



series

NEW



Pump type Type de pompe Pumpentype Tipo de bomba Tipo di pompa	Flow rate Débit Förderleistung Caudal Portata		Max. pressure Pression Druck Presión Pressione			r.p.m. tr./min. u.p.m. r/min. g./min.	Power Puissance Leistung Potencia Potenza		Weight Poids Gewicht Peso Peso	Dimensions Dimensions Dimension Dimensiones Dimensioni
	l/min.	G.P.M. (U.S.A.)	bar	MPa	p.s.i.		kW	hp		

NEW WK355	57	15.1	350	35	5075	1000	38,10	51,8	63	507x367x210
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Table of Contents

1	INTRODUCTION	22
2	DESCRIPTION OF SYMBOLS	22
3	SAFETY	22
3.1	General safety warnings	22
3.2	Essential safety in the high pressure system	22
3.3	Safety during work	22
3.4	Rules of conduct for the use of lances	22
3.5	Safety during system maintenance	23
4	PUMP IDENTIFICATION	23
5	TECHNICAL CHARACTERISTICS	23
6	DIMENSIONS AND WEIGHT	24
7	OPERATING INSTRUCTIONS	24
7.1	Water temperature	24
7.2	Maximum pressure and flow rate	24
7.3	Minimum rotating speed	24
7.4	Sound emission	24
7.5	Vibration	24
7.6	Brands and types of oils recommended	25
8	PORTS AND CONNECTIONS	26
9	PUMP INSTALLATION	27
9.1	Installation	27
9.2	Rotation direction	27
9.3	Version change	27
9.4	Hydraulic connections	27
9.5	Pump supply	27
9.6	Suction line	28
9.7	Filtration	28
9.8	Outlet line	29
9.9	Calculation of the internal diameter of the duct pipes	29
9.10	V-belt transmission	30
9.11	Transmission definition	30
9.12	Definition of static pull to apply on belts	32
9.13	Transmission of power from the second PTO	32
10	START-UP AND OPERATION	33
10.1	Preliminary checks	33
10.2	Start-up	33
11	PREVENTIVE MAINTENANCE	33
12	PUMP STORAGE	33
12.1	Long-term inactivity	33
12.2	Method for filling pump with anti-corrosion emulsion or anti-freeze solution	33
13	PRECAUTIONS AGAINST FROST	33
14	GUARANTEE CONDITIONS	34
15	OPERATING FAULTS AND THEIR POSSIBLE CAUSES	34
16	EXPLODED DRAWING AND PARTS LIST	35
17	FLUSHING CIRCUIT DIAGRAM OF USE	39
18	DECLARATION OF INCORPORATION	40

1 INTRODUCTION

This manual describes the instructions for use and maintenance of the HF pump and should be carefully read and understood before using the pump.

Proper pump operation and duration depend on the correct use and maintenance.

Interpump Group disclaims any responsibility for damage caused by negligence or failure to observe the standards described in this manual.

Upon receipt, verify that the pump is intact and complete. Report any faults before installing and starting the pump.

2 DESCRIPTION OF SYMBOLS

Read the contents of this manual carefully before each operation.



Warning Sign



Read the contents of this manual carefully before each operation.



Danger Sign

Danger of electrocution.



Danger Sign

Wear a protective mask.



Danger Sign

Wear protective goggles.



Danger Sign

Put on protective gloves before each operation.



Danger Sign

Wear appropriate footwear

3 SAFETY

3.1 General safety warnings

Improper use of pumps and high pressure systems as well as non-compliance with installation and maintenance standards can cause serious damage to people and/or property. Anyone assembling or using high pressure systems must possess the necessary competence to do so, knowing the characteristics of the components that will assemble/use and take all precautions necessary to ensure maximum safety in all conditions of use. In the interest of safety, both for the Installer and the Operator, no reasonably applicable precaution should be omitted.

3.2 Essential safety in the high pressure system

1. The pressure line must always be provided with a safety valve.
2. High pressure system components, particularly for systems that operate primarily outside, must be adequately protected from rain, frost and heat.
3. The electrical control system must be adequately protected against sprays of water and must meet specific regulations in force.
4. The high pressure pipes must be properly sized for maximum operating pressure of the system and always and only used within the operating pressure range specified by the Manufacturer of the pipe itself. The same rules should be observed for all other auxiliary systems affected by high pressure.
5. The ends of high pressure pipes must be sheathed and secured in a solid structure, to prevent dangerous whiplash in case of bursting or broken connections.

6. Appropriate protective casing must be provided in pump transmission systems (couplings, pulleys and belts, auxiliary power outlets).

3.3 Safety during work



The room or area within which the high pressure system operates must be clearly marked and prohibited to unauthorised personnel and, wherever possible, restricted or fenced. Personnel authorised to access this area should first be instructed how to operate within this area and informed of the risks arising from high pressure system defects or malfunctions.

Before starting the system, the Operator is required to verify that:

1. The high pressure system is properly powered, see chapter 9 par. 9.5.
2. The pump suction filters are perfectly clean; it is appropriate to include a device indicating the clogging level on all devices.
3. Electrical parts are adequately protected and in perfect condition.
4. The high pressure pipes do not show signs of abrasion and the fittings are in perfect order.

Any fault or reasonable doubt that may arise before or during operation should be promptly reported and verified by qualified personnel. In these cases, pressure should be immediately cleared and the high pressure system stopped.

3.4 Rules of conduct for the use of lances



1. The operator must always place his safety and security first, as well as that of others that may be directly affected by his/her actions, or any other assessments or interests. The operator's work must be dictated by common sense and responsibility.
2. The operator must always wear a helmet with a protective visor, waterproof gear and wear boots that are appropriate for use and can ensure a good grip on wet floors.

Note: *appropriate clothing will protect against sprays of water but not from direct impact with jets of water or very close sprays. Additional protections may therefore be necessary in certain circumstances.*

3. It is generally best to organise personnel into teams of at least two people capable of giving mutual and immediate assistance in case of necessity and of taking turns during long and demanding operations.
4. The work area jet range must be absolutely prohibited to and free from objects that, inadvertently under a pressure jet, can be damaged and/or create dangerous situations.
5. The water jet must always and only be pointed in the direction of the work area, including during preliminary tests or checks.
6. The operator must always pay attention to the trajectory of debris removed by the water jet. Where necessary, suitable guards must be provided by the Operator to protect anything that could become accidentally exposed.
7. The operator should not be distracted for any reason during work. Workers needing to access the operating area must wait for the Operator to stop work on his/her own initiative, after which they should immediately make their presence known.
8. It is important for safety that all team members are always fully aware of each other's intentions in order to avoid dangerous misunderstandings.

9. The high pressure system must not be started up and run under pressure without all team members in position and without the Operator having already directed his/her lance toward the work area.

3.5 Safety during system maintenance

1. High pressure system maintenance must be carried out in the time intervals set by the manufacturer who is responsible for the whole group according to law.
2. Maintenance should always be performed by trained and authorised personnel.
3. Assembly and disassembly of the pump and the various components must only be carried out by authorised personnel, using appropriate equipment in order to prevent damage to components, in particular to connections.
4. Always only use original spare parts to ensure total reliability and safety.

4 PUMP IDENTIFICATION

Each pump has its own Serial No. XX.XXX.XXX see pos. ① and an identification label, see pos. ② of Fig. 1 which shows:

- Pump model and version
- Max revs
- Absorbed power HP - kW
- Pressure bar - P.S.I.
- Flow rate l/min - Gpm

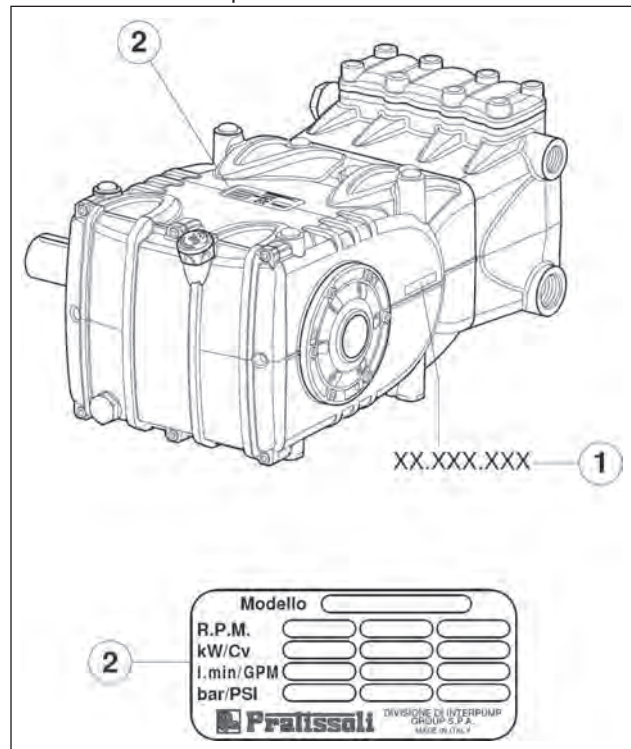


Fig. 1



Model, version and serial number must always be indicated when ordering spare parts

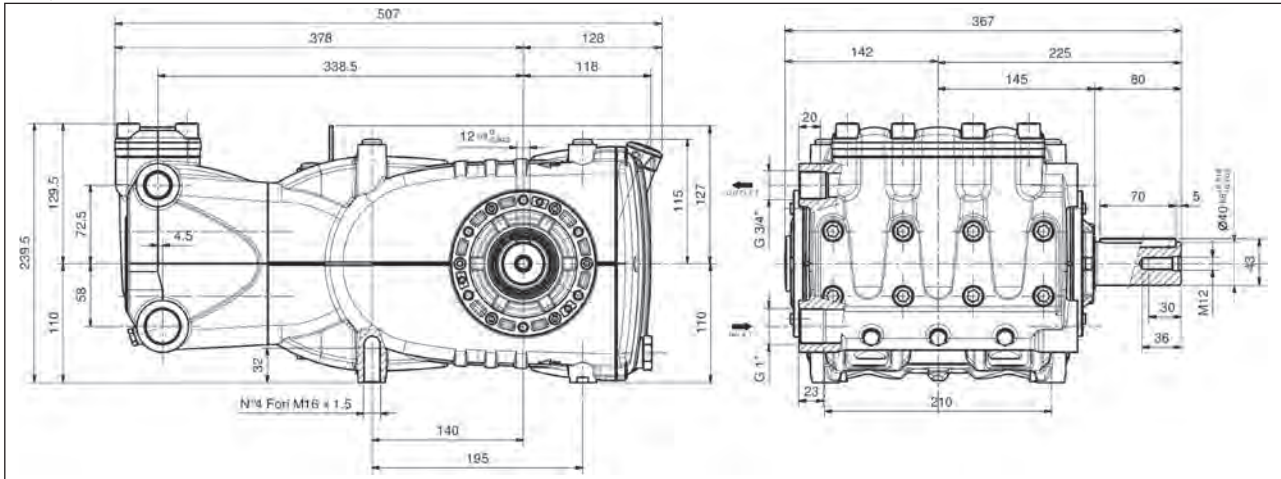
5 TECHNICAL CHARACTERISTICS

Model	Rpm	Flow rate		Pressure		Power	
		l/min	Gpm	bar	psi	kW	HP
HF 18	800	30	8.1	600	8700	35.5	48
	1000	38	10.1	500	7250	36.8	50
HF 20	1000	47	12.4	400	5800	36.8	50
HF 22	800	45	12	400	5800	35.5	48
	1000	57	15	350	5075	36.8	50
HF 25 HF 25N HF 25N-F	1000	73	19.3	280	4060	36.8	50
WK355	1000	57	15.1	350	5075	38.1	51.8

