INSTRUCTION MANUAL

DulcoFlex Peristaltic Pumps:

DFB010
DFB013
DFB016
DFB019
DFB022

This manual forms an integral part of the pump and must accompany it until its demolition. The peristaltic pump is a machine destined to work in industrial areas and as such the instruction manual must form part of the legislative dispositions and the applicable technical standards and does not substitute any installation standard or eventual additional standard.

GENERAL SAFETY WARNING

Pumps are machines that due to their functioning under pressure and moving parts can present dangers.
- Improper use
- Removing the protections and/or disconnecting the protection device
- The lack of inspections and maintenance

CAN CAUSE SERIOUS DAMAGE OR INJURY

The person in charge of safety should therefore guarantee that

- The pump is transported, installed, put in service, used, maintained and repaired by qualified personnel who should therefore posses:

- Specific training and sufficient experience.

- Knowledge of the technical standards and applicable laws.

- Knowledge of the general national and local safety standards and also of installation.

Any work carried out on the electrical part of the pump should be authorised by the person responsible for safety. Given that the pump is destined to form part of an installation, it is the responsibility of whoever

supervises the installation to guarantee absolute safety, adopting the necessary measures of additional protection.

INDEX

IDENTIFICATION RECORD OF EQUIPMENT

MANUFACTURER:

IMPORTER / SUPPLIER:

MODEL OF PUMP:
SERIAL NUMBER:

DRIVER MARK:
DRIVER POWER / SPEED:
REDUCER MARK & MODEL:
REDUCTION RATIO:

FIXED SPEED MOTOR GEAR REDUCER:
MECHANICAL VARIATOR + GEAR REDUCER:
GEAR REDUCER WITH INTEGRATED INVERTER:

WORK SPEED:
MAXIMUM SPEED:
MINIMUM SPEED:

WORKING MANOMETRIC PRESSURE:

MAXIMUM DESIGN PRESSURE: 116 PSI

HOSE MATERIAL:

CONNECTIONS MATERIAL:

TRANSPORT and STORAGE

TRANSPORT

- The pump is protected by a cardboard packaging.
- The packaging materials are recyclable.
- During transportation, the pump is in a resting position (the hose is not compressed)

STORAGE

- The pump should be in a resting position. (The hose should not be compressed).
- Avoid areas open to inclement weather or excessive humidity.
- For storage periods of longer than 60 days, protect the coupling surfaces (DFBs, reducers, motors) with adequate anti-oxidant products.
- Hose/tube spares should be stored in a dry place away from direct light.

GENERAL SAFETY STANDARDS

- The instructions of this manual, whose inobservance is determined as a failure to meet safety standards, are identified by this symbol

- The instructions of this manual, whose inobservance compromises electrical safety.

WARNING!

- The instructions of this manual, whose inobservance compromises the correct working of the pump, are identified with this symbol.

Do not start the pump without first having installed the front cover.

For any manipulation of the equipment, it is necessary to make certain that the pump is stopped and the electricity supply disconnected.

Changing the hose should be done with the pump stopped.

WARNING!

Do not exceed the nominal pressure, speed or temperature of the pump, or use the pump for applications other than that originally planned without first consulting the manufacturer.

WARNING!

Cleaning the pipe, including the hose, should be done with fluids compatible with the mentioned drive pump and at its maximum temperature recommended.

WARNING!

Do not start the pump without it being properly secured to the floor.

Do not carry out any maintenance operations or dismantle the pump without first making sure that the pipes are not under pressure and are empty or isolated.

The start system of the motor should be provided with a direction inverter, stop-go button and emergency stop button (together with the pump), in such a way that the pump can be manipulated with total safety.

In the case of the hose becoming stuck during extraction or fitting it is necessary to reverse the direction of the pump, re-lubricate, and then repeat the operation.

The DulcoFlex pump is a positive displacement pump and therefore susceptible to a closed valve (dead headed) condition. Installing a pressure relief valve on the discharge piping can help prevent damage caused by a “dead headed” condition.

Check the turning direction of the pump, as it is reversible it could generate pressure in the suction and compromise the safety of the installation. The circulation of the fluid should be in the same direction as the turning direction of the pump as seen from the inspection plate situated on the front cover.

Since hose/tube life is so unpredictable, it may be necessary to equip the pump with a moisture sensing device that can shut the pump down in the event of a hose/tube failure.

WARNING!

For C.I.P. type cleaning process, it’s necessary to check with the manufacturer

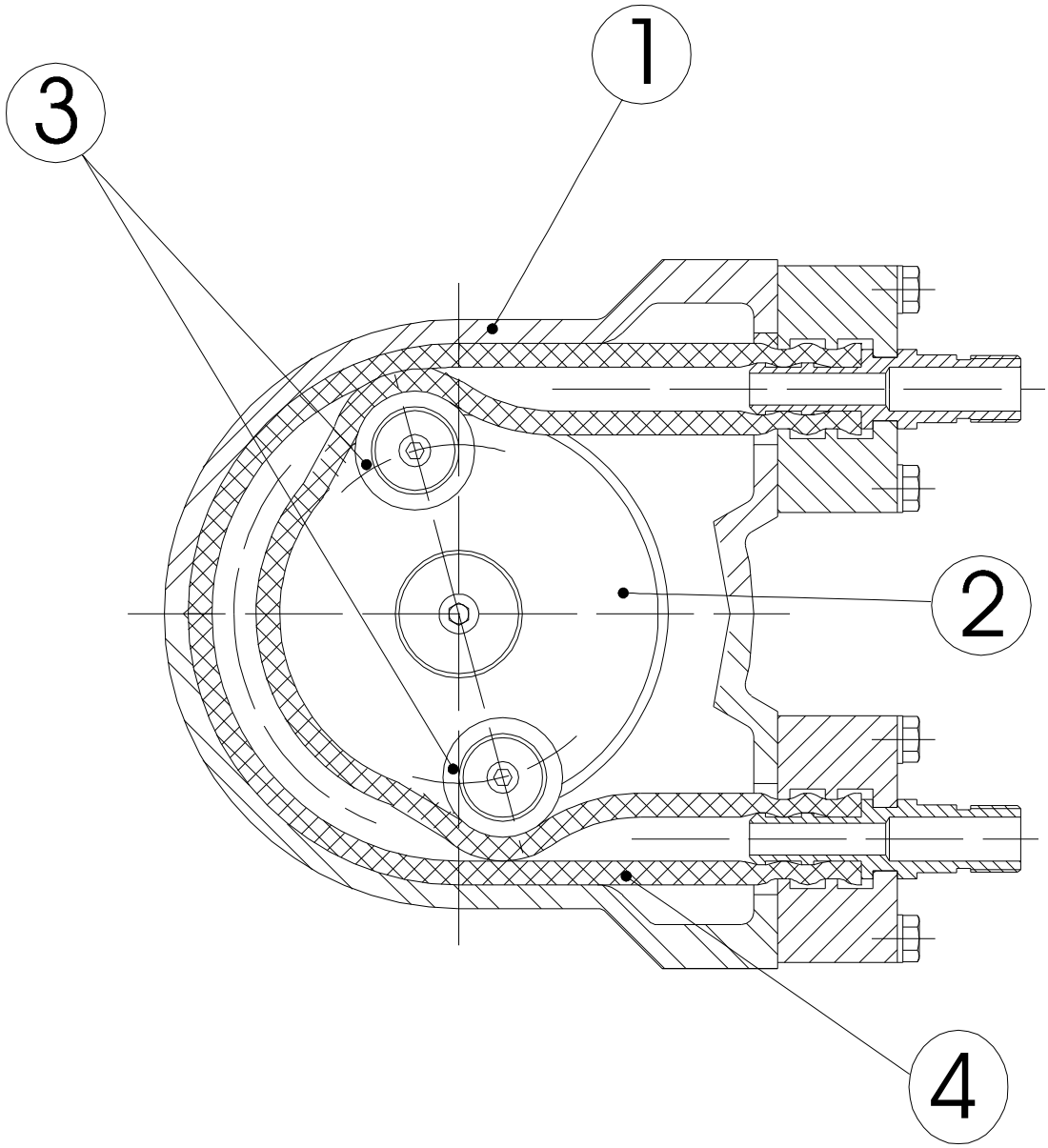
the correct installation of the pump (it's necessary to use a special installation), and also the compatibility of the cleaning products with the peristaltic hose.

