Tapflo TX Aseptic EHEDG Air Operated Double Diaphragm Pumps

The Tapflo Aseptic EHEDG Series of Air Operated Double Diaphragm Pumps has been developed for service within the pharmaceutical, bio-tech and food industries where a clean process and ability to clean components quickly is critical. This series of pumps is EHEDG Certified and is constructed from FDA & USP VI approved materials and also conforms to ATEX directive 94/9/EC which means it is perfectly suited to almost any applications in the aforementioned markets.

The EHEDG (European Hygienic Engineering & Design Group) certificate is your guarantee that the design is according to the hygienic guidelines. Furthermore the pump is clean ability tested, which means bacteria does not grow in the pump after the cleaning and draining procedure. Units can also be delivered with backup diaphragm systems.

There are no hidden areas where bacteria can grow. The manifold clamps and the housing screws are simply removed for complete disassembly and cleaning. The pump is also designed for cleaning and sterilization in place – C.I.P. and S.I.P. After such operations, the pump is easily turned in its support for drainage.

Models are supplied with an extra fine surface finish to Ra 0.8 as standard and to Ra 0.5 upon request.

The pumps are supplied as standard with ISO Tri-Clamp connections. However, they may also be equipped with almost any type of connection used in the hygienic field – DIN clamps, SMS milk, RJT, DIN aseptic to mention a few.

Thanks to Tapflo's innovative, simple & ingenious design these pumps are compact, robust & reliable. Furthermore, they are quick & easy to maintain, keeping your service costs and process down time to an absolute minimum.

When used in conjunction with Tapflo's patented control and monitoring equipment, preventive and routine maintenance is also easily integrated into any process, whilst also enabling accurate and precise control of the pump's performance. Optimising your system to the best of its ability!

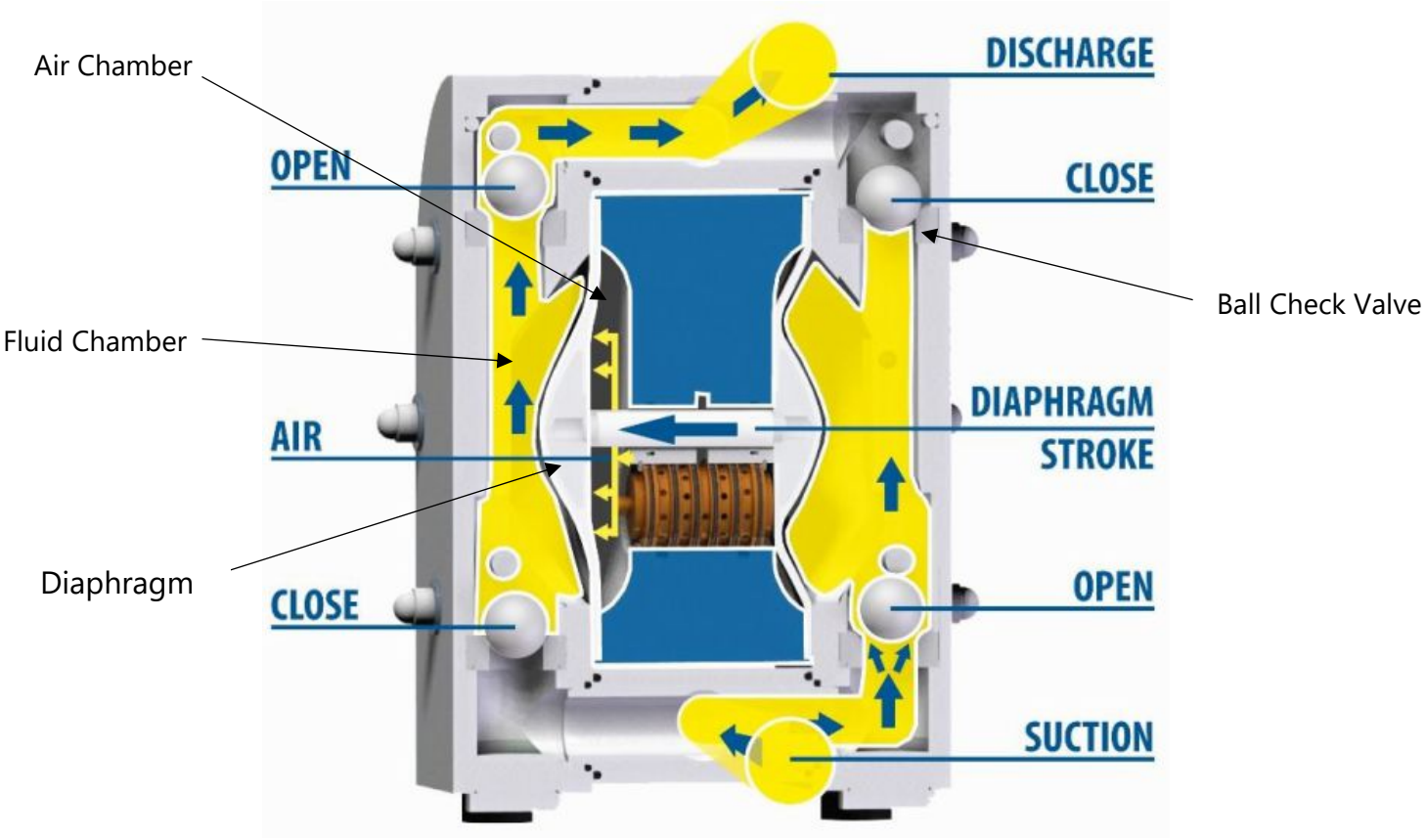
Certificates & Approvals:

Typical Applications:

The Tapflo Sanitary Air Operated Diaphragm Pumps are ideally suited to a plethora of applications in numerous industries, such as:

Industry	Example of application
Food & Dairy	Soup, Cream, Syrup, Dairy Products, Flavouring, Alcohol, Chocolate, Paste
Grocery	Ketchup, mayonnaise, tomato products, mustard
Beverages	Flavours, colouring, fruit juice
Bakery	Dough, ingredients
Brewery	Beer, flavours, colouring, wort
Hygiene	Soap, toothpaste, shampoo
Cosmetics	Cream, alcohol, perfume
Pharmaceuticals & Cosmetics	Cream, Paste, Alcohol & Filtration Gels

Operating Principle:



An Air Operated Diaphragm Pump is principally made up of 2 Liquid Chambers, 2 Air Chambers and 2 Diaphragms. The Liquid and Air Chambers are separated by a Flexible Diaphragm.

Compressed Air is supplied to the air valve which distributes the air from the Centre Block, where 2 ports direct the flow of air to the right and left side Air Chambers.

The same air pressure from the air supply is directly applied to the back side of one of the Diaphragms, forcing it forward and therefore the medium out of the Fluid Chamber, lifting the Ball Check Valve and out of the Discharge Port (2), with equal pressure to that which is supplied.

The Diaphragms are connected by a shaft which is screwed into the centre of each. As one of them is forced forward the other is pulled towards the Centre Block, causing a vacuum effect on the suction side. The medium is subsequently drawn through the Suction Port (1) and into Fluid Chamber.

The Air Valve automatically transfers the air pressure to the opposing side at the end of each stroke, reversing the action. Hence the term 1:1 reciprocating pump.

The Ball Check Valves alternately Open & Close in unison with the reciprocating action of the diaphragms. Enabling filling of the Fluid Chambers and preventing back flow through the pump. A variety of Balls can be supplied to provide both chemical resistance and different weights to suit the viscosity of the medium.