6 DIMENSIONS AND WEIGHT

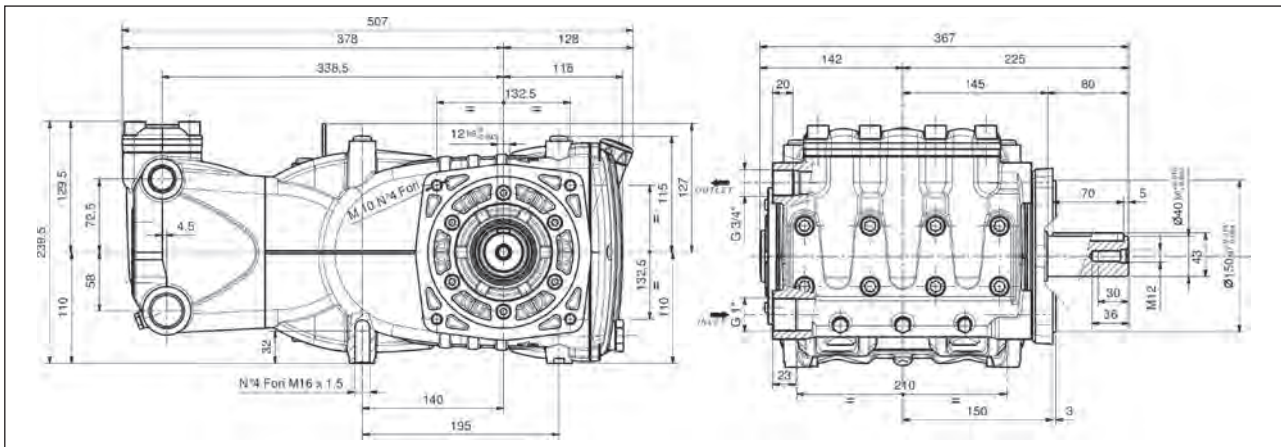
For Standard Version pump dimensions and weight, refer to Fig. 2.

For type "A" Flange Version pump dimensions and weight, refer to Fig. 2/a.



Dry weight 60 kg.

Fig. 2



Dry weight 61 kg.

Fig. 2/a

7 OPERATING INSTRUCTIONS



The HF pump has been designed to operate in environments with atmospheres that are not potentially explosive, with filtered water (see par. 9.7) and at a maximum temperature of 40°C. Other liquids can be used only upon formal approval by the **Technical** or **Customer Service Departments**.

7.1 Water temperature



The maximum permissible water temperature is 40°C. However, the pump can be used with water up to a temperature of 60°C, but only for short periods. In this case, it is best to consult the **Technical** or **Customer Service Departments**.

7.2 Maximum pressure and flow rate

The rated specifications stated in our catalogue are the max. that can be obtained by the pump. **Independently** of the power used, the maximum pressure and rpm indicated in the specification label can never be exceeded unless upon prior formal authorisation by our **Technical** or **Customer Service Departments**.

7.3 Minimum rotating speed

Any rotating speed other than that indicated in the performance table (see chapter 9) must be expressly formally authorised by our **Technical** or **Customer Service Departments**.

7.4 Sound emission

The sound pressure detection test was performed according to Directive 2000/14 of the European Parliament and Council (Machinery Directive) and EN-ISO 3744-1995 with class 1 instrumentation.

A final detection of sound pressure must be performed on the complete machine/system.

Should the operator be located at a distance of less than 1 metre, he will have to use appropriate hearing protection according to current regulations.

7.5 Vibration















The detection of this value shall be carried out only with the pump set up on the plant and at the performance declared by the customer.

Values must be in accordance with regulations.

7.6 Brands and types of oils recommended

The pump is supplied with oil suitable for room temperatures from 0°C to 30°C.

Some types of recommended oil are indicated in the table below, these oils have additives to increase corrosion resistance and fatigue resistance (DIN 51517 part 2). Alternatively you can also use Automotive Gear SAE 85W-90 oil for gearing lubrication.

Manufacturer	Lubricant
 Agip	AGIP ACER220
 ARAL	Aral Degol BG 220
 BP	BP Energol HLP 220
 Castrol	CASTROL HYPSPIN VG 220 CASTROL MAGNA 220
 DEA	Falcon CL220
 elf	ELF POLYTELIS 220 REDUCTELF SP 220
 Esso	NUTO 220 TERESSO 220
 FINA	FINA CIRKAN 220
 FUCHS	RENOLIN 212 RENOLIN DTA 220
 Mobil	Mobil DTE Oil BB
 Shell	Shell Tellus Öl C 220
 SRS	Wintershall Ersolon 220 Wintershall Wiolan CN 220
 TEXACO	RANDO HD 220
 TOTAL	TOTAL Cortis 220

Check the oil level and top up if necessary

Using the oil dipstick pos. ①, Fig. 3.

The correct checking of the oil level is made with the pump not running, at room temperature. The oil change must be made with the pump at working temperature, removing: the oil dipstick, pos. ①, and then the plug pos. ②, Fig. 3.

The oil check and change must be carried out as indicated in the table in Fig. 14 chapter 11.

The quantity required is ~ 3.8 litres.

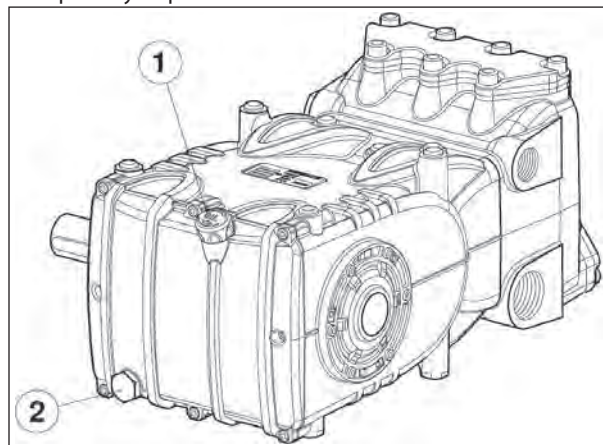


Fig. 3

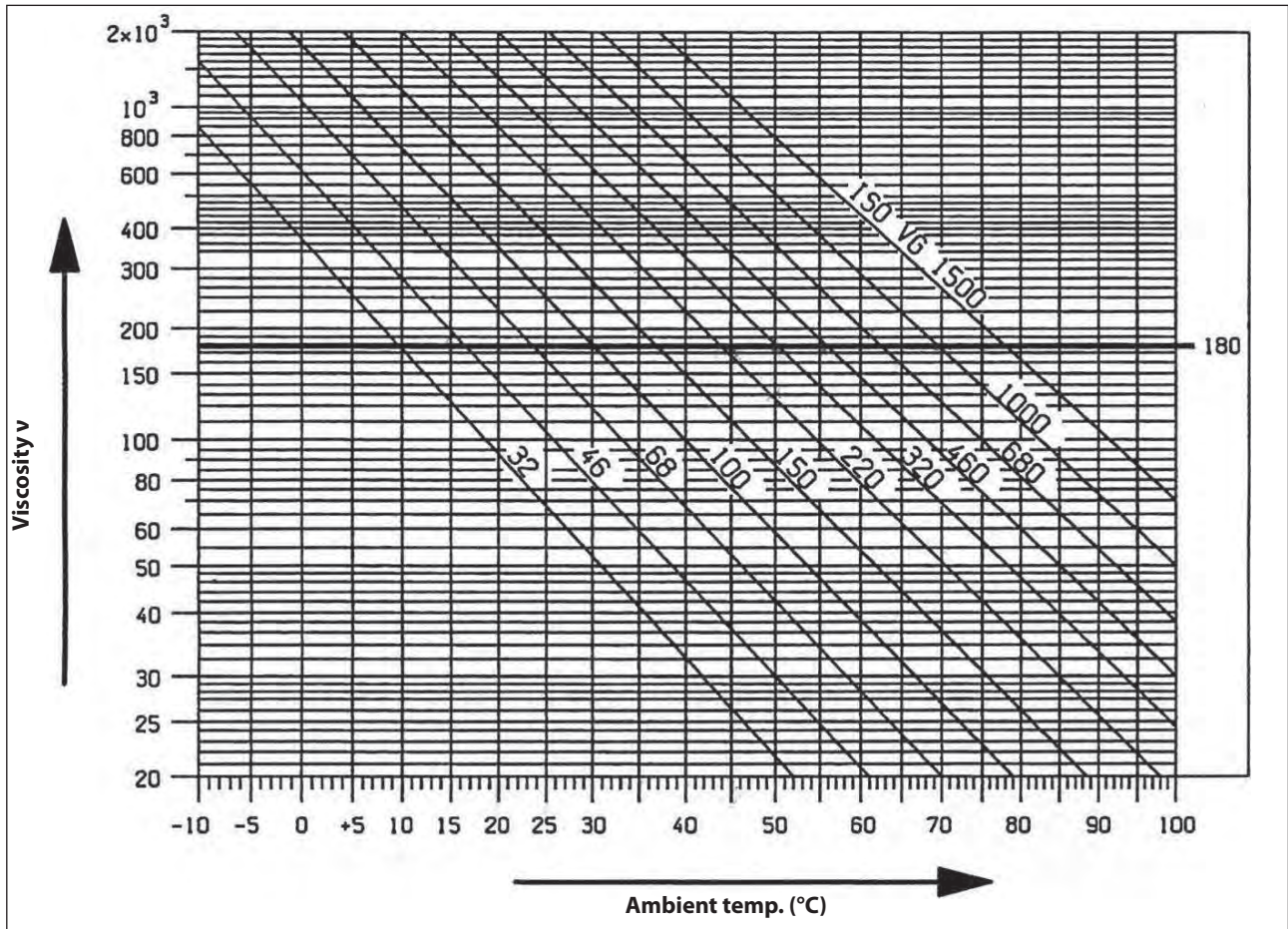


In any case the oil must be changed at least once a year, as it is degraded by oxidation.

For a room temperature other than between 0°C - 30°C, follow the instructions in the following diagram, considering that oil must have a minimum viscosity of 180 cSt.

Viscosity / Room Temperature diagram

mm²/s = cSt



The used oil must be placed in a suitable container and disposed of in special centres. It absolutely should not be discarded into the environment.

8 PORTS AND CONNECTIONS

The HF series pumps (see Fig. 4) are equipped with:

- ① 2 "IN" inlet ports 1" Gas.

Line connection to any of the two ports is indifferent for proper pump functioning. The unused ports must be hermetically closed.

- ② 2 "OUT" outlet ports 3/4" Gas.

