

	ENGLISH (Translated from Italian)
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2 MACHINE AND MANUFACTURER IDENTIFICATION	
CODE PRODUCT	PIUSI S.p.A.
MODEL	DISPENSER PUMP FOR THE TRANSFER OF AD-BLUE® - AUS32/AUS40 - WATER - ANTIFREEZE
TECHNICAL DATA	12-24V DC
AVAILABLE MODELS	PIUSI S.p.A.
MANUFACTURER	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. HEREBY STATES under its own responsibility that the equipment described below: Description: Dispenser Pump for the transfer of Ad-Blue® - Aus32/Aus40 - 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@piusi.com. 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, directly fanged 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.
STORAGE	- Store in a covered and dry place. - Store the unit away from dirt and vibration ENVIRONMENTAL CONDITIONS: Storage humidity: Max 90% Storage temperature: min 10 °C / Max 50 °C
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)
Versione 12V	3,6	350 x 180 x 280
Versione 24V	3,6	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.
Reproduction rights	All reproduction rights are reserved by Piusi S.p.A. The text cannot be reprinted without the written permission of Piusi S.p.A. © Piusi S.p.A. THIS MANUAL IS THE PROPERTY OF Piusi S.p.A. ANY REPRODUCTION, EVEN PARTIAL, IS FORBIDDEN.

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	To help prevent fire and explosion: Use equipment only in well ventilated areas.
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.	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	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.
Electrocution or death	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 electrical 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!
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.
To avoid severe burns do not touch hot fluid or equipment.	

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.	To avoid severe burns do not touch hot fluid or equipment.

Burn Hazard Equipment surfaces and fluid that is heated can become very hot during operation	
Toxic Fluid or Fumes Hazard	Read MSDSs 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	In the event of problems developing following EYE/SKIN CONTACT, INHALATION or INGESTION of the treated product, please refer to the SAFETY DATA SHEET Aus32/Aus40/DEF/Ad-Blue®/Antifreeze.
Persons who have suffered electric shock	Disconnect the power source, or use a dry insulator to protect yourself while you move the injured person away from any electrical conductor. Avoid touching the injured person with your bare hands until he is far away from any conductor. Immediately call for help from qualified and trained personnel. Do not operate switches with wet hands.
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	
Other equipment	Prolonged contact with the treated product may cause skin irritation; always wear protective gloves during dispensing.
Protective gloves	

9 TECHNICAL DATA	
9.1 PERFORMANCE SPECIFICATIONS	
The performance diagram shows flow rate as a function of back pressure.	
Functioning Point	Typical Delivery Configuration
A (Maximum flow rate)	Flow Rate: 36 l/min Voltage (V): 12 Absorption (A): 16 No. 4 metres of 3/4" pipe K24 Meter Manual nozzle Automatic Dispensing Nozzle
B (High flow rate)	Flow Rate: 33 l/min Voltage (V): 12 Absorption (A): 17
C (Normal conditions)	Flow Rate: 30 l/min Voltage (V): 12 Absorption (A): 19
D (By pass)	Flow Rate: 0 l/min Voltage (V): 12 Absorption (A): 20 Delivery closed
Flow rate (l/min) vs Pressure (bar) Back pressure (bar)	

ATTENTION

The curve refers to the following operating conditions:
Fluid: Aus32/Aus40 - 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).

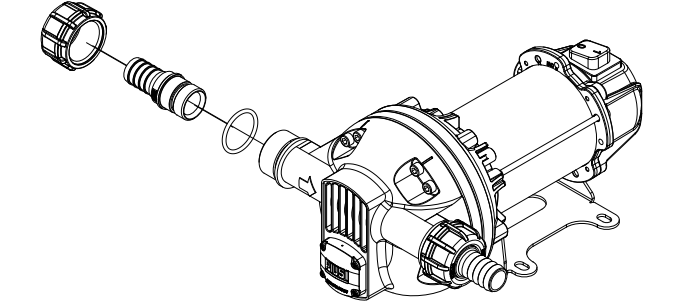
10 ELECTRICAL DATA	
PUMP MODEL	POWER SUPPLY CURRENT
12V version	DC 12 20 20
24V version	DC 24 10 10
(*) Refers to functioning in by-pass mode.	

11 OPERATING CONDITIONS	
11.1 ENVIRONMENTAL CONDITIONS	
TEMPERATURE	min. +25 °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 12/24V 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 Power supply from lines with values that do not fall within the indicated 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 20-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	- Aus32/Aus40 (DEF, AD-Blue®); - WATER - ANTIFREEZE - DIESEL FUEL - PETROL - INFLAMMABLE LIQUIDS - CORROSIVE CHEMICAL PRODUCTS - SOLVENTS - LIQUIDS WITH VISCOSITY >20 cst
FLUIDS NON-PERMITTED AND RELATED DANGERS	- OXIDATION OF PUMP - FIRE - EXPLOSION - CORROSION AND INJURY TO PERSONS - DAMAGE TO GASKET SEALS - 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).
ATTENTION	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 CHARACTERISTICS OF DELIVERY PIPES	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).
NOTE	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 m.	
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 m. 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 meters.
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	
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 diameter for the cable gland to ensure protection grade IP55.

SPECIFICATIONS	
1	Cables with faston connector coupling for connection to the power supply line
2	RED cable: positive pole (+)
3	BLACK cable: negative pole (-)
4	Terminal strip box (protection class IP55 in conformance with the directive EN 60034-5-97) complete of:
4A	ON/OFF switch;
4B	Safety fuse against short circuits and overcurrent, 25a fuse for 12v models
4C	Safety fuse against short circuits and overcurrent, 15a fuse for 24v models
5	power cable complete of pincers for connection to the battery
ATTENTION	IT IS THE RESPONSIBILITY OF THE INSTALLER TO CARRY OUT THE ELECTRICAL CONNECTIONS IN COMPLIANCE WITH THE APPLICABLE REGULATIONS. DO NOT INVERT FUSES TO AVOID ANY MOTOR DAMAGE OR MALFUNCTION. 25A FUSE CAN BE FITTED ONLY ON 12V PUMP 15A FUSE CAN BE FITTED ONLY ON 24V PUMP
NOTE	Diagram showing the electrical connection setup with a terminal block, switch, and fuses.

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. Do not run the pump dry for more than 5 minutes. This can cause serious damage to its components. Fluid leaks can damage objects and injure persons.
ATTENTION	- 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.
NOTE	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.
NOTE	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.
WARNING	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 m; - that all air has been released from the delivery pipe.
IF THE PUMP DOES NOT PRIME	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.
AT THE END OF THE INITIAL START-UP	

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) 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
Authorised maintenance personnel Measures to be taken	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.
ONCE A WEEK:	- Check that the pipe connections are not loose to prevent any leaks;
ONCE A MONTH:	- Check and keep the filter installed on the suction line clean;
Long periods without the pump being used	- Check the pump body and keep it clean and free of any impurities; - Check that the electrical supply cables are in good condition. 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 shall be followed by a washing cycle. In any case, it is recommended to wash the pump with demineralised water.

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 components
	Motor problems Contact the Service Department
	Burned fused Replace the fuse
THE MOTOR TURNS SLOWLY WHEN STARTING	Low voltage in the electric power line Bring the voltage back within the anticipated limits
	Low level in the suction tank Refill the tank
	Foot valve blocked Clean and/or replace the valve
	Filter clogged Clean the filter
LOW OR NO FLOW RATE	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
INCREASED PUMP NOISE	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
	Cavitation occurring Reduce suction pressure
LEAKAGE FROM THE PUMP BODY	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
THE PUMP DOES NOT PRIME THE LIQUID	Seal damaged Check and replace the seal
	Suction circuit blocked Remove the blockage from the suction circuit
	Malfunction of foot valve fitted on suction circuit Replace foot valve
	The suction chambers are dry Add liquid from pump delivery side
	The pump chambers are dirty Remove the blockages from the suction and delivery valves
	or blocked

DIAPHRAGM PUMP 12/24V

MADE IN ITALY

Manuale di installazione, uso e manutenzione

Installation, use and maintenance manual

BULLETIN MO2138 ITEN_01

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PIUSI S.p.A. - Suzzara (MN) Italy

doc.tec@piusi.com