General Benefits to Air Operated Diaphragm Pumps:

- Run Dry without damage – No need for dry run protection devices
- Infinitely variable flow control – achievable by adjusting the air flow to the pump via a blocking needle valve
- Air Operated – Intrinsically safe and simple to install, no special training required.
- Self-priming up to 9 m, when wetted
- Solids Handling & resistant to abrasion
- Can handle both thin and viscous fluids
- Can operate against a closed valve without damage – the pump will simply stall
- Available in a wide variety of materials to suit almost any fluid
- Sealless – no mechanical seal, which is the weakest point on any type of pump
- Decent volumetric efficiency – enables them to be used in batching and metering applications
- Relatively low initial cost
- Simple maintenance and low cost of ownership
- Wide range of installation possibilities
- Discharge Pressures up to 8 bar as standard, 16 bar when being used with a booster

Tapflo Design Features & Benefits:

The Tapflo Aseptic EHEDG Air Operated Diaphragm Pumps have taken the innovative design of the standard Sanitary series and improved on it by smoothening out the internal crevices and parts in contact with the fluid to ensure that there is absolutely no areas where bacteria and contamination can build up.

Keeping your process clean

Smooth surfaces and clean ability are important keys for the EHEDG certification

Quick dismantling

The clamp system ensures rapid dismantling without any tools.

Pollution free air valve

The sealing system is lubrication free, always keeping your product and environment free from oil contamination.

Plain surface

The sandwich diaphragm has a completely plain surface, which eliminates bacteria growth problems. The diaphragm is available in food grade materials - PTFE or white EPDM.

Superior finish

Both liquid side and outside is electropolished*, to obtain superior finish and hygiene. Special surface finish may be done according to your requirements.

Easy draining

Drain the pump by turning the pump in its support

Our design allows for total visual inspection of the wetted parts. There are no hidden areas where bacteria can grow. The manifold clamps and the housing screws are simply removed for complete disassembly and cleaning. The pump is also designed for cleaning and sterilization in place – C.I.P. and S.I.P. After such operations, the pump is easily turned in its support for drainage.

After the CIP procedure, the pump usually has to be drained from the CIP fluid. The Tapflo sanitary series is supplied with a hygienic stand, enabling 360° rotation of the pump unit in 3 simple steps!

1. Disconnect the pump from the pipework
2. Loosen the two socket head cap screws on the stand & rotate the pump 180° to let the remaining fluid drain off. The airline may be left connected during this operation.
3. Rotate the pump back into position and refit the socket head cap screws and reconnect the pipework.

Materials Data:

Component	Material
Wetted Metal Parts	AISI 316L, Ra 0.8, Ra 0.5 on request
Centre Block	PP Conductive
Diaphragms	PTFE (FDA & USP VI approved), PTFE 1705B (Solvents, FDA & USP VI approved), EPDM (FDA on request) White EPDM (FDA approved), PTFE with White Back (FDA & USP VI approved)
Valve Balls	PTFE (FDA approved), PTFE (FDA & USP VI approved), AISI 316L
Air Valve	Body: brass (standard), AISI 316L or PET, O-rings: NBR (standard), EPDM (FDA & USP VI approved) or FKM (FDA approved)
Sealing (Wetted)	EPDM (FDA approved), EPDM (FDA & USP VI approved) FEP/FKM (FDA approved)
Housing Pin Screws	Stainless Steel AISI 316
Diaphragm Shaft	Stainless Steel AISI 304L

Performance Range:

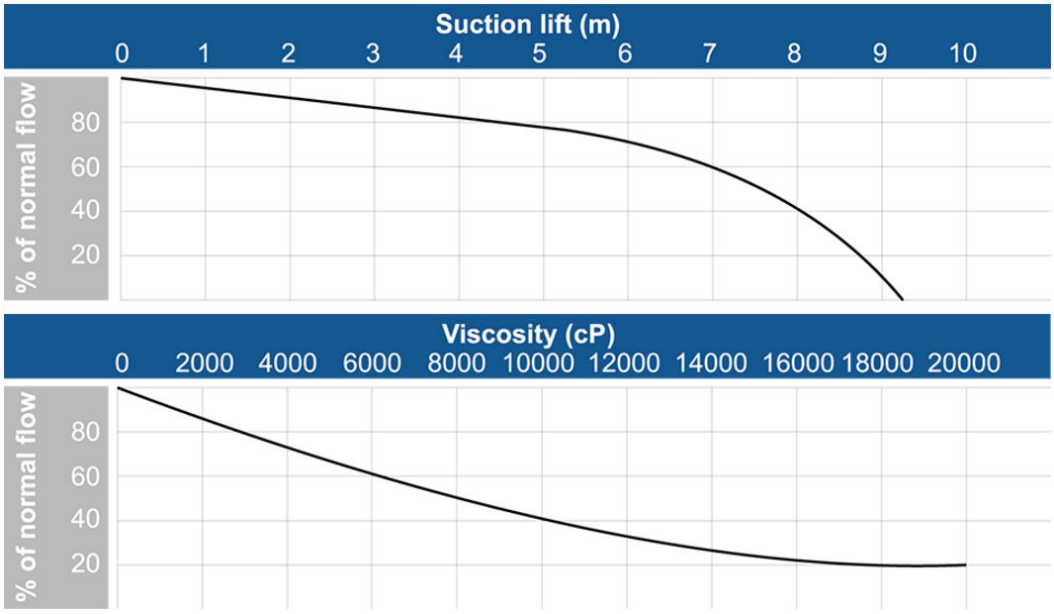
The Tapflo Aseptic EHEDG Air Operated Double Diaphragm Pumps have a wide range of capacities to suit almost any application, from metering and dosing to general transfer. The max capacity range varies from 94 - 330 l/min with discharges pressures up to 8 bar as standard & solids passage up to 10 mm.

Data	Pump Size		
	TX94	TX144	TX244
Max Capacity, l/min	94	144	330
Volume / Stroke, ml (*)	320	515	1415
Max Discharge Pressure, Bar	8	8	8
Max Air Pressure, Bar	8	8	8
Max Dry Suction Lift, m (**)	2	3	4.4
Max Wet Suction Lift, m	8	9	9
Max Permissible ø of Solids, mm (Ball Valves / Flap Valves)	6	6	10
Max Fluid Temp with EPDM Diaphragms, ºC	80		
Max Fluid Temp with PTFE Diaphragms, ºC	110		
Min Fluid Temp, ºC	-20		
Weight, Kg	15	22	46

* = Based on pumps fitted with EPDM Diaphragms, pumps with PTFE Diaphragms are subject to approx. 15% loss in flow.
** = This is max value with stainless steel valve balls, other valve ball materials may reduce the suction.

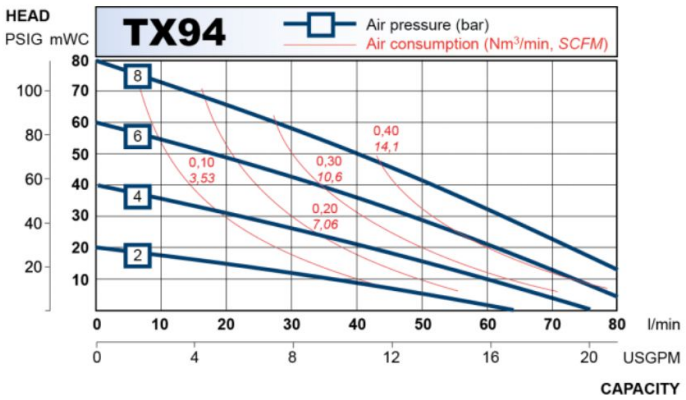
Changes in Capacity due to Suction Lift & Viscosity:

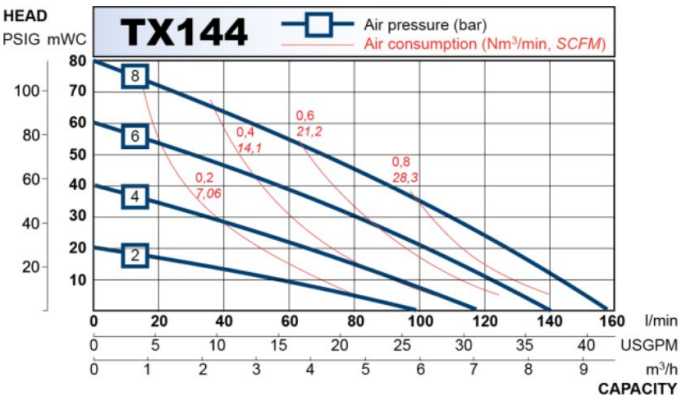
An AODDs capacity will vary according to changes in both viscosity and suction lift, below are charts displaying the % drops in flow according to the changes in both. These variations need to be taken into account when selecting a suitable pump.