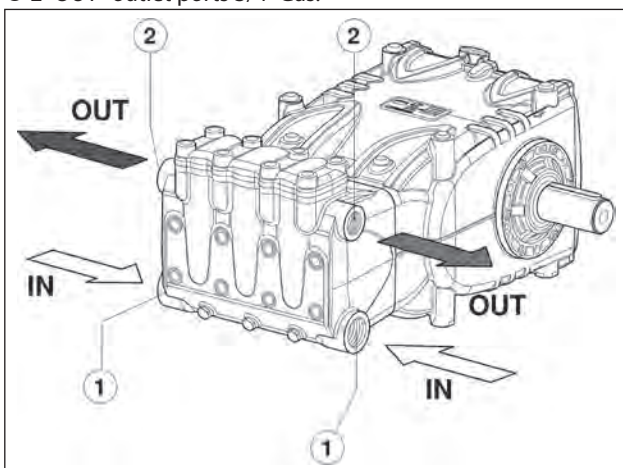


Fig. 4

9 PUMP INSTALLATION

9.1 Installation

The pump must be fixed horizontally using the M16x1.5 threaded support feet. Tighten the screws with a torque of 210 Nm.

The base must be perfectly flat and rigid enough as not to allow bending or misalignment on the pump coupling axis/transmission due to torque transmitted during operation. The unit cannot be fixed rigidly to the floor but must interposed with vibration dampers.

For special applications contact the **Technical** or **Customer Service Departments**.

A lifting bracket is mounted on the pump for easy installation, as per the figure below.



Replace the oil filling hole closing service plug (red) positioned on the rear casing cover. Check the correct quantity with the oil dipstick.

The oil dipstick must always be reachable, even when the unit is assembled.



The pump shaft (PTO) should not be rigidly connected to the propulsion unit.

The following types of transmission are recommended:

- Hydraulics by flange, for proper application consult with our **Technical** or **Customer Service Departments**.
- V-belts.
- Cardan-shaft (comply with manufacturer's Max. recommended working angles).
- Flexible joint.

9.2 Rotation direction

The rotation direction is indicated by an arrow located on the casing near the drive shaft.

From a position facing the pump head, the rotation direction will be as in Fig. 5.

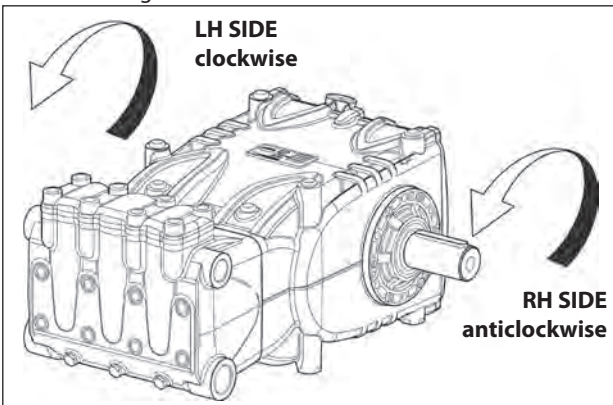


Fig. 5

9.3 Version change

The pump version is defined as right when:

Observing the pump facing the head side, the pump shaft must have a PTO shank on the right side.

The pump version is defined as left when:

Observing the pump facing the head side, the pump shaft must have a PTO shank on the left side.

Note. The version shown in Fig. 5 is right.



The version can only be modified by trained and authorised personnel and carefully following the instructions below:

1. Separate the hydraulic part from the mechanical part as indicated in chapter 2 par. 2.2.1 of the **Repair manual**.
 2. Turn the mechanical part 180° and reposition the rear casing cover in such a way that the oil dipstick is turned upward. Reposition the lifting bracket and relative hole closing plugs in the upper part of the casing. Finally, properly reposition the specification label in its housing on the casing.
- Make sure that the lower casing draining holes in correspondence with the pistons are open and not closed from the plastic plugs provided for the previous version.**
3. Unite the hydraulic part to the mechanical part as indicated in chapter 2 par. 2.2.5 of the **Repair manual**.



9.4 Hydraulic connections

In order to isolate the system from vibrations produced by the pump, it is advisable to make the first section of the duct adjacent to the pump (both suction and outlet) with flexible piping. The consistency of the suction section must be such as to prevent deformations caused by vacuums produced by the pump.

9.5 Pump supply

To obtain the best volumetric efficiency, feed the pumps with a positive head (NPSH_r).

The recommended value, measured on the head suction flange, is given in the following table:

	HF 18	HF 20	HF 22	HF 25
NPSH _r (m)	2.5	4.0	4.0	4.5



The values given apply to the rated speed of rotation; otherwise, contact our Technical or Customer Service Departments.



For any supply conditions other than those specified above, contact our Technical or Customer Service Departments.

9.6 Suction line

For a smooth operation of the pump, the suction line should have the following characteristics:

1. Minimum internal diameter as indicated in the graph in par. 9.9 and in any case equal to or exceeding that of the pump head.



Localised restrictions should be avoided along the run of the duct, as these can cause load losses resulting in cavitation. Avoid 90° elbow bends, connections with other piping, constrictions, counterslopes, inverted U- curves and T-connections.

2. With a layout that is set in such a way to prevent cavitation.
3. Completely airtight and constructed to ensure sealing over time.
4. Prevent that pump stopping causes emptying, even partial.

5. Do not use 3 or 4-way hydraulic fittings, adapters, swivel joints, etc. as they could jeopardise pump performance.
6. Do not install Venturi tubes or injectors for detergent suction.
7. Avoid use of base valves or other types of unidirectional valves.
8. Do not recirculate by-pass valve discharge directly into suction.
9. Provide for proper guards inside the tank to prevent that water flow from the bypass and the tank supply line can create vortexes or turbulence near the pump supply pipe port.
10. Make sure the suction line is thoroughly clean inside before connecting it to the pump.

9.7 Filtration

1 filter must be installed on the pump suction line, positioned as indicated in Fig. 6 and Fig. 6/a.

With a manually activated control valve

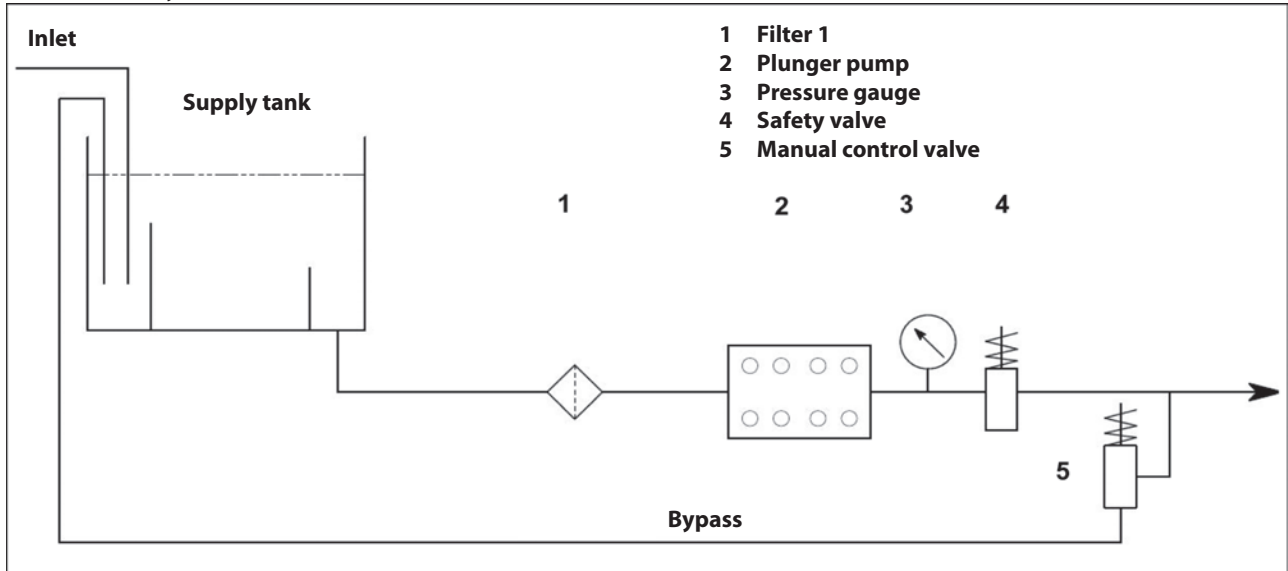


Fig. 6

With a pneumatically activated control valve

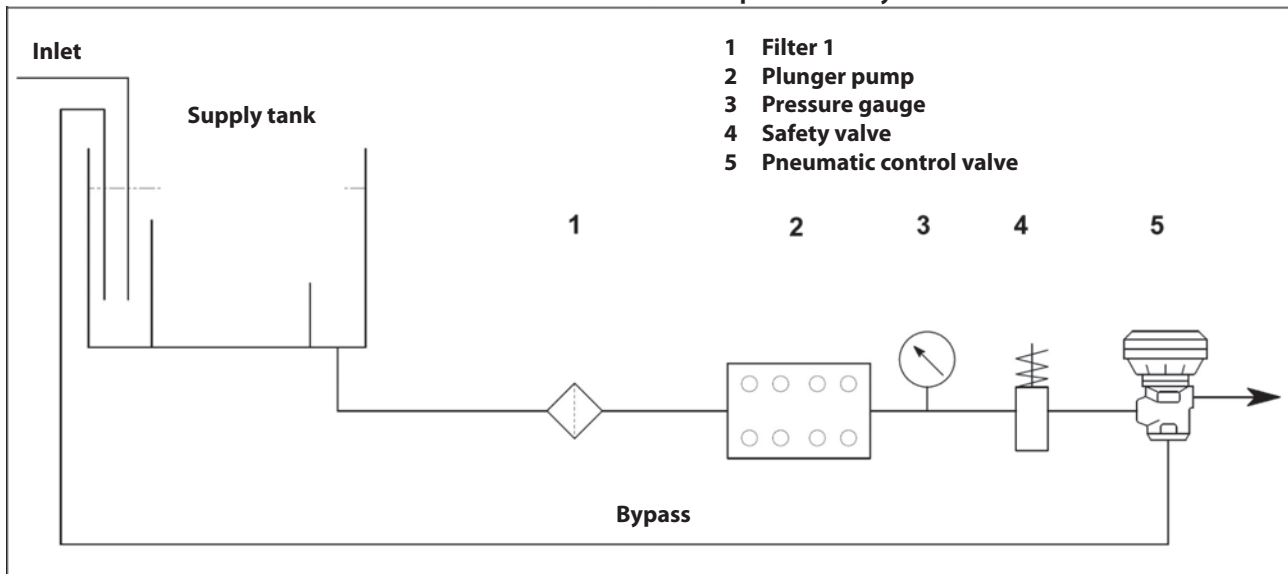


Fig. 6/a

The filter must be installed as close as possible to the pump, it must be easily inspected and must have the following characteristics:

1. Minimum flow rate at least 3 times the nominal flow rate of the pump.
2. Inlet/outlet port diameters no smaller than the inlet port diameter of the pump.
3. Filtration grade between 200 and 360 μm .



For smooth pump operation, regular filter cleaning is necessary, planned according to the actual use of the pump in relation to the quality of water used and actual clogging conditions.