GENERAL DESCRIPTION

PERISTALTIC PUMP

- **Construction of the pump.**

As shown in the figure below, the pump unit is a very simple design, robust and with very few moving parts.



The outer casing (1) terminates with threading connectors. Inside the casing are found the rotor (2), completed with two rollers (3). As this is revolving it compresses the reinforced tube (4) and in this way

generates a pumping action. A change in the direction of rotation will give rise to a change in direction of the pumped fluid.

INSTALLATION

- Installation should normally be made in a well ventilated area away from heat sources. If it is necessary to place the pump outside it should be provided with a cover to protect it from sunlight and inclement weather.

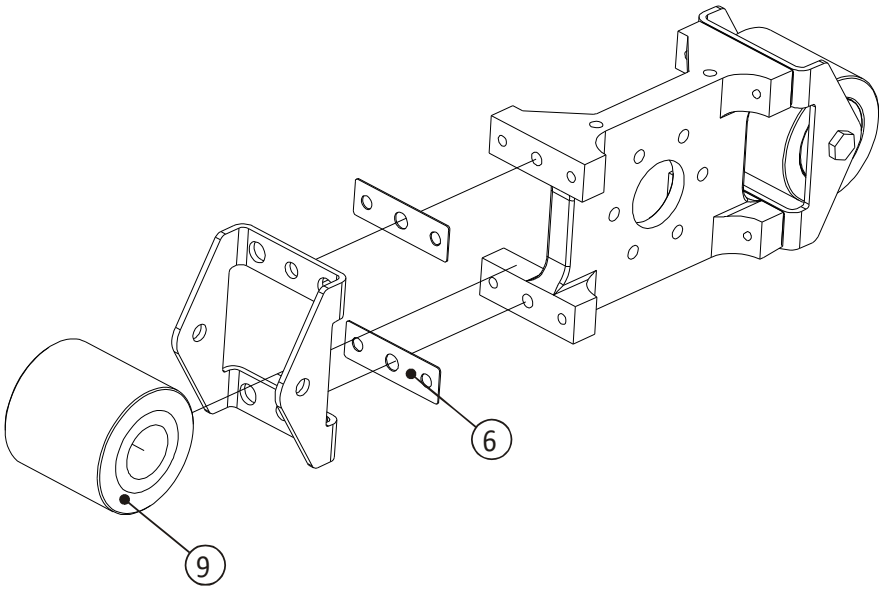
- The positioning of the pump should allow easy access for all kinds of maintenance operations.

Suction. The pump should be as near as possible to the supply of liquid so that the suction pipe is as short and straight as possible. The suction pipe should be perfectly airtight and made of suitable material so that it does not collapse due to the internal drop in vacuum. The minimum diameter should be similar to that of the tubular element. With viscous fluids a larger diameter is recommendable. (Consult manufacturer or distributor)**.** The pump has automatic suction and does not need an inlet valve. The pump is reversible, and so the suction connection can be either one of the two. (Normally the one which adapts itself physically better to the installation would be chosen). It is recommendable to use a flexible connection between the piping and the collars of the pump in order to avoid the transmission of vibration to the piping.

Discharge. To reduce power being absorbed, use the straightest and shortest piping possible. The diameter should be the same as the nominal diameter of the pump, excepting precise calculations of load losses. With viscous fluids a larger diameter is needed. (Consult the manufacturer or distributor). Connecting the fixed piping to the pump with a length of flexible pipe facilitates maintenance and avoids vibrations and loads on the pump. Tighten all piping firmly. The discharge is slightly pulsatory: To avoid such effect, it is advisable to install pulsation dampeners. (See accessories.)

ROLLER PRESSURE ADJUSTMENT

The peristaltic pump, includes a shims (Figure 6), that are used to adjust the exact pressing distance of the roller (figure 9).



The shims are installed from factory to work at the work conditions indicated (in function of the speed and the work pressure), and following the next tables:

DFB10B (Number of shims of 0.5 mm.)

rpm	0-19	20-39	40-59	60-79	80-99
PSI					
7.25	1	1	1	1	1
29	1	1	1	1	1
58	2	1	1	1	1
87	2	2	2	--	--
116	3	2	--	--	--

The standard position of assembly is 4 bar.

DFB10B, THERMOPLASTIC HOSE (Number of shims of 0.5 mm.)

rpm	0-19	20-39	40-59	60-79	80-99
PSI					
7.25	5	5	5	5	5
29	5	5	5	5	5

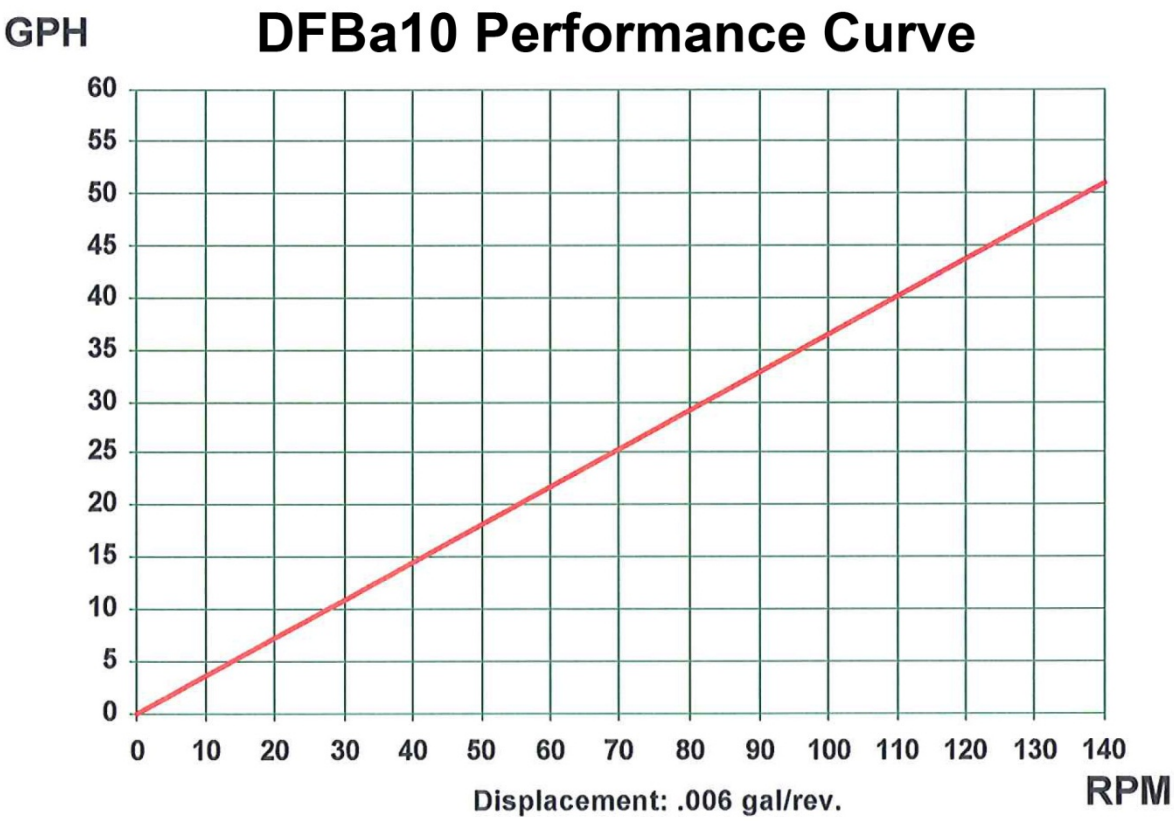
WORK CONDITIONS

There are limits of temperatures and pressures, in function of the hose selected. Those limits are the next:

MATERIAL	MINIMUM TEMP (ºF)	MAXIMUM TEMP (ºF)	MIN AMBIENT (ºF)	MAX. PRESS. (PSI)
NR	-4	176	-40	116
NBR	14	176	-40	116
EPDM	14	176	-40	116
NR-A	14	176	-40	116
NBR-A	14	176	-40	116
NORPRENE	-40	248	-40	29
TYGON	14	158	-40	29

PERFORMANCE CURVES

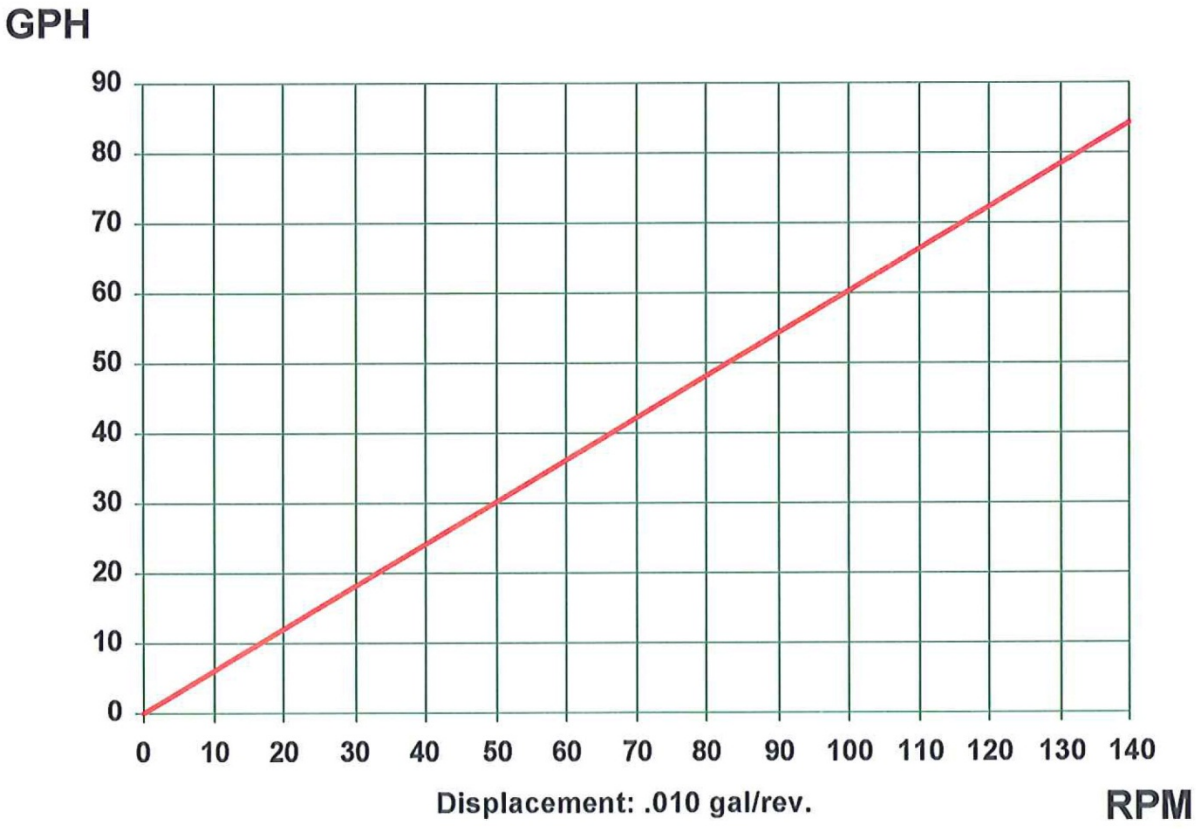
DFB10B



Maximum Pressure for Continuous Duty	
RPM	PSI
46	116
68	58
87	29

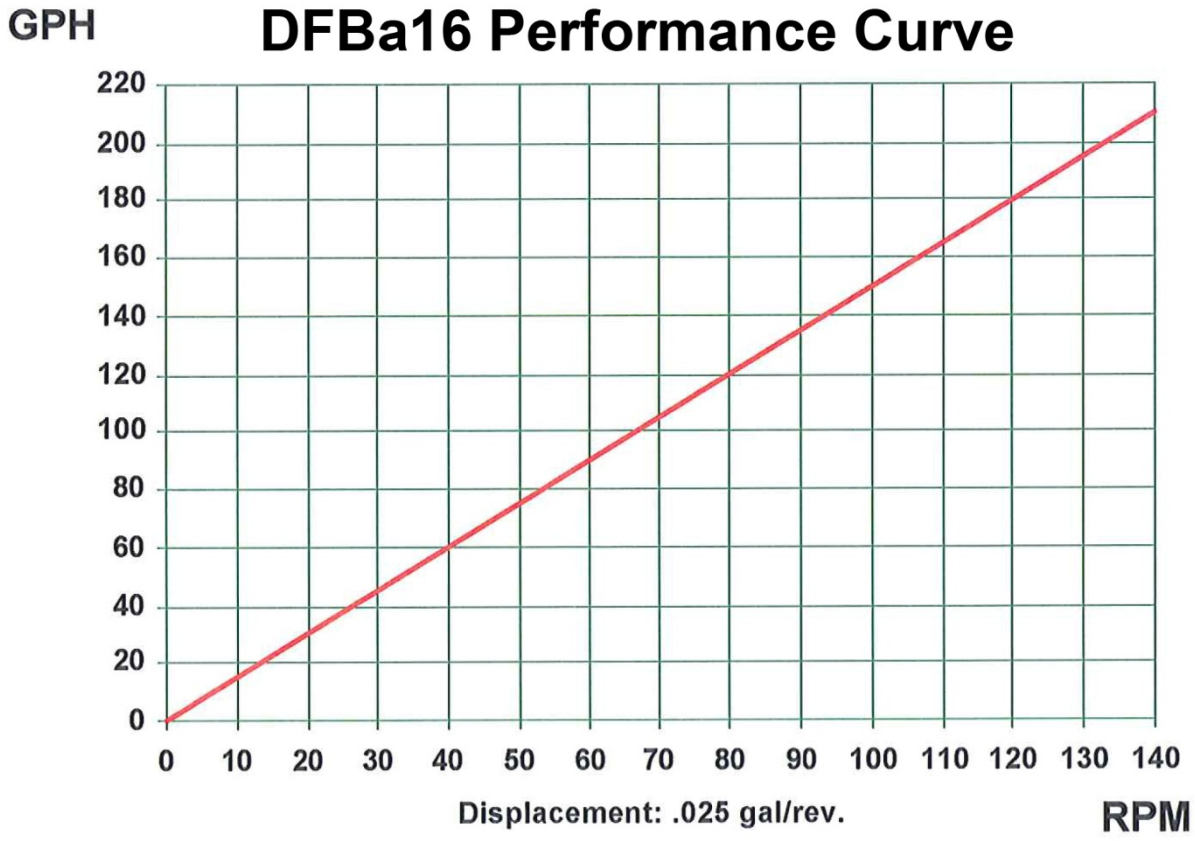
HP Required at Max. RPM	
RPM	HP
46	0.25
140	0.33

