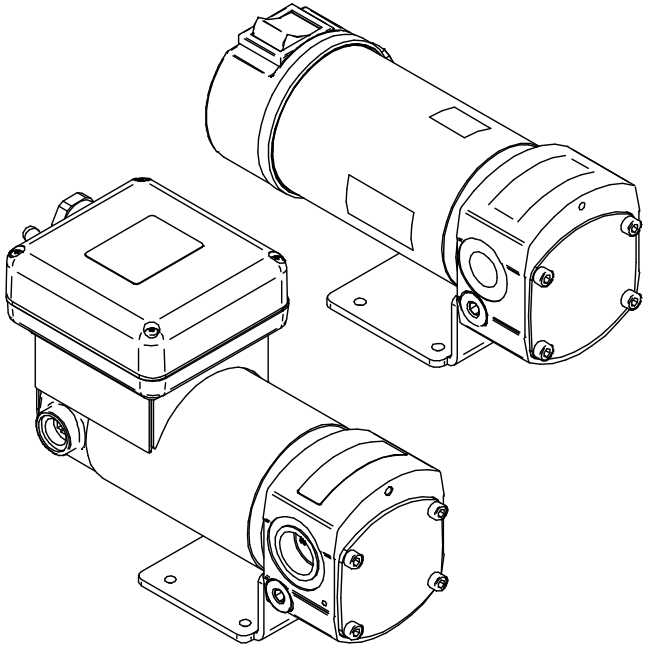
PIUSI Fluid Handling Innovation

VISCOMAT
120/1
60/1
60/2



MADE IN ITALY

Installaltion, use and maintenance manual EN

BULLETIN M0128E EN_00

ENGLISH

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BULLETIN MO128E

EN

2 MACHINE AND MANUFACTURER IDENTIFICATION



AVAILABLE MODELS	• VISCOMAT DC 60/1 12V • VISCOMAT DC 60/1 24V • VISCOMAT DC 60/2 12V • VISCOMAT DC 60/2 24V • VISCOMAT DC 120/1 12V • VISCOMAT DC 120/1 24V
MANUFACTURER	PIUSI S.p.A. Via Pacinotti 16/A z.i. Rangavino - 46029 Suzzara - Mantova - Italy

3 FACSIMILE COPY OF EU DECLARATION OF CONFORMITY

The undersigned PIUSI S.p.A.
Via Pacinotti 16/A z.i. Rangavino - 46029 Suzzara - Mantova - Italy
HEREBY STATES under its own responsibility that the equipment described below:

Description : **Pump for lubricant oil transfer**

Model : **VISCOMAT DC 60/1-60/2-120/1 12 - 24 Vdc**
Serial number: refer to Lot Number shown on CE plate affixed to product
Year of manufacture: refer to the year of production shown on the CE plate affixed to the product
complies with the following legislation:
- Machinery Regulations
- Electromagnetic compatibility

The technical file is at the disposal of the competent authority following motivated request at PIUSI S.p.A. or following request sent to the e-mail address: doc_tec@piusi.com.

THE ORIGINAL DECLARATION OF CONFORMITY IS PROVIDED SEPARATELY WITH THE PRODUCT

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4 MACHINE DESCRIPTION

PUMP Electric self-priming rotary external gear pump, equipped with a by-pass valve.

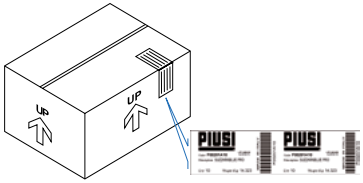
MOTOR Brush motor powered by continuous current, low voltage, with intermittent cycle,closed type, IP55 protection class according to CEI EN 60034-5, flange-mounteddirectly to the pump body.

4.1 HANDLING AND TRANSPORT

Foreword Due to the limited weight and dimensions of the pumps, special lifting equipment is not required to handle them. The pumps are carefully packed before dispatch. Check the packing when receiving the material and store in a dry place.

PACKAGING The pump is equipped comes packed suitably for shipment.
On the packaging a label shows the following product information:

- name
- code
- weight



MODEL	WEIGHT (Kg)	PACKAGING DIMENSION (mm)
VISCOMAT DC 60/1 12V **VISCOMAT DC 60/1 24V**	3	200 X 120 X 140
VISCOMAT DC 60/2 12V **VISCOMAT DC 60/2 24V** **VISCOMAT DC 120/1 12V** **VISCOMAT DC 120/1 24V**	4,9	345 X 175 X 255

5 GENERAL WARNINGS

Warnings To ensure operator safety and to protect the dispensing system from potential damage, workers must be fully acquainted with this instruction manual before attempting to operate the dispensing system.

Symbols used in the manual The following symbols will be used throughout the manual to highlight safety information and precautions of particular importance:

ATTENTION
This symbol indicates safe working practices for operators and/or potentially exposed persons.

WARNING
This symbol indicates that there is risk of damage to the equipment and/or its components.

NOTE
This symbol indicates useful information.

Manual preservation This manual should be complete and legible throughout. It should remain available to end users and specialist installation and maintenance technicians for consultation at any time.

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6 SAFETY INSTRUCTIONS

ATTENTION Mains - preliminary checks before inst		**You must avoid any contact between the electrical power supply and the fluid that needs to be FILTERED.**
Maintenance control		**Before any checks or maintenance work are carried out, disconnect the power source.**
FIRE AND EXPLOSION When flammable fluids are present in the work area, such as gasoline and windshield wiper fluid, be aware that flammable fumes can ignite or explode.	 	To help prevent fire and explosion: Use equipment only in will ventilated area. Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline. Do not plug or unplug power cords or turn lights on or off when flammable fumes are present. Ground all equipment in the work area. Stop operation immediately if static sparking occurs or if you feel a shock. Do not use equipment until you identify and correct the problem. Keep a working fire extinguisher in the work area.
ELECTRIC SHOCK Electrocution or death	 	This device must be grounded. Improper grounding setup or usage of the system can cause electric shock. Turn off and disconnect power cord before servicing equipment. Connect only to a grounded electrical outlets. Ensure ground prongs are intact on power and extension cords. Outdoors, use only extensions suitable for the specific use, in accordance with the regulations in force. The connection between plug and socket must remain away from water. Never touch the electric plug of socket with wet hands. Do not turn the device on if the power connection cord or other important parts of the apparatus are damaged, such as the inlet outlet plumbing, dispensing nozzle or safety devices. Replace damaged components before operation. For safety reasons, we recommend that, in principle, the equipment be used only with a earth-leakage circuit breaker (max 30 mA). Electrical connections must use ground fault circuit interrupter (GFCI). Installation operations are carried out with the box open and accessible electrical contacts. All these operations have to be done with the unit isolated from the power supply to prevent electrical shock!
EQUIPMENT MISUSE Misuse can cause death or serious injury		Do not operate the unit when fatigued or under the influence of drugs or alcohol. Do not leave the work area while equipment is energized or under pressure. Turn off all equipment when equipment is not in use. Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not kink or over bend hoses or use hoses to pull equipment. Keep children and animals away from work area. Comply with all applicable safety regulations.

Burn Hazard Equipment surfaces and fluid that is heated can become very hot during operation		To avoid severe burns do not touch hot fluid or equipment.
Toxic Fluid or Fumes Hazard		Read MSDS's to know the specific hazards of the fluids you are using. Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines. Prolonged contact with the treated product may cause skin irritation: always wear protective gloves during dispensing.

7 FIRST AID RULES

Electrocution		Disconnect the unit from the mains, or use a dry insulator as protection while moving the electrocuted person far from any conductor. Do not touch the electrocuted person with bare hands until he/she is far from any conductor. Ask qualified and trained people for help immediately.
SMOKING PROHIBITED		When operating the pump and in particular during refuelling, do not smoke and do not use open flame.

8 GENERAL SAFETY RULES

ESSENTIAL PROTECTIVE EQUIPMENT CHARACTERISTICS		Wear protective equipment that is: - suited to the operations that need to be performed; - resistant to cleaning products.
PERSONAL PROTECTIVE EQUIPMENT THAT MUST BE WORK		Safety shoes;
		Close-fitting clothing;
		Protective gloves;
		Safety goggles;
OTHER EQUIPMENT		Instruction manual
PROTECTIVE GLOVES		Prolonged contact with the treated product may cause skin irritation; always wear protective gloves during dispensing.

9 TECHNICAL DATA

9.1 PERFORMANCE

The data in the table relate to functioning with oil of a viscosity equal to approximately 500 cSt. As the viscosity of the oil varies, the variation in the pump's performance will be more noticeable the greater the back pressure against which the pump is working.
VISCOMAT DC pumps can pump oils of very different viscosities,to the maximum of 2000 cst without requiring any adjustment of the by-pass

PUMP MODEL	Qmax (l/min)	Qmin (l/min)	Pmax (bar)	P by-pass (bar)
VISCOMAT DC 60/1 12V	4,5	3,2	5	6
VISCOMAT DC 60/1 24V	4,2	3,2	5	6
VISCOMAT DC 60/2 12V	11,6	9,5	4	5,5
VISCOMAT DC 60/2 24V	12	10,8	4	5,5
VISCOMAT DC 120/1 12V	5,5	4,5	9	11
VISCOMAT DC 120/1 24V	5,5	4,5	9	11

ATTENTION

The power absorbed by the pump depends on the functioning point and the viscosity of the oil being pumped. The data for MAXIMUM CURRENT provided in the Table refer to pumps functioning at the point of maximum compression Pmax, with oils of a viscosity equal to approximately 500 cSt.

9.2 ELECTRICAL DATA

PUMP MODEL	FUSES (A)	TENSION (V)	ABSORBTION (A)	POWER (W)
VISCOMAT DC 60/1 12V	25	12	18,5	150
VISCOMAT DC 60/1 24V	15	24	9,5	150
VISCOMAT DC 60/2 12V	40	12	35	300
VISCOMAT DC 60/2 24V	30	24	18	300
VISCOMAT DC 120/1 12V	40	12	26,5	200
VISCOMAT DC 120/1 24V	30	24	13,5	200

10 OPERATING CONDITIONS

10.1 ENVIRONMENTAL CONDITIONS

TEMPERATURE min. +10 °C / max +60 °C

RELATIVE HUMIDITY max. 90%

ATTENTION

The temperature limits shown apply to the pump components and must be respected to avoid possible damage or malfunction. It is understood, nevertheless, that for a given oil, the real functioning temperature range also depends on the variability of the viscosity of the oil itself with the temperature. Specifically:
• The minimum temperature allowed (+10°C) could cause the viscosity of some oils to greatly exceed the maximum allowed, (2000 cSt for VISCOMAT 60/1 E 120/1; 600 cSt for VISCOMAT 60/2) with the consequence that the static torque required during the starting of the pump would be excessive, risking overload and damage to the pump.
• The maximum temperature allowed (+60°C) could, on the other hand, cause the viscosity of some oils to drop well below the minimum allowed (50 cSt), causing a degradation in performance with obvious reductions in flow rate as the back pressure increases.

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10.2 ELECTRICAL POWER SUPPLY

NOTE

Depending on the model, the pump must be fed by three-phase or single-phase alternating current whose nominal values are those indicated in the Table of paragraph TECHNICAL DATA. The maximum acceptable variations from the electrical parameters are:
Voltage: +/- 5% of the nominal value

ATTENTION

Power from lines with values outside the indicated limits can damage the electrical components.

10.3 WORKING CYCLE

NOTE

The pumps are designed for INTERMITTENT use with a 30 - minute work cycle under conditions of maximum back pressure.

ATTENTION

Functioning under by-pass conditions is only allowed for brief periods of time (2-3minutes maximum). After a work cycle of 30 minutes, wait for the motor to cool.

10.4 PERMITTED AND NON-PERMITTED FLUIDS

FLUIDS PERMITTED	OIL with a viscosity from 50 to 2000 cSt (at working temperature)Viscosity from 50 to 600 cSt for VISCOMAT 60/2 12V and VISCOMAT 60/2 24V.	
FLUIDS NON PERMITTED AND RELATED DANGERS	- GASOLINE	- FIRE - EXPLOSION
	- INFLAMMABLE LIQUIDS with PM < 55°C	- FIRE - EXPLOSION
	- WATER	- PUMP OXIDATION
	- FOOD LIQUIDS	- CONTAMINATION OF THE SAME
	- CORROSIVE CHEMICAL PRODUCTS	- PUMP CORROSION - INJURY TO PERSONS
	- SOLVENTS	- FIRE - EXPLOSION - DAMAGE TO GASKET SEALS
	- DIESEL	- USURY OF THE PUMP

11 INSTALLATION

ATTENTION

The pump must never be operated before the delivery and suction lines have been connected.

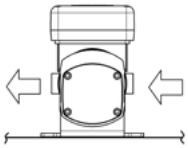
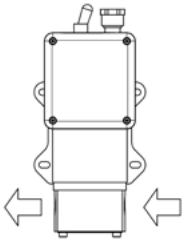
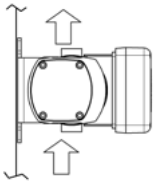
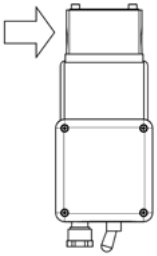
PRELIMINARY INSPECTION

- Verify that all components are present. Request any missing parts from the manufacturer;
- Check that the pump has not suffered any damage during transport or storage;
- Carefully clean the suction and delivery inlets and outlets, removing any dust or other packaging material that may be present;
- Check that the electrical data corresponds to those indicated on the data plate;
- Make sure that the motor shaft turns freely;
- Always install in an illuminated area;
- Install the pump at a height of min. 80 cm;

11.1 POSITIONING, CONFIGURATIONS AND ACCESSORIES

NOTE In the case of installation in the open air, proceed to protect the pump by providing a protection roof.

The pump can be installed in any position (horizontal or vertical axis pump) how accordance with the scheme below:

A Horizontally 	**B To the wall. With pump body upwards:** 
C To the wall with pump body a side only with check valve installed: 	**D To the wall. With check valve installed:** 

It is recommended to install a check valve in order to resume the system operation quickly and easily even after the first priming.

The pump must be secured in a stable way using the holes on the bed of the motor and vibration damping devices.

NOTE **Under conditions C and D, a check valve is to be installed. Moreover, during the initial start-up phase, the suction tube is to be filled with oil.**

ATTENTION **THE MOTORS ARE NOT OF THE ANTI-EXPLOSIVE-TYPE. DO NOT install them where inflammable vapours could be present.**

It is the responsibility of the installer to provide the necessary line accessories to ensure the correct and safe operation of the pump. The accessories that are not suitable to be used with the previously indicated material could damage the pump and/or cause injury to persons, as well as causing pollution.

To maximise performance and prevent damage that could affect pump operation, always demand original accessories.

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11.2 CONSIDERATIONS REGARDING DELIVERY AND SUCTION LINES

DELIVERY

FOREWORD

The choice of pump model to use should be made keeping in mind the viscosity of the oil to be pumped and the characteristics of the system attached to the delivery of the pump.

EFFECTS ON FLOW RATE

The combination of the oil viscosity and the characteristics of the system could, in fact,create back pressure greater than the anticipated maximums (equal to Pmax), so as to cause the (partial) opening of the pump by-pass with a consequent noticeable reduction of the flow rate supplied.

HOW TO REDUCE EFFECTS ON FLOW RATE

In such a case, in order to permit the correct functioning of the pump equal to the viscosity of the oil being pumped, it will be necessary to reduce resistance in the system by employing shorter hoses and/or of larger diameter. On the other hand, if the system cannot be modified it will be necessary to select a pump model with a higher Pmax.

SUCTION

FOREWORD

VISCOMAT series pumps are characterized by excellent suction capacity. In fact, the characteristic flow rate/back pressure curve remains unchanged even at high pump suction pressure values. In the case of oils with viscosity not greater than 100 cSt the suction pressure can reach values on the order of 0.7 - 0.8 bar without compromising the proper functioning of the pump. For Viscomat 60/2, the suction limit is reached with oil viscosity equal to 600 cSt.

Beyond these suction pressure values,cavitation phenomena begin as evidenced by accentuated running noise that over time can cause pump damage, not to mention a degradation of pump performance. As viscosity increases, the suction pressure at which cavitation phenomena begin decreases. In the case of oils with viscosities equal to approximately 500 cSt, the suction pressure must not exceed values of the order of 0,3 -0,5 bar to avoid triggering cavitation phenomena. The values indicated above refer to the suction of oil that is substantially free of air.

ATTENTION

If the oil being pumped is mixed with air, the cavitation phenomena can begin at lower suction pressures.

HOW TO PREVENT CAVITATION

It is important to ensure low vacuums at suction mouth by using:
- Short pipes with larger or identical diameter to that recommended;
- Reduce bends to the utmost;
- Use large-section suction filters;
- Use foot valves with minimum possible resistance;
- Keep the suction filters clean because, when they become clogged, they increase the resistance of the system.

WARNING

In any case, for as much as was said above, it is important to guarantee low suction pressures (short hoses and possibly of larger diameter than the inlet opening of the pump,fewer curves, filters of wide cross-section and kept clean).

ATTENTION

It is a good system practice to immediately install vacuum and air pressure gauges at the inlets and outlets of the pump which allow verification that operating conditions are within anticipated limits. To avoid emptying the suction hose when the pump is turned off, the installation of a foot valve is recommended.

EN

11.3 LINE ACCESSORIES

The pumps are supplied without line accessories. The most common line accessories are listed below. Their use is compatible withthe proper use of the pumps.

DELIVERY
- Easy Oil nozzles
- Meters
- Flexible tubing

SUCTION
- Foot valve with filter
- Rigid and flexible tubing

ATTENTION **It is the installer's responsibility to provide the line accessories necessary for the safeand proper functioning of the pump. The use of accessories that are inappropriate for use with oil can cause damage to thepump or people as well as pollution.**

12 CONNECTIONS

12.1 ELECTRICAL CONNECTIONS

GENERAL WARNING Comply with the following (not exhaustive) instructions to ensure a proper electrical connection:

1. Before installation and maintenance make sure that power supply to the electric lines has been turned off.
2. Use cables with minimum cross-sections, rated voltages and installation type that are suitable for the characteristics indicated in paragraph "ELECTRICAL SPECIFICATIONS".
3. Always close the cover of the terminal strip box before switching on the power supply, after having checked the integrity of the seal gaskets that ensure the IP55 protection grade.

ATTENTION **For connection the installer shall have to use a cable of adequate diamater for the cable gland to ensure protection grade IP55.**

The electrical box of Viscomat 120/1 and 60/2 comes with a terminal board for connection ofthe power cord (optional). In case of connection of the cable kit with pincers (Piusi optional),proceed as follows:

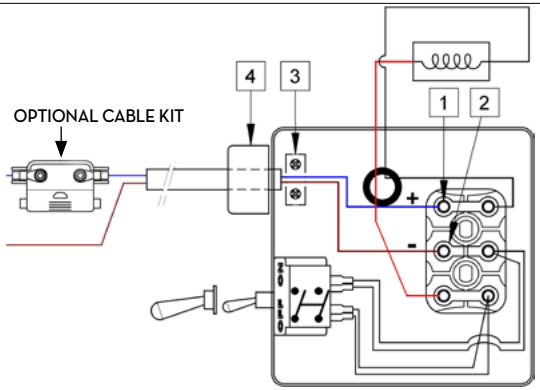
- open the terminal box cover;
- loosen the core hitch ring nut with rubber (4) and insert the cable;
- open the cable clamp U-bolt (3) which is located inside the electrical box;
- fix the eyelet (for screw M4) of the positive cable (blue) to the terminal, in position 1 (seereference in the diagram);
- fix the eyelet (for screw M4) of the negative cable (brown) to the terminal, in position 2 (seereference in the diagram);
- tighten the U-bolt (3);
- screw the ring nut (4).

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With the Piusi cable kit, make surethat the red pliers are connectedto the positive pole (+) and theblack pliers are connected to thenegative pole (-)

VISCOMAT DC 12VWITH 40 A FUSE3Minimum cable section = 6 mm2

VISCOMAT DC 24VWITH 30 A FUSE3Minimum cable section = 4 mm2



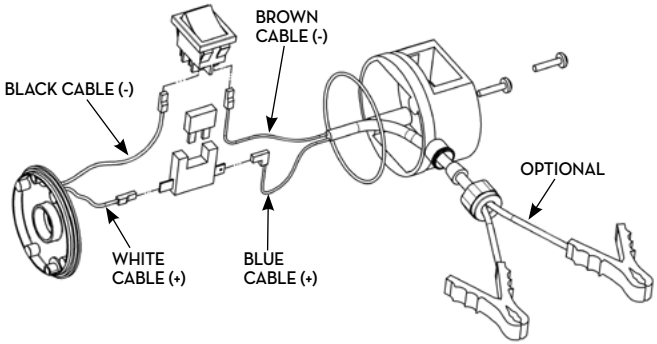
CABLE KIT + PLIERS (BATTERY KIT)

• Cables fitted with faston type plugs for power connection;
- WHITE cable (or BROWN): positive pole (+)
- BLACK cable (or BLUE): negative pole (-);

VISCOMAT 60/1

• Terminal strip box (protection IP55 in conformance with EN 60034-5-97 regulations) complete with:
- start/stop switch;
- protection fuse against short circuits and overloads with following features:
25A for 12V models
15A for 24V models.

To carry out the electrical connection of Viscomat 60/1, follow the diagram below:



In the event of power connection with cable which is not supplied by Piusi, it is necessary toobserve the following characteristics:
• for Viscomat DC 12V - use a bipolar cable with minimum section of 6 mm2
• for Viscomat DC 24V - use a bipolar cable with minimum section of 4 mm2

ATTENZIONE

It is important to use fuses as indicated in paragraph E, to prevent the pump motor from being damaged in the event of a short circuit.It is the installer's responsibility to carry out the electrical connection with respect to theapplicable regulations.

EN

12.2 PIPING CONNECTIONS

FOREWORD - Before carrying out any connection, refer to the visual indications i.e. arrow on the pump head, to identify suction and delivery.

ATTENTION  **Wrong connection can cause serious pump damage.**

PRELIMINARY INSPECTION
- Check that the machine has not suffered any damage during transport or storage.
- Clean the inlet and outlet openings, removing any dust or residual packing material.
- Make sure that the motor shaft turns freely.
- Check that the electrical specifications correspond to those shown on the identification plate.

CONNECTION
- Make sure that the hoses and the suction tank are free of dirt and filing residue that might damage the pump and accessories.
- Always install a metal mesh filter in the suction hose.
- Before connecting the delivery hose, partially fill the pump body with oil to avoid the pump running dry during the priming phase.
- Do not use conical threaded joints that could damage the threaded pump openings if excessively tightened.

The MINIMUM recommended characteristics for hoses are as follows:

SUCTION HOSE
- Diameter: 20 mm
- Nominal pressure: twice the p by-pass pressure
- Appropriate for use with suction

DELIVERY HOSE
- Diameter: 1/2" for 60/1 and 120/1 versions
- Diameter: 3/4" for 60/2 version
- Nominal pressure: twice the P bypass pressure

ATTENTION  **It is the installer's responsibility to use tubing with adequate characteristics. The use of hoses that are inappropriate for use with oil can cause damage to the pump or people as well as pollution. The use of hoses and/or line components that are inappropriate for use with oil or have inadequate nominal pressures can cause damage to objects or people as well as pollution. The loosening of connections (threaded connections, flanges, gasket seals) can like wise cause damage to objects or people as well as pollution. Check all of the connections after installation and on a regular on-going basis with adequate frequency. To avoid affecting the proper functioning of the pump, use a hose-end fitting with a thread of length less than 15 mm.**

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13 INITIAL START-UP

AVANT-PROPOS

VISCOMAT DC series pumps are self-priming and, therefore, able to draw oil from the tank even when the suction hose is empty on start-up. The priming height (distance between the surface of the oil and the inlet opening) must not exceed 2,5 meters.

- Check that the quantity of fluid in the suction tank is greater than the amount you wish to transfer.

- Make sure that the residual capacity of the delivery tank is greater than the quantity you wish to transfer

- Make sure that the piping and line accessories are in good condition.

ATTENTION



Fluid leaks can damage objects and injure persons.

Wetting the Pump. Before starting the pump, wet the inside of the pump body with oil through the inlet and outlet openings.

If the pump is already installed, the operation can be performed by removing the cover of thechamber, filling the internal chamber with oil and placing the cover again, paying attention tothe O-ring seal.

REMARQUE



- Never start or stop the pump by connecting or cutting out the power supply.

- Prolonged contact with some fluids can damage the skin. The use of goggles and gloves is recommended.

In the priming phase the pump must blow the air that was initially present in the tubing into the line. Therefore, it is necessary to keep the delivery open. When the tube is filled with oil, the purging phase is concluded.

The priming phase may last from several seconds to a few minutes, depending on the characteristics of the system. If this phase is excessively prolonged, stop the pump and verify:

• That the pump is not running completely"dry".
• That the suction hose guarantees against air infiltration And is correctly immersed in the fluid to be drawn.
• That any filters installed are not blocked.
• That the delivery hose allows for the easy evacuation of the air.
• That the priming height is not greater than 2,5 meters;
• The exact rotation direction of the motor: it must be in a counter-clock wise considering the motor from pos. 1 of the exploded diagram.

When priming has occurred, after reattaching the delivery gun, verify that the pump is functioning within the anticipated ranges, possibly checking:

1 That under conditions of maximum back pressure, the power absorption of the motor stays within the values shown on the identification plate.

2 that the suction pressure does not exceed the limits indicated in paragraph CONSIDERATIONS REGARDING SUCTION & DELIVERY LINES.

3 that the back pressure in the delivery line does not exceed the values indicated in paragraph CONSIDERATIONS REGARDING SUCTION & DELIVERY LINES.

14 EVERY DAY USE

FOREWORD

No particular preliminary operation is required for every day use of VISCOMAT pumps.

MANUAL OPERATION

1 Before starting the pump, make sure that the ultimate shut-off device (delivery nozzle or line valve) is closed. If the delivery has no shut-off device (free delivery) make sure that it is correctly positioned and appropriately attached to the delivery tank.

2 Turn the on-switch present on some pump models (single-phase) or the start/stop switch installed on the electrical power line.

3 Make sure that the tank is filled with a quantity of oil greater than the quantity to be supplied (running dry could damage the pump).

4 Open the delivery valve or activate the delivery nozzle, gripping it securely.

ATTENTION



Never start the pump by simply inserting the plug in the outlet.

Fluid exits at high pressure from a delivery gun fed by a VISCOMAT pump. Never point the outlet of the gun towards any part of the body.

5 Close the delivery gun or the line valve to stop delivery. The pump will immediately enter by-pass mode.

ATTENTION



Functioning with the delivery closed is only allowed for brief periods (2 to 3 minutes maximum). Functioning under nominal conditions is limited to a work cycle of 30 minutes. If this time is exceeded, you have to turn off the pump and wait for it to cool. After use, make sure the pump is turned off.

6 Stop the pump.

15 MAINTENANCE

Safety instructions

VISCOMAT DC series pumps are designed and constructed to require a minimal amount of maintenance.
Before carrying out any maintenance work, disconnect the dispensing system from any electrical and hydraulic power source. During maintenance, the use of personal protective equipment (PPE) is compulsory.
In any case always bear in mind the following basic recommendations for a good functioning of the pump

Authorised maintenance personnel

All maintenance must be performed by qualified personnel. Tampering can lead to performance degradation, danger to persons and/or property and may result in the warranty being voided.

ONCE A WEEK:

On a weekly basis, check that the tubing joints have not loosened, to avoid any leakage.

ONCE A MONTH:

On a monthly basis, check the pump body and keep it clean of any impurities.
On a monthly basis check and clean the filters placed at the pump inlet.
On a monthly basis, check that the electric power supply cables are in good condition.

16 NOISE LEVEL

In normal operating conditions, noise emissions of all models do not exceed 70 dB at a distance of 1 meter from the electric pump.

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17 PROBLEMS ET SOLUTIONS

For any problems contact the authorised dealer nearest to you.

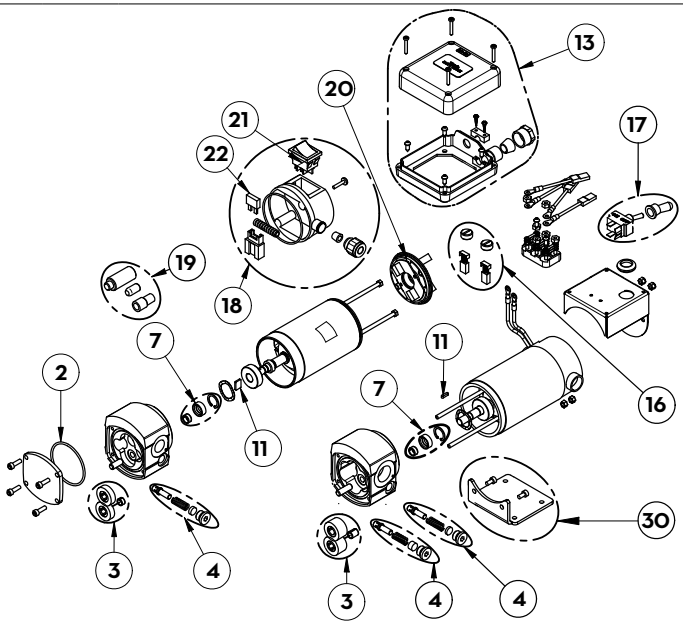
PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
THE MOTOR IS NOT TURNING	Lack of electric power	Check the electrical connections and the safety systems
	Rotor jammed	Check for possible damage or obstruction of the rotating components
	Motor problems	Contact the Service Department
	Fuse burnt out	Replace the fuse
THE MOTOR TURNS SLOWLY WHEN STARTING	Low voltage in the electric power line	Bring the voltage back within the anticipated limits
	Excessive oil viscosity	Verify the oil temperature and warm it to reduce the excessive viscosity
LOW OR NO FLOW RATE	Low level in the suction tank	Refill the tank
	Foot valve blocked	Clean and/or replace the valve
	Filter clogged	Clean the filter
	Excessive suction pressure	Lower the pump with respect to the level of the tank or increase the cross-section of the piping
	High loss of head in the delivery circuit (working with the by-pass open)	Use shorter piping or of greater diameter
	By-pass valve blocked	Dismantle the valve, clean and/or replace it
	Air entering the pump or the suction piping	Check the seals of the connections
	A narrowing in the suction piping	Use piping suitable for working under suction pressure
	Low rotation speed	Check the voltage at the pump. Adjust the voltage and/or use cables of greater cross-section
	The suction piping is resting on the bottom of the tank	Raise the piping
	Excessive oil viscosity	Verify the oil temperature and warm it to reduce the excessive viscosity
	Cover loosened	Tighten the screws of the cover
INCREASED PUMP NOISE	Cavitation occurring	Reduce suction pressure
	Irregular functioning of the by-pass	Dispense until the air is purged from the by-pass system
	Presence of air in the fluid	Verify the suction connections
LEAKAGE FROM THE PUMP BODY	Seal damaged	Check and replace the seal
HIGH ABSORPTION	The cover is screwed too tightly	Loosen the screws of the cover
	Excessive oil viscosity	Verify the oil temperature and warm itto reduce the excessive viscosity

18 DEMOLITION AND DISPOSAL

FOREWORD	If the system needs to be disposed, the parts which make it up must be delivered to companies that specialize in the recycling and disposal of industrial waste and, in particular:
Disposing of packing materials	The packaging consists of biodegradable cardboard which can be delivered to companies for normal recycling of cellulose.
Metal parts disposal	Metal parts, whether paint-finished or in stainless steel, can be consigned to scrap metal collectors.
Disposal of electric and electronic components	These must be disposed of by companies that specialize in the disposal of electronic components, in accordance with the indications of directive 2012/19/EU (see text of directive below).
	European Directive 2012/19/EU requires that all equipment marked with this symbol on the product and/or packaging not be disposed of together with non-differentiated urban waste. The symbol indicates that this product must not be disposed of together with normal household waste. It is the responsibility of the owner to dispose of these products as well as other electric or electronic equipment by means of the specific refuse collection structures indicated by the government or the local governing authorities.
Information regarding the environment for clients residing within the european union	Disposing of RAEE equipment as household wastes is strictly forbidden. Such wastes must be disposed of separately.
	Any hazardous substances in the electrical and electronic appliances and/or the misuse of such appliances can have potentially serious consequences for the environment and human health.
	In case of the unlawful disposal of said wastes, fines will be applicable as defined by the laws in force.
Miscellaneous parts disposal	Other components, such as pipes, rubber gaskets, plastic parts and wires, must be disposed of by companies specialising in the disposal of industrial waste.

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19 EXPLODED DIAGRAM

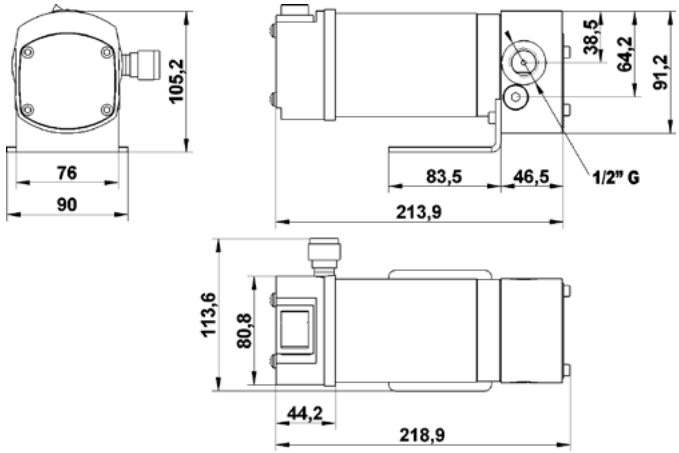


ATTENTION **Always specify the spare part position number with the product code and serial number.**

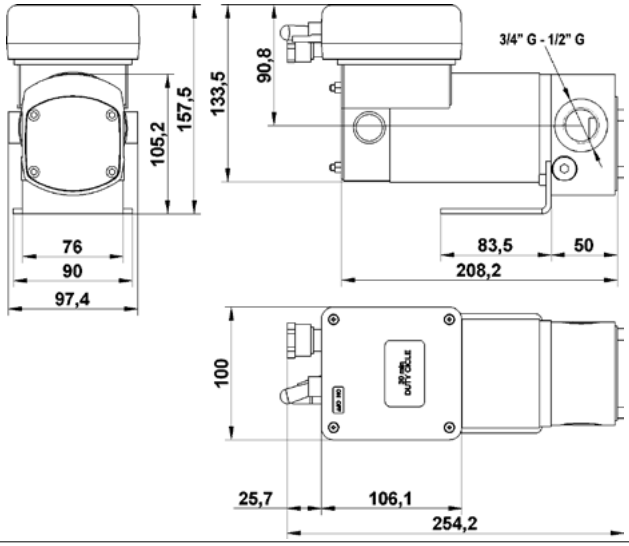
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20 DIMENSIONS

VISCOMAT 60/1



VISCOMAT 60/2 - VISCOMAT 120/1



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