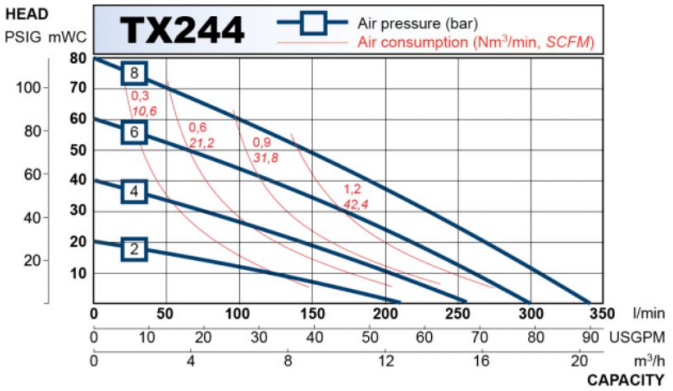


All performance charts are based on test done with water, therefore, if an application demanded a 4 m suction lift on a fluid that was approx. 3000 cPs, then potentially a larger pump which could produce 40% more capacity would be required.

Performance Curves:

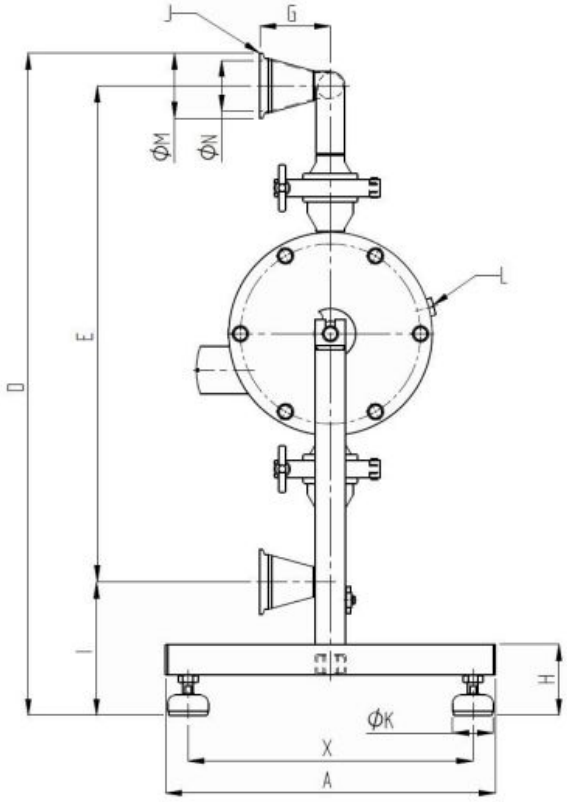


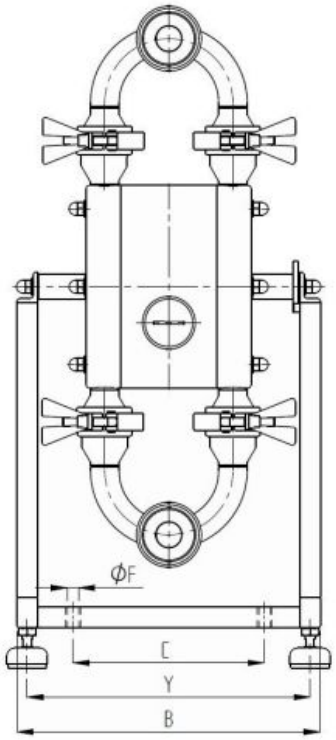




General Dimensional Information:

NOTE: Build specific GA Drawings in 2D as well as DWG and STEP Files are available on request for easy integration into system installations and OEM products. Dimensions are in mm and based on standard build constructions.

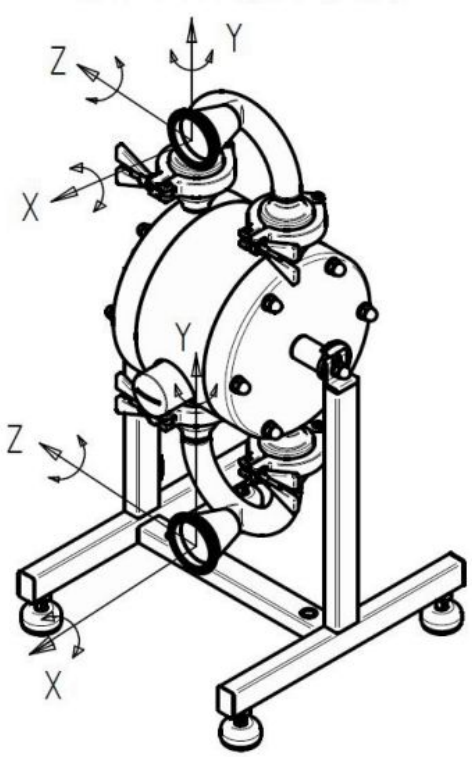




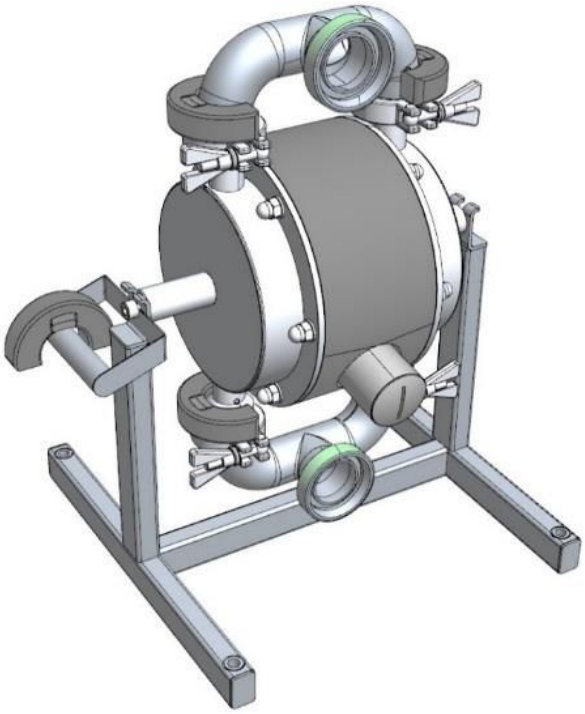
Dim	Pump Size		
	TX94	TX144	TX244
A	304	324	405
B	295	298	380
C	185	188	270
D	594	652	903
E	457	488	700
F	11	11	11
G	52	70	102
H	70	70	70
I	112	131	158
J DIN 32676[1]	DN40	DN50	DN65
K	40	40	40
L	¼"	¼"	½"
M	50.5	64	91
N	38	50	66
X	260	280	360
Y	275	278	360

Permitted Loads on Manifolds:

We recommend not exceeding the following loads & forces reacting on the manifolds.



TX94		
Direction	**Load (N)**	**Moment of Force (Nm)**
X	31	6.3
Y	31	6.3
Z	31	6.3
TX144		
Direction	**Load (N)**	**Moment of Force (Nm)**
X	35	7.3
Y	35	7.3
Z	35	7.3
TX244		
Direction	**Load (N)**	**Moment of Force (Nm)**
X	43	8.8
Y	43	8.8
Z	43	8.8



Magnetic Ball Lifters

Magnetic ball lifters are implemented in Sanitary and Aseptic EHEDG series of AODD pumps, to enable pump emptying without removing it from the installation when no other draining option is available. Rotating the pump is also no longer needed.