Performance Curve **DFBa13**



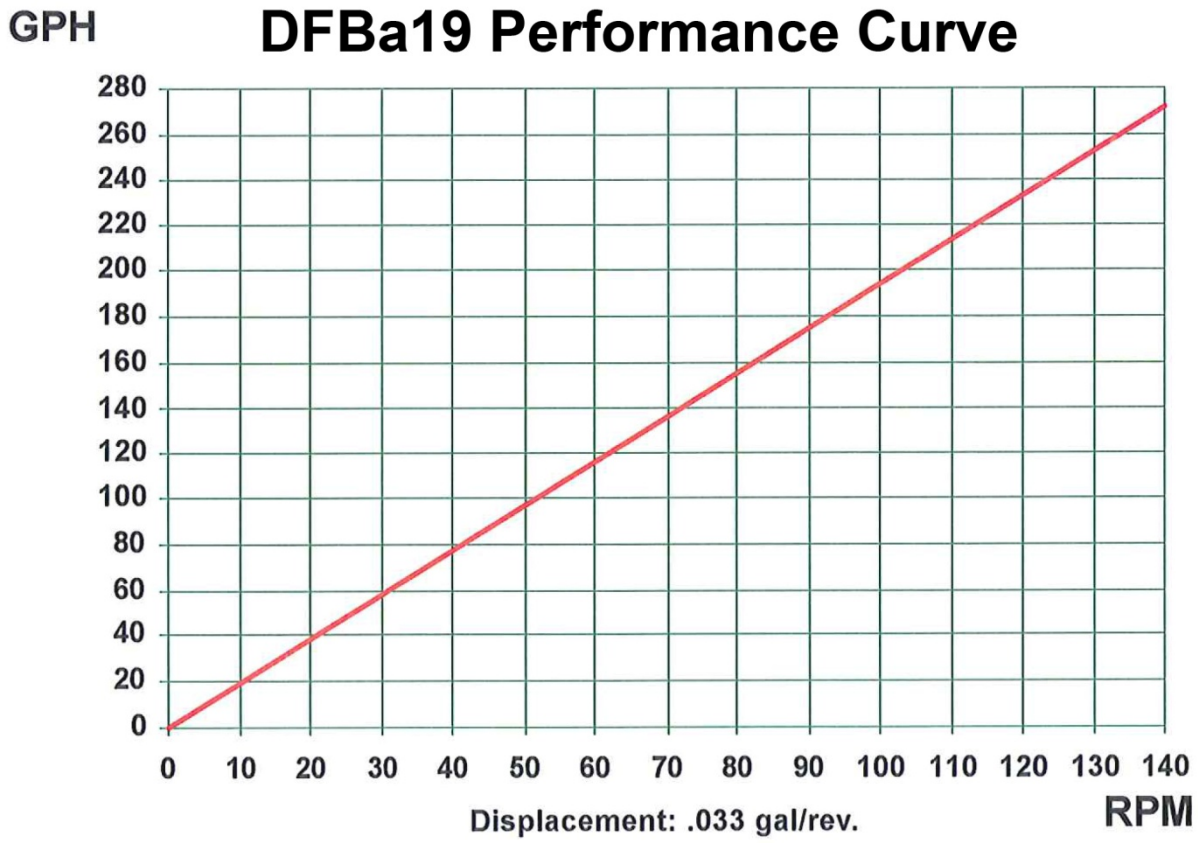
Maximum Pressure for Continuous Duty	
RPM	PSI
46	116
68	58
87	29

