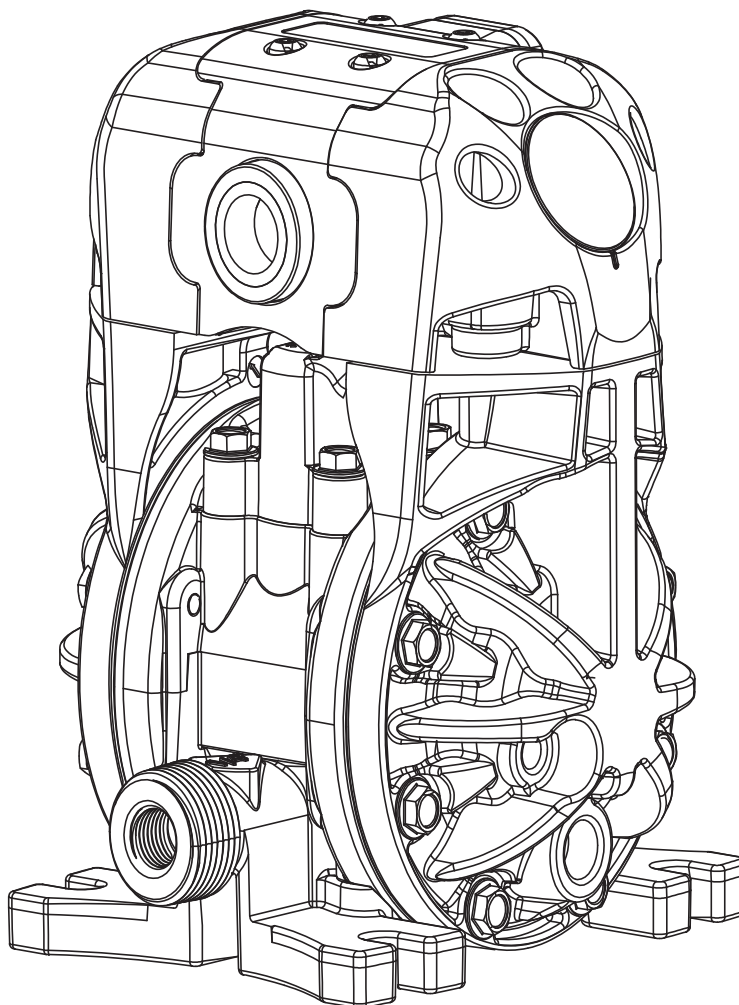


Parts and technical service guide

Guía de servicio técnico y recambio



2018_11_16-13:00

EN 1/4" DOUBLE DIAPHRAGM PUMP DC20, 20 l/min (5,28 US gal/min)

1

ES BOMBA DE DOBLE MEMBRANA 1/4" DC20, 20 l/min (5,28 US gal/min)

12

CODING / CODIFICACIÓN

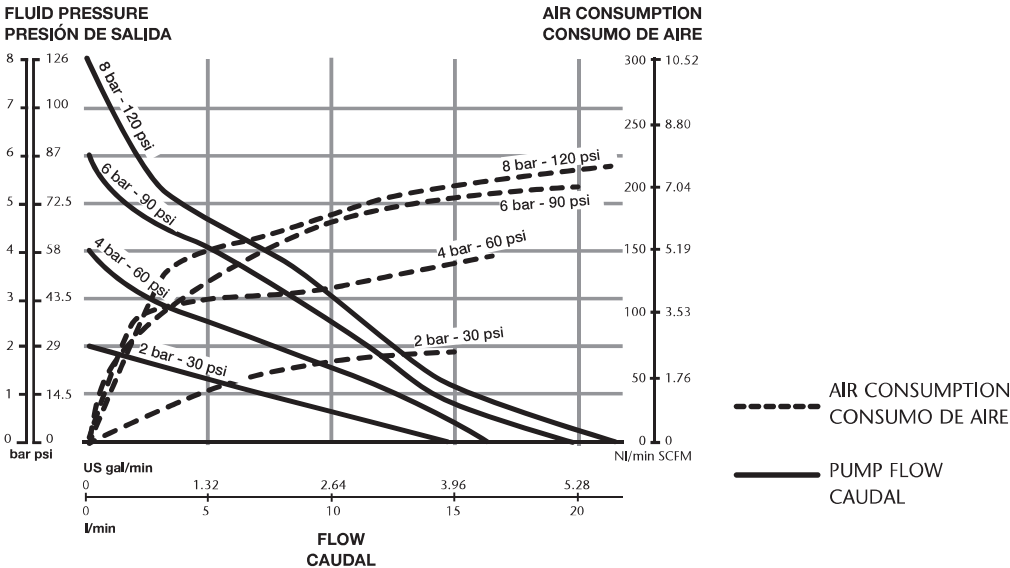
DC20	X	X	X	X	X	X	X	X	X	X
AIR VALVE	BODY PUMP	PUSH ROD	SEALS	SEATS	BALLS	DIAPHRAGMS	CONNECTIONS	OPTIONS		
P Polypropylene	P Polypropylene	S Stainless steel	V FKM	P Polypropylene	T PTFE	H Hytrel®	B BSP	A Standard pump	C Diaphragm leak detector	D Cycle sensor
	B Conductive PP	Y Hastelloy® C	E EPDM	C POM	C POM	T PTFE	N NPT			E Externally controlled with solenoid valve (not included)
	C POM		T PTFE	W PVDF		M Santoprene®				F Nose muffler included
	D Conductive POM			M Santoprene®						G Externally controlled with solenoid valve (not included) and inductive end of stroke sensors NPN (included)
	W PVDF			H Hytrel®						I Externally controlled with solenoid valve (not included) and inductive end of stroke sensors ATEX-Namur (included)
	K Conductive PVDF									U Pump suitable for UV fluids

