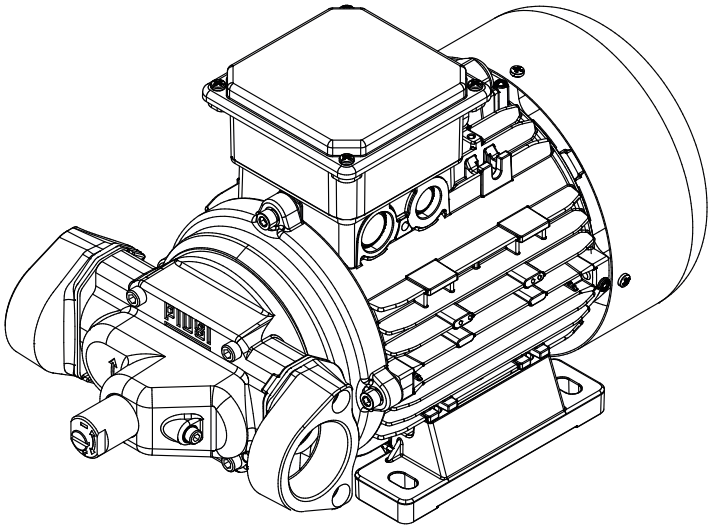
PIUSI

VISCOMAT GEROTOR 400V



MADE IN ITALY

Installation, Use and Maintenance Manual EN

BULLETIN M0634 EN_03

ENGLISH

TABLE OF CONTENTS

BULLETIN MO634

1 MACHINE AND MANUFACTURER IDENTIFICATION

AVAILABLE MODELS: VISCOMAT GEROTOR T 400V/50Hz

MANUFACTURER PIUSI S.p.A. - Via Pacinotti 16/A - Z.I. Rangavino
46029 Suzzara - (MN) - Italy

2 CONFORMITY

2.1 FACSIMILE COPY OF THE UE DECLARATION OF CONFORMITY

The undersigned PIUSI S.p.A.
Via Pacinotti 16/A z.i. Rangavino - 46029 Suzzara - Mantova - Italy
DECLARES, under its own responsibility, that the unit described below:
Description: **Pump for transferring lubricating oils**
Model: **VISCOMAT GEROTOR T 400V/50Hz**
Serial number: refer to the Lot Number indicated on the CE plate affixed to the product
Year of manufacture: refer to the year of production indicated on the CE plate affixed to the product.
complies with the following legal references:
- Machinery Directive
- Electromagnetic Compatibility

The technical file is at the disposal of the competent authority upon justified request to PIUSI S.p.A. or by sending a request by e-mail to doc_tec@piusi.com.

THE ORIGINAL DECLARATION OF CONFORMITY IS SUPPLIED SEPARATELY WITH THE PRODUCT

3 DESCRIPTION OF THE MACHINE

PUMP Rotary electric pump of the volumetric type, equipped with a pressure limiting valve.

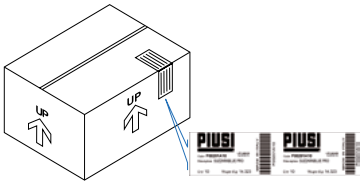
MOTOR Asynchronous motor, three phase, four-poles, closed type (IP54 protection rating according to the EN 60034-5-86), self-ventilated.

3.1 HANDLING, TRANSPORT AND STORAGE

FOREWORD The pumps are carefully packed before shipment. Check packaging on receipt and store in a dry place.

PACKAGING The electric pump is supplied with packaging suitable for shipment. A label with the following product information is affixed to the packaging:

- name
- code
- weight



STORAGE
- Store in a covered, dry place.
- Store the unit away from dirt and vibrations

ENVIRONMENTAL CONDITIONS:

Storage humidity:	Max. 90%
Storage temperature:	Min. -10 °C
	Max. +50 °C

MODEL	WEIGHT (kg)	PACKAGING DIMENSIONS (mm)
VISCOMAT GEROTOR	24	45x20xh25

3.2 PERMITTED AND NON-PERMITTED FLUIDS

Permitted fluids
- Oil viscosity from 32 to 1000 cst (at operating temperature).
- Lubricants
- Silicone liquids

Non-permitted fluids and respective hazards	- Petrol	- Fire/explosion
	- Flammable liquids with pm < 55°c	- Fire/explosion
	- Water	- Pump oxidation
	- Food liquids	- Contamination
	- Corrosive chemicals	- Pump corrosion - Personal injury
	- Solvents	Fire/explosion - Damage to seals

3.3 NON-PERMITTED USES

Non-permitted fluids and respective hazards

WARNING Do not install / operate / store the pump:
- beyond the prescribed temperature limits (see § 5.2.1, 5.2.2).
- in an area with a potentially explosive atmosphere.
- in a place where it is exposed it to weather elements, such as sun, wind and rain.
- in locations with high mechanical vibrations.

4 GENERAL WARNINGS

IMPORTANT INFORMATION

For operators' safety and to prevent any damage, the instruction manual must be fully read and understood before carrying out any operation.

Symbols used in the manual

The following symbols will be used in the manual to highlight particularly important instructions, warnings and information.

CAUTION
This symbol indicates safety regulations for the operators and/or any persons at risk.

WARNING
This symbol indicates the possibility of damage to the unit and/or its components.

NOTE
This symbol indicates useful information.

Storage of the manual

This manual must be whole and legible in its entirety. The end user and specialist technicians authorised for installation and maintenance must be able to read it at any time.

Reproduction rights

5 SAFETY INSTRUCTIONS

CAUTION
Electrical supply - preliminary checks for installation

Completely avoid contact between the electrical supply and the liquid to be pumped.

Inspection and maintenance operations

Before any inspection or maintenance, cut off the power supply

FIRE AND EXPLOSION
If there are flammable liquids in the working area, flammable vapours may be present and may cause fire or explosion during station use.

To prevent fire and explosion risks:

Use the unit only in ventilated areas

Keep the work area free of scraps, including scraps and solvent or petrol tanks.

Do not plug or unplug or operate the switch in the presence of flammable vapours.

All devices in the work area must be grounded.

Interrupt immediately any action if there are sparks or shocks. Do not use the station until you have identified and resolved the problem.

Keep a fire-extinguisher in good working order close to the working area.

ELECTRIC SHOCK **Electrocution or death**		This unit must be grounded. Improper installation or use may result in danger of electric shock.
		Switch the unit off and unplug the power cord after use.
		Connect only to earthed sockets.
		Use only grounded cables in accordance with the applicable regulations. Unsuitable extension leads may be dangerous.
		Make sure that the plug and socket of the extension cords are intact. In outdoor use, use only extensions suitable for the specific use, according to the regulations in force.
		Do not expose to rain. Install in a sheltered location.
		Never touch the plug or the socket with wet hands.
		Do not turn the unit on if the power connection cable or other parts (such as the suction/delivery tube, the gun, or the safety devices) are damaged. Replace the damaged pipe immediately before use.
		The plug and socket must be connected far from water.
		Outdoors, use only authorised extension leads for which this use is envisaged with an adequate wire diameter in accordance with the regulations in force.
		As a general rule of electrical safety it is always recommended to power the device by protecting the line with: - circuit breaker/disconnector with a current rating suitable for the power line - 30 mA residual current device
		The electrical connection must have a ground fault current interrupter (GFCI).
		To avoid electrocution hazards, all installation operations involving the opening of the electrical box and access to electrical contacts must be carried out with the unit isolated from the mains.
IMPROPER USE **Improper use can cause serious damage or death.**		Do not operate the device when tired or under the influence of drugs or alcohol.
		Do not leave the work area while the unit is on and operating.
		Turn off the unit when not in use.
		Do not alter or modify the device. Alterations or modifications may invalidate its type-approval and result in dangers to safety.
		Arrange the pipe and the power cables always far from transit areas, sharp edges, moving parts and hot surfaces.
		Do not twist the hose or use a stronger hose.
		Keep children and animals far from the work area
		Observe all applicable safety regulations.
		Do not exceed the maximum working pressure or temperature of the component with the lowest device rating. See the technical specifications in all manuals of the unit.
		Use fluids compatible with the unit. See the technical specifications in all machine manuals. Read the manufacturer's warnings on fluid compatibility. To obtain more information about the material, request the Safety Data Sheet (MSDS) from your distributor or dealer.
		Check the unit every day. Repair or replace worn or damaged parts immediately with original manufacturer's spare parts only.
		Use only the unit for its intended purpose. Contact your distributor for more information.
		Do not bend or bend the hoses too much or use the pipes to pull the unit.

Danger of smoke and toxic fluids.		For problems deriving from the product handled with eyes, skin, inhalation and ingestion, refer to the safety data sheet of the fluid used.
		Store treated liquids in suitable containers and in compliance with applicable regulations.
		Prolonged contact with the product handled may cause skin irritation; always use protective gloves when dispensing.

6 FIRST AID REGULATIONS

Persons subjected to electrical discharge		Disconnect the supply, or use a dry insulator for protection when moving the victim far away from any lead. Avoid touching the victim with bare hands until they are far away from any lead. Request the assistance of trained, qualified staff immediately. Never operate switches with wet hands.
NO SMOKING		Do not smoke near the pump and do not use the pump near open flames.

7 GENERAL SAFETY REGULATIONS

Basic characteristics of the protective equipment		Wear protective equipment that is: • suitable for the operations to be carried out • resistant to the products used for cleaning.
Personal protective equipment to be worn		Safety shoes;
		Close-fitting clothing;
		Protective gloves;
		Safety goggles.
Other devices		Instruction manual.
Protective gloves		Prolonged contact with the product handled may cause skin irritation; always use protective gloves when dispensing.

8 TECHNICAL DATA

The data in the table are for operation with 10W40 oil at 350 cSt, at a temperature of 25°C.
As the viscosity of the oil varies, the performance of the pump varies more noticeably the greater the counter-pressure at which the pump operates. VISCOMAT GEROTOR pumps can pump oils with very different viscosities within the limits indicated in the TECHNICAL DATA.

DATA	VALUE	UM
Motor power	2.2 - 3F	kW Shaft power
Number of phases	3	F
VOLTAGE	400	V
Amperage	5	A
Motor speed	1350	rpm
On-board thermostat for installing motor protection, if required	YES	
Duty cycle	S2 60min	
Use with inverter	YES	
Motor insulation rating	H	
IP	54	
Max. viscosity	32 - 1000	Cst
Q*	65	l/min
Pmax*	12	bar
Maximum suction side pressure:	0.5	bar
Dry running	Max. 40	sec
Self-priming	NO	
Amb.T. Min	-20	°C
Amb.T. Max	40	°C
Max oil T.	100	°C
Noise	< 70	dB (A)
Technology	Gerotor	
Wet materials	Cast iron, steel, brass, FKM	
Pressure regulator	4-9	bar
Flanges included	Flanges included 1 1/2" BSP	

***= Reference oil viscosity: 350 cSt**

CAUTION

The power drawn by the pump depends on the operating point and the viscosity of the oil being pumped. The data given in the table refer to pumps operating at the point of maximum compression with oil viscosity of approximately 350 cSt.

For a long service life of the pump, the oil cleanliness, according to ISO 4406, must not be lower than level 21/18/15.

9 INSTALLATION

CAUTION

Risk of personal injury.
It is forbidden to operate the pump before connecting delivery and suction lines.

PRELIMINARY CHECKS

- Check that all components are present. Ask the manufacturer for any missing components.
- Check that the pump was not damaged during transport or storage.
- Carefully clean the suction and delivery outlets, removing any dust or residual packing material.
- Check that the electrical data correspond to the data on the rating plate.
- Always install in a well-lit location
- Install the pump at a height of at least 80 cm.
- Make sure that the motor shaft rotates freely.

CAUTION

Risk of personal injury.
To avoid personal injury, when lifting the pump, make sure proper lifting technique is used.
Make sure that all lifting devices are working properly and that they are approved for the weight of the pump.
Use lifting straps under the pump unit to avoid personal injury.

9.1 POSITIONING, CONFIGURATIONS AND ACCESSORIES

NOTE

In the case of outdoor installation, the pump must be protected by a protective shelter.

The pump can be installed in any position (vertical or horizontal pump axis).

CAUTION

An unstable condition may occur during the installation phase.

The pump must be firmly fixed using the holes provided in the motor base and using vibration dampers.

The fixing support must be rigid in nature.

Fastening must be done with M10 screws.

Fixing the pump must not cause the holder to tip over

CAUTION

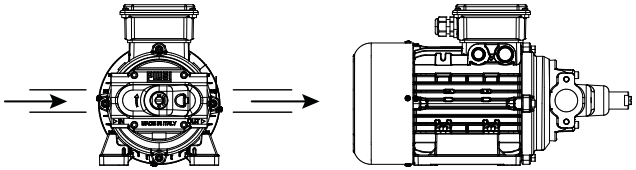
THE MOTORS ARE NOT OF THE EXPLOSION-PROOF TYPE.
Do not install where flammable vapours may be present.

The installer is responsible for providing the line accessories needed for safe and correct operation of the pump. Choosing accessories unsuitable for use with the above can cause damage to the pump and/or people as well as pollution.

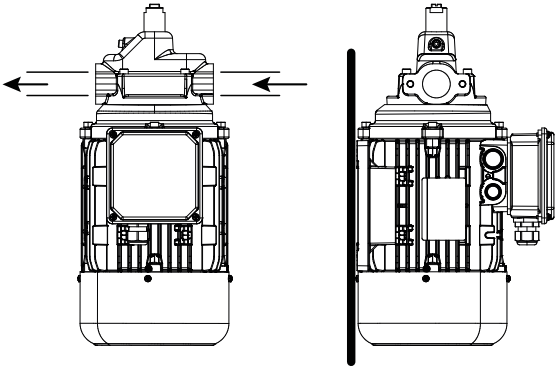
Request original accessories to maximise performance and avoid damage that could impair the operation of the pump.

VISCOMAT GEROTOR series pumps can be installed in the following ways:

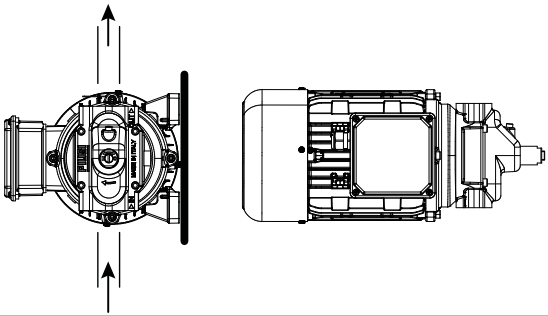
1
Horizontal axis



2
Wall-installation
With pump body facing upwards



3
Wall-installation
With side pump body



NOTE

The installation of a check valve is always recommended, which allows the immediate and easy reuse of the system after the initial priming.

CAUTION

Installation of the vertical axis pump with the pump body downwards is not recommended. If this is unavoidable, a foot valve must be installed and the suction pipe must be filled with oil during the initial start-up phase.

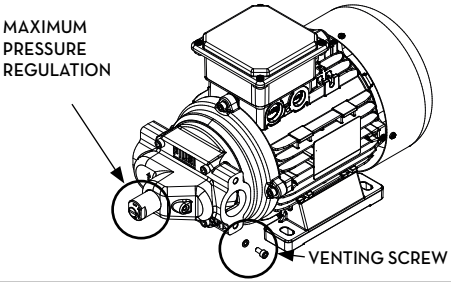
Fasten the pump using screws of a suitable diameter to the fixing holes provided.

Venting device

The VISCOMAT GEROTOR pump is equipped with a vent screw which is useful for emptying the system of air bubbles or for maintenance work.

Maximum pressure adjustment screw

The maximum operating pressure is adjustable via a screw at the head of the pump body. By tightening the screw, the pressure is reduced to 4 bar. By loosening the screw, 9 bar is reached.



CAUTION	⚠	**The maximum pressure regulating device is not a by-pass. An external device must be installed if the pump is to be used with closed delivery.**
CAUTION	⚠	**CLOSED-DELIVERY OPERATION IS NOT ALLOWED BECAUSE IT CAN LEAD TO AN INCREASE IN THE TEMPERATURE OF THE PUMP. THIS CAN CAUSE A BURN HAZARD OR DAMAGE TO THE PUMP.**
		If the installation is equipped with a foot valve, the priming device can be shut down once the start-up phase is complete (see the "Daily Use" paragraph). If you choose to leave the bleed valve open at all times, take into account that 0.5-1 l/min. of oil will recirculate in the tank.
CAUTION	⚠	**Make sure that the air outlet tube is not immersed in the oil of the sampling tank, in which case the operation of the priming device may be cancelled out.**

9.2 CONSIDERATIONS ON DELIVERY AND SUCTION LINES

DELIVERY	
FOREWORD	The pump model to be used must be chosen taking into account the viscosity of the oil to be pumped and the characteristics of the system at the pump outlet.
FACTORS INFLUENCING THE FLOW RATE	The combination of the viscosity of the oil and the characteristics of the system can create back pressures in excess of the maximum expected pressures (equal to Pmax) to cause the (partial) opening of the pump bypass, resulting in a significant reduction in the flow rate.
HOW TO DECREASE THE FACTORS INFLUENCING THE FLOW RATE	In this case, in order for the pump to function properly, with the same viscosity of the oil pumped, it is necessary to reduce the resistance of the system by using shorter and/or larger diameter pipes. Since it is not possible to modify the system, it will be necessary to select a pump model with a higher Pmax.

SUCTION

CAVITATION In the case of oils with a viscosity of 500cSt or more, provide suction pipes with a suitable diameter (minimum 1" 1/2 diameter pipes are recommended).

CAUTION **Cavitation can occur if the pumped oil is emulsified with air even at very low vacuum values.**

HOW TO AVOID CAVITATION
It is important to ensure low suction vacuum by using:
- Short pipes with a diameter greater than or equal to that recommended
- Minimising curves
- Bottom valves with the lowest possible resistance

WARNING In any case, due to the above, it is important to ensure low suction vacuum (short pipes with a diameter possibly larger than that of the pump suction inlet; reduced number of bends; filters with a large cross-section, kept in a clean condition).

CAUTION **It is good engineering practice to install vacuum gauges and pressure gauges immediately upstream and downstream of the pump to check that the operating conditions are within the expected range. We recommend the installation of a foot valve to prevent the suction line from emptying when the pump stops.**

WARNING **At suction, do not go below -0.5 bar**

PIPE CONNECTION

FOREWORD Before connection, refer to the visual indications to identify the suction and delivery with certainty.

CAUTION **Incorrect connection can cause damage to the pump.**

CONNECTIONS
• Make sure that the pipes and the suction tank are free of deposits or solid threading residues which might damage pump and accessories.
• Always install a wire mesh filter on the suction pipe.
• Before connecting the pressure line, partially fill the pump body with oil to prevent the pump from running dry during priming.
• Do not use conical thread couplings when connecting pump models with BSP (cylindrical gas) threads. Over-tightening could cause damage to the pump ports.

The MINIMUM recommended characteristics for pipes are as follows:

SUCTION PIPE
- minimum nominal diameters: **1"/ 1/4**
- recommended pressure rating:
Working pressure 10 bar
- suitable for vacuum operation.

DELIVERY PIPE
- minimum nominal diameters: **1"**
- recommended pressure rating:
Working pressure 30 bar

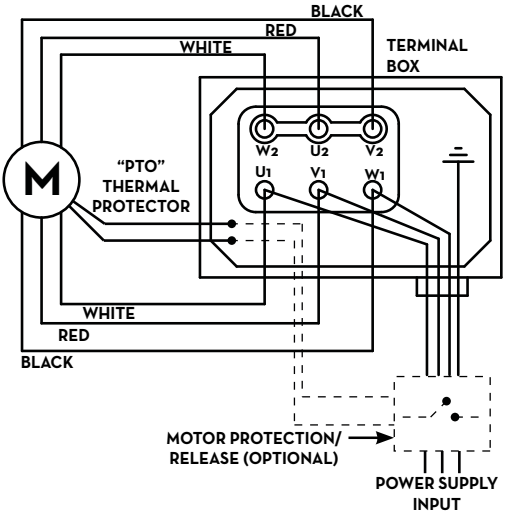
CAUTION **The use of pipes and/or line components unsuitable for use with oil or of inadequate pressure ratings can cause damage to property or persons and pollution. Loose connections (threaded connections, flanges, gaskets) can also cause damage to property or persons and pollution. Check all connections after installation and regularly and appropriately thereafter.**

9.3 ELECTRICAL CONNECTIONS

FOREWORD **The pumps are supplied without a power cable and without a power switch. Follow the diagram below for electrical wiring**

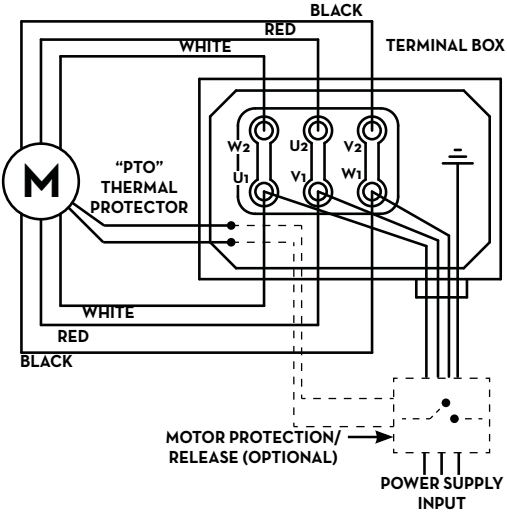
THREE-PHASE MOTOR DIAGRAM 400V (phase-to-phase) 5A

STAR VERSION



THREE-PHASE MOTOR DIAGRAM 230V (phase-to-phase) 8.5A

TRIANGLE VERSION



PTO-type thermal protector	**This is a normally closed bimetallic contact that opens electrically when the maximum permissible temperature is reached. This cuts off an electrical signal which, when connected to the switchgear/ relay/saver, removes power from the motor.**

CAUTION **INSTALLATION MUST BE CARRIED OUT BY QUALIFIED PERSONNEL IN ACCORDANCE WITH THE APPLICABLE STANDARDS.**

WARNING **Observe the following (non-exhaustive) instructions to ensure correct electrical installation:**

Single-phase motors are supplied with capacitors wired and installed inside the terminal box (see diagram). The capacitor specifications are indicated for each model on the rating plate of the pump. The switch has a pump start/stop function and can in no way replace the main switch required by the applicable regulations.

CAUTION Make sure that the power supply lines are not live during installation and maintenance.

- Use cables with minimum cross-sections, rated voltages and type of laying appropriate to the characteristics indicated in the "TECHNICAL DATA" section and to the installation environment.
- For three-phase motors, make sure that the direction of rotation is correct, with reference to the arrow visible on the pump casing.
- All motors are equipped with an earth terminal to be connected to the mains earth line.
- Always close the terminal box cover before supplying power, after ensuring the integrity of the gaskets that ensure IP54 protection.

NOTE Insert an overload protection device that may be connected to the PTO thermal protector.

CAUTION **Provide protection systems for electrical equipment such as fuses, motor protectors, disconnectors, systems against accidental re-ignition after periods of power failure.**

9.4 FIRST ACTIVATION

FOREWORD

- Check that the amount of liquid in the suction tank is greater than the amount you want to transfer.
- Make sure that the remaining capacity of the delivery tank is greater than the capacity you want to transfer.
- Make sure that the pipe and line fittings are in good condition.

CAUTION

Pump wetting. Before starting the pump, wet the inside of the pump housing with oil through the inlet and outlet ports.

NOTE

Prolonged skin contact with certain liquids can cause damage. The use of goggles and gloves is always recommended.

The priming can last from a few seconds to a few minutes, depending on the characteristics of the system. If it takes too long, stop the pump and check:

• that the pump does not run completely dry;
• that the suction pipe ensures no air infiltration and is correctly immersed in the fluid to be aspirated;
• that the intake filter (where fitted) is not clogged;
• that the delivery pipe allows easy evacuation of air;

Check that the pump is operating within the expected range, checking if possible:

1 That the motor absorption is within the values indicated on the rating plate;

2 That the suction depression does not exceed the limits indicated in the paragraph "CONSIDERATIONS ON DELIVERY AND SUCTION LINES";

3 That the back pressure on the delivery side does not exceed the values indicated in the paragraph "CONSIDERATIONS ON DELIVERY AND SUCTION LINES".

For a correct and complete verification of items 2) and 3), we recommend the installation of vacuum and pressure gauges upstream and downstream of the pump.

10 DAILY USE

FOREWORD		No special preliminary operations are required for daily use of the pumps.
MANUAL OPERATION	**1**	Before starting up the pump, ensure that the delivery is correctly positioned and secured in a suitable housing in the target tank.
	2	Operate the run/stop switch installed on the supply line.
	3	Ensure that the reservoir is filled with more oil than the amount to be dispensed (dry running can damage the pump).
	4	Dispense
CAUTION		**Never start the pump by simply plugging it into the wall socket.**
CAUTION		**Bypass operation with closed delivery is not permitted. When the thermal protector is triggered, switch off the power supply and wait for the engine to cool down.**
	5	Stop the pump.

11 MAINTENANCE

CAUTION		**Risk of personal injury.** **It is strictly forbidden to put the pump into operation before the supply and suction line connections have been made.**
Safety information		The VISCOMAT GEROTOR series pumps are designed and built to require minimal maintenance. Before carrying out any kind of maintenance, the distribution system must be disconnected from all sources of electrical and hydraulic supply including the battery. During maintenance, using the personal protective equipment (PPE) is mandatory. In any case, bear the following minimum recommendations for efficient pump operation in mind.
Staff authorised for maintenance operations		Maintenance operations must be performed solely by specialist staff. Any tampering may impair the performance and endanger persons and/or property, as well as invalidate the warranty.
ONCE A WEEK		Check that the joints of the pipes have not loosened, to avoid any leaks. Always check for leaks.
ONCE A MONTH		Check the body of the pump and keep it clean from dirt. Check and keep clean the filters upstream of the pump. Check that the electrical supply cables are in good condition.

12 PROBLEMS AND SOLUTIONS

For any problems, it is a good idea to contact the authorised service centre closest to your area.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
THE MOTOR DOESN'T TURN	Lack of power	Check the electrical connections and the safety systems
	Rotor blocked	Check for any damage or obstruction to the rotary components.
	Thermal protector intervention	Wait for the engine to cool down, check the restart, search for the cause of overheating
	Motor problems	Contact the Support Service
THE MOTOR TURNS SLOWLY WHEN STARTING	Low supply voltage	Bring the voltage back within the limits
	Excessive oil viscosity	Check the oil temperature and, if necessary, warm it up to reduce excessive viscosity
FLOW RATE LOW OR ZERO	Low suction tank level	Refill the tank
	Bypass valve blocked	Clean and/or replace the valve
	Filter clogged	Clean the filter
	Excessive suction vacuum	Lower pump in relation to the level of the tank or increase the section of the pipes
	High pressure loss in the flow circuit (open bypass operation)	Use it shorter or larger diameter pipes
	Bypass valve blocked	Remove the valve, clean and/or replace it
	Air entering the pump or suction tube	Check the tightness of the connections
	Tightening of suction tube	Use a tube suitable for working under vacuum
	Low rotation speed	Check the voltage to the pump; adjust the voltage or/and use cables with a greater diameter
	The suction pipe rests on the bottom of the tank	Lifting the pipe
	Excessive oil viscosity	Check the oil temperature and, if necessary, warm it up to reduce excessive viscosity
HIGH PUMP NOISE LEVELS	Presence of cavitation	Reduce the suction vacuum
	Irregular by-pass operation	Dispense to vent all the air in the by-pass
	Presence of air in the fluid	Wait for the oil in the tank to decant
LEAKS FROM THE PUMP BODY	Damage to the seal	Check and, if necessary, replace the seal

13 SCRAPPING AND DISPOSAL

Foreword

If the system is scrapped, its components must be consigned to companies specialised in the disposal and recycling of industrial waste and, in particular:

Disposal of the packaging

The packaging is made of biodegradable cardboard that can be handed over to companies for the normal recycling of cellulose.

Disposal of metal parts

The metal parts, both painted and stainless steel, can normally be recycled by companies specialised in the metal scrapping sector.

Disposal of electrical and electronic components

These must of necessity be disposed of by companies specialised in the disposal of electronic components, in compliance with the indications of the directive 2012/19/EU (see directive text below).

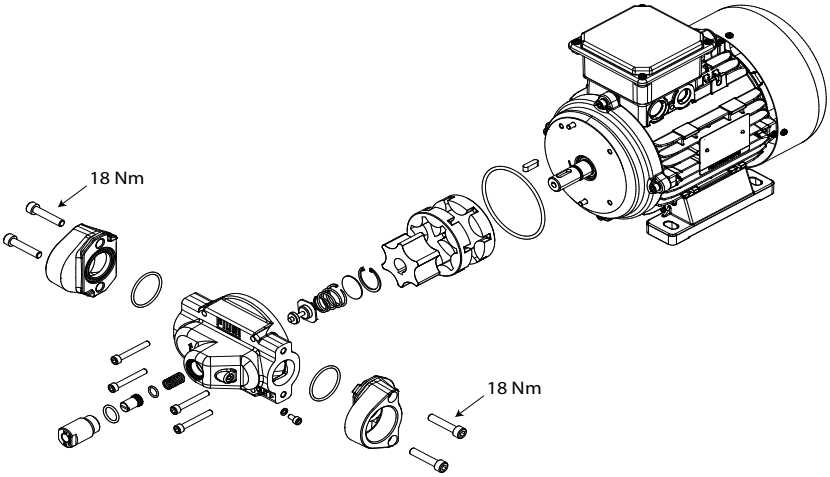
Environmental information for customer resident in the European Union

European Directive 2012/19/EU requires equipment marked with this symbol on the product and/or packaging not to be disposed of together with mixed municipal waste. The symbol indicates that this product must not be disposed of together with normal domestic waste. It is the responsibility of the owner to dispose of both these products and other electrical and electronic equipment through the specific collection facilities indicated by the government or local public authorities.
The disposal of Waste Electrical and Electronic Equipment (WEEE) as domestic waste is strictly prohibited. This type of waste must be disposed of separately.
Any dangerous substances that may be present in the electrical and electronic equipment and/or incorrect use of such equipment may potentially have serious consequences for the environment and human health.
In the case of unlawful disposal of such waste, the sanctions envisaged by the regulations in force may be applied.

Disposal of further parts

Further product parts, such as hoses, rubber seals, plastic parts and wiring should be handled by companies specialising in industrial waste disposal.

14 EXPLODED VIEWS



15 DIMENSIONS