HP Required at Max. RPM	
RPM	HP
46	0.25
140	0.33

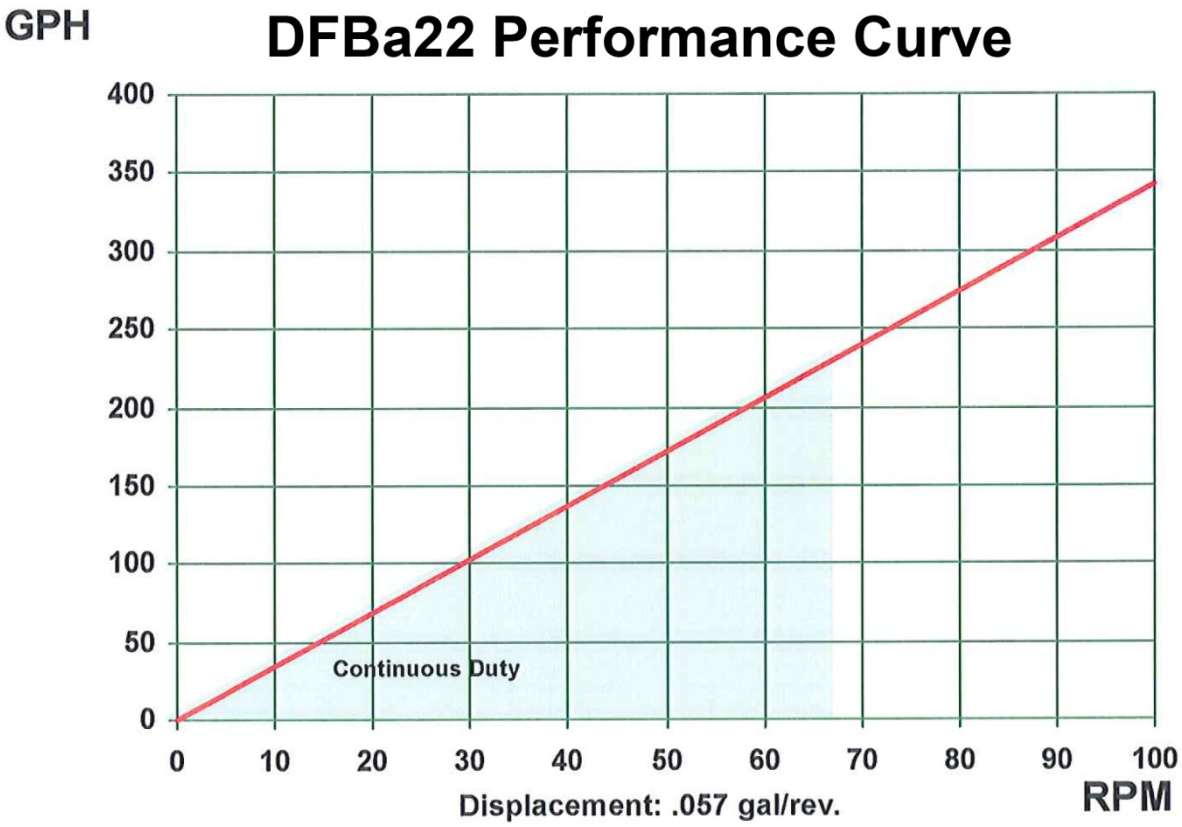


Maximum Pressure for Continuous Duty	
RPM	PSI
35	116
55	58
85	29

HP Required at Max. RPM	
RPM	HP
20	0.25
46	0.33
140	0.5



HP Required at Max. RPM	
RPM	HP
20	0.25
46	0.33
140	0.5



Maximum Pressure for Continuous Duty	
RPM	PSI
28	116
48	58
64	29

CHECKS BEFORE SWITCHING ON THE PUMP

Check that the pumping equipment has not suffered any damage during transportation or storage, any damage should be notified to the supplier immediately.

Check that the network voltage is suitable for the motor.

Make sure that the hose is suitable for the fluid to be pumped and that it will not be chemically affected, check also that the temperature of the fluid does not exceed that recommended.
If the hose is in a resting position, then the pump has come from storage or transportation; now is the moment to install the second roller. **Do not switch on the pump without the front cover being correctly installed.**

Lubrication. Check that the drive pump and the inner of the rollers are correctly greased. The specially formulated grease can be obtained from the authorized distributor.

Check that the protectors of the moving parts are correctly assembled.

Check that the thermal protector corresponds with that of the values on the plate on the motor.

Check that the direction of rotation is the desired one. (rotation test).

Check that the optional electrical components are connected to the control panel and test that they function correctly.

In cases of doubt of the valuation of discharge pressure (e.g. high viscosity), mount a pressure gauge on the discharge.

Check in predicted working conditions that the values of flow, pressure and absorbed power of the motor correspond to the project.

MAINTENANCE

Any work carried out on the pump must be done when the pump is stationary and disconnected from the electricity supply.

Lubrication

Check that the rollers and the hose are correctly greased. Check it every 200 hours of work. Add lubricant as necessary.

> **NOTE: Lubricant MUST be a silicon based lubricant. Any use of an oil/grease based lubricant will damage the hose/tube.**

Check that the lubricant level in the gear reducer is correct and carry out periodic changes of lubricant according to the maintenance manual.

REPOSITIONING OF HOSE - DISMANTLING

- First, all valves must be closed to prevent losses of the product.
- Disconnect the suction and discharge pipes.
- Dismantling of the suction/discharge connections. Dismantling of the rollers that compress the drive pump. Remove the tube to be replaced and separate the connections from both pipe ends.

REPOSITIONING OF HOSE - MOUNTING

- Clean the internal surfaces of the pump body. Lubricate the internal faces of the body of the pump where there could be friction with the hose. To carry out this operation correctly it is necessary to remove the front cover.

- **Inspect the rollers**, checking that there is no damage to the pressure surface. If the machine is being set up for the first time, see paragraph Rotor in the section CHECKS BEFORE SWITCHING ON THE PUMP.

- Insert the connections in each hose end.

- Install the hose in the pump body, lubricating with grease the hose and the inner of the rollers.

- Mount the tightening collars that fasten the hose and its connections to the pump body.

- Fit the rollers.

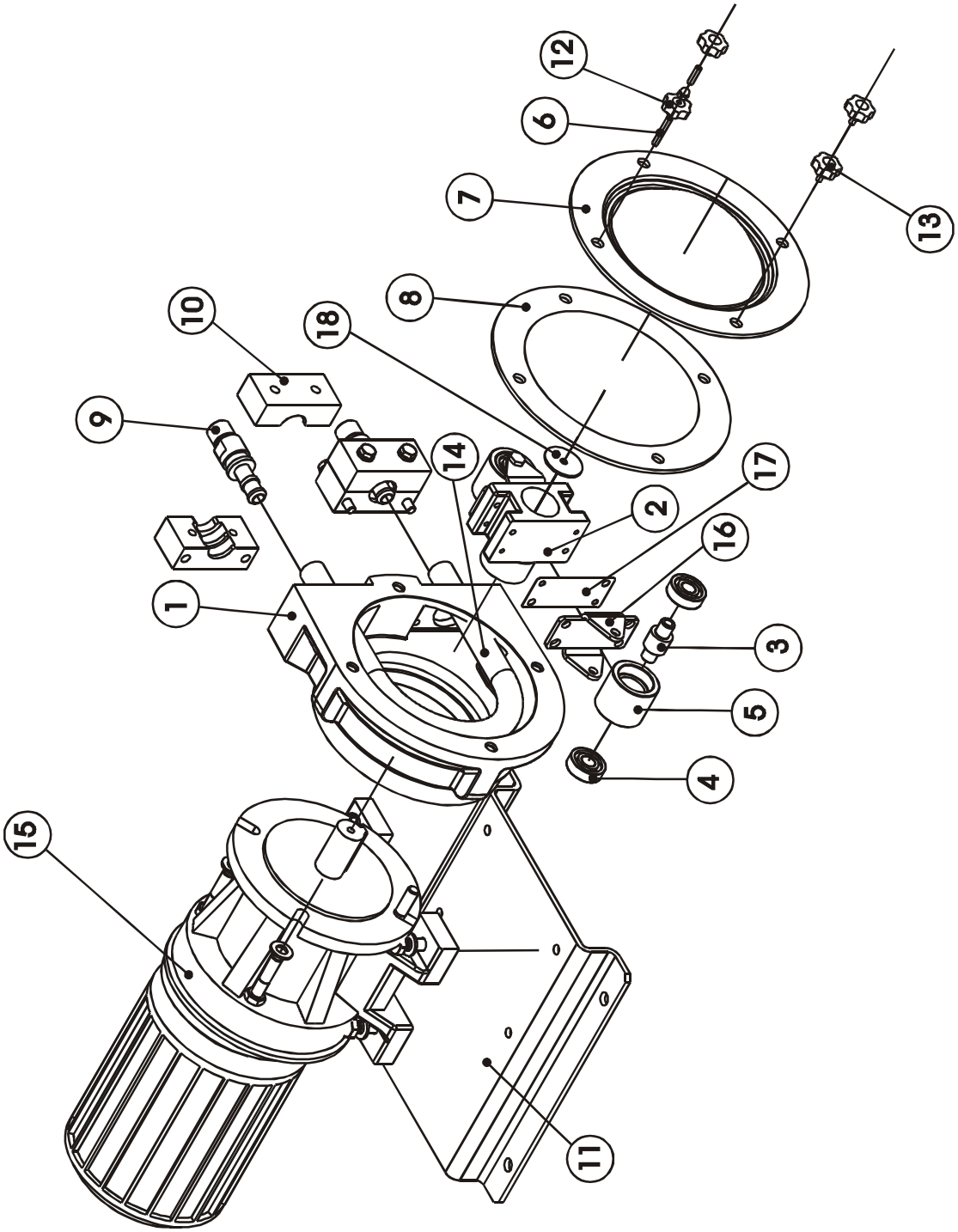
- Fit the front cover.

- Connect suction/discharge pipes.

PROBLEMS, CAUSES AND SOLUTIONS

PROBLEM	POSSIBLE CAUSE	SOLUTIÓN
Elevated temperature	Hose with no lubricant Elevated temperature of product Poor or bad suction conditions Excessive pipe tightening Excessive pumping speed	Use original lubricant Reduce pumping temperature Check there are no obstructions Recalculate sections and lengths Check rollers shaft mounting Reduce velocity of pump
Reduction of capacity/pressure	Suction or impulsion valve closed. Hose insufficiently compressed Rupture of the hose (the product leaks to the casing) Partial obstruction of suction piping Insufficient product amount in suction reservoir Insufficient diameter of suction piping Excessive length of suction pipe High viscosity of product Entry of air via the suction connections High pulsation on suction	Open valves Check rollers shaft mounting Replace drive hose Clean piping Fill or stop Increase section length/reduce pump speed Shorten suction piping Reduce viscosity Increase section length of piping Confirm that the pump is suitable Tighten connections and accessories Install pulsation dampener to discharge Reconsider application (speed etc.)
Vibrations in pump and piping	The piping is not correctly fixed together Excessive pumping speed Insufficient diameter of piping Bedplate of pump loose Elevated pulsation of pump	Check all piping connections Reduce the speed of the pump Increase pipe diameter Fix the bedplate firmly Install pulsation dampener to discharge
Short life of the hose	Chemical attack High speed of pump High pumping temperature High working pressure Abnormal elevation of temperature Unsuitable lubricant Insufficient quantity of grease Cavitation of the pump	Confirm compatibility of the hose with the pumped fluid and the cleaning fluid Reduce speed of pump Reduce temperature of product Reduce speed of pump Increase section diameter of piping Check rollers shaft mounting Use original lubricant Top up lubricant Adjust suction conditions
Stretching of the hose inside the pump	Insufficient grease High suction pressures (>3 Bar) Hose full of sediment Brackets insufficiently tightened	Top off lubricant Reduce suction pressure Clean hose Retighten brackets
The pump does not start	Insufficient starter power Insufficient power from frequency convertor Blockage in the pump	Increase starter power Increase power Check that the voltage is adequate Do not drop below a frequency of 10Hz (confirm this point with the distributor) The starting up will occur at at least 10Hz. Check there are no obstructions in the pipe

