CLD

CENTRIFUGAL IN-LINE DOUBLE PUMPS

INSTRUCTION MANUAL



IMPPUMPS®

Intelligent Motor Pumps

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FOREWORD, WARRENTIES AND LIMITATIONS

1) **PURPOSE**

The purpose of this instruction manual is to ease as much as possible the installation, operation and servicing of CLD In-line centrifugal pumps.
We strongly recommend to read it attentively and to consult it whenever work is done on the pump.
Unobservance of the instructions here reported or improper use od the pump by unskilled personnel may result in heavy damage to things and/or injuries to the person due to the presence of miving parts, pressurized flids and electrical connections.

IMP PUMPS technical assistance is readily available: for any doubt or possible problem, please contact u salso by phone.

2) **CHECK THE DOCUMENTS**

Check the equipment at delivery against the accompanying documents, paying particular attention to its completeness and to possible damage occurred during transportation.
The same should be done for any ancillary equipment.

3) **WARRANTY**

The warranty does not include possible damage or failure caused by mishandling, wrong electrical connections and uncorrect assembling; the warranty also excludes in all cases remboursements for the equipment or for major damage.
IMP PUMPS declines any responsibility for damage to persons and thins due to improper use of the machinery here described.
Consumables are not subject to warranty.

CHAPTER 1

DESCRIPTION

1.1 **Construction feauters**
CLD pumps are centrifugal horizontal pumps coupled by means of a spindle to a three-phase totally enclosed asynchronous motor with external ventilation for motor cooling.
Sealing is ensured by mechanical shaft seal.
Typical performances refer to continuous duty with clear water (specific weight 1.000 Kg./m³) with a manometric suction head of 2 meters if not otherwise specified.
With higher heads, till a maximum of 6 to 8 meters of suction column, pump performances are reduced in delivery values.
Pump nameplate reports the following data :
- Manufactures
- Pump type
- Serial number
- Delivery (litres per minute)
- Head (meters)
- Month / year of construction
- Break power (kW)
- Rounds per minute (min-1)

1.2 **APPLICATIONS**
CLD pumps are mainly employed in the following application :
- Heating and air conditioning systems
- Water lifting from lakes, rivers, wells, etc…
- Irrigation systems on ground surface or by sprinkling
- Water supply for small communities or isolated houses
- Pressure systems
- Supply systems for domestic hot water

CLD pumps should always operate within the following operating limits :
- Max. operating pressure 10 bars
  (6 bars for models 32x100 and 40x100)
- Max. liquid temperature +130°C
  (+50°C for model 32x100)
- Min. liquid temperature -10°C
- Max. ambient temperature +40°C
- Max. liquid viscosity 5E
- Max. n° of startups / hour 20 (at regular intervals)

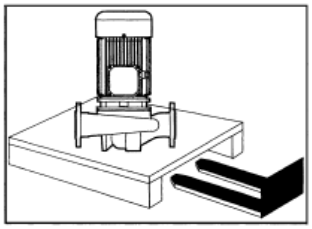
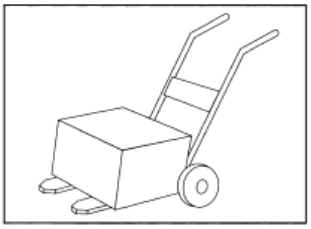
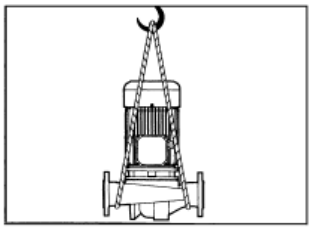
ATTENTION : (Optional supply)
To ensure reliable operation of pumps installed in plants with cold water *, and have a high reliability, electric motors are provided with holes for exhaust condensation on the flange coupling with the pump.
Check that the condensate drain holes are clear.

1.3 **Noise levels**
The following table reports the noise level produced by CLD pumps running within their operating limits and installed according to the instructions given in this manual.
(Average values measured at 1 meter from the pump and elaborated according to ISO curve A – standard R 1680).

