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2 MACHINE AND MANUFACTURER IDENTIFICATION

| | | | | |
|----------------|---|--|----------------------------|---------------------|
| CODE PRODUCT |  | PIUSI S.p.A. SUZZARA (VI) ITALY | YEAR 2022 MADE IN ITALY | YEAR OF MANUFACTURE |
| MODEL |  | 60020390 SUZZARABLU PUMP 230V/50HZ 230V/50HZ 1600 RPM 1.55 A | YEAR OF MANUFACTURE | |
| TECHNICAL DATA | | | | |

| | |
|------------------|--|
| AVAILABLE MODELS | 120 - 230 V AC |
| MANUFACTURER | PIUSI S.p.A. Via Pacinotti 16/A - Z.I. Rangavino - 46029 Suzzara (MN) - 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: **Dispenser Pump for the transfer of Ad-Blue® - AUS32 - Water - Antifreeze**

Model: **Diaphragm pump**
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@piusicom.
THE ORIGINAL DECLARATION OF CONFORMITY IS PROVIDED SEPARATELY WITH THE PRODUCT

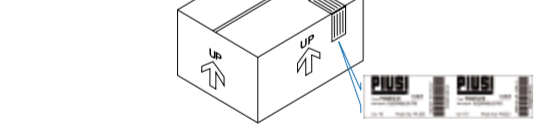
4 MACHINE DESCRIPTION

PUMP MOTOR
Five-chamber positive-displacement diaphragm pump
Brush motor, DC, low tension with intermittent cycle, closed type in protection class IP55 according to CEI-EN 60034-5.

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.
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) |
|------------------------------|-------------|--------------------------|
| SUZZARABLU PUMP 230V/50Hz | 7 | 350 x 180 x 280 |

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
Maintenance control
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.

ELECTRIC SHOCK
Electrocution or death

EQUIPMENT MISUSE
Misuse can cause death or serious injury

Burn Hazard
Equipment surfaces and fluid that is heated can become very hot during operation

Toxic Fluid or Fumes Hazard
Read MSDS 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

Contact with the product
Persons who have suffered electric shock

NOTE
Please refer to the safety data sheet for the product

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 worn
- safety shoes;
- close-fitting clothing;
- protection gloves;
- safety goggles;
- instructions manual

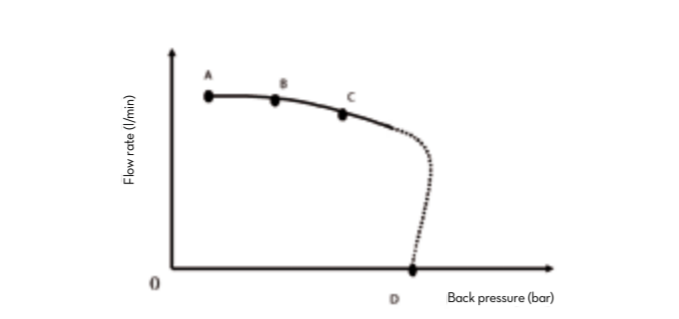
Protective gloves
Prolonged contact with the treated product may cause skin irritation; always wear protective gloves during dispensing.

9 TECHNICAL DATA

9.1 PERFORMANCE SPECIFICATIONS

The performance diagram shows flow rate as a function of back pressure.

| Typical Delivery Configuration | | | | |
|--------------------------------|----------------|---------------------------|-----------------|---------------|
| Flow Rate | Absorption (A) | No. 4 metres of 3/4" pipe | K24 Meter | Manual nozzle |
| A (Maximum flow rate) | 28 120 3.1 | 32 230 1.2 | . | . |
| B (High flow rate) | 27 120 3.2 | 31 230 1.3 | . | . |
| C (Normal conditions) | 25 120 3.3 | 29 230 1.3 | . | . |
| D (By pass) | 0 120 3.3 | 230 1.3 | Delivery closed | |



ATTENTION
The curve refers to the following operating conditions:
Fluid: AUS32 - DEF - Ad-Blue® - Antifreeze
temperature: 20°C
Suction conditions: The pipe and the pump position relative to the fluid level is such that a low pressure of 0.3 bar is generated at the nominal flow rate.
Under different suction conditions higher low pressure values can be created that reduce the flow rate compared to the same back pressure values. To obtain the best performance, it is very important to reduce loss of suction pressure as much as possible by following these instructions:
- shorten the suction pipe as much as possible
- avoid useless elbows or throttling in the pipes
- keep the suction filter clean
- use a pipe with a diameter equal to, or greater than, indicated (see Installation).

10 ELECTRICAL DATA

| PUMP MODEL | POWER SUPPLY | | CURRENT |
|--------------|--------------|-------------|---------|
| | Current | Voltage (V) | |
| 120V version | AC | 120 60 | 3.5 |
| 230V version | AC | 230 50 | 1.5 |

(*) Refers to functioning in by-pass mode.

11 OPERATING CONDITIONS

11.1 ENVIRONMENTAL CONDITIONS
TEMPERATURE min. -23°F / max. +104°F
min. -5°C / max. +40°C
max. 90%
RELATIVE HUMIDITY
ATTENTION The temperature limits shown apply to the pump components and must be respected to avoid possible damage or malfunction.

11.2 ELECTRICAL POWER SUPPLY

NOTE
N.B.: THE PUMP SHOULD BE POWERED BY A SAFE SOURCE, BATTERY OR POWER SUPPLY 12V/24V WITH SAFETY TRANSFORMER.
In accordance with the model, the pump must be powered by a direct current line, the nominal values of which are indicated on the table in the paragraph "ELECTRICAL DATA".
The maximum acceptable variations from the electrical parameters are:
Voltage: +/- 10% of the nominal value

ATTENTION
Power supply from lines with values that do not fall within the indicate limits could cause damage to the electrical components and reduction of working performance.

11.3 DUTY CYCLE
NOTE
The pumps have been designed for intermittent use and a 5-minute duty cycle under conditions of maximum back pressure.

ATTENTION
Functioning under by-pass conditions is only allowed for short periods of time (max. 3 minutes).

11.4 PERMITTED AND NON-PERMITTED FLUIDS

| FLUIDS PERMITTED | FLUIDS NON-PERMITTED AND RELATED DANGERS |
|--|--|
| - AUS32 (DEF, AD-Blue®), - WATER, - ANTIFREEZE | - OXIDATION OF PUMP - FIRE |
| - DIESEL FUEL - PETROL | - INFLAMMABLE LIQUIDS - CORROSIVE CHEMICAL PRODUCTS |
| - SOLVENTS | - DAMAGE TO GASKET SEALS |
| - LIQUIDS WITH VISCOSITY >20 cst. | - MOTOR OVERLOAD |

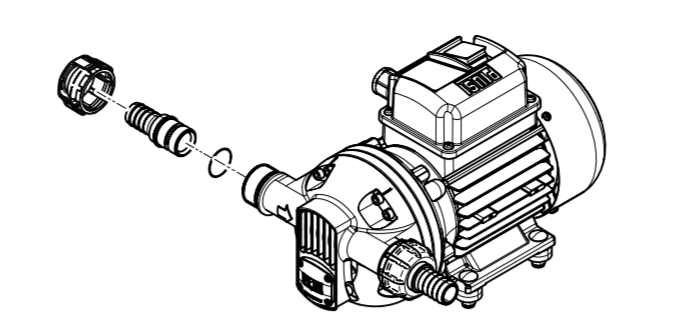
12 INSTALLATION

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.
- Always install in an illuminated area.
- Install the pump at a height of min. 80 cm.

12.1 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 (pump axis vertical or horizontal).
The pump must be secured in a stable way using the holes on the bed of the motor and vibration damping devices.
THE MOTORS ARE NOT OF THE ANTI-EXPLOSIVE-TYPE. DO NOT install them where inflammable vapours could be present.
NOTE
The broad range of pump accessories make it suitable for many different uses, installations and applications. The supporting base can be positioned in different ways.
ATTENTION
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.
ATTENTION
To maximise performance and prevent damage that could affect pump operation, always demand original accessories.



12.2 NOTES ON SUCTION AND DELIVERY LINES

DELIVERY EFFECTS ON FLOW RATE
Length and diameter of pipe, flow rate of dispensed liquid, accessories fitted, can create back pressures above those allowed. In this case, the pump mechanical control (bypass) will trip to reduce the flow rate.
HOW TO REDUCE EFFECTS ON FLOW RATE
To avoid these problems, system flow resistances must be reduced using shorter and/or larger diameter pipes, as well as line accessories with low resistances (e.g. automatic nozzle for higher flow rates).
CHARACTERISTICS OF DELIVERY PIPES
The delivery pipe must have the following technical characteristics:
- recommended minimum nominal diameter: 3/4"
- recommended nominal pressure: 10 bar

SUCTION FOREWORD
Diaphragm positive-displacement pumps are self-priming and feature good suction capacity.
During the start-up phase, when the suction pipe is empty and the pump is wet, the electric pump unit is able to suck liquid from a maximum vertical distance of 2 mt.