DFBu10B & DFBu13B SPARE PARTS



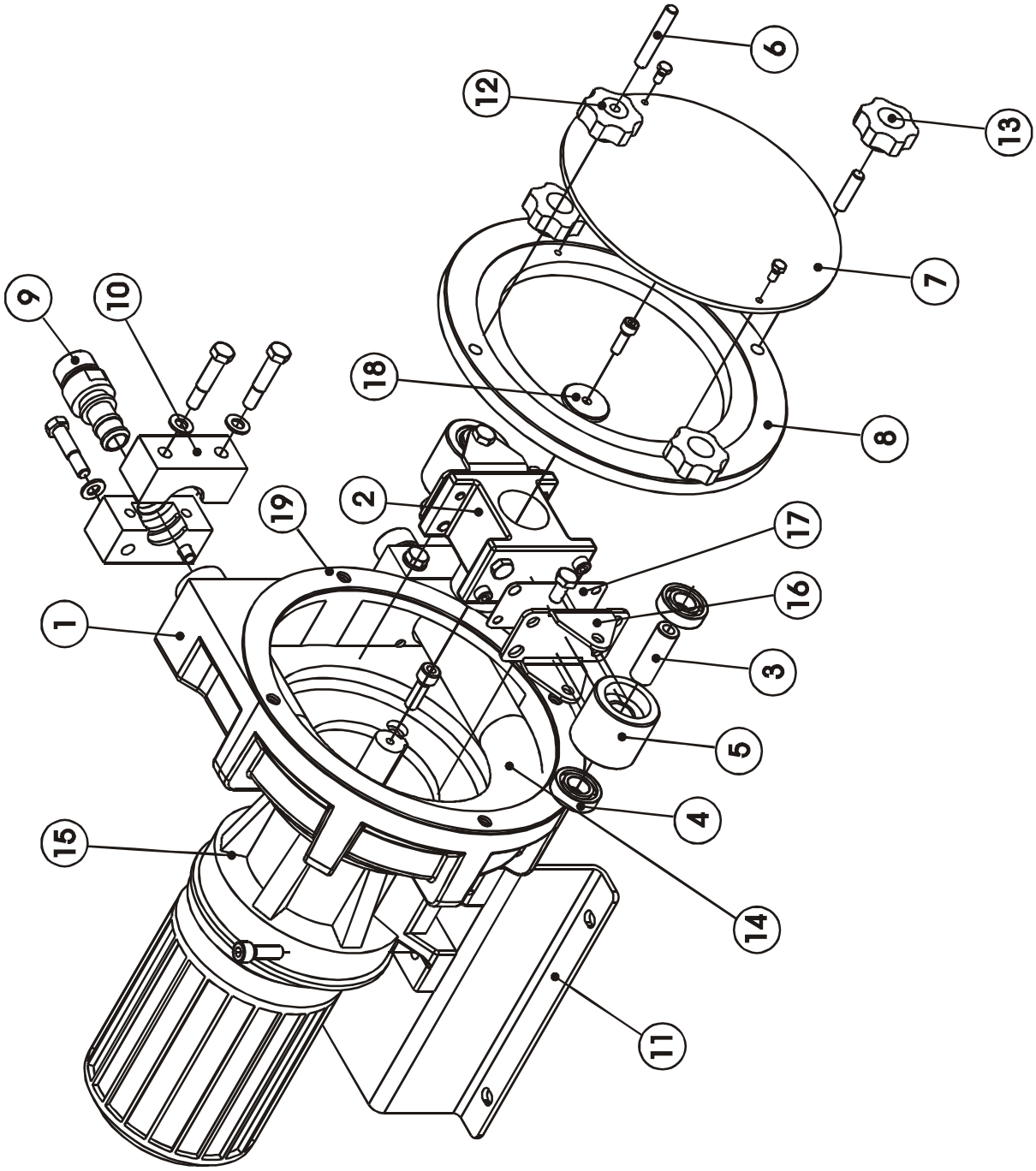
DFB10B parts list

ITEM	DESCRIPTION	Q	CODE	ProMinent Part #	
1	casing	1	102.01.01	7761086	
2	rotor	1	102.01.03	7761088	
	rotor 3 rollers	1	102.01.11	7761096	
3	roller shaft	2	102.01.04	7761089	
4	roller ball bearing	4	102.01.02	7761087	
5	roller ϕ 35	2	102.01.09	7761094	
6	long stud	1	102.00.07	7761074	
	short stud	3	102.00.14	7761077	
7	front cover	1	102.01.08	7761093	
8	gasket front cover	1	102.01.05	7761090	
9	connection S.S.-BSP	2	102.00.10	NA	
	connection PP-BSP	2	102.00.15	NA	
	Connection PVDF-BSP	2	102.00.16	NA	
	Connection S.S.-NPT	2	102.00.17	7761078	
	Connection PP-NPT	2	102.00.18	7761079	
	Connection PVDF-NPT	2	102.00.19	NA	
	Connection DIN NW-10	2	102.00.20	NA	
	Connection SMS	2	102.00.21	NA	
	Connecion TRI-CLDFB 1/2"	2	102.00.22	7761081	
10	Press flange standard	2	102.00.11	7761075	
	Press flange (thermoplastic hose)	2	102.00.23	7761082	
11	Base plate	1	102.00.12	7761076	
	Base plate S.S.	1	102.00.24	7761083	
12	Press pommel	1	102.00.25	7761084	
13	Press pommel blind	3	102.00.26	7761085	
14	Hose NR	1	102.00.27	1037150	
	Hose NR-A	1	102.00.32	1037153	
	Hose NBR	1	102.00.28	1037151	
	Hose NBR-A	1	102.00.29	1037154	
	Hose EPDM	1	102.00.30	1037152	
	Hose NORPRENE	1	102.00.31	1037155	
	Hose HYPALON	1	102.00.33	1037156	
15	Driver	1			
16	Roller support	2	102.01.06	7761091	
	Roller support (3 rollers)	3	102.01.13	7761097	
17	Shim		102.01.07	7761092	
	Shim (3 rollers)		102.01.14	7761098	
18	Rotor washer	1	102.01.10	7761095	

DFB13B parts list

ITEM	DESCRIPTION	Q	CODE	Prom Part #	
1	casing	1	102.01.01	7761086	
2	rotor	1	102.01.03	7761088	
	rotor (3 rollers)	1	102.01.11	7761088	
3	roller shaft	2	102.01.04	7761089	
4	roller ball bearing	4	102.01.02	7761087	
5	roller ϕ 35	2	102.01.09	7761094	
6	long stud	1	102.00.07	7761074	
	short stud	3	102.00.14	7761077	
7	front cover	1	102.01.08	7761093	
8	gasket front cover	1	102.01.05	7761090	
9	connection S.S.-BSP	2	103.00.10	NA	
	connection PP-BSP	2	103.00.15	NA	
	connection PVDF-BSP	2	103.00.16	NA	
	connection S.S.-NPT	2	103.00.17	7761100	
	connection PP-NPT	2	103.00.18	7761101	
	connection PVDF-NPT	2	103.00.19	NA	
	connection DIN NW-15	2	103.00.20	NA	
	connection SMS	2	103.00.21	NA	
	connection TRI-CLDFB 3/4"	2	103.00.22	7761103	
10	press flange standard	2	103.00.11	7761099	
	press flange (thermoplastic hose)	2	102.00.11	7761075	
11	base plate	1	102.00.12	7761076	
	base plate S.S.	1	102.00.24	7761083	
12	press pommer	1	102.00.25	7761084	
13	press pommel (blind)	3	102.00.26	7761085	
14	hose NR	1	103.00.27	1037157	
	hose NR-A	1	103.00.33	1037160	
	hose NBR	1	103.00.28	1037158	
	hose NBR-A	1	103.00.29	1037161	
	hose EPDM	1	103.00.30	1037159	
	hose NORPRENE	1	103.00.31	1037162	
	hose HYPALON	1	103.00.32	1037163	
15	driver	1			
16	roller support	2	102.01.06	7761091	
	roller support (3 rollers)	3	102.01.13	7761097	
17	shim		102.01.07	7761092	
	shim (3 rollers)		102.01.14	7761098	
18	roller washer	1	102.01.10	7761095	

DFBa016 & DFBa019

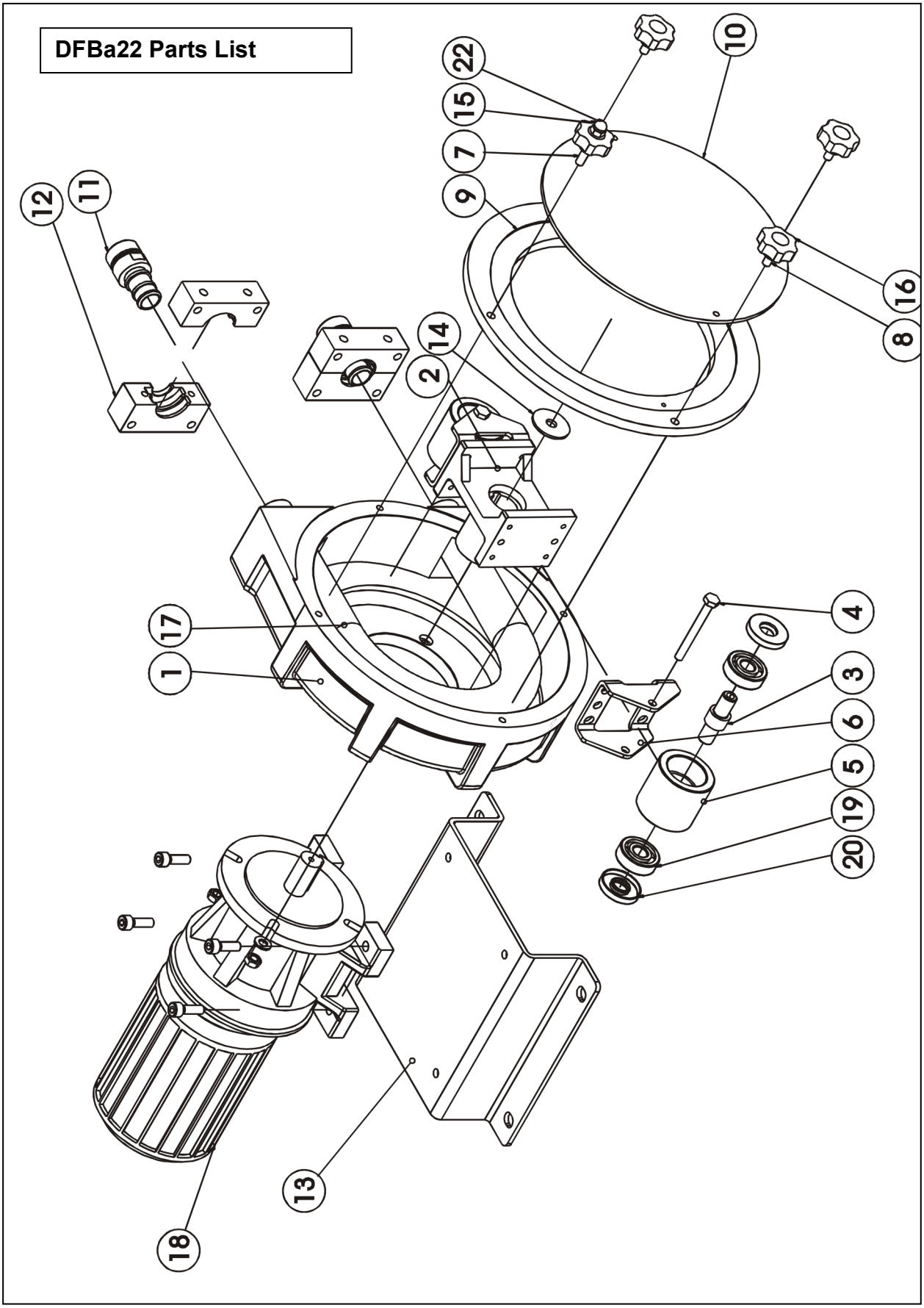


DFB16C parts list

ITEM	DESCRIPTION	Q	CODE	Prom Part #	MATERIAL
1	Pump casing	1	101.02.01	7761068	
2	Rotor	1	101.02.03	7761069	
3	Roller shaft	2	101.01.04	7761066	
4	Roller ball bearings	4	101.01.36	7761067	
5	Roller D45	2	105.01.07	7761131	
6	Long stud	1	102.00.07	7761074	
	Short stud	3	102.00.14	7761077	
7	Plastic cover	1	101.00.12	7761057	
8	Metallic cover	1	101.00.11	7761056	
9	connection INOX-BSP	2	101.00.13	NA	
	conexión PP-BSP	2	101.00.14	NA	
	Connection PVDF-BSP	2	101.00.15	NA	
	Connection SS-NPT	2	101.00.16	7761058	
	Connection PP-NPT	2	101.00.17	7761059	
	Connection PVDF-NPT	2	101.00.18	NA	
	Connection DIN	2	101.00.19	NA	
	Connection SMS	2	101.00.20	NA	
	Connection TRI-CLDFB	2	101.00.21	7761061	
10	Press flange standard	2	101.00.22	7761062	
	Press flange thermoplastic hose	2	101.00.23	7761063	
11	Base plate	1	101.00.24	7761064	
	Base plate S.S.	1	101.00.25	7761065	
12	Pommel	1	102.00.25	7761084	
13	Pommel blind	3	102.00.26	7761085	
14	Hose NR	1	101.00.26	1037164	
	Hose NBR	1	101.00.27	1037165	
	Hose NBR-A	1	101.00.32	1037168	
	Hose EPDM	1	101.00.28	1037166	
	Hose Norprene	1	101.00.30	1037169	
	Hose NR-A	1	101.00.31	1037167	
	Hose HYPALON	1	101.00.33	1037171	
	Hose TYGON	1	101.00.29	1037170	
15	Driver	1			
16	Roller Support	2	101.02.34	7761071	
17	Shim		101.02.35	7761072	
18	Rotor washer	1	101.02.13	7761070	
19	Cover gasket	1	101.02.40	7761073	

DFB19C parts list

ITEM	DESCRIPTION	Q	CODE	Prom Part #	MATERIAL
1	Pump casing	1	101.02.01	7761068	
2	Rotor	1	101.02.03	7761069	
3	Roller shaft	2	101.01.04	7761066	
4	Roller ball bearings	4	101.01.36	7761066	
5	Roller D45	2	105.01.07	7761131	
6	Long stud	1	102.00.07	7761074	
	Short stud	3	102.00.14	7761077	
7	Plastic cover	1	101.00.12	7761057	
8	Metallic cover	1	101.00.11	7761056	
9	connection INOX-BSP	2	105.00.13	NA	
	connection PP-BSP	2	105.00.14	NA	
	Connection PVDF-BSP	2	105.00.15	NA	
	Connection SS-NPT	2	105.00.16	7761127	
	Connection PP-NPT	2	105.00.17	7761128	
	Connection PVDF-NPT	2	105.00.18	NA	
	Connection DIN	2	105.00.19	NA	
	Connection SMS	2	105.00.20	NA	
	Connection TRI-CLDFB	2	105.00.21	7761130	
10	Press flange standard	2	101.00.22	7761062	
11	Base plate	1	101.00.24	7761064	
	Base plate S.S.	1	101.00.25	7761065	
12	Pommel	1	102.00.25	7761084	
13	Pommel blind	3	102.00.26	7761085	
14	Tube NORPRENE	1	105.00.27	1037173	
	Tube TYGON	1	105.00.26	1037172	
15	Driver	1			
16	Roller Support	2	101.02.34	7761071	
17	Shim		101.02.35	7761072	
18	Rotor washer	1	101.02.13	7761070	
19	Cover gasket	1	101.02.40	7761073	


DFBa22 Parts List
22
15
7
9
10
12
11
16
8
14
2
17
1
4
3
6
5
19
20
13
18

DFBa22 parts list

ITEM	DESCRIPTION	Q	CODE	Prom Part #	MATERIAL
1	Pump casing	1	113.00.01	7761321	
2	Rotor	1	113.00.02	7761322	
3	Shaft roller	2	113.00.03	7761323	
4	Screw roller shaft	2	113.00.04	7761324	
5	Roller standard	2	113.00.05	7761325	
	Roller for thermoplastic hose	2	113.00.06		
6	Roller support	2	113.00.07	7761326	
7	Stud long	1	102.00.07	7761074	
8	Stud short	3	102.00.14	7761077	
9	Cover metallic part	1	113.00.08	7761327	
10	Cover plastic part	1	113.00.09	7761328	
11	Connection INOX-BSP	2	113.00.10	NA	
	Connection PP-BSP	2	113.00.11	NA	
	Connection PVDF-BSP	2	113.00.12	NA	
	Connection SS-NPT	2	113.00.13	7761329	
	Connection PP-NPT	2	113.00.14	7761330	
	Connection PVDF-NPT	2	113.00.15	NA	
	Connection DIN	2	113.00.16	NA	
	Connection SMS	2	113.00.17	NA	
	Connection TRI-CLDFB	2	113.00.18	7761332	
12	Press flange standard	2	113.00.19	7761333	
	Press flange thermoplastic hose	2	113.00.20	7761334	
13	Base plate	1	113.00.21	7761335	
	Base plate S.S.	1	113.00.22	7761336	
14	Washer rotor	1	113.00.23	7761337	
15	Press pommel	1	102.00.25	7761084	
16	Press pommel blind	3	102.00.26	7761085	
17	Hose NR	1	113.00.24	1037175	
	Hose NBR	1	113.00.25	1037176	
	Hose NBR-A	1	113.00.26	1037180	
	Hose EPDM	1	113.00.27	1037178	
	Hose Norprene	1	113.00.28	1037181	
	Hose NR-A	1	113.00.29	1037179	
	Hose HYPALON	1	113.00.30	1037182	
18	Driver	1			
19	Ball bearing roller	4	113.00.31	7761338	
20	Lip seal roller	4	113.00.32	7761339	

DECLARATION OF CONFORMITY

The company:

Declares under its own sole responsibility that the next industrial peristaltic pump:

Model: **DFB10B**

Serial number:

☐ **CE DECLARATION OF CONFORMITY (Ann. II.A, 98/37/CE)**

The pump is conform to the safety requirements according to the 98/37/CE norms and amendments.

☐ **MANUFACTURER DECLARATION (Ann. II.B, 98/37/CE)**

The pump cannot be operated before the machine in which is assembled the pump, will be declared in conformity with the safety requirements according to the 98/37/CE norms and amendments.

☐ **FOOD PRODUCTS-CONTACT SUITABILITY DECLARATION**

The pump is made with materials suitable to come in contact with food grade product according to the 89/109/EEC norms and amendments.

on:

The technical Director.

GUARANTEE

- The contractor shall obtain from the manufacturer its warranty that the equipment shall be warranted for a period of one (1) year from the date of start-up or 18 months from signed delivery acknowledgement, whichever comes first, to be free from defects in materials and workmanship. This guarantee does not include the hose or the lubricant as these are elements that have a normal function wear, irrespective of their duration.

- This guarantee is valid as long as the equipment functions within the parameters indicated in the technical information card supplied with every pump or on subsequent changes authorised.

- This guarantee includes materials and work but not the transportation of materials to or from our warehouses, being necessary to do so arising from the necessities of the client, the corresponding costs of displacement and expenses will be charged.