The balls are lifted by simply attaching the magnets to the pumps manifold.

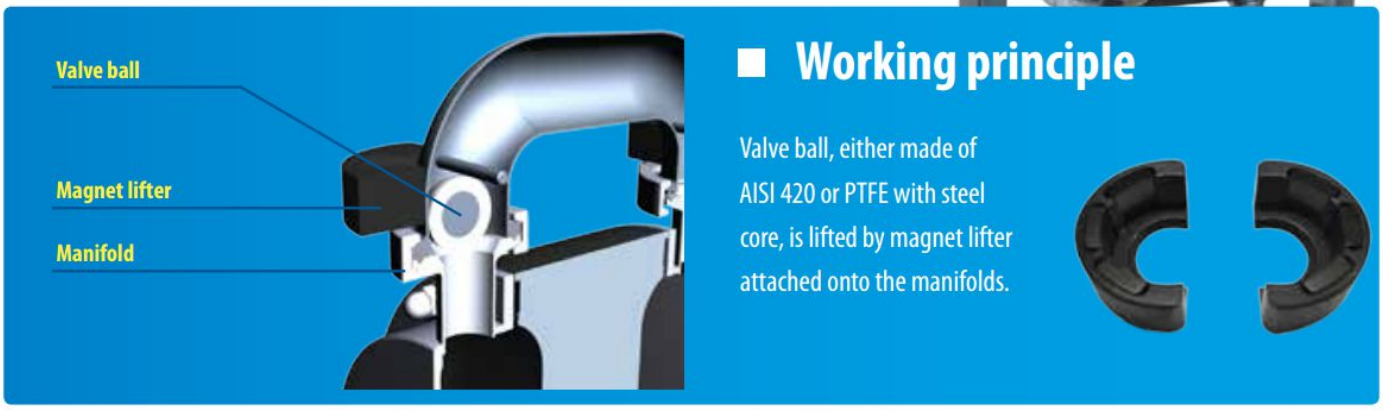
Valve balls are available in AISI 420 magnetic stainless steel or PTFE with steel cores.

Pump Emptying Procedure:

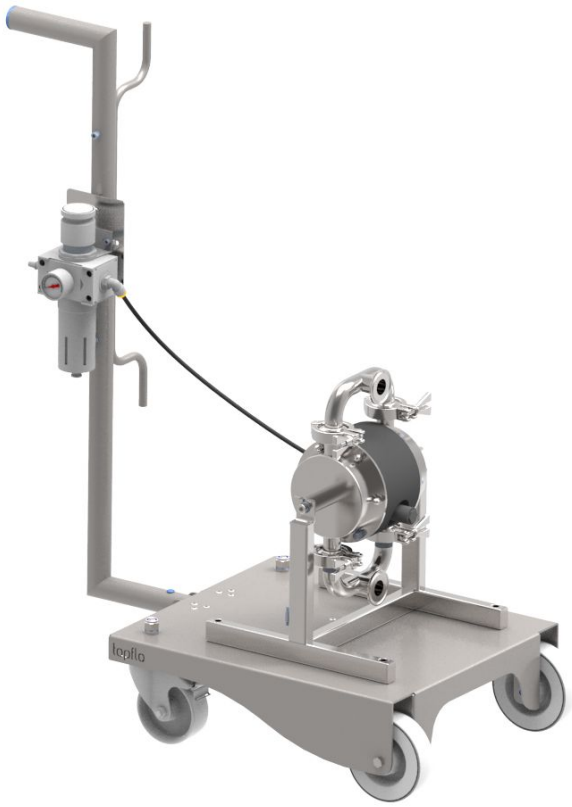
1. Install the magnets onto the pump manifolds in the valve seat area
2. Run the pump slowly
3. After a few cycles the pump will start to dry run
4. Turn off the pump
5. Take off the magnets & manifold

Modify your existing pump to be suitable for use with Magnetic Ball Lifters with the following additional parts!

4 x Valve Balls (PTFE Steel Core or AISI 420)
4 x Magnetic Ball Lifter
1 x Magnet Holder



Trolley Mounted Options:



Trolley Mounted Units can be supplied to fit all sizes of Tapflo Aseptic EHEDG Air Operated Diaphragm Pumps, with 2 or 4 wheels (2 fixed, 2 free) mounting plate for control apparatus, hose wrap points & / or fitted with a variety of dedicated control & protection features.

Such as:

- Variable Flow & Pressure Control
- Barrier Protection
- Pneumatic & Electronic Batching & Metering
- Dry Run & Stop
- Dead Head & Stop
- Dead Head & Restart
- Stroke Counters w/ VFC

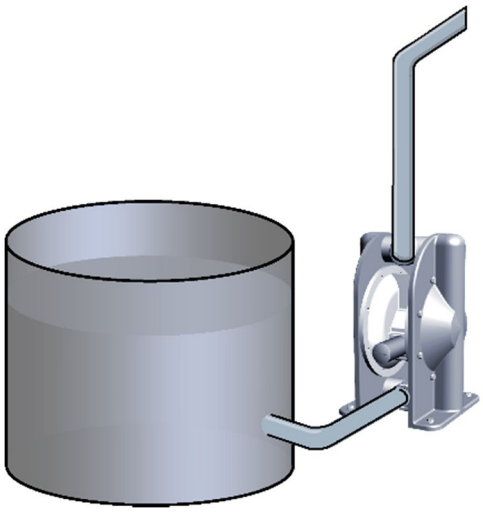
The units can also be ATEX rated for use in hazardous areas and are hygienically rated for use in sanitary environments and fitted with pneumatic wheels for use on uneven surfaces. The result is a mobile range of pump units providing a solution to a wide spread of technological processes. The portability of the units allows easy movement to various locations with almost limitless applications.

The hygienic trolleys are all fitted with drain channels in the base and a drain valve at the rear and have a surface finish to Ra <1.6

With Tapflo's customised Mobile Solutions, the user is provided with not only a product but functionality. Based on our extensive experience with pumping skid units, we deliver complete "made to measure" mobile units, ready to use out of the box.

Types of Installations:

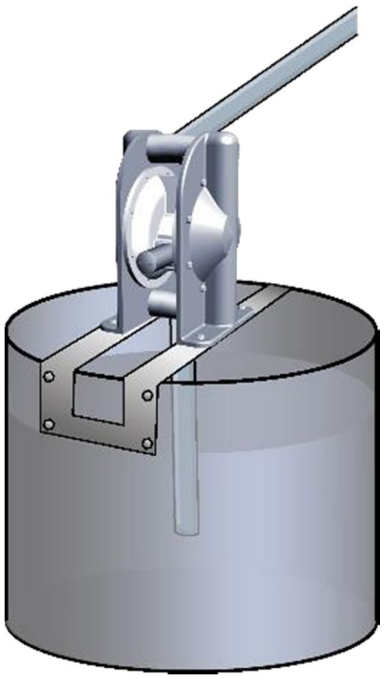
The Tapflo Aseptic EHEDG Air Operated Double Diaphragm Pump is flexible to many types of installations. Below are the 2 types of installations which they are commonly operated in:



Flooded

The piping system is designed so that the pump is fed with a positive suction head. This is the best way to install a pump when it is necessary to completely empty all the liquid from the suction tank or container, or where viscous products are being transferred.

Note: Do not exceed 0.7 bar suction pressure as higher pressures than this may cause premature diaphragm failure and irregular pump operation such as siphoning.



Self-Priming

The Tapflo Air Operated Diaphragm Pump is designed to pull a high vacuum. It is able to evacuate air from an empty suction pipe without damaging itself. The suction lift capability is up to 5 m from an empty pipe and up to 8 m from a wetted pipe.

