Lubrication Flow metering device

Version in compliance with Directive CE 94/9 (ATEX)

User and Maintenance Manual

Original text translation

Warranty Information

CONTENTS

CE Ex II 2GD c IIC T85 °C IP65

1. INTRODUCTION

This user and maintenance manual relates to the Atex Low pressure flow metering device, version in compliance with ATEX standards, for potentially hazardous areas, classified zones 1 and 21 with presence II group inflammable gas and combustible dusts. The maximum surface temperature developed by Atex Low pressure flow metering device in the most extreme conditions is 85°C.

The latest version may be obtained from Dropsa Sales Office, or by consulting our web site http://www.dropsa.com**.**

This user and maintenance manual contains important information about protecting the health and safety. You must read and look after it carefully, making sure that it is available at all times for any operators that may need to consult it.

2. GENERAL DESCRIPTION

The flow metering device operates according using a cyclic progressive divider concept: a volumetric piston enables the operation of the next piston and will continually run as long as flow is being achieved through the device.
The Lubrication metering device is built upon the principle of three pistons. One complete cycle of all pistons is equivalent to 0.35 cm3 dosage per cycle.
Volumetric output is read by an inductive proximity switch: each consecutive leading edge transition of the proximity sensor (ON to OFF) represents one full cycle the metering device and represents the 0.35cm3 nominal output

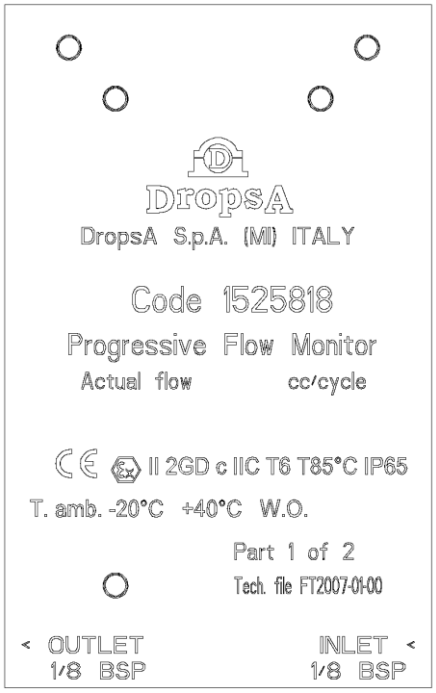
Key elements of flow meter (see fig. Par.5):

- Volumetric Flow metering;
- Separate base plate for easy maintenance
- Intrinsically safe Proximity sensor (NAMUR NC);
- Removable cartridge filter integrated in feeder body;
- Integrated Flow Bypass in case of spool blockage.

3. MACHINE IDENTIFICATION AND MARKING

CE and ATEX marking below is laser engraved on the feeder body.

Figure 3.1



3.1 ATEX Information

II	Group of equipment for surface (not for mines or underground)
2GD	equipment for explosive atmosphere due to flammable gas and combustible dust. 2GD Category is appropriate for zones classified as 1 zone (2 zone included) and 21 zone (22 zone included).
c	Protection mode designed for the method of construction (EN 13463-5 normative).
IIC	IIC Group flammable gas admitted.
T6	Max. surface temperature for flammable gas.
T 85 °C	Max. surface temperature for combustible dust.
IP65	Protection grade (see note).

Note: IP65 protection grade is referred to electric parts. Not electric parts are protected from combustible dust by the type of process that provides for the continued presence of oil and grease on the mechanical ignition sources.

4. TECHNICAL CHARACTERISTICS

The Atex Lubrication flow metering device consists of a series of components with the following characteristics:

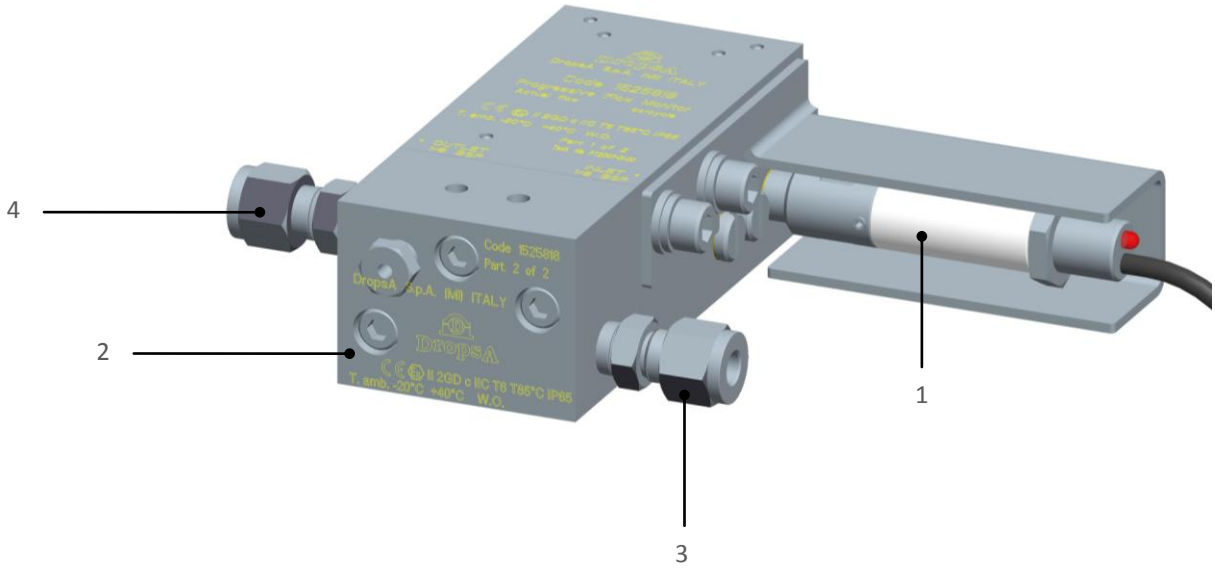
GENERAL CHARACTERISTICS	
Empty weight	2 Kg
ELECTRICAL CHARACTERISTICS	
V max voltage supply	8 V DC
Prox Sensor maximum reading range	2mm
I max current consumed	<= 3mA
Type of protection	Intrinsically safe
HYDRAULIC CHARACTERISTICS	
Max. number of readings	100/min
Max. measured flow rate	35 cc/min
Flow rate for reading sensor	0.35 cc/ cycle nominal
Min. operating pressure	10 bar
Max. operating pressure	400 bar
By-pass setting pressure	40 bar
Outlet connection	G3/8" BSP
Removable filter cartridge	25 µ mesh
Temperature of use	- 20 ÷ + 40 °C
Operating humidity	90 % rel. humidity
Permitted lubricants (1)	Mineral lubricating oil min 32 cSt max1000cSt; grease max NLGI00
Storage temperature	-20 ÷ +60 °C

N.b. The specifications refer to the temperature of use of +20°C (+68°F)

(1) **If a different product is used, please contact Dropsa S.p.A. to ensure it is suitable for use.**

WARNING: **do not supply the machine with voltages and pressures different from those indicated on the plate.**

5. MACHINE COMPONENTS

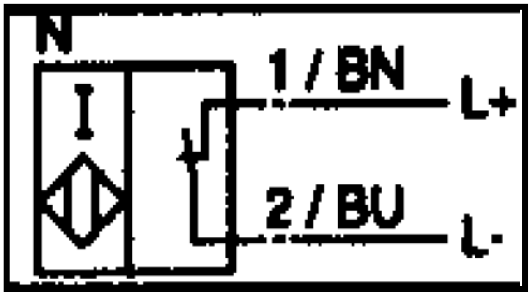


STANDARD COMPONENTS	
1	Sensor
2	Divider
3	Inlet
4	Output

5.1 ELECTRICAL CONNECTIONS

Inductive Proximity Sensor:

NAMUR NC
8 V DC Nominal Voltage
-25°C + 100 °C IP65
II 3GD
II 2GD
EEx ia II C T6



ATTENTION: Sensor must be supplied by an associated equipment with intrinsically safe barrier. This associated equipment shall be installed in a safe area (Zone not classified) according to the diagram to par.7.4.

5.2 GROUNDING CONNECTOR

- For grounding connection of different parts of flow metering device an electric cables with appropriate cable lugs should be used;
- all single grounding wires must be connected to each parts of flow metering device;
- The EXPLOSION PROOF inductive sensor has its own grounding.

6. UNPACKING AND INSTALLATION

6.1 UNPACKING

Once a suitable location has been found to install the unit remove the machine from the packaging. Check the device has not been damaged during transportation or storage. No particular disposal procedures are necessary, as packaging materials are not dangerous or polluting. Refer to the local regulations for disposal.

6.2 INSTALLATION

Unit can be installed only by a trained staff familiar with hazardous area equipment.
Not use the flow metering device submerged in fluids or in corrosive environments.
Use protective gloves and safety glasses as provided in data sheet of the lubricating oil.

DO NOT use lubricants that are incompatible with NBR rubber gaskets, in case of doubt consult a Dropsa engineering.
Do not ignore dangers to health and observe all normal necessary safety precautions.
WARNING*!: All components must be grounded.* This applies both to the electrical components and control devices. To do this, make sure that the grounding wire is properly connected. For safety reasons, the earth conductor should be about 100 mm longer than the phase conductors. In case of accidental disconnection of the cable, the protective earth terminal will be the last to come off.

Installation Requirements

To install the flow meter you should follow these steps:

- Verify classification of the hazardous area;
- flow metering device installation must be in an area where it is protected from accidental shocks;
- It is not suitable to be installed outdoors, unless protection against rain and water splashes is applied;
- Avoid possible salt spray that could compromise the corrosion resistance of the mechanical parts;
- ATTENTION! Inductive sensor is EEx ia type: It can work in Ex hazardous area only if it is interfaced with an INTRINSICALLY SAFE ISOLATED BARRIER, to be installed by customer and not included with the sensor.

7. INSTRUCTIONS FOR USE

7.1 INSTRUCTION FOR START UP

Before starting the first time make following checks:

1. Check the integrity of all parts;
2. Make sure that you use a suitable lubricant;
3. Verify that the environment temperature is within the working range;
4. Make sure that the electrical connection of the inductive sensor is properly executed;
5. Ensure correct procedures for venting environment.

7.2 INSTRUCTIONS FOR USE

1. Program the calibration curve of the sensor for the pressure range (0-400 bar) into your control system;
2. Check that there is a regular reading of the inductive sensor once the system is purged;
3. Make sure that during operation there are no leaks and monitor that there is regular output from the inductive sensor (flashing light).

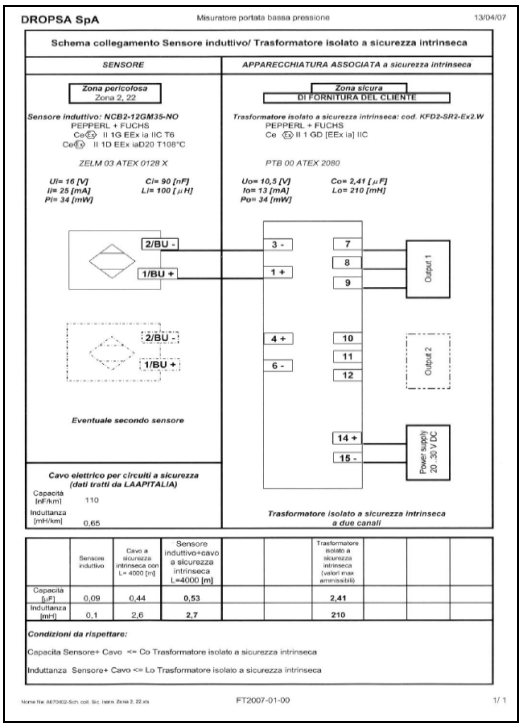
7.3 INSTRUCTIONS FOR EMERGENCY SHUTDOWN

Note: The Flow sensor is not equipped with command electrical device. All operating logic must be implementing by the customer.

ATTENTION*:* In case of emergency shutdown of lubrication system, the flow meter will indicate a loss of impulses due to a flow failure across the device. The host machine's control system should monitor this alarm condition and determine if a shutdown of the machines is necessary in order to avoid possible damage (seizures).

7.4 ELECTRICAL CONNECTION DIAGRAM OF SENSOR

The sensor cycle must be connected to a barrier by the end user.
In the figure below is summarized the connection wiring schematic.



8. TROUBLESHOOTING

***ATTENTION*: The machine may only be opened and repaired by authorized Dropsa personnel.**

The following diagnostic table indicates the main anomalies, which may be encountered, the probable causes and possible solutions.
If you cannot solve the problem, do not attempt to disassemble parts of the machine but contact the Engineering Department of DROPSA S.p.A., pointing out anomaly details.

PROBLEM	CAUSE	SOLUTION
No lubricant supply	Loss of lubricant from the inlet or outlet fitting.	Tighten or replace two fittings sealing of the two pipes
No flow through device/no sensor indication of flow	Seizure one of three pistons dosing	Replace the flow metering device
Irregular pressure	Check that there are no leaks from the fittings	Tighten the two fittings leak or replace gaskets
Irregular flow	Problem of incorrect reading of the inductive sensor • Check that there are no small leaks from the fittings	Adjust inductive sensor position to ensure correct reading. Tighten the two fittings leak or replace gaskets
Failure to read flow	Damage to the inductive sensor The bypass valve or spring may have failed.	Replace of inductive sensor Replace of spring bypass

9. MAINTENANCE

Place flow metering device under a test system to easily verify flow and pressure
Ensure use of adequate personal protection where necessary to avoid contact with mineral oil.

GENERAL INFORMATION
All installation, use, maintenance and removal of flow meter must be performed only by adequately trained personnel familiar with operating IN POTENTIALLY EXPLOSIVE ENVIRONMENTS. All equipment used in hazardous environments must be suitably protected to avoid sources of ignition during maintenance operations (e.g. electrical equipment)

Periodically, you should check:

VERIFY	CYCLE WORKING/ TIME WORKING
1. Status of lubrication	1000 hour/ every 6 months
2. oil grease levels	2000 hour / once a year
check that there is no leakage of lubricant from the flow meter connection	Daily
Daily dusting the Flow meter in case on its surface you accumulate more than 5 mm of dust flammable per day. Otherwise, dust surfaces at least once a week	Daily or weekly
3. Filter cleanliness	1000 hour

The machine does not require any special equipment for any control and/or maintenance activity. It is recommended to use tools and personal protective devices suitable for use (gloves) and that are in good condition according to current regulations to prevent damage to people or machine parts.

***ATTENTION*: Make sure that the electric and hydraulic power supplies are disconnected before carrying out any maintenance work.**

In the case of doubts and/or problems that cannot be solved, do not try to discover the reason by disassembling machine parts, but contact the DROPSA S.p.A technical office.

10. DISPOSAL

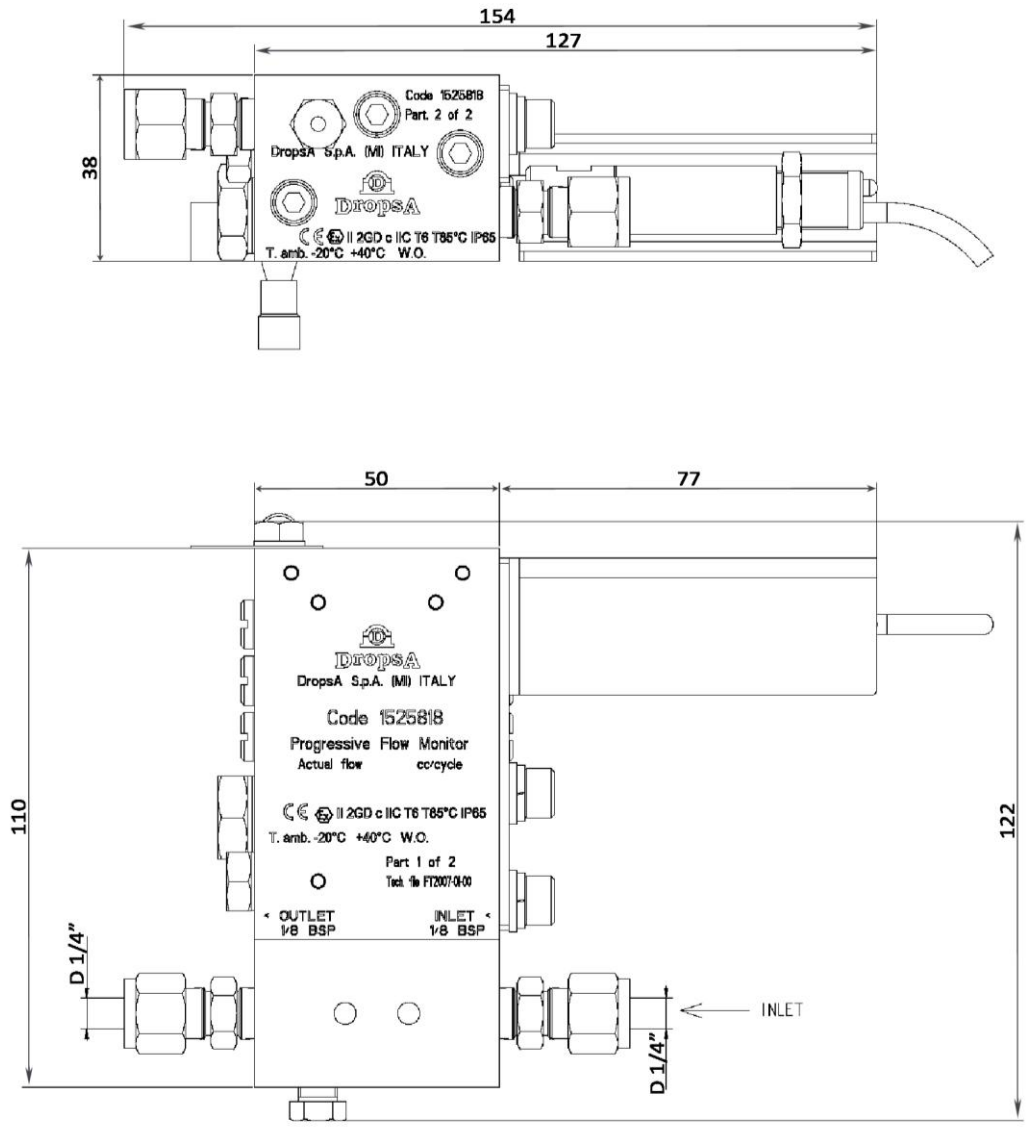
During machine maintenance, or if it is demolished, do not dispose of the polluting parts in an improper manner. Refer to the local regulations for their correct disposal. When demolishing the machine, the identification plate and all other documents must be destroyed.

11. ORDERING INFORMATION

DESCRIPTION	PART NUMBER
Complete Flow metering device	1525818

SPARE PARTS DESCRIPTION	PART NUMBER
Sensor	1655212
25µ Filter cartridge	0712101

12. DIMENSIONS



13. HANDLING AND TRANSPORT

Before shipment, Flow meters are carefully packed in a cardboard box. During carriage and storage of equipment, pay attention to the direction indicated on the box. Upon receipt, check that the packaging is not damaged and store the product in a dry place.

Lift the equipment according to the direction shown on the cardboard package.
The machine components can support storage temperatures between
-20 to + 60 °C; however, to prevent damage, the machine must only be started up after the machine has reached a temperature of +5 °C.

14. PRECAUTIONS

The warnings about the risks involved in using a pump for lubricants must be read.
The operator must understand its operation and clearly understand the hazards connected to pumping pressurised grease.
Therefore we recommend the following:

- Check the chemical compatibility of the material with which the pump is built with the fluid to be pumped (see chap. 4). An incorrect selection could cause, in addition to damaging the pumps and pipes, serious risks for people (spillage of irritating products that are harmful to health) and for the environment.
- Never exceed the maximum operating pressure permitted for the pump and the components connected to it. In the case of doubt, refer to the data specified on the machine plate.
- Only use original spare parts.
- If components must be replaced with others, make sure they are suitable for operating at the pump's maximum operating pressure.

ATTENZIONE! ATTENTION!
Never try to stop or deviate any leaks with your hands or other body parts.

NOTE: Personnel must use protective devices, garments and tools in compliance with current standards with regard to the location and the use of the pump both during work as well as during maintenance operations.

Electric current
Do not carry out any work on the machine before disconnecting it from the electrical power supply and making sure that no one can reconnect it during the operation. All the installed equipment (electric and electronic), tanks and basic structures must be connected to the ground line.

Inflammability
The lubricant used in the lubrication circuits is normally not an inflammable liquid. It is however necessary to adopt all the possible measures to prevent that it comes into contact with very hot parts or open flames.

Pressure
Before each operation, make sure there in every branch of the lubrication circuit that there is no residual pressure that could cause oil to spray when disassembling fittings or components. After long periods of inactivity, check the seal of all the parts subject to pressure. Do not subject the fittings, pipes and pressurised parts to violent impacts. Damaged flexible pipes or fittings are DANGEROUS and must be replaced.
Only original spare parts should be used.

Noise
Under normal operating conditions, noise emission **does not exceed 70 dB "A"** at a distance of 1 metre (39.3 inches) from the flow meter.

A comparison table is provided between the classification of NLGI lubricants (National Lubricating Grease Institute) and the ASTM classification (American Society for Testing and Materials) for greases for the values that concern the pump.

GREASES	
NLGI	**ASTM**
000	445 – 475
00	400 – 430

For further information about the technical specifications and the safety measures to adopt, refer to the product safety sheet (Directive 93/112/EEC) relative to the type of lubricant selected and supplied by the manufacturer.

NOTA: NOTE:
The pump was designed to operate with lubricants with a maximum rating NLGI 00. Use lubricants that are compatible with NBR gaskets. Any internal residual lubricant used for assembly and testing purposes is NLGI 000 oil.

15. CLEANING

It is necessary to remove periodically dust from pump avoiding the spread in the air. For this operation refers to Safety Officer.

16. TRAINING

Personnel assigned to installation, electrical connections and ordinary and special maintenance of the pump, must have at least 8 hours of specific training by an appropriate organism on equipment for explosive atmospheres caused by the inflammable gases and combustible dusts.

17. WARRANTY

All products manufactured and marketed by Dropsa are warranted to be free of defects in material or workmanship for a period of at least 12 months from date of delivery. Extended warranty coverage applies as follows:

Complete system installation by Dropsa: 24 Months

All other components: 12 months from date of installation; if installed 6 months or more after ship date, warranty shall be maximum of 18 months from ship date.

If a fault develops, notify us giving a complete description of the alleged:

- ✓ malfunction
- ✓ part number(s)
- ✓ test record number where available (format xxxxxx-xxxxxx)
- ✓ date of delivery
- ✓ date of installation
- ✓ operating conditions of subject product(s)

We will subsequently review this information and, at our option, supply you with either servicing data or shipping instruction and returned materials authorization (RMA) which will have instructions on how to prepare the product for return.

Upon prepaid receipt of subject product to an authorized Dropsa Sales & Service location, we will then either repair or replace such product(s), at out option, and if determined to be a warranted defect, we will perform such necessary product repairs or replace such product(s) at our expense.

Dropsa S.p.A. reserves to right to charge an administration fee if the product(s) returned are found to be not defective.

This limited warranty does not cover any products, damages or injuries resulting from misuse, neglect, normal expected wear, chemically caused corrosion, improper installation or operation contrary to factory recommendation. Nor does it cover equipment that has been modified, tampered with or altered without authorization.

Consumables and perishable products are excluded from this or any other warranty.

No other extended liabilities are states or implied and this warranty in no event covers incidental or consequential damages, injuries or costs resulting from any such defective product(s).

The use of Dropsa product(s) implies the acceptance of our warranty conditions. Modifications to our standard warranty must be in made in writing and approved by Dropsa S.p.A.

18. DECLARATION OF CONFORMITY

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AN ISO 9001 APPROVED COMPANY

DICHIARAZIONE CE DI CONFORMITÁ/DECLARATION OF COMPLIANCE WITH STANDARDS/ DECLARATION DE CONFORMITE/ KONFORMITÄTSERKLÄRUNG DES STANDARDS /DECLARACIÓN DE CONFORMIDAD/ DECLARAÇÃO DE CONFORMIDADE

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DICHIARA /CERTIFIES / CERTIFIE/ ZERTIFIZIERT, DASS/ DECLARA/ CERTIFICA:

che il prodotto denominato/that the product called/ le produit appelè/ das Produkt mit dem Namen/ el producto que se llama/ o produto chamado:

“Misuratore di portata a bassa pressione”
Code: 1525818
Category: II2GD
Class of temperature: T6/T85 °C
Gas group: IIC
Year of construction: 2012
Technical file: 2007-01-00

è conforme alle condizioni previste dalle Direttive CEE /has been constructed in conformity with the Directives Of The Council Of The European Community on the standardization of the legislations of member states/ a été construite en conformité avec les Directives Du Conseil Des Communautes Europeennes/ Entsprechend den Richtlinien des Rates Der Europäischen Union, für die Standarisierung der Legislative der Mitgliederstaaten, konstruiert wurde/ cumple con las condiciones establecidas por las directivas comunitarias/ foi construído em conformidade com as diretivas do Conselho das Comunidades Europeias:

- 94/9 CE Direttiva Atex Atmosfere Esplosive/ ATEX Explosive Atmospheres Directive/ Directive ATEX Atmosphères explosives/ATEX explosionsgefährdeten Bereichen Richtlinie 94-9-EG /Atmósferas explosivas ATEX/Directiva ATEX Atmosferas Explosivas

CE

La persona autorizzata a costituire il Fascicolo Tecnico presso Dropsa S.P.A.
The person authorized to compile the Technical File care of Dropsa S.P.A.

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Maurizio Greco

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Legal representative
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Vimodrone (MI), September 2012

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