IMPORTANT NOTE
Priming time can last a few minutes. We suggest performing priming operations without automatic nozzle and making sure the pump is properly wet.
WARNING
Always install a foot valve to prevent the suction pipe from being emptied and to keep the pump wet at all times. In this way, the pump will always start up immediately the next times it is used.

CAVITATION
The pump is able to work with vacuums of up to 0.5 bar at the suction mouth. Over this value, CAVITATION can occur that causes a fall in flow rate and increase in noise levels.
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
The vertical distance between the pump and the fluid must fall within the 2 mt. maximum required for priming. If the distance is greater, a foot valve must be installed to allow the suction pipes to fill up and the diameter pipes must be larger. It is recommended that the pump not be installed at a vertical distance greater than 2 metres.

ATTENTION
If the suction tank is higher than the pump, an anti-siphon valve should be installed to prevent accidental product leaks. Size the installation to contain the back pressures caused by water hammering.
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 prevent the suction pipes from being emptied when the pump stops, a foot valve should be installed.

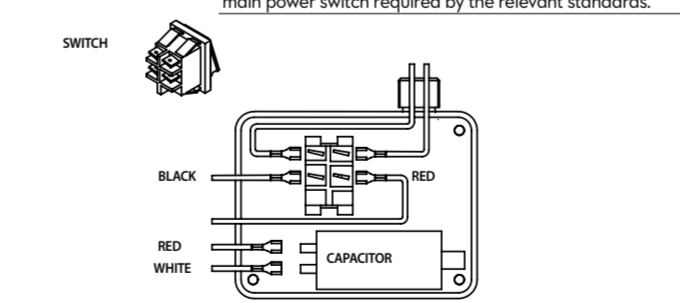
CHARACTERISTICS OF THE SUCTION PIPES
The suction pipe must have the following technical specifications:
- recommended minimum nominal diameter: 3/4"
- recommended nominal pressure: 10 bar;
- use pipes suitable for low pressure operation (e.g. with metal core)

13 CONNECTIONS

13.1 ELECTRICAL CONNECTIONS
ATTENTION
IT IS THE INSTALLER'S RESPONSIBILITY TO CARRY OUT THE ELECTRICAL CONNECTIONS IN COMPLIANCE WITH THE RELEVANT STANDARDS.
WARNING
Comply with the following (not exhaustive) instructions to ensure a proper electrical connection:

- During installation and maintenance make sure that power supply to the electric lines has been turned off.
- Use cables with minimum sections, rated voltages and installation type that are suitable for the characteristics indicated in paragraph "ELECTRICAL DATA" and the installation environment.
- Always make sure that the cover of the terminal strip box is closed before switching on the power supply, after having checked the integrity of the seal gaskets that ensure the IP55 protection grade.
- All motors are equipped with a grounding terminal that is to be connected to the ground line of the electrical system.
The pump is fitted with:
- single-phase motor with 2-mt. power cord
- bipolar switch
- capacitor
Wired and installed inside the terminal strip box (see chart)

PUMP FITTINGS
NOTE
The capacitor characteristics are those indicated on the pump label. The switch has the only function of starting/stopping the pump and cannot in any way replace the main power switch required by the relevant standards.



SWITCH
The capacitor characteristics are those indicated on the pump label. The switch has the only function of starting/stopping the pump and cannot in any way replace the main power switch required by the relevant standards.

13.2 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
- Before connection, make sure that the piping and the suction tank are free of dirt and solid residue that could damage the pump and its accessories.
- Before connecting the delivery pipe, partially fill the pump body, from delivery side, with the liquid that needs to be pumped in order to facilitate priming.
- Do not use conical threaded fittings, which could damage the threaded inlet or outlet openings of the pump if excessively tightened.

NOTE
If not already fitted, fit a suction filter

14 INITIAL START-UP

FOREWORD
- 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
Do not run the pump dry for more than 20 minutes. This can cause serious damage to its components.
NOTE
Fluid leaks can damage objects and injure persons.
- 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.

ATTENTION
Extreme operating conditions with duty cycles longer than 20 minutes can cause the motor temperature to rise thus damaging the engine. For each duty cycle of 20 minutes, allow for a rest phase of 20 minutes with motor switched off.
ATTENTION
During the priming phase, the pump must discharge all the air that is initially present from the delivery line. Therefore it is necessary to keep the outlet open to permit the evacuation of the air.
WARNING
If an automatic type dispensing nozzle is installed on the end of the delivery line, the evacuation of the air will be difficult because of the automatic stopping device that keeps the valve closed. It is recommended that the automatic nozzle be temporarily removed during initial start-up.