Note: The suction lift capability is dependent on the size of the pump.

Installation Example:

Below is an installation example showing "best practice" when installing a Tapflo Air Operated Diaphragm Pump. Our air valves are constructed for oil-free air. Lubricated air is not permitted and will damage the pump. However, if the air is very dry (laboratory air), the air may be lubricated with water. The maximum allowed air pressure is 8 bar, and as a preventative measure, the air must be filtered to at least 5 micron or less. Recommended air quality according to PN-ISO8573-1:2010 is particles class 6, water class 7 and oil class 4.

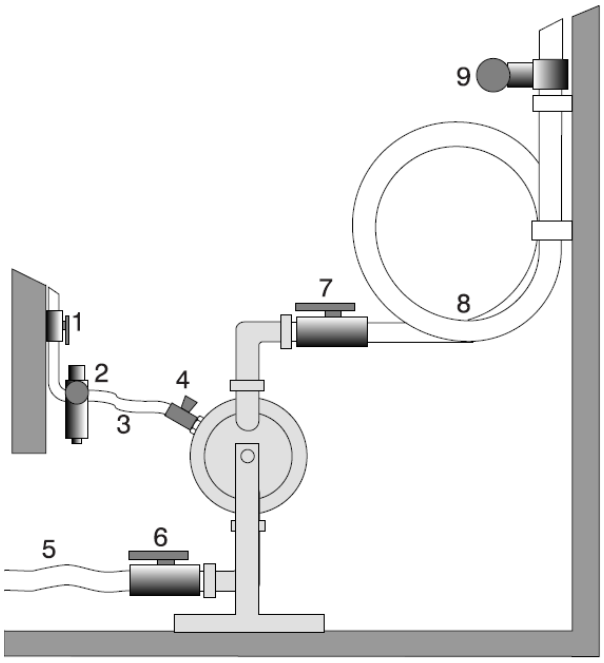
To facilitate the operation of the pump, and cater for the above parameters, we recommend an air treatment system connected to the air supply.

These components should be included:

1. Regulator to adjust the air pressure and therefore the discharge pressure generated by the pump.
2. Manometer to read the output pressure to the pump
3. Needle valve to adjust the air flow to the pump and therefore the flow rate generated by the pump. This is especially useful when operating the pump in the lower ranges of its performance capabilities and for accurate control of flow rate.
4. Filter to ensure that the pumps air valve doesn't become contaminated.

These components are included in Tapflo's Air treatment system which can be ordered from us and installed onto the pump so that it is ready to use upon delivery.

1. Gate valve for isolating compressed air supply
2. Air Filter and Pressure Regulator w/ mounted Manometer
3. Flexible Air Hose feeding to the pump Air Inlet
4. Needle Valve for regulating pump flow rate
5. Flexible Suction Hose feeding to pump suction side to absorb any vibrations and water hammer effects.
6. Gate Valve fitted to the pump suction to enable insolation for maintenance.
7. Gate Valve fitted to the pump discharge to enable insolation for maintenance.
8. Coiled flexible piping fitted to the pump discharge to provide back pressure and also the required distance between the pump and flow gauge / meter to retain accuracy.
9. Flow gauge to provide an accurate read out of generated flow to ensure that the pump is working comfortably.



Trouble-Shooting:

To ensure safe operation and the life of the pump and to form part of a preventative maintenance schedule, routine and complete inspection of the pump is recommended.

Routine Inspection can be done by frequent observation of the pump operation is required to detect problems. A change in sound of the running of the pump can be an indication of wearing parts as well as leakages and changes in performance.

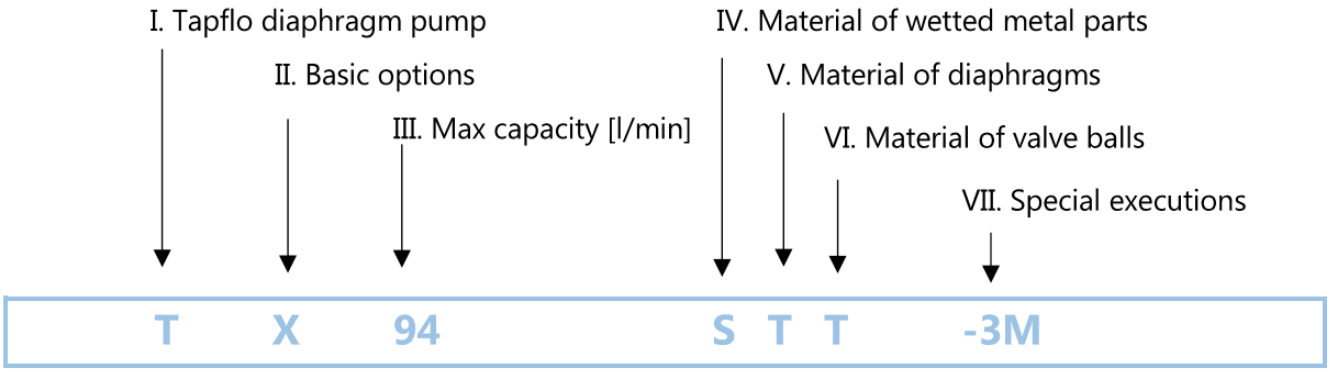
The intervals for a complete inspection depend upon the operation conditions of the pump. The characteristics of the liquid, temperature, materials used in the pump and running time decide how often a complete inspection is necessary. Nevertheless, Tapflo recommend to inspect the pump at least once a year. As part of this inspection Air and Liquid Kits should be changed and Valve Kits should be changed once every 2 years.

Tapflo recommend stocking at least a Liquid and Air Kit to ensure that expensive down time is avoided.

PROBLEM	POSSIBLE FAULT	POSSIBLE SOLUTION
The pump does not run	The air pressure is to low	Increase air pressure via a filter-regulator
	The air connection is blocked	Check / clean air supply connection
	Muffler is blocked	Check / clean / replace muffler
	Air valve is defective	Clean / replace complete air valve
	Dirt in the pump chamber	Remove debris from the chambers
	Diaphragm breakdown	Replace diaphragm
The suction is bad	Suction connection is not tight	Tighten the suction line
	Suction connection is blocked	Clean suction line
	Muffler is blocked	Check / clean / replace muffler
	Valve balls are blocked or damaged	Check dimensions and shape of valve balls
	Valve seats are worn	Check dimensions and shape of valve seats
	Pump starts with high pressure	Start the pump slowly (see chapter 2.2 of manual)
	Air in suction / discharge line	Vent suction / discharge line
	Dry suction against discharge pressure	Wet the pump / start without discharge pressure
The pump runs irregularly	Valve balls are blocked	Check dimensions and shape of valve balls
	Sealing in centre block	Replace sealing
	Air valve is defective	Clean / replace air valve
	Diaphragm breakdown	Replace diaphragm
	Valve seats are worn	Check dimensions and shape of valve seats
	Icing on the muffler	Improve air quality (see chapters 1.7.1 and 2.2.2 of manual)
Bad flow / pressure	Pressure fall in air supply	Increase air pressure via a filter-regulator
	Pressure losses on suction side	Check/change installation on suction side
	Air supply / air valve leaking	Check / repair / replace air supply / air valve
	Suction or air connection blocked	Check / clean air supply / suction connection
	Muffler is blocked	Check / clean / replace muffler
	Valve ball worn or broken	Check dimensions and shape of valve balls
	Valve seats are worn	Check dimensions and shape of valve seats
	Air in liquid	Seal suction line; check / refill container

	Diaphragm breakdown Icing on the muffler	Check / replace diaphragms Improve air quality (see chapters 1.7.1 and 2.2.2 of manual)
Liquid leaks from the pump	Screws on the housing not properly tightened O-rings on manifolds damaged Damaged diaphragm Tension / stress form the installation	Check tightening torques of the screws Replace O-rings Check / replace diaphragms Adjust installation, eliminate stress, when using a dampener provide separate support for it (see dampener IOM manual).
Liquid comes out of the muffler	Diaphragm breakdown	Replace diaphragm
Diaphragm breakdown	Wrong selection of material Too high pressure in the installation Long periods of dry running Too high pressure on suction side	Contact us for information on material selection Use air treatment system for protection When dry, run pump slowly (see chapter 2.2 of manual) Make sure there is pressure balance between the air and liquid side of the diaphragm

Pump Codification:



I. T = Tapflo diaphragm pump

II. Basic options:
- B = Backup diaphragm pump
- X = ATEX approved, group II, cat. 2

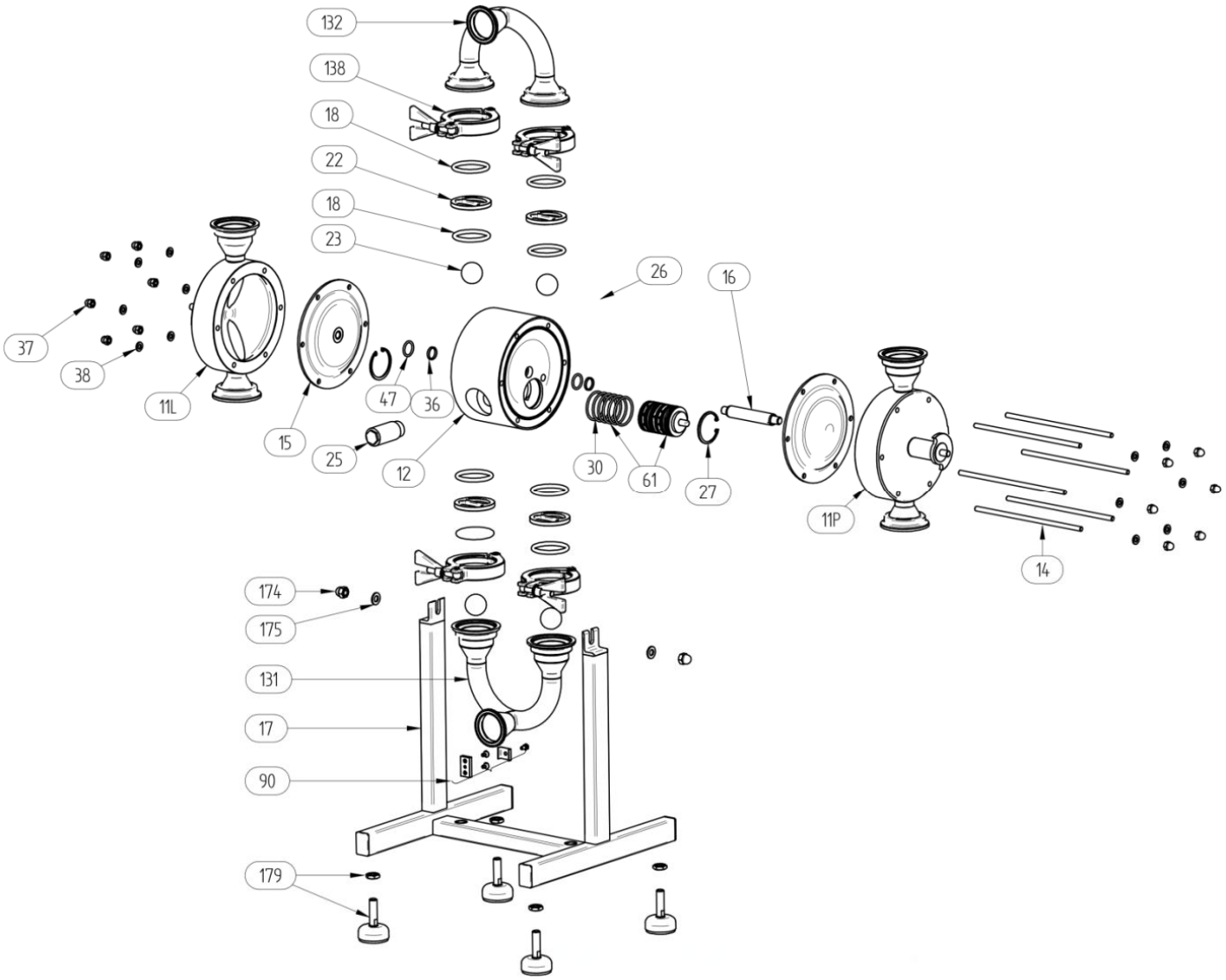
IV. Material of wetted metal parts:
- S = stainless steel AISI 316L

IV. Material of diaphragms:
- E = EPDM (FDA)
- W = White EPDM (FDA)
- T = PTFE TFM, (FDA/USP VI)
- B = PTFE TFM 1705B (solvents) (FDA /USP VI)
- Z = PTFE with white back EPDM (FDA/USP VI)

V. Material of valve balls:
- T = PTFE (FDA)
- S = AISI 316 stainless steel
- B = PTFE TFM 1635 (FDA/USPVI)

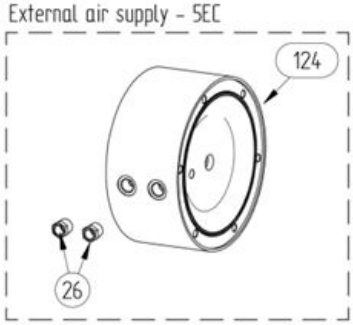
VI. Special executions:
- 3 = Optional connection type
- 4 = Backup diaphragm system configuration
- 5 = Other special executions*
- 6 = Optional material of centre body
- 7 = Optional material of air valve
- 8 = Optional material of pos. 18 seals
- 9 = Optional material of housing pin screws

Spare Parts, TX94:



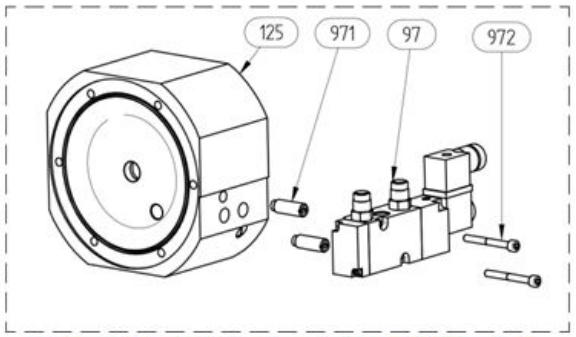
Pos.	Qty	Description	Material	KIT LIQ	KIT AIR
11L	1	Housing, Left Side	AISI 316L		
11R	1	Housing, Right Side	AISI 316L		
12	1	Centre Block	PP, Conductive PP		
131	1	Manifold Inlet	AISI 316L		
132	1	Manifold Outlet	AISI 316L		
138	4	Tri-Clamp	AISI 304L		
14	6	Pin Screw	A4-80		
15	2	Diaphragm	EPDM (FDA), White EPDM (FDA), PTFE (FDA & USP VI), PTFE TFM 1705B (FDA & USP VI), PTFE w/ White Back (FDA & USP VI)	x	
16	1	Diaphragm Shaft	AISI 304L		x
17	1	Stand	AISI 304L		
174	2	Domed Nut	A4-70		
175	2	Washer	A4-70		
179	4	Adjustable Foot Set	AISI 316L		
18	8	O-Ring	FEP/FKM (standard, FDA & USP VI) EPDM (FDA & USP VI) – standard	x	x
22	4	Valve Ball Stop	AISI 316L		
23	4	Valve Ball	PTFE TFM (FDA & USP VI) - standard AISI 316L	x	
25	1	Muffler	PP		x
26	1	Air Intake Adaptor	Galvanised Brass		
27	2	Circlip	Cr3 Coated Steel		
30	6	O-Ring	NBR, FKM, EPDM		
36	2	Centre Block Seal	PE		x
37	16	Nut	A4-70		
38	16	Washer	A4-70		
47	2	O-Ring (Back up for 36)	NBR		x
61	1	Air Valve Complete	Brass/NBR (standard), AISI 316L/FKM, Brass/EPDM, AISI 316L/FKM, PET/FKM		x
90	1	Grounding Set	AISI 316L		

External air supply - 5EC



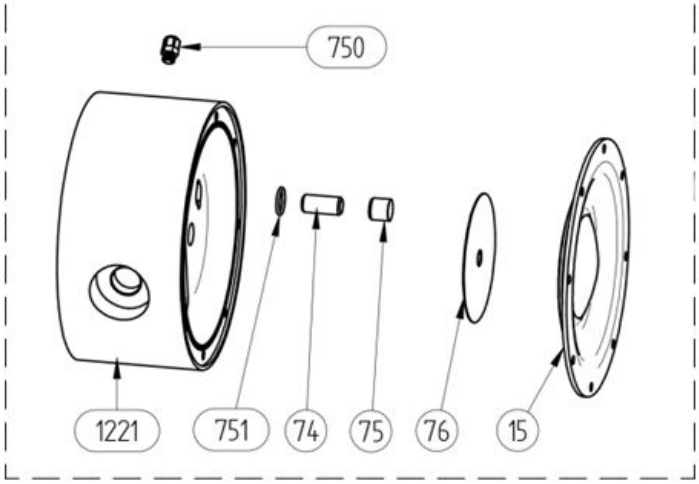
External Air Supply - 5EC			
Pos.	**Qty**	**Description**	**Material**
124	1	Centre Block	PP, PP Cond.
26	2	Air Intake Adaptor	Brass

External control build on solenoid valve, no air valve - 5EV



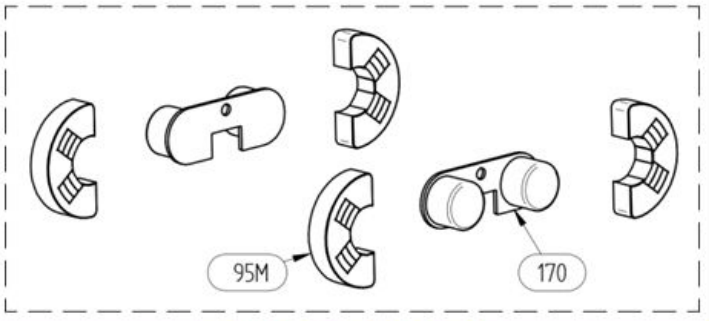
External Control, Built on Solenoid Valve - 5EV			
Pos.	**Qty**	**Description**	**Material**
125	1	Centre Block	PP, PP Cond.
97	1	Solenoid Valve	-
971	2	Threaded Insert	AISI 316L
972	2	Screw	A4-70

Diaphragm stroke sensor - 5C



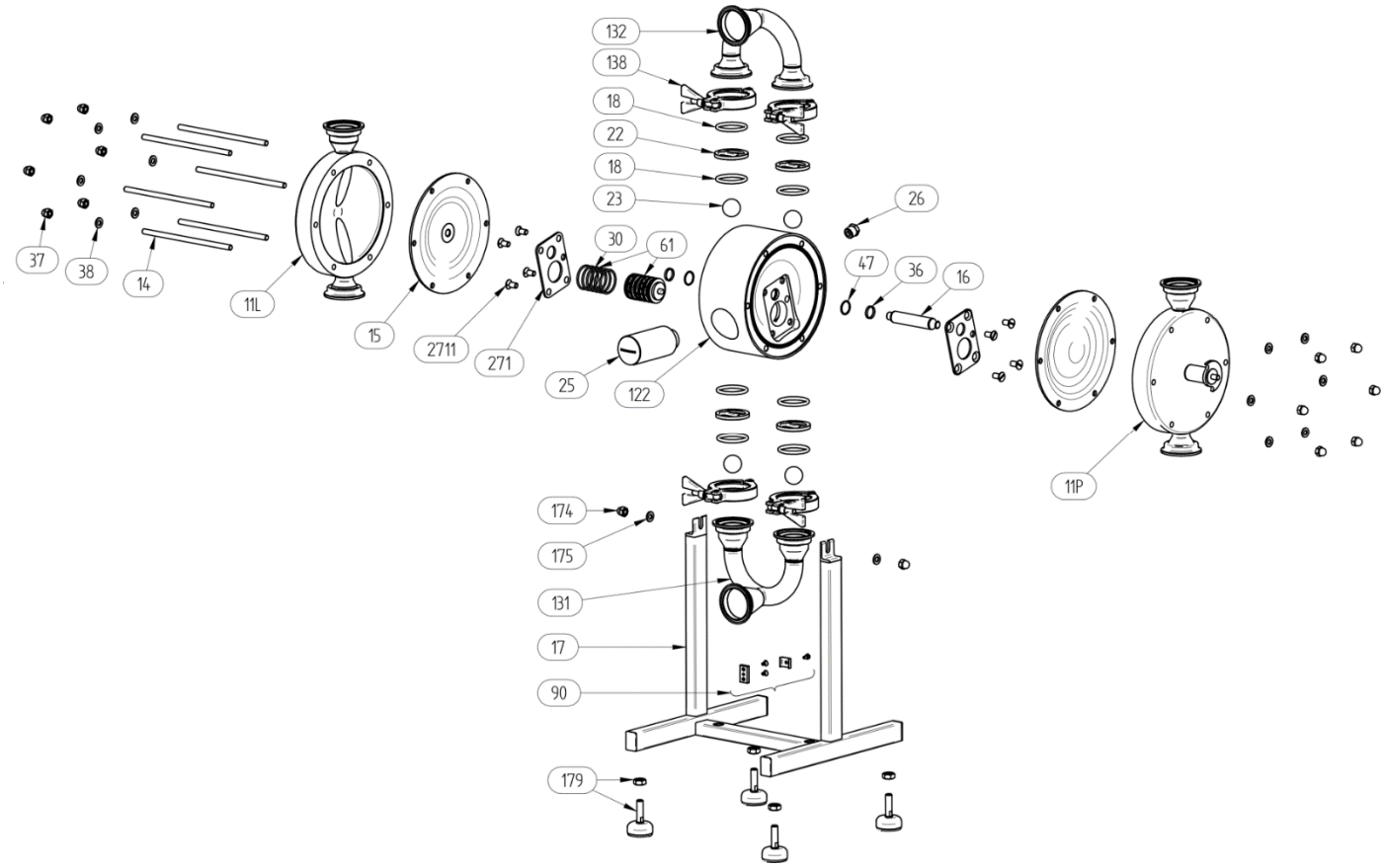
Diaphragm Stroke Sensor - 5C			
Pos.	**Qty**	**Description**	**Material**
1221	1	Centre Block for Stroke Sensor	PP
751	1	O-Ring	NBR, FKM, EPDM
74	1	Inductive Sensor	CuZn
75	1	Sensor Cap	PP
76	1	Sensing Plate	AISI 316L
750	1	Cable Gland	PP

Magnetic ball lifters - 5ML



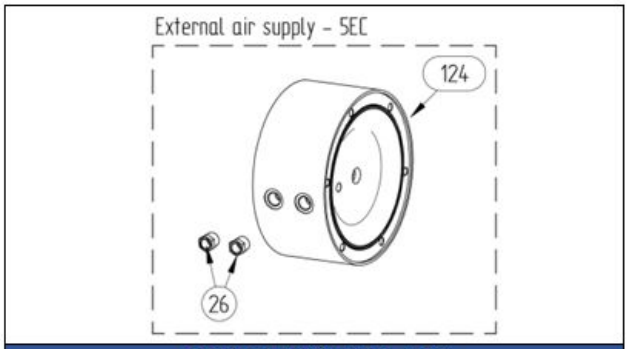
Magnetic Ball Lifters - 5ML			
Pos.	**Qty**	**Description**	**Material**
23-15	4	Valve Ball	PTFE / SS Core
23-59	4	Valve Ball	AISI 420
95M	4	Magnetic Ball Lifter	PE1000
170	2	Holder	AISI 316L

Spare Parts, TX144 & TX244:

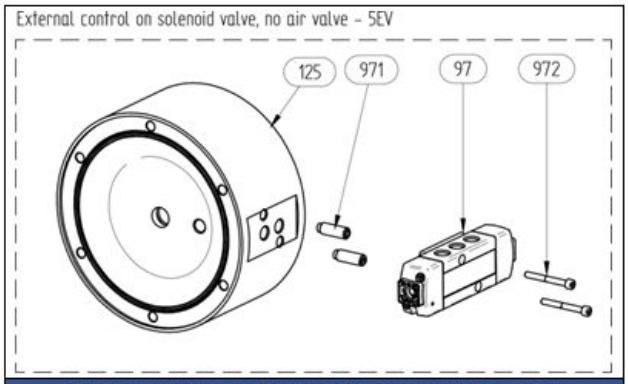


Pos.	Qty	Description	Material	KIT LIQ	KIT AIR
11L	1	Housing, Left Side	AISI 316L		
11R	1	Housing, Right Side	AISI 316L		
12	1	Centre Block	PP, Conductive PP		
131	1	Manifold Inlet	AISI 316L		
132	1	Manifold Outlet	AISI 316L		
138	4	Tri-Clamp	AISI 304L		
14	6/8*	Pin Screw	A4-80		
15	2	Diaphragm	EPDM (FDA), White EPDM (FDA), PTFE (FDA & USP VI), PTFE TFM 1705B (FDA & USP VI), PTFE w/ White Back (FDA & USP VI)	x	
16	1	Diaphragm Shaft	AISI 304L		x
17	1	Stand	AISI 304L		
174	2	Domed Nut	A4-70		
175	2	Washer	A4-70		
179	4	Adjustable Foot Set	AISI 316L		
18	8	O-Ring	FEP/FKM (standard, FDA & USP VI) EPDM (FDA & USP VI) – standard	x	x
22	4	Valve Ball Stop	AISI 316L		
23	4	Valve Ball	PTFE TFM (FDA & USP VI) - standard AISI 316L	x	
25	1	Muffler	PP		x
26	1	Air Intake Adaptor	Galvanised Brass		
271	1	Set of 2 Plates (L + R)	AISI 316L		
2711	8	Screw	AISI 316		
30	6	O-Ring	NBR, FKM, EPDM		
36	2	Centre Block Seal	PE		x
37	12/16**	Domed Nut	AISI 316L		
38	12/16**	Washer	AISI 316L		
47	2/4***	O-Ring (Back up for 36)	NBR		x
61	1	Air Valve Complete	Brass/NBR (standard), AISI 316L/FKM, Brass/EPDM, AISI 316L/FKM, PET/FKM		x
90	1	Grounding Set	AISI 316L		

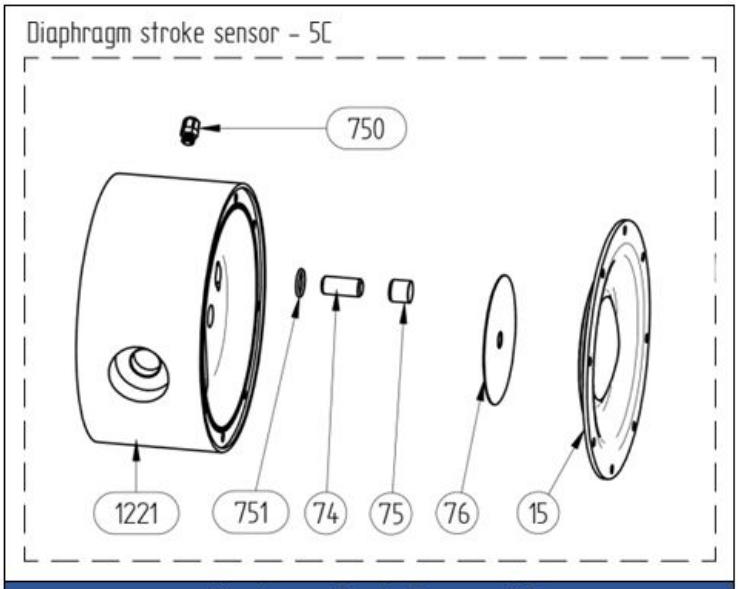
* *6 for TX144 / 8 for TX244*
** *12 for TX144 / 16 for TX244*
*** *4 for TX144 / 2 for TX244*



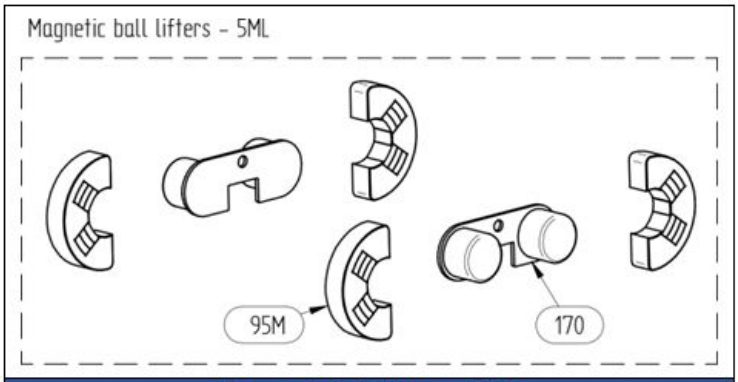
External Air Supply - 5EC			
Pos.	**Qty**	**Description**	**Material**
124	1	Centre Block	PP, PP Cond.
26	2	Air Intake Adaptor	Brass



External Control, Built on Solenoid Valve - 5EV			
Pos.	**Qty**	**Description**	**Material**
125	1	Centre Block	PP, PP Cond.
97	1	Solenoid Valve	-
971	2	Threaded Insert	AISI 316L
972	2	Screw	A4-70



Diaphragm Stroke Sensor - 5C			
Pos.	**Qty**	**Description**	**Material**
1221	1	Centre Block for Stroke Sensor	PP
751	1	O-Ring	NBR, FKM, EPDM
74	1	Inductive Sensor	CuZn
75	1	Sensor Cap	PP
76	1	Sensing Plate	AISI 316L
750	1	Cable Gland	PP



Magnetic Ball Lifters - 5ML			
Pos.	**Qty**	**Description**	**Material**
23-15	4	Valve Ball	PTFE / SS Core
23-59	4	Valve Ball	AISI 420
95M	4	Magnetic Ball Lifter	PE1000
170	2	Holder	AISI 316L

Recommended Spares for Stocking:

Even during normal operating conditions some parts in the pump will be subject to wear and tear. In order to avoid expensive breakdowns we recommend having a few spare parts in stock.

Depending on the severity of the operation and the importance of assuring continuous operation we offer two different spare part kits which are recommended to be replaced at 2 different time intervals. Note that this is only a recommendation. The characteristics of the liquid, temperature, materials used in the pump and running time decide how often the service intervals are necessary.

	Pos.	Description	Qty
KIT LIQ	15	Diaphragm	2
	18	Sealing	8
	23	Valve Ball	4

	Pos.	Description	Qty
KIT AIR	18	O-Ring / Gasket Set	8
	61	Air Valve Complete	1
	16	Diaphragm Shaft	1
	36	Centre Block Seal	2
	47	O-Ring (Back up for 36)	2/4*
	25	Muffler	1

** 4 for TX144 / 2 for TX244*