9.8 Outlet line

For the correct laying of the outlet line, the following installation rules must be followed:

1. The internal diameter of the pipe must be sufficient to ensure correct fluid velocity, see graph in par. 9.9.
2. The first section of the line connected to the pump outlet must be a flexible hose, in order to isolate the vibrations produced by the pump of the rest of the system.
3. Use high pressure pipes and fittings to ensure high safety margins in all operating conditions.
4. The outlet line must always be provided with a Max. pressure valve.
5. Use pressure gauges suitable to withstand pulsating loads typical of the plunger pumps.
6. During the design stage, keep in mind the line load losses which result in a drop in pressure during use with respect to the pressure measured on the pump.
7. For those applications where pulses produced by the pump on the outlet line may prove harmful or unwanted, install a pulsation dampener of sufficient size.

9.9 Calculation of the internal diameter of the duct pipes

To determine the internal diameter of the duct, refer to the following diagram:

Suction duct

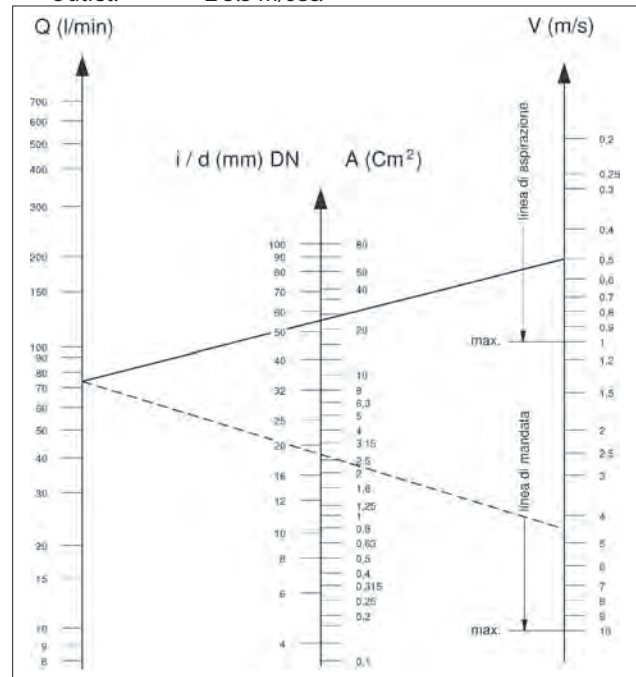
With a flow rate of ~ 74 l/min and a water velocity of 0.5 m/sec. The graph line joining the two scales meets the central scale showing the diameters, corresponding to a value of ~ 55 mm.

Outlet duct

With a flow rate of ~ 74 l/min and a water velocity of 5.5 m/sec. The graph line joining the two scales meets the central scale showing the diameters, corresponding to a value of ~ 19 mm.

Optimal speeds:

- Suction: ≤ 0.5 m/sec.
- Outlet: ≤ 5.5 m/sec.



The graph does not take into account pipe resistance, valves, load loss produced by the length of the ducts, the viscosity of the liquid pumped or the temperature itself.

If necessary, contact our **Technical** or **Customer Service Departments**.

9.10 V-belt transmission

The pump can be controlled by a V-belt system. For this pump model, we recommend use of 4 XPB belts (16.5x13 serrated). Use an XPC profile only for long durations. Both the characteristics and transmissible power of each belt can be verified in the diagram in Fig. 7, in relation to the number of rpm normally declared by the manufacturer. Minimum duct pulley diameter (on pump shaft): ≥ 250 mm. The radial load on the shaft must not exceed 7500 N (value necessary for Layout definition). The transmission is considered adequate if the load is applied to a maximum distance $a=40$ mm from the shaft shoulder (P.T.O) as shown in Fig. 10.



For dimensions differing from those specified above, contact our **Technical** or **Customer Service Departments**.

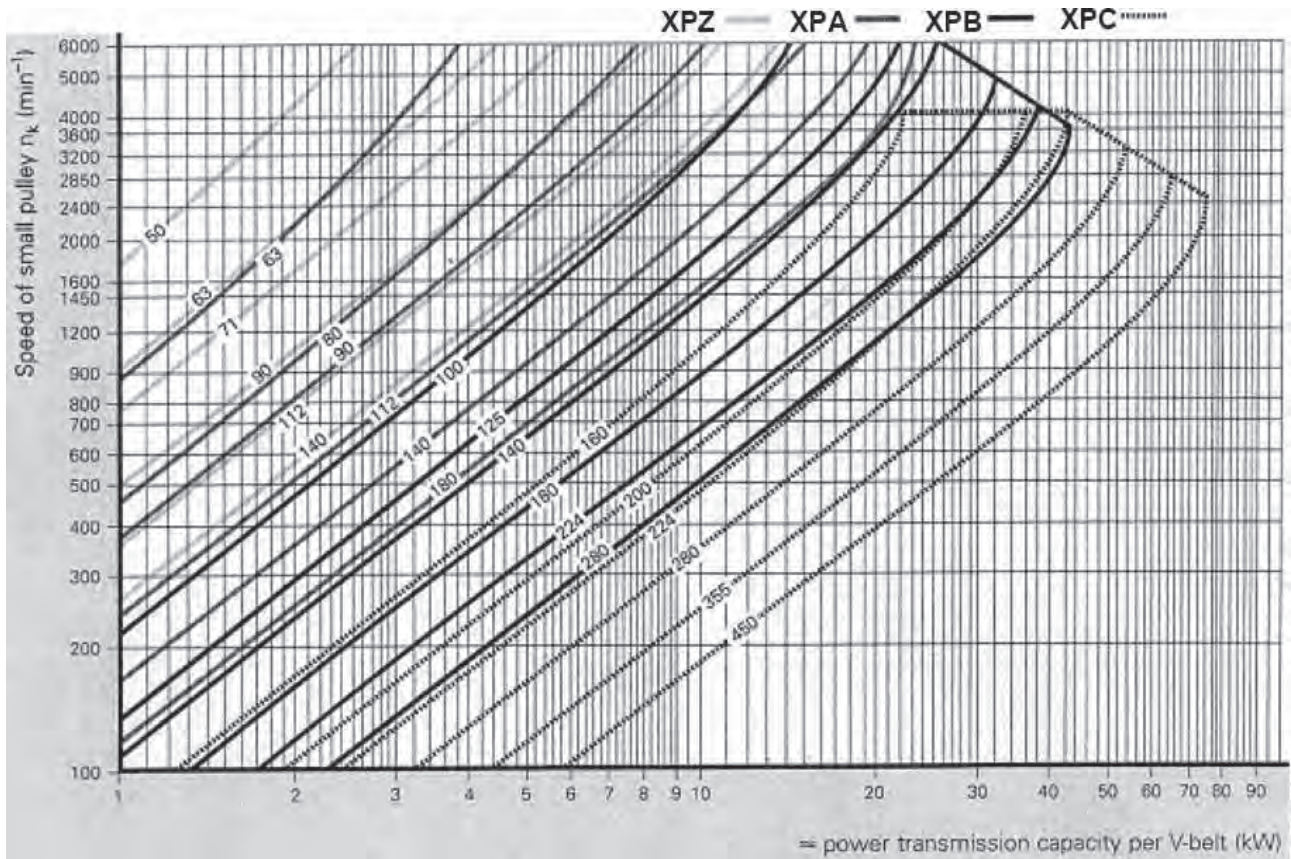


Fig. 7

9.11 Transmission definition

To prevent irregular radial loads on the shaft and the relative bearing, follow these directions:

- a) Use pulleys with V-belts with the size of the groove required/recommended by the manufacturer of belt used. In the absence of directions, follow Fig. 8 and the table in Fig. 9.

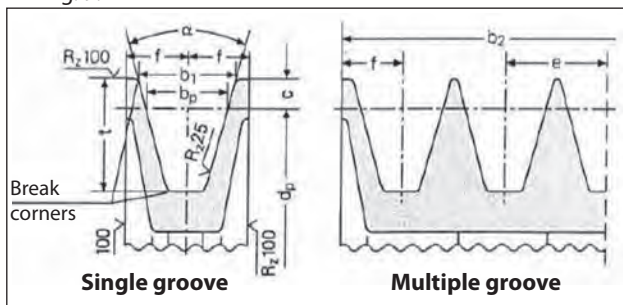


Fig. 8

Dimensions (in mm)

Belt section as per DIN 7753 part 1 and B.S. 3790		DIN symbol symbol B.S./ISO	XPB/SPB SPB	XPC/SPC SPC	
Belt section as per DIN 2215 and B.S. 3790		DIN symbol symbol B.S./ISO	17 B	22 C	
Pitch width		b_w	14.0	19.0	
Increased grooving width $b_1 \approx$		$\alpha = 34^\circ$ $\alpha = 38^\circ$	18.9	26.3	
			19.5	27.3	
		c	8.0	12.0	
Distance between grooving		e	23 ± 0.4	31 ± 0.5	
		f	14.5 ± 0.8	20.0 ± 1.0	
Increased grooving depth		t_{min}	22.5	31.5	
α	34°	by primitive diameter narrow-section V-belts DIN 7753 part 1	d_w	from 140 to 190	from 224 to 315
	38°			> 190	> 315
α	34°	by primitive diameter classic section V-belts DIN 2215	d_w	from 112 to 190	from 180 to 315
	38°			> 190	> 315
Tolerance for $\alpha = 34^\circ-38^\circ$			$\pm 1^\circ$	$\pm 30'$	
Pulleys for b2 by grooving number z $b_2 = (z-1) e + 2 f$			1	29	40
			2	52	71
			3	75	102
			4	98	133
			5	121	164
			6	144	195
			7	167	226
			8	190	257
			9	213	288
			10	236	319
			11	259	350
			12	282	381
Minimum pulley diameter must be respected. Do not use laminated V-belts.					

Fig. 9

- b) Use high performance belts – for example **XPB** instead of **SPB** – as a lower quantity of belts for the same transmitted power may be necessary and a consequent shorter resulting distance compared to the shaft shoulder (P.T.O) "a" of Fig. 10.

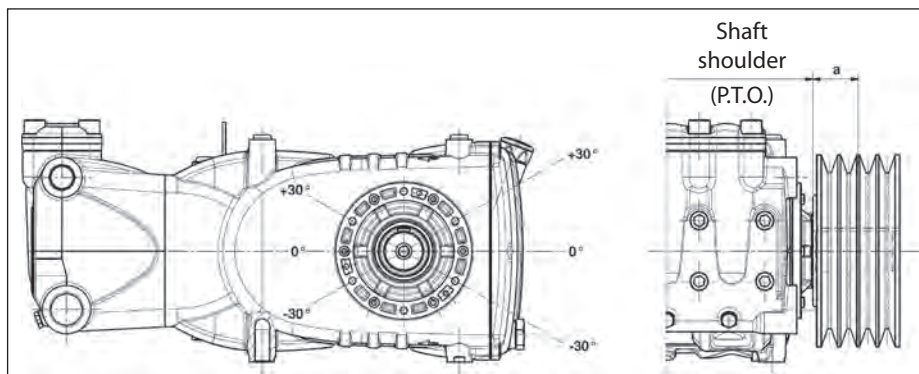


Fig. 10

- c) Pull the belts according to manufacturer instructions. Excessive pulling can cause reduced bearing life and wear out the pulley prematurely. Pulling depends on different variables as indicated in par. 9.12.
- d) Belt length has a natural tolerance $\geq \pm 0.75\%$. For this reason, the 2 belts must be purchased as a pair.
- e) Follow the direction of the belt pull as shown in Fig. 9 for other needs, contact our **Technical** or **Customer Service Departments**.
- f) Take care of the alignment of the driving pulley and driven pulley grooves.

9.12 Definition of static pull to apply on belts

Static pull depends on:

- a) The wheelbase between the two pulleys (belt length).
- b) The load due to static pull of the belt.
- c) The number of belts.
- d) The winding angle of the smallest pulley.
- e) Average speed.
- f) Etc.

Values of the static pull to be applied can be obtained from the diagram in Fig. 11 for belts with a XPB profile in relation to the wheelbase.

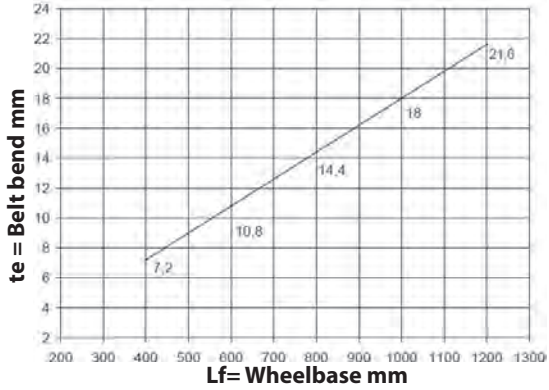


Fig. 11

Conclusion: with a wheelbase of 600 mm and with a dynamometer, loading the belt branch with 75 N as indicated in Fig. 12, a "te" bend of approximately 10.8 mm is obtained.

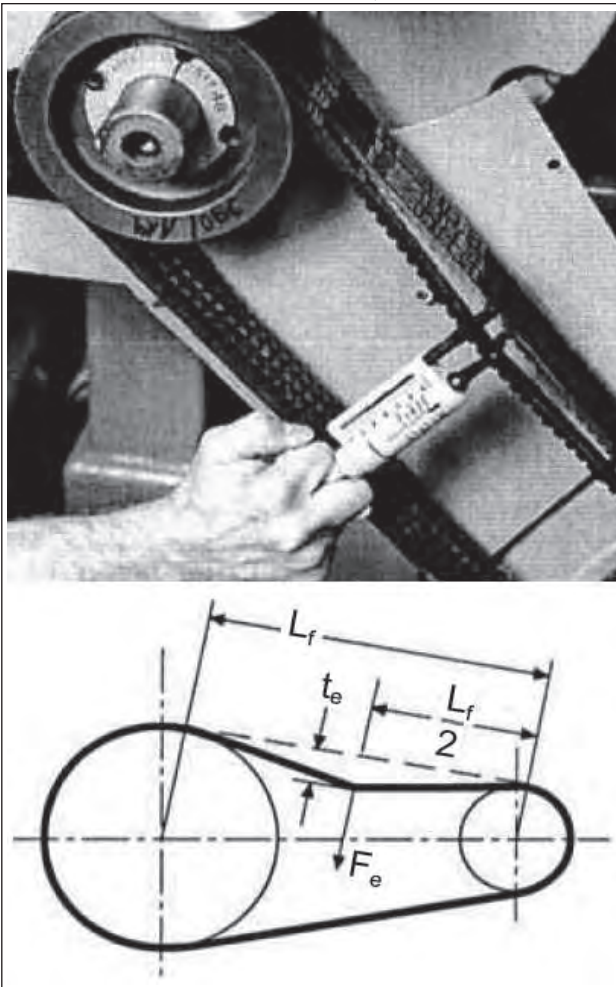


Fig. 12

Lf = Wheelbase
te = Belt bend
Fe = 75 N Dynamometer load

Note₁. Unless otherwise stated by the supplier of the belts, control of proper pull and its relative re-tensioning should be performed after no less than 30 minutes of motion necessary for the normal adjustment of the belts. Best performance and durability will be achieved with proper tensioning.

Note₂. In case of necessity or for routine maintenance, never replace a single belt but the complete set.

9.13 Transmission of power from the second PTO

Upon request, HF series pumps can be supplied with an auxiliary PTO on the opposite side to the drive (Transmission of power from the second PTO).

Transmission can be carried out:

- By means of the V-belts.
- By means of the joint.

By means of the V-Belts, withdrawable Max Torque is:

65 Nm which corresponds to:

- 7 HP at 750 rpm;
- 7.4 HP at 800 rpm;
- 8.3 HP at 900 rpm;
- 9.3 HP at 1000 rpm;
- 11.1 HP at 1200 rpm.

By means of the joint, withdrawable Max Torque is:

130 Nm which corresponds to:

- 14 HP at 750 rpm;
- 14.8 HP at 800 rpm;
- 16.6 HP at 900 rpm;
- 18.6 HP at 1000 rpm;
- 22.2 HP at 1200 rpm.

By means of the V-belt, the transmission is considered suitable if: belt pull is applied at a max distance of 22 mm from the bend shaft shoulder

Fig. 13. Min diameter of pulley to be used = Ø 100 mm
 With transmission by means of the joint, pay particular attention to perfect alignment so that no transverse forces are generated on the pump shaft.

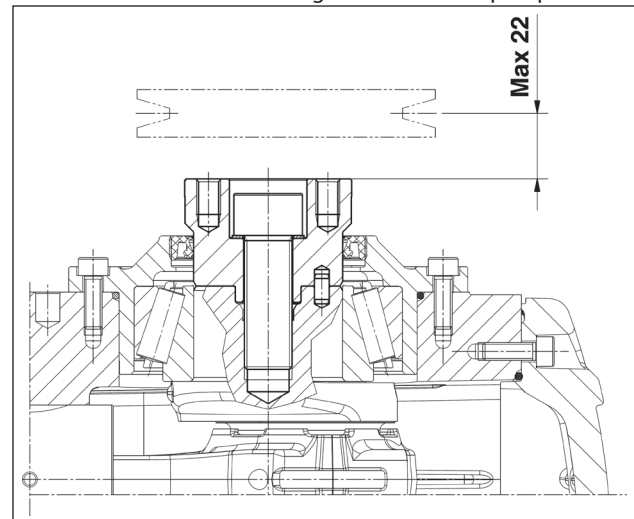


Fig. 13

For applications differing from those specified above, contact our **Technical** or **Customer Service Departments**.

10 START-UP AND OPERATION

10.1 Preliminary checks

Before start-up, ensure that:



The suction line is connected and pressurised (see par. 9.4 - 9.5 - 9.6) the pump must never run dry.

1. The suction line ensures a hermetic seal over time.
2. Any shut-off valves between the supply source and the pump are fully open. The outlet line during is free discharge, to permit air present in the pump head to come out quickly and therefore favour fast priming.
3. All suction and outlet fittings and connections are properly tightened.
4. The coupling tolerances on the pump/transmission axis (half-joint misalignment, Cardan joint tilt, belt pulling, etc.) remain within limits required by the transmission manufacturer.
5. Oil in the pump casing is at level, verified with a dipstick (Fig. 14, pos. ①) and exceptionally with a level indicator (Fig. 14, pos. ②).

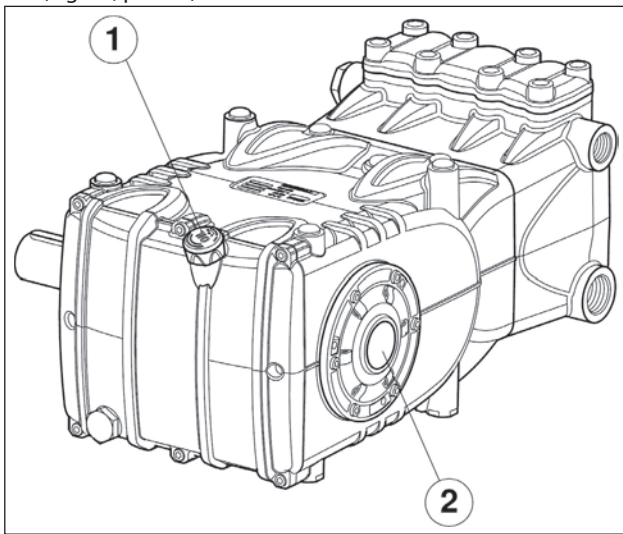


Fig. 14



In case of prolonged storage or long-term inactivity, check proper functioning of the suction and outlet valves.

10.2 Start-up

1. At first start-up, verify that the rotation direction and the supply pressure are correct.
2. Start-up the pump without any load.
3. Check that the supply pressure is correct.
4. Check that the rotation rpm during operation does not exceed the nominal rpm of the pump.
5. Let the pump run for a period of no less than 3 minutes, before putting it under pressure.
6. Before each pump stop, reset pressure by means of the control valve or with any relieving devices and reduce to a minimum rpm (activation with combustion motors).

11 PREVENTIVE MAINTENANCE

For pump reliability and efficiency, comply with maintenance intervals as shown in the table of Fig. 15.

PREVENTIVE MAINTENANCE	
Every 500 hours	Every 1000 hours
Check oil level	Change oil
	Check / Replace: Valves Valve seats Valve springs Valve guides
	Check / Replace: H.P. seals L.P. seals

Fig. 15

12 PUMP STORAGE

12.1 Long-term inactivity



If the pump is started for the first time after a long period from the date of shipment, before operation check the oil level, inspect the valves as specified in chapter 10, then follow described start-up procedures.

12.2 Method for filling pump with anti-corrosion emulsion or anti-freeze solution

Method for filling pump with anti-corrosion emulsion or anti-freeze solution using an external diaphragm pump based on the layout shown in par. 9.7, between pos. ① and pos. ② of Fig. 6 and Fig. 6/a:

- In place of the service tank, use a suitable container containing the solution to be pumped.
- Close the filter drainage, if open.
- Make sure that the hoses to be used are clean inside and spread grease on their connections.
- Connect the high pressure exhaust pipe to the pump.
- Connect the suction pipe to the diaphragm pump.
- Connect the suction pipe between the pump head and the diaphragm pump.
- Fill the service container with solution/emulsion.
- Insert the free ends of the suction pipes and the high pressure exhaust pipe inside the container.
- Switch on the diaphragm pump.
- Pump the emulsion until it exits from the high pressure exhaust pipe.
- Continue pumping for at least another minute.
- Stop the pump and remove the previously connected pipes.
- Clean, grease and plug the connections on the pump head.

The characteristics of the emulsion can be strengthened if necessary by adding, for example, Shell Donax.

13 PRECAUTIONS AGAINST FROST



Follow the instructions in Chapter 12 in areas and times of the year at risk of frost (see par. 12.2).



In the presence of ice, do not run the pump for any reason until the circuit has been fully defrosted, in order to avoid serious damage to the pump.

14 GUARANTEE CONDITIONS

The guarantee period and conditions are contained in the purchase agreement.

