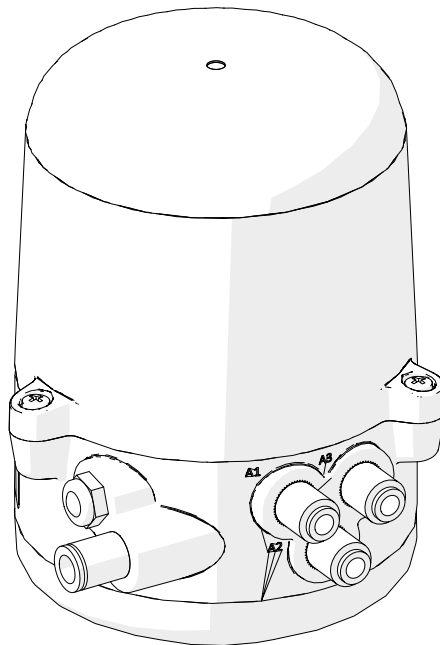


INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

## CONTROL HEAD

# C-TOP eX



10.428.32.0005



Original Instructions

10.428.30.01EN

(0) 2024/07



**INOXPA S.A.U.**

Telers, 60  
17820 - Banyoles (España)

hereby declare under our sole responsibility that the

Machine: **CABEZAL DE CONTROL**

Model: **C-TOP eX**

Type: **C-TOP eX 0E 1D, C-TOP eX 0E 2D, C-TOP eX 0E 3D  
C-TOP eX 1E 2D, C-TOP eX 2E 2D, C-TOP eX 3E 3D**

Serial number **IXXXXXXXXXX to IXXXXXXXXXX  
XXXXXXXXXXIINXXX to XXXXXXXXXXXIINXXX**

fulfills all the relevant provisions of the following directive:

**Directive on Equipment for Explosive Atmospheres (ATEX) (2014/34/EU)**



II 2G Ex ia IIC T4 Gb  
II 2D Ex ia IIIC T135 °C Db

**Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment**

and with the following harmonized standards and/or regulations

**EN IEC 60079-0:2018  
EN 60079-11:2012  
EN IEC 63000:2018**

Additionally, this machine fulfills the requirements of the following regulations:

**EN 61326-1:2013  
EN 61010-1:2010/A1:2019/AC:2019-04  
EN 60204-1:2018**

The Official Laboratory J. M. Madariaga (LOM), Notified Body No. 0163, has carried out an EU-type examination and issued the EU-type examination certificate number LOM24ATEX1014X.



David Reyero Brunet  
Technical Office Manager  
1st July 2024



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## 2. Generalities

### 2.1. INSTRUCTIONS MANUAL

This manual contains information about the reception, installation, operation, assembly and maintenance of the control head C-TOP Ex.

Carefully read the instruction before starting the control head, familiarize yourself with the installation, operation and correct use of the control head and strictly follow the instructions. These instructions should be kept in a safe location near the installation area.

The information published in the instruction manual is based on updated data.

INOXPA reserves the right to modify this instruction manual without prior notice.

### 2.2. COMPLIANCE WITH THE INSTRUCTIONS

Not following the instructions may impose a risk for the operators, the environment and the machine, and may cause the loss of the right to claim damages.

This non-compliance may cause the following risks:

- failure of important machine/plant functions,
- failure of specific maintenance and repair procedures,
- possible electrical, mechanical and chemical hazards,
- the risk to the environment due to the type of substances released.

### 2.3. WARRANTY

The conditions of the warranty are specified in the General Sales Condition that has been delivered at the time of placing your order.



The machine may not undergo any modification without prior approval from the manufacturer.

For your safety, only use original spare parts and accessories. The usage of other parts will relieve the manufacturer of any liability.

Changing the service conditions can only be carried out with prior written authorization from INOXPA.

The non-compliance of the prescribed indications in this manual means misuse of this gear on the technical side and the personal safety and this, exempt INOXPA of all responsibility in case of accidents and personal injuries and/or property damage. Also, excluded from the warranty all breakdowns caused by improper use of the gear.

Please do not hesitate to contact us in case of doubts or if further explanations are required regarding specific data (adjustments, assembly, disassembly, etc.).

# 3. Security

## 3.1. WARNING SYMBOLS



Safety hazard for people in general and/or for the control head



Electrical hazard



Important instructions for explosion protection



Indicate the need for the user to consult the Installation, Service, and Maintenance Instructions

**ATTENTION**

Important instruction to prevent damage to the equipment and/or its function

## 3.2. GENERAL SAFETY INSTRUCTIONS



Read the instruction manual carefully before installing and starting the control head. Contact INOXPA in case of doubt.

For a reliable and without problems function follow the instructions of this manual.

The installation and the use of the control head always must be following the health and safety applicable regulations.

### 3.2.1. During installation



Always take into account the [Technical Specifications in chapter 8](#).

Use the device only for its intended use and only with the recommended equipment by INOXPA.

Before performing the installation ensure that the compressed air and the power supplies are switched off and that the actuator of the process valve is pressureless.

Ensure that the power supply does not restart.



The electrical installation should be equipped with protection systems and disconnection devices, such as a residual current device or an automatic switch.

All the electrical work should be carried out by specialised personnel.

Use only power supplies that ensure electrical insulation of the operating voltage in accordance with IEC/DIN EN 60204-1 and IEC 62368-1.

Observe the general requirements for PELV circuits in accordance with IEC/DIN EN 60204-1.

Installation errors can damage the electronics or cause malfunctions.



The C-TOP eX contains electrostatically sensitive components. Electrostatic discharge caused by improper handling or incorrect earthing can damage the internal electronics. Disconnect the PLC power supply before handling the control head, as it is part of the PLC input/output system. The control head must be powered by the same power supply as the PLC. The power supply must not be used to supply power to other equipment and must comply with the requirements of the EN 61131-2 standard. The installation must be protected against reverse polarity and short circuits

### 3.2.3. During operation



Always take into account the [Technical Specifications in chapter 8](#).  
Only use the product if it is in perfect technical condition.  
NEVER exceed the specified limit values.  
Do not touch the inside of the control head when it is in operation.



All the electrical work should be carried out by specialised personnel.  
The C-TOP eX contains electrostatically sensitive components. Electrostatic discharge caused by improper handling or incorrect earthing can damage the internal electronics.

### 3.2.2. During maintenance



Always take into account the [Technical Specifications in chapter 8](#).  
Before starting the maintenance work, make sure that the compressed air supply is switched off and that the air supply hoses are pressureless. Secure the system against accidental restarting.  
Clean the control head according to the standard procedure and using neutral products. Do not use high-pressure cleaning machines or aggressive cleaning products to clean the control head.  
All control heads and their replaced components must be disposed of or recycled appropriately, in accordance with the existing directives in each region.



All the electrical work should be carried out by specialised personnel.  
Disconnect the PLC power supply before handling the control head, as it is part of the PLC input/output system.  
Before starting the maintenance work, make sure that the power supplies are switched off. Secure the system against accidental restarting.

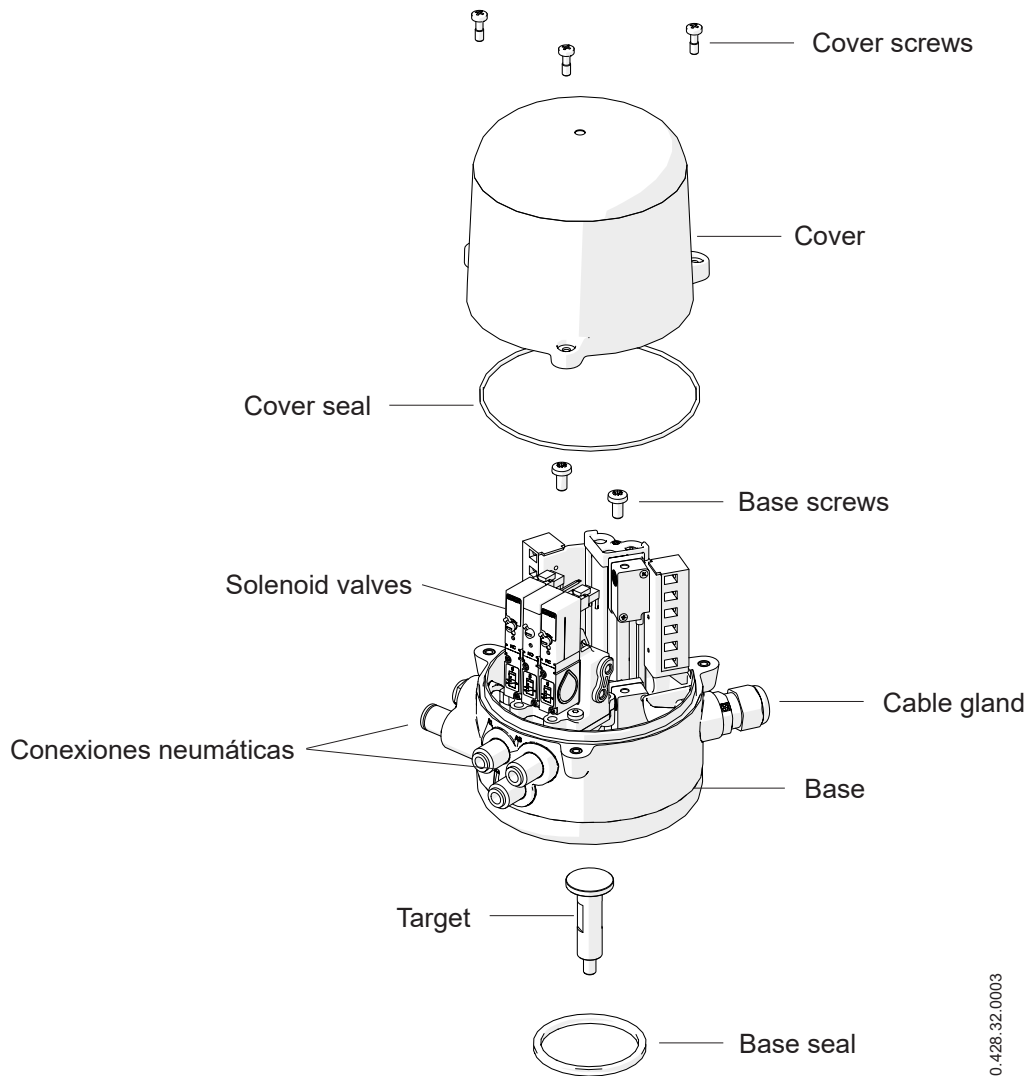
# 4. General Information

## 4.1. DESCRIPTION

The C-TOP S is a control head that adapts to all of the INOXPA actuators to automate pneumatically driven process valves located in potentially explosive areas.

The control head contains up to three solenoid valves to automate the process valves. These solenoid valves operate the valve based on external signals.

Additionally, the control head can contain up to three sensors capable of reading and informing the valve actuator position.



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## 4.2. APPLICATION

The C-TOP eX can be installed in any process valve (butterfly valves, ball valves and simple or double seat valves) located in potentially explosive areas within food, beverage, chemical and pharmaceutical industries.

## 5. Installation

### 5.1. RECEPTION OF THE CONTROL HEAD



INOXPA is not liable for any deterioration of the material caused by its transport or unpacking.

When receipt the control head, check to see whether all the parts listed on the delivery slip are present:

- control head,
- quick installation guide with access to the complete instructions manual.

INOXPA inspects all control heads before packaging. However, it cannot guarantee that the merchandise arrives at the user intact.

When unpacking the valve:

- take all possible precautions against damage to the control head and its components,
- inspect the valve or the parts that comprise it for possible damage incurred during shipping.

### 5.2. TRANSPORT AND STORAGE



The buyer or user shall be liable for assembly, installation, start-up and operation of the control head.

Take all possible precautions when transporting and storing the control head to avoid damaging it and its components.



The symbol indicates that the product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.

### 5.3. IDENTIFICATION OF THE CONTROL HEAD

The control head is inscribed with a fabrication number for identification and the specific ATEX marking.

II 2G Ex ia IIC T4 Gb  
II 2D Ex ia IIIC T135 °C Db

Indicate the fabrication number on all documents to refer to the control head.

### 5.4. LOCATION

Place the control head leaving enough space around it to realize easily the dismantling, the inspection and the review of the control head. The installation should allow that the removable parts are could remove easily.

When the control head is mounted on equipment, the specific ATEX marking of the other components should be checked to ensure compatibility the working area where the equipment will be installed. The most restrictive marking of the equipment components should always prevail.

The equipment must be protected from exposure to direct sunlight or ultraviolet (UV) radiation.

## 5.5. MECHANICAL INSTALLATION OF THE CONTROL HEAD

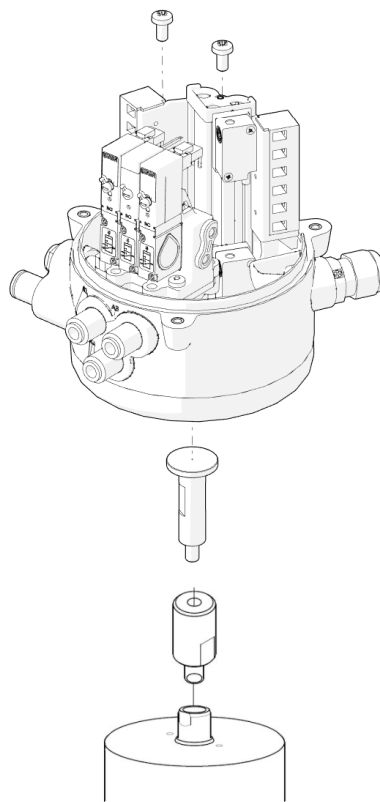


All the installation work of the control head should be carried out by specialised personnel. Always follow the instructions of the present manual.

Check that the compressed air and power supply are switched off and the actuator is pressureless before starting the assembly or disassembly works.

To mount the control head on the actuator of the valve follow the next process:

1. sure that the adapter shaft of the valve is suitable for the C-TOP eX,
2. remove the control head cover (02) by loosening the screws (01),
3. place the target on the valve shaft adapter,
4. place the control head,
5. tighten the base screws (04) which join the head with the valve actuator,
6. place the cover (02) and tighten the cover screws (01).



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## 5.6. PNEUMATIC INSTALLATION OF THE CONTROL HEAD



All the installation work of the control head should be carried out by specialised personnel. Always follow the instructions of the present manual. Check that the compressed air and power supply are switched off and the actuator is pressureless before starting the assembly or disassembly works.

The identification of the connections is on the control head.

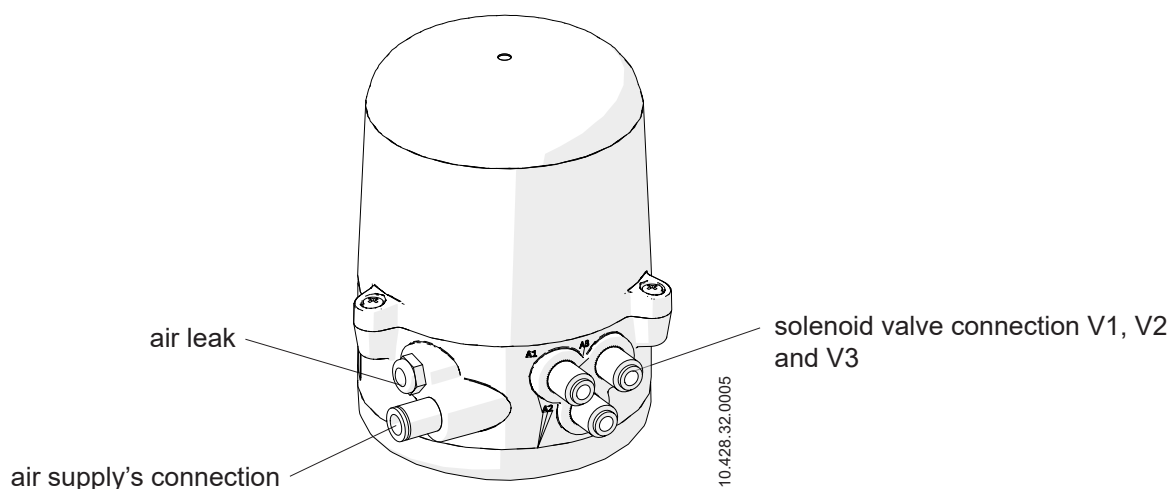
The pneumatic installation is only required for control heads with solenoid valves. Control heads without solenoid valves are only used to perform valve position measurement.

Cut the air hoses at the needed length before starting the pneumatic installation.

To perform the pneumatic installation follow the next process:

1. connect the air hoses between air connection A1, A2 and/or A3 of the control head and the valve actuator's air connection,
2. connect the air supply hose to the air intake 1 of the control head,
3. connect the compressed air supply.

Connection	Description	tube outer $\varnothing_{ext}$	Thread
1	supply port of operating pressure	8 mm	
3	exhaust air connection	-	
A1	working port of solenoid valve V1		G 1/8"
A2	working port of solenoid valve V2	6 mm	
A3	working port of solenoid valve V3		



Use only approved air supply connections and suitable quality for the installation. Cut the air connections with a suitable cutter to avoid damage to them. Use the air supply's connections with sufficient length to avoid tensions on them and to avoid its disassemble if separate the control head of the valve is needed.

## 5.7. ELECTRICAL INSTALLATION OF THE CONTROL HEAD



All the electrical work should be carried out by specialised personnel.  
Check that the power supplies are switched off.

Secure the installation to prevent unintentional activation.

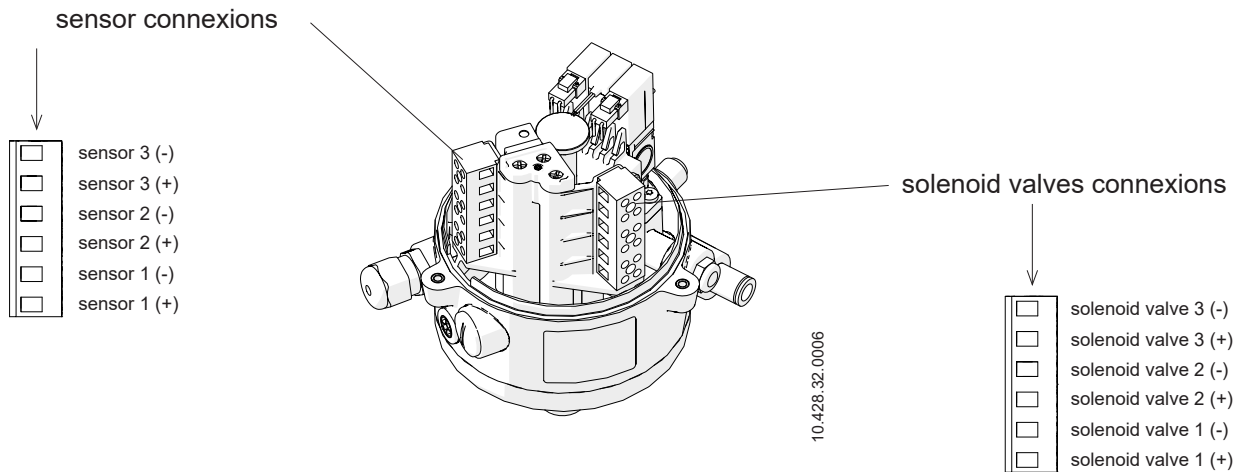
The electrostatic discharge caused by improper handling or incorrect earthing can damage the internal electronics.

The C-TOP eX control head is available with digital 24V DC communication with 1, 2 or 3 sensors and 0, 1, 2 or 3 solenoid valves.

### 5.7.1. Electrical installations with digital communication 24V DC

To perform the electrical installation of the control head with digital 24V DC communications follow the next steps:

1. remove the cover screws (01) of the cover (02),
2. lift and remove the cover (02),
3. route the electrical cable through the cable gland (08),
4. connect the cables to the terminal according to the wiring diagram,
5. tighten the cable gland (08),
6. place the cover (02) and fix it with the cover screws (01).



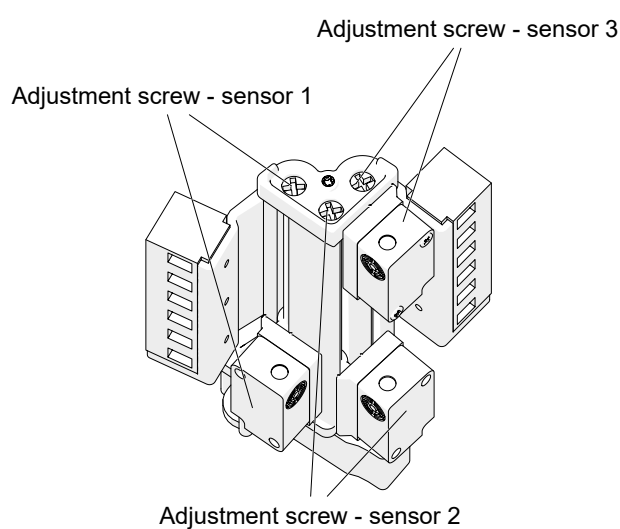
## 6. Start-up

The number of sensors on the control head depends on the type of the valve to be automated.

The sensors installed on the control head have an LED that remains lit when they do not detect any position from the valve actuator.

To configure the control head, follow these steps:

1. remove the cover,
2. ensure that the valve is in the position you want to memorize,
3. adjust the respective sensor using the corresponding adjustment screw until the LED turns off,
4. repeat the previous two steps for each sensor in the control head,
5. mount the cover.



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## 7. Operating problems

Before doing a fault diagnosis check that the control head is correctly connected.

Fault description	Possible causes	Action
The electrical signal is NOT sent or received	The cables are defective or improperly connected	Check the electric connection and the power supply
	The electronic module is defective	Replace the electronic module
	The inductive sensor is malfunctioning	Replace the inductive sensor
The valve NOT activate	The solenoid valve doesn't receive the external signal	Check the electric connection
	Solenoid valve break	Replace the solenoid valve
Wrong operation of the process valves	The pneumatic connections are not correctly connected	Check that each pneumatic hose is connected to the corresponding output of the control head

# 8. Technical Specifications

## 8.1. MATERIALS

Plastic parts	PA6
Screws	A2
Seals	NBR
Air fittings	nickel-plated brass

## 8.2. ENVIRONMENT

Outdoor use	location protected from direct sunlight or UV radiation
Storage temperature	-20°C to 50°C
Environment temperature	-5°C to 50°C
Relative humidity	80%
Relative humidity	80% until 31°C reducing until 50% to 40°C
Maximum height	2000 m
Overvoltage category	II
Degree of pollution	2
Degree of protection	IP65/67

## 8.3. CONTROL HEAD

Stroke	≤ 70 mm
Maximum shaft diameter	22 mm
Adapter shaft diameter	6 mm
Assembly type	screws
Fluid	filtered compressed air, filtration degree 40 µm lubricated or not lubricated

## 8.4. INDUCTIVE SENSOR

Supply	NAMUR
Output function	Normally closed
Detection range	2 ± 10% mm
Nominal DC	voltage 8.2 V
DC connection voltage	7.5 to 30 V (for use in a safe area)
State indication	LED, red (internal)
Measuring principle	electromagnetic induction

## 8.5. SOLENOID VALVES

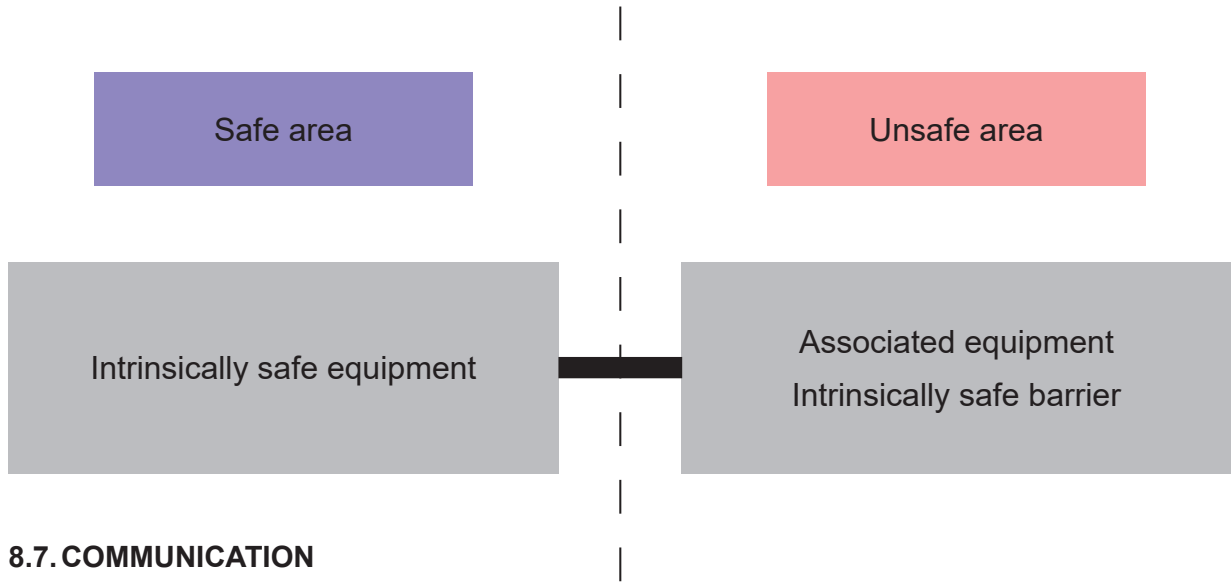
Quantity	0 to 3
Type	3/2 way, normally closed with manual locking
Pressure range	3 - 7 bar
Supply voltage	24 V DC ± 10%
Power consumption	0.5 W

## 8.6. ELECTRICAL INTERFACE

All the electrical signals of each element should be connected to an electrical safety barrier in a safe area to form intrinsically safe circuits.

For equipment in the IIC group:

	NAMUR Sensor	Solenoid valves
Maximum feed voltage ( $U_i$ )	15 V	28 V
Maximum input current ( $I_i$ )	50 mA	115 mA
Maximum input power ( $P_i$ )	0,12 W	0,8 W
Maximum self-inductance ( $L_i$ )	110 $\mu$ H	0 $\mu$ H
Maximum self-capacitance ( $C_i$ )	145 nF	0 nF



**8.7. COMMUNICATION**

Terminal

type push-in, nominal cable section 0.2 to 0.75 mm<sup>2</sup> (22 AWG a 18 AWG)

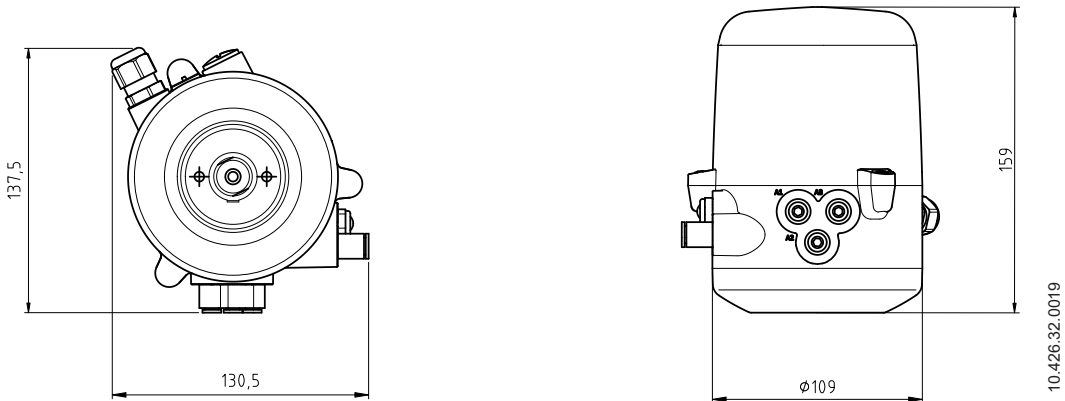
Main input

cable gland M16 x 1.5 (Ø 4 mm to Ø 10 mm diameter cable)

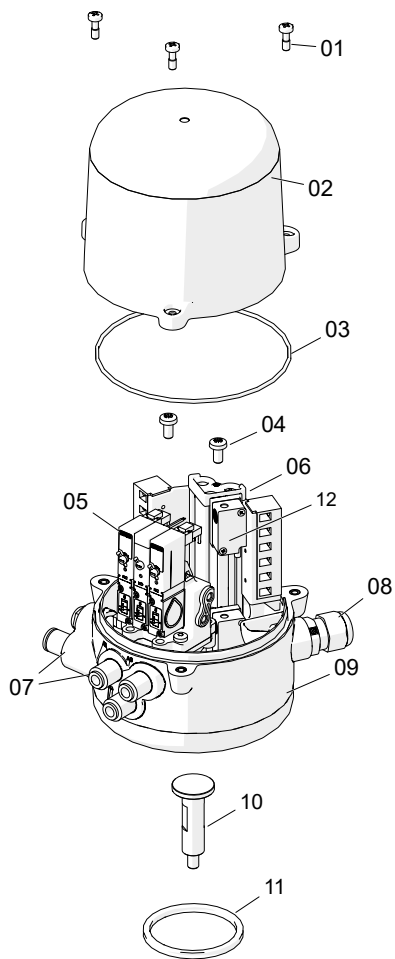
Outlets

NAMUR

**8.8. DIMENSIONS**



### 8.9. EXPLODED DRAWING AND PARTS LIST



Position	Description
01	cover screws
02	cover
03	cover seal
04	base screws
05	solenoid valve
06	support guide
07	pneumatic ports
08	cable gland
09	base
10	target
11	base seal
12	inductive sensor

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**How to contact INOXPA S.A.U.:**

Contact details for all countries are continually updated on our website

Please visit [www.inoxpa.com](http://www.inoxpa.com) to access the information.



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