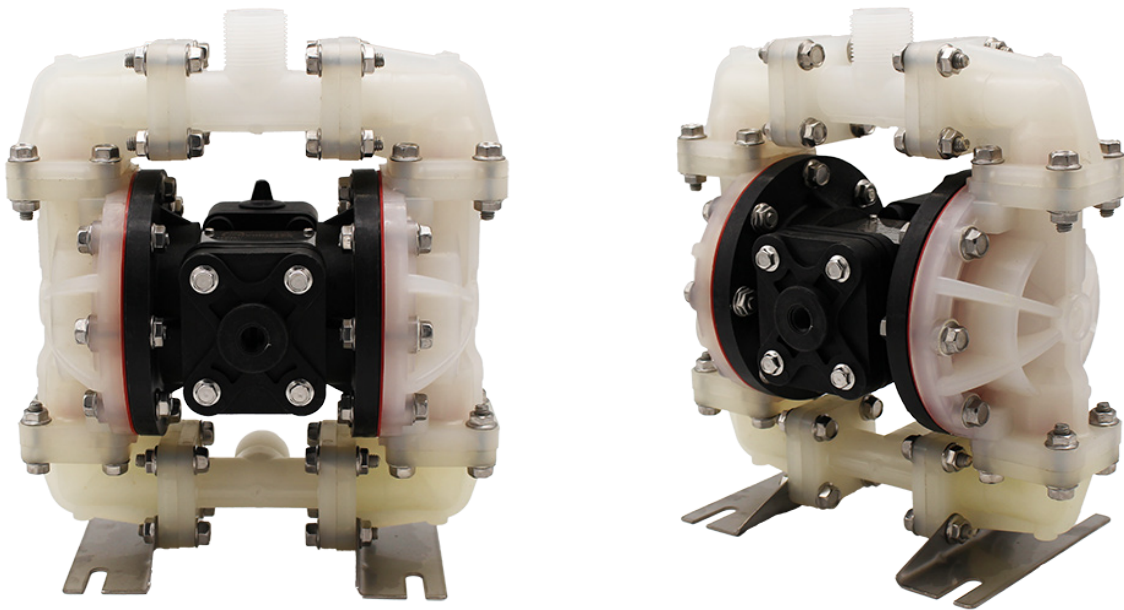


# EF05 Non-Metallic Pumps

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## Assembly, Installation and Operation Manual



**UK  
CA**

# Contents

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Safety Information ..... 1

How AODD Pumps Work ..... 2

Material Recommendations & Restrictions ..... 3

Diaphragm Servicing ..... 4

Troubleshooting Guide ..... 5

Pump Matrix ..... 6

Performance Curve & Tech Spec ..... 7

Dimensional Drawings ..... 8

Suggested Installation ..... 9

Torque Sequence ..... 10

Exploded View ..... 11

Parts List ..... 12

Certificates ..... 14

# Safety Information

## IMPORTANT



Read the safety warnings and instructions in this manual before pump installation and start-up. Failure to comply with the recommendations stated in this manual could damage the pump and void factory.



When the pump is used for materials that tend to settle out or solidify, the pump should be flushed after each use to prevent damage. In freezing temperatures the pump should be completely drained between uses.

## CAUTION



Before pump operation, inspect all fasteners for loosening caused by gasket creep. Retighten loose fasteners to prevent leakage. Follow recommended torques stated in this manual.



Nonmetallic pumps and plastic components are not UV stabilized. Ultraviolet radiation can damage these parts and negatively affect material properties. Do not expose to UV light for extended periods of time.

## WARNING



When used for toxic or aggressive fluids, the pump should always be flushed clean prior to disassembly.



Before maintenance or repair, shut off the compressed air line, bleed the pressure, and disconnect the air line from the pump. Be certain that approved eye protection and protective clothing are worn at all times. Failure to follow these recommendations may result in serious injury or death.



Airborne particles and loud noise hazards. Wear eye and ear protection.



In the event of diaphragm rupture, pumped material may enter the air end of the pump, and be discharged into the atmosphere. If pumping a product that is hazardous or toxic, the air exhaust must be piped to an appropriate area for safe containment.



Take action to prevent static sparking. Fire or explosion can result, especially when handling flammable liquids. The pump, piping, valves, containers and other miscellaneous equipment must be properly grounded.



This pump is pressurised internally with air pressure during operation. Make certain that all fasteners and piping connections are in good condition and are reinstalled properly during reassembly.



Use safe practices when lifting.

# How do AODD Pumps Work?

## Basic Principle

An AODD pump uses compressed air to move two flexible diaphragms back and forth, creating a pumping action that draws fluid in and pushes it out.

## How It Works

The pump has two chambers, each with a diaphragm, inlet valve, and outlet valve. The diaphragms are connected by a shaft so they move together in unison.

### Image 1:

- Compressed air enters the right diaphragm chamber, pushing the right diaphragm to the left.
- This action pulls the left diaphragm to the left, creating a vacuum in the left chamber.
- As a result:
  - The left inlet valve opens, drawing fluid into the left chamber.
  - The left outlet valve closes to prevent backflow.
  - The right chamber, now being compressed, pushes fluid out through its open outlet valve.
  - The right inlet valve remains closed.

### Image 2:

- The air valve now redirects compressed air to the left chamber, pushing the left diaphragm to the right.
- The right diaphragm is pulled to the right, creating a vacuum in the right chamber.
- As a result:
  - The right inlet valve opens, allowing fluid into the right chamber.
  - The right outlet valve closes.
  - The left chamber, under compression, discharges fluid through its open outlet valve.
  - The left inlet valve is closed.

## Cycle Repeats

This alternating action of air pressure:

- Moves the diaphragms back and forth,
- Continuously draws fluid into one chamber while pushing it out from the other.

## Key Advantages

- Can run dry without damage\*
- Self-priming
- Suitable for abrasive, viscous, or chemically aggressive fluids
- Explosion-proof (for ATEX models)

Image 1

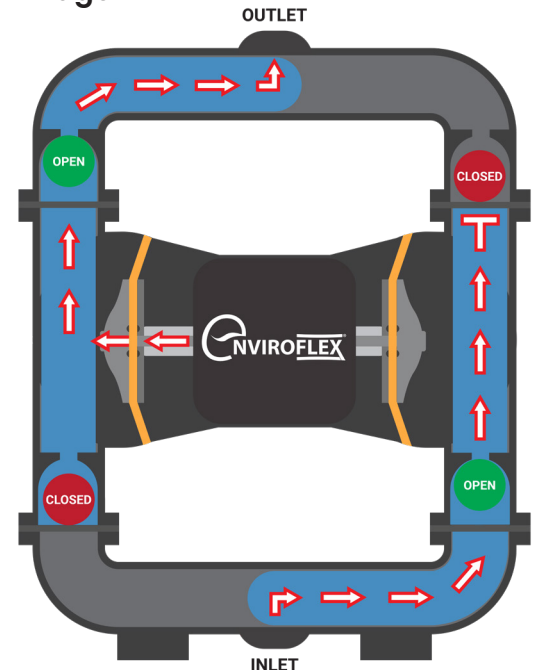
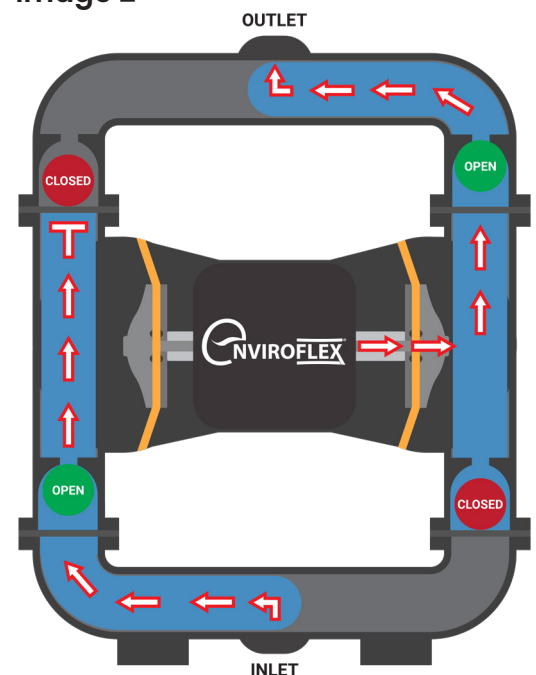


Image 2



## DISCLAIMER

\*Dry Running Disclaimer: AODD pumps can safely run dry without damaging internal components, making them ideal for intermittent or stop-start applications. However, prolonged dry operation may increase wear on diaphragms and valve seats over time, so it's best used as a short-term feature rather than a continuous one.

# Material Recommendations

| Material Profile:                                                                                                                                                                                                                                                                                                                 | Operating Temperature |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------|
|                                                                                                                                                                                                                                                                                                                                   | Max.                  | Min.             |
| CAUTION! Operating temperature limitations are as follows:                                                                                                                                                                                                                                                                        |                       |                  |
| <b>Acetal:</b> Tough, impact resistant, ductile. Good abrasion resistance and low friction surface. Generally inert, with good chemical resistance except for strong acids & oxidising agents.                                                                                                                                    | 190 °F<br>88 °C       | -20 °F<br>-29 °C |
| <b>EPDM:</b> Shows very good water and chemical resistance. Has poor resistance to oils and solvents, but is fair in ketones and alcohols.                                                                                                                                                                                        | 280°F<br>138°C        | -40°F<br>-40°C   |
| <b>FKM:</b> (Fluorocarbon) Shows good resistance to a wide range of oils and solvents; especially all aliphatic, aromatic and halogenated hydrocarbons, acids, animal and vegetable oils. Hot water or hot aqueous solutions (over 70°F(21°C)) will attack FKM.                                                                   | 350°F<br>177°C        | -40°F<br>-40°C   |
| <b>Hytrel:</b> Good on acids, bases, amines and glycols at room temperatures only.                                                                                                                                                                                                                                                | 220°F<br>104°C        | -20°F<br>-29°C   |
| <b>Neoprene:</b> All purpose. Resistance to vegetable oils. Generally not affected by moderate chemicals, fats, greases and many oils and solvents. Generally attacked by strong oxidising acids, ketones, esters and nitro hydrocarbons and chlorinated aromatic hydrocarbons.                                                   | 200°F<br>93°C         | -10°F<br>-23°C   |
| <b>Nitrile:</b> General purpose, oil-resistant. Shows good solvent, oil, water and hydraulic fluid resistance. Should not be used with highly polar solvents like acetone and MEK, ozone, chlorinated hydrocarbons and nitro hydrocarbons.                                                                                        | 190°F<br>88°C         | -10°F<br>-23°C   |
| <b>Nylon:</b> 6/6 High strength and toughness over a wide temperature range. Moderate to good resistance to fuels, oils and chemicals.                                                                                                                                                                                            | 180°F<br>82°C         | -32°F<br>-0°C    |
| <b>Polypropylene:</b> A thermoplastic polymer. Moderate tensile and flex strength. Resists strong acids and alkali. Attacked by chlorine, fuming nitric acid and other strong oxidising agents.                                                                                                                                   | 180°F<br>82°C         | -32°F<br>-0°C    |
| <b>PVDF:</b> (Polyvinylidene Fluoride) A durable fluoroplastic with excellent chemical resistance. Excellent for UV applications. High tensile strength and impact resistance.                                                                                                                                                    | 250°F<br>121°C        | -0°F<br>-18°C    |
| <b>Santoprene:</b> Injection molded thermoplastic elastomer with no fabric layer. Long mechanical flex life. Excellent abrasion resistance.                                                                                                                                                                                       | 275°F<br>135°C        | -40°F<br>-40°C   |
| <b>UHMW PE:</b> A thermoplastic that is highly resistant to a broad range of chemicals. Exhibits outstanding abrasion and impact resistance, along with environmental stress-cracking resistance.                                                                                                                                 | 180°F<br>82°C         | -35°F<br>-37°C   |
| <b>Urethane:</b> Shows good resistance to abrasives. Has poor resistance to most solvents and oils.                                                                                                                                                                                                                               | 150 °F<br>66 °C       | -32°F<br>-0°C    |
| <b>PTFE:</b> (PFA/TFE) Chemically inert, virtually impervious. Very few chemicals are known to chemically react with PTFE; molten alkali metals, turbulent liquid or gaseous fluorine and a few fluoro-chemicals such as chlorine trifluoride or oxygen difluoride which readily liberate free fluorine at elevated temperatures. | 220°F<br>104°C        | -35°F<br>-37°C   |
| Maximum and Minimum Temperatures are the limits for which these materials can be operated. Temperatures coupled with pressure affect the longevity of diaphragm pump components. Maximum life should not be expected at the extreme limits of the temperature ranges.                                                             |                       |                  |
| Metals:                                                                                                                                                                                                                                                                                                                           |                       |                  |
| <b>Alloy C:</b> Equal to ASTM494 CW-12M-1 specification for nickel and nickel alloy.                                                                                                                                                                                                                                              |                       |                  |
| <b>Stainless Steel:</b> Equal to or exceeding ASTM specification A743 CF-8M for corrosion resistant iron chromium, iron chromium nickel and nickel based alloy castings for general applications. Commonly referred to as 316 Stainless Steel in the pump industry.                                                               |                       |                  |
| For specific applications, always consult the Chemical Resistance Chart.                                                                                                                                                                                                                                                          |                       |                  |

**Ambient temperature range:** -20°C to +40°C

**Process temperature range:** -20°C to +80°C for models rated as category 1 equipment  
-20°C to +100°C for models rated as category 2 equipment

In addition, the ambient temperature range and the process temperature range do not exceed the operating temperature range of the applied non-metallic parts as listed in the manuals of the pumps.

# Diaphragm Servicing

**Step 1:** With manifolds and outer chambers removed, remove diaphragm assemblies from diaphragm rod. DO NOT use a pipe wrench or similar tool to remove assembly from rod. Flaws in the rod surface may damage bearings and seal. Soft jaws in a vise are recommended to prevent diaphragm rod damage.

(NOTE: Not all inner diaphragm plates are threaded. Some models utilise a through hole in the inner diaphragm plate. If required to separate diaphragm assembly, place assembly in a vise, gripping on the exterior cast diameter of the inner plate. Turn the outer plate clockwise to separate the assembly. Always inspect diaphragms for wear cracks or chemical attack. Inspect inner and outer plates for deformities, rust scale and wear. Inspect intermediate bearings for elongation and wear. Inspect diaphragm rod for wear or marks. Clean or repair if appropriate. Replace as required.)

**Step 2:** Reassembly: There are two different types of diaphragm plate assemblies utilised throughout the Enviroflex Pumps product line: Outer plate with a threaded stud, diaphragm, and a threaded inner plate. Outer plate with a threaded stud, diaphragm, and an inner plate with through hole. Secure threaded inner plate in a vise. Ensure that the plates are being installed with the outer radius against the diaphragm.

**Step 3:** Lightly lubricate, with a compatible material, the inner faces of both outer and inner diaphragm plates when using on non Overlay diaphragms (For EPDM water is recommended. No lubrication is required.)

**Step 4:** Push the threaded outer diaphragm plate through the centre hole of the diaphragm. Note: Most diaphragms are installed with the natural bulge out towards the fluid side. 05, 07, and 10 non-metallic units are installed with the natural bulge in towards the air side.

**Step 5:** Thread or place, outer plate stud into the inner plate. For threaded inner plates, use a torque wrench to tighten the assembly together. Torque values are called out on page 10. Repeat procedure for second side assembly. Allow a minimum of 15 minutes to elapse after torquing, then re-torque the assembly to compensate for stress relaxation in the clamped assembly.

**Step 6:** Thread one assembly onto the diaphragm rod with sealing washer (when used) and bumper.

**Step 7:** Install diaphragm rod assembly into pump and secure by installing the outer chamber in place and tightening the capscrews.

**Step 8:** On opposite side of pump, thread the remaining assembly onto the diaphragm rod. Using a torque wrench, tighten the assembly to the diaphragm rod. Align diaphragm through bolt holes, always going forward past the recommended torque. Torque values are called out on page 10. NEVER reverse to align holes, if alignment cannot be achieved without damage to diaphragm, loosen complete assemblies, rotate diaphragm and reassemble as described above.

**Step 9:** Complete assembly of entire unit. One Piece Diaphragm Servicing (Bonded PTFE with integral plate) The One Piece diaphragm has a threaded stud installed in the integral plate at the factory. The inner diaphragm plate has a through hole instead of a threaded hole. Place the inner plate over the diaphragm stud and thread the first diaphragm / inner plate onto the diaphragm rod only until the inner plate contacts the rod. Do not tighten. A small amount of grease may be applied between the inner plate and the diaphragm to facilitate assembly. Insert the diaphragm / rod assembly into the pump and install the outer chamber. Turn the pump over and thread the second diaphragm / inner plate onto the diaphragm rod. Turn the diaphragm until the inner plate contacts the rod and hand tighten the assembly. Continue tightening until the bolt holes align with the inner chamber holes. **DO NOT LEAVE THE ASSEMBLY LOOSE**

## IMPORTANT



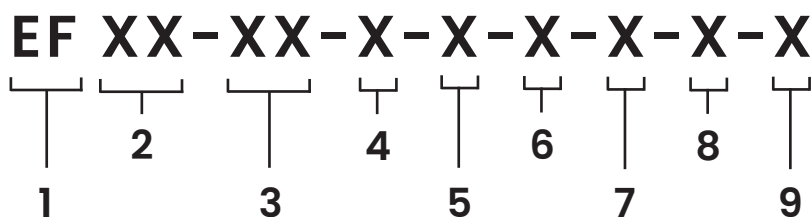
Read these instructions completely, before installation and start-up. It is the responsibility of the purchaser to retain this manual for reference. Failure to comply with the recommendations stated in this manual will damage the pump, and void factory.

# Troubleshooting Guide

| Symptom:                                                            | Potential Cause(s):                                                               | Recommendation(s):                                                                                                                                                                                                                   |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pump Cycles Once</b>                                             | Deadhead (system pressure meets/exceeds air supply pressure).                     | Increase the inlet air pressure to the pump. Pump is designed for 1:1 pressure ratio at zero flow. (Does not apply to high pressure 2:1 units).                                                                                      |
|                                                                     | Air valve or intermediate gaskets installed incorrectly.                          | Install gaskets with holes properly aligned.                                                                                                                                                                                         |
|                                                                     | Bent or missing actuator plunger.                                                 | Remove pilot valve and inspect actuator plungers.                                                                                                                                                                                    |
| <b>Pump Will Not Operate / Cycle</b>                                | Pump is over lubricated.                                                          | Set lubricator on lowest possible setting or remove. Units are designed for lube free operation.                                                                                                                                     |
|                                                                     | Lack of air (line size, PSI, CFM).                                                | Check the air line size and length, compressor capacity (HP vs. CFM required).                                                                                                                                                       |
|                                                                     | Check air distribution system.                                                    | Disassemble and inspect main air distribution valve, pilot valve and pilot valve actuators.                                                                                                                                          |
|                                                                     | Discharge line is blocked or clogged manifolds.                                   | Check for inadvertently closed discharge line valves. Clean discharge manifolds/piping.                                                                                                                                              |
|                                                                     | Deadhead (system pressure meets/exceeds air supply pressure).                     | Increase the inlet air pressure to the pump. Pump is designed for 1:1 pressure ratio at zero flow. (Does not apply to high pressure 2:1 units).                                                                                      |
|                                                                     | Blocked air exhaust muffler.                                                      | Remove muffler screen, clean or de-ice, and re-install.                                                                                                                                                                              |
|                                                                     | Pumped fluid in air exhaust muffler.                                              | Disassemble pump chambers. Inspect for diaphragm rupture/loose diaphragm plate assembly.                                                                                                                                             |
|                                                                     | Pump chamber is blocked.                                                          | Disassemble and inspect wetted chambers. Remove or flush any obstructions.                                                                                                                                                           |
| <b>Pump Cycles and Will Not Prime or No Flow</b>                    | Cavitation on suction side.                                                       | Check suction condition (move pump closer to product).                                                                                                                                                                               |
|                                                                     | Check valve obstructed. Valve ball not seating properly (sticking).               | Disassemble the wet end of the pump and manually dislodge obstruction in the check valve pocket. Clean out around valve ball cage and valve seat area. Replace valve ball or valve seat if damaged. Use heavier valve ball material. |
|                                                                     | Valve ball missing (pushed into chamber or manifold).                             | Worn valve ball or valve seat. Worn fingers in valve ball cage(replace part). Check Chemical Resistance Guide for compatibility.                                                                                                     |
|                                                                     | Valve ball(s) / seat(s) damaged or attacked by product.                           | Check Chemical Resistance Guide for compatibility.                                                                                                                                                                                   |
|                                                                     | Check valve and/or seat is worn or needs adjusting.                               | Inspect check valves and seats for wear and proper setting. Replace if necessary.                                                                                                                                                    |
|                                                                     | Suction line is blocked.                                                          | Remove or flush obstruction. Check and clear all suction screens or strainers.                                                                                                                                                       |
|                                                                     | Excessive suction lift.                                                           | For lifts exceeding 20' of liquid, filling the chambers with liquid will prime the pump in most cases.                                                                                                                               |
|                                                                     | Suction side air leakage or air in product.                                       | Visually inspect all suction-side gaskets and pipe connections.                                                                                                                                                                      |
|                                                                     | Pumped fluid in air exhaust muffler.                                              | Disassemble pump chambers. Inspect for diaphragm rupture/loose diaphragm plate assembly.                                                                                                                                             |
| <b>Pump Cycles Running Sluggish / Stalling, Flow Unsatisfactory</b> | Over lubrication.                                                                 | Set lubricator on lowest possible setting or remove. Units are designed for lube free operation.                                                                                                                                     |
|                                                                     | Icing.                                                                            | Remove muffler screen, de-ice, and re-install. Install a point of use air drier.                                                                                                                                                     |
|                                                                     | Clogged manifolds.                                                                | Clogged manifolds. Clean manifolds to allow proper air flow.                                                                                                                                                                         |
|                                                                     | Deadhead (system pressure meets/exceeds air supply pressure).                     | Increase the inlet air pressure to the pump. Pump is designed for 1:1 pressure ratio at zero flow. (Does not apply to high pressure 2:1 units).                                                                                      |
|                                                                     | Cavitation on suction side.                                                       | Check suction (move pump closer to product).                                                                                                                                                                                         |
|                                                                     | Lack of air (line size, PSI, CFM).                                                | Check the air line size, length, compressor capacity.                                                                                                                                                                                |
|                                                                     | Excessive suction lift.                                                           | For lifts exceeding 20' of liquid, filling the chambers with liquid will prime the pump in most cases.                                                                                                                               |
|                                                                     | Air supply pressure or volume exceeds system hd.                                  | Decrease inlet air (press. and vol.) to the pump. Pump is cavitating the fluid by fast cycling.                                                                                                                                      |
|                                                                     | Undersized suction line.                                                          | Meet or exceed pump connections.                                                                                                                                                                                                     |
|                                                                     | Restrictive or undersized air line.                                               | Install a larger air line and connection.                                                                                                                                                                                            |
|                                                                     | Suction side air leakage or air in product.                                       | Visually inspect all suction-side gaskets and pipe connections.                                                                                                                                                                      |
|                                                                     | Suction line is blocked.                                                          | Remove or flush obstruction. Check and clear all suction screens or strainers.                                                                                                                                                       |
|                                                                     | Pumped fluid in air exhaust muffler.                                              | Disassemble pump chambers. Inspect for diaphragm rupture/loose diaphragm plate assembly.                                                                                                                                             |
|                                                                     | Check valve obstructed.                                                           | Disassemble the wet end of the pump and dislodge obstruction in the check valve pocket.                                                                                                                                              |
|                                                                     | Check valve and/or seat is worn or needs adjusting.                               | Inspect check valves and seats for wear and proper setting. Replace if necessary.                                                                                                                                                    |
|                                                                     | Entrained air or vapor lock in chamber(s).                                        | Purge chambers through tapped chamber vent plugs. This can be dangerous.                                                                                                                                                             |
| <b>Product Leaking Through Exhaust</b>                              | Diaphragm failure, or diaphragm plates loose.                                     | Replace diaphragms, check for damage and ensure diaphragm plates are tight.                                                                                                                                                          |
|                                                                     | Diaphragm stretched around centre hole or bolt holes.                             | Check for excessive inlet pressure or air pressure. Consult Chemical Resistance Chart for compatibility with products, cleaners, temperature limitations and lubrication.                                                            |
| <b>Premature Diaphragm Failure</b>                                  | Cavitation.                                                                       | Enlarge pipe diameter on suction side of pump and increase positive static suction head where possible.                                                                                                                              |
|                                                                     | Excessive flooded suction pressure.                                               | Move pump closer to product. Raise pump/place pump on top of tank to reduce inlet pressure. Install Back pressure device (Tech bulletin 41r). Add accumulation tank or pulsation dampener.                                           |
|                                                                     | Misapplication (chemical/physical incompatibility).                               | Consult Chemical Resistance Chart for compatibility with products, cleaners, temperature limitations and lubrication.                                                                                                                |
|                                                                     | Incorrect diaphragm plates or plates on backwards, installed incorrectly or worn. | Check Operating Manual to check for correct part and installation. Ensure outer plates have not been worn to a sharp edge.                                                                                                           |
| <b>Unbalanced Cycling</b>                                           | Excessive suction lift.                                                           | For lifts exceeding 20' of liquid, filling the chambers with liquid will prime the pump in most cases.                                                                                                                               |
|                                                                     | Undersized suction line.                                                          | Meet or exceed pump connections.                                                                                                                                                                                                     |
|                                                                     | Pumped fluid in air exhaust muffler.                                              | Disassemble pump chambers. Inspect for diaphragm rupture/loose diaphragm plate assembly.                                                                                                                                             |
|                                                                     | Suction side air leakage or air in product.                                       | Visually inspect all suction-side gaskets and pipe connections.                                                                                                                                                                      |
|                                                                     | Check valve obstructed.                                                           | Disassemble the wet end of the pump and dislodge obstruction in the check valve pocket.                                                                                                                                              |
|                                                                     | Check valve/seat is worn/needs adjusting.                                         | Inspect check valves and seats for wear and proper setting. Replace if necessary.                                                                                                                                                    |
|                                                                     | Entrained air or vapor lock in chamber(s).                                        | Purge chambers through tapped chamber vent plugs.                                                                                                                                                                                    |

# Pump Matrix

---



## 1 - Pump Brand

EF - Enviroflex

EFHDF - Enviroflex Heavy Duty Flap

## 2 - Pump Size

02 - 1/4"

05 - 1/2"

07 - 3/4"

10 - 1"

1F - 1"

15 - 1 1/2"

20 - 2"

30 - 3"

## 3 - Design Level

01 - Design Level

02 - Design Level

## 4 - Wetted Material

A - Aluminium

I - Cast Iron

K - PVDF

P - Polypropylene

S - Stainless Steel

## 5 - Non-Wetted Material Options

A - Aluminium

P - Polypropylene

S - Stainless Steel

## 6 - Diaphragm/Check Valve Materials

1 - Santoprene/Santoprene

2 - PTFE-Santoprene/PTFE

B - Nitrile/Nitrile

E - EPDM/EPDM

G - PTFE-Neoprene/PTFE

V - FKM/FKM

## 7 - Check Valve Seat

A - Aluminium

B - Nitrile

E - EPDM

K - PVDF

N - Neoprene

P - Polypropylene

S - Stainless Steel

T - PTFE

U - FKM

W - UHMW Polyethylene

## 8 - Porting Options

A - ANSI Flange (150lb FF Dimensions)

B - BSPT Threads

N - NPT Threads

U - Universal Flange (ANSI 150lb FF / PN10 BS4504 Dimensions)

## 9 - Muffler Options

0 Standard Muffler

6 Metal Muffler

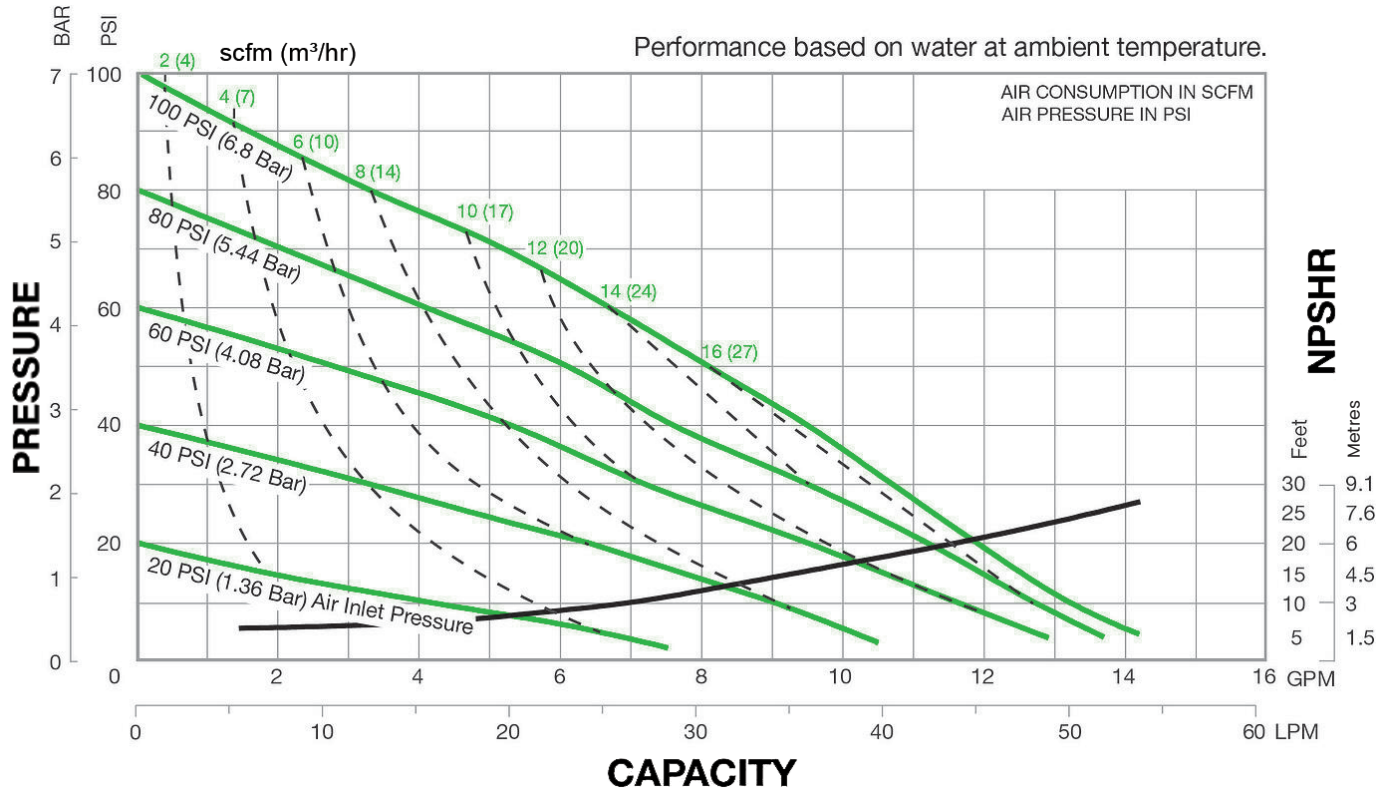
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Record the model number and serial number below for future reference. This is important information when ordering replacement parts or when technical assistance is required.

Your Serial #: \_\_\_\_\_

Your Pump Model #: \_\_\_\_\_

# Performance



## PORT SIZE

- 1/2" Female or 1" Male BSP Dual Connection
- 1/2" Female or 1" Male NPT Dual Connection

## MAX FREE FLOW ON WATER AT 20°C/68°F

- 56 LPM / 15 USGPM

(on some models 20% reduction should PTFE Diaphragms be fitted)

## VOLUME DISPLACEMENT PER FULL CYCLE

- 0.196 Litres / 0.052 US Gallons

## VOLUME PER STROKE (HALF CYCLE)

- 0.098 Litres / 0.026 US Gallons

## MAX WORKING PRESSURE @ 20°C/68°F

- 6.8 Barg / 100 Psig

## PUMP BODY MIN/MAX WORKING TEMP

- Polypropylene - 4-66°C / 40-150°F
- PVDF - 0-93°C / 32-200°F

## MAX PUMPABLE PARTICLE SIZE

- 3.2mm / 1/8" in diameter

## MAX DRY SUCTION LIFT ON WATER

- 4.4 metres / 13 feet (Rubber Balls)

## MAX WET SUCTION LIFT ON WATER

- 7.6 metres / 23 feet (Rubber Balls)

## MAX AIR CONSUMPTION

- 16 scfm / 27 m³/hr

## AIR INLET PORT SIZE

- 1/4" NPT Female

## AIR OUTLET PORT SIZE / MUFFLER

- 3/8" NPT Female

## MAX SOUND POWER LEVEL (DBA - ISO 9614-2)

- 95 dBA

(at max air inlet pressure - will reduce with air pressure)

## BODY MATERIALS AVAILABLE AND WEIGHT

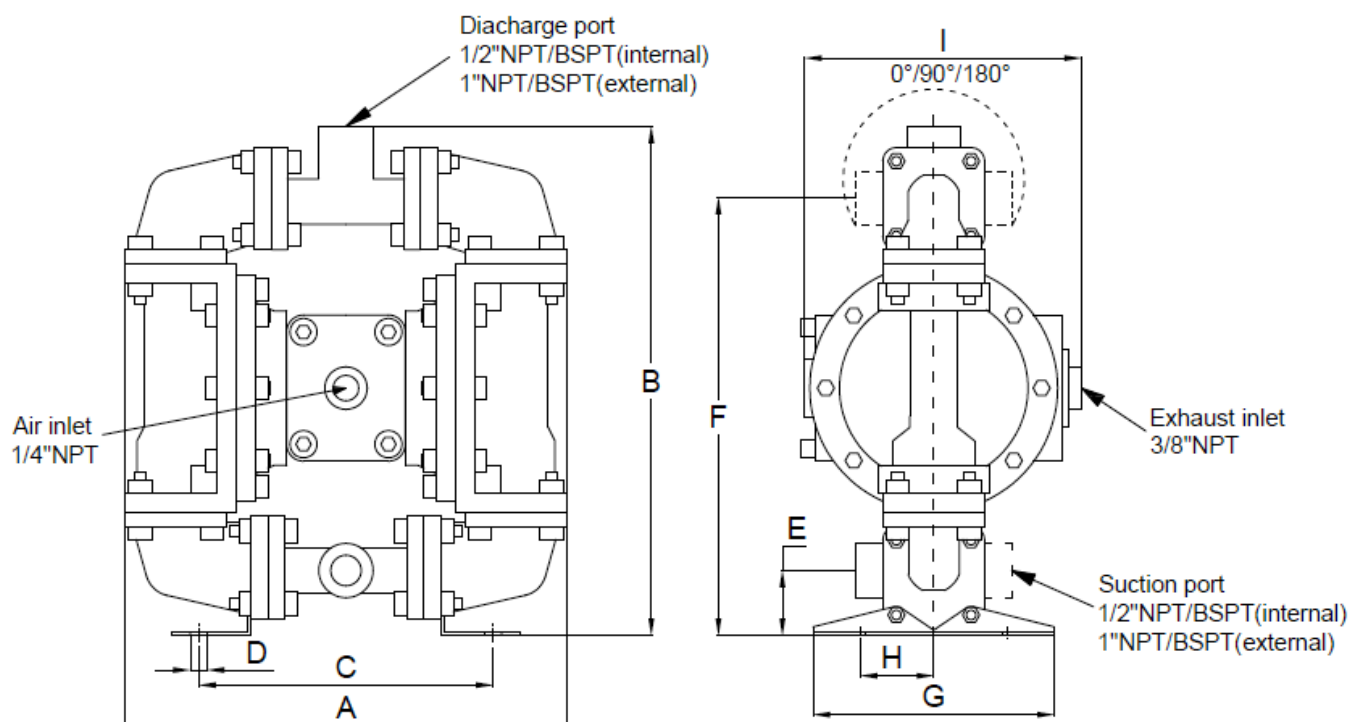
- Polypropylene - 5.5 kg
- PVDF - 6.3 kg

## DIAPHRAGM & CHECK VALVE

### MATERIALS AVAILABLE

- Santoprene
- PTFE
- Neoprene
- Hytel
- Nitrile
- FKM
- EPDM
- Stainless Steel

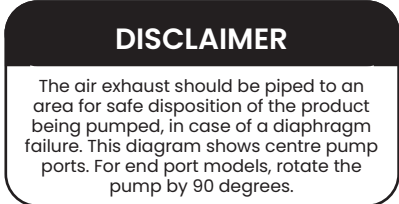
# Dimensional Drawings



## Dimension Tolerance :±5mm or ±0.2"

| Port Size                                        | Air Inlet Size | Exhaust Port Size | A   | B   | C   | D  | E  | F   | G   | H  | I                   |                  |
|--------------------------------------------------|----------------|-------------------|-----|-----|-----|----|----|-----|-----|----|---------------------|------------------|
|                                                  |                |                   | mm  | mm  | mm  | mm | mm | mm  | mm  | mm | standard muffler mm | metal muffler mm |
| 1/2" NPT/BSP (internal)<br>1" NPT/BSP (external) | 1/4" NPT       | 3/8" NPT          | 257 | 293 | 166 | 9  | 36 | 250 | 142 | 92 | 181                 | 224              |

---



Position the pump as close as possible to the source of the product being pumped. To ensure optimal efficiency, minimise both the length of the suction line and the number of fittings used. Do not reduce the diameter of the suction line.

Connect the pump's air inlet to a supply that can deliver adequate pressure and volume to achieve the desired performance. A pressure-regulating valve should be installed to ensure the air pressure does not exceed the recommended limits. Please ensure the correct air line diameter is installed, to match the same as the pump air inlet size.

The pump's air distribution system is designed to operate without the need for lubrication. This is the standard operating mode. However, if lubrication is preferred, install an in-line air lubricator adjusted to deliver one drop of SAE 10 non-detergent oil for every 20 SCFM (9.4 litres/second) of air consumed. Consult the performance curve to determine the air consumption rate.

Moisture in the compressed air can lead to icing in the exhaust system, which may cause irregular pump cycling or complete shutdown. To reduce moisture, install a point-of-use air moisture separator near the pump.

To start the pump, gradually open the air shut-off valve. Once the pump has primed, the valve can be opened further to increase airflow as required. If opening the valve increases the pump's cycling rate without improving flow, cavitation may have occurred. In such cases, slightly closing the valve can help achieve a more efficient air-to-flow ratio.

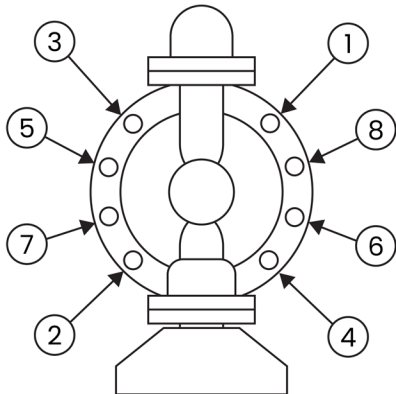
# Torque Sequence

## Torque Instructions

Always follow torque sequence when instructed to torque fasteners.

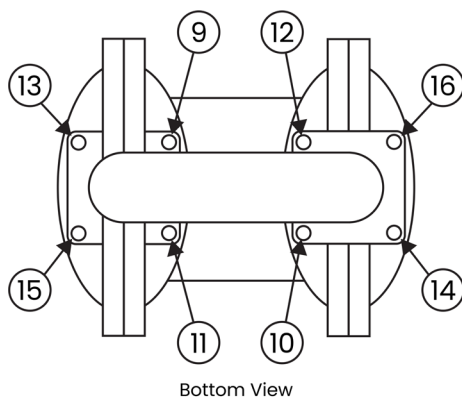
### 1. Left/Right Fluid Covers

Torque bolts to 6 – 7 Nm.



### 2. Inlet Manifold

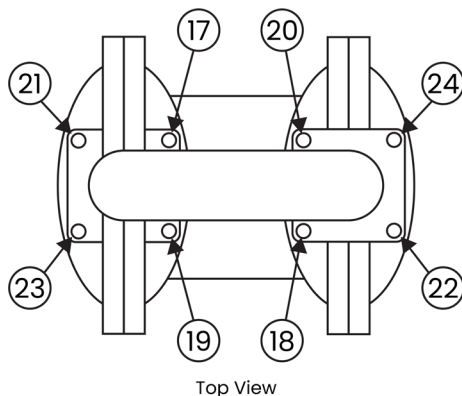
Torque bolts to 6 – 7 Nm.



Bottom View

### 3. Outlet Manifold

Torque bolts to 6 – 7 Nm.

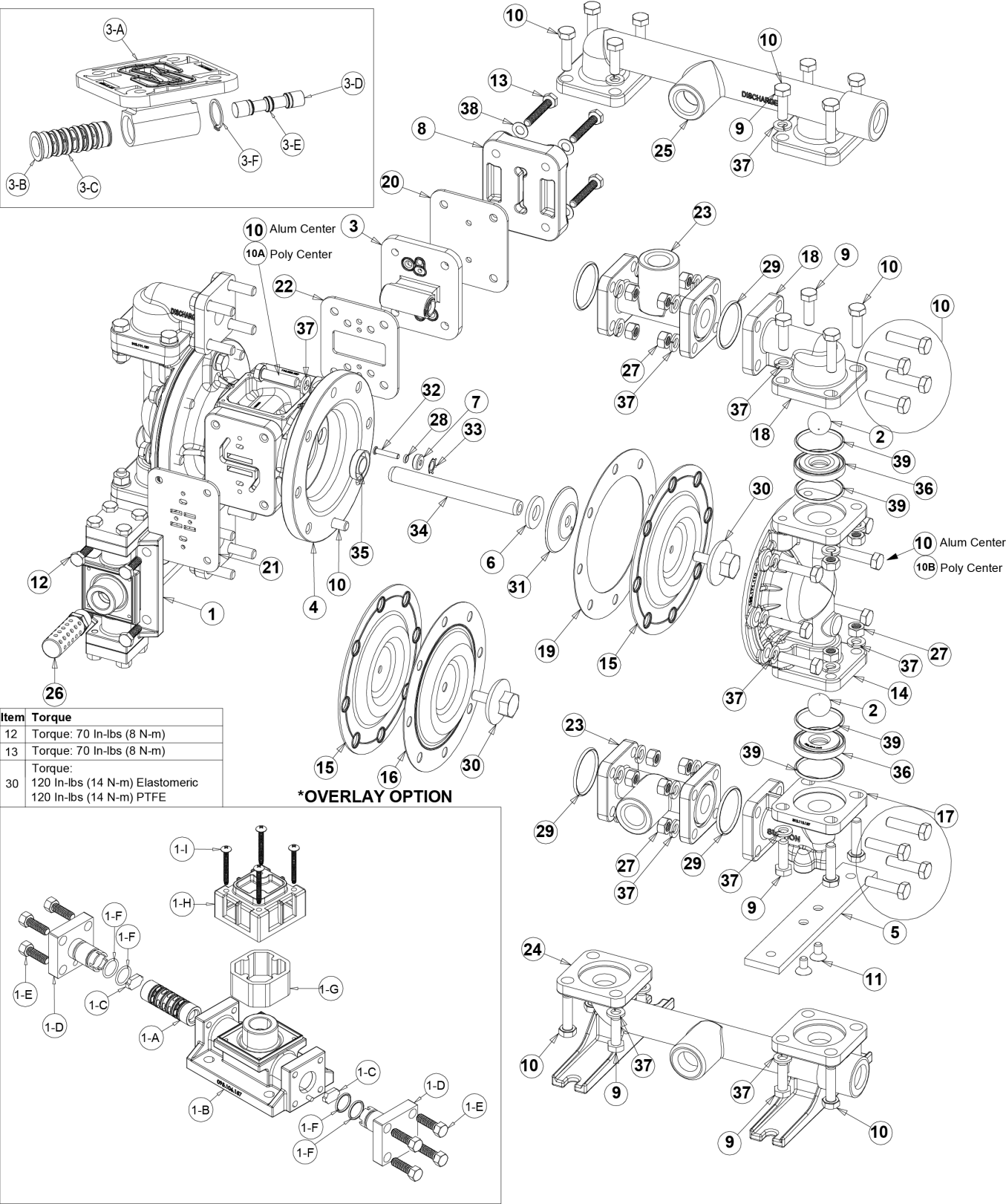


Top View

#### DISCLAIMER

Torque values are for guidance only. Use care when tightening, especially with Heli-Coil or similar inserts. Do not overtighten, as this may damage threads or components.

# Exploded View



# Parts List

| Item | Part Number   | Description                       | Qty | Mtl             |
|------|---------------|-----------------------------------|-----|-----------------|
| 1    | EF031.166.000 | Air Valve Assembly                | 1   | Glass Filled PP |
| 1    | EF031.168.000 | Air Valve Assembly (No Muffler) * | 1   | Glass Filled PP |
| 1-A  | EF095.106.551 | Body, Air Valve                   | 1   | Glass Filled PP |
| 1-B  | EF031.132.000 | Sleeve and Spool Set              | 1   | Aluminium       |
| 1-C  | EF560.101.360 | O-Ring                            | 8   | Nitrile         |
| 1-E  | EF165.122.551 | End Cap                           | 2   | Glass Filled PP |
| 1-F  | EF560.026.360 | O-Ring                            | 2   | Nitrile         |
| 1-G  | EF675.062.115 | End Cap Retainer                  | 2   | Stainless Steel |
| 1-H  | EF530.031.550 | Muffler                           | 1   | PE              |
| 1-I  | EF165.109.551 | Muffler Cap                       | 1   | Glass Filled PP |
| 1-J  | EF710.011.115 | Self-Tapping Screw                | 4   | Stainless Steel |
| 2    | EF050.022.600 | Ball,Check,PTFE ◊                 | 4   | PTFE            |
| 2    | EF050.027.354 | Ball,Check,Santoprene Δ           | 4   | Santoprene      |
| 2    | EF050.027.356 | Ball,Check,Hytrel                 | 4   | Hytrel          |
| 2    | EF050.027.360 | Ball,Check,Nitrile                | 4   | Nitrile         |
| 2    | EF050.027.363 | Ball,Check,FKM                    | 4   | FKM             |
| 2    | EF050.027.364 | Ball,Check,EPDM                   | 4   | EPDM            |
| 2    | EF050.027.365 | Ball,Check,Neoprene               | 4   | Neoprene        |
| 3    | EF095.091.000 | Pilot Valve Assembly *            | 1   | Glass Filled PP |
| 3-A  | EF095.087.551 | Valve Body                        | 1   | Glass Filled PP |
| 3-B  | EF755.051.000 | Sleeve(with O-Rings)              | 1   | Aluminium       |
| 3-C  | EF560.033.360 | O-Ring(Sleeve)                    | 6   | Nitrile         |
| 3-D  | EF775.055.000 | Spool(with O-Rings)               | 1   | Stainless Steel |
| 3-E  | EF560.023.360 | O-Ring(Spool)                     | 3   | Nitrile         |
| 3-F  | EF675.037.080 | Retaining Ring                    | 1   | Carbon Steel    |
| 4    | EF114.023.551 | Bracket,Intermediate              | 1   | Glass Filled PP |
| 5    | EF115.140.115 | Bracket,Mounting                  | 2   | Stainless Steel |
| 6    | EF132.034.360 | Bumper,Diaphragm *                | 2   | Nitrile         |
| 7    | EF135.036.506 | Bushing,Plunger *                 | 2   | POM             |
| 8    | EF165.110.551 | Cap,Air Inlet                     | 1   | Glass Filled PP |
| 9    | EF171.062.115 | Capscrew,Flanged 5/16-18*1.00     | 12  | Stainless Steel |
| 10   | EF171.063.115 | Capscrew,Flanged 5/16-18*1.25     | 24  | Stainless Steel |
| 11   | EF171.064.115 | Capscrew,Flanged 5/16-18*1.50     | 12  | Stainless Steel |
| 12   | EF171.066.115 | Capscrew,Flanged 1/4-20*1.25      | 8   | Stainless Steel |
| 13   | EF171.075.115 | Capscrew,Flanged 5/16-18*0.88     | 4   | Stainless Steel |
| 14   | EF196.178.552 | Chamber,Outer,Poly                | 2   | PP              |
| 14   | EF196.178.520 | Chamber,Outer,PVDF                | 2   | PVDF            |
| 15   | EF286.095.354 | Diaphragm ◊ Δ                     | 2   | Santoprene      |
| 15   | EF286.095.356 | Diaphragm                         | 2   | Hytrel          |
| 15   | EF286.095.360 | Diaphragm                         | 2   | Nitrile         |
| 15   | EF286.095.363 | Diaphragm                         | 2   | FKM             |
| 15   | EF286.095.364 | Diaphragm                         | 2   | EPDM            |
| 15   | EF286.095.365 | Diaphragm                         | 2   | Neoprene        |
| 16   | EF286.096.600 | Diaphragm ◊                       | 2   | PTFE            |
| 17   | EF312.106.552 | Elbow,Suction,Poly                | 2   | PP              |
| 17   | EF312.106.520 | Elbow,Suction,PVDF                | 2   | PVDF            |

# Parts List

|                      |               |                                            |    |                    |
|----------------------|---------------|--------------------------------------------|----|--------------------|
| 18                   | EF312.112.552 | Elbow,Discharge,Poly                       | 2  | PP                 |
| 18                   | EF312.112.520 | Elbow,Discharge,PVDF                       | 2  | PVDF               |
| 19                   | EF360.099.360 | Gasket,Spacer(use w/TPE Diaphragms only) Δ | 2  | Nitrile            |
| 20                   | EF360.100.379 | Gasket,Air Inlet                           | 1  | Conductive Nitrile |
| 21                   | EF360.101.360 | Gasket,Pilot Valve *                       | 1  | Nitrile            |
| 22                   | EF360.102.360 | Gasket,Air Valve *                         | 1  | Nitrile            |
| 23                   | EF518.138.552 | Manifold                                   | 2  | PP                 |
| 23                   | EF518.138.520 | Manifold                                   | 2  | PVDF               |
| 24                   | EF530.024.000 | Muffler,Metal                              | 1  | Carbon Steel       |
| 25                   | EF544.005.115 | Nut,Flanged Nut,Flanged 5/16-18            | 36 | Stainless Steel    |
| 26                   | EF560.001.360 | O-Ring *                                   | 2  | Nitrile            |
| 27                   | EF612.091.552 | Plate,Outer Diaphragm,Poly                 | 2  | PP                 |
| 27                   | EF612.091.520 | Plate,Outer Diaphragm,PVDF                 | 2  | PVDF               |
| 28                   | EF612.177.330 | Plate,Inner Diaphragm,Poly                 | 2  | Zinc Plated Steel  |
| 29                   | EF620.019.115 | Plunger,Actuator *                         | 2  | Stainless Steel    |
| 30                   | EF675.042.115 | Ring,Retaining *                           | 2  | Stainless Steel    |
| 31                   | EF685.056.120 | Rod,Diaphragm                              | 1  | Stainless Steel    |
| 32                   | EF720.012.360 | Seal,Diaphragm Rod *                       | 2  | Nitrile            |
| 33                   | EF720.045.600 | Seal,Manifold ◇ Δ                          | 4  | PTFE               |
| 34                   | EF722.099.600 | Seat,Check Valve,PTFE ◇ Δ                  | 4  | PTFE               |
| 34                   | EF722.100.110 | Seat, Check Valve, Stainless Steel         | 4  | Stainless Steel    |
| 42                   | EF720.065.600 | Seal, Check Valve Seat (steel seats only)  | 8  | PTFE               |
| <b>Air Side Kits</b> |               |                                            |    |                    |
|                      | EF476.219.000 | * Included in the air side kit             |    |                    |
| <b>Wet Side Kits</b> |               |                                            |    |                    |
|                      | EF476.202.654 | ◇ Included in the wet side kit             |    | PTFE/Santoprene    |
|                      | EF476.202.354 | Δ Included in the wet side kit             |    | Santoprene         |



# Certificate of Compliance

No. 3N221114.ECC82

Certificate's  
Holder:

Enviroflex Ltd.  
Pump Point, 21 Ascot Drive, DERBY, DE24 8GZ, United Kingdom

Certification  
ECM Mark:



Product:  
Model(s):

Air Operated Double Diaphragm Pump (Conductive)  
(see the following annex)

Verification to:

Standard:

BS EN IEC 60079-0:2018, BS EN ISO 80079-37:2016,  
BS EN IEC 60079-15:2019-TC

related to GBR Regulation:

Equipment and Protective Systems Intended for use in Potentially  
Explosive Atmospheres Regulations 2016

**Remark:** This document has been issued on a voluntary basis and upon request of the manufacturer. It is our opinion that the technical documentation received from the manufacturer is satisfactory for the requirements of the ECM Certification Mark. The conformity mark above can be affixed on the product(s) accordingly to ECM regulation about its release and its use. The regulation can be found at [www.entecerma.it](http://www.entecerma.it).

Additional information and clarification about the Marking:



The manufacturer is responsible for the UKCA Marking process, and if necessary, must refer to a Notified Body. This document has been issued on the basis of the regulation on ECM Voluntary Mark for the certification of products. RG01\_ECM available at: [www.entecerma.it](http://www.entecerma.it)

**Issuance date: 14 November 2022**

**Expiry date: 13 November 2027**

For online check:



Approver  
Ente Certificazione Macchine  
Legal Representative  
Luca Bedonni



**Ente Certificazione Macchine Srl**

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# Annex I

No. 3N221114.ECC82

## Model(s):

EFG05 series, EFG1F series, EFG15 series, EFG20 series, EFG30 series;  
 EF05 metallic series, EF1F metallic series, EF15 metallic series, EF20 metallic series, EF30 metallic series;  
 EF02 non-metallic conductive series, EF05 non-metallic conductive series, EF07 non-metallic conductive series, EF10 non-metallic conductive series, EF1F non-metallic conductive series, EF15 non-metallic conductive series, EF20 non-metallic conductive series;  
 EF66605H series, EF66610X metallic series, EF66615X metallic series, EF6662XX metallic series, EF6663XX metallic series;  
 EFPD15 metallic series, EFPD20 metallic series, EFPD30 metallic series;  
 EFT02 series, EFT04 series, EFT08 series, EFT15 series;  
 EFE5 metallic series;  
 EFHDF10 series, EFHDF20 series, EFHDF30 series, EFHDF40 series;  
 EFL1F metallic series, EFL15 metallic series, EFL20 metallic series, EFL30 metallic series;  
 EFTA1 series, EFTA2 series, EFTA3 series;  
 EFT1F food series, EFT15 food series, EFT20 food series, EFT30 food series;  
 EFF2 hygienic series, EFF4 hygienic series, EFF8 hygienic series, EFF15 hygienic series

## Marking:

-  II 2G c T5
-  II 2D c T100°C
-  II 2 G Ex h IIB T4...T3 Gb