The guarantee will in any case be invalidated if:

- a) The pump is used for purposes other than for those agreed upon.
- b) The pump is fitted with an electric or combustion motor with performance exceeding those indicated in the table.
- c) Safety devices are decalibrated or disconnected.
- d) The pump is used with accessories or parts not supplied by Interpump Group.
- e) Damage has been caused by:
 - 1) improper use
 - 2) failure to follow maintenance instructions
 - 3) any use different from that described in the operating instructions
 - 4) lack of sufficient flow rate
 - 5) defective installation
 - 6) improper positioning or sizing of pipes
 - 7) unauthorised design modifications
 - 8) cavitation.



The pump is overheated:

- The pump is working in pressure excess or the number of rpms is higher than the nominal rate.
- Oil in the pump casing is not at level or not the recommended type as detailed in chapter 7 (see par. 7.6).
- Excess belt tension or joint or pulley alignment is incorrect.
- Excessive pump tilt during operation.



Vibrations and shock to pipes:

- Air suction.
- Imperfect functioning of the pressure control valve.
- Valve malfunction.
- Non-uniformity in the transmission motion.

15 OPERATING FAULTS AND THEIR POSSIBLE CAUSES



The pump does not produce any noise upon start-up:

- The pump is not primed and is running dry.
- No suction water.
- Valves are blocked.
- The outlet line is closed and does not allow air present in the pump head to come out.



The pump pulsates irregularly:

- Air suction.
- Insufficient supply.
- Bends, elbow bends, fittings along the suction line are choking the passage of liquid.
- The suction filter is dirty or too small.
- The booster pump, where installed, is supplying insufficient pressure or flow rate.
- The pump is not primed for insufficient head or the outlet is closed during priming.
- The pump is not primed due to valve jamming.
- Worn valves.
- Worn pressure seals.
- Imperfect functioning of the pressure control valve.
- Problems on the transmission.



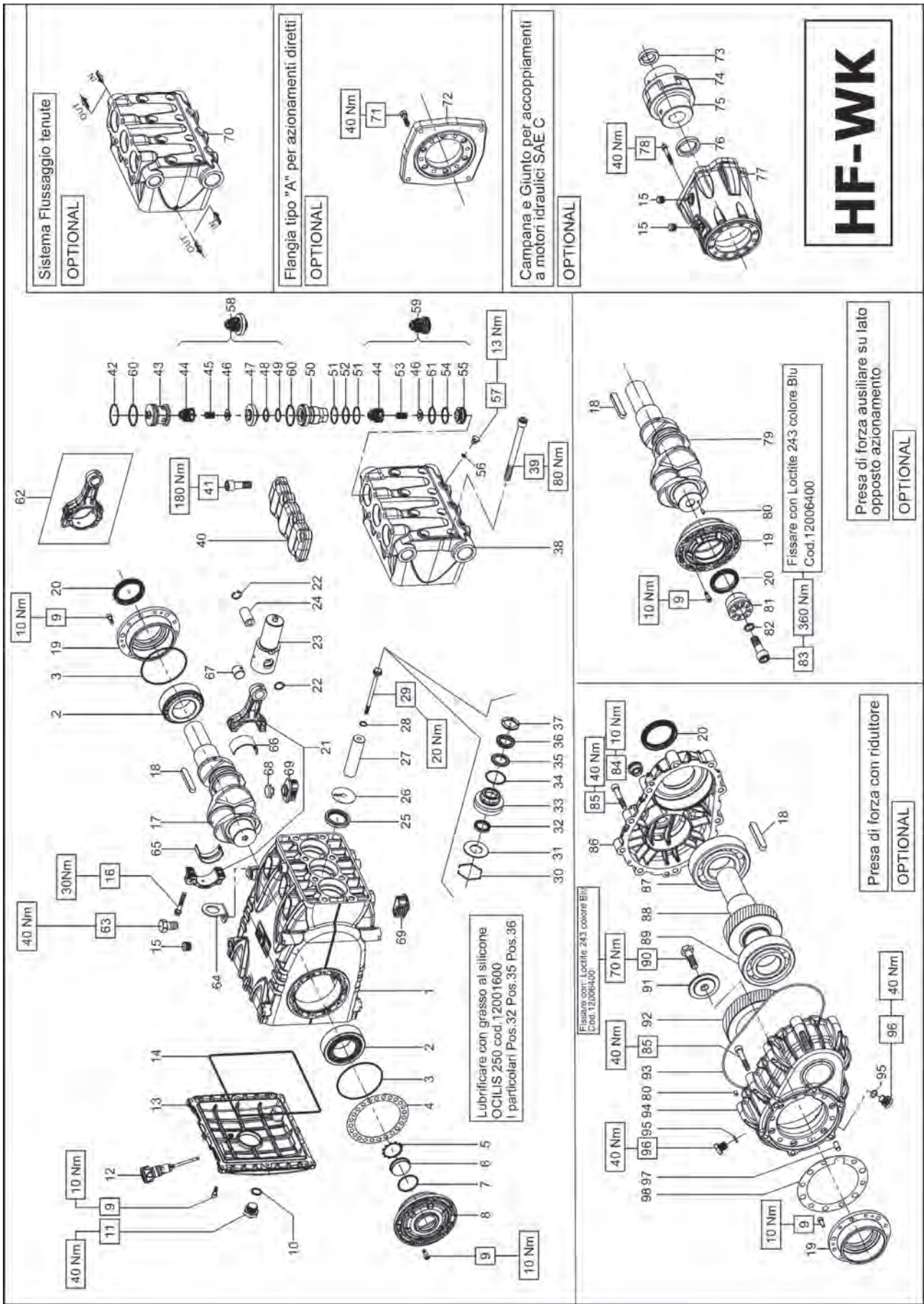
The pump does not supply the nominal flow rate/ excessive noise:

- Insufficient supply (see various causes as above).
- The number of rpms is less than the nominal rate;
- Excessive leakage of the pressure control valve.
- Worn valves.
- Excessive leakage of the pressure seals.
- Cavitation due to:
 - 1) Improper sizing of suction ducts/undersized diameters.
 - 2) Insufficient flow rate.
 - 3) High water temperature.




The pressure supplied by the pump is insufficient:

- Use (nozzle) is or has become higher than the capacity of the pump.
- The number of rpms is insufficient.
- Excessive leakage of the pressure seals.
- Imperfect functioning of the pressure control valve.
- Worn valves.



KIT RICAMBIO – SPARE KIT

		HF18	HF20	HF22 WK355	HF25
A	Kit tenute pompanti – Plunger packing kit	KIT 2024	KIT 2071	KIT 2026	KIT 2028
B	Kit valvole aspirazione – Suction valves kit	KIT 2031		KIT 2022	
C	Kit valvole di mandata – Outlet valves kit			KIT 2023	
D	Kit tenute complete – Complete seals kit	KIT 2025	KIT 2072	KIT 2027	KIT 2029
E	Kit bronzine bielle – Conrod bushing kit	KIT 2135 (STD) - 2154 (+0,25) - 2155 (+0,50)			



WF355

HF18 - HF20
HF22 - HF25

POS	CODE CODICE	DESCRIPTION DESCRIZIONE	KIT	NR. PCS.	POS	CODE CODICE	DESCRIPTION DESCRIZIONE	KIT	NR. PCS.	POS	CODE CODICE	DESCRIPTION DESCRIZIONE	KIT	NR. PCS.
1	71.0100.22	CARTER POMPA		1						67	90.9110.00	BOCCOLA PIEDE BIELLA		1
2	91.8590.00	CUSCINETTO RULLI CON. 33210		2						68	71.2259.51	CAPPUCCIO TAPPO CARTER		3
3	90.3918.00	OR D. 94.92x2.62 NBR 70SH 3375	D	2						69	71.2258.51	TAPPO CARTER		6
4	71.2200.81	SPESSORE DI RASAMENTO 0.1 mm.		-						CON SISTEMA FLUSHING – FLUSHING SYSTEM				
	71.2203.81	SPESSORE DI RASAMENTO 0.25 mm.		-						70	-	TESTATA FLUSHING		1
5	90.0756.00	ANELLO SEEGER D. 45	D	1						CON FLANGIA "A" – WITH DIRECT DRIVE FLANGE				
6	70.2118.01	SPIA LIVELLO OLIO		1										
7	90.3877.00	OR D. 39.34x2.62 NBR 70SH 3156	D	1						71	99.3098.00	VITE M8X35 5931 12.9 G321		6
8	71.1501.22	COPERCHIO LATERALE LATO SPIA		1						72	10.0677.20	FLANGIA MOTORE IDRAULICO		1
9	99.1867.00	VITE M06X18 5931 8.8 ZINC		20						MOTORE IDR. SAE-C – SAE-C HYDR. MOTOR DRIVE				
10	90.3841.00	OR D. 17.13x2.62 NBR 70SH 3068	D	1						15	98.2060.00	TAPPO PER FORO D. 15 - TTN18		2
11	98.2187.00	TAPPO G 1/2"x13 TE27 ZINC.		1						73	10.0745.70	DISTANZIALE D. 31.75 H.10.5		1
12	98.2120.00	TAPPO CON ASTA D. 21.5x91		1						74	10.0747.47	ELEMENTO ELASTICO		1
13	71.1600.22	COPERCHIO POSTERIORE CARTER		1						75	10.7428.01	GIUNTO ELASTICO D. 40x31.75		1
14	90.4000.00	OR D. 215.00x3.00 NBR 70SH	D	1	39	99.4480.00	VITE M12x150 5931 12.9 G321A+M		8	76	10.0746.70	DISTANZIALE D. 40 H.10		1
15	98.2060.00	TAPPO PER FORO D. 15 - TTN18		4	40	71.2100.36	COPERCHIO VALVOLE		1	77	10.0750.20	FLANGIA MOTORE IDRAULICO SAE-C		1
16	99.3138.00	VITE SERRAGGIO BIELLA M8x1x48		6	41	99.4850.00	VITE M14x40 5931 12.9G321A+M		8	78	99.3146.00	VITE M8X50 5931 12.9 G321		6
17	71.0200.35	ALBERO A GOMITI C.50		1	42	90.5220.00	ANELLO ANTIEST. D. 40,9x45x1.5	D	3	PDF AUSILIARIA – AUXILIARY PTO				
18	91.5000.00	LINGUETTA 12x8x70 UNI 6604		1	43	71.2110.70	TAPPO VALVOLE		3	9	99.1867.00	VITE M6X18 5931 8.8 ZINC		6
19	71.1500.22	COPERCHIO LATERALE LATO PTO		1	44	36.2097.51	GUIDA VALVOLA		6	18	91.5000.00	LINGUETTA 12x8x70 UNI 6604		1
20	90.1700.00	ANELLO RAD. D. 50x65x8 VITON	D	1	45	94.7401.00	MOLLA Dm. 12x17		3	19	71.1500.22	COPERCHIO LATERALE LATO PTO		1
22	90.0606.00	ANELLO SEEGER D. 20 UNI 7437		6	46	36.2039.66	VALVOLA SFERICA		6	20	90.1700.00	ANELLO RAD. D. 50x65x8 VITON		1
23	71.0500.15	GUIDA PISTONE		3		36.2050.66	VALVOLA SFERICA - HF18			79	71.0207.35	ALBERO A GOMITI C.50 - D.PTO		1
24	97.7430.00	SPINOTTO D. 20x38		3	47	36.2043.66	SEDE VALVOLA		3	80	97.6152.00	SPINA D. 5x10		1
25	90.1678.00	ANELLO RAD. D. 38x52x7/8.5	D	3	48	90.3851.00	OR D. 21,89x2,62 NBR 70SH 3087	D	3	81	71.2265.54	DISPOSITIVO DOPPIA PTO S.71		1
26	96.7140.00	ROSETTA D. 10x50x1		3	49	90.5145.00	ANELLO ANTIEST. D. 22,9x27x1,5	D	3	82	96.7378.00	ROSETTA D. 17X24X1 DIN988		1
	71.0400.09	PISTONE D. 18x95			50	71.2115.66	BUSSOLA VALVOLE		3	83	99.5142.00	VITE M16X45 5931 12.9 G321		1
	71.0415.09	PISTONE D. 20x95			51	90.5179.00	ANELLO ANTIEST. D. 31,4x35,5x1,5	D	6	RIDUTTORE – GEARBOX				
	71.0401.09	PISTONE D. 22x95			52	90.3866.00	OR D. 29,82x2,62 NBR 70SH 3118	D	3	9	99.1867.00	VITE M6X18 5931 8.8 ZINC		6
	71.0402.09	PISTONE D. 25x95			53	94.7397.00	MOLLA Dm. 11,4x20		3	18	91.5000.00	LINGUETTA 12x8x70 UNI 6604		1
27				3						19	71.1500.22	COPERCHIO LATERALE LATO PTO		1
28	90.3671.00	OR D. 11.00x2.00 NBR 90SH	D	3	54	90.5177.00	ANELLO ANTIEST. D. 30x34,5x1,5	D	3	20	90.1700.00	ANELLO RAD. D. 50x65x8 VITON		1
29	71.2195.66	VITE FISSAGGIO PISTONE		3		90.5155.00	ANELLO ANTIEST. D. 23,9x28x2 - HF18	D	3	80	97.6152.00	SPINA D. 5x10		1
30	90.0797.00	ANELLO DI FERMO D. 52 INOX		3		36.2042.66	SEDE VALVOLA		3	84	97.5940.00	SPIA LIVELLO OLIO G1/2"		1
	71.2170.70	ANELLO PER TENUTA D. 18				36.2049.66	SEDE VALVOLA - HF18			85	99.3146.00	VITE M8X50 5931 12.9 G321A+M		16
	71.2247.70	ANELLO PER TENUTA D. 20			56	90.3576.00	OR D. 6,75x1,78 NBR 70SH 106		3	86	72.2109.20	COPERCHIO SCATOLA RIDUTTORE		1
	71.2172.70	ANELLO PER TENUTA D. 22			57	98.1972.00	TAPPO G 1/8"x8		3	87	91.8593.00	CUSCINETTO SFERE 6310		1
	71.2174.70	ANELLO PER TENUTA D. 25			58	36.7139.01	GRUPPO VALVOLA DI MANDATA	C	3		10.0708.35	PIGNONE Z27 R1,250 ELICOIDALE		
	90.2648.00	ANELLO TEN. ALT. D. 18x26x5,5 LP	A-D		59	36.7138.01	GRUPPO VALVOLA D'ASPIRAZIONE	B	3	88	10.0709.35	PIGNONE Z25 R1,500 ELICOIDALE		1
	90.2688.00	ANELLO TEN. ALT. D. 20x28x5,5 LP	A-D			36.7144.01	GRUPPO VALVOLA D'ASPIRAZIONE - HF18	B			10.0710.35	PIGNONE Z22 R1,830 ELICOIDALE		
	90.2713.00	ANELLO TEN. ALT. D. 22x30x5,5 LP	A-D		60	90.3878.00	OR D. 39,34x2,62 NBR 90 SH 3156	D	6	89	91.8577.00	CUSCINETTO SFERE 6309		1
	90.2746.00	ANELLO TEN. ALT. D. 25x33x5,5 LP	A-D		61	90.3866.00	OR D. 29,82x2,62 NBR 70SH 3118		3	90	99.4307.00	VITE M12X40 5739 8.8 ZINC		1
	71.2140.70	SUPPORTO GUARNIZIONI D. 18				90.3856.00	OR D. 23,47x2,62 NBR 70SH 3093 - HF18			91	72.2110.55	RONDELLA FISSAGGIO CORONA		1
	71.2248.70	SUPPORTO GUARNIZIONI D. 20			62	71.0307.01	BIELLA COMPLETA		3		10.0711.35	CORONA Z34 R1,250 ELICOIDALE		
	71.2151.70	SUPPORTO GUARNIZIONI D. 22			63	99.4266.00	VITE M12x25 5739 8,8 ZINC		1	92	10.0712.35	CORONA Z37 R1,500 ELICOIDALE		1
	71.2152.70	SUPPORTO GUARNIZIONI D. 25			64	71.2230.74	STAFFA DI SOLLEVAMENTO		1		10.0713.35	CORONA Z40 R1,830 ELICOIDALE		
34	90.3875.00	OR D. 37,77x2.62 NBR 70SH 3150	A-D	3		90.9243.00	SEMIBOCCOLA TESTA BIELLA - INF.	E		93	90.3948.00	OR D. 209,22x2.62 NBR 70SH 2-172		1
	90.2687.00	ANELLO RESTOP D. 18x32x6,2/3	A-D		65	90.9244.00	SEMIBOCCOLA TESTA BIELLA +0,25 - INF.	E	3	94	72.2108.20	SCATOLA RIDUTTORE		1
	90.2704.00	ANELLO RESTOP D. 20x35x5,5/2	A-D			90.9245.00	SEMIBOCCOLA TESTA BIELLA +0,50 - INF.	E		95	90.3585.00	OR D. 10,82x1,78 NBR 70SH 2043		2
	90.2730.00	ANELLO RESTOP D. 22x35x5,5/2	A-D			90.9240.00	SEMIBOCCOLA TESTA BIELLA - SUP.	E		96	98.2042.50	TAPPO G 1/4"x13 TE17 ZINC.		2
	90.2748.00	ANELLO RESTOP D. 25x38x5/2,1	A-D		66	90.9241.00	SEMIBOCCOLA TESTA BIELLA +0,25 - SUP.	E	3	97	97.6185.00	SPINA D. 8x18 ZB-G2 H5		1
						90.9242.00	SEMIBOCCOLA TESTA BIELLA +0,50 - SUP.	E		98	72.2107.84	GUARNIZIONE SCATOLA RIDUTTORE		1

KIT RICAMBIO – SPARE KIT

		HF22N	HF25N - HF25N/F
A	Kit tenute pompanti – Plunger packing kit	KIT 0202	KIT 2174
B	Kit valvole aspirazione – Suction valves kit	KIT 2172	
C	Kit valvole di mandata – Outlet valves kit	KIT 2173	
D	Kit tenute complete – Complete seals kit	KIT 2257	KIT 2175
E	Kit bronzine bielle – Conrod bushing kit	KIT 2135 (STD) - 2154 (+0,25) - 2155 (+0,50)	

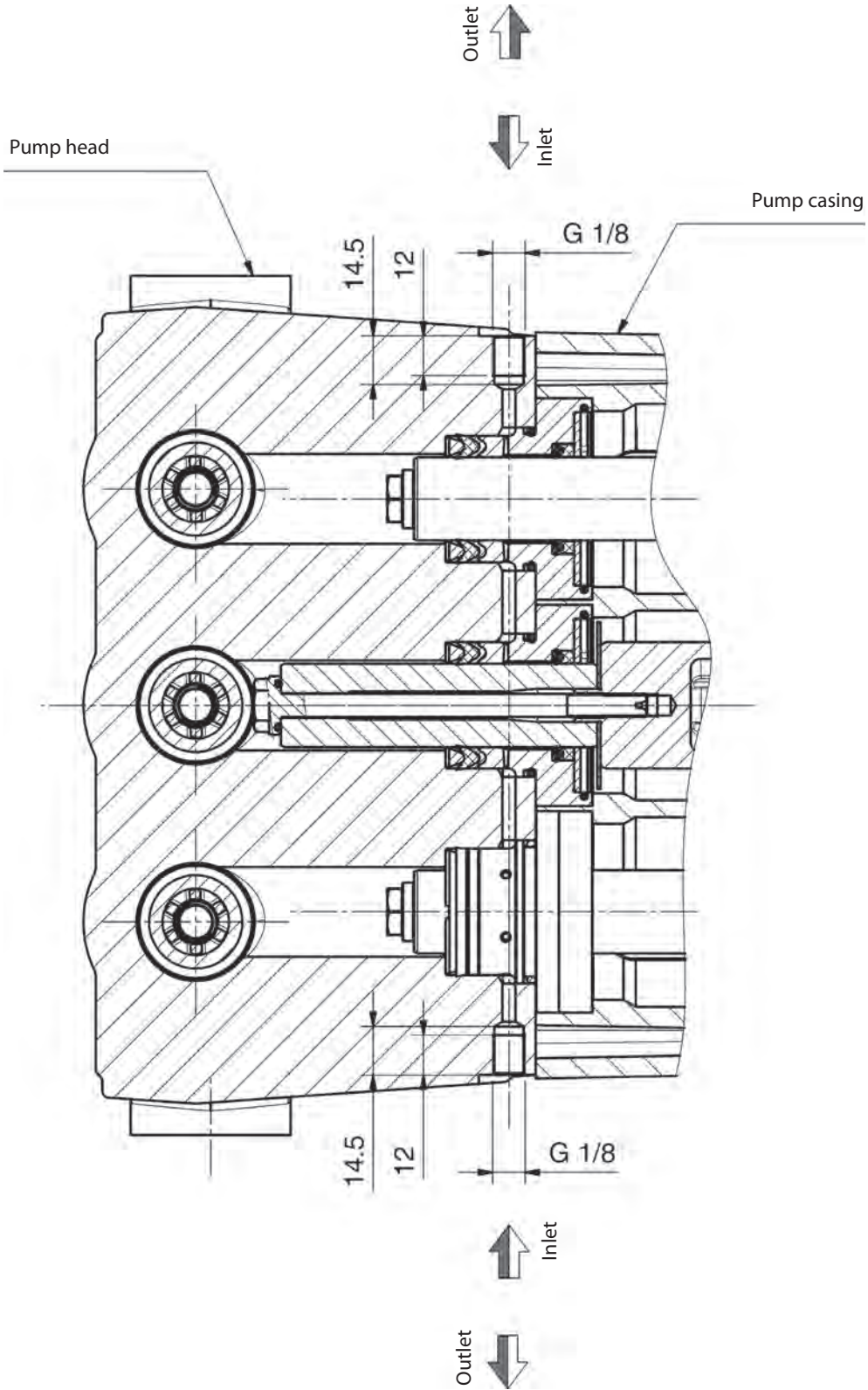


38

POS	CODE CODICE	DESCRIPTION DESCRIZIONE	KIT	NR. PCS.	POS	CODE CODICE	DESCRIPTION DESCRIZIONE	KIT	NR. PCS.	POS	CODE CODICE	DESCRIPTION DESCRIZIONE	KIT	NR. PCS.	
1	71.1203.56	TESTATA D. 22		1	36	71.2258.51	TAPPO CARTER		6	MOTORE IDR. SAE-C – SAE-C HYDR. MOTOR DRIVE					
	71.1204.56	TESTATA D. 22 – NPT			37	91.8590.00	CUSCINETTO A RULLI 33210		2	15	98.2060.00	TAPPO PER FORO D. 15		2	
	71.1281.56	TESTATA D. 25			38	90.3918.00	OR D. 94.92x2.62 (3375)	D	2	73	10.0745.70	DISTANZIALE D. 31.75 H.10.5		1	
	71.1280.56	TESTATA D. 25 – NPT				71.2200.81	SPESSORE 0.1 mm.		-	74	10.0747.47	ELEMENTO ELASTICO		1	
2	98.1972.00	TAPPO G 1/8"x8		3		71.2203.81	SPESSORE 0.25 mm.		-	75	10.7428.01	GIUNTO ELASTICO D. 40x31.75		1	
3	90.3576.00	OR D. 6.75x1.78 (106)	D	3	40	90.0756.00	ANELLO SEEGER D. 45	D	1	76	10.0746.70	DISTANZIALE D. 40 H.10		1	
4	36.7189.01	GRUPPO VALVOLA D'ASPIRAZIONE	B	3	41	70.2118.01	SPIA LIVELLO OLIO		1	77	10.0750.20	FLANGIA MOTORE IDRAULICO SAE-C		1	
5	36.2105.66	SEDE VALVOLA D'ASPIRAZIONE		3	42	90.3877.00	OR D. 39,34x2,62 (3156)	D	1	78	99.3146.00	VITE M8x50 5931		6	
6	90.5177.00	ANELLO ANTIEST. D. 30x34.5x1.5	D	3	43	71.1501.22	COPERCHIO LATERALE LATO SPIA		1	PDF AUSILIARIA – AUXILIARY PTO					
7	90.3866.00	OR D. 29.82x2.62 90 (3118)	D	3	44	99.1867.00	VITE M6x18 UNI 5931		20	44	99.1867.00	VITE M8x35 UNI 5931		6	
8	36.2095.66	VALVOLA SFERICA		3	45	98.2187.00	TAPPO G 1/2"x13 TE27 ZINC.		1	57	91.5000.00	LINGUETTA 12x8x70 UNI 6604		1	
9	94.7397.00	MOLLA Dm. 11.4x20		3	46	90.3841.00	OR D. 17,13x2,62 (3068)	D	1	58	71.1500.22	COPERCHIO LATERALE LATO PTO		1	
10	36.2097.51	GUIDA VALVOLA		6	47	71.1600.22	COPERCHIO POSTERIORE CARTER		1	59	90.1700.00	ANELLO RAD. D. 50x65x8		1	
11	71.2263.56	BUSSOLA VALVOLE		3	48	98.2120.00	TAPPO CON ASTA D. 21,5x91		1	79	71.0207.35	ALBERO A GOMITI C.50 - D.PTO		1	
12	90.5179.00	ANELLO ANTIEST. D. 31.4x35.5x1.5	D	6	49	90.4000.00	OR D. 215x3	D	1	80	97.6152.00	SPINA D. 5x10		1	
13	90.3866.00	OR D. 29.82x2.62 (3118)	D	3	50	71.0100.22	CARTER POMPA		1	81	71.2265.54	DISPOSITIVO DOPPIA PTO S.71		1	
14	90.3878.00	OR D. 39.34x2.62 90 (3156)	D	6	51	98.2060.00	TAPPO PER FORO Ø 15		4	82	96.7378.00	ROSETTA D. 17x24x1		1	
15	36.7188.01	GRUPPO VALVOLA DI MANDATA	C	3	53	99.4266.00	VITE M12x25 5739 8,8 ZINC.		1	83	99.5142.00	VITE M16x45 5931		1	
16	90.5145.00	ANELLO ANTIEST. D. 22.9x27x1.5	D	3	54	71.2230.74	STAFFA DI SOLLEVAMENTO		1	RIDUTTORE – GEARBOX					
17	90.3851.00	OR D. 21.89x2.62 (3087) - 90 Sh.	D	3		90.9243.00	SEMIBOCCOLA TESTA BIELLA - INF.	E		44	99.1867.00	VITE M6x18 UNI 5931		6	
18	36.2104.66	SEDE VALVOLA DI MANDATA		3		90.9244.00	SEMIBOCCOLA TESTA BIELLA +0,25 - INF.	E	3	57	91.5000.00	LINGUETTA 12x8x70 UNI 6604		1	
19	71.2264.66	TAPPO D. 45		3		90.9245.00	SEMIBOCCOLA TESTA BIELLA +0,50 - INF.	E		58	71.1500.22	COPERCHIO LATERALE LATO PTO		1	
20	94.7401.00	MOLLA Dm. 12x17		3	56	71.0200.35	ALBERO A GOMITI C.50		1	59	90.1700.00	ANELLO RAD. D. 50x65x8		1	
21	90.5220.00	ANELLO ANTIEST. D. 40.9x45x1.5	D	3	57	91.5000.00	LINGUETTA 12x8x70 UNI 6604		1	80	97.6152.00	SPINA D. 5x10		1	
22	71.2262.56	COPERCHIO VALVOLE		1	58	71.1500.22	COPERCHIO LATERALE LATO PTO		1	84	97.5940.00	SPIA LIVELLO OLIO G 1/2"		1	
23	90.3671.00	OR D. 11x2 (110-20)	D	3	59	90.1700.00	ANELLO RAD. D. 50x65x8	D	1	85	99.3146.00	VITE M8x50 UNI 5931		16	
	90.2310.00	ANELLO TEN. ALT. D. 22x35x9 HP	A-D	3	60	90.0606.00	ANELLO SEEGER D. 20		6	86	72.2109.20	COPERCHIO SCATOLA RIDUTTORE		1	
	90.2370.00	ANELLO TEN. ALT. D. 25x38x10 HP	A-D		61	97.7430.00	SPINOTTO D. 20x38		3	87	91.8593.00	CUSCINETTO A SFERE 6310		1	
25	90.3875.00	OR D. 37.77x2.62 (3150)	D	3	62	71.0500.15	GUIDA PISTONE		3		10.0708.35	PIGNONE Z27 R1,250 ELICOIDALE		1	
	71.2282.66	SUPPORTO GUARNIZIONI D. 22		3		90.9240.00	SEMIBOCCOLA TESTA BIELLA - SUP.	E		88	10.0709.35	PIGNONE Z25 R1,500 ELICOIDALE			
	71.2261.66	SUPPORTO GUARNIZIONI D. 25					90.9241.00	SEMIBOCCOLA TESTA BIELLA +0,25 - SUP.	E	3		10.0710.35	PIGNONE Z22 R1,830 ELICOIDALE		
27	90.0797.00	ANELLO DI FERMO D. 52		3		90.9242.00	SEMIBOCCOLA TESTA BIELLA +0,50 - SUP.	E		89	91.8577.00	CUSCINETTO A SFERE 6309		1	
	71.2281.66	ANELLO PER TENUTA D. 22		3	64	71.2259.51	CAPPUCCIO TAPPO CARTER		3	90	99.4307.00	VITE M12x40 5739		1	
	71.2260.66	ANELLO PER TENUTA D. 25			67	71.0307.01	BIELLA - COMPLETA		3	91	72.2110.55	RONDELLA FISSAGGIO CORONA		1	
	71.0401.09	PISTONE D. 22x95		3	68	90.9110.00	BOCCOLA PIEDE BIELLA		3		10.0711.35	CORONA Z34 R1,250 ELICOIDALE		1	
	71.0402.09	PISTONE D. 25x95			69	99.3138.00	VITE SERRAGGIO BIELLA		6			10.0712.35	CORONA Z37 R1,500 ELICOIDALE		
	71.2238.56	VITE FISSAGGIO PISTONE		3	CON SISTEMA FLUSHING – FLUSHING SYSTEM								10.0713.35		CORONA Z40 R1,830 ELICOIDALE
	90.2300.00	ANELLO TEN. ALT. D. 22x28.15 LP	A-D	3		-	TESTATA D. 25 FLUSHING		1	93	90.3948.00	OR D. 209.22x2.62		1	
	90.2368.00	ANELLO TEN. ALT. D. 25x31.15 LP	A-D				71.1282.56	TESTATA D. 25 FLUSHING - NPT		1	94	72.2108.20	SCATOLA RIDUTTORE		2
32	99.4850.00	VITE M14x40 UNI 4762		8	CON FLANGIA "A" – WITH DIRECT DRIVE FLANGE							95	90.3585.00	OR D. 10.82x1.78	1
33	99.4480.00	VITE M12x150 UNI 4762		8	71	99.3098.00	VITE M8x35 UNI 5931		6	96	98.2042.50	TAPPO G 1/4"x13 TE17 ZINC.		2	
34	96.7140.00	ROSETTA D. 10x50x1		3	72	10.0677.20	FLANGIA MOTORE IDRAULICO		1	97	97.6185.00	SPINA D. 8x18		1	
35	90.1678.00	ANELLO RAD. D. 38x52x7	D	3						98	72.2107.84	GUARNIZIONE SCATOLA RIDUTTORE		1	

17 FLUSHING CIRCUIT DIAGRAM OF USE

Adhere to the following values for proper system operation:
 minimum circuit flow rate 4 l/min, maximum fluid pressure 6 bar.



18 DECLARATION OF INCORPORATION

DECLARATION OF INCORPORATION

(In accordance with Annex II of European Directive 2006/42/EC)

The manufacturer **INTERPUMP GROUP S.p.A. - Via E. Fermi, 25 - 42049 - S. ILARIO D'ENZA - Italy** **DECLARES** that the product identified and described as follows:

Name: Pump
Type: Reciprocating plunger pump for high pressure water
Trademark: INTERPUMP GROUP
Model: HF / WK Series

Is found to comply with the Machinery Directive 2006/42/EC.

Standards applied: UNI EN ISO 12100:2010 - UNI EN 809:2000

The pump identified above meets the following essential safety and health protection requirements as listed in section 1 of Annex I of the Machinery Directive:

1.1.2 - 1.1.3 - 1.1.5 - 1.3.1 - 1.3.2 - 1.3.3 - 1.3.4 - 1.5.4 - 1.5.5 - 1.6.1 - 1.7.1 - 1.7.2 - 1.7.4 - 1.7.4.1 - 1.7.4.2
and the relevant technical documentation has been compiled in accordance with Annex VII B.

In addition, the manufacturer undertakes to make available, following a reasoned request, a copy of the relevant technical pump documentation in the manner and terms to be defined.

The pump should not be put into service until the plant to which the pump is to be incorporated has been declared in accordance with the provisions of the relevant directives and/or standards.

Person authorized to compile the technical file Name: Maurizio Novelli
Address: INTERPUMP GROUP S.p.a. - Via E. Fermi, 25 -
42049 - S- ILARIO D'ENZA (RE) - Italy

Person authorized to draw up the declaration: CEO Ing. Paolo Marinsek
Reggio Emilia - December 2012

Signed:

