DIAPHRAGM PUMP



USE AND MAINTENANCE MANUAL EN

ENGLISH

To the customers

Congratulations on receiving your Combo Pump.We are Pleased to Provide you with a system designed to give you maximum reliability and efficiency.

The pump has been designed,tested,and approved for use with AUS32.

Please take care of all the precautions when handling this liquid.

Your safety is important to us.
Furthermore to assure the longest possible service life,it is Important that you follow the operation and maintenance Procedures outlined in this manual.

We are proud to provide you with a quality product and dedicated support.Together with your careful use,we are sure that you will have years of safe and dependable use.

The President
Combo Power Group

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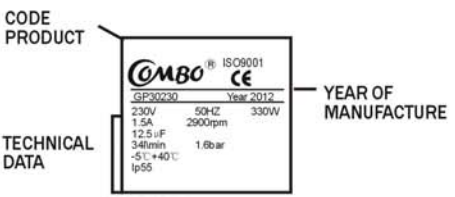
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2 MACHINE AND MANUFACTURER IDENTIFICATON



AVAILABLE MODELS: 120/230VAC
MANUFACTURER:

3 MACHINE DESCRIPTION

PUMP: Five-chamber positive displacement diaphragm pump.
MOTOR: Asynchronous motor,single-phase,2 pole,closed type,protectior class IP55

① HANDLING AND TRANSPORT

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.

4 GENERAL WARNINGS

Important precautions

To ensure operator safety and to protect the pump from potential damage,workers must be fully acquainted with this instruction manual before performing any operation.

Symbols used in the manual

The following symbols will be used throughout the manua! Tohighlight safety information and precautions of particular importance:



ATTENTION

This symbolindicates safe working practices for operators and/or potentially exposed persons.



WARNING

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



NOTE

This symbolindicates 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.

5 FIRST AID RULES

Contact with the product

In the event of problems developing following EYE/ SKIN CONTACT,INHAL ATION or INGESTION of the treated product,please refer to the SAFETY DATA SHEET AUS32/ DEF/AD BLUE.

Persons who have suffered electric shock

Disconnect the power source, or use a dry insulator to protect yourself while you move the injurecl 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.

NOTE



Please refer to the safety data sheet for the product

6 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 producr may cause skin irntatlon; always wear protective gloves during dispensing.

DANGER



Never touch the electric plug or socket with wet hands.

Do not switch the dispensing system on if the network connection cable or important parts of the apparatus are

Damaged,such as the inlet/outlet pipe,nozzle or safety devices.Replace the damaged pipe immediately.

Before each use, check that the network connection cable and power plug are not damaged Have the network connection cable replaced immediately by a qualified electrivian.

ATTENTION



The electrial connection between the plug and socket must be kept well away from water.

Unsuitable extension leads can be dangerous. In accordance with current regulations, only extension cords that are labelled for outdoor use and have a sufficient conduction path should be used outdoors.

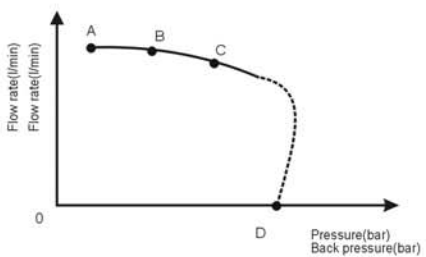
For safety reasons,we recommed that,in principle,the equipment be used only with a earth leakage circuit breaker (max 30 mA).

7 TECHNICAL DATA

PERFORMANCE SPECIEICATIONS

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

Functioning Point	Flow Rate	Voltage(V)	Absorption(A)	Typical Dellvery Configuration			
				No.4 metres of3/4 pipe	FM30 Meter	Manual nozzle	Automatic Dispensing 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	Delivery closed			
		230	1.3				



ATTENTION

8 ELECTRICAL DATA

PUMP MODEL	POWER SUPPLY			CURRENT
	Current	Voltage(V)	Frequency(HZ)	Max(*)(A)
120V version	AC	120	60	3.5
230V version	AC	230	50	1.5

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

9 OPERATING CONDITONS

① ENVIRONMENTAL CONDITIONS

TEMPERATURE	Min.+23°F/max+104°F min.-5℃/max+40℃
RELATIVE HUMIDITY	Max 90%
LIGHTING	The environment must conform to directive 89/654/EEC on work environments. In case of non-EU countries.refer to directive EN ISO 12100-2 § 4.8.6.
ATTENTION	The temperature limits xhown opply to the pump components and must be respected to avoid possible damage or malfunction.

② ELECTRICAL POWER SUPPLY

NOTE	The pump must be powered by AC single-phase line,the nominal values of which are indicated on the table in the paragrapl, "G ELECTRICAL DATA" The maximum acceptable variations from the electrical parameters are; Voltage: +/- 5%of the nominal value Frequency: +/-2% of the nominal value
ATTENTION	Power supply from lines with values that do not fall within the indicated limits could cause damage to the electrical components.

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).

④ PERMITTED AND NON-PERMITTED FLUIDS

FLUIDS PERMITTED	- AUS32 (DFF,AD-Blue); DIESEL, OIL - WATER - LIQUID FOOD PRODUCTS	
FLUIDS NON PERMITTED AND RELATED DANGERS	- PETROL - INFLAMMABLELIQUIDS - CORROSIVE CHEMICAL PRODUCTS - SOLVENTS - LIQUIDS WITH VISCOSITY>20 cst	- OXIDATION OF PUMP - FIRE - EXPLOSION - CORROSION AND INJURY TO PERSONS - DAMAGE TO GASKET SEALS MOTOR OVERLOAD

10 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.

① PSSITIONING 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.

ATTENTION

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 differenf uses,installtions and applications. The supporting base can be positioned in different ways.

NOTE

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

ATTENTION

It is the ressponsibility 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 offect pump operation,always denmand original accessories.



② NOTES ON SUCTION AND DELIVERY LINES

DELIVERY

EFFECTS ON FLOW RATE Length and diameter of pipe, flow rate of dis pensed 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,aswell as line accessories with low resistanced (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 2mt.

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 Te 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 ge 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 pressvres caused by water hammering.

ATTENTION



It is a good system practice to immediately install vacuum and air perssure gauges at the inlets and outlets of the pump which allwo verification ghat operating conditions are within anticipated limits.To prevent the suction pipes from being emptied when the pump stops,a foot vaive should be installed.

CHARACTERISTICS OF THE SUCTION PIPES



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

11 CONNECTIONS

① ELECTRICAL CONNECTIONS

ATTENTION ***IT IS THE INSTALLER'S RSEPONSIBILITY TO CARRY OUT THE ELECTRICAL CONNECTIONS IN COMPLIANCE WITH THE RELEVANT STANDARDS.***

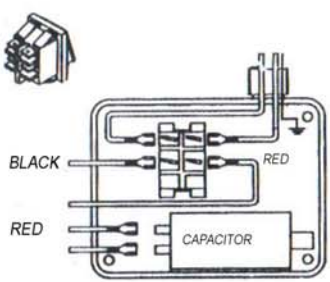
WARNING Comply with the following (not exhaustive)instructions to ensure a proper electrical connection:

- During installation and maintenance make sure that power supply to the electric lines has been tumed off.
- Use cables with minimum sections,rated voltages and installation type that are suitable for the characteristics indicated in paragraph I-ELECTRICAL DATA and the installation environment.
- Always make sure that the cover of the terminal strip box is dosed before switching on the power supply, after having chedced 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.

PUMP FITTINGS 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)

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 reptace the man power switch required by the relevant standards.



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.

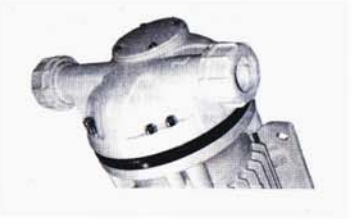
ATTENTION ***Wrong connection can cause serious pump damage.***

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



12 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 20minutes.This can cause serious damage to its components.

Fluid leaks can damage objects and injure persons.

NOTE

- 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 couse the motor temperature to rise thus damaging the engine.For each duty cycle of20 minutes,allow for a rest phase of 20 minutes with motor switched off.

NOTE

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 INI- TIAL START-UP

When priming has occurred, verify that the pump is operating within the anticipated range,in particular:

- that under conditions of maximum badk 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.

13 EVERY DAY USE

USE PROCE- DURE

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 dispensinq
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 apower 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 in side 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

14 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)R compulsocy. 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.
Measures to be taken	Whenever there is risk of frost,emptythecircuit and the pump,taking care to place the pump in an environment where the temperature is no lower tha 0°C/32°F. Check that the labels and plates found on the dispensing system do not deterlorate or become detached over time.
ONCE A WEEK:	-Check that the pipe connections are not loose to prevent any leaks; -Check and keep the filter installed on the suction line clean.
ONCE A MONTH:	-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 shall be followed by a washing cycle.

15 NOISE LEVEL

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

16 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 satety systems.
	Rotor dammed	Check for possible damage or obstruction of the rotating components
	Motor problems	Contact the Service Department
THE MOTOR TURNS SLOWLY WHEN START-ING	Low voltage in the electric power line	Bring the voltage back within the anticipated lirnits
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
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
THE PUMP DOES NOT PRIME THE LIQUID	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 or blocked	Remove the blockages from the suction and delivery valves