



INSTRUCTION MANUAL
FasTrak®



Instruction, installation and
maintenance manual





INSTRUCTION MANUAL

FasTrak®



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See also addendum:

- 4044 – FT Software
- 4035 – Field barrier (ID)




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1.0 GENERAL INFORMATION

1.1 General warnings

Important 	<p>This Instruction Manual is an integral part of the device, it should be carefully read before carrying out any operation and it should be kept for future references.</p> <p>This Instruction Manual covers only the FT positioner.</p> <p>This Instruction Manual is realized in accordance with the Directive 2006/42/CE.</p>
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1.2 Generalities

STI S.r.l. products are conceived, manufactured and controlled according to the Quality Control System in compliance with EN ISO 9001 International Standard.

1.3 Manufacturer

With respect to Machinery Directive 2006/42/EC the Manufacturer of the described product, is STI S.r.l. as specified on nameplate.

Address: **STI S.r.l.**
Via Dei Caravaggi 15
24040 Levate (Bergamo) – ITALY

1.4 Terms and conditions

STI S.r.l. guarantees each single product to be free from defects and to conform to current goods specifications. The warranty period is one year from the date of installation by the first user, or eighteen months from the date of shipment to the first user, whichever occurs first.

The warranty does not cover special products or components not covered by warranty in their turn by subcontractors. No warranty is given for products which have been subject to improper storage, improper installation, misuse, or corrosion, or which have been modified or repaired by unauthorised personnel. Repair work due to improper use will be charged at standard rates.

1.5 Manufacturer's liability

STI S.r.l. declines all liability in the event of:

- use of the device in contravention of local safety at work legislation;
- incorrect installation, disregard or incorrect application of the instructions provided on the nameplate and in this manual;
- modifications without STI's authorisation;
- work done on the unit by unqualified or unsuitable persons.

1.6 Applicable Standards and Directives

- EN ISO 12100:2010: Safety of machinery - General principles for design. Risk asses and risk reduction.
- 2006/95/EC: Directive for Low Voltage Equipment (LV).
- 2004/108/EC: Directive relating to the Electromagnetic Compatibility (EMC).
- 2014/34/UE: Directive concerning equipment for use in potentially explosive atmospheres (ATEX).



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2.0 DESCRIPTION

The FasTrak[™] positioner is a high-capacity, high-precision digital-pneumatic valve controller that replaces conventional positioner. The FasTrak[™] has several advanced control and diagnostic features.

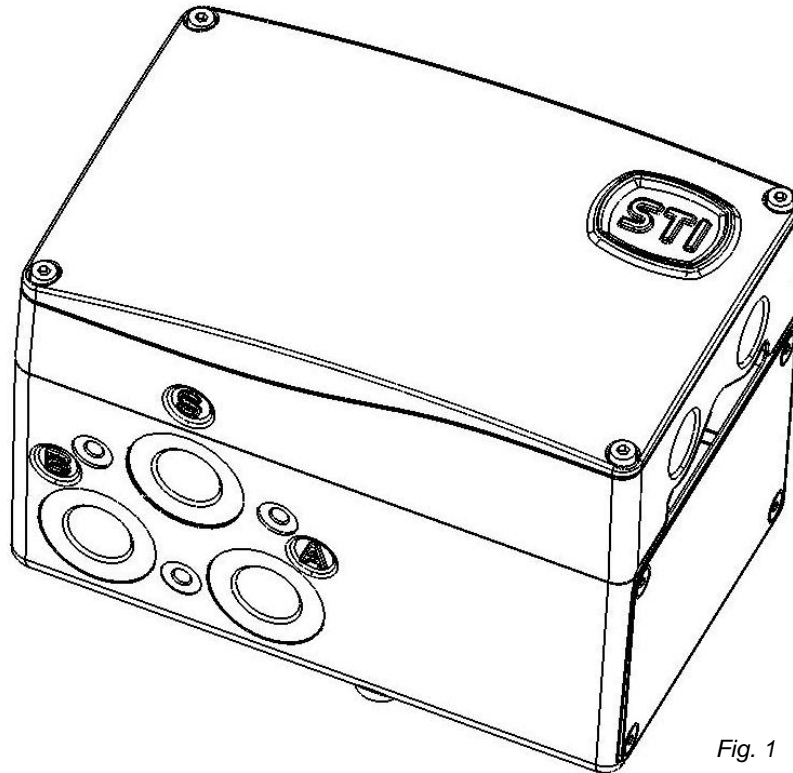


Fig. 1

- Excellent dynamic performance
- High precision and high flow positioner.
- Configuration and calibration through HART, serial or handheld device.
- Self calibration.
- Compatible with double and single acting actuators, with/without spring, piston or diaphragm.
- Auto tuning on control stroking time applications from 0.5 sec to 50 sec.
- Control and PID parameter independently adjustable for open and close.
- Stroking time user independently adjustable to open and to close.
- Travel limit position independently user adjustable to open and to close up to 50% of stroke.
- Tight shut off position to open and to close independently adjustable up to 50% of stroke.
- Pressure shut off to open and to close independently adjustable.
- Split range user adjustable capability.
- Travel characterization linear, eq% 25:1, 30:1, 50:1, 1:50, 1:30, 1:25, user adjustable 16 point.
- Visualization of selected characterization curve with limit and shut off by Remote Control.
- Analog output 4 20mA position.
- Two digital input user configurable to fully open or to fully close.
- Two digital output user configurable as virtual limit switch or to indicate position error or low pressure.
- Power/signal fail position mechanically configured (not software adjustable).



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2.1 Specifications for intrinsically safe

- **Connections**
 - POWER: 2 wires from signal (min 3.5 mA, 12÷30 Vdc – Z equivalent 550 ohm)
 - ELECTRICAL CONNECTION:
 - Signal ½" NPT (or metric M20x1.5 on request)
 - Auxiliary input/output ½" NPT (or metric M20x1.5 on request)
 - PNEUMATIC CONNECTION: ½" NPT female
 - COMMUNICATION PROTOCOL: HART, TTL RS232
- **Input**
 - ANALOG: 4÷20 mA – HART™
 - ON OFF: 2x configurable digital (optocoupler 24 Vdc)
- **Output**
 - ANALOG: 4÷20 mA passive loop 10÷26,5 V
 - ON OFF: 2x configurable digital (optocoupler 24 Vdc)
- **Stroke Movement**
 - FEEDBACK ANGLE OF ROTATION: 30°÷120° (<30° with lower resolution)
 - ADJUSTABLE SPEED: range 0÷300 seconds, individually configurable for each direction
 - CHARACTERISTIC CURVE:
 - linear
 - equal percentage
 - configurable
 - CONTROL PARAMETER: individually configurable for each direction
 - TRAVEL CONTROL: Min. and Max settable stroke limits; adjustable pressure on seat
- **Air supply**
 - INSTRUMENT AIR: free of oil, water and dust to ISO 8573-1 – Class 3
 - SUPPLY PRESSURE: 2.5÷10 bar
 - AIR CONSUMPTION: 1.5 Nm³/h at 6 bar
- **Performance Data (for angle > 90°) according to IEC 61514-2**
 - HYSTERESIS+DEADBAND: ±0.15%
 - REPEATIBILITY: ±0.15%
 - SENSITIVITY: ±0.1%
 - LINEARITY: ±0.3%
- INFLUENCE OF AMBIENT TEMPERATURE: ≤0.3% for every 10°C
- FLOW CAPABILITY: 180Nm³/h at 6bar (CV 2.3)
- ACTION: configurable single or double
- **Environmental capabilities**
 - HAZARDOUS PROTECTION: ATEX II 1G Ex ia IIC T6/T5/T4
 - AMBIENT:
 - protection IP66 (NEMA 4x)
 - operation temperature: -40°C / +80°C (-55°C / +80°C for TR CU)
 - storage temperature: -40°C / +80°C (storehouse must be clean and dry, absence of corrosive gases or vapours)
 - HUMIDITY: up to 100%
 - VIBRATIONS: up to 2g (ISA-S75.13)
 - CE MARK: CE conformity and EMC
- **Case materials and weights**
 - Aluminium, low copper content with stainless steel feedback shaft – 3,25 kg
 - Stainless steel 316 – 8,82 kg
- **Options available**
 - FAIL FREEZE (for more information see page 20)
 - REMOTE FEEDBACK SENSOR (for more information see page 21)
 - DISPLAY AND PUSH BUTTON (only with aluminum case) (for more information see page 22)
 - UNIVERSAL LINKAGE FOR:
 - Linear long stroke actuator (70÷1500 mm)
 - VDE/VDI 3845 for quarter turn applications
 - Lever for side yoke or top mounting application
 - SPECIFIC ACCESSORIES:
 - gauges
 - CF device
 - BV and BW boosters
 - COLLECTED OR HIGHLY SILENCED EXHAUST
 - HIGH SPEED COMMUNICATION KIT
 - HIGH CORROSION RESISTENCE WITH 316 STAINLESS STEEL CASE

**See selection guide for options / certifications available*



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2.2 Specifications for explosion proof

- **Connections**
 - POWER: 2 wires from signal (min 3.6 mA, 19÷24 Vdc – Z equivalent 950 ohm)
 - ELECTRICAL CONNECTION:
 - Signal ½" NPT (or metric M20x1.5 on request)
 - Auxiliary input/output ½" NPT (or metric M20x1.5 on request)
 - PNEUMATIC CONNECTION: ½" NPT female
 - COMMUNICATION PROTOCOL: HART, TTL RS232
- **Input**
 - ANALOG: 4÷20 mA – HART™
- **Output**
 - ANALOG: 4÷20 mA passive loop powered 14,5÷24,5 V
- **Stroke Movement**
 - FEEDBACK ANGLE OF ROTATION: 30°÷120° (<30° with lower resolution)
 - ADJUSTABLE SPEED: range 0÷300 seconds, individually configurable for each direction
 - CHARACTERISTIC CURVE:
 - linear
 - equal percentage
 - configurable
 - CONTROL PARAMETER: individually configurable for each direction
 - TRAVEL CONTROL: Min. and Max settable stroke limits; adjustable pressure on seat
- **Air supply**
 - INSTRUMENT AIR: free of oil, water and dust to ISO 8573-1 – Class 3
- SUPPLY PRESSURE: 2.5÷10 bar
- AIR CONSUMPTION: 1.5 Nm³/h at 6 bar
- **Performance Data (for angle > 90°) according to IEC 61514-2**
 - HYSTERESIS+DEADBAND: ±0.15%
 - REPEATIBILITY: ±0.15%
 - SENSITIVITY: ±0.1%
 - LINEARITY: ±0.3%
 - INFLUENCE OF AMBIENT
 - TEMPERATURE: ≤0.3% for every 10°C
 - FLOW CAPABILITY: 180Nm³/h at 6bar (CV 2.3)
 - ACTION: configurable single or double
- **Environmental capabilities**
 - HAZARDOUS PROTECTION: ATEX II 2 (1) G Ex d IIC T6/T5/T4
 - AMBIENT:
 - protection IP66 (NEMA 4x)
 - operation temperature: -40°C / +80°C (-55°C / +80°C for TR CU)
 - storage temperature: -40°C / +80°C (storehouse must be clean and dry, absence of corrosive gases or vapours)
 - HUMIDITY: up to 100%
 - VIBRATIONS: up to 2g (ISA-S75.13)
 - CE MARK: CE conformity and EMC
- **Case materials and weights**
 - Aluminium, low copper content with stainless steel feedback shaft – 4,11 kg
 - Stainless steel 316 – 10,78 kg
- **Options available**

Same of intrinsically safe execution (excluded fail freeze version)

**See selection guide for options / certifications available*

2.3 Specifications for natural gas execution

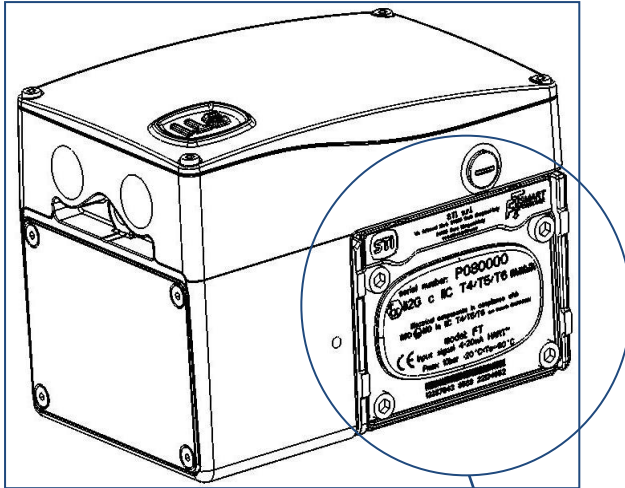
- **Natural gas supply**
 - Natural gas clean and dry as ISO 8573-1 – Class 3
 - SUPPLY PRESSURE: 2.5÷6 bar
 - GAS CONSUMPTION: 1.5 Nm³/h at 6 bar



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2.4 Manufacturer's identification



Every FT positioner is provided with a name plate with its serial number and with the year of manufacturing (*).

Year of manufacturing

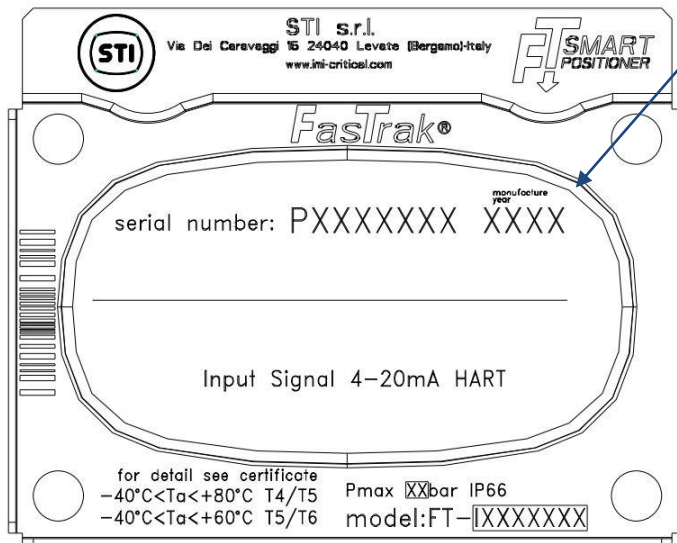


Fig. 2

The serial number is shown in the HART panel.

(*) In the old version the year of manufacturing was indicated by the first two digits of the serial number. For example: P141968 → year of manufacturing 2014.

3.0 GENERAL SAFETY INSTRUCTIONS

In order that you can make the best use of this document and to ensure safety during commissioning, operation and maintenance of the equipment, please note the following explanation of the symbols used: as well as the instructions in this document, you must also follow applicable accident prevention and safety regulations.

Please read this document carefully before installation and commissioning.

Symbol definitions



Indicates an **imminently hazardous** situation which, if not avoided, **will result** in death or serious injury. (*High level of risk*)



Indicates a **potentially hazardous** situation which, if not avoided, **could result** in death or serious injury. (*Medium level of risk*)



Indicates a **potentially hazardous** situation which, if not avoided, **could result** in minor or moderate injury. (*Low level of risk*)



Indicates a **potentially harmful** situation which, if not avoided, **may result** in damage of the product itself or of adjacent objects. (*Damage to property*)

Signs of warning

Be careful where these symbols are shown, they indicate a potentially hazardous situation and they warn that if the steps are not properly performed, MAY RESULT CAUSING serious injury, death or long-term risks to the health of exposed persons.



GENERAL DANGER



DANGER POWER SUPPLY



CRUSHING HAZARD

Safety measures



General obligation (with the possible supplementary signboard).



Must wear protective clothing.



Obligation to wear protective footwear.



Is required to wear a helmet.



Is required to protect the eyes.



Obligation to protect your hearing.

This chapter provides important instructions for your safety. Proper and safe operation of the FT positioner requires:

- proper transportation and storage;
- mounting, electrical and pneumatic installation and commissioning by qualified personnel;
- correct operation according to the instructions in this manual;
- correct use;
- careful maintenance.



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In order to keep the device in a safe condition and ensure safe operation, please carefully read and follow the instructions given in the sections marked with the respective symbols.

The device must be shut down and secured reliably against unintentional restart if it must be assumed that safe operation is no longer ensured. Possible reasons for this assumption can be:

- visible damage of the device;
- failure of the electrical function;
- exposure to a storage temperature of more than 85°C for a long time period;
- exposure to considerable strain or wear during transport.

Only the manufacturer is authorized to repair the device.

If the device is damaged or faulty do not continue use.

WARNING

For display version do not hit the display, do not use cleaning solvent for cleaning it and do not use cutting tools because display is composed by a sensitive diaphragm.

3.1 Device safety instructions

Observe the accident prevention rules of the H&S organizations. The non-observation of the following safety instructions and of the instruction manuals can result in serious injury. Installation must be carried by our qualified person.

3.2 Installation

- The electrical connections must be done according to the diagram and label.
- To achieve optimum performance from the FT Positioner, it is recommended that shielded cables be used when installing the positioner.
- The use of a ground strap between the FT positioner housing and a suitable earthed point is necessary.
- When changing electrical connections inside the FT positioner housing, observe ESD handling precautions. The use of a conductive, earthed, wrist strap is recommended.
- The pneumatic connections must be done according to the diagram and label, is not allow the FT Positioner supply pressure to exceed 10 bar.
- The supply circuit must be protected to prevent the voltage or current exceeding the stated limits.
- The equipment must be provided with cable entries and filler plugs certified according to the required certification.
- The actuator must be installed and used according to the design specification.
- The fluid must be chemically compatible with the gaskets and lubricant used in the installation.
- When FT positioner is installed in a hazardous area, ensure that electrical barriers are used between the FT positioner and the electrical power sources.
- To prevent injuries always ensure that the air supply is removed from the FT positioner before the Mode Selection Plate is changed.
- Only trained personnel should permitted to alter the software control parameters stored within the FT positioner electronics. Incorrect settings may lead to personnel injury and or property damage.

3.3 Maintenance

Before making changes to the pneumatic configuration make sure that the compressed air supply is isolated from the FT positioner and to avoid unpredictable movement of the actuator always remove the electrical power to the FT positioner electronics before changing electrical connections.

- Must be done by qualified person.
- Cleaning must be done with a humid cloth (also for display version).
- Use instrument air. Clean and dry. Free of oil and dust according to ISO 8573-1.

Product Disposal

The disposal of this product should be carried out in a way that conforms to the 2007 Weee Directive, and any other locally applicable directions a regulations.



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3.4 Special instructions for FT positioner intrinsically safe execution

In hazardous area FT positioner is to be installed with electrical barriers between the FT positioner and the electrical power sources.

The type plate is attached to the positioner. It indicates the degree of explosion protection and the certificate valid for your positioner. Additional electrical information is shown in the internal electronic board label.

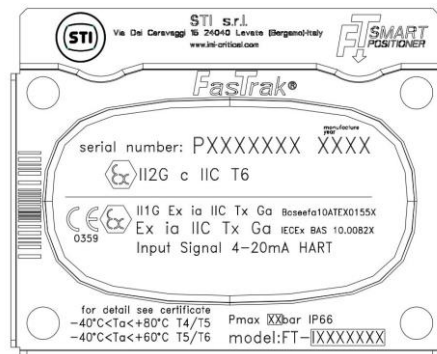


Fig. 3

FT positioner's mechanical enclosure and components are suitable for installation in hazardous atmospheres. The complete FT positioner is suitable for installation in potentially explosive atmospheres 94/9/CE ATEX directive.



Equipment group II surface industry, category 2 for use in zone 1 with explosive atmospheres caused by gases, vapours or mists, Group II and class of ignitability C in conformity to types of protection standardized EN 60079-0. The component is considered to be suitable for installation with temperature classification:

- with FT positioner supplied via connector J3, 4÷20 mA loop, only, with no connection to connectors J6, digital input & J1 digital output or connector J10, analogue feedback:
T5 in ambient temperature -40°C / +80°C;
T6 in ambient temperature -40°C / +60°C.
- With FT positioner supplied using all of the inputs:
T4 in ambient temperature -40°C / +80°C;
T5 in ambient temperature -40°C / +60°C.

See dedicated certificate for operating temperature.

WARNING

- Any user-made changes or manipulations of the device are prohibited! Only the manufacturer and an expert for explosion protection are authorized to modify the device.
- Before re-using a FT positioner that has already been used in another installation place always reset the device to the factory setting. Never start the auto adjustment function before having restored the factory setting! Otherwise, hazardous situations may occur due to improper settings.
- Do not use the (J7) communication interface when the positioner is installed and used in the hazardous area.

WARNING

- Do not use flammable gas mixture nor oxygen or oxygen-enriched gas as a pressure medium.
- Use cable entries and cables approved for a service temperature corresponding to the maximum ambient temperature increased by 10 K or corresponding to the minimum ambient temperature, respectively.

3.5 Electromagnetic interference

- Do not lay signal lines close to power lines. Power lines produce interference in their near vicinity, which may affect measured value transmission on the signal line.
- When changing electrical connections inside the FT positioner housing, observe ESD handling precautions. The use of a conductive, earthed, wrist strap is recommended.



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- It is recommended that lid is rest closed in normal operation.

WARNING

Always observe the specifications and special requirements for your positioner stipulated in the applicable certificate.

3.6 Pneumatic safety

- Observe the accident prevention rules of the H&S organizations.
- Observe the safety instructions for the pneumatic actuator used.

NOTE

- Take suitable precautions to ensure that even in case of malfunctions the positioner's max. admissible operating pressure is not exceeded. Otherwise, the positioner and/or the actuator may be damaged.
- The positioner must be supplied with instrument air free from oil, water and dust according to ISO 8573-1, Class 3.
 - Purity: max. particle size 5 µm, max. particle density 5 mg/m³.
 - Oil content: max. concentration 1 mg/m³.
 - Pressure dew point: maximum value 10 K below operating temperature.
 - Before using these products with fluids other than air or for non-industrial applications, consult STI.

Before connecting the air pipes blow them out to remove dust, splinters and other particles.

3.7 Electrical safety

WARNING

- Observe the common safety regulations and the accident prevention rules of the H&S organizations.
- Observe the common standards and safety regulations for the installation and operation of electrical systems.
- When connecting the device, observe all electrical specifications in these operating instructions or in the drawing.
- For the electrical installation of explosion-protected devices, observe all standards, regulations and directives governing explosion protection and applicable for the construction and use of explosion-protected systems, the directives for explosion protection (EN 60079), and the special requirements and specifications for your devices. In particular make sure that:
 - Used in situations that comply with the certification conditions stated in this handbook.
 - Maintained only by qualified personnel with adequate training on hazardous area instrumentation.
 - This product is not intended for use in life support systems.
 - The use of a ground strap between the FT positioner housing and a suitable earthed point is necessary.
 - The supply circuit must be protected to prevent current exceeding the fixed limit.
 - The equipment must be provided with cable entries and filler plugs certified according to the required certification.

3.8 Correct use

The FT positioner is an electro-pneumatic positioner for pneumatic final control elements. It is designed for being attached to linear and rotary actuators following the instructions in this manual. The positioner may be used only for the applications listed in these operating instructions. Any other use is considered as incorrect.

The signal current circuit and the input and output circuitry must meet the explosion protection requirements stipulated in the certificates

DANGER

Only those persons familiar with the installation, commissioning, operation and maintenance of the FT positioner or similar instruments who have the required qualification and have read and understood the operating instructions are authorized to work on the positioner.

These people must be sufficiently trained and experienced and know the relevant standards and regulations to be able to judge their assigned tasks and recognize potential hazards. Only people who are qualified or have been trained adequately and who have the required certificates are authorized to work on explosion-protected devices.



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4.0 INSTALLATION

Remove the FT positioner from its packing, the pneumatic and electric port are protected by plastic plugs not suitable for working. They must be removed and all ports not connected must be plugged with tight plug suitable for the pressure rating and area classification.

4.1 Pneumatic connections

Pressure line port S, port A and port B are ½" NPT female.

The full flow performance of FT positioner requires that the piping between FT and actuators has to be ½" without any restriction and shorter as possible, the pressure line pipe has to be sized to avoid significant pressure drop during the actuator stroke.

During piping connection be careful to keep clean the internal side of piping and fittings free from threaded sealing material and any other contaminant.

The FT positioner is suitable to operate 2.5 to 10 bar anyway the line pressure must be set lower than actuator design pressure.

No load or bending moment are allowed by piping on FT connection.

The FT positioner is suitable for rotary or sliding actuators; double acting with or without spring or single acting.

The port "A" is fully vent in case of power fail and/or signal 0%.

Double acting:

Port "A" must be connected to the actuator air chamber that has to vent at signal fail position (no power).

Port "B" must be connected to the other actuator air chamber, that has to be pressurized at signal fail position.

Port "A" connected to the stem side port on sliding actuator that has to extend stem on power fail and signal fail.

Port "B" connected to the port opposite of stem side on sliding actuator that has to retract stem on power fail and signal fail.

Double acting with spring:

Port "A" must be connected to the actuator port that has lower volume on air fail (volume minimized by spring action).

Port "B" must be connected to the other actuator air chamber, that has to be pressurized at 0 signal position.

Single acting:

Port "A" must be connected to the actuator air chamber.

Port "B" must be plugged.

Important: to set FT as single acting positioner move plate on FT electronic board to read "single". STI standard configuration of FT is double acting (see fig. 5 at page 14).

To check the correct connections have been made, the system supply can be pressurised without any power signal. With no power rest that the valve/actuator moves to the 0% signal position.

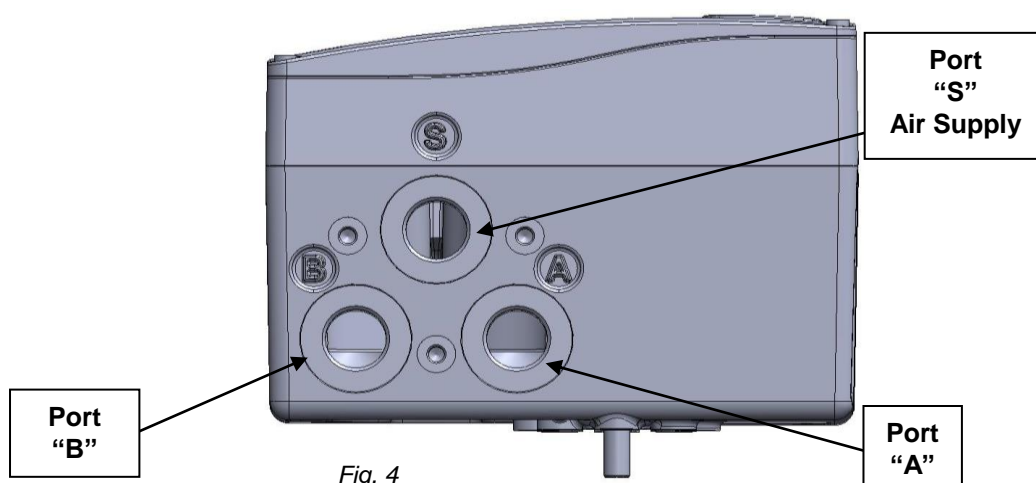


Fig. 4



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4.2 Electrical connections

4.2.1 Intrinsically safe

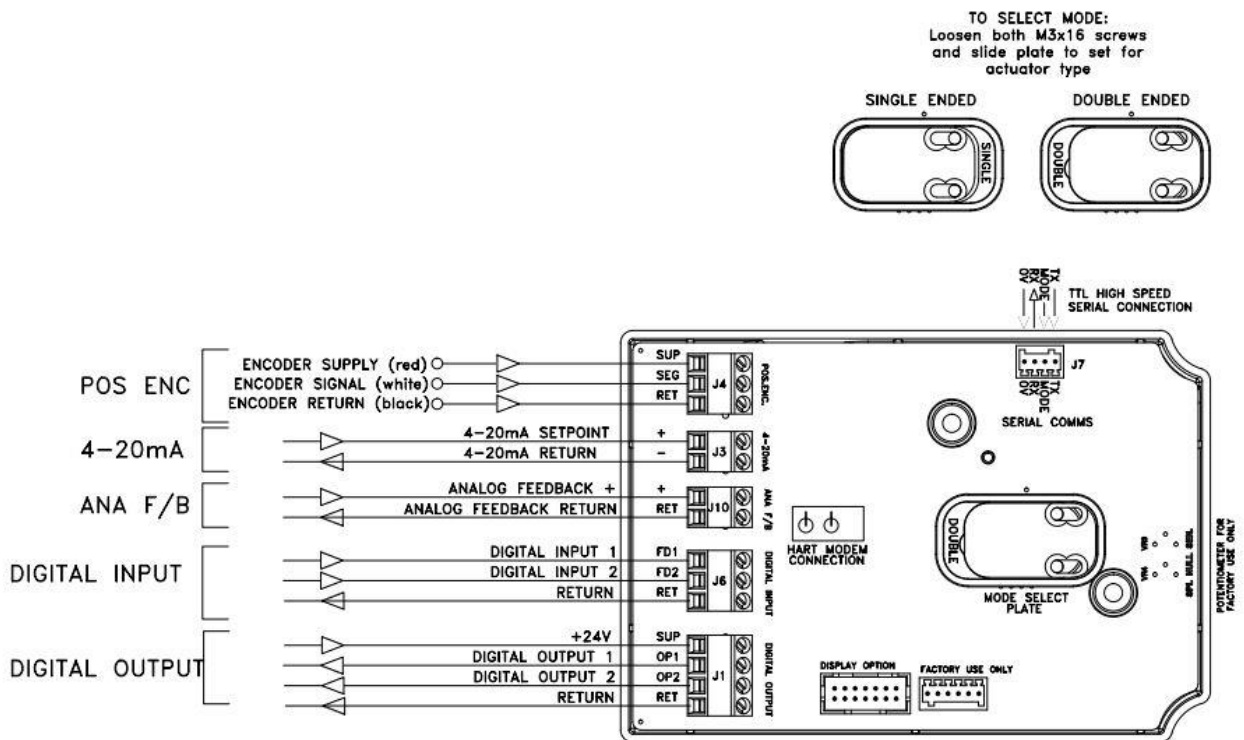


Fig. 5

4-20mA input signal:

4-20mA signal generator

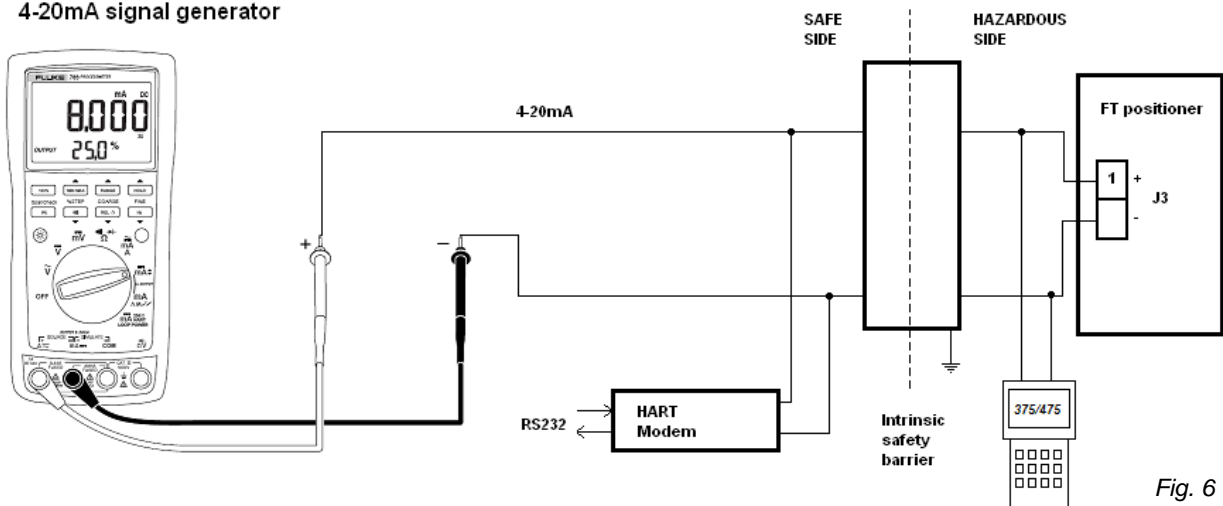


Fig. 6

Input port J3 should be connected to HART compliant 4-20mA signal source.

Input signal is used to:

- provide power to the positioner;
- inform the positioner about the 'requested position'.



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The HART communication signal is superimposed on 4-20mA signal. The signal generator and the intrinsically safe barrier must be compliant with HART protocol.

NON-HAZARDOUS AREA

HAZARDOUS AREA

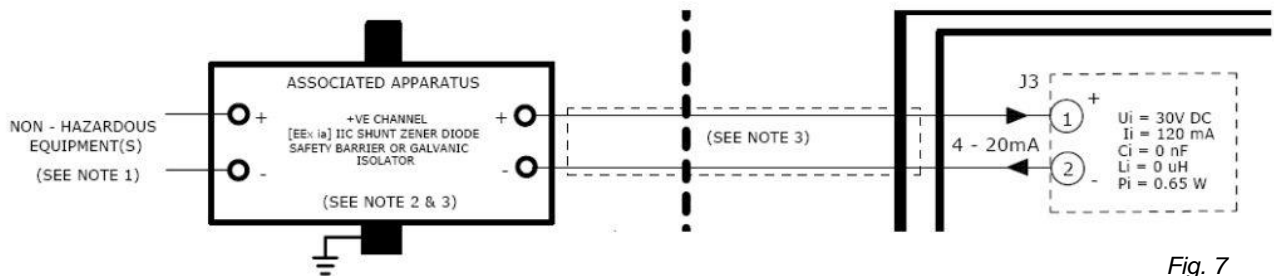


Fig. 7

NOTE

1. Unspecified except that it must not be supplied from nor contain under normal or abnormal conditions a source of potential with respect to earth in excess of 250 volts RMS or 250 volts DC.
2. A positive ATEX certified shunt zener diode safety barrier or galvanic isolator for group IIC ia, whose output U_o less than or equal to 30V I_o less than or equal to 120mA P_o less than or equal to 0.65W and is suitable for use with smart transmitters.
3. The associated apparatus (C_o), less terminal (C_i), gives the total external cable capacitance permitted for each separate I.S. circuit. The associated apparatus (L_o), less terminal (L_i), gives the total external cable inductance for each separate I.S. circuit.

Refer to "HART Application guide, HCF-LIT-34" for important information about Intrinsically safe barrier and HART signals.

- **Analog feedback:**

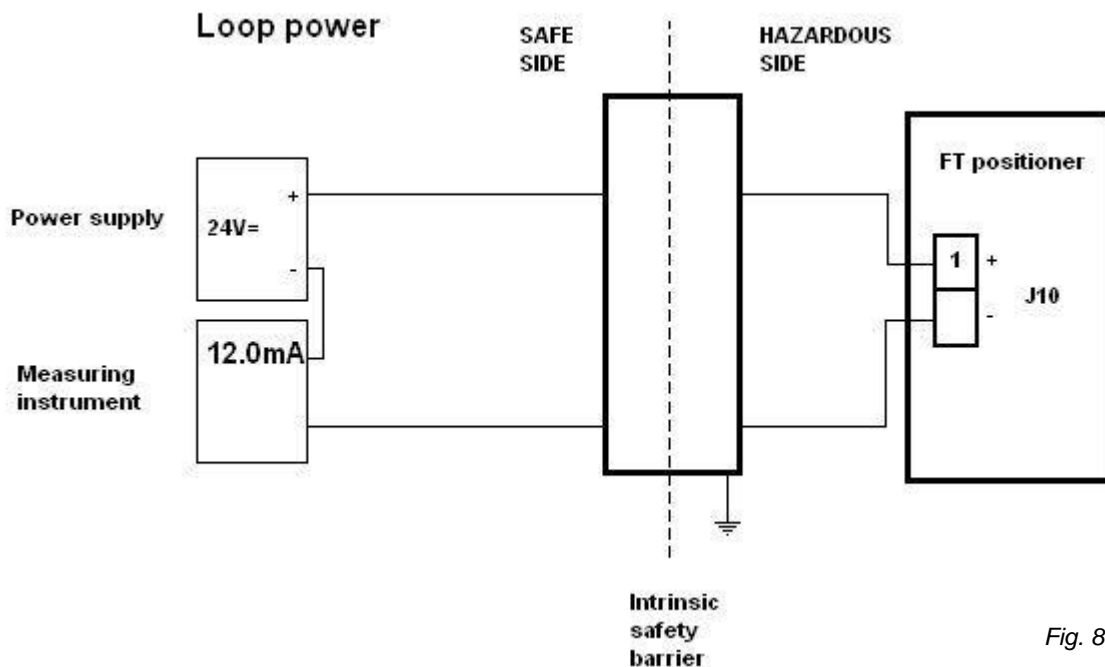


Fig. 8

The 4-20mA output must be energized from the loop.



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NON-HAZARDOUS AREA

HAZARDOUS AREA

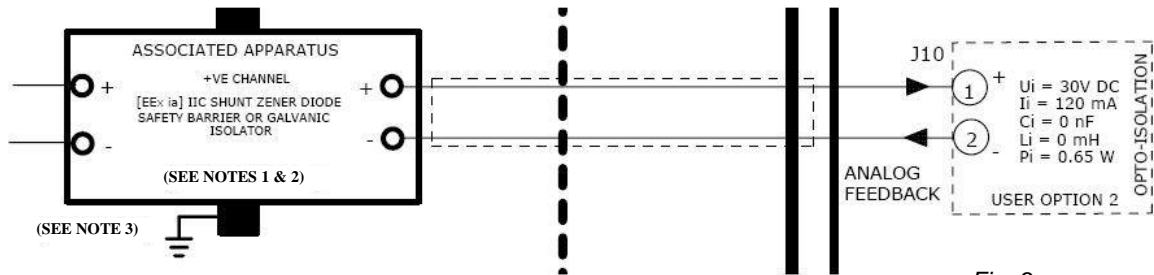


Fig. 9

NOTE

1. The associated apparatus (Co), less terminal (Ci), gives the total external cable capacitance permitted for each separate I.S. circuit. External cable inductance permitted for each separate I.S. circuit. The associated apparatus (Lo), less terminal (Li), gives the total.
2. A positive ATEX certified shunt zener diode safety barrier or galvanic isolator for group IIC whose output parameters are less than or equal to that specified.
3. I.S. installation earth (required for zener barriers only).

• Digital INPUT:

Digital Input is isolated by an optocoupler. The input resistance value is 2200 ohms. Apply a 24Vdc signal between the digital input and the return signal to energize the input.

• Digital OUTPUT (only intrinsically safe and standard location):

Digital output is isolated by an optocoupler. The output is made by a transistor with a series resistor of 1Kohm. When the output is energized the impedance is less than 4 Kohm, when de-energized the impedance is greater than 100 Kohm. The optocoupler requires an external power source to be energized via J1 pins 1 & 4.

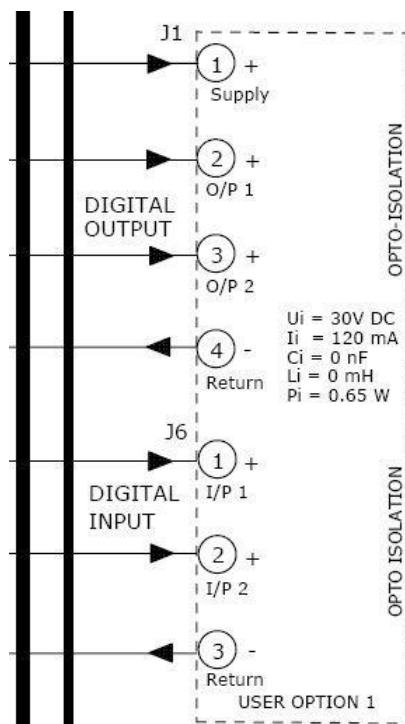


Fig. 10



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- **High speed serial connection:**
(Only for standard location)

A dedicated interface cable is needed (STI code 81569).



High speed transfer data TTL cable (fig. 11).

SERIAL COM.

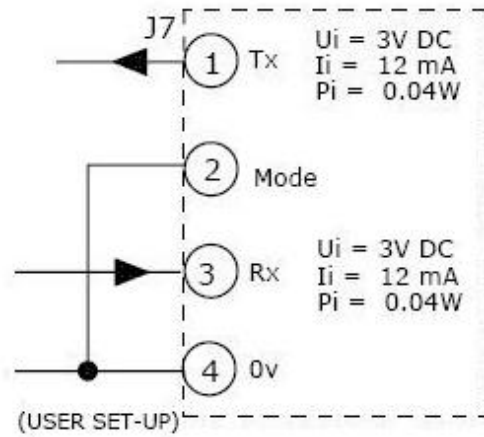


Fig. 12



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4.2.2 Explosion proof

Electrical connection FT series Ex dia [ja Ga] IIC T5/T6 Gb:

