CSF

CENTRIFUGAL PUMPS CL/CLC SERIES

CSF SANITARY CENTRIFUGAL PUMP CL/CLC

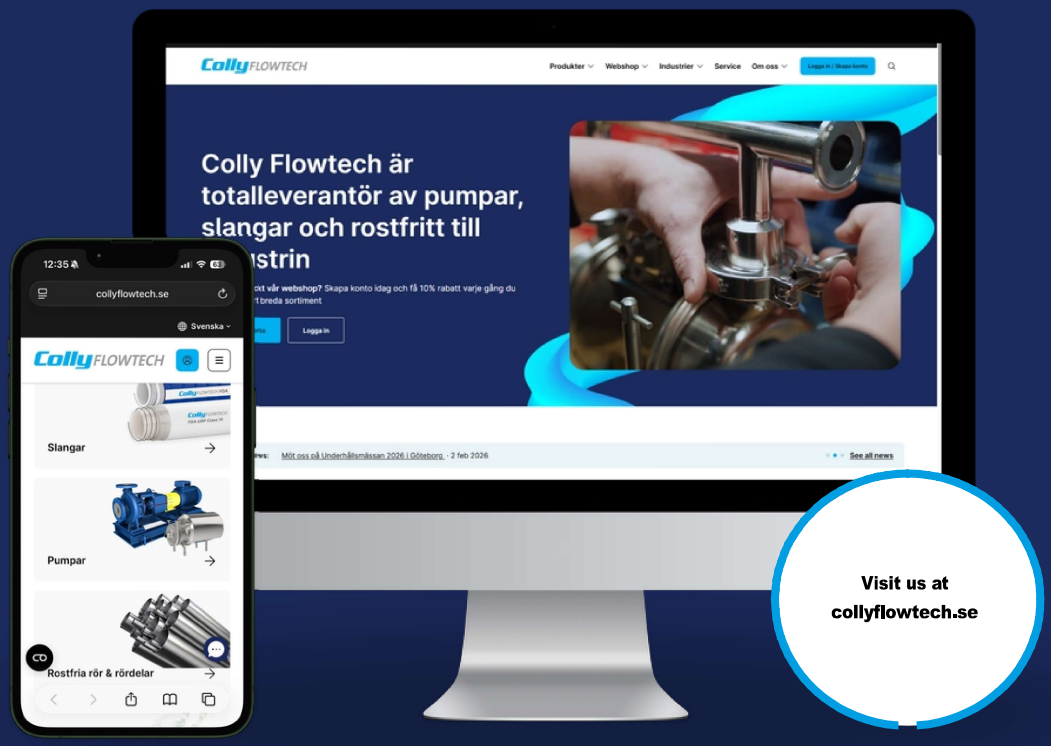
Instructions for assembly, installation, operation and maintenance



Colly FLOWTECH

Översättning av bruksanvisning original

Rev_1-2026



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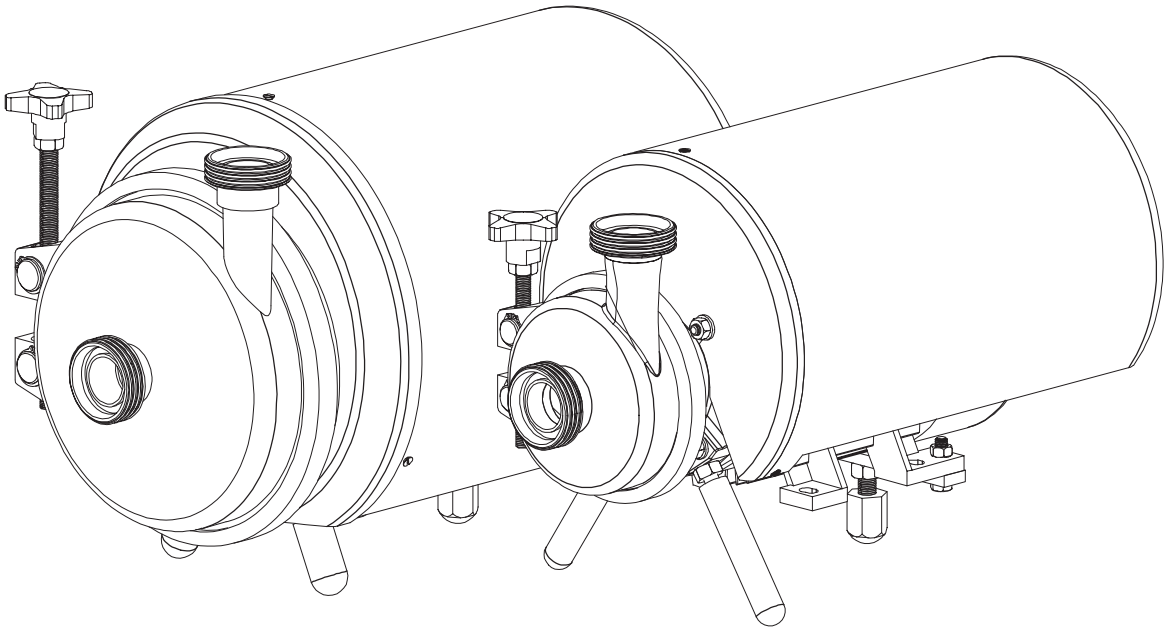
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CSFinoxGroup
FLOW TECHNOLOGY COMPONENTS

CENTRIFUGAL PUMPS
CL - CLC Series



INSTRUCTIONS FOR ASSEMBLY, INSTALLATION,
OPERATION AND MAINTENANCE

CSF

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Self-printed

Version: 03 Date: 14/03/2025

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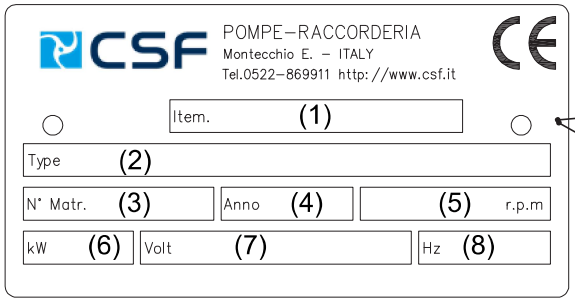
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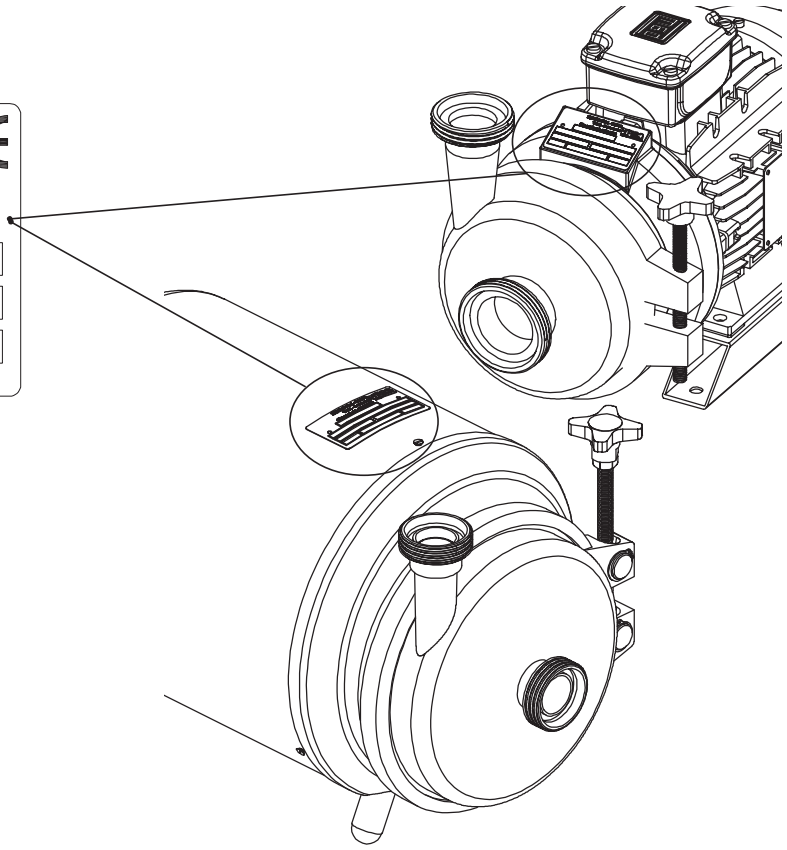
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FOREWORD

This instruction manual is designed to provide the user with all the information needed to perform all use and maintenance activities concerning the pump throughout its entire service life.
Read the instructions carefully and keep them for future consultation.
C.S.F. Inox S.p.A. reserves the right to make any changes to the documentation it deems necessary without being obliged to update publications that have already been issued.
When requesting information, spare parts or assistance, always specify the pump type (2) and serial number (3) in order to ensure fast and efficient service: the complete code is given on the plate and in the purchase documents.
This manual refers exclusively to the pump supplied.

CSF Plate example





1. *System item provided by the client*
2. *Manufacturing series, size and execution*
3. *Serial number*
4. *Year of construction*
5. *Pump rotation speed*
6. *Installed power in kW*
7. *Motor voltage*
8. *Motor frequency*

1.0 - SYMBOLS

	Pay great attention to the text parts indicated by this symbol.		Compulsory foot and hand protection PPE: gloves and safety shoes
	Danger: the non-observance of instructions can cause serious damages to persons and/ or objects.		Compulsory respiratory tract PPE: mask
	Danger: only skilled personnel is allowed to carry out operations concerning the electric parts.		Danger: hot surfaces

2.0 - SAFETY WARNINGS

The pumps supplied are designed for professional use and are not intended to come into contact with the general public and minors.
Operators and maintenance personnel must read and comprehend the instruction manual.
Maintenance personnel must have adequate training and qualifications to carry out maintenance operations in compliance with safety standards.
Trainees may only carry out activities under the supervision of qualified, expert personnel.

When the pump is working the following occurs:



- Mechanical parts are moving
- Pump casing, pipelines and articulations are under internal pressure. Therefore do not remove any safeguard or locking, do not loosen screws or clamps, as this can cause serious damage to persons or objects.



- Electric parts are in tension
- Non-observance of inspection and maintenance operations can cause damages to persons and objects, especially when dangerous or toxic liquids are pumped.



- When pumping liquids at a temperature over 60°C, adequate protection and warning signals are required.
- Operations on the electric parts have to be carried out by skilled personnel, according to technical directions and law, on authorization of the responsible installer.



- Installation must ensure adequate ventilation to cool the motor, as well as enough space for maintenance operations.
- Before carrying out any operations involving disassembly of the pump (inspection, cleaning, seal replacement, etc.), the following preliminary operations must be carried out:



- Switch off engine tension and disinsert electric connection
- Close the gate valves on the suction and outlet pipelines, in order to avoid the risk of flooding;



- Use adequate protections for hands and face, if the pump contains liquids which are injurious to health (for example acids, solvents, etc.)



- Assess whether or not the liquid which flows out of the pump during disassembly is hazardous and implement adequate safety measures accordingly.



2.1 - SAFEGUARDS

Inspect the condition of the guards and relative fasteners on a regular basis (at least every 12 months).
If the guards are damaged, worn or have been removed or if the fastening devices have been removed or come loose, the user must immediately restore the condition of the guards and relative fastenings.

3.0 - GUARANTEE

All products manufactured by C.S.F. Inox S.p.A. are guaranteed to the purchaser, for one year from the date of purchase, against hidden defects in materials or manufacture, providing that they are installed and used according to instructions and recommendations of the manufacturer.
The guarantee does not cover wear parts or repairs for damage caused by improper use, abrasion, corrosion, negligence, defective installation, non-observance of inspection and maintenance operations, use of non-genuine spare parts, accidents or any work carried out by the purchaser designed to alter the machine's performance as indicated by the manufacturer.

Before returning to C.S.F. Inox S.p.A. any item to be substituted or repaired under guarantee, inform about the problem the Customer Assistance Office and follow instructions of the manufacturer. Returned items must be properly packed in order to avoid damages during transport and a technical report describing the defect and how it manifested itself must accompany the returned item/s.

Any item with a presumed fault should be returned to C.S.F. Inox S.p.A. at the customer's expense, accompanied by a Declaration of Decontamination (attached to page 29), unless otherwise agreed.
C.S.F. Inox S.p.A. will examine, repair and/or replace the returned piece and then send it back to the purchaser on ex-works basis.
Should the piece be found under warranty, no further costs will be owed by the purchaser. If, on the contrary, the fault is not found under warranty, all necessary reparations and replacements will be charged at normal cost to the purchaser.
C.S.F. Commercial parts incorporated in C.S.F. Inox products are guaranteed by their corresponding manufacturers.

4.0 - GOODS TRANSPORTATION, RECEIVING AND TRANSFERRING

4.1 - TRANSPORT

The packings of all pumps manufactured by C.S.F. Inox S.p.A. are defined when placing the order. Unless prior arrangements have been made, goods are packed for transit conditions only and not for long-term storage; in case it should be necessary to store the pumps outside, you are requested to cover the pumps appropriately in order to protect the pneumatic parts of the motor from rain, dust, humidity etc.

4.2 - DELIVERY

On delivery of the supply it is essential to make sure that the packaging has not been damaged during transport so that any claims can be made immediately to the carrier.

Should any damage be ascertained, the following procedure must be observed:
- Accept the goods with reservation
- Take photographic evidence of the damage
- Notify the carrier of the damage sustained via registered mail with the photographic evidence attached.

4.3 - SITE PREPARATION

It is the user's responsibility to:
- Prepare the installation sites as prescribed by local legislation governing health and safety in the workplace

- Make sure the electrical power supply is compliant with the legislation in force and possesses an efficient earthing system.

LIGHTING

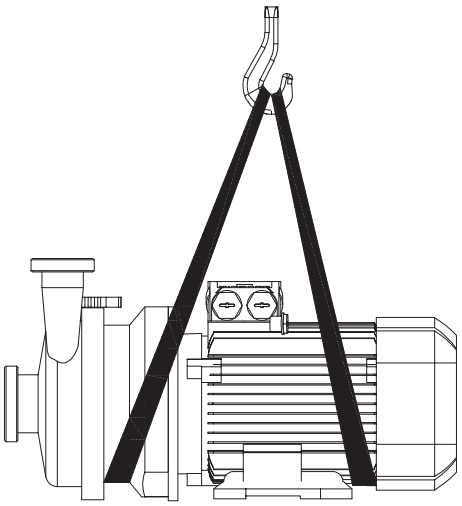
The machine installation site must have adequate natural and/or artificial lighting in compliance with the legislation in force in the country of installation.
Lighting must be uniform, guarantee good visibility in every part of the machine and must not create hazardous reflections to the operator. It must also be such that commands on the control panels and emergency stop buttons can be clearly seen.

4.4 - TRANSFERRING

The personnel involved must have adequate qualifications and experience in handling and lifting operations.
Use suitable and certified equipment for lifting and handling the machine supplied

Carry the packed pumps as close as possible to the place of installation by means of appropriate lifting devices and unpack them. During this operation take care, as unsteady parts could fall down.
The material used for packing should be properly disposed of, according to the corresponding rules in force in receiver's country.
After unpacking the pump, use special lifting belts and move the pump-motor-set to the place of installation; never use the eyebolts on the motor to move the pump, as the eyebolts are for moving the motor only.
In versions complete with shroud, take the shroud off before moving the pump-motor-set, in order to avoid damages.

Observe the health & safty regulations in force locally.



5.0 - TURNS

- Empty all product out of the pump.
- Wash, clean and thoroughly dry the pump, especially in the case of harmful or explosive liquids.
- A duly compiled Declaration of Decontamination must accompany the pump (see page 29).

6.0 - DESCRIPTION

The CL-CLC series consists of close-coupled single-stage centrifugal pumps with single suction port. The impeller is keyed directly onto the motor shaft. They are designed and constructed to sanitary standards and are intended for professional use. All models have threaded connections for fittings to DIN 11851 standards (unless otherwise requested) and all models are fitted with mechanical seals. The materials used for the components and the mechanical seal are chosen according to the liquid to be pumped. They are fitted with three-phase electric motors with IP 55 protection rating, unless otherwise specified in the order.
CL series pumps are fitted with an open impeller with 3 (or 6) blades made in such a way as to limit any product whipping as much as possible. CLC series pumps, on the other hand, have a closed 6-blade impeller, designed to optimize fluid flow efficiency. The pumps in question are used in all those cases where the liquid to be pumped, as well as for services requiring special characteristics:
- is not subject to pollution of any kind,
- must under no circumstances come into contact with the outside environment.

6.1 - TECHNICAL DATA

- Maximum operating pressure: 6 bar up to 100°C
- Temperature range: -10°C ÷ 120°C

The operating temperature range is determined by the type of mechanical seal and the material of the elastomers used.
If there is any need to use the pump with different performance data and product characteristics to those indicated at the time of ordering, contact C.S.F. Inox S.p.A. to make sure the pump is suitable for your requirements.

6.2 - SOUND PRESSURE LEVEL

The sound pressure level of centrifugal pumps is the following (see table):

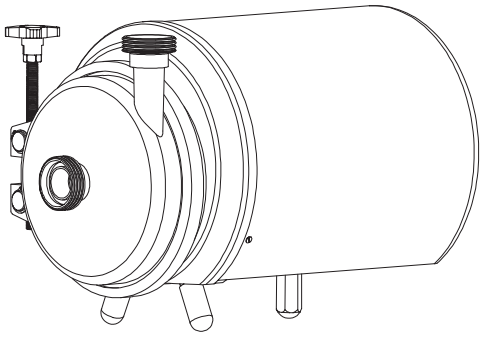
		Pump type			
Noise Index dB(A)	< 80	CL 22 CL 31 CL 41 CL 51	2 & 4-pole 2 & 4-pole 4-pole HP 3/4/5,5	CLC 41 CLC 51	2 & 4-pole 2-pole HP 2,2/3/4/5,5
	80 ÷ 85	CL 51 CLC 51	2-pole HP 7,5/10 2-pole HP 7,5/10		
	85 ÷ 90	CL 51 CLC 51	2-pole HP 15/20 2-pole HP 15/20		

The measurement has been made by means of a phon-meter placed at 1 m distance from the pump and at a height of 1.6 m from the ground.
Preliminary condition is that the pump is fixed correctly; the above mentioned values do not take into account external noise sources (e.g. valves, abrupt hydraulic deflections).

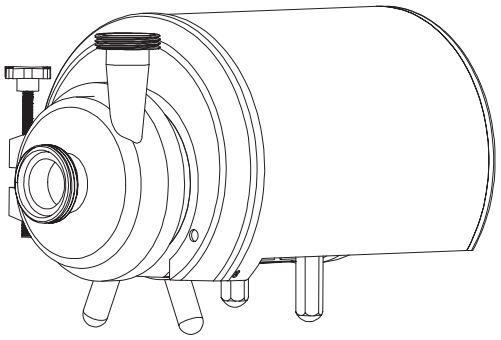
6.3 - WEIGHTS

The weight may vary depending on the execution (see types on page 11), the make and/or model of the motor installed.
For information on the weight of the pump, see the data sheet provided as an appendix to the instructions.

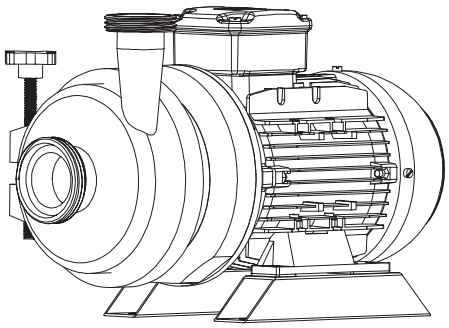
6.4 - SET-UPS



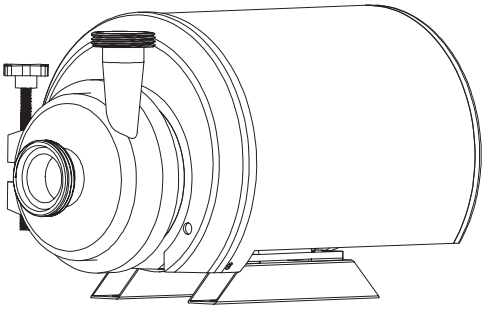
CL-CLC shrouded execution with 3 adjustable feet for motors from 0.55 to 4 kW



CL-CLC shrouded execution with 4 adjustable feet for motors from 5.5 to 15 kW



CL-CLC shroudless exec. with fixed feet



CL-CLC shrouded exec. with fixed feet

7.0 - NON-PERMITTED USES

Do NOT use the pump in the following cases:

- Without guards and/or with disabled, faulty or missing safety devices.
- If it has not been installed correctly.
- If there are power supply faults.
- In the event of serious maintenance shortcomings.
- Following unauthorized modifications.
- For improper use of the machine.
- Without following the instructions provided.
- The pump must always be used in an environment appropriate to the level of protection of the motor. Always check this on the motor plate before installation.

THE PUMP MAY NOT BE USED IN ENVIRONMENTS WHICH REQUIRE A HIGHER LEVEL OF PROTECTION OR A HIGHER SPECIFICATION MOTOR OR ELECTRICAL PARTS.

Components complying with the safety standards for the environment in question must be used.

8.0 - INSTALLATION

8.1 - SUCTION AND INFLOW CONDITIONS

(NPSH = Net Positive Suction Head)
NPSHa (NPSH available)
In order to ensure that pump operation is free from cavitation, it is essential to observe the maximum permitted suction lift **ha geo max** or the minimum allowable head **hc geo min.**
NPSH of system (available NPSH)
The centrifugal pumps can operate correctly only if vapour has not formed inside. For this reason the static head at the reference point for the NPSH is the centre of the impeller, that is the point of intersection of the pump shaft axis with the vertical plane that passes through the external points of the blade inlet corners.
NPSHr (required NPSH) is the value required by the pump, expressed in metres, obtained from the performance curve. In practice 0.5 m should be added to this value as a safety margin.

8.2 - PIPING

In order to prevent the creation of harmful stresses, the suction and discharge pipes must be connected to the pump ports without the use of force. These pipes must also be supported independently avoiding causing stresses on the pump. The internal diameter must be the same size as the pump connections. It must in any case not be smaller to avoid head loss and/or poor performances. Always use elbows with large radius. If the pipe diameter changes along the line, use reduction cones, choosing the ones that are most suitable to avoid any formation of air pockets (Pict.1).

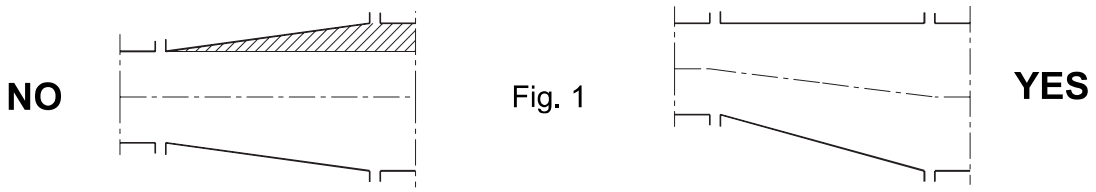


Fig. 1

The suction pipe must be as short as possible and rise as it moves towards the pump if it is sucking from a tank (Pict.2). If on the other hand the pump is below the level of the liquid, the pipe should descend slightly (Pict.3). If the pump is used for transporting hot liquids, fit expansion joints to compensate any expansion of the piping. The maximum velocity of the liquid in the suction pipe must not be greater than 3 m/s. Velocities between 1 and 2 m/s are recommended.

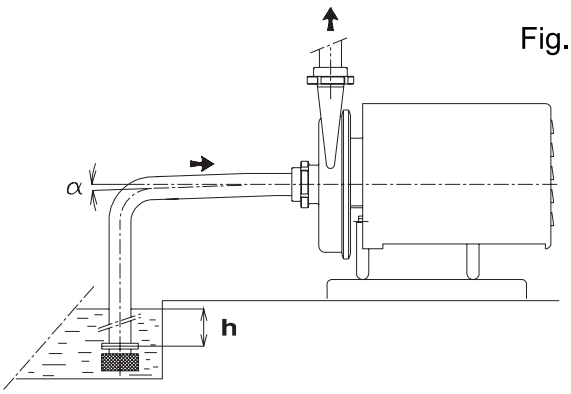


Fig. 2

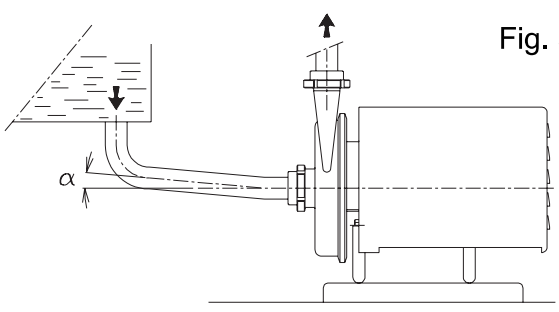


Fig. 3

The suction pipe must be designed in such a way as to prevent air from entering the pump.
For this reason, when sucking from a tank located at a lower level, the pipe must reach below the free surface of the liquid. In order to prevent the formation of vortices and avoid the risk of sucking in air, always keep a minimum head at the pipe inlet (h. min.) equal to at least the dynamic head

$$\text{h мин.} = \frac{Va^2}{2g} + 0{,}1$$

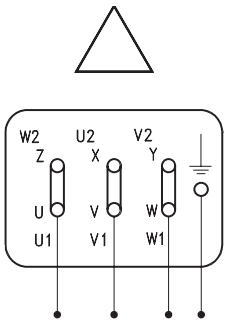
h мин = м
V = м/с

plus a safety margin of 0.1 m (Pict.2).
In order to prevent the formation of vortices when it is not possible to observe the values of minimum available head, it is possible to fit crosses in the piping. This system is suitable even for tanks with a positive head.
Avoid creating obstacles which could increase suction losses disrupting smooth fluid flow. Make sure that there are no restrictions, sharp turns or tight elbows on the discharge line, since these increase disturbance.
During electro-welding work never use the pump as an earthing point and make sure the current does not flow through the bearings.
Before using the pump, make sure the tank and piping are clean and examine the inside of the pump before connecting the piping.

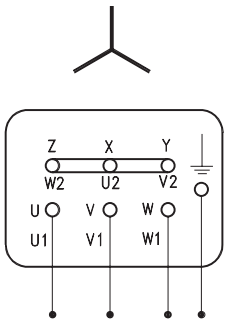
8.3 - ELECTRICAL CONNECTION

Make the electrical connection only after the hydraulic connection has been completed; set up the motor control system in conformity with the technical standards and regulations in force (EN 60204-1): in particular a manual electric power switch must be installed with adequate current switching capacity; devices for overcurrent and overload protection (e.g. fuses, automatic switches, etc.) must also be fitted, plus, if necessary, a device to prevent accidental restarting.
Check that the main frequency and voltage and the available power are suitable for the motor installed. All the material used for the electrical connection (cables, cable clamps, switches and shielding) must have a suitable level of protection for the environment in which it is installed. Be sure to use cables of sufficient cross-section for the current shown on the motor plate so as to prevent them from overheating.
Before doing anything else, make the motor's earth connection, using the terminal on the motor and a cable of sufficient cross-section. The cables may be connected to the terminal board using either a delta or star arrangement. Follow the data given on the motor plate for the main voltage, as shown in the diagram in pict.4; when starting, the motor's current absorption increases briefly to 5-6 times the nominal value. If the mains supply is unable to substain this increase in absorption, use a star-delta starter or other kind of device (e.g. an autotransformer).

Lower voltage



Pict.4



Lower voltage

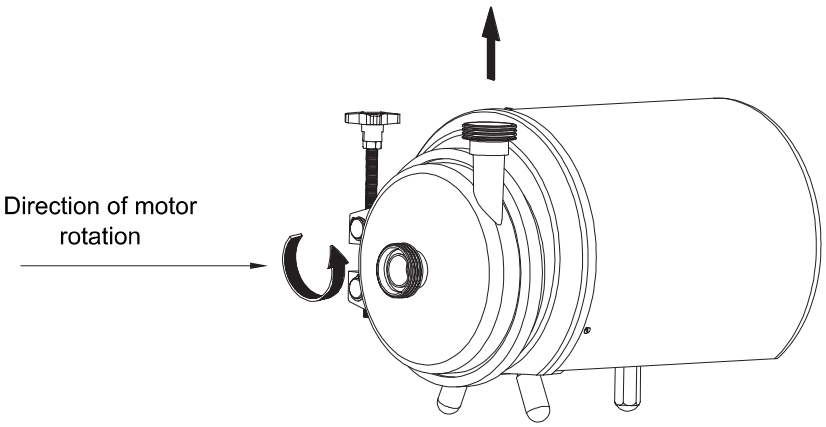
C.S.F. Inox S.p.A. will accept no responsibility for damage to property and/or injury to persons caused by failure to comply with the technical standards and regulations in force.

9.0 - OPERATION

9.1 - PRELIMINARY OPERATIONS BEFORE START-UP

- Check that the pump turns freely under hand pressure
- The clamp joining the pump casing and the lantern bracket must be well tightened and it should not be easily unscrewed by hand.

The clamp must be tightened using a wrench and NOT simply by hand.



- Check that the pump turns in the marked direction as described in the figure (counterclockwise as seen from the pump side).

The suction pipe and the pump must be filled with liquid. There are two possible cases:

a) When the pump is to operate with a negative suction head, it must be primed by introducing liquid into the pump casing.

b) When the pump is to operate below the level of the suction liquid, i.e. with a positive head, the suction and discharge gate valves must be opened until the pressure gauge on the pump discharge shows a pressure corresponding to the positive suction head.

c) If the sealing chamber is to be cooled, open the cooling fluid supply and adjust the flow.

- After carrying out the preliminary operations, then close the discharge valve completely and make sure that the suction valve is completely open.
- Start the pump and check once again that it rotates in the right direction.

OPERATING CHECKS

- If the pump does not generate the required discharge head rapidly, stop and repeat the priming operations.
- If the delivery gate valve is opened more than necessary, i.e. further than the specified working point, and the pump is operating with a lower discharge head than that required, there will be an increase in delivered capacity and absorbed power. If this occurs, throttle the discharge until the required head and capacity values are obtained.
- If the discharge head generated by the pump is greater than that required, the diameter of the impeller can be reduced. If, on the other hand, the head is lower than required, with equal flow rate, an impeller with a larger diameter can be installed (provided that the one installed isn't already the largest) and probably a more powerful motor is needed.
- The pump must operate smoothly and without vibrations.
- Do not operate without liquid and in any case avoid prolonged operation with the discharge gate valve closed.

- Check that the suction liquid level is always sufficient to grant an adequate energy load for normal operation of the pump.
- Mechanical seal: check that there is no leakage along the shaft.

9.2 - EXTENDED STOP

When stopping the pump for a longer time, empty the pump completely and wash it accurately in order to avoid the formation of scales and/or encrustations. When starting the pump again, please follow the above-mentioned instructions.

9.3 - CLEANING THE PUMP

In order to guarantee maximum life expectancy of the seal and pump itself, before periods of non-use always wash the pump if it has been used to handle products which tend to solidify or crystallize. It is the user's responsibility to ensure that the washing liquids are compatible with the process liquid and the pump.
For correct cleaning of the pump, please see the washing procedures described in heading 15 on page 27.

10.0 - SPARE PARTS

10.1 - MAIN PARTS SUBJECT TO REPLACEMENT

Pump type CL-CLC / Detail	22	31	41 motor, size 80 – 112	51 motor, size 80 – 112	51 motor, size 132 – 160	CLC 66	CL 66
***Mechanical seal EN12756-ISO3069**	D.14	D. 18	D. 24		D.28	D. 24	D.28
Casing O-ring	OR 8462	OR 206	OR 8650	OR 8850	OR 8850	OR 81050	
TMR seal ring	---	HN2390 30/47/7	HN2390 40/55/8		HN2390 45/62/8		

* NB: The type and materials of the seals are identified in the enclosed technical parts list

10.2 - RECOMMENDED SUPPLY

RECOMMENDED SPARE PARTS FOR TWO YEARS OF OPERATION FOR THE QUANTITY OF PUMPS INSTALLED IN ACCORDANCE WITH VDMA STANDARD					
Denomination	NUMBER OF PUMPS (including reserve)				
	1	2	3	4	5
MECHANICAL SEAL	1	2	3	4	4
PUMP COVER O-RING SEAL	2	3	5	6	7
NORD-LOCK WASHER (FOR CLC SERIES)	1	2	3	4	5

C.S.F. Inox declines all responsibility for damage or injury resulting from the use of non-original spare parts

11.0 - OPERATING MALFUNCTIONS

We are herewith listing some of the possible working irregularities which may occur using the pumps, with a table helping to find out the possible causes and how to solve the problem.

Trouble:

A) The pump does not run
B) Insufficient flow rate
C) The pressure is not sufficient
D) The pump stops priming
E) Power absorption too high
F) Leaks from mechanical seal
G) Short life of the mechanical seal
H) Failure of the mechanical seal
I) Anomalous vibrations and/or noise
J) Short life of bearings

Possible causes and necessary operations to solve them:

1) Pump not properly primed: repeat priming operations
2) Air entering from suction connections: check tightness
3) Air entering from the mechanical seal: replace the seal or arrange a solution with a vacuum spring in case of vacuum suction operation.
4) Obstructions present along suction pipes or valves closed along piping: check for and remove all foreign matter from pipes and verify valve status (open if closed).
5) NPSH available in the plant is lower than NPSH needed by the pump: reduce the friction loss or adjust the pump at a lower delivery point.
6) Defective operation of the bottom valve (not flooded pumps): restore proper operation of the valve or replace it with one in good condition.
7) Plant friction losses higher than pump performance: reduce friction losses or replace the pump with a more suitable one for requested performances.
8) Incorrect direction of rotation or velocity too low (in the case of a pump operated by an inverter): restore correct direction of rotation or increase motor speed.
9) Impeller clogged by foreign matter (in the case of pump with closed impeller): remove all foreign matter.
10) Worn seals: replace worn parts.
11) Worn or partially clogged impeller: replace the impeller or remove foreign matter.
12) Product viscosity higher than specified: check pump size.
13) Too much gas in the fluid: install a deaerator.
14) Plant friction losses lower than foreseen: increase friction losses or set the pump at a higher working point.
15) Specific weight of the fluid higher than envisaged: increase the installed motor power.
16) Pumped fluid viscosity too high: check pump size.
17) Pump operating at a higher flow rate than envisaged due to plant friction losses lower than expected: set the pump at a lower working point or increase plant friction losses.
18) Rotation speed too high (when pump is controlled by an inverter): reduce speed.
19) Internal friction caused by rubbing between rotating and fixed parts: restore correct assembly conditions
20) Pump-motor misalignment or deformed shaft: restore correct alignment between pump and motor or replace shaft with a new one.
21) Damaged pump or motor bearings: replace the bearings.
22) Incorrect electrical hook-up: modify electrical hook-up observing the data provided on the motor data plate based on available voltage.
23) Incorrect voltage for motor installed: replace the motor with one which has a suitable voltage.
24) Excessive wear on the seal: change the mechanical seal.
25) Pumped fluid and/or fluid temperature not suitable for the seal type or the materials from which it is made: verify the choice of seal.

26) Inadequate cleaning of pump handling liquids which tend to crystallize: do not allow the product to remain inside the pump for a long time.
27) Incorrect seal assembly: reassemble taking care to do it correctly.
28) Incorrect direction of rotation for non-reversible seals: restore correct direction of rotation.
29) Insufficient flushing for external flushed seals: increase the quantity of flushing fluid.
30) Dry operation of pump: to prevent further occurrences of dry operation, install protective devices (e.g. flow switch) to block pump operation when necessary.
31) Shaft oscillations due to excessive play in the assembly, worn bearings, etc.: restore correct assembly conditions replacing any worn parts.
32) Suspended solids in the fluid: verify the choice of seal.
33) Temperature too high or thermal shock: gradually increase the temperature of the fluid to avoid sudden massive temperature changes, avoid dry operation of the pump.
34) Unbalanced impeller: replace the impeller
35) Pump running with excessively low flow rate: set the pump at a higher working point.
36) Pump running with excessively high flow rate: set the pump at a lower working point.
37) Pump and/or piping not adequately anchored: check and adjust the anchorage of the relative parts.
38) Bearings not lubricated (when lubrication is foreseen): replace bearings and restore correct lubrication (lubricant must be topped up from time to time based on operating conditions).
39) Water infiltration due to worn radial shaft seal: replace worn parts.

POSSIBLE CAUSES AND NECESSARY OPERATIONS TO SOLVE THEM	PROBLEM ENCOUNTERED									
	A	B	C	D	E	F	G	H	I	L
1	●	●								
2	●	●		●						
3	●	●		●						
4	●	●		●						
5	●	●		●						
6	●	●								
7	●	●	●							
8	●	●	●							
9	●	●	●		●					
10		●	●							
11		●	●						●	
12		●	●							
13			●	●						
14				●						
15					●					
16					●					
17					●					
18					●					
19					●				●	●
20					●	●	●		●	●
21					●				●	
22		●	●		●					
23		●	●		●					
24						●				
25						●	●	●		
26						●	●	●		
27						●	●			
28						●				
29						●	●			
30						●	●			
31						●	●			
32							●			
33								●		
34									●	●
35									●	
36									●	
37									●	
38										●
39										●

12.0 - SEALS

All CSF Inox CL-CLC series pumps are fitted with mechanical seals with standardized seats in compliance with standards EN12756 and ISO 3069. The type of mechanical seal and material are chosen according to the liquid to be pumped.

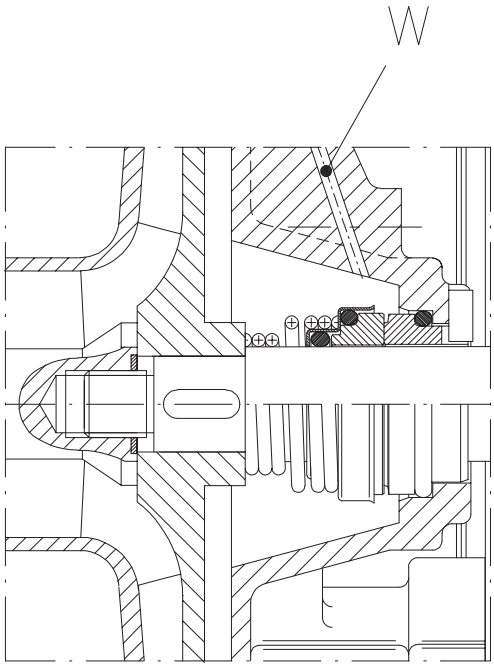
Before using the pump for any liquids other than those specified in the order, make sure that mechanical seals and gaskets are compatible with the new product.

MATERIAL CODES

METALS	ELASTOMERS	RESINS
H - Chromium-nickel stainless steel, AISI 304	6 - Nitrile (NBR)	5 - Normal PTFE
X - Stainless steel Inox AISI 316L	**7** - Ethylene propylene (EPDM)	4 - Loaded PTFE
	Y - Fluorocarbon (FPM)	F - O-RING FEP

METAL OXIDES	CARBONS	METAL CARBONS
2 - Alumina ceramic	V - Normal carbon	3 - Hard metal welded on stainless steel (TUC)
	Z - Special carbon	R - Integral hard metal hard metal (TUC)
		K - Integral silicate carbon (SIC)

T-W EXECUTION



STANDARD MECHANICAL SEAL “T”

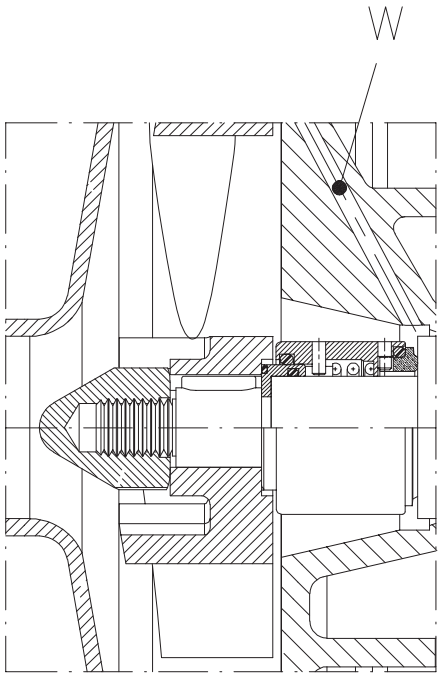
The mechanical rotary seal is internally mounted to allow better cooling and therefore a longer service life of the seal itself. The type of mechanical seal, the materials used on the sliding surfaces and the elastomers are selected on an individual basis from a wide range of available options.

MECHANICAL SEAL WITH CIRCULATION "W"

When pumping hot liquids (near boiling point) it ensures forced circulation of liquid in the area around the seal to prevent the formation of steam bubbles that can damage the seal.
It removes any deposits, limiting sedimentation.



TH-WH EXECUTION



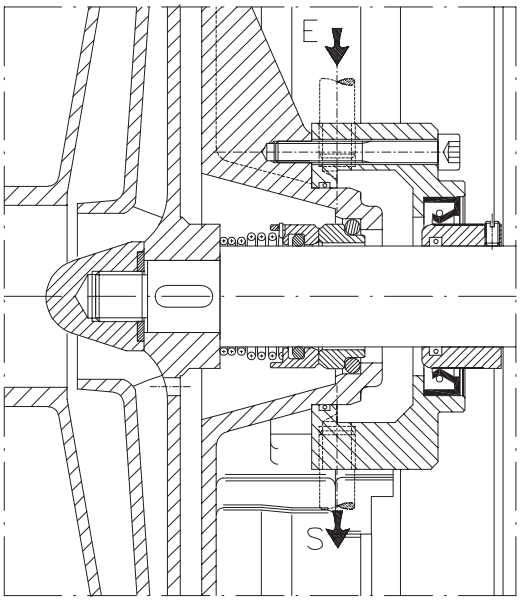
INTERNAL MECHANICAL SEAL “TH-WH”

Protected, balanced and bidirectional execution, suitable for applications with high hygiene requirements, vacuum applications and for use with viscous liquids. Easy to clean, it is ideal for use with food, health care and pharmaceutical products and where sterilization processes are required.

W = Execution with forced internal circulation of the pumped liquid.



V EXECUTION



INTERNAL FLUSHED MECHANICAL "V" SEAL

The external chamber, with flushing liquid circulation, prevents any damage to the electric motor or contamination of the environment caused by any aggressive or toxic substances leaked from the mechanical seal. Helps to cool, lubricate and clean the contact surfaces of the mechanical seal.

Radial mech. seal

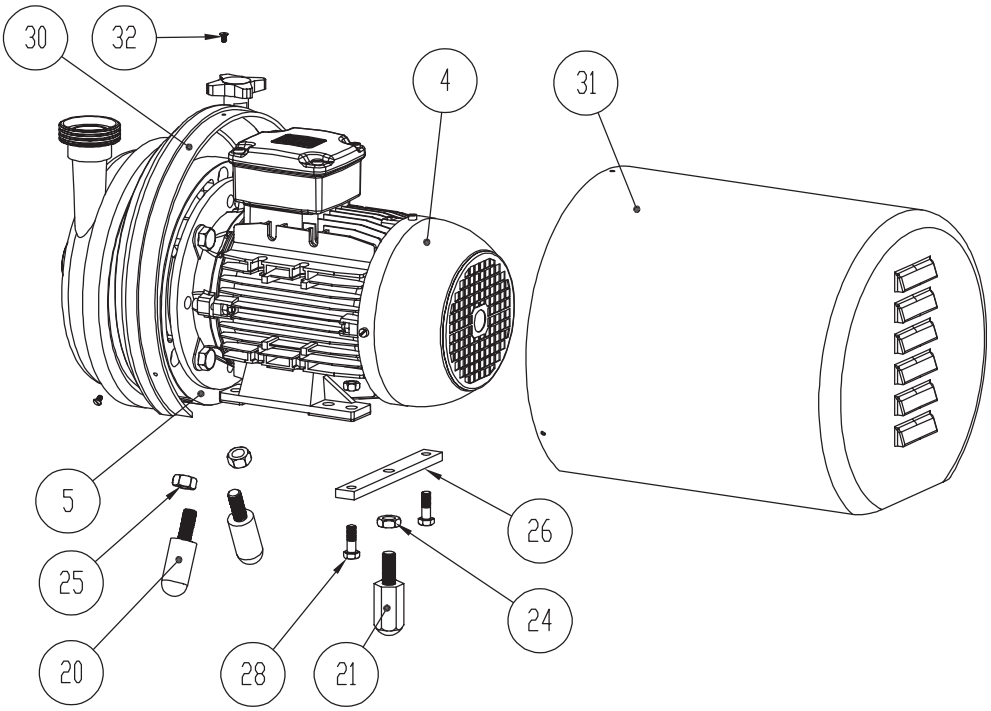


Axial mech. seal

13.0 - PUMP DISASSEMBLY

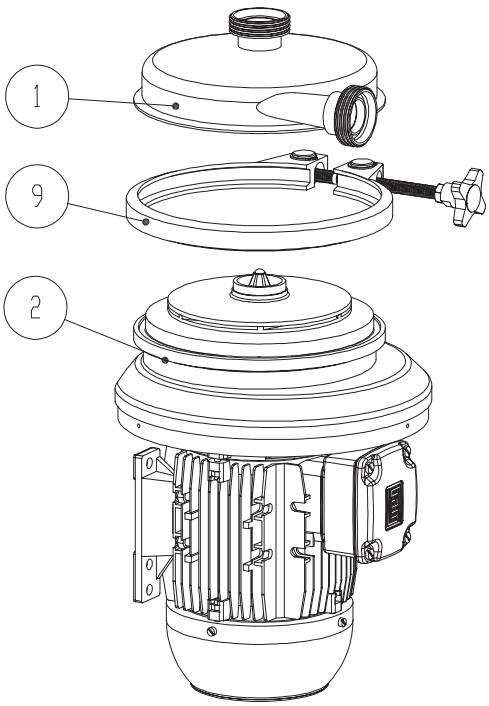
13.1 - DISASSEMBLY OF PUMP "T/W" EXEC. (Version with single mechanical seal)

1. Remove the screws (32) to take off the shroud (31) from the eccentric closure casing (30). Unscrew the front feet (20) and the nuts (25) from the motor flange (5) and the rear foot components (21-24) from the bracket (26); remove the latter from the feet of the motor (4) by unscrewing the coupling screws (28).

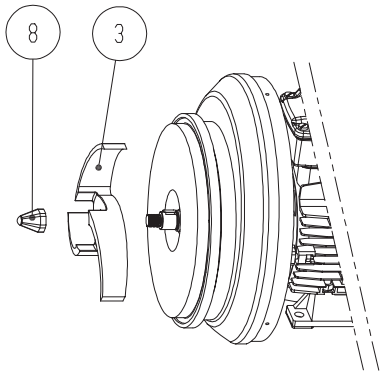


N.B.: THE FOLLOWING OPERATIONS MUST BE CARRIED OUT PLACING THE PUMP UPRIGHT.

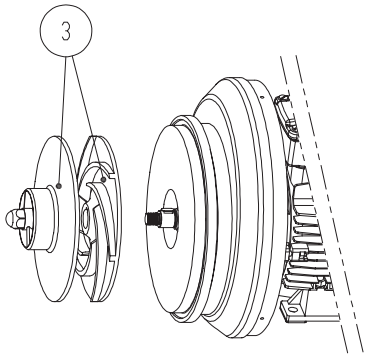
2. Loosen the clamp (9) and remove the pump casing (1) from the cover (2).



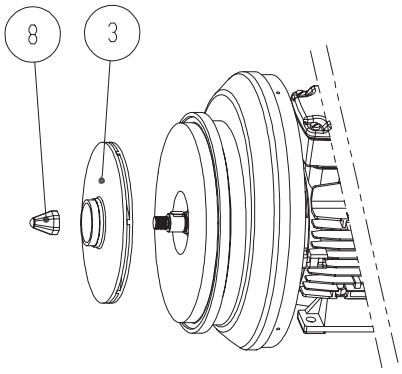
3. Disassembly of the impeller:
Using a suitable wrench, loosen the impeller cover (3) or the nut (8) and remove by unscrewing counter-clockwise.
N.B.: For this operation, at the rear end of the motor shaft there is an hexagonal socket or two flat surfaces for a fixed wrench which must be used to block the shaft when unscrewing the nut (8) or impeller cover (3).
Pull the impeller (3) off the shaft.



Exec. CL
OPEN IMPELLER

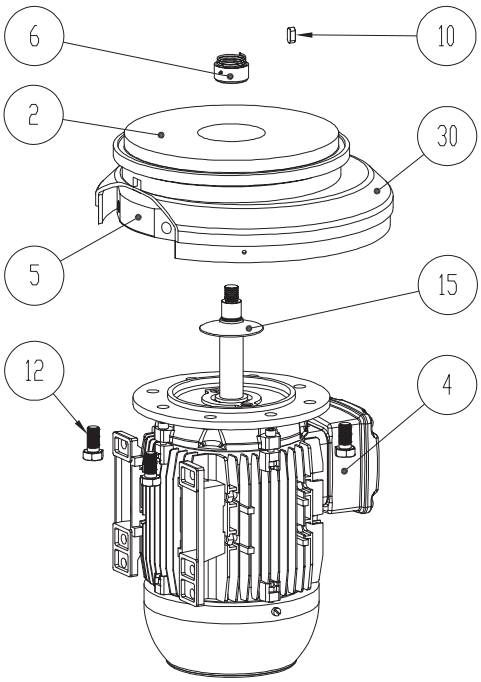


Exec. CLC
CLOSED COMPOSITE IMPELLER

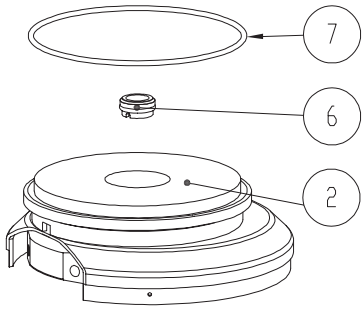


Exec. CLC
CLOSED IMPELLER

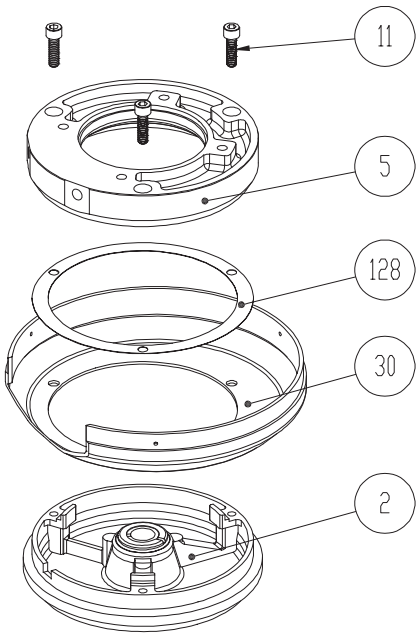
4. Remove the key (10) and slide off the rotary part of the mechanical seal (6), located inside the cover (2), leveraging on the spring with two screwdrivers.
Proceed by unscrewing the screws (12), which secure the motor to the pump coupling flange (5) and separate the pump block (2-30-5) from the motor (4); Remove the splash guard ring (15).
[N.B .: for CL 22 or CL 32 pumps, the motor (4) is directly fastened to the cover (2) and there is no coupling flange (5)].



5. Extract the O-ring (7) and the fixed part of the mechanical seal (6) from the cover (2).

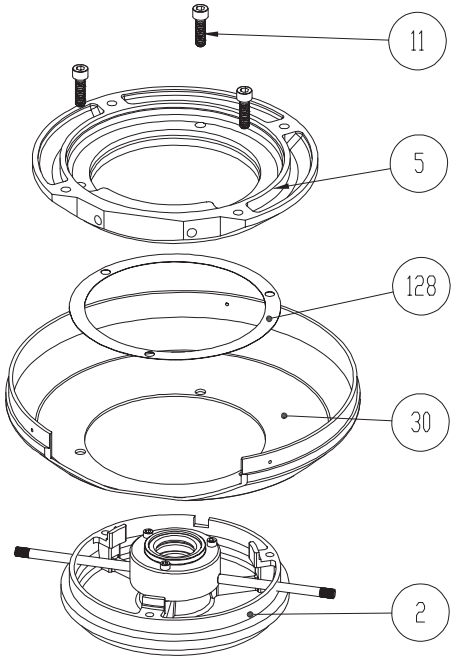


6. Turn the block over, remove the fixing screws (11) and take apart the coupling flange (5), the gasket (128), the eccentric closure casing (30) and the cover (2).



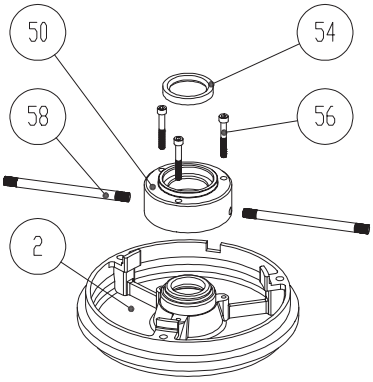
13.2 - DISASSEMBLY OF PUMP "V" EXEC.

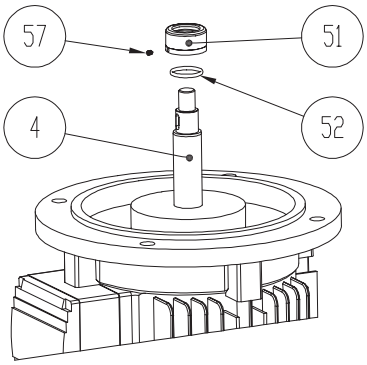
1. Carry out operations 1, 2, 3, 4 and 5 as described in the previous heading 14.1 (in step 4, for seals in "V" exec., there is no splash guard ring (15).



2. Remove the screws (11) and separate the flange (5), the gasket (128) and the eccentric closure casing (30) from the cover (2).

3. Unscrew the seal flushing pipes (58). Unscrew the screws (56) to remove the seal cover (50) from the pump cover (2); remove the radial mechanical seal (54) from the cover (50).

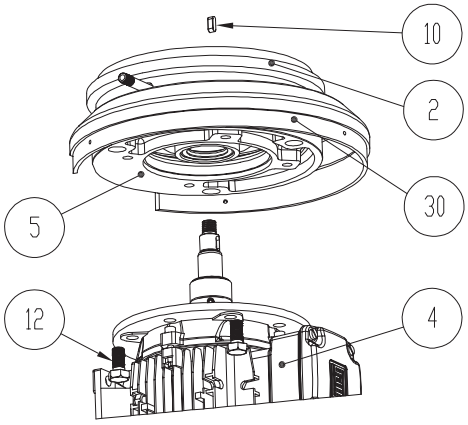




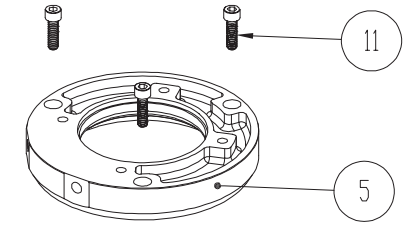
4. Remove the fixing grub screw (57) from the bush (51), and take it off the motor shaft (4) and separate it from the O-ring (52).

13.3 - DISASSEMBLY OF PUMP "U" EXEC.

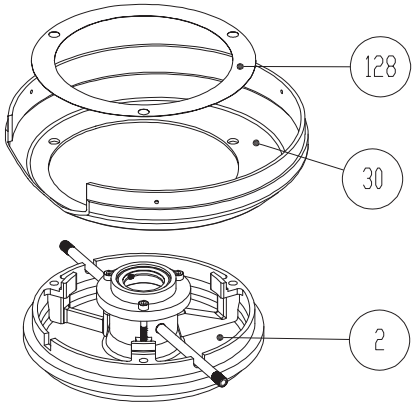
1. Perform the operations 1, 2 and 3 as described in the previous heading 14.1.

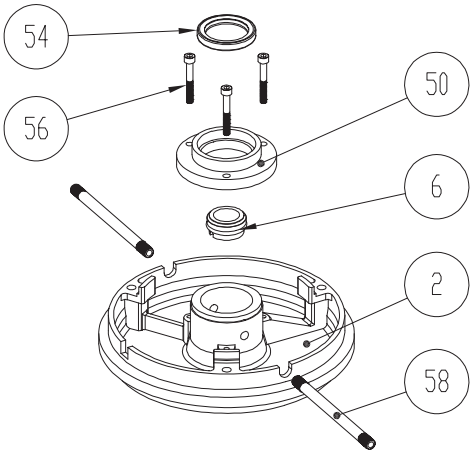


2. Remove the key (10), unscrew the screws (12) and separate the pump assembly (2-30-5) from the motor (4).
[N.B .: for CL 22 or CL 32 pumps, the motor (4) is directly fastened to the cover (2) and there is no coupling flange (5)].



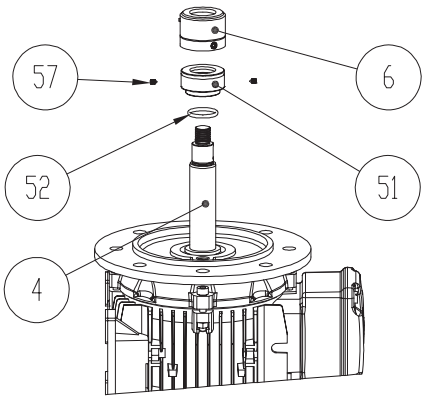
3. Remove the screws (11) and separate the flange (5), the gasket (128) and the eccentric closure casing (30) from the cover (2).





4. Unscrew the seal flushing pipes (58), the screws (56), extract the radial mechanical seal (54) from the seal cover (50) and the fixed part of the mechanical seal (6) from the pump cover (2).

5. Loosen the fixing grub screws on the rotary part of the mechanical seal (6) and slide it off the motor shaft (4). Loosen the fixing grub screw (57) from the bush (51), and take it off the (4) before separating it from the O-ring (52).



14.0 - PUMP ASSEMBLY

14.1 - PUMP ASSEMBLY

Observing the positioning of the seals as described in heading 12.0, carry out the assembly operations described in the previous heading 13.0 in reverse order to obtain the sequence of steps needed to assemble the pump.

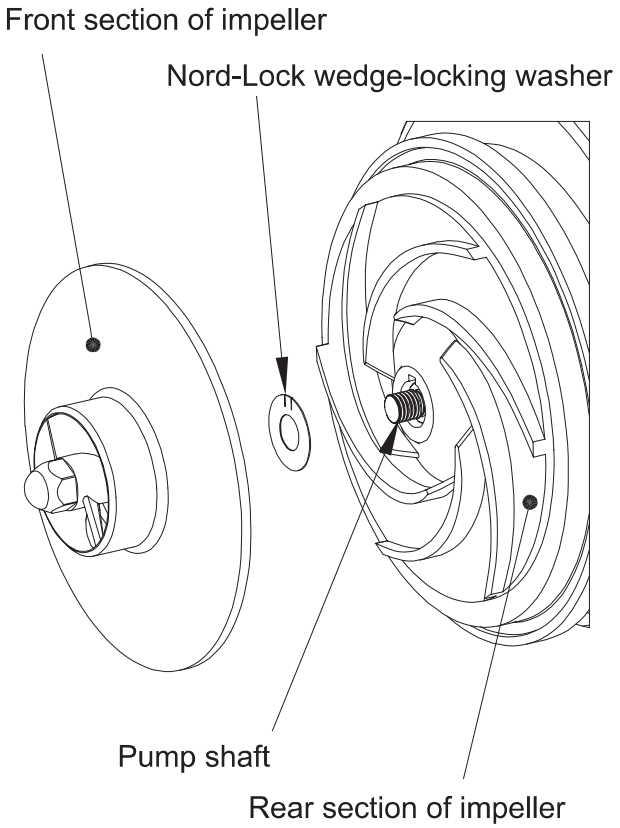
Heading 13.1 for "T/W" execution pumps;
Heading 13.2 for "V" execution pumps;
Heading 13 .3 for "U" execution pumps;

N.B.: Refer to table 1 in the following paragraph for instructions on how to assemble the composite version of the impeller (two pieces) in CLC pumps.

14.2 - COMPOSITE IMPELLER ASSEMBLY FOR CLC PUMPS

In the CLC version with 2-piece impeller (impeller + cover) there is a special WEDGE WASHER to prevent the cover from coming loose in the event of incorrect rotation (this may occur during installation due to start-ups with reverse rotation).

To assemble the impeller, push the rear section onto the motor shaft followed by the wedge washer. Screw on the front section of the impeller using a torque wrench.



TIGHTENING TORQUE VALUES	
CLC 41-2-3 CLC 41-2-4 CLC 41-2-5.5 CLC 51-2-2 CLC 51-2-3 CLC 51-2-4 CLC 51-2-5.5 CLC 51-2-7.5	Mt = 89 N • m Fs = 34 KN
CLC 51-2-10 CLC 51-2-15	Mt = 136 N • m Fs = 46 KN

Tab. 1

15.0 - CLEANING PROCEDURE

Use suitable personal protective equipment during cleaning operations.

15.1 - EXTERNAL CLEANING

Periodically clean the external parts of the pump and motor to prevent dust and deposits building up which could reduce heat dissipation and/or damage the external surfaces.

15.2 - CLEANING OF INTERNAL PARTS

Before performing any maintenance work which requires disassembly of the pumping parts, carry out internal cleaning by running the pump with washing fluids compatible with the pumped fluid and the pump materials.
If the pump needs to be sent back to C.S.F. Inox for maintenance/repair work, fill in the Declaration of Decontamination (page 29).

15.3 - CLEANING OF FOOD-CONTACT PUMPS

When a pump is intended to handle food products, it must be perfectly clean before it is put into operation.

This can be achieved by performing a CIP (cleaning in place) washing procedure or by disassembling the pumping part for manual cleaning.

It is up to the user to choose the most suitable cleaning method based on the type of product being handled and the processing stage in which the pump is used.

In the case of CIP, the user is responsible for selecting the necessary detergents, operating temperatures and detergent product concentrations based on the type of food product being pumped.

The duration of each step in the CIP washing cycle depends on the type of dirt/residue that needs removing.

It is important to check the compatibility of the chemical products and operating temperatures used in the washing cycle with the pump components specified in the data sheet (elastomers, mechanical seal).
The cleaning process must also be carried out in the following situations:

- Before a long period of non-use
- Before any disassembly operations for maintenance work and after subsequent reassembly if worn parts have been replaced
- Before restarting after a long period of non-use.
- At intervals established by the user based on the characteristics of the pumped products and the type of process in which the pump is used, in order to guarantee food product hygiene.

It is the user's responsibility to verify the effectiveness of the cleaning procedure adopted.

Alkaline detergents:

A sodium hydroxide/water solution may be used at concentration 1-3% at a temperature of 70-90°C; a surfactant could be added to increase the rinse cleaning.

Acid solution:

It is used to neutralize alkaline residual and for the passivation of the stainless steel surface; a solution of nitric acid at 1-2,5% could be used at ambient temperature up to 45°C.
Other acid solution could be: citric acid and water (0,5-3% at 70°C) and phosphoric acid at 0,5% with a temperature up to 45°C (with inhibitor of corrosion).

15.4 - CIP WASHING PROCEDURE

A typical example of a CIP washing procedure is described below:

a) Prerinse with cold water (15-25°C) for 10-15 minutes to remove any residue.
b) Warm prerinse with water at 45-60°C for 10 minutes.
c) Rinse with alkaline solution at 70-80°C for 20-30 minutes.
d) Intermediate rinse with water (warm or cold) up to 60°C for 5-10 minutes.
e) Rinse with acid solution like nitric acid for 10 – 15 minutes at ambient temperature.
f) Final rinse with cold water for 10-15 minutes or until any traces of cleaning agent have been removed.

Warnings:

a) During the CIP process there are thermal expansion: take care that there are not rapid temperature variations.
b) Chemical agents at high temperature can cause potential health risk: respect the safety regulation and use protection devices.
c) Control the concentrations and temperature of chemical agents during the CIP.
d) Store the cleaning agents in compliance with the safety regulations.

Sterilization:

If requested, a sterilization can be carried out by means of hot water or steam; the pump must be stopped during the sterilization process with steam.
See the admissible temperature for sterilization depending on gasket compound

Elastomers / temperature limits	Steam/hot water	Chemical bactericidal
EPDM	121°C	82°C
FPM/FKM	149°C	82°C

Impeller cap nut cleaning and sterilization:
1) The dismantled nut should be cleaned before assembling (internal threads).
2) Clean the nut with ultrasound washing system or detergent and rinsing with clean water.
3) Sterilize the cap nut using steam at 143°C for 30 minutes in an autoclave or using chemicals (for example glutaraldehyde-based solutions). Do not use chlorine solutions because stainless steel could be damaged by corrosion.

DECLARATION OF DECONTAMINATION

In observance of the legal provisions in force and to protect the health and safety of our personnel, you must fill in, sign and return this declaration to us before we can processyour order. Please make sure that the same declaration is attached to the outside of the packaging.

Shipping address: **C.S.F INOX S.p.a.** Strada per Bibbiano, 7 42027 Montecchio E. (RE), Italy	**For information contact:**

***Mandatory fields**

* Pump: _ _ _

16.0 - WASTE DISPOSAL AND DECOMMISSIONING



The pump, complete with electrical drive system, is a plant component which must be disposed of in accordance with regulations governing the disposal of waste derived from professional electrical and electronic equipment.

Neither the pump nor any of its parts may be disposed of with household waste.

16.1 - PACKAGING MATERIALS

The packaging material consists of wooden or cardboard boxes, polyethylene shrink-wrap covers and polyurethane foam, galvanized steel screws, polyester belts.
Wooden or cardboard boxes and screws can be recycled or sent to authorized waste disposal facilities.
The remaining packaging materials must be sent to authorized waste disposal facilities.

16.2 - WASTE RESULTING FROM MAINTENANCE OPERATIONS

All materials replaced during maintenance operations must be disposed of in compliance with current regulations and sent to an authorized waste disposal facility.
Consult the pump's bill of materials, supplied with this manual, to identify the materials used to make the replacing components.
All replaced metal parts must be sent to metal recycling centres; plastic or elastomeric parts and spent lubricants must be disposed of at authorized waste disposal facilities.

16.3 - DISPOSAL OF THE PUMP

For disposing the pump please observe the following instructions:
- disconnect electrical and hydraulic connections according to technical rules and laws in force.
Disassemble all components of the pump for separate dismantling; wash the components and clean the structure accurately.

The main components of the pump are made from the following materials:

- Pump casing, cover, impeller, shaft, impeller nut: AISI 316L stainless steel (for special alloy pumps, see the bill of materials)
- Elastomers/Polymers NBR-EPDM-FKM-FFKM-PTFE
- Support and external parts: AISI 304
- Other components: composite mechanical seals, stainless steel and elastomers, ball and roller bearings.
- Motor: Aluminium - Cast Iron - Copper (consult the manual supplied by the manufacturer)
- Spend oils and greases

For further details, consult the pump's bill of materials, supplied with this manual, to identify the materials used to make the various components.

There are no components containing asbestos, cadmium or lead, PBB or PBDE.

The components of the pump should be properly got rid, according to the corresponding rules in force in receiver’s country.

CSF

DECLARATION OF CONFORMITY

The company: **C.S.F. Inox S.p.A.**

based in: **Strada per Bibbiano, 7**
Montecchio Emilia (R.E.)
ITALIA

hereby declares, under its sole responsibility that the pump:

CENTRIFUGAL PUMP

Type XXX

Serial no. XXX Year XXX

CE Declaration of Conformity (Ann. II.A, 2006/42/EC)

to which this declaration refers, is in conformity with safety requirements according to Directive 2006/42/EC.

Name and address of the person authorized to compile the technical file:
C.S.F. Inox S.p.A. Strada per Bibbiano 7 - 42027
Montecchio Emilia (RE) ITALY

Applied Regulations:

EN 12100 2010
EN 809 2009

Food products-contact suitability declaration

is made with materials suitable to come in contact with food
according to the regulation (EC) no. 1935/2004.

2014/35/EU : electrical material intended for use within certain voltage limits.

Montecchio Emilia, XX-XX-XX

The Chairman Mr. Rolando Paterlini

DISCOVER THE WIDTH OF OUR RANGE!

Colly Flowtech offers one of the market's widest ranges of flow technology for industry. We offer everything from pumps, homogenisers, industrial hoses and heat exchangers to stainless steel piping systems, valves, couplings, quick-connect fittings and filter solutions. With both standard products and customised solutions, we help industry create safe, efficient and reliable flow systems.











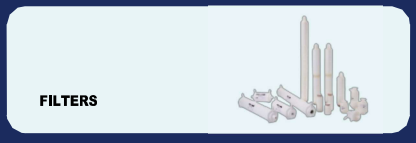














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ISO 9001 14001 CERTIFIED

Colly FLOWTECH

Since 2007, we have combined local presence, high service levels and strong expertise to deliver comprehensive flow solutions to the manufacturing industry across Scandinavia. Through collaboration with world-leading suppliers, we provide our customers with the latest technology and innovative products.

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