IF THE PUMP DOES NOT PRIME
Depending on the system characteristics, the priming phase can last from several seconds to a few minutes. If this phase is prolonged, stop the pump and verify:
- that the pump is not running completely dry (fill with fluid from the delivery line);
- that the suction pipe guarantees against air infiltration;
- that the suction filter is not clogged;
- that the suction height is not higher than 2 mt.
- that all air has been released from the delivery pipe.
AT THE END OF THE INITIAL START-UP
When priming has occurred, verify that the pump is operating within the anticipated range, in particular:
- that under conditions of maximum back pressure, the power absorption of the motor stays within the values shown on the identification plate;
- that the suction pressure is not greater than 0.5 bar;
- that the delivery back pressure does not exceed the maximum back pressure for the pump.

15 EVERY DAY USE

USE PROCEDURE
1 If flexible pipes are used, attach the ends of the piping to the tanks. In the absence of an appropriate slot, solidly grasp the delivery pipe before beginning dispensing.
2 Before starting the pump make sure that the delivery valve is closed (dispensing nozzle or line valve)
3 Turn the ON/OFF switch on
4 Open the delivery valve, solidly grasping the pipe
5 While dispensing, do not inhale the pumped product
6 Should you spill any fluid while dispensing, bank it with earth or sand to absorb it and limit its spreading
7 Close the delivery valve to stop dispensing
8 When dispensing is finished, turn off the pump

ATTENTION
The by-pass valve allows functioning with delivery closed only for short periods (max. 3 minutes)
ATTENTION
To avoid damaging the pump, after use, make sure the pump is off.
In case of a power break, switch the pump off straight away.
Should any sealants be used on the suction and delivery circuit of the pump, make sure that these products are not released inside the pump.
Foreign bodies in the suction and delivery circuit of the pump could cause malfunctioning and breakage of the pump components.
In case of prolonged dry-running of the pump, the suction circuit may be empty and suction may become difficult. If so, fill the suction circuit with demineralised water.

16 MAINTENANCE

Safety instructions
The dispensing system was designed and built 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
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.
Whenever there is risk of frost, empty the circuit and the pump, taking care to place the pump in an environment where the temperature is no lower than 0°C/32°F.
Check that the labels and plates found on the dispensing system do not deteriorate or become detached over time.
- Check that the pipe connections are not loose to prevent any leaks;
- Check and keep the filter installed on the suction line clean.
- Check the pump body and keep it clean and free of any impurities;
- Check that the electrical supply cables are in good condition.
Long periods without the pump being used
Whenever it is thought that the system will remain unused for at least 15 days, it must be emptied in order to prevent the product from crystallising inside. This should be followed by a washing cycle.

17 NOISE LEVEL

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

18 PROBLEMS AND 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 component. |
| THE MOTOR TURNS SLOWLY WHEN STARTING | Motor problems | Contact the Service Department |
| | Low voltage in the electric power line | Bring the voltage back within the anticipated limits |
| 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 |
| INCREASED PUMP NOISE | High loss of head in the delivery circuit (working with the by-pass diameter) | Use shorter piping or of greater diameter |
| | By-pass valve blocked | Dismantle the valve, clean and/or replace it |
| LEAKAGE FROM THE PUMP BODY | 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 |
| THE PUMP DOES NOT PRIME THE LIQUID | 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 |
| THE PUMP DOES NOT PRIME THE LIQUID | Cavitation occurring | Reduce suction pressure |
| | Irregular functioning of the by-pass | Dispense until the air is purged from the by-pass system |
| THE PUMP DOES NOT PRIME THE LIQUID | Presence of air in the fluid | Verify the suction connections |
| | Seal damaged | Check and replace the seal |
| THE PUMP DOES NOT PRIME THE LIQUID | Suction circuit blocked | Remove the blockage from the suction circuit |
| | Mulction of foot valve fitted on suction circuit | Replace foot valve |
| THE PUMP DOES NOT PRIME THE LIQUID | The suction chambers are dry | Add liquid from pump delivery side |
| | The pump chambers are dirty or blocked | Remove the blockages from the suction and delivery valves |

19 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:
The packaging consists of biodegradable cardboard which can be delivered to companies for normal recycling of cellulose.

Disposing of packing materials
Metal Parts
Disposal of electric and electronic components
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.
Disposing of RAEE equipment as household wastes is strictly forbidden. Such wastes must be disposed of separately.

Information regarding the environment for clients residing within the European Union
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 solid 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.

