



INSTRUCTION MANUAL

VERTICAL CENTRIFUGAL PUMPS - TYPHOON



ENGLISH



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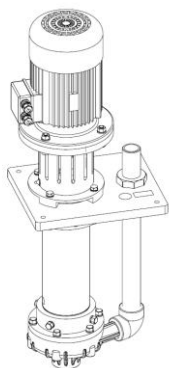
INTRODUCTION

TYPHOON pumps have been manufactured to the Machinery Directive 2006/42/CE. Therefore, if used according to the instructions contained in this manual, the TYPHOON pumps will not represent any risk to the operator. This manual must be preserved in good condition and/or accompany the machine as reference for maintenance purposes. The manufacturer rejects any liability for any alteration, modification, incorrect application or operation not complying with the content of this manual and that may cause damage to the health and safety of persons, animals or objects stationing near the pumps. All the technical values refer to the standard version of TYPHOON pumps (please see "TECHNICAL FEATURES"). However, our continuous search for innovation and improvements in the technological quality means that some of the features may change without notice. All drawings and any other representation in the documents supplied with the pump are property of the Manufacturer who reserves all rights and FORBIDS distribution to third parties without his authorization in writing. THEREFORE REPRODUCTION, EVEN PARTIAL, OF THIS MANUAL, TEXT OR DRAWINGS ARE STRICTLY FORBIDDEN.

ABOUT THIS MANUAL

This manual is an integral part of the pump, and represents a SAFETY DEVICE. It contains important information that will assist the purchaser and his personnel in installing, using and servicing the pumps in good condition and safety during service life. PLEASE CONTACT THE MANUFACTURER'S CUSTOMER ASSISTANCE DEPARTMENT FOR ANY FURTHER INFORMATION REGARDING THE CONTENTS OF THIS MANUAL.

PUMP IDENTIFICATION



Each pump is supplied with an identification label carrying its serial number, model and year of manufacture. The identification code "MODEL" heading specifies the composition and the materials used to build the pump. This data will help ascertain whether the pump is suitable for the product to be pumped. Check these data upon receiving the goods. Any discrepancy between the order and the delivery must be communicated immediately. WARNING: removing or altering this identification plate and/or the data it contains is forbidden.

**fluimac**[®]
pump solution


MADE IN ITALY

CODE: **TY010PD-0500-1-71-IE**

MODEL →

SERIAL No: **TY0000000**

DATE: **06/2025**

YEAR OF MANUFACTURE →

SERIAL NUMBER →

www.fluimac.com

DECLARATION OF CONFORMITY



fluimac[®]
PUMPS WE TRUST



EU DECLARATION OF CONFORMITY

PRD.01-2a - Rev.1

MANUFACTURED BY:

FLUIMAC SRL

VIA BRESCIA, 1
21049 TRADATE (VA) - ITALY

TYPE:

VERTICAL CENTRIFUGAL PUMP WITHOUT MOTOR

SERIES:

...

PUMP MODEL:

...

CODE:

...

SERIAL NUMBER:

...

Questo prodotto è conforme alle seguenti direttive comunitarie e relativi standard armonizzati:
This product requirements the following European Directives and related harmonized standards:
2006/42/CE - Direttiva Macchine.
2006/42/CE - Machinery Directive
UNI EN ISO 12100:2010 - Sicurezza del macchinario - Principi generali di progettazione, costruzione e riduzione del rischio.
UNI EN ISO 12100:2010 - Safety of machinery - General principles of design - Risk assessment and risk reduction.
UNI EN ISO 809:2009 - Regole tecniche di sicurezza per la costruzione, l'assemblaggio, il funzionamento, la manutenzione, di una pompa o di un gruppo di pompaggio per liquido.
UNI EN ISO 809:2009 - Technical safety requirements for the construction, assembly, operation, maintenance of a pump or a pumping group for liquids.
UNI EN 12162:2009 - Pompe per liquido - Regole tecniche di sicurezza - Procedure per prove idrostatiche.
UNI EN 12162:2009 - Pumps for liquids - Safety rules - Procedure for hydrostatic tests.
UNI EN ISO 20361: 2020 - Pompe e gruppi di pompe per liquidi - Norme tecniche - Procedure per prove di rumorosità - Classi di accuratezza 2 e 3.
UNI EN ISO 20361: 2020 - Liquid pumps and pump units - Normative standards - Procedures for noise tests - Grades 2 and 3 of accuracy

LA SEGUENTE CONFORMITA' È RIFERITA AL PROTOTIPO DELLA DRAGON 20 MATRICOLA NR. DR0002 DEL 10.12.2020.
THIS COMPLIANCE REFERS TO PROTOTYPE SERIAL NUMBER DR0002 OF 10.12.2020.

ESTENSIONI: la presente dichiarazione si estende anche ai modelli TYPHOON 6, TYPHOON 10, TYPHOON 15, TYPHOON 20, TYPHOON 25, TYPHOON 30, TYPHOON 40, TYPHOON 45, TYPHOON 50, TYPHOON 60, TYPHOON 65 e TYPHOON 80.
EXTENSION: this declaration is also valid for the following versions TYPHOON 6, TYPHOON 10, TYPHOON 15, TYPHOON 20, TYPHOON 25, TYPHOON 30, TYPHOON 40, TYPHOON 45, TYPHOON 50, TYPHOON 60, TYPHOON 65 e TYPHOON 80.

ATTENZIONE: data l'immensità varietà di prodotti e composizioni chimiche, l'utilizzatore è ritenuto il maggior conoscitore delle reazioni e compatibilità con i materiali costruttivi della pompa. Pertanto, prima dell'impiego, eseguire con perizia tutte le verifiche e prove necessarie al fine di evitare situazioni pericolose anche se remote che non possono essere conosciute ed imprevisti al costruttore. Per ogni controversia il Foro Competente è quello di Varese.

WARNING: in or there exists an endless variety of products and chemical composition, the user is presumed to have the best knowledge of their reaction and compatibility with the materials used to build the pump. Therefore, before using the pump, all the necessary checks and tests must be performed with great care to avoid even the slightest risk, an event that the manufacturer cannot foresee and of which he cannot be held responsible. Any controversy lies within competence of the Court of Varese.