MOTOR POWER (kW)	POLES	NOISE LEVELS dB(A)
0.25-2	2	Inferiore a 70
3	2	72
4-6.3	2	78
7.5-15	2	80
18.5-22	2	81
30-37	2	83
0.25-9	4	Inferiore a 70

CHAPTER 2

TRANSPORT AND STORAGE


2.1 **Transport**
Before transportation, please perform the following checks :
- Weight of pump / motor group
- Overall dimensions of pump / motor unit
- Suitability of lifting points, eye bolt from size motor 132

The electric pump can be dispatched in the following ways :
- Box
- Single pallet
- Pallet with other pumps

The pump should be handled with equipment suited to its weight and to the shape of its packaging (see side pictures).
Lifting by hand is allowed only for weights lower than 20 Kg.

2.2 **Storage**
During storage. Please observe the following precautions :
- Store the pump in a dry, sheltered environment
- Check that ambient temperature never falls lower than 5°C
- Restore the motor after long storage (more than 6 months)

CHAPTER 3

GENERAL SAFETY INSTRUCTIONS

3.1 **General instructions**
The pump(s) should be used only for the applications specified in section 1.2.
Recommended operational limits must be strictly observed.
In case of applications not specified on this manual, please contact IMP PUMPS to check for pump suitability, installation safety and pump life.
We recommend besides to install the pump in a safe place.

ATTENTION
In case of emergency, switch off line voltage and warn service personnel.



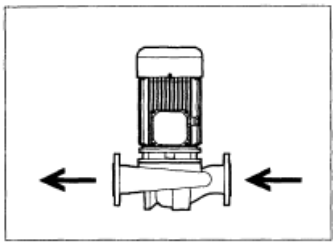
3.2 **Precautions during operation**
Never put your hands or any kind of object into pump openings where the shaft rotates (see side picture).
Protect motor and electrical parts in general according to current regulations.
If warm water is pumped, do not touch the pump.

3.3 **Residual risks**
Take care not to :
- Kick the pump
- Pressurize the pump beyond recommended limits
- Use the pump unproperly
- Damage the pump by wrong handling

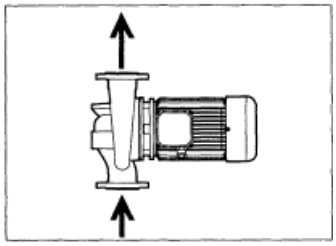
CHAPTER 4

INSTALLATION

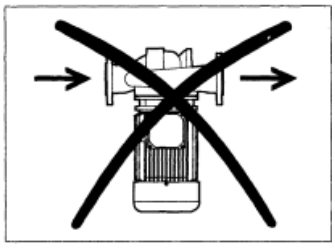
(1)



(2)



(3)



(1) Installation suitable for heating and conditioning plants*.

(2) Installation allowed for heating plants.

(3) Installation not allowed.

4.1 **Installation**

For what concerns handling and installation, please refer to section 2.1.

Pipings should always be connected so to avoid any kind of stress to pumps.

Suction pipe should be absolutely airtight, with a diameter larger or (at most) equal to pump suction nozzle diameter.

Fluid velocity inside the piping should never exceed 2 mt/ sec. at suction and 3 mt/sec. at delivery.

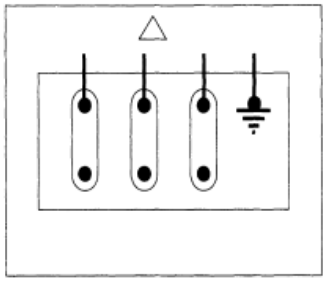
The pumps can be installed on delivery or return pipes and in horizontal or vertical position, provided the motor is never placed below the pump to avoid water leakage into motor or bearings (see pictures).

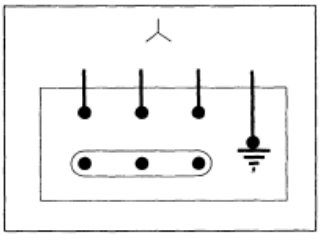
We recommended the use of gate valves upstream and downstream the pump.

Leave enough room for motor ventilation.

Also, the pump should not be installed in the lowest point of the system to avoid settlements buildup.

For a correct air bleeding it is necessary to fill up the whole system.





4.2 **Electrical connections**

Electrical connections should be made only by specialized personnel, strictly following the instructions of pump and electrical equipment manufacturers.

Remove terminal board cover by unscrewing its screws.

Connect electrical lines as shown in the picture aside and inside the terminal board.

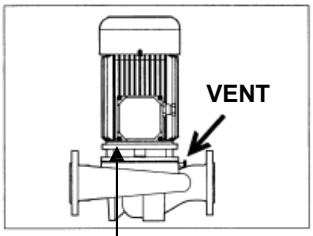
NOTE

We recommended to install upstream the motor a safety switch to protect the motor against voltage drop or overload.

Please refer to voltage data on motor nameplate for its correct sizing.

CHAPTER 5

COMMISSIONING AND STARTUP



HOLES FOR EXHAUST CONDENSATION

(Optional supply)

5.1: Startup

Before starting the pump it is necessary to fill and vent the whole system using, for what concerns the pump, the relevant bleeding valve.
Check rotation direction against the arrow on pump/motor casing; if pump rotation does not match the one shown by the arrow, reverse motor phases (only in case of three-phases motors).
Once the pump has been primed, close delivery gate valve, start the pump and open slowly delivery gate valve (startup with closed gate valve reduces starting voltage peak).

ATTENTION
Never leave delivery gate valve closed for more than a minute as the pump can dangerously overheat.
Avoid dry running.

During operation, check shaft seal: it is a mechanical seal, and therefore there should be no leaks.
Check also that the pump runs within its operating limits and that voltage values reported on control panel do not exceed motor nameplate rated values. If necessary, partially close gate valve or adjust pressure switches intervention.
A slight dripping from the mechanical seal is quite normal and should not be of concern.
However, if some misfunctioning is detected during startup, stop immediately the pump and investigate the problem starting with the Fault Finding chart (chapter 7).

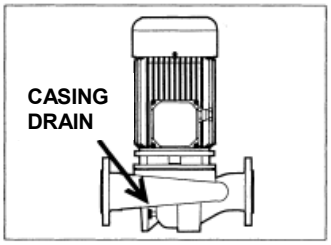
ATTENTION
The system should be fully completed before starting the pump, especially for what concerns electrical, mechanical and hydraulic components. All safety systems must be operating correctly.

ATTENTION
Junction box cover must always be fixed on motor.

ATTENTION
Pumpsets for conditioning plants, must be expressly requested.
To ensure reliable operation of pumps installed in plants with cold water *, and have a high reliability, electric motors are provided with holes for exhaust condensation on the flange coupling with the pump. (Optional supply)
Check that the condensate drain holes are clear.

CHAPTER 6

MAINTENANCE



6.1: Ordinary Maintenance

Once started the pump, check it as frequently as possible by means of system instrumentation like pressure gauges, vacuum meters and ammeters.
The pump needs normally no maintenance, except a periodical check for:

- Absorbed power, suction head and final pressure.
- Mechanical seal operation (there should be no leaks).
- Bearing operation.

If a danger of frost exists, drain the pump completely during idle periods in winter.
Before starting the unit again, make sure the rotor is not jammed or clogged by scales or similar. If so, turn the motor fan with a screwdriver till the rotor can freely turn.
As far as the cooling systems are concerned, make sure that no condensate has developed inside the motor, otherwise place the motor in vertical position and make exhaust holes on motor shields to release condensate.
This operation must be carried out by skilled personnel only. Pump and system can now be primed again as described in chapter 5.1.

CHAPTER 7

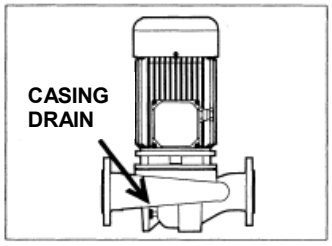
FAULT FINDING

PROBLEM	PROBABLE CAUSE	RIMEDY
1 THE PUMP GIVES NO WATER	1.1 Pump and suction pipe not well primed, with air trapped in the system.	Prime again pump and suction pipe.
	1.2 Air enter the system through suction pipe open taps.	Correct installation.
	1.3 Suction head too high.	Correct installation.
	1.4 Wrong rotation direction.	See par. 5.1
	1.5 The total head required by the system is higher than rated pump head.	The pump is not suited to the duty required.
2 UNSUFFICIENT DELIVERY	2.1 Foreign bodies at impeller channels or the same causes as points 1.1,1.3,1.4,1.5.	Remove the causes.
	2.2 Undersized suction pipe valve, or wrong positioning of suction pipe.	Correct installation.
	2.3 Worn impeller and/or pump casing.	See chapter 8.
3 UNSUFFICIENT PRESSURE	3.1 Liquid viscosity higher than specified and/or the same causes as points 1.4, 1.5, 2.3.	Pump not suited to the viscosity and/or remove the causes.
4 EXCESSIVE BREAK POWER	4.1 Pump performances are different than rated.	Delivery gate valve partially closed.
	4.2 Liquid SG higher than specified.	Pump not suited to the service, delivery gate valve partially closed.
	4.3 Abnormal internal rubbing (rotating parts rub against fixed parts).	Repair the pump (see chapter. 8).

PROBLEM	PROBABLE CAUSE	REMEDY
5 THE SEAL LEAKS EXCESSIVELY	5.1 Worn mechanical seal.	See chapter. 8.
	5.2 Worn shaft at mechanical seal position.	Repair the pump see chapter. 8.
6 THE PUMP VIBRATES AND IT'S NOISY	6.1 Unbalanced rotating assembly.	Repair the pump see chapter 8.
	6.2 Motor bearing failure.	See chapter 8.
	6.3 The pump runs with too low or too high capacity, also the same causes as points 1.3, 2.1, 2.2.	Operate the pumps differently, remove the causes of the misfunctioning.
	6.4 Pump and/or piping not firmly fastened.	Correct installation.

CHAPTER 8

REPAIRING THE PUMP



Before disassembling the pump:
Switch off line voltage.
Close suction and delivery gate valves.
Leave the pump to cool off in case warm liquid has been pumped.
Drain the pump through the relevant draining hole (see picture).

Removing the pump from the system:
a) Full removal from the system:

Remove bolts from suction and delivery flanges.
Remove all screws fastening the pump to the ground and lift the pump with a suited hoist (see section 2). For repairing, please send the pump to the manufacturer or to an authorized shop.

b) Partial removal from the installation:

Unscrew the screws between pump casing and lantern and remove the assembly motor/lantern cover/impeller without removing the pipes to which pump casing remains connected.
Use a suited hoist when moving/lifting the pump; see section 2.
For twin pumps, it is possible to remove only one assembly motor/lantern cover/impeller, replacing it with the blind locking flange supplied.

c) Mechanical seal replacement :
When replacing the mechanical seal, ensure the complete cleaning of each part and use all necessary care to avoid damaging the seal by knocks, jolts, cutting edges, etc.
Take care not to foul sealing faces, especially with grease or oil.
To re-install the pump, please refer to sections 4 and 5.

CHAPTER 9

SPARE PARTS

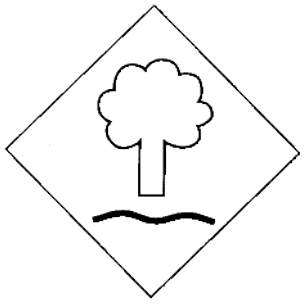
9.1: Spare parts ordering

For a faster processing of your order, when ordering spare parts please specify:

- Pump type.
- Pump serial number.
- Part name and reference number as listed on sectional drawings.
- Pump type and serial number are easily found on pump nameplate.

CHAPTER 10

DECOMMISIONING AND DISMANTLING



10.1: Dismantling

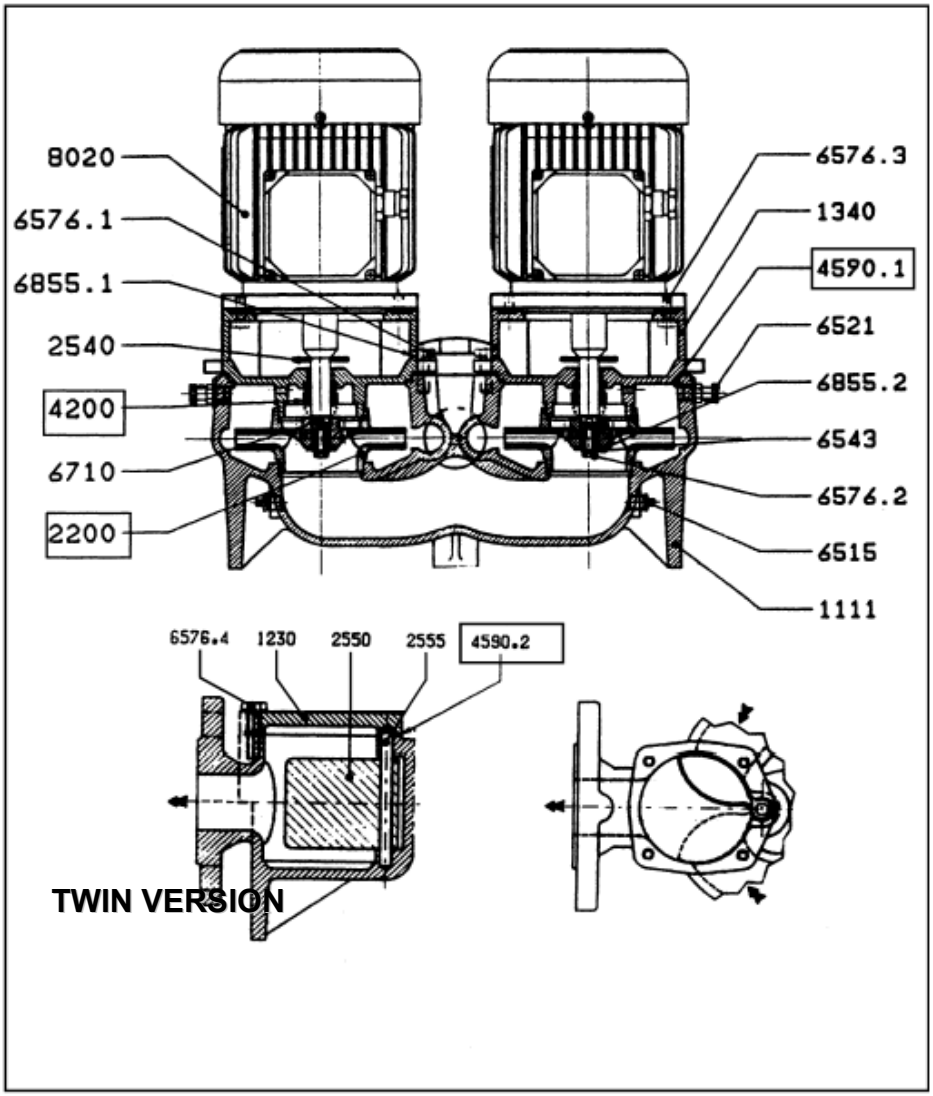
When the pump will be permanently stopped and dismantled, the various materials composing it should be properly disposed of.
It is important to make sure that no residual polluting liquids are trapped within the pump.
The materials used in pump construction are:

- Steel and cast iron.
- Aluminium.
- Rubber and plastic.
- Copper and brass.

The disposal of polluting liquids and materials should follow current environmental regulations.
Environment protection is an increasingly pressing problem.

Pos.	Denomination
1111	Pump casing
1222	Gland cover
1230	Inspection cover
1340	Lantern - cover
2200	Impeller
2540	Baffle
2550	Shutter
2555	Shutter pivot
2912	Impeller nut
4200	Mechanical seal
4590	Gasket
6515	Drain plug
6521	Vent plug
6543	Spring washer
Hexagonal head screw	
Hexagonal head screw	
Hexagonal head screw	
Hexagonal head screw	
6580	Hexagonal nut
6710	Tab
Washer	
Washer	
8020	Motor

Recommended spare parts



TWIN VERSION