TECHNICAL DATA / DATOS TÉCNICOS

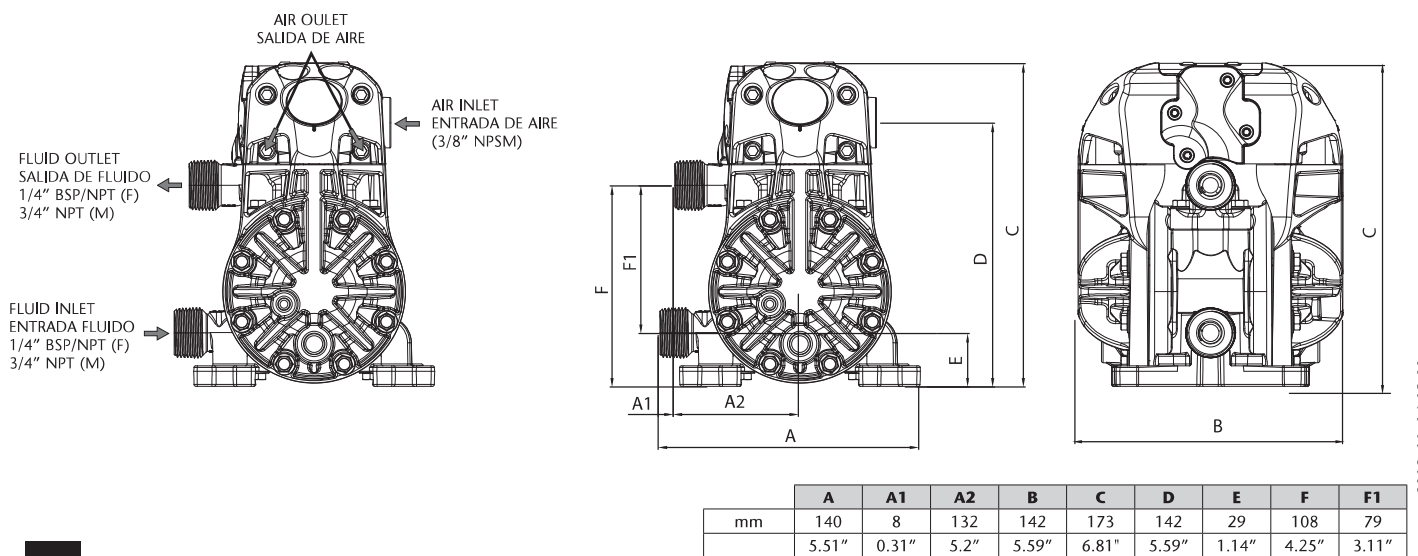
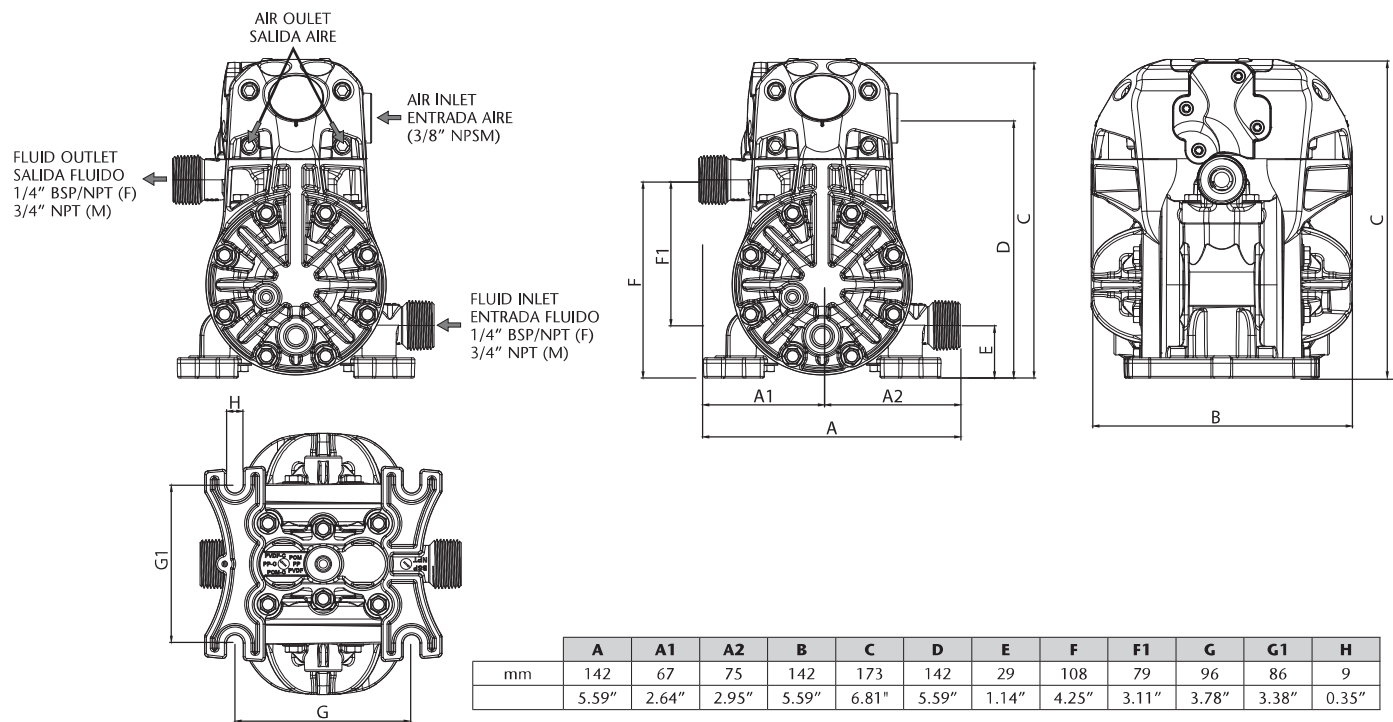
		DC20
RATIO	RATIO	1:1
MAXIMUM FREE FLOW	MÁXIMO CAUDAL SALIDA LIBRE	5,28 Us gal/min (20 l/min)
AIR PRESSURE OPERATING RANGE	RANGO DE PRESIÓN	22 to 115 psi (1,5 a 7 bar)
SOLID IN SUSPENSION MAX SIZE	MAX. TAMAÑO DE PARTÍCULAS EN SUSPENSIÓN	3/32" (2 mm)
MAXIMUM SUCTION HEAD	ALTURA MÁXIMA DE SUCCIÓN	6 1/2" ft (2 m) dry, 23 ft (7 m) wet 6 1/2" ft (2 m) seco, 23 ft (7 m) húmedo
WEIGHT	PESO	2,65 lb (1,2 kg)
FLUID INLET/OUTLET CONNECTIONS	ENTRADA DE FLUIDO/CONEXIONES DE SALIDA	1/4" BSP (F) or NPT (F) 3/4" NPT (M)
AIR INLET	ENTRADA DE AIRE	3/8" NPSM (F)
TEMPERATURE RANGE	RANGO DE TEMPERATURAS DE TRABAJO	32 -158 °F (0 - 70 °C)

(oz, ft, gal/min) all in EEUU units.
(oz, ft, gal/min) todo en unidades EEUU.

CAPACITY CURVES / CURVAS DE CAPACIDAD



Tested at room temperature, using water. Flooded pump with 3.5 inches (80 mm), positive suction head.
Ensayo realizado con agua a temperatura ambiente y bomba inundada en 80 mm de succión positiva.



EN

IMPORTANT: When doing a pump maintenance that implies manifold disassembling and pump is fitted with PTFE o-rings (white colour), they must be replaced by new ones in order to avoid fluid leakages".

ES

IMPORTANTE: Cuando realice un mantenimiento en la bomba que implique desmontaje de los colectores y la bomba esté configurada con juntas de PTFE (color blanco), estas tienen que ser reemplazadas por unas nuevas con objeto de evitar fugas de fluido".

2018_11_16-13:00

WARNINGS AND CAUTIONS

In this document you will find warnings and cautions for installation, use and maintenance of the pumps.

Here's the meaning of symbols you may find in this document and general warnings that you should keep in mind.



WARNING: This symbol aware that there is a danger of serious bodily injury or death if you ignore the warning described.

CAUTION: This symbol aware that there is a danger of personal injury or property damage if you ignore the caution described.



WARNING: CAREFULLY READ THE INSTRUCTIONS AND WARNINGS BEFORE OPERATING THE EQUIPMENT!

- This equipment is for professional use only.
- Do not degrade the integrity of the equipment. Use only original replacement components from Samoa Industrial, S.A.
- Fluids not suitable for the pump can cause damage to the pump unit and involve risk of serious personal injury.
- Always consult Samoa Industrial, S.A. if you have any questions about the compatibility within the fluids and the pump materials, including elastomers.
- Install and use the pump according to all local and national regulations and abide all health and safety laws or legislation.
- The pump can produce fluid pressures equal to the air supply pressure. Do not exceed the maximum allowable pressure of 115 psi (7 bar) air supply. The total hydraulic pressure (differential pressure + system) should never exceed 115 psi (7 bar).
- Never use a pump that leaks, that is damaged, that is corroded or otherwise it may lack the capacity to contain the fluid.
- Frequently check that the bolts on the diaphragm cover of the pump are torqued correctly.
- Do not use a model with aluminium wetted surfaces to pump fluids for human consumption, there is a possibility of trace contamination of lead.
- Danger of explosion if used 1,1,1-trichloroethane, methylene chloride or other halogenated hydrocarbon solvents with aluminium wetted materials. It could cause serious injury and property damage.
- Inside the pump, diaphragms separate the fluid that is being pumped from the air supply. If a diaphragm breaks, the fluid can leak out of the air exhaust and contaminate the environment.
- When handling hazardous fluids, always route the air exhaust into a suitable container and locate it in a safe place.
- When the fluid source level is situated higher than the pump, (flooded suction), the outlet tank must be at a higher level than the product to prevent spills.
- For pumps handling hazardous fluids that are a danger to humans or to the environment, install a suitable container surrounding the pump to prevent any leaks or spills.
- Ensure that the operators of this equipment are trained on the operation and limitations. Use safety equipment as safety goggles or other equipment required.

DESCRIPTION

Air operated double diaphragm pumps are air-powered, reciprocating positive displacement pumps with two pumping chambers. Two diaphragms, centrally located in the chambers, separate the compressed air (dry side) from the fluid being pumped (wet side). A shaft transmits the reciprocating motion of one diaphragm to the other. A directional valve alternatively distributes the air from one chamber to the other; thus a reciprocating movement of the diaphragms is created. With each stroke, fluid is discharged by one of the diaphragms whilst the opposite diaphragm sucks new fluid into the expanding chamber. Check valves, two on the discharge side and two on the suction side, control and direct the fluid flow.

MATERIAL	TEMPERATURE RANGE
PTFE	5 °C - 105 °C / 41 °F - 221 °F
NBR	10 °C - 80 °C / 50 °F - 176 °F
Acetal	10 °C - 90 °C / 50 °F - 194 °F
Hytrel®	10 °C - 90 °C / 50 °F - 194 °F
Santoprene®	-29 °C - 135 °C / -20 °F - 275 °F
Viton®	-10 °C - 120 °C / -4 °F - 248 °F
Polypropylene	10 °C - 80 °C / 50 °F - 176 °F

INSTALLATION

- Remove the pump from its package and install it on the chosen location.
- Try to minimize the suction head. Install the pump as close as possible to the fluid being pumped.
- Remember to have enough space around the pump to perform maintenance tasks.
- Keep in mind to connect the inlet and outlet of the pump correctly.
- In case of diaphragm pump failure, the air exhaust will expel the product being pumped.
- When the pump is installed in a place where a spill of fluid can cause an environmental impact, the exhaust should be directed to a place where this spill could be contained.
- When installing the pump in its place, use brackets to secure its base.
- Fasten all bolts with the torques contained in this manual.

DC PUMPS ARE VERY EASILY CONFIGURED AND EASY TO INSTALL.

FLOODED:

The pumping system was designed with positive pressure at the inlet. This is the best possible installation when you need to evacuate the liquid from the drum or tank, or when working with viscous fluids.

Not recommended for hazardous fluids.

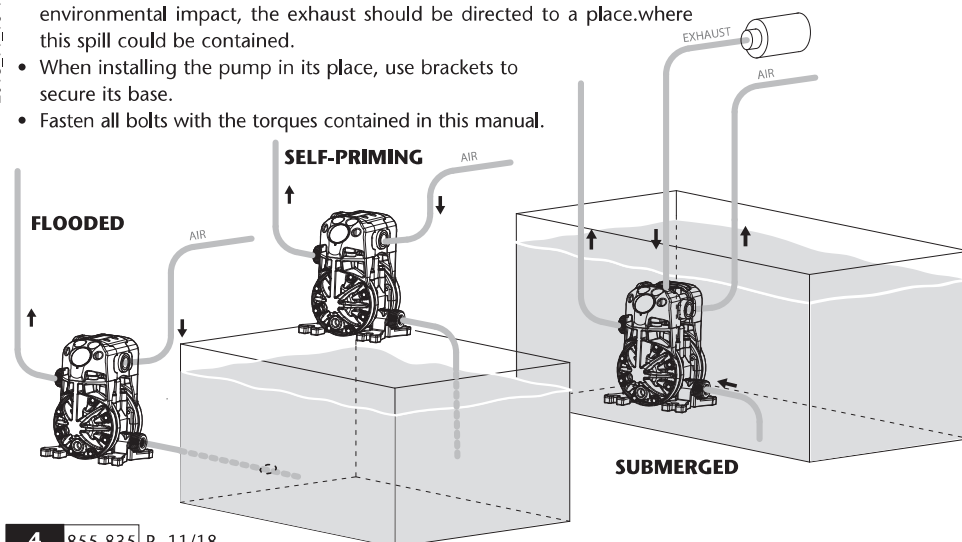
SELF-PRIMING:

Pump is designed to generate vacuum. It is possible to evacuate all the air from a hose or pipe without damaging the pump. Maximum suction height is 6 1/2" (2 m), with the suction hose empty and up to 23" (7 m) with the hose primed. (See page 1 for corresponds suction lift).

SUBMERGED:

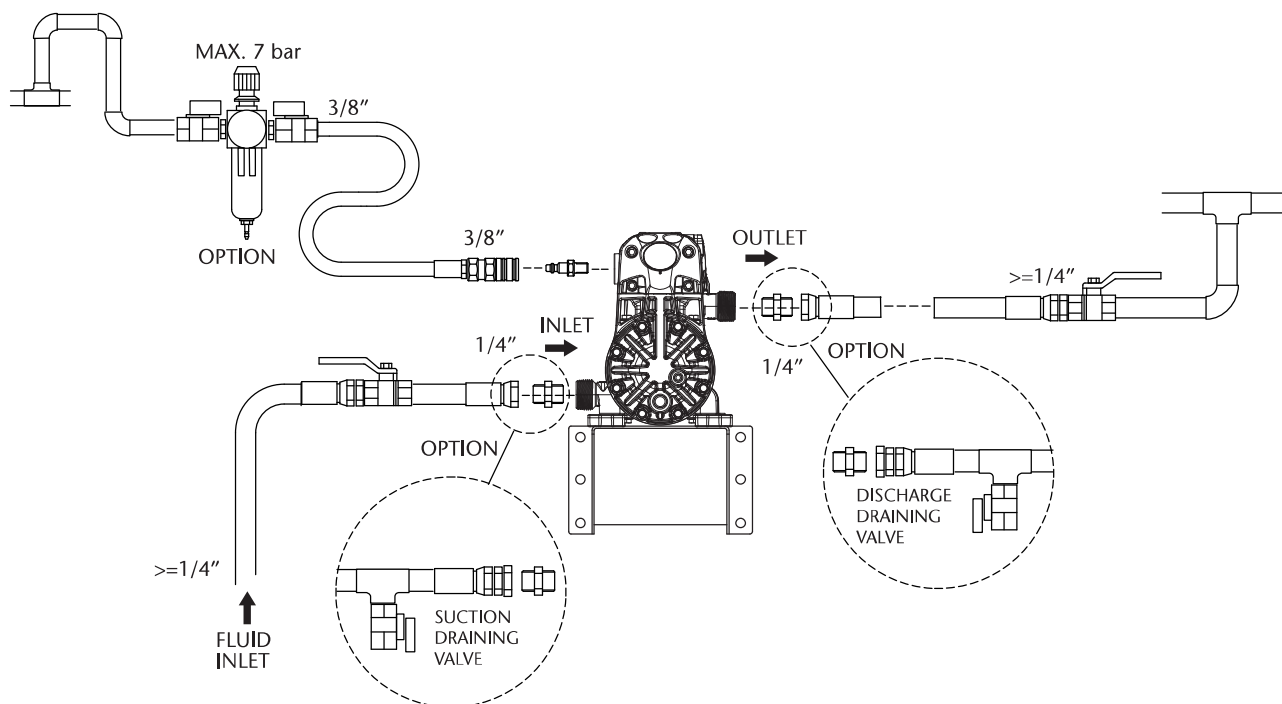
All pumps can be immersed in fluids. It is important to verify that all components that are in contact with the fluid are chemically compatible. In this case, air exhaust and fluid must be carried by hoses (optional air connection).

NOTE: Use a pressure regulator with built-in filter inlet.



INSTALLATION

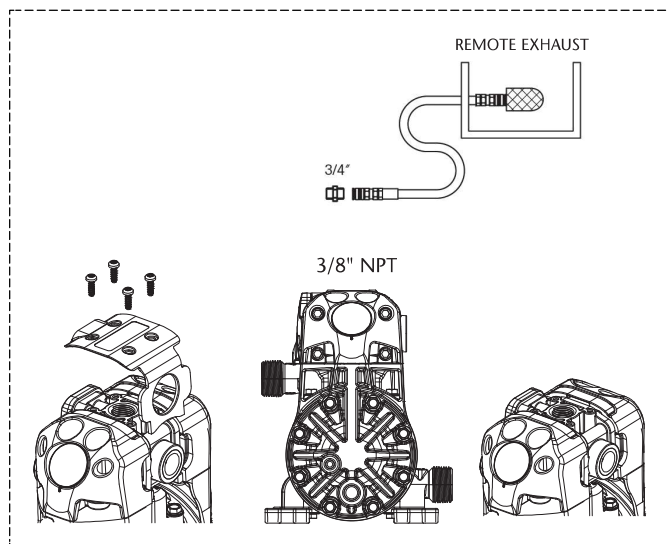
RECOMMENDED INSTALLATION



AIR EXHAUST DISPOSAL

WARNING

- Optional kit is required for remote exhaust.
- Unscrew the 4 bolts and remove the air cap.
- Connect a hose to the new exhaust port and install the muffler at the end of the hose. Use a hose with the same diameter as the exhaust port 3/8" NPT. (If the hose is more than 5 feet (1.5 m), consult your dealer or Samoa Industrial, S.A.).
- Have a moat, a protective housing, etc. at the end of the hose.



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AIR CONNECTION

WARNING

To ensure that the air supply is sufficient to meet the demand of the pump, the diameter of the pipe must be equal to the diameter of the supply port of the pump. Choose auxiliary air treatment equipment and fittings with sufficient airflow to exceed the air consumption of the pump. In addition,

peripheral air treatment equipment must be installed as close as possible to the pump unit.

The use of a coupler to connect the hoses aids future operation and maintenance tasks.

OPERATING INSTRUCTIONS

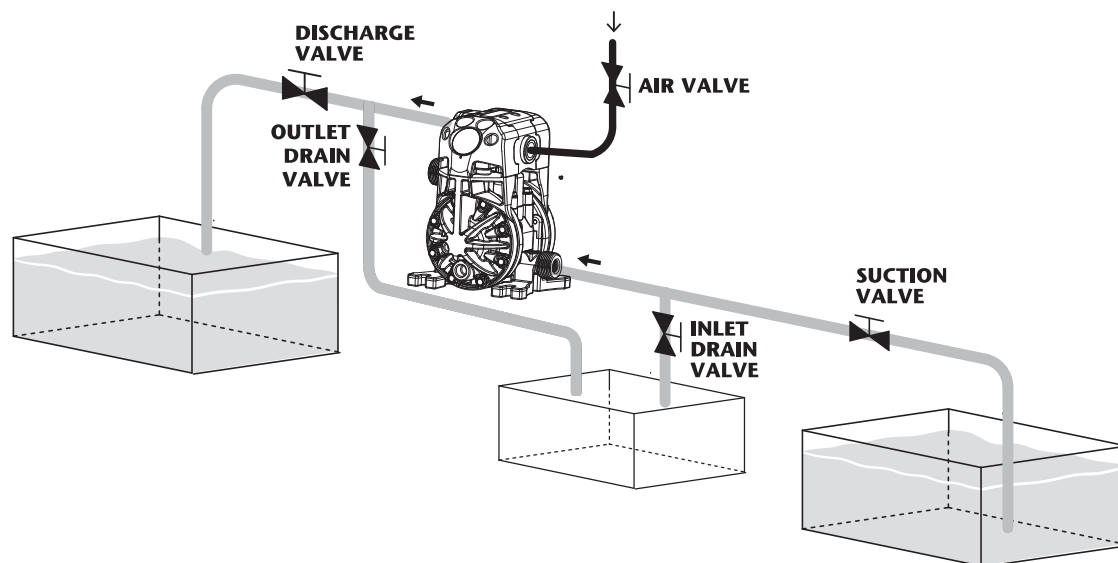
THIS PUMP IS SELF-PRIMING.

To prime it the first time, you must connect the air pump supply to a low pressure using the pressure regulators while keeping the outlet valve open. When fluid begins to flow from the pump outlet, the pump is primed. For regulation of fluid pressure, the unit must be supplied with an air pressure

between 14 and 100 psi (1 and 7 bar). Adjust the discharge valve on the discharge side to control flow. For the performance characteristics of the pump see the capacity curve shown on page 3.

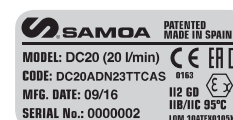
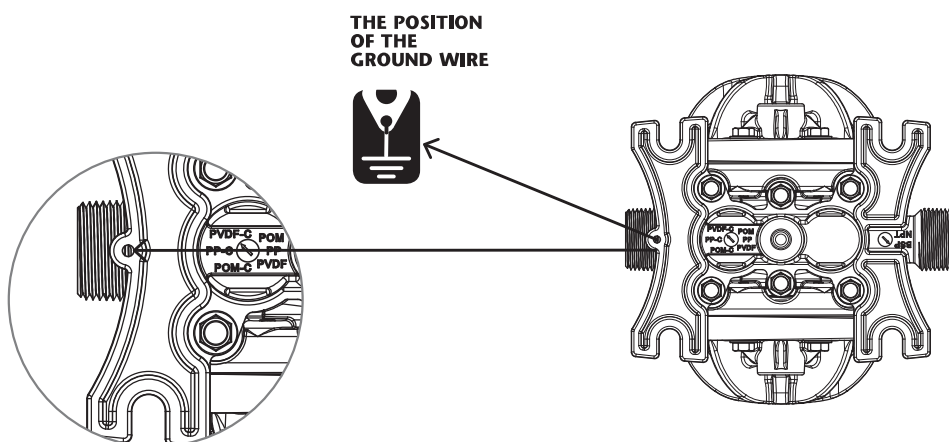
STOPPING THE PUMP FOR MAINTENANCE TASKS

- Stop the air supply.
- Make sure for your safety that the air valve is closed.
- Turn off the air compressor, or close the valve on the air supply side of the auxiliary equipment.
- Close the discharge valve and the suction valve. Open inlet and outlet drain valves.
- Open the air valve of the pump, running bring on the pump and flushing the remaining fluid.
- Close the air valve.
- After ensuring that the pump was turned off and the pressure was released, pump is ready for its maintenance.



GROUNDING THE PUMP

- When installing the pump, be sure to perform grounding in the specified location.
- Also connect ground wires for the auxiliary equipment and piping.
- Use a grounding cable of at least 12 gauge (2.0 mm²).
- If the pump you have purchased is valid for Atex, a specific Atex manual will accompany this one. Read this manual before operating the pump.
- If the unit is marked with the symbol, Ex it can be used in potentially explosive atmospheres. Below this symbol, in the nameplate of the pump, are indicated the areas for which the equipment is approved. You will also find the maximum allowable surface temperature in the same plate.



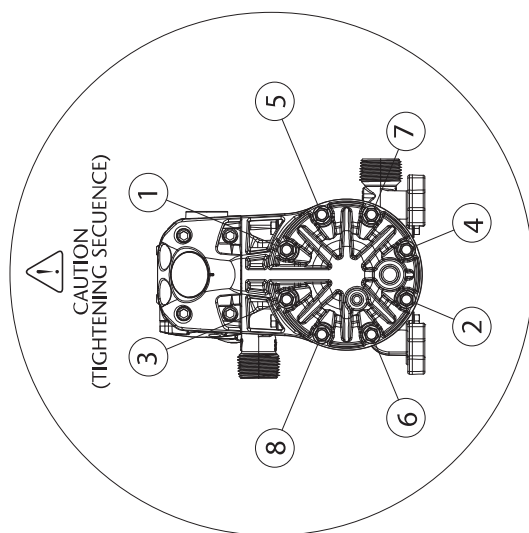
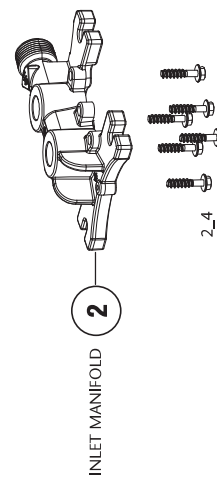
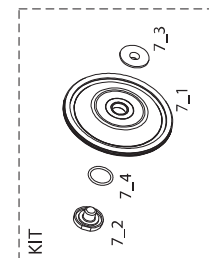
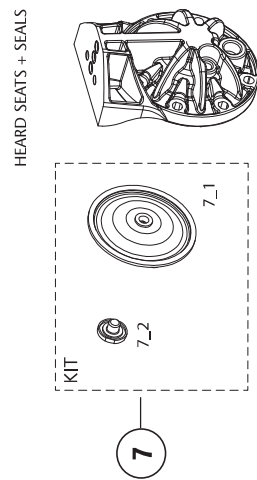
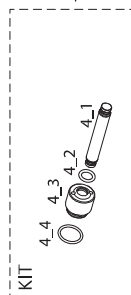
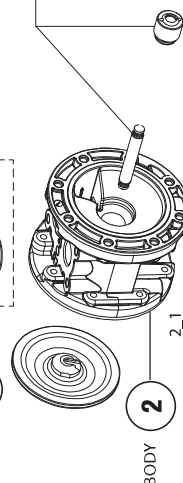
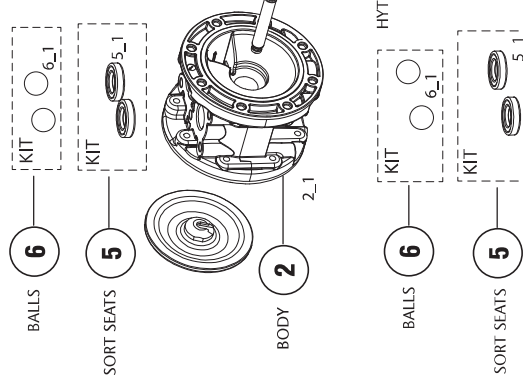
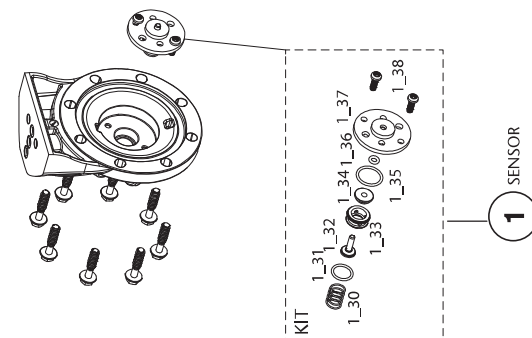
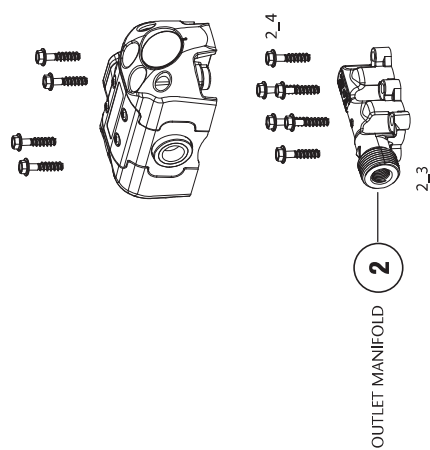
WARNING

- Connect grounding wires to the pump, piping and all other equipment too.
- When the pump operates ungrounded or with an incorrect connection, friction between parts and abrasion caused by some fluids that flow inside the pump, can generate static electricity. Moreover, according to the type of fluid pump and the installation environment (such as gases in the air or the type of the surrounding facilities) static electricity can cause fire or electric shock.

TROUBLESHOOTING

THE PUMP DOES NOT WORK	
Cause	Recommended measure
The discharge valve on the discharge side is not open.	Open the discharge valve on the discharge side.
No air supply.	Turn on the compressor and open the air valve and air regulator.
The air supply pressure is low.	Check the compressor and the configuration of the air line.
Air leaks in connecting elements.	Check the connection elements and the tightening of the screws.
The air pipes or ancillary equipment is clogged with mud.	Check and clean the air line.
The exhaust port (muffler) of the pump is clogged with mud.	Check and clean the exhaust port and muffler.
The fluid pipe is clogged with mud.	Check and clean the fluid line.
Pump is clogged with mud.	Remove, inspect and clean the pump body.
THE PUMP RUNS BUT NO FLUID COMES OUT	
Cause	Recommended measure
The valve on the suction side is not open.	Open the valve on the suction side.
Too much suction or discharge height.	Confirm the configuration of the pipe and reduce the height of the same.
Fluid pipe discharge side (including the filter) is clogged with mud.	Check and clean the fluid line.
Pump is clogged with mud.	Dismantle the pump, check and clean.
The ball and ball seat is worn or damaged.	Inspect and replace parts.
THE FLOW IS DECREASING	
Cause	Recommended measure
The air supply pressure is low.	Check the compressor and the configuration of the air line.
The air line or peripheral equipment clogged with mud.	Check and clean the air line.
Valve discharge side drive will not open normally.	Adjust the discharge valve discharge side.
The air mixes with the fluid.	Replenish fluid and check the configuration of the pipe on the suction side.
Cavitation occurs.	Adjust air supply pressure and discharge pressure and reduce the suction.
Vibrations.	Adjust air supply pressure and discharge pressure. Reduce the flow of the inlet valve to adjust pressure and volume of fluid.
Ice formation in the air exhaust.	Remove ice from the air bypass valve and check and clean the air filter. Use a pipe in the exhaust air that the ice does not form in the muffler.
The fluid line (including the filter) plugged with mud.	Check and clean the fluid pipe and strainer.
The exhaust port (muffler) of the pump is clogged with mud.	Check and clean the exhaust port and muffler.
Pump is clogged with mud.	Remove, inspect and clean the pump body.
LEAKAGE OF FLUID THROUGH THE HOLLOW EXHAUST (SILENCER)	
Cause	Recommended measure
The diaphragm is damaged.	Remove and inspect the pump and replace the diaphragm.
IRREGULAR NOISE	
Cause	Recommended measure
The air supply pressure is too high.	Adjust air supply pressure.
The pump is clogged with sludge particles larger than the diameter allowed.	Remove, check and clean the pump body.
IRREGULAR VIBRATION	
Cause	Recommended measure
The elements of connection and the support of the pump are loose.	Review each element of connection and tighten the screws.
The air supply pressure is too high.	Adjust air supply pressure.
The range and ball valve vibrates.	Adjust air supply pressure and exhaust pressure.
IN FLUID WITH AIR BUBBLES	
Cause	Recommended measure
Diaphragm damaged.	Replace diaphragm.
Suction hose loose or broken.	Tighten or replace.
POWERED AIR LEAK PRESSURE OF 3 TO 8 BAR	
Cause	Recommended measure
Wear directional valve.	Replace directional valve components.
NO START-UP AND IS LEAKING AIR WITHOUT CYCLES	
Cause	Recommended measure
Stiff air sensors.	Change air sensor.
Wear directional valve.	Replace.

PLASTIC PUMP PARTS DRAWING DC20



REGULAR MAINTENANCE SCREWS AND TOOLS

SCREW	TYPE	REQUIRED TOOL
DIRECTIONAL VALVE		
FLUID MANIFOLDS (Valve, seat and seals)	Flanged hex head screw	Socket wrench Metric: 8 mm Standard: 5/16"
DIAPHRAGM COVERS (Diaphragm and central pushing rod)		

*Further maintenance (Air Sensors and Spool valve) will require a T20 Torx screwdriver

PLASTIC PUMP PARTS DRAWING DC20

DC20	X	X	X	X	X	X	X	X	X	X	X	X
	1	2	3	4	5	6	7	8	9			
	AIR VALVE	BODY PUMP	PUSH ROD	SEALS	SEATS	BALLS	DIAPHRAGMS	CONNECTIONS	OPTIONS			
	P Polypropylene	P Polypropylene	S Stainless steel	V FKM	P Polypropylene	T PTFE	H Hytrel®	B BSP	A Standard pump			
		B Conductive pp	Y Hastelloy® C	E EPDM	C POM	C POM	T PTFE	N NPT	C Diaphragm leak detector			
		C POM		T PTFE	W PVDF		M Santoprene®		D Cycle sensor			
		D Conductive POM			M Santoprene®				E Externally controlled with solenoid valve (not included)			
		W PVDF			H Hytrel®				F Nose muffler included			
		K Conductive PVDF							G Externally controlled with solenoid valve (not included) and inductive end of stroke sensors NPN (included)			
									I Externally controlled with solenoid valve (not included) and inductive end of stroke sensors ATEX-Namur (included)			
									U BPump suitable for UV fluids			

1	AIR VALVE			
	AIR VALVE		AIR SENSORS	
	POS 1_1 a 1_9		POS 1_30 a 1_38	
P	558623		558624	
2	CENTRAL BODY AND MANIFLOD			
	CENTRAL BODY	INLET MANIFLOD		OUTLET MANIFLOD
	POS 2_1	POS 2_2		POS 2_3
		BSP (threads)	NPT (threads)	BSP (threads)
P	894692	894697	894697.300	894698.300
B	894693	894699	894699.300	894700.300
C	N/A	N/A	N/A	N/A
D	894694	894701	894701.300	894702.300
W	894695	894703	894703.300	894704.300
K	894696	894705	894705.300	894706.300

3		4		PUSH ROD REPAIR KIT	
PUSH ROD		SEALS	CÓD. KIT	NUMERICAL CODING 55XXXX	
			ATEX PUMP		
S	V		558600	NO ATEX PUMP	
S	E		558601	558605	556115
S	T		558602	558606	
Y	V		558603	558607	
Y	T		558604	558608	
				558609	

5		4		SEATS VALVE REPAIR KIT	
SEATS	SEALS	CÓD. KIT	NUMERICAL CODING 55XXXXXX		
P	V	558610	556115		
P	E	558611			
P	T	558612			
C	V	558613			
C	E	558614			
C	T	558615			
W	T	558616			
H	-	558617			
M	-	558618			

TECHNICAL CHARACTERISTICS LABEL



PATENTED
MADE IN SPAIN

MODEL: DC20 (20 l/min - 5.3 gal/min)

CODE:

MFE DATE:

SERIAL No.:

www.samoaindustrial.com

AIR PRESSURE RANGE:
1.5 - 7 bar / 22 - 102 psi

MAX. FLUID PRESS.:

FLUID IN / OUT:



MODEL:
55XXXX (numerical coding)
DC20XXXXXXX (alphanumeric coding)

6	BALLS VALVE REPAIR KIT	
	CÓD. KIT	NUMERICAL CODING 55XXXX
C	558321	
T	558319	556115
7	DIAPHRAGMS	
	CÓD. KIT	NUMERICAL CODING 55XXXX
	(1) 558619	
T	(2) 558620	
M	558621	556115
H	558622	

(1) For pump fitted with stainless steel central pushing rod.
(2) For pump fitted with hastelloy C central pushing rod.

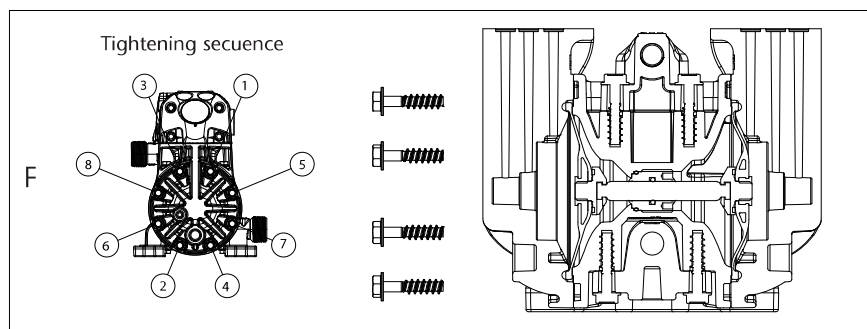
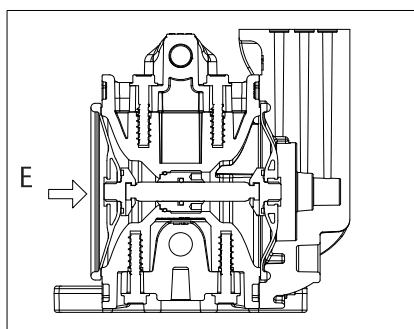
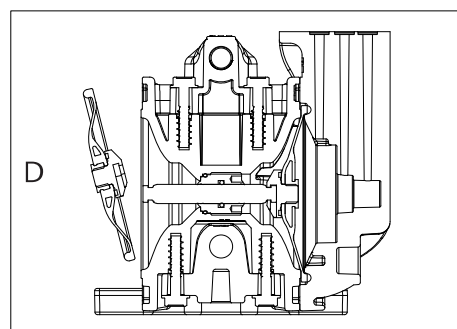
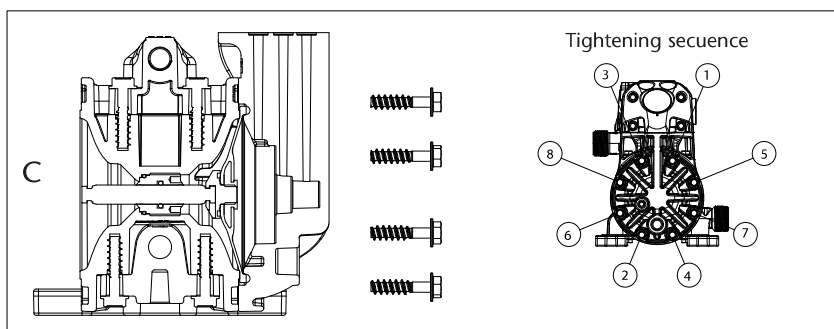
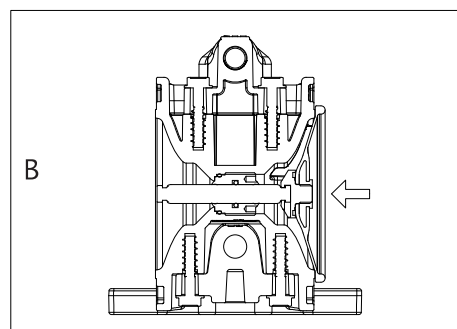
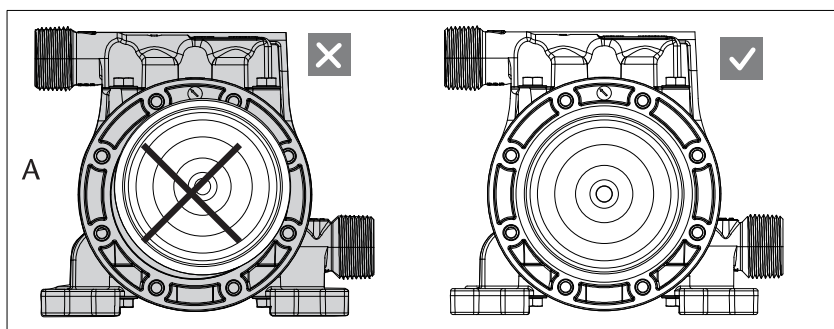
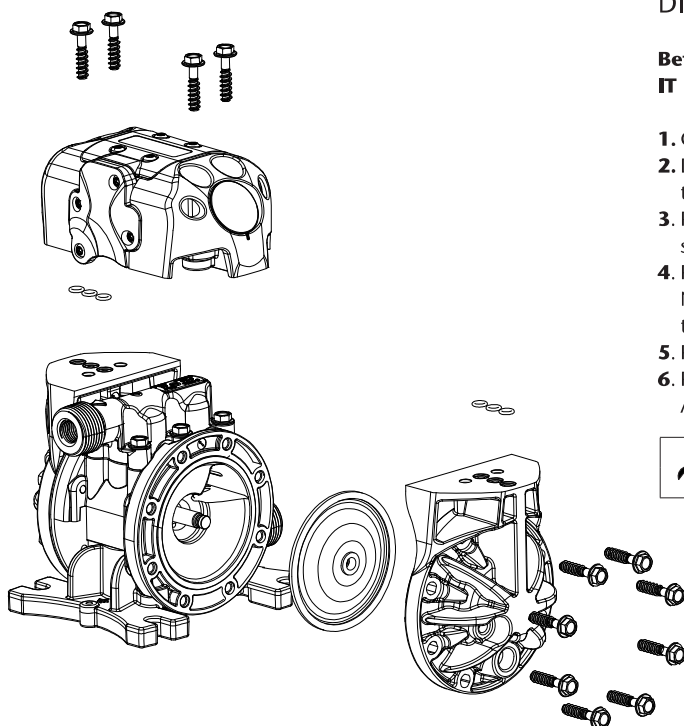
DIAPHRAGM REPLACEMENT

Before any intervention: DISCONNECT AIR SUPPLY OF THE PUMP. IT IS NOT NECESSARY TO REMOVE THE PUMP FROM THE FLUID LINE.

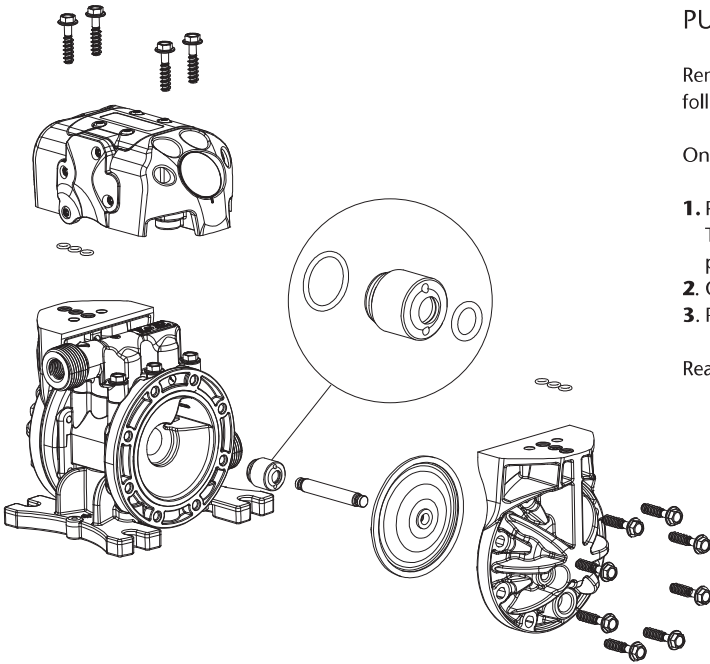
1. Close fluid valves.
2. Drain the fluid inside the pump. Anticipate a drainage of fluid from inside the pump.
3. Remove the directional valve while being careful not to damage the seals shown in the figure.
4. Remove the diaphragm cap.
NOTE: To tighten these screws you must use a torque wrench calibrated to (see torque table in this page).
5. Remove the cover by gently pulling back.
6. Remove the used diaphragm and place the new one in the proper position. Assemble cover according to the following table:

	PP body	PP conductive body	POM conductive body
	5 N·m	4.2 N·m	5 N·m

7. Same procedure in other diaphragm.
8. Assemble the directional valve checking all O-rings seals are placed and tighten the screws with a maximum torque of 44 lbf.in (5 N.m).



REPAIR AND MAINTENANCE PROCEDURES



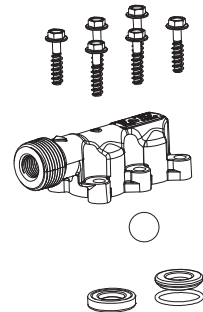
PUSHING ROD

Remove the side cover on the right of the fluid inlet as shown in the figure, following the procedure to "Replace diaphragms".

Once the shaft is visible, use the following procedures:

1. Remove the shaft from its housing by pulling it from one end.
The Teflon® sleeve is threaded into the body. To remove use snap ring pliers in the two holes indicated in the figure.
2. Once the cap has been removed, remove the quad ring inside the pump body.
3. Replace the kit following the correct order shown in the assembly drawing.

Reassemble the pump in reverse order.



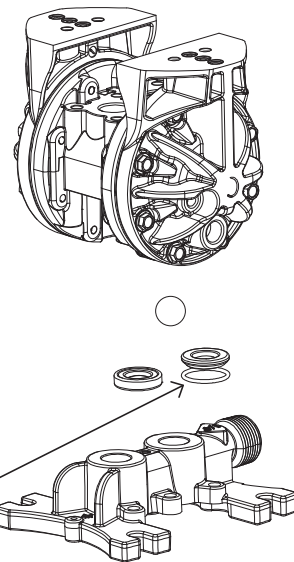
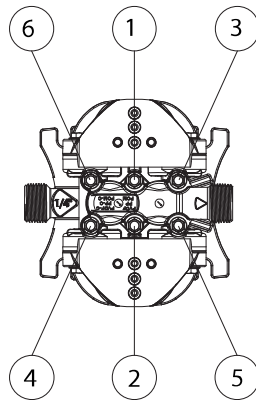
BALL VALVES REPLACEMENT

1. Close fluid valves.
2. Drain the fluid from inside the pump. Anticipate a drainage of fluid from inside the pump.
3. Loosen the screws to remove the directional valve. Take special care with the O-ring seals and the orientation of the directional valve.
4. Remove the inlet and outlet manifolds. Take note of the orientation of the manifolds.
5. Install a new set of valves and/or seats according to the assembly drawing. Once the seats and seals are mounted, the seals should be visible.
6. Tighten the manifold screws following the tighten sequence according to the table:

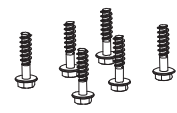
IMPORTANT: Always approximate manifold screws before final tightening.

	PP body	PP conductive body	POM conductive body
	5 N·m	4.2 N·m	5 N·m

7. Assemble the directional valve checking all O-rings seals are placed and tighten the screws with a maximum torque of 44 lbf.in (5 N·m).



IMPORTANT: When doing a pump maintenance that implies manifold disassembling and pump is fitted with PTFE o-rings (white colour), they must be replaced by new ones in order to avoid fluid leakages".



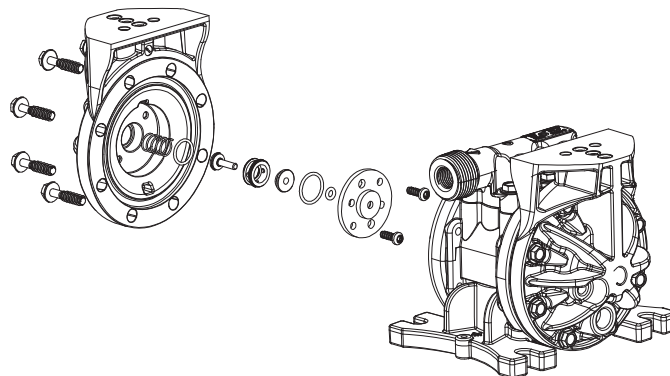
AIR SENSOR (ONLY FOR MODELS WITH DIRECTIONAL VALVE)

The air sensors are on the inside part of the diaphragm covers. To access them, follow the procedure for "Replacing diaphragms".

Once removed the covers following procedure:

1. Remove the two screws that secure the air sensor to the top.
2. Remove all components of the sensor. Clean the area.
3. Introduce new components in the order shown and tigh the two screws sensor with a torque 1.5 N·m.
4. Fit the cover on the pump and tighten the screws to the body of the pump according to the table:

	PP body	PP conductive body	POM conductive body
	5 N·m	4.2 N·m	5 N·m



EC CONFORMITY DECLARATION / DECLARATION CE DE CONFORMIDAD

EN

SAMOA INDUSTRIAL, S.A., Pol. Ind. Porceyo, I-14 · Camino del Fontán, 831 · 33392 - Gijón - Spain, declares that the product(s):
DC20 conform(s) with the EU Directive(s): **2006/42/EC**

ES

SAMOA INDUSTRIAL, S.A., Pol. Ind. Porceyo, I-14 · Camino del Fontán, 831 · 33392 - Gijón - España, declara que el(los) producto(s):
DC20 cumple(n) con la(s) Directiva(s) de la Unión Europea:
2006/42/CE

**For SAMOA INDUSTRIAL, S.A.
Por SAMOA INDUSTRIAL, S.A.**



Pedro E. Prallong Álvarez

Production Director
Director de Producción

2018_11_16-13:00