The person authorized to constitute the technical file of the machine is the Legal representative of Fluimac S.r.l. domiciled at the registered office of the company. La persona autorizzata a costituire il fascicolo tecnico della macchina è il presidente della Fluimac S.r.l. domiciliato presso la sede legale della società

LEGAL RAPPRESENTATIVE

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USE AND INSTRUCTION
MANUAL

WARRANTY

All of the mechanical parts of Fluimac pumps are guaranteed for **12 months**. All the wear parts are excluded from the warranty. The warranty period is calculated from the date of delivery.

Warranty is void in all cases of improper or incorrect use and in case of negligence in following the information herein contained.



Fluimac S.r.l.

Via Brescia, 1 Tradate 21049 (VA) Tel. 0331.866688 - Fax 0331.864870 - C.F. e P.I. 03259160129
Registro imprese di Varese n. 03259160129 - Rea di Varese n. 336521 - Capitale sociale Euro 119.000,00 i.v.

IDENTIFICATION CODE

MODEL	SIZE	PUMP CASING	GASKET	AVAILABLE LENGTHS	CONNECTIONS	MOTOR CASE	MOTOR TYPE
TY=TYPHOON	6	P=PP	V=VITON	250	1=BSP	71	IE= IEC FLANGE
	10		N	500		80	
	15	K=PVDF		800	2=	90	-= WITHOUT
	20		D=EPDM	1000	FLANGED	100	MOTOR
	25			1250		112	
	30			1500		132	
	40			1750		160	
	45			2000			
	50						
	60						
	70						
	80						

PUMP DESCRIPTION

RECOMMENDED USE

TYPHOON vertical centrifugal pumps have been designed and manufactured to pump below head liquids having an apparent viscosity between 1 and 500cps, and that are chemically compatible with the pump manufacturing materials. Pump is designed to operate with a fluid working temperature between +3°C and 95°C, according to the type of material used to build the pump (please refer to TECHNICAL CHARACTERISTICS). TYPHOON vertical centrifugal pumps are designed for a max working speed of 3000 revs/min, with direct drive motors assembled with having the following technical manufacturing characteristics:

THREE-PHASE/2 POLES ASYNCHRONOUS MOTOR

- Euro tension;
- S1 status (continuous service)
- Class F insulation;
- IP 55 protection rating.



WARNING: Whenever the variation range of environmental temperature as well as of the fluid process temperature approaches the max pump temperatures, according to the pump's construction materials (pls refer to TECHNICAL CHARACTERISTICS), it is necessary to safeguard the plant installing a protection device stopping the pump and/or preventing it from reaching the threshold temperature.

WORKING PRINCIPLES

TYPHOON vertical, centrifugal pumps must be installed using fixed brackets in a tank with appropriate procedures to avoid vortex formation and consequent air bubble suction. The pump must work **ONLY** when **FLOODED**.

The impeller integrally joined to the shaft and to the direct drive motor, using an elastic transmission joint, at a pre-set speed (max 3.000 revs/min); its centrifugal effect activates suction in the main duct and a delivery in the peripheral duct.



WARNING: any use of TYPHOON vertical, centrifugal pumps other than that detailed above is improper and forbidden by the manufacturer FLUIMAC.

IMPROPER USE

It is **SPECIFICALLY** forbidden to use TYPHOON pumps:

- for pumping petrol and/or flammable liquids and/or in an explosive environment;

- with an opposite rotation to the one specified;
- in self-priming working conditions;
- for suction in the presence of vortexes, turbulence or air bubbles;
- for vacuum service;
- when immersed in excess of the maximum level indicated;
- if not fixed by brackets and/or for mobile transfers:
- if the suction inlet is obstructed or too close to the bottom of the tank;
- if the axis is inclined or not perfectly level;
- if the maintenance operations foreseen have not been carried out;
- with liquids that are chemically incompatible with the manufacturing materials;
- with water that is very hard or contains deposits;
- with product temperatures and characteristics that are not compatible with the characteristics of the pump;



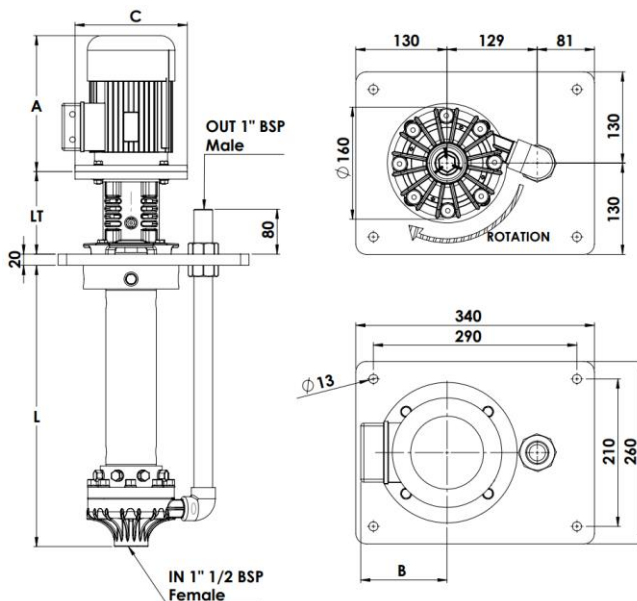
WARNING: due to the wide variety of products and chemical compositions, the operator is considered to be the best evaluator of reactions and compatibility with the pump's construction materials. Therefore, before use, carry out all necessary checks and tests to avoid any possible hazardous situation, that cannot be predicted or for which the manufacturer cannot be held liable.



WARNING: use of the pump that does not comply with the instructions indicated in the use and maintenance manual will cancel compliance to the requirements for safety. The risks associated with the use of the pump under the exact conditions set forth in the use and maintenance manual have been analysed, whilst the analysis of the risks associated with the interface with other system components must be carried out by the installer.

TECHNICAL FEATURES

The data related to performance refer to standard procedures. The **NOMINAL** flow and the **MAX** head values refer to pumping of water at 18°C with free-flow suction and delivery.



	FRAME SIZE	kW	WEIGHT [kg]*	A* [mm]	B* [mm]	C* [mm]	LT [mm]
TY006	IEC 71	0,37	5,6	225	183	160	147
	IEC 71	0,55	6,1	225	183	160	147
	IEC 80	0,75	9,1	250	212	200	147
TY010	IEC 80	1,1	10,2	250	212	200	147
	IEC 90S	1,5	12	260	230	200	157
	IEC 80	1,1	10,2	250	132	200	194
TY015	IEC 90S	1,5	12	260	140	200	194
	IEC 90L	2,2	15	285	140	200	194
	IEC 100L	3	22,3	326	147	250	194
TY020	IEC 112	4	26,7	335	174	250	194
	IEC 132S	5,5	38,5	356	187	300	216
	IEC 100L	3	22,3	326	147	250	315
TY025	IEC 112	4	26,7	335	174	250	315
	IEC 132S	5,5	38,5	356	187	300	315
	IEC 132S	7,5	42,2	356	187	300	315
TY030	IEC 160M	11	101	500	265	350	315
	IEC 160M	15	111	500	265	350	315
	IEC 160L	18,5	126	545	265	350	315

TECHNICAL DATA	Unit	TY6	TY10	TY15	TY20	TY25	TY30	TY40	TY45	TY50	TY60	TY70	TY80
Suction	inches	1" 1/2 f	1" 1/2 f	1" 1/2 f	2" f	2" f	2" f	2" f	2" 1/2 f	2" 1/2 f	2" 1/2 f	2" 1/2 f	2" 1/2 f
Delivery connection	inches	1" m	1" m	1" m	1" 1/2 m	1" 1/2 m	1" 1/2 m	1" 1/2 m	2" m	2" m	2" m	2" m	2" m
Max pump temperature													
- PP	°C	65	65	65	65	65	65	65	65	65	65	65	65
- PVDF	°C	95	95	95	95	95	95	95	95	95	95	95	95
Max head	m	8	10	12	14	16	19	23	26	30,5	35	40	45
Max flow (at 3000 rpm with water at 18°)	m³/h	6	10	14	20	25	30	37	60	64	68,5	73	78

WARRANTY

If there is ever a defect, please contact the Manufacturer's After-Sales Service, your dealer or the nearest Customer Service Centre where you will receive assistance as quickly as possible and please provide the following:

- Your complete address
- Pump identification
- Anomaly description

All TYPHOON pumps are covered by the following warranty:

- Twelve months for any faulty mechanical parts. The warranty period starts from the date of delivery.
- Every fault or anomaly must be reported to the Manufacturer within 8 days.
- Repairs under warranty will only be carried out in the manufacturer work-shop after receiving the pump.
- Warranty shall not be extended in case of repair or replacement.
- Faulty parts must be shipped to the manufacturer who reserves the right to inspect them in this own factory to identify the fault or any external reason that may have caused it. Should the parts be found not faulty, the Manufacturer reserves the right to invoice the total cost of the parts that had been replaced under this warranty.

The manufacturer is not liable for costs and risks connected to transportation of faulty and repaired parts, or for those supplied as spare parts, including possible custom duties. Repair or replacement of faulty parts fully satisfies the warranty obligations. The warranty DOES NOT include any indirect damage, in particular lost production. Moreover, the warranty does not include any consumable and wearable materials. Parts

that have been damaged due to improper installation, negligent use, lack of and/or improper maintenance and/or damage due to transport or any other cause other than defective manufacturing, are not covered by the warranty.

The following are specifically excluded from the warranty:

- any damage caused by incorrect use or installation of the plant;
- any damage caused by use of the pump that differs from that declared by the purchaser in his order;
- any damage caused by working in dry conditions and/or presence of air bubbles;
- any damage caused by abrasion;
- any damage caused by foreign matters in the pump;
- any damage caused by wrong rotation direction of the pump or motor;
- any damage caused by using the pump at temperatures in excess of those allowed;
- any damage caused by water that is very hard or contains deposits;
- any damage to the ceramic on reinforced teflon bushing, except when a manufacturing defect is obvious;
- any damage caused by lack of maintenance.

The warranty excludes all cases of improper use of the pump or incorrect applications or non-observance of the information contained in this manual. Any controversy falls within the jurisdiction of the Court of Varese.

SAFETY INSTRUCTIONS

The manufacturer is not liable for hazardous procedures, or procedures contrary to safety regulations and to that recommended in this manual that can cause severe injuries and even death, besides material damage.



WARNING: these instructions are indispensable for the pump to comply with safety requirements; therefore, they must be made known, available, understood and used.



WARNING: the installation, inspection and maintenance personnel must be adequately technically trained and be knowledgeable in the field of application (compatibility and hazards related to possible chemical reaction of the product to be pumped).



WARNING: use of the pump that does not comply to the instructions indicated in the use and maintenance manual will invalidate all warranty and safety requirements.



WARNING: before any operation on the pump and/ or before any maintenance or repair, proceed as follows:

- a) discharge the product being pumped;
- b) proceed with washing the inside with appropriate liquid (non-flammable);
- c) stop the pump motor;
- d) close the manual, shut-off valves (suction and delivery of product);
- e) section and disconnect the power supply to the pump motor;
- f) wear suitable individual protection before any intervention (masks, gloves, closed shoes, aprons, etc.).



WARNING: before using the pump, ensure that the fluid to be pumped is compatible with the manufacturing materials: CORROSION, LEAKAGE AND/OR EXPLOSION HAZARDS DUE TO CHEMICAL REACTIONS.

For the installation and use, take the following precautions:

- check that the pump is flooded and the tank level is at least 100mm higher than the minimum level of the pump;
- check that the pump has been installed in a vertical position and the suction inlet is at least 100 mm from the bottom of the tank, for the TY006, TY010 and TY015, and is at least 150 mm from the bottom of the tank, for the TY020, TY025, TY030 and TY040;
- check that the pump has been fixed with brackets using suitable bolting in the appropriate holes provided on the plate;
- check that the fluid is free from solid parts and ensure that no solid parts can enter the fluid;
- Check that there are no restrictions affecting the pump suction, thus avoiding cavitations and electrical motor strain;
- Check that the connecting pipes are suitable and resistant and that the pump is not burdened by their weight;
- If the pump is to be inactive for long periods, clean it thoroughly with a detergent fluid (non-flammable) compatible with the pump materials;
- if the pump is to be spent for a long time, it is recommended to flush the circuit with clean water for a few minutes to avoid incrustations;
- Always protect the pump from possible accidental knocks caused by moving objects or other blunt materials that could damage and/or cause a reaction on contact;
- install a guard to prevent any contact with the transmission joint, even accidental, when the pump is energized;
- provide a suitable guard that will contain any leakage, conveying it to a tank, caused by excessive use and/or negligent maintenance;
- check that there is no dirt or deposits on the bottom of the tank that could obstruct suction.



WARNING: It is **FORBIDDEN** to expose a TYPHOON pump to dry working conditions; this could damage the shaft guide bushing, cause the fusion of elements exposed to horizontal friction and possibly cause a fire.



WARNING: it is **FORBIDDEN** to use the pump for self priming installation; the suction inlet must always be immersed and away from vortexes or turbulence that could cause air retention and damage the shaft guide bushing.



WARNING: when pumping aggressive, toxic or hazardous fluids, the pump must have an appropriate protective device to contain the product in the event of leakage caused by an anomaly: **POLLUTION, CONTAMINATION, INJURY AND/OR DEATH HAZARD.**



WARNING: It is forbidden to use the pump with fluids that are incompatible with the component materials or in an environment with non-compatible fluids.



WARNING: It is forbidden to install the pump without fitting the shut-off valves at the delivery of the product that enable shut-off in case of leakage: **HAZARD OF UNCONTROLLED LEAKAGE OF THE PRODUCT.**



WARNING: whenever there is the possibility to exceed the temperature limits herein detailed, it is necessary that the plant be fitted with a protective device preventing it from operating and/or reaching the threshold temperature (fluid and environment) of 95°C for PVDF pumps and 65°C for PP (polypropylene) pumps.



WARNING: The pump must always be earthed, independently from any other equipment connected to it.



WARNING: aggressive, toxic or hazardous fluids can cause serious physical injuries and/or damages to health, consequently it is forbidden to return a pump containing such products to either the manufacturer or to a service centre. Empty and wash the internal circuit and treat the pump before delivering it.



WARNING: Check that there is no abnormal noise during functioning. In this case, stop the operation of the pump immediately and eliminate the fault.



WARNING: check that the outgoing fluid does not contain any air or gas; if so, stop the pump from operating immediately and correct the fault before starting again.



WARNING: TYPHOON pumps must not be used for water that is very hard or contains deposits that can cause anomalous incrustations on the wearing bushings.



WARNING: the internal shaft guide bushing is exceedingly exposed to wear. Its life span is strongly influenced by the working conditions and chemical and physical stress or lack of maintenance.

Tests carried out on thousands of pumps indicate that its standard life span is in excess of 1,500 hours. In the event of excessive wear vibration of the shaft can cause leakage of the product from the spindle and projection into the surrounding area. Therefore, for safety reasons, the internal bushing should be disassembled and checked every 500 hours, and should be replaced every 1,500 hours.



WARNING: Only use original spare parts for replacements.

The manufacturer is not liable for non-compliance with the above instructions, which may constitute a hazard for the operator, technicians, to people exposed, the pump and/or to the environment.

INSTALLATION AND USE INSTRUCTION

TRANSPORTING AND POSITIONING

The operators in charge of the assembly / disassembly must be informed and trained on the dangers relating to the use of mechanical tools, even small ones. When receiving the goods, check that the pump packaging is undamaged; afterwards proceed as follows:

1. According to the equipment size and weight the plant is either packaged with cardboard, boxes or on pallets. Open and discard the packaging;
2. Consult the Use and Maintenance Manual and comply with its instructions;
3. Lift the pump with appropriate lifting means, attaching the lifting belts to the spindle taking care to avoid the shaft and the transmission joint.
4. Check the correct tightening of all screws.

NOTE: TYPHOON pumps are supplied with or without motor. If the pump does not have a motor, before proceeding with positioning, assemble the motor as described in the chapter entitled "ELECTRIC MOTOR ASSEMBLY".

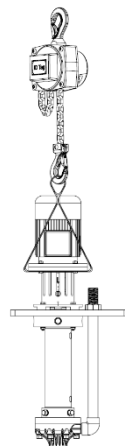


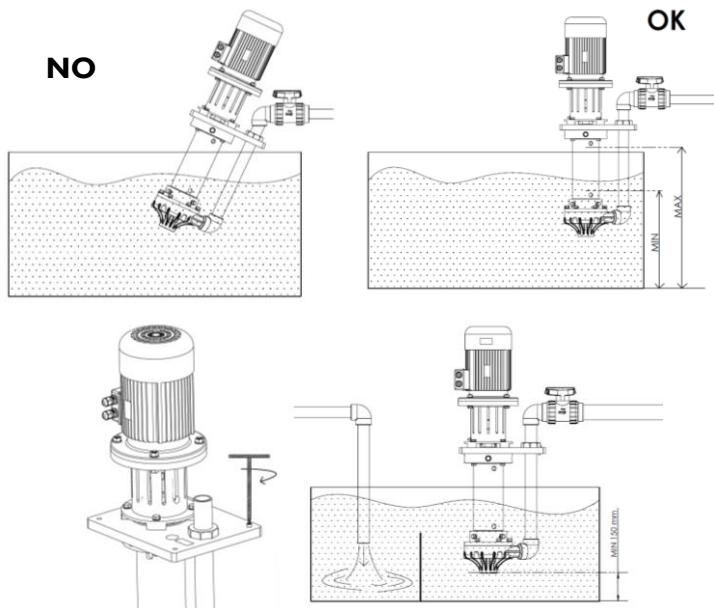
WARNING: TYPHOON pumps must be fixed in a vertical position using brackets fixed to the drilled plate provided. Vertical, centrifugal pumps are not self priming; therefore, they must always be installed in a sufficiently filled tank, guaranteeing minimum and maximum immersion levels.

5. Position the pump in a perfectly vertical position in the place of installation, attaching it using suitable bolts in the drilled plate. Ensure to provide adequate space for future maintenance operations.



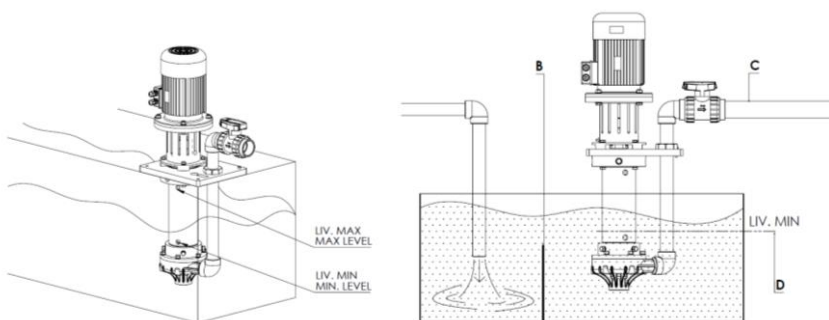
WARNING: the suction inlet must be at least 100 mm, for TY006, TY010 and TY015, and it must be at least 150 mm, for TY020, TY025, TY030 and TY040. from the bottom of the tank in order to prevent the formation of deposits and obstructions. Do not install filters of any type on the suction inlet.





WARNING: dry operation of TYPHOON pumps, in addition to damaging the bushing, may cause excessive wear of elements subject to horizontal friction and subsequent internal overheating and possible fire, therefore the following rules must be complied with:

- the pump is not self priming and must always be installed and adequately immersed;
- the suction inlet must be housed inside a suitable weir and away from vortexes, turbulence and/or free discharges into the tank;
- the weight of the delivery pipe must not burden the pump;
- fit a level regulator device that can halt the motor when the pump is under the minimum level.



Put the following prohibition and danger signs near the place where the pump is installed:

General danger sign	Danger explosive material	Danger incandescent liquid sprinkles	Prohibition putting out fires with water	Prohibition on open flames use	Danger flammable material
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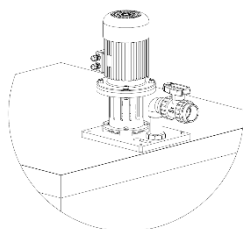
					
Danger flammable material	Danger toxic material	Danger high voltage	Face protection must be worn	Safety gloves must be worn	No smoking
					
Respiratory equipment must be worn	Safety overalls must be worn	Safety boots must be worn	Eye protection must be worn		
					

PRODUCT CIRCUIT CONNECTION

After having correctly positioned the plant, proceed with connecting the pump to the product circuit, as follows:

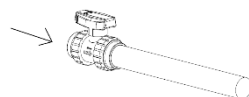


WARNING: To connect the product circuit to the pump only use connections with cylindrical gas threads made with materials compatible with the fluid to be pumped and with the pump materials. Check if the connection tubes to the pump are clean inside and do not contain any working residue.



1. Install a manual full-bore ball valve on the delivery manifold, of a diameter equal to the pump connection (never smaller), thus to ensure fluid shut-off in case of leaks and/or future maintenance.

2. Install the delivery conduit on the manual valve of the pump, using rigid tubes made from the same material as the pump.

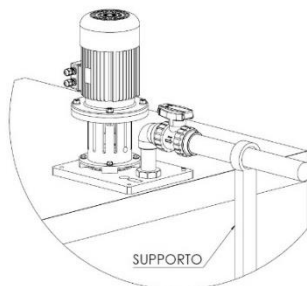


WARNING: Always use flexible joints with fittings made of the same material of the pump (PP with PP, PVDF with PVDF). Do not use threadlockers and/or Teflon paste. The installer must ensure that the fittings are centred during assembly to prevent cracks and/or to prevent the threads from yielding. Also check that any excess PTFE tape and excessive clamp clamping pressure does not place stress on the connection or other parts of the pump. Pay particular attention to stress corrosion cracking. The pump material may deteriorate due to the combined action of corrosion and application of a load, which may cause parts subjected to stress to break suddenly and unexpectedly, especially at low temperatures.



WARNING: pipes must be adequately supported; delivery piping must not form siphons and must never burden the pump.

3. Provide adequate support for the delivery conduit.



WARNING: Check that the treated fluid does not or could contain solid matter of a large size or a potentially damaging shape and that there are no restrictions or obstructions on the suction and/or delivery of the pump, thus avoiding phenomena such as cavitation and electrical motor strain.

ELECTRICAL MOTOR CONNECTION AND ROTATION CHECK

In order to carry out the electrical motor connection, proceed as follows:



WARNING: this operation must be carried out by a registered and qualified electrician, after disconnecting power from the network.

1. Remove the cover of the motor terminal box;
2. Loosen the cable fastener;
3. Put the power cable in position, tighten the cable fastener and clamp the appropriate terminals to the cable conductors;
4. Check that the voltage of the motor is compatible with the power supply



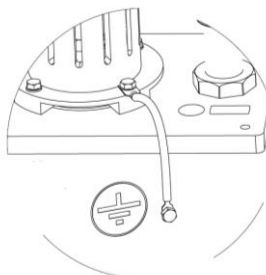
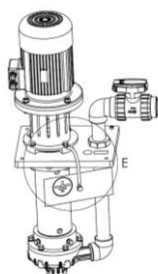
WARNING: to power the motor with a tension either lower or higher than the recommended one (see connection) can damage or burn the motor.

5. Carry out the connection of the earthing conductor to the appropriate clamp and tightly fasten the screw.



WARNING: the electrical plant upstream the motor must be fitted with an efficient earthing wire and with correctly dimensioned fuses.

6. Ensure that the pump is well earthed, installing an adequately sized cable to discharge any static current.



7. **SINGLE-PHASE MOTOR CONNECTION:** the arrangement of the clamps bars determines the single-phase motor rotation direction. In order to carry out the connection, proceed as follows:

7.1. Loosen the clamp nuts as in the figure.

7.2. Arrange the clamp bars and insert the terminals of the two conductors on the respective contacts as shown in the illustration.

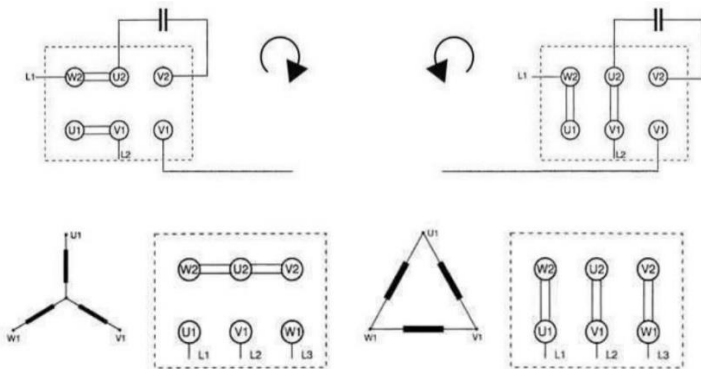
7.3. Reassemble the washers and respective nuts and fasten tightly.

NOTE: In order to invert the single-phase motor rotation direction, change the arrangement of the bars and repeat the operations described above for the connection.

8. **THREE-PHASE, ASYNCHRONOUS MOTOR CONNECTION:** the arrangement of the clamp bars must be changed.

8.1. **WITH LOWER VOLTAGE POWER** (triangular diagram Δ). The power supply to a motor with lower voltage (e.g. A = 23-400V power at 230V; B = 400-690V power at 400V) must be carried out with the bars arranged according to the triangular diagram Δ .

8.2. **WITH HIGHER VOLTAGE POWER** (Star diagram). Power supply of a motor with higher voltage (e.g. A = 239-400V power at 400V; B = 400-690V power at 690V) must be carried out with the bars arranged according to the "star" diagram.



8.3 **WITH POWER FOR STAR/TRIANGLE START-UP.** Star/triangle start-up must be used for power higher than 4Kw(5,5HP) and/or frequent start-ups (more than 5 a day) or when operated for periods lasting just a few minutes, as well as to contain absorption during start-ups and to safeguard the motor. This type of usage is achieved with appropriate equipment, abolishing the terminal box bars and carrying out power cable connection as in the diagram. The star/triangle motor start-up must be carried out with the lowest mains voltage. Example:

- A = 230-400V power at 230V

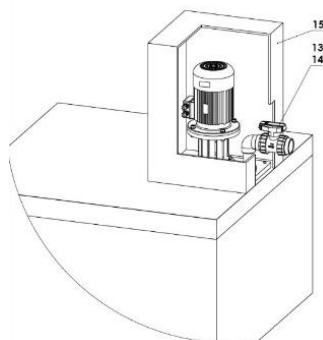
- B = 400-690V power at 400V

8.4 Loosen the motor terminal nuts and arrange the bars according to the desired type of power and startup.

8.5 Insert the conductor terminals on to the respective clamps as shown in the figure.

8.6 Re-assemble the washer and nuts and tighten them.

- 15 Install a guard to contain and convey the fluid to a tank in case of accidental breakdown of the pump.
- 16 Install a guard that prevents contact, even accidental, with the transmission joint when the pump is connected to the electric supply.



START-UP

The installer/operator must always use material compatible with the pumped liquid and in line with the pump design.



WARNING: it is forbidden to use liquids that are incompatible with the materials of the pump components or in an environment where there are incompatible fluids.

In order to start-up the pump, proceed as follows:

1. Check that the product delivery conduit is connected.



WARNING: Dry operation of TYPHOON pumps, besides damaging the internal bushing, causes overheating and fusion of parts subject to horizontal friction, and may subsequently cause a fire.

2. Open the manual ball valve of the fluid piping;
3. Fill the tank, respecting the MIN and MAX levels, so as to flood the pump.
4. Start the motor with the appropriate controls.
5. To stop the pump, only use the stop controls of the pump's electric motor.



WARNING: never stop a working pump by closing the delivery ball valve of the fluid circuit: the pump may stall and/or a fire may be caused by the fusion of the shaft guide bushing due to dry operation.



WARNING: check that there is no anomalous noise vibration while the pump is working. If so, immediately stop the pump, check and eliminate the cause.



WARNING: check that there are no air or gas bubbles in the output fluid. If so, immediately stop the pump, check and eliminate the cause.

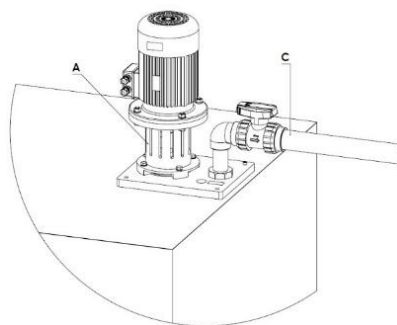


WARNING: do not install filters on the suction inlet as they may cause pressure loss.

6. After the first two hours of operation of the pump, and after having stopped it correctly, you must:
 - a. Visually check that there is no product leakage from the casing;
 - b. check the tightening of all bolts;
 - c. check the seal of the fluid delivery conduit.

The noise levels of the machine correspond to:

- The sound pressure level of the A weighted emission, in the working place, is less than 75 dB.



STANDARD MAINTENANCE

In order to guarantee performance and safe use, TYPHOON pumps need standard maintenance operations throughout their life span and in accordance to the time-schedule detailed in the table. The time schedule for routine maintenance shown in the table refers to standard use and working conditions; more demanding working conditions require more frequent operations, with a 30% to 50% more frequent interventions than that indicated.



WARNING: failure to proceed and/or comply with standard maintenance and/or its time schedule, renders the warranty null and can excessively wear and damage the internal parts of the pump and/or the motor, as well as create hazardous situations, for which the manufacturer is not to be held liable.

GREASE THE BEARING	EVERY 100 HOURS
PRODUCT CIRCUIT MAINTENANCE	EVERY 1.000 HOURS
INTERNAL CLEANING OF THE PUMP	EVERY 1.000 HOURS
REPLACEMENT OF STATIC SEALS	EVERY 1.000 HOURS
REPLACEMENT OF THE WEARING BUSHING	EVERY 1.500 HOURS

BEARING LUBRIFICATION

The pump bearing must be periodically lubricated after every 100 hours of operation as follows:

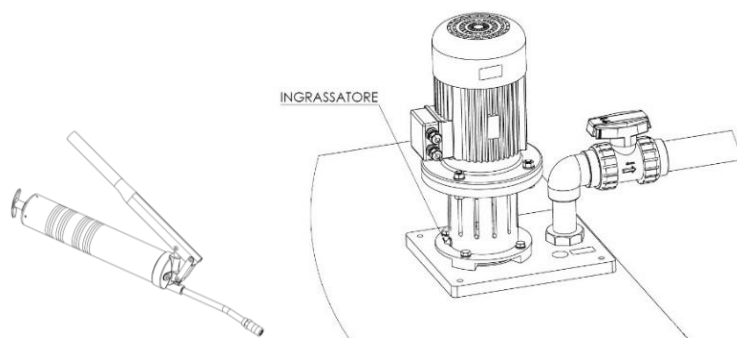


WARNING: before starting any work on the pump and/or carrying out this maintenance work you must first:

- A. stop the motor and disconnect the electric supply to prevent it from starting in an uncontrolled manner;
- B. discharge the product that was being pumped and close the onoff delivery valve;
- C. wear suitable protective equipment before starting work (face mask, gloves, closed shoes, overalls, etc.). Fluid must not be allowed to come into contact with anything.

A1. Fill the grease cup using a grease gun, without overfilling it. **WARNING:** lubricate using bearing grease.

A2. Remove any grease from the pump shaft using a clean cloth.



MAINTENANCE FOR THE PRODUCT CIRCUIT

Product circuit maintenance checks must be carried out periodically every 1,000 hours to check for product leakage, proceeding as follows:

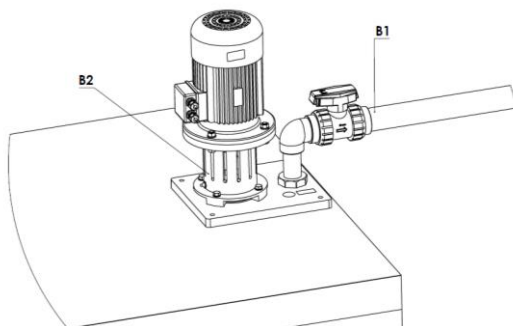
B1. Check that there is no product leakage from the delivery conduit.

B2. Visually check that there is no leakage between the flange and the casing.



WARNING: in case any leakage results, before any operation on the pump and/or before any maintenance or repair operation, proceed as follows:

- A. discharge the product being pumped and close the product delivery on-off valve;
- B. circulate a suitable, nonflammable washing fluid, after which drain it out by opening the delivery valve; stop the pump motor
- C. close the product on-off valve
- D. section the power supply to the motor of the pump to prevent uncontrolled start-ups;



- E. wear appropriate individual protective devices before any operation (mask, gloves, tie-up shoes, aprons, etc.).



WARNING: To clean the pump, only use a clean cloth, moistened with an appropriate detergent.

Before intervening on the pump and/or before carrying out maintenance or repair operations, you must:

- Wait for the pump to cool down for at least fifteen minutes
- Perform the necessary operations while wearing protection gloves and any other appropriate personal protection equipment (face masks, gloves, closed shoes, etc.): Danger of burning and ejection of liquid under pressure.

B3. To carry out maintenance and/or internal repairs, disassemble the pump as follows:

- Disconnect the fluid delivery pipe.
- Disconnect the power supply cable from the terminal board of the motor.
- Proceed with disassembling and remove the pump from the installation area, using appropriate lifting equipment.

NOTE: For the pump assembly and disassembly sequence of the operations hereafter described consult the relevant, spare parts table.

PUMP OPENING AND INTERNAL CLEANING

This operation must be carried out regularly every 1,000 working hours or, in the event of loss of performance, to verify the condition and/or to replace the impeller.

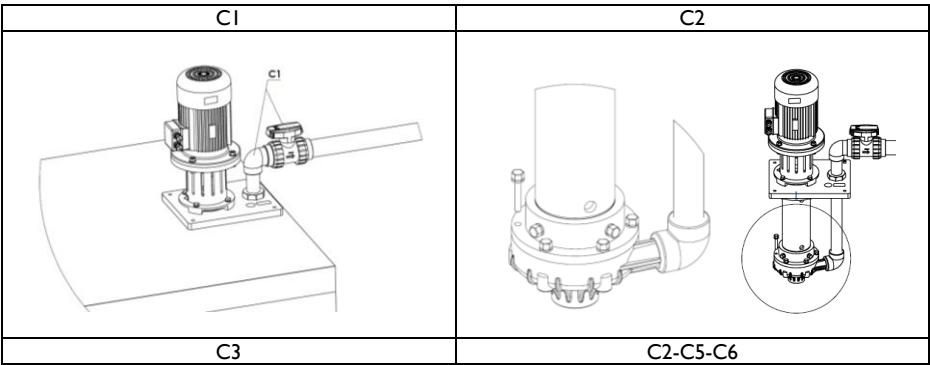
To open na clean the pump, proceed as follows:

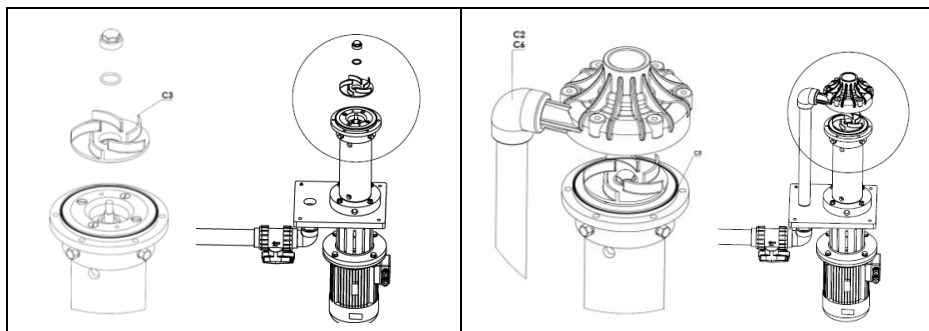
- C1. Remove any elbows and/or manual valves from the delivery pipe.
C2. Remove the screws and the outer cover of the pump body;
C3. Clean the impeller and/or, if it is damaged, replace with original spare parts.

 **WARNING:** all OR gaskets must be replaced every time the pump is opened/reassembled:
PRODUCT LEAKAGE HAZARD.

- C4. Remove any deposits found inside the body of the pump, the internal conduits and the area behind the impeller.
C5. Replace the gaskets with original spare parts of the same type.
C6. Proceed with reassembly, following the inverse order and fasten the bolts on the pump cover evenly.

The impeller cleaning and/or replacement is now completed and it is now feasible to reposition and connect the pump as described in the previous Chapters.





REPLACEMENT OF THE STATIC SEALS

The static seals must be replaced every time that the pump is disassembled, but in any case, complete replacement must occur after 1,000 working hours, proceeding as follows:

- D1. Disassemble the pump as described in “PUMP OPENING AND INTERNAL CLEANING” section.
- D2. With the help of the spare parts lists, disassemble the internal parts of the pump.
- D3. Replace all of the internal static seals with original parts of the same type.
- D4. Reassemble the pump following the drawings on the spare parts lists.

REPLACEMENT OF THE WEARING BUSHINGS

This standard maintenance operation must be carried out every 1.500 working hours, either for a check or due to a flow-through or leaks through the holes of the casing flange. In order to disassemble the internal bushing, proceed as follows:



WARNING: lack of maintenance and excessive wear of the internal bushing causes internal vibration of the shaft that may cause product leakage from the spindle flange: **PRODUCT PROJECTION HAZARD**

- E1. Disassemble the pump as described in “PUMP OPENING AND INTERNAL CLEANING” section.
- E2. Remove the manual valve on the pump’s delivery conduit.
- E3. Remove the screws and withdraw the external shell of the pump body with the delivery conduit.
- E4. Holding the impeller still with an appropriate whip, loosen the impeller’s lock nut.
- E5. Withdraw the OR gaskets and the impeller.
- E6. Verify the play of the shaft and the ceramic bushing in their housings.
- E7 To replace the bushing, proceed as follows:
 - E7.1 Remove the key of the impeller from the shaft.
 - E7.2 Withdraw the worn bushing from the shaft.
 - E7.3 Unscrew the screws of the support flange with the worn external bushing and remove it with the help of extraction holes.



WARNING: the internal bushing is composed of extremely precise elements, manufactured in ceramic material and in reinforced Teflon, hence they must never be lubricated and/or handled with dirty hands to avoid irreparable bare or damage.

- E7.4 Wear clean protective gloves and glasses.

E7.5 To clean the bushing, use a clean cloth, moisten with alcohol.

E7.6 Reassemble the new internal bushing in its housing

E7.7 Reassemble the support flange with the new external bushing and fix it with appropriate screws.

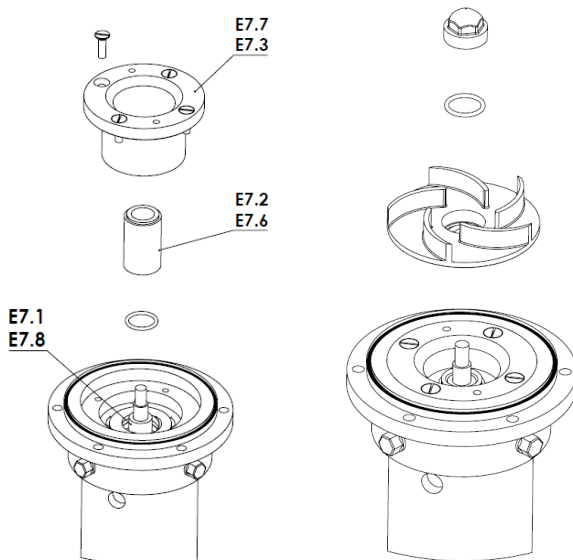


WARNING: all OR gaskets must be replaced every time the pump is opened/reassembled:
PRODUCT LEAKAGE HAZARD.

E7.8 Fit the key on the shaft housing.

E7.9 Fit the front O-ring gasket and the nut and tighten it until the impeller is locked.

E7.10 Reassemble the pump casing and the fastening screws and evenly tighten with a crosssequence.



TROUBLESHOOTING

The following instructions are exclusively reserved to qualified and authorized maintenance operators. In case of malfunctioning and to restore working conditions, follow the instructions hereafter to identify the malfunction.

The pump doesn't start	Power failure	Check the electrical power circuit and supply.
	Seized impeller	Disassemble the pump body and check.
The pump runs but doesn't pump	The impeller is damaged	Disassemble the pump and check the impeller.
	The manual delivery valve is closed	Open the delivery valve and/or check the delivery pipes
	Clogged suction	Check and clean
	The trasmission joint is damaged.	Disassemble the motor and check.
The pump does not deliver as per performance curve	Fluid is too dense	No solution
	Clogged delivery pipe	Check and clean
	Clogged suction	Check and clean
	The impeller is damaged	Replace the impeller.

	Damaged pump body	Disassemble the pump body and check.
	Electrical motor is wrongly-connected	Check the electrical connection and power tension.
	The electric motor is damaged	Replace the motor
	The wearing bushing is damaged.	Open the pump and check or replace the wearing bushing.
The pump vibrates	Suction clogs while working	Clean the suction conduit and any dirt contained in the tank.
	Damaged pump shaft	Disassemble pump and motor and check the shaft and its rotation concentricity.
	The impeller touches the pump body	Open the pump and check.
	The bushing is worn out.	Open the pump, disassemble the wearing bushing and check its condition.
	The bearings are worn out.	Open the pump, disassemble the motor and check the play of the bearing.
	Incorrect installaiton	Check the installation again with greater care.
The motor overheats	Fluid is too dense	No solution
	Wrong electrical connection	Check the supply voltage and the motor connection
	The impeller touches the pup body or there is some foreign matter	Open the pump and check
	Damaged pump shaft	Open the pump, disassemble the motor and check the pump shaft and its rotation concentricity
	The bearing is damaged.	Check the condition and/or replace the bearing.

DECOMISSIONING

In case of long periods of inactivity, proceed as follows:



WARNING: discharge all fluid from the pump. The pump must be suitable washed and treated by running a non-flammable liquid detergent through it that is compatible with the pump's construction materials: FIRE, INJURY, HEALTH AND/OR DEATH HAZARD.

1. Proceed with washing the inside using products appropriate to the fluid pumped;
2. Wait for the product discharge and then stop the motor and section the electrical power;
3. Close the fluid delivery valve assembled on the pump;
4. If the pump is to be stored, proceed with:
 - 4.1 If the pump has not worked for long periods, it is recommended to put clean water in the circuit for a few minutes before starting operation again, thus avoiding sediments.
 - 4.2 Disconnect the electrical motor from the power supply;
 - 4.3 Disassemble the pump as described in the first section, "MAINTENANCE OF THE PRODUCT CIRCUIT" Chapter.
 - 4.4 Supply the motor with packets of hygroscopic salt for humidity and protect it with a plastic sack



WARNING: storage must be in a closed and protective environment, with a temperature between 5° and 28°C and a humidity level not higher than 90%.

DISMANTLING AND DEMOLITION

TYPHOON vertical, centrifugal pumps are not made with hazardous materials or parts; however, at the end of their working life the following disposal instructions must be followed:



WARNING: discharge all fluid from the motor pump. In case of hazardous, toxic and/or harmful products, wash and treat appropriately. **INJURY, HEALTH AND/OR DEATH HAZARD.**

1. Disconnect electrical power from the motor pump;
2. Disassemble the pump from the installation place;
3. Wash and treat the pump internally and externally, according to the product it treated;
4. Sort out the components by type, and in accordance with the pump composition as indicated on the identification plate.



WARNING: For disposal, please refer to authorized firms, ensuring that small or large components that could cause pollution, accidents or direct and/or indirect damage are not abandoned or dispersed in the environment.

SPARE PARTS

To obtain the list of spare parts for each TYPHOON pump model, write an email to FLUIMAC assistance (info@fluimac.com), indicating the type of pump and serial number.



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The user manual must be delivered to the user of the pump, who is required to read it carefully and keep it for future reference. Any changes do not imply updating the manuals already distributed.

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