supply is first locked out and the system depressurized before any service is performed on this system. Never connect or disconnect lines or change filter elements or undertake any service work when this system is running or energized. Severe injury or death may occur.

Warning:
The tank isolation valves (located on the underside of each tank) must be in the open position when operating the system and in the closed position when servicing the system.

8.1 Replacement parts

Tank desiccant air breather (part number 46Z134)
This is the air filter on the top of the tanks. When the colored beads on the inside of the breather turn from orange to dark green, it is time to replace the filter.
The filter can be screwed on and off.

Tank level gauge 113/246/454/908 litre (30/65/120/240 US gal) – Top mount, mechanical float
The tank level gauge is located at the top center of each tank.
It can be removed and replaced by screwing it on or off.

Direct mount overfill alarm (parts 921100, 921101, or 921102)
This is optional equipment which signals if your tank is overfilling.
There is an audible only alarm, a flashing light only alarm and an alarm which combines the audible alarm and a flashing light.
These alarms are fitted to the tank level gauge located on the top of every tank.

The alarm has a 9-Volt lithium battery which should be replaced at least once per year. Battery life is shortened if the unit is left in alarm mode for extended periods of time.

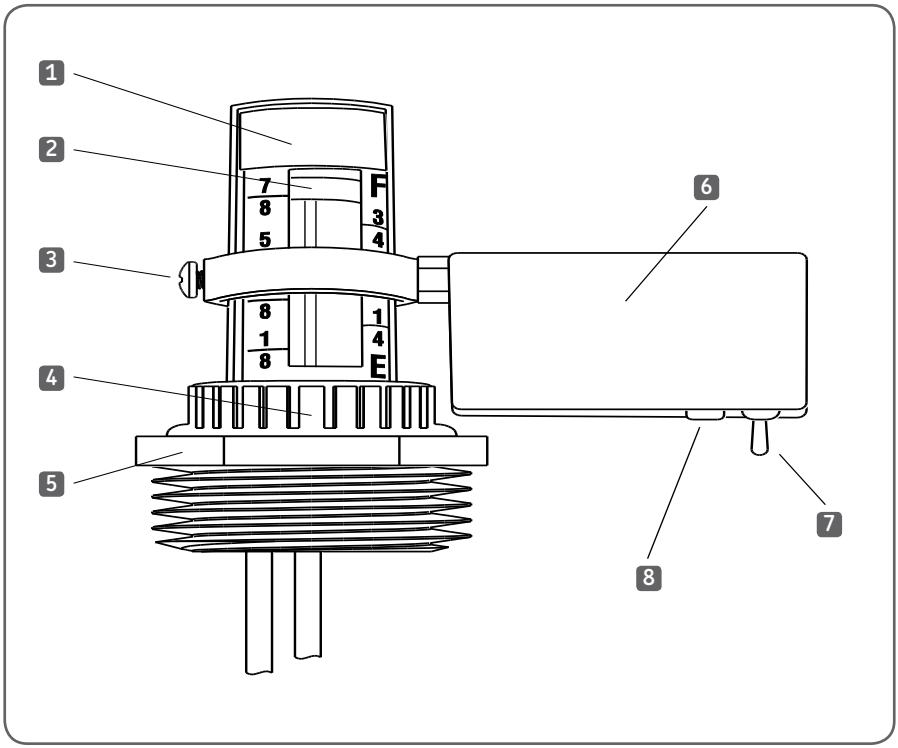


Fig 26 Overfill alarm

1.	Calibration	5.	Aliminum bushing
2.	Red indicator	6.	Alarm box
3.	Sensor center line	7.	Toggle switch
4.	Red locking nut	8.	Visual flashing light (not on all models)

Colored ball knob for standard steel shut off valve (available in 10 colors – see table below for part numbers)
The ball knob on the end of the dispensing faucet handle is color-coded to match the fluid tank it corresponds with. If the ball knob is damaged or requires replacing for any reason, it can be removed by unscrewing it from the handle and replacing it with a new knob. Be sure to keep the color-coded system in place to allow users to easily recognize which dispensing faucet goes with each tank.

Steel auto shut-off faucet (with black ball knob)
The steel auto shut-off faucet can be removed and replaced as needed. There are also spare parts available for the steel auto shut-off faucet as noted by asterisks in figure 27.

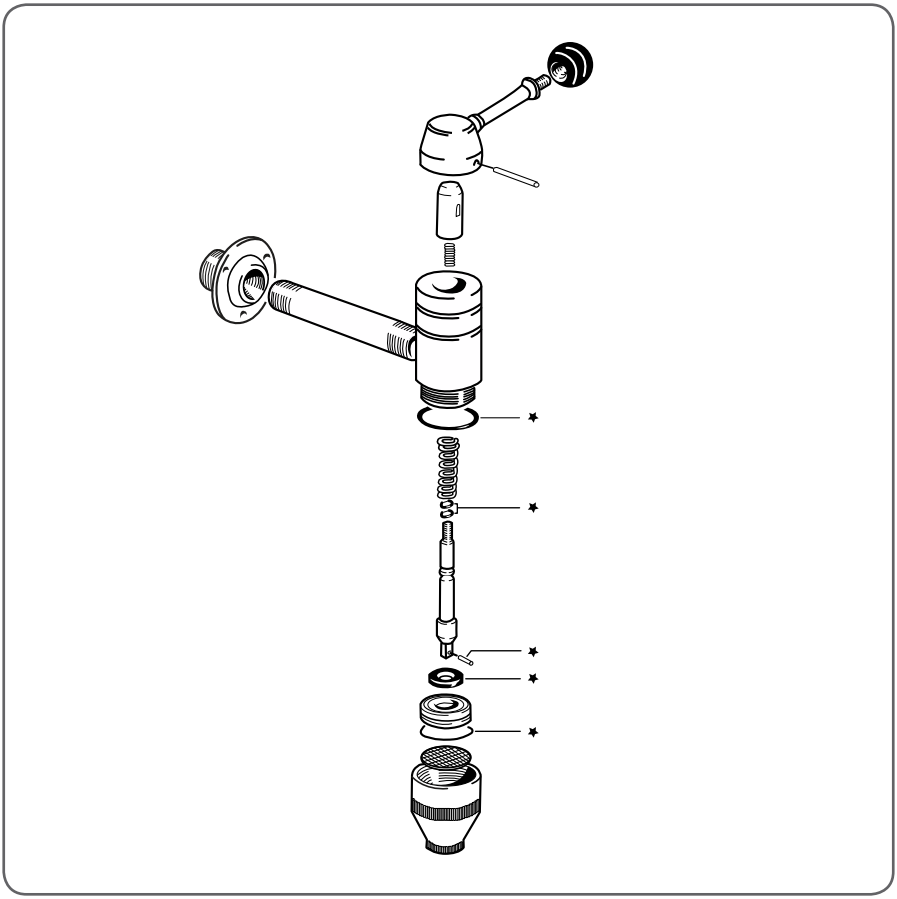


Fig 27 Steel auto shut off faucet – exploded view

Spin-on filter (4, 7 or 25 um – micro glass)
This is the filter for the tank. The micron rating required will depend on your stated specification. Contact your supplier for additional information.

Static discharge grounding reel (retractable) 7,6 m (25ft)
The static discharge grounding reel can be removed and replaced. Disassembly of the reel will void any warranty. Contact your supplier for additional information.

Spill pallet overflow connector - Rubber sealing washer (1")
If the rubber sealing washers that connect the spill pallets together become degraded, contact your supplier for replacement parts.

Suction hose assembly - Stainless steel tube W / Reinforced PVC hose
The suction hose assembly used to load fluid from 55 gallon drums can be replaced. Contact your supplier for additional information.

Table 1: Spare and replacement parts list

Description	Type	Part #
Direct mount overfill alarm (audible & flashing light)- fits to tank level gauge	Alarm	921102
Colored ball knob for steel faucet shut off valve - Beige	Ball knob	921000
Colored ball knob for steel faucet shut off valve - Black	Ball knob	921001
Colored ball knob for steel faucet shut off valve - Blue	Ball knob	921002
Colored ball knob for steel faucet shut off valve - Dark green	Ball knob	921003
Colored ball knob for steel faucet shut off valve - Gray	Ball knob	921004
Colored ball knob for steel faucet shut off valve - Mid green	Ball knob	921005
Colored ball knob for steel faucet shut off valve - Orange	Ball knob	921006
Colored ball knob for steel faucet shut off valve - Purple	Ball knob	921007
Colored ball knob for steel faucet shut off valve - Red	Ball knob	921008
Colored ball knob for steel faucet shut off valve - Yellow	Ball knob	921009
Tank desiccant air breather	Breather	46Z134
Steel auto-shut off faucet (with black ball knob)	Faucet	921020
Brass faucet – fire upgrade option – 3/4"	Faucet	921110
Brass faucet – fire upgrade option – 2"	Faucet	921111
Spin-on filter - 4um - β2000 - micro glass	Filter	469904
Spin-on filter - 7um - β2000 - micro glass	Filter	469907
Spin-on filter - 25um - β2000 - micro glass	Filter	469925
Tank level gauge 113/246/454 litre (30/65/120 US gal) - top mount, mechanical float	Gauge	921105
Tank level gauge 908 litre (240 US gal) - top mount, mechanical float	Gauge	921106
Blind end cap (1") for fill port inlet dixon coupling	Hardware	921180

Description	Type	Part #
Steel auto-shut off faucet - complete gasket kit - spare part for 921020	Seal O-Ring / Gaskets	921025
Static discharge grounding reel, retractable 7,6 m (25 ft)	Reel	921275
Steel auto-shut off faucet dispenser nozzle O-Ring – spare part for 921020	Seal- O-Ring	920120
Spill pallet overflow connector - rubber sealing washer (1")	Seal - rubber washer	9211350
Dixon coupling - rubber sealing washer (1")	Seal - rubber washer	921190
Suction hose assembly - stainless steel tube W / Reinforced PVC hose	Tube	921300

8.2 Tank or motor replacement

For repair or replacement of a tank or motor, contact your supplier for ordering information. Prior to servicing, the tank should be pumped empty and then isolated using the tank isolation valves on the underside of the tank, power should be disconnected from the system, and all hoses and cords removed from the tank assembly. There are two holding down bolts on the underside of the tank that must be removed prior to uninstalling the tank.

The motor/pump assembly is secured to the pod using a removable skid which is bolted to the pod. For motor removal and replacement, disconnect all lines from the motor/pump and remove the skid bolts. The motor/pump skid can then be pulled out and the new motor/pump can be set into place and connected.

When servicing, removing, or replacing parts, there may be specific tools required. The table below lists tool specifications for servicing, removing, or replacing equipment.

Table 2: Tools and wrench list item description fastener tool size

Description	Fastener	Tool	Size
Dispensing console - Faucet mounting screws	No. 10/24 Cap screws	Hex key	1/8"
Dispensing console - Pressure gauge face mounting screws	No. 6 Cap screws	Hex key	5/64"
Dispensing console - Stainless splash plate - mounting screws	5/16" Unc cap screws	Hex key	3/16"
Dispensing console - Steel mounting plate screws	5/16" Unc cap screws	Hex key	3/16"
Hose connections - All discharge hydraulic hose connections	3/4" Jic hose coupler	Wrench	1 1/4"
Hose connections - All pump by-pass return hose connections	1/2" Jic hose coupler	Wrench	7/8"
Hose connections - All suction hydraulic hose connections	1" Jic hose coupler	Wrench	1 1/2"
Hose connections - All system pressure gauge hose connections	1/4" Jic hose coupler	Wrench	9/16"
Hose connections - Dixon cam & groove coupling (male adaptor)	1" Npt male adaptor	Wrench	1 1/2"
Motor - Holding down bolts	5/16" Unc bolt	Wrench	1/2"
Motor/pump manifold foundation bracket - Holding down bolts	3/8" Unc bolt	Wrench	9/16"
Motor/pump skid - Holding down bolts	3/8" Unc bolt	Wrench	9/16"
Spill pallet connector - Through wall lock nuts	1" Through-wall lock nut	Wrench	1 1/2"
Static discharge grounding reel - Mounting bolts	1/4" Unc bolt	Wrench	7/16"
System leveling/jacking bolts	1/2" Unc bolt	Wrench	3/4"
Tank - mechanical float level gauge - Steel bung adaptor	2" Npt bung adaptor	Wrench	2 3/8"
Tank - sealing plug (rear face - bottom auxiliary port)	1" Npt hex socket plug	Hex key	5/8"

9. Data tables

Tank re-circulation ("Kidney-loop") cycle time guide								
Iso viscosity	32	46	68	100	220	320	460	680
Pump flow rate *(GPM)*	3	3	3	3	3	3	3	3
Rated tank size	**Approximate circulation time** *(Minutes)*							
113 litre (30 US gal)	70	70	70	70	70	70	70	70
246 litre (65 US gal)	152	152	152	152	152	152	152	152
454 litre (120 US gal)	280	280	280	280	280	280	280	280
908 litre (240 US gal)	560	560	560	560	560	560	560	560
Single pass filtration factor	7							
(Reservoir size × 7) / Pump flow rate = Time								

- Times will be a function of initial oil cleanliness, oil grades, oil temperature and other factors. Times based on a rated full tank (not brimful capacity).
- Flow rate values are approximate.
- Motor pump set 1HP / (120 V - 240 V) / (50HZ - 60 HZ)
- Factory supplied micro-glass, β2000 spin-on filters.

Bulk oil tank capacities

Standard tank	Approx. brim full capacity
113 litre (30 US gal)	136 litre (36 US gal)
246 litre (65 US gal)	276 litre (73 US gal)
454 litre (120 US gal)	568 litre (150 US gal)
908 litre (240 US gal)	1 136 litre (300 US gal)

System weights and dimensions

Item	Approx. dimensions w × d × h	Approx. weight (empty)
Tank pod (inc. tanks)	116 × 116 × 232,5 cm (46 × 46 × 88 in.)	748 kg (1 650 lb)
113 litre (30 US gal)	24 × 100 × 58,5 cm (9.375 × 39.5 × 23 in.)	48,5 kg (107 lb)
246 litre (65 US gal)	48 × 100 × 58,5 cm (19 × 39.5 × 23 in.)	65 kg (144 lb)
454 litre (120 US gal)	98 × 100 × 58,5 cm (38.5 × 39.5 × 23 in.)	105 kg (232 lb)
908 litre (240 US gal)	98 × 100 × 117 cm (38.5 × 39.5 × 46 in.)	163 kg (360 lb)

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