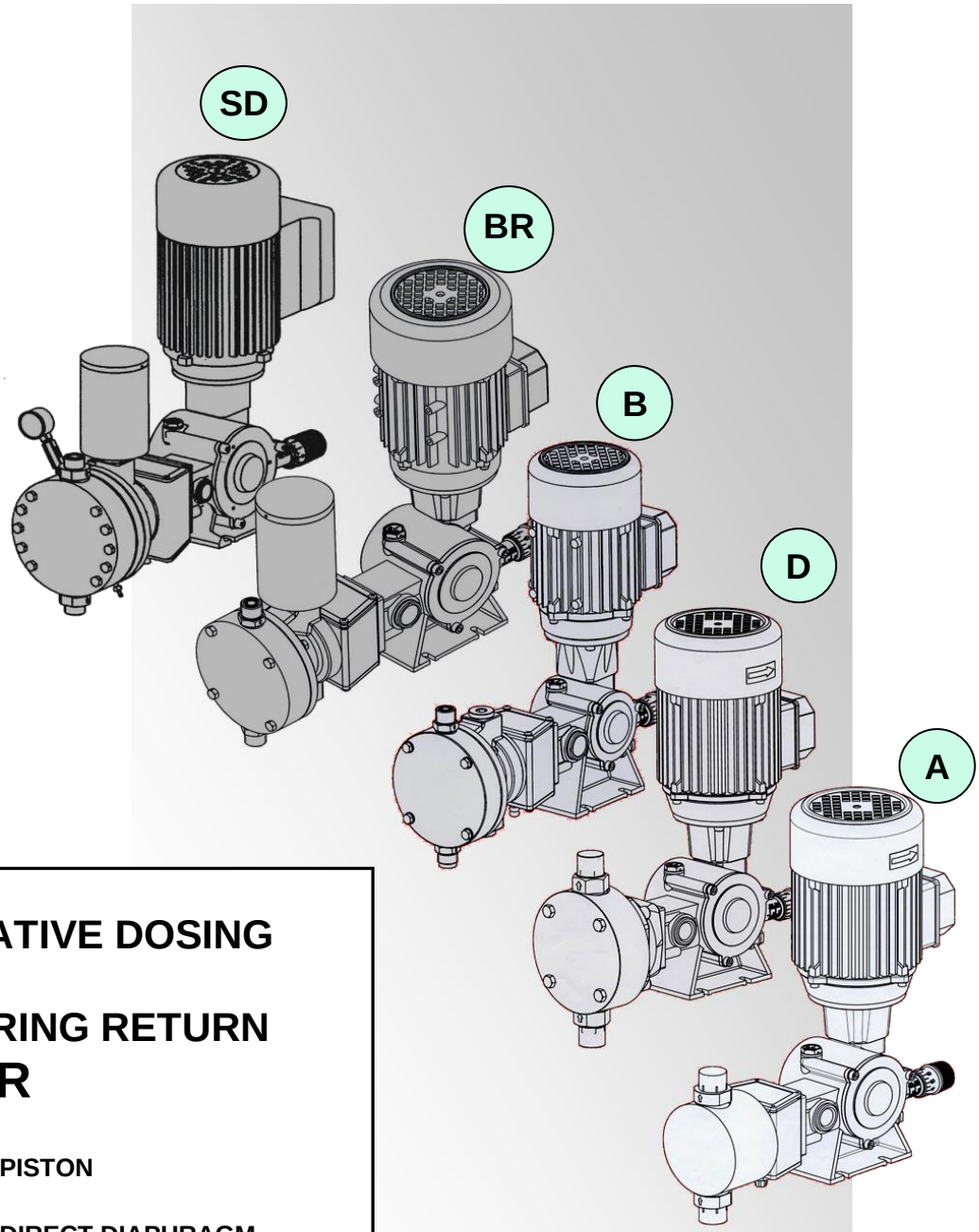
SAFETY INSTRUCTIONS MANUAL DOSING PUMPS FOR POTENTIALLY EXPLOSIVE ATMOSPHERES

Directive 2014/34/UE

EN

TRANSLATION OF ORIGINAL INSTRUCTIONS

EDITION 01/2019



ALTERNATIVE DOSING PUMP WITH SPRING RETURN

Series **SR**

mod. **A**	**PISTON**
mod. **D**	**DIRECT DIAPHRAGM**
mod. **B**	**HYDRAULIC DIAPHRAGM**
mod. **BR**	**HYDRAULIC DIAPHRAGM**
mod. **SD**	**HYDRAULIC DIAPHRAGM**

Group II category 2G
Group II category 3G

Doseuro
METERING PUMP SOLUTIONS

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DOC. No. XLDE0PCGG000G0019	Rev. 0	LANGUAGE EN	Date 28/08/2019
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Rev.	Description	Controlled by	Date
01	Eliminato logo ISO pagina 4	L. FUMAGALLI	09/04/2021

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DECLARATION OF CONFORMITY

DOSEURO®S.r.l.
with headquarters in: Via G. Carducci, 141 - Cologno Monzese (Mi) Italy

Declares under its' own responsibility that the:

DOSING PUMPS WITH SPRING RETURN

Series: **SR** Model: **A - D - B - BR - SD**

Bearing the following marking:

II 2G… **II 3G….**

Comply with **DIRECTIVE 2014/34/UE; 2006/42/CE; 2014/30/UE; 2014/35/UE**

Conformity has been verified on the basis of requirements from the following regulations:

UNI EN 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
UNI EN 809:2009	Pumps and pump units for liquids - Common safety requirements
EN 1127-1	Explosive atmospheres — Explosion prevention and protection - Part 1: Basic concepts and methodology
EN ISO 80079-36	Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements
EN ISO 80079-37	Part 37: Non-electrical equipment for explosive atmospheres — Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k" (ISO 80079-37: 2016)

In accordance with the provisions of Annex VIII of Directive 2014/34/EU, the technical documentation was filed with the following notified body:
Notified body: **No. 0722** - CESI - Via Rubattino, 54 - 200134 MILAN (ITALY)
Deposit: **No. CESI – B8003867R**

PLACE AND DATE: ***Cologno Monzese – 2019/10/31***
Signature and position of declarant

Technical Management Director
LUCA FUMAGALLI
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20093 Cologno Monzese (Mi)

Il certificato è prodotto con dispositivo elettronico ed è valido senza firma. The certificate is produced with EDP and valid without signature

1 - REQUIREMENTS FOR USE IN CLASSIFIED AREAS (ATEX)

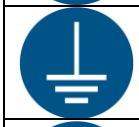
1.1 - General safety warnings

The supplemental pump instructions manual contains the fundamental points characterising installation, operation and maintenance of pumps destined to be used in potentially explosive atmospheres and brings together the main points that characterise the explosion proof protection in conformity to **Directive 2014/34/EU**. It is therefore necessary for the installer, specialised service personnel or the plant manager to carefully read the manual before installation and start-up.
It is not sufficient to only follow the general safety instructions contained; one must also follow specific safety provisions and provisions contained in the use and maintenance manual related to the manufacture series of the pump in question.

1.2 - Symbols used

It is necessary to bring attention to the symbols used to highlight residual risks in this publication that are connected to intended pump use.
To read and use the symbols correctly we recommend referring to standard **EN ISO 7010 graphical symbols -- safety colours and safety signs -- Registered safety signs**.

Here below we include pictograms that highlight the main warnings and the behaviour the operator must follow when the symbol indication is present, to carry out his functions in total safety.

TABLE OF SYMBOLS EN ISO 7010	
	**Sign for general compulsory action** This indicates a compulsory action
	**Refer to the instructions manual / booklet** This means that you must read the instructions manual / booklet
	**Wear hearing protection** This means that is it necessary to wear hearing protection
	**Wear eye protection** This means that is it necessary to wear protection for the eyes
	**Connect an earth terminal to earth** This means that an earth terminal needs to be connected
	**Wear safety footwear** This means that it is necessary to wear safety shoes
	**Wear protective gloves** This means that it is necessary to wear protective gloves
	**Wear protective clothing** This means that it is necessary to wear protective clothing
	**Wear head protection** This means that is it necessary to wear protection for the head

	**Wear respiratory protection** This means that it is necessary to wear respiratory protection
	**Disconnect before performing maintenance or repairs** Means that the machine or equipment, which is not connected to the mains by a plug, must be disconnected from all power sources before performing maintenance or repairs
	**General warning sign** This indicates a general warning
	**Warning; electricity** This is an electrical warning
	**Warning: Hot surface** This warns of a hot surface
	**Warning; Corrosive substance** This warns of a corrosive substance
	**Warning; Risk of crushing hands** This warns you of the closing movement of mechanical parts of the equipment

Safety requirements for use in areas classified according to the ATEX directive.	
The safety instructions from these paragraphs contain provisions that must be followed in order to guarantee the safety of persons and avoid significant damage to the machine.	

1.3 - Clothing

The installer must know the ATEX classification for the installation area, along with the risks resulting from potentially explosive atmospheres being present in the environment.
Before carrying out any type of intervention on the pump or the system, the operator must wear suitable protections according to current law regulation standards (81/08) for preventing contact with pumped liquid, such as:

Protective gloves, protection goggles, breathing masks, earmuffs or earplugs for the noise, protective suit, safety shoes, which must be suitable for atex areas.

COMPULSORY CLOTHING SIGNS

2 - GENERAL INTRODUCTION TO ATEX DIRECTIVE

As far as protection against explosion when potentially explosive atmospheres are present, it is prevalent and mandatory to apply **Directive 2014/34/EU** describing minimum product safety requirements, **Directive 99/92/EC** includes minimum requirements with reference to safety in the work environment. For all other risks regarding machinery, all requirements included in the Machinery Directive must also be applied.
Directive **2014/34/EU**, known as "**ATEX**", is about devices and protection systems destined to be used in potentially explosive atmospheres.
Based on the directive, it is not permitted to place on the market or in service any devices, protection systems and safety devices that do not include the "**CE**" declaration of conformity, or are without "**CE**" marking and the specific explosion proof marking "**EX**".

2.1 Assessment of the dangers of ignition

Group EN/IEC 60079-0	**I**		**II**			**III**		
EPL EN/IEC 60079-0	**M1**	**M2**	**Ga**	**Gb**	**Gc**	**Da**	**Db**	**Dc**
Group (Directive 2014/34/UE)	I		II					
Category (Directive 2014/34/UE)	M1	M2	1G	2G	3G	1D	2D	3D
Normal operation	✓	✓	✓	✓	✓	✓	✓	✓
Expected malfunction	✓	✓	✓	✓		✓	✓	
Rare malfunction	✓		✓			✓		

For **cat. 1** the potential sources of ignition need to be considered during **normal function as well as during foreseeable and rare malfunctions**.

For **cat. 2** the potential sources of ignition need to be considered during **normal function as well as during foreseeable malfunction**.

For **cat. 3** only the potential sources of ignition need to be considered during **normal function**.

2.2 Division of group EN/IEC 60079-0:

GROUP I: mines with the presence of firedamp
GROUP II: explosive atmospheres due to the presence of gases, vapours and mists other than firedamp
GROUP III: explosive atmospheres due to the presence of combustible dust

2.3 Division of EPL EN/IEC 60079-0:

M1: very high protection level; operating conditions powered in the presence of explosive atmosphere.
M2: high protection level; operating conditions not powered in the presence of explosive atmosphere.
Ga: very high protection level zone 0,
Gb: high protection level zone 1
Gc: normal protection level zone 2

2.4 Division of directive 2014/34/EU

Group I: equipment intended for use in the mine with firedamp *(Equipment intended for underground work in mines and their surface plants, which could be exposed to the risk of the release of firedamp and / or combustible dust)*

Group II: equipment intended for use in explosive atmospheres on the surface **(GAS (G) & DUST (D))** *equipment intended for use in other sites which could be endangered by potentially explosive atmospheres*

Category M1: protection level Very high Two means of protection Two foreseeable failures; operating conditions Powered in the presence of explosive atmosphere

Category M2: protection level High Guaranteed in normal and heavy duty operation; operating conditions Not powered in the presence of explosive atmosphere

Category 1G: *zone 0* Place where an explosive atmosphere consisting of a mixture of air and flammable substances in the form of gas, vapours or mists is present continuously, or for long periods of time (> 1000 hours/year)

Category 2G: *zone 1* Place where it is probable that an explosive atmosphere consisting of a mixture of air and flammable substances in the form of gas, vapours or mists develops sporadically during normal operation (10 - 1000 hours/year)

Category 3G: *zone 2* Place where it is improbable that an explosive atmosphere consisting of a mixture of air and flammable substances in the form of gas, vapours or mists develops during normal operation or, if it develops, that it is only infrequent and for short periods of time (< 10 hours/year)

Category 1D: *zone 20* Place where an explosive atmosphere, in the form of a cloud of combustible dust in the air, is present continuously, for long periods, or frequently (> 1000 hours/year)

Category 2D: *zone 21* Place where there is likely to be an explosive atmosphere, in the form of a cloud of combustible dust in the air, sporadically during normal operation (10 - 1000 hours/year)

Category 3D: *zone 22* Place where it is improbable that there be an explosive atmosphere in the form of a cloud of combustible dust in the air during normal operation or, if it develops, that it is only infrequent and for short periods of time (< 10 hours/year)

IMPORTANT NOTE: THE GROUPS IDENTIFIED IN STANDARD 60079-0 DIFFER FROM THOSE OF DIRECTIVE 2014/34/EU

Normal operation: operation of equipment compliant with the design specifications and used within the limits specified by the manufacturer.

Malfunction: situation in which equipment or components do not perform their intended function with respect to protection against explosions.

Expected malfunction: a disturbance or malfunction of the equipment that can normally occur during use.

Rare malfunction: a type of malfunction which can happen, but only in rare cases. Two independent expected malfunctions which, separately, would not create a source of ignition, but which, when combined, create a source of ignition, are considered to be a single rare malfunction.

2.5 ZONES GROUPS AND CATEGORIES

EN 60079-0		DIRECTIVE 2014/34/UE		EN 60079-10-1 & EN 60079-10-2
EPL	**Group**	**Equipment group**	**Equipment category**	**ZONE**
Ma	I	I	M1	NA
Mb			M2	
Ga	II	II	1G	0
Gb			2G	1
Gc			3G	2
Da	III		1D	20
Db			2D	21
Dc			3D	22

1.1.1 CATEGORY 1

Type of zone	AE probability in 365 d (one year)	Duration	Admissible categories	Protection level	Description
Zone 0	$> 10^{-1}$	**expl. atm. >1000 h/year**	1G	Very high	The required protection level is ensured even in the event of an exceptional failure of the equipment. In case of failure of one of the protection means, at least one second independent means ensures the required protection level In the event of two independent failures, the required protection level is guaranteed
Zone 20			1D		

1.1.2 CATEGORY 2

Type of zone	AE probability in 365 d (one year)	Duration	Admissible categories	Protection level	Description
Zone 1	$10^{-1} > P > 10^{-3}$	**expl. atm. 10-1000 h/year**	1G 2G	High	The required protection level is also ensured in the event of recurring anomalies or malfunctions of the equipment, which must usually be taken into account.
Zone 21			1D 2D		

1.1.3 CATEGORY 3

Type of zone	AE probability in 365 d (one year)	Duration	Admissible categories	Protection level	Description
Zone 2	$10^{-3} > P > 10^{-5}$	**expl. atm. 0.1-10 h/year**	1G 2G 3G	Normal	The protection level required under normal operating conditions is ensured
Zone 22			1D 2D 3D		

2.6 EQUIPMENT TEMPERATURE CLASSES AND IGNITION TEMPERATURES

Temperature class	Maximum surface temperature of the equipment	Maximum admissible surface temperature	Ignition temperature of the flammable substance	Temperature class of the Ex correlated equipment
T1	450°C	440°C	> 450 °C	from T1 to T6
T2	300°C	290°C	> 300 ≤ 450°C	from T2 to T6
T3	200°C	195°C	> 200 ≤ 300°C	from T3 to T6
T4	135°C	130°C	> 135 ≤ 200°C	from T4 to T6
T5	100°C	95°C	> 100 ≤ 135°C	from T5 to T6
T6	85°C	80°C	> 85 ≤ 100°C	T6

2.7 DOSING PUMPS PROTECTION DEGREE

The dosing pumps marked with protection mode letter **h** according to standard **UNI IEC EN ISO 80079-37** have **protection degree "c" for construction safety and degree "k" for immersion in liquid**. This is due to the construction characteristics of the pump reducer, the helical gear and the worm screw which are closed in the reducer and the moving parts are in an oil bath (splash lubrication of the reducer) thus ensuring the two degrees of protection.

2.8 DOSING PUMP MARKING

The dosing pumps are suitable for GROUP II surface in category 2G and **according to the ignition hazard assessment, the equipment marked for group II 2G** (according to EN/IEC 60079-0 with ignition risk analysis normal malfunction + expected malfunction) **are suitable for group II 3G** (normal malfunction ignition risk analysis) **and marked accordingly also for this group.**

Accordingly machines with the following marking:

2014/34/EU ← CE Ex II 2G Ex h IIB T4 Gb; → EN ISO 80079-36

CE Ex **II 2G Ex h IIB T3 Gb;**

CE Ex **II 2G Ex h IIB T4…T3 Gb**

CE Ex **II 3G Ex h IIB T4 Gc;**

CE Ex **II 3G Ex h IIB T4 Gc;**

CE Ex **II 3G Ex h IIB T4…T3 Gc**

Are suitable for:

CE [a] = conformity to European directives, CE marking

Ex = "Epsilon" marking for equipment intended for use in explosive atmospheres

II = GROUP 2 (SURFACE)

2 = category 2 zone 1

3 = category 3 zone 2

G = explosive atmosphere with gases or vapours

Ex h = protection mode (Non electric protection type for construction safety «c» - for immersion in liquid «k»)

IIB = equipment group

T3 = temperature class 200 °C

T4 = temperature class 135 °C

T4…T3 [b] **=** Maximum surface temperature, suitable for the corresponding inflammable substance.

Gb = EPL, zone 1 equipment protection level 1*(IEC/EN 60079-0)*

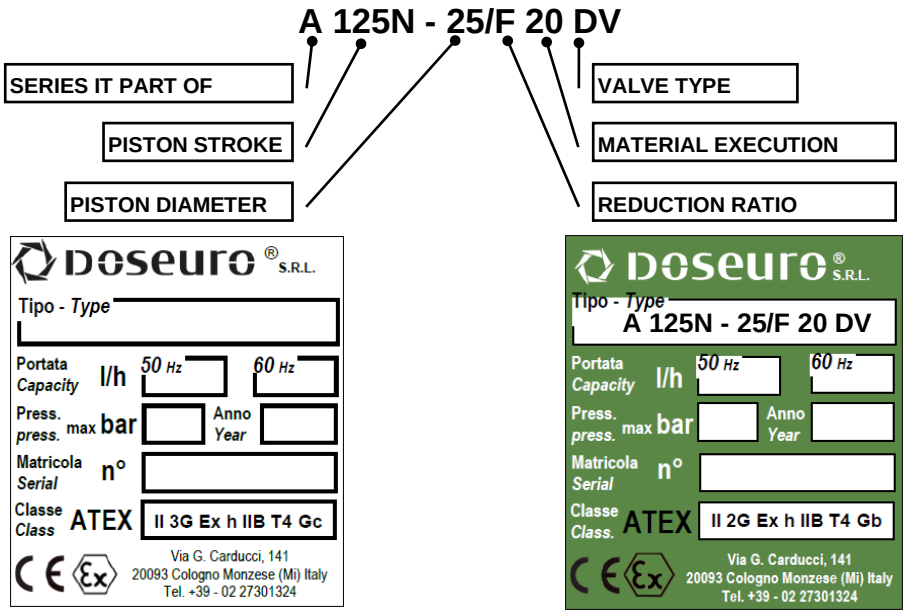
Gc = EPL, zone 2 equipment protection level 1*(IEC/EN 60079-0)*

a) Letters "CE " are the abbreviation for the French "Conformité Européenne " which means "European conformity". The manufacturer affixes the CE marking, after carrying out a conformity assessment, establishing a technical dossier and signing an EC declaration of conformity. The CE marking is the declaration that the product is assessed before being placed on the market and meets the essential requirements of European legislation on health, safety and environmental protection, known in practice as "product directives". It is a "passport" of a product, because it ensures the free movement of the product in the single market of EFTA & European Union (EU).

b) Ref. EN ISO 80079-36 p.11.2 f) & annex C3: If the actual maximum surface temperature does not depend on the equipment itself, but mainly on the operating conditions (such as a fluid heated in a pump), a single temperature class or a maximum surface temperature cannot be marked by the manufacturer. A reference to this situation must be included in the marking using a T range or a temperature range (e.g. T6 ... T4 or 85 ° c ... 150 ° c) the marking and relative information must be provided in the instructions.If the maximum surface temperature does not depend on the pump itself, but mainly on the heated fluid being conveyed, the temperature class cannot be determined by the manufacturer. It is determined by the user according to the indications provided by the manufacturer in the instructions (see clause 10).

3 - IDENTIFICATION PLATE FOR USE IN ATEX ENVIRONMENT

An adhesive identification plate is placed on the pump body, including design characteristic data, wording for the class it belongs to and possible installation area.



4 - OPERATING CONDITIONS IN AN ATEX CLASSIFIED AREA

The gear reducer, as a result of technical design characteristics, must not exceed a difference (ΔT) of +80°C compared to maximum environment temperature with a maximum limit of +40°C.
Under normal operating conditions, maximum heating of the pump body surface is based on environment temperature, pump operating pressure and the density or temperature of the liquid to be dosed. A very high temperature would be damaging to the static and dynamic seals used and proper operation.

ATTENTION!

In case of abnormal operation, an excessive noise or an increase in temperature, immediately stopping the pump is recommended.
Even the hydraulic portion, especially if the liquid being dosed is hot, since it comes in direct contact it is easy for connected components to be effected by it.
It is therefore recommended to check surface temperature in the most stressed points.

4.1 - Material compatibility in relation to the area of use

For this group and category, the dosing pump may operate in environments where there are remote possibilities that explosive atmospheres resulting from gas, vapours, mists, and air mixes, may occur and however only for a brief period of time.
In any case the materials used must be compatible with the product to be dosed and resistant the temperature class foreseen for the type of system.
In any case it is the manager that must guarantee that the temperature of the transported liquid (operating temperature) is respected.

ATTENTION!

The customer must sign the self-certification in terms of responsibility to identify and classify the area where the dosing pump is to be installed and is destined to be used.
DOSEURO® **S.r.l. is not liable if the supplied pump is suitable for non classified areas, complete with motor and other remote adjustment or control accessories (electrical servo control, impulse giver, pressure switch, pressure gauge etc.), is installed in a classified area, it may be a possible source for a spark and resulting damages to persons and/or property.**

ATTENTION!

The installation of the dosing pump in an environment with strong fumes and high humidity levels is not recommended, because the gear reducer body and the motor are in aluminium alloy, even if they are protected by paint, they may become compromised; differently from the pump head made in plastic or stainless steel, that are instead a compatible choice.
It is therefore strongly recommended to install the dosing pump in an environment that is sufficiently protected and ventilated.

5 - MATERIAL EXECUTIONS AND MAXIMUM TEMPERATURES OF THE LIQUID BEING DOSED

These tables include data related to the types of pump head compatible with installation in areas classified with respect with **Directive 2014/34/EU (ATEX) Group II Category 2G (also for Group II Category 3G)**.
For temperatures that exceed these limits it will be necessary to adopt technical solutions that are specific for each case and in any way one must contact the technical office in order to received suitable information.

ATTENTION!

As far as hydraulic characteristics, refer to the tables inserted in the use and maintenance manual.

5.1 - Maximum temperature heads

Temperatures expressed in the tables indicate the maximum heat stability limits of the materials used.

"A" SERIES PISTON PUMP HEADS			
Pump head material	Piston	Piston and valve gaskets	Maximum temperature
STAINLESS STEEL	Ceramic	All compatible mixtures	**70°C**
	Stainless steel		**150°C**
PVC	Ceramic	All compatible mixtures	**50°C**
	Stainless steel		**80°C**
PTFE	Ceramic	All compatible mixtures	**70°C**
	Stainless steel		**150°C**
PVDF	Ceramic	All compatible mixtures	**70°C**
	Stainless steel		**150°C**
PP	Ceramic	All compatible mixtures	**70°C**
	Stainless steel		**70°C**

"D" SERIES DIAPHRAGM PUMP HEADS			
Pump head material	Valve gasket	Diaphragm	Maximum temperature
STAINLESS STEEL	All compatible mixtures	PTFE / NBR	**70°C**
PVC	All compatible mixtures	PTFE / NBR	**50°C**
PTFE	All compatible mixtures	PTFE / NBR	**70°C**
PVDF	All compatible mixtures	PTFE / NBR	**70°C**
PP	All compatible mixtures	PTFE / NBR	**70°C**

HYDRAULIC DIAPHRAGM PUMP HEAD "B – BR - SD" SERIES				
Pump head material	Gaskets piston	Diaphragm	Gaskets valves	Maximum temperature
STAINLESS STEEL	AU/NBR	PTFE/NBR	All compatible mixtures	**70°C**
		PTFE/FPM		
		PTFE/EPDM		
		PTFE		**100°C**
PVC	AU/NBR	PTFE/ NBR	All compatible mixtures	**50°C**
		PTFE/FPM		
		PTFE/EPDM		
		PTFE		
PTFE	AU/NBR	PTFE/ NBR	All compatible mixtures	**70°C**
		PTFE/FPM		
		PTFE/EPDM		
		PTFE		**100°C**
PVDF	AU/NBR	PTFE/NBR	All compatible mixtures	**70°C**
		PTFE/FPM		
		PTFE/EPDM		
		PTFE		**100°C**
PP	AU/NBR	PTFE / NBR	All compatible mixtures	**70°C**
		PTFE/FPM		
		PTFE/EPDM		
		PTFE		

6 - INDICATIONS FOR INSTALLATION IN CLASSIFIED AREA

Besides the operations indicated in the use and maintenance manual, before connecting for commissioning it is necessary to verify that technical data and the ATEX conformity marking correspond to system design data and operating conditions can be assured for proper operation.

ATTENTION!

The installer, before installing and starting the pump, must carry out the following controls and he must use tools that are suitable for the classified area when monitoring.

6.1 - Pump location

The pump must be set above a strong base (metal, cement, etc.) that is stable and properly levelled, avoiding tension on its axis.
The base must always be equipped with an earthing terminal unit.
Plan for sufficient space (operative areas), to be able to easily inspect and calibrate the pump, or take apart the hydraulic part (valve and pump head).

6.2 - Pump start-up

- **Block removal**
  Before pump installation it is necessary to remove protective caps, located on the suction and discharge openings of the valves.
- **Check the oil level**
  Before first start-up, the operator must fill the oil, with the pump placed in its final position, pouring very slowly to avoid exceeding the centre line of the level window.
- **Electrical connection**
  The installer must prepare a suitable disconnecting switch for the electrical line and use cables with a suitable size for supporting the maximum current absorbed and suitable delayed tripping devices must be installed in order to protect against overheating.
- **Motor connection**
  Before completing the connections, consult indications contained in the terminal strip. Verify that the direction of motor rotation matches the arrow on the fan cover.
  Eliminate any possible objects that block a correct ventilation.
  The metal mass must be earthed using a fixed wire.
- **Connection of the suction and discharge circuit**
  The correct completion of the piping path, is particularly important for proper pump operation.
  - **In suction,** the route of the pipes must be as short and linear as possible; the piping and fittings must be sized at a nominal diameter that is equal to or greater than that of the valves.
    There must be no air infiltrations along the path and the fittings because it may cause the pump to disengage or favour air stagnation.
    Before connecting piping to pump connections, it is best to wash the piping to eliminate any extraneous object, weld drops and gasket shavings.
  - **In discharge**, the pipe must be supported independently avoiding any burden on the pump head.
    It is always recommended to plan for one or more "T fittings" after the discharge connection because they can be used to install control and safety instruments for the system. It is recommended to install the pulsation dampener diaphragm in order to stabilise the liquid and avoid excessive vibrations on the piping, protective safety relief valve.
- **Control and verification of the system and safety accessories**
  Make sure that safety instruments are connected and ready to intervene if needed.
  Before start-up it is necessary to make sure that the stop valves along the suction and discharge piping are completely open and, if the system is made using flexible piping, that there are no folds or bottlenecks.
  Check that the liquid being dosed has not solidified or frozen in the piping.
  Initial start-up should be with minimum pressure and flow rate 0, (zero), increasing it gradually using the adjustment handle, until it reaches maximum pump flow rate, in order to favour the flow of air.

7 - CONNECTION TO POWER SOURCES IN A CLASSIFIED AREA

If there are protection of adjustment systems, safety and control devices, useful or necessary to operation, installed, even they are subject to directive **2014/34/EU (ATEX) and must therefore respect its conformity.**
The electrical connection must be completed by a qualified electrician that operates according to the IEC 60079-14 standards.
According to electrical standards all equipment where network voltage is present and its isolation is class 1, the metal mass must be earthed using a fixed wire.

7.1 - Motor connection

Before pump start-up, make sure the data on the motor plate are suitable for the characteristics of the mains supply.
Make sure it is not close to any obstacles that would prevent any inspection and maintenance operations from being carried out on the installed pump, or its correct ventilation.

Connection diagram of motors to power sources

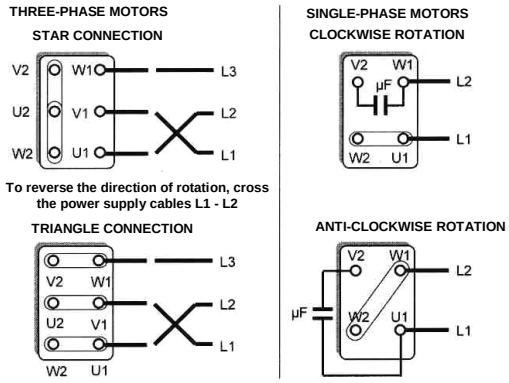
ATTENTION!

Verify that the direction of rotation of the motor matches the direction of the arrow on the fan cover.

Do not open the terminal strip in areas where there is a strong presence of flammable substances.

Cable glands compliant with EN 60079-0 must be used to feed in the cables. Unused inputs must be closed with EX certified caps.

N.B. if using a single-phase explosion proof motor, the condenser must be installed inside the control panel or inside the terminal.



8 - PUMP MAINTENANCE AND REPAIRS IN A CLASSIFIED AREA

8.1 - Maintenance procedure

ATTENTION!

Maintenance to pumps installed in areas classified as "ATEX" must only be carried out by specialised and authorised personnel, the operator must use tools that are suitable for classified and potentially explosive areas.

- The pump is stopped and disconnected from the electrical supply mains.
- The pump head and the system have been depressurised and emptied of any liquid.
- The pump has reached a temperature level where it can be moved safely.
- Clean plastic parts using a damp cloth in order to avoid accumulation of electrostatic charges.
- Once the above mentioned conditions have been confirmed, accurately wash pump components.

With reference to the use of tools in areas with potentially explosive atmospheres, be reminded of the prescriptions in **EN ISO 1127-1 Annex A**.

8.2 - Information for the use of tools in potentially explosive atmospheres:

The use of hand tools must take into account the following:

Two different types of instruments can be distinguished:

a) tools that can cause single sparks only when they are used (e.g. screwdrivers, wrenches, impact screwdrivers);

b) tools that generate a shower of sparks when used during cutting or grinding.

In zones 0 and 20, tools that can cause sparks should not be allowed.

In zones 1 and 2, only steel tools according to letter **a)** should be allowed. The tools referred to in letter **b)** should only be allowed if there is no dangerous explosive atmosphere in the workplace.

However, the use of any type of steel tools should be forbidden in zone 1 if there is a risk of explosion due to the presence of substances belonging to explosion group II C (according to IEC / TR3 60079-20, acetylene, carbon disulfide, hydrogen) and hydrogen sulphide, ethylene oxide, carbon monoxide, unless there are hazardous explosive atmospheres in the workplace while working with these tools.

The steel tools according to **a)** can be admitted in zones 21 and 22. The steel tools according to **b)** can only be admitted if the workplace is shielded from the remaining area of zones 21 and 22 and the following additional measures have been implemented:

c) dust deposits have been removed from the workplace

or

d) the workplace is kept so humid that it is not possible to disperse dust in the air or develop combustion processes.

When grinding or cutting in zones 21 and 22 or nearby, the produced sparks can be thrown over great distances and lead to the formation of smoking particles. For this reason, other areas around the workplace should also be included in the mentioned protection measures.

The use of tools in zones 1, 2, 21 and 22 should be subject to a "work permit" system (with approval by the safety manager). This should be included in the workplace safety information.

8.3 - Fluid leak measured by the hole located under the lantern

Determine whether the fluid collected is mechanical oil or pumped fluid.

- If it is pumped fluid, it means that the piston seal gasket is worn or damaged. It will therefore be necessary to replace it.
- If it is mechanical oil, it means that the **Mim** seal gasket of the slide is worn or damaged, it is therefore be necessary to replace it.

In order to make evacuation of any fluid leaks within the potentially explosive atmosphere easier, apply the transfer pipe to the cover located under the lamp holding the pump head.

8.4 - Periodical pump head check

Due to negligence, it is possible that malfunctions or operational problems may occur that only require extraordinary maintenance or operational verification.

The operator must avoid that deposits or significant dust accumulation occur, in order to help cool down the most stressed parts, subject to an overheating problem that is not compatible with areas where there is a possibility that explosive atmospheres occur.

Periodically verify that there are no liquid leaks from the seal gaskets. If pumping dangerous fluids, it is mandatory to immediately replace seal gaskets in order to avoid that any flammable vapours form in the area around the pump.

Checking the pump head

The pump head must be checked regularly to keep the pump safe and performance high.

- **A Series -** Piston pump heads: periodically check hydraulic flow capacity, in order gasket seal. Making sure that there is no leaking of dosed liquid in the rear part and that air does not form in the discharge piping.
- **D Series -** Direct diaphragm heads: periodically check hydraulic flow capacity, in order check gasket seal. Making sure that there is no leaking of dosed liquid in the rear part and that air does not form in the discharge piping.
- **B Series -** Hydraulic diaphragm pump heads: it is necessary to check that there are no oil leaks from the filling and draining plugs located in the oil chamber, from the diaphragm or from the piston seal. Any one of these leaks may initially cause a decrease in the flow rate, followed by the breaking of the diaphragm at a later date.

- **BR Series -** Hydraulic or recirculation diaphragm pump heads: besides verifying if there are any leaks, make sure that the oil contained in the recirculation vessel has not been contaminated, that the level is stable and does not oscillate significantly, this means that the recirculation and/or restore valves need to be calibrated. Prompt intervention is recommended when there are such anomalies.
- **SD Series -** Dual hydraulic or recirculation diaphragm pump heads with alarm equipment using pressure switch and visual signal using pressure gauge: besides checking for leaks, closer controls are required to maintain pump safety.

Checking the mechanical seal gaskets

- The seal gaskets must never operate dry because they may exceed operational temperature limits, therefore the pump head must always be full of liquid.
- The flushed hydraulic seals must be protected by monitoring the flushing fluid, contamination of this liquid signals irregular or defective operation of the gasket, replacement is recommended.
- The flushing fluid must always be pressurised, both during operation and during pump start-up and shut-off. It is recommended to replace the flushing liquid when it is greatly contaminated by loss of fluid.

8.5 - Valve unit cleaning

It is recommended to carry out the procedures in the indicated order after consulting the assembly drawings.

- Discharge circuit: unscrew the discharge container. Remove the valve seat, the ball and the valve guide, paying attention to the order it is assembled in.
- Clean the threaded parts of the pump head and the valves of any impurity.
- Clean valve components. If the parts are worn, proceed with replacement.

8.6 - Maintenance and maintaining protection type "c" and "k"

To keep the equipment safe and comply with the minimum parameters to maintain the protection levels of the machine, periodic checks must be carried out, as listed in maintenance.

- As specified in the paragraphs above, periodically check the gaskets and seals for leaks
- Check the lubricant level and make sure the caps are properly tightened.
- Make sure the motor connection joint does not produce hot surfaces
- Periodic inspection of the pump head tightening screws.
- Use an oil to lubricate the mechanism, with the following characteristics:

SAE 85 W-140 - viscosity cSt +40°C 328 - flash point +224°C

Quantity of oil to be inserted in the pump body

Model	Q. of oil ml	1st oil change h	2nd oil change h
A 125A/ A 125N/ B 125N/ BR 125N/ SD 125N/ S 050N/ D 050N/ D 100N	***150***	*500*	*3,000*
A 175 A/A 175N/ B 175N/ BR 175 N/ SD 175N/ D 101 N/ D 121N/ D 122N	***300***	*500*	*3,000*
A 250N/ A 350N / B 250N/ BR 250N/ SD 250N	***650***	*500*	*3,000*

9 - PROGRAMMED MAINTENANCE INTERVENTIONS

In order to preserve safety, reliability, and performance over time, the pump must be subject to periodic and programmed maintenance interventions that consist in verification, control and replacement of deteriorated parts.

It is good practice to use only original spare parts for repairs in order to guarantee pump reliability and safety at all times.
Maintenance must be carried out by applying the safety criteria expressed in the ATEX directive.

Verifications and controls are essentially visual: one must make sure that pump parts, external and internal, are not affected by corrosion or deterioration.
Particular attention must be given to installations made in plastic material, especially as far as shrinkage, cracks and breakage. Obviously the presence of these problems requires replacement of interested parts.

PERIOD	TYPE OF CONTROL	TYPE OF INTERVENTION
Monthly	Visual check of any leaks from sealing parts.	Locating leaks, repair
Every 800 hours	Verification of piston seal	Adjustment or repair
Every 6 months (or 1500 hours)	Accurate cleaning of valve units, filters, end valve.	Replacement or repair

Programming maintenance interventions is subordinate to the type and quality of the liquid being dosed.

10 - SURFACE TEMPERATURE DETECTION

The control and monitoring of pump and system surface temperatures must be carried out carefully since the products are destined to be used in areas at risk for explosion.
It is responsibility of the use or maintenance personnel to make sure that product and equipment temperature does not exceed the value of the safety and conformity standard, by carrying out regular and continual inspections and maintenance interventions.

11 - DECOMMISSIONING

Should it be necessary to decommission the pump, it is important to observe certain essential rules to

protect the product and the operating personnel.
Before disposal, an accurate cleansing with liquids compatible with the pumped liquid is necessary as there may be residues of toxic, caustic and acid liquids or sediments that can easily crystallise.

- Before removing the pump from the system, one must pay attention to the possible presence of pressurised liquids, therefore shutting off the pipe in proximity of the pump.

12 - DISPOSING OF TOXIC SUBSTANCES

Since there are classified areas, it is recommended that the user separates materials and recycles them according to National and Regional laws regarding waste disposal.
To ensure that there are no residual risks of environmental pollution, the materials used for the production process, particularly the lubricant, must be stored and disposed of in compliance with national laws.

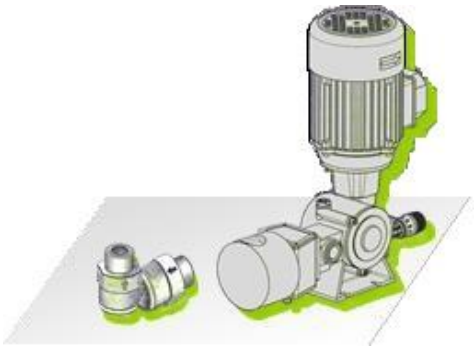
In case of product dismissing or demolition, the parts it is made of must be separated and placed in the care of companies that specialise in waste disposal and recycling of industrial waste.

13 - REPAIR ACCOUNT MAINTENANCE

In most cases, replacing worn parts, does not constitute a great operational difficulty, before carrying out the intervention, the operator must consult drawings in the manual ***(DRAWINGS AND ELEVATIONS)*** manual and follow instructions contained in it.
If the malfunction were difficult to solve within an operational area, sending the pump to our workshop is recommended.
INVIOLABLE CONDITIONS FOR ACCEPTING ANYTHING UNDER A REPAIRS ACCOUNT IN OUR WORKSHOP ARE THE FOLLOWING.

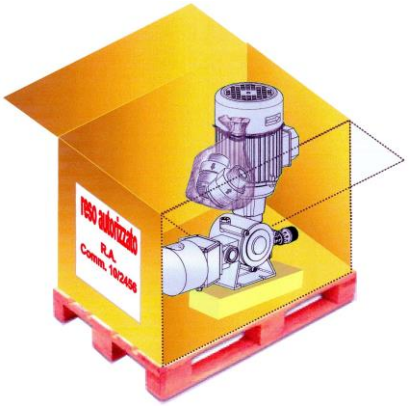
Practical recommendations for pump reclamation.

If water is not suitable to clean the pump head, use a liquid compatible with the dosed product.



1) **Disassemble both pump head valve units and wash them separately so that no residue remains inside. Dry them and place them in a bag.**
2) **Position the pump in a pre-set position for collecting washing liquids. Keeping at a proper distance, wash the pump using the reclamation fluid, passing it through the valve unit hole and allowing any deposits present to detach.**

3) **Completely empty the oil contained in the gear reducer body.**
4) **Position the pump firmly in adequate packaging to avoid damage due to transport, together with the previously washed valve units.**
5) **The customer must accompany the goods with a declaration that the material has been reclaimed to be handled safely.**



6) **Before shipment the sender must contact our Sales Department (tel. 0227301324 – fax 0226700883). The appropriate form will then be sent and must be filled-in in its entirety accompanying the pump, together with the labelling that must be applied on the packaging.**
7) **If we receive any material and the above requirements were not followed, it will be returned and expenses will be charged.**

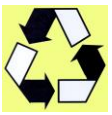
RESIDUAL RISK!

Adopt suitable protective measures in order to guarantee operator safety and protection and machine integrity, carefully choosing the most suitable reclamation fluid.

14 - USER INFORMATION

Pursuant to article 13 and to Legislative Decree 25 July 2005, no. 151, Implementation of Directives 2011/65/EU, 2012/19/EU, 2003/108/EC relative to the restriction of the use of certain hazardous substances in electrical equipment, as well as waste disposal.

The crossed out bin symbol on the appliance indicates that at the end of functioning the product cannot be disposed of as if normal urban waste.
The user must take the equipment to suitable separate collection centres for electric waste.



Adequate recycling helps avoid possible negative effects on the environment and health, as well as favouring the re-use of materials which make up the appliance.
The illegal disposal of the product by the user entails the application of administrative sanctions under "art. 255 Leg. Decree no. 152/2006.

15 - ATTACHED FORMS

DOSING PUMP MAINTENANCE SHEET

PUMP TYPE: ……..SERIAL No.: ……ITEM: ……
Liquid pumped: …….. Date of installation: …….. Date of commissioning: ……..

Operation period: …… Date:……..

FREQUENCY	COMPONENT	TYPE OF INTERVENTION	ACTION

SPARE PARTS REQUEST FORM		
APPLICANT DATA	COMPANY NAME	
	NAME SURNAME	
	ADDRESS	
	LOCATION	
	POST CODE	
	PROVINCE	
	TELEPHONE	
	FAX	
	E-MAIL	

MACHINE DATA	MACHINE NAME	
	MODEL	
	SERIAL NUMBER	
	YEAR OF MANUFACTURE	

	DRAW. SECTION	POSITION	DESCRIPTION	QUANTITY
LIST OF PARTS TO BE ORDERED				

NOTES:	

DECLARATION OF RECLAMATION BY THE CUSTOMER

Company:			Spokesperson:	
Address:		No.	Telephone:	
City:		Post code:	Fax:	
Province:			E-mail:	

RESIDUAL RISK!

Each pump must be clean, reclaimed and shipped carriage paid with the indications of the dosed liquid.

Each pump must arrive at the Doseuro workshop with the **valve unit disassembled from the pump and fully reclaimed.**

Before shipping the pump, **contact the sales office** to receive the **AUTHORISED ACCEPTANCE NUMBER**.

The form must be filled in all its parts, being an essential condition for carrying out maintenance work.
Cases for which **the material is rejected to the sender carriage forward**:

- Packaging and/or TD without AA number (Authorised Acceptance).
- Material not reclaimed or without the repair form.
- Valves still mounted on the pump and/or presence of reclamation fluid and/or chemical product in the packaging.

GOODS DESCRIPTION

No. of Pieces:		Dosing Pump:		Other:	

Model:	Serial No.
Order No.:	Fluid treated:

FAULT DESCRIPTION AND OTHER INDICATIONS

Notes:

We declare under our responsibility that the pump delivered for repairs has been reclaimed by us following the procedure requested by you. We believe that there is no residue inside that may cause a hazardous situation to the health of the operator in charge of maintenance.

DECLARATION OF RECLAMATION	SEAL AND SIGNATURE	DATE:
	_____	_____

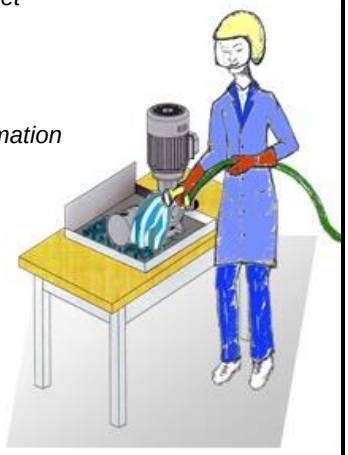
MANDATORY CONDITIONS FOR ACCEPTANCE FOR REPAIRS

- Dear customer, every product to be sent to DOSEURO S.r.l. to perform maintenance, must be properly cleaned and decontaminated.
On-site repair of the pumps can only be carried out if the service technician has been informed of the risks and of the directives in force.
The service technician will open the packaging and start maintenance operations only after receiving confirmation of the decontamination.
The goods sent to us that are considered by the company as a potential source of risks, shall be immediately returned to the sender with the costs borne by the latter.

Remove the valve unit from the pump head and wash it separately so that no residue remains trapped.
Place them in a bag.

Place the pump in a pre-set position for collecting washing liquid, keeping at a proper distance, wash the pump using the reclamation fluid, passing it through the valve unit hole and allowing any deposits present to detach.

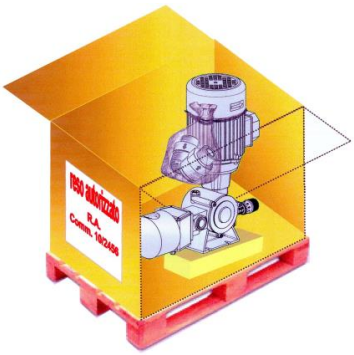
Fully drain the oil contained in the body of the reducer.



Position the pump firmly in a suitable packaging to avoid damage due to transport and remember to place the previously bagged valve unit back in the packaging.

The customer must accompany the goods with a declaration that the material has been reclaimed to be handled safely.

*On at least two visible sides, place the labels showing The **AUTHORISED ACCEPTANCE NUMBER** found on the next page.*



RESIDUAL RISK!

Adopt suitable protective measures in order to guarantee operator safety and protection and machine integrity, carefully choosing the most suitable reclamation fluid.

MISCELLANEOUS:

To request to DOSEURO:

Doseuro METERING PUMP SOLUTIONS	Support service	Rev.: 0 of 2010 Date: 07/2010

AUTHORISED ACCEPTANCE No.:

AA0066/15

PLACE IN A VISIBLE SPOT ON THE PACKAGING

Doseuro METERING PUMP SOLUTIONS	Support service	Rev.: 0 of 2010 Date: 07/2010

AUTHORISED ACCEPTANCE No.:

AAnnnn/aa

PLACE IN A VISIBLE SPOT ON THE PACKAGING

For a better completion and use of your dosing pump, choose:

ACCESSORIES by Doseuro S.r.l.

Request them from our Sales Office

Doseuro™

METERING PUMP SOLUTIONS

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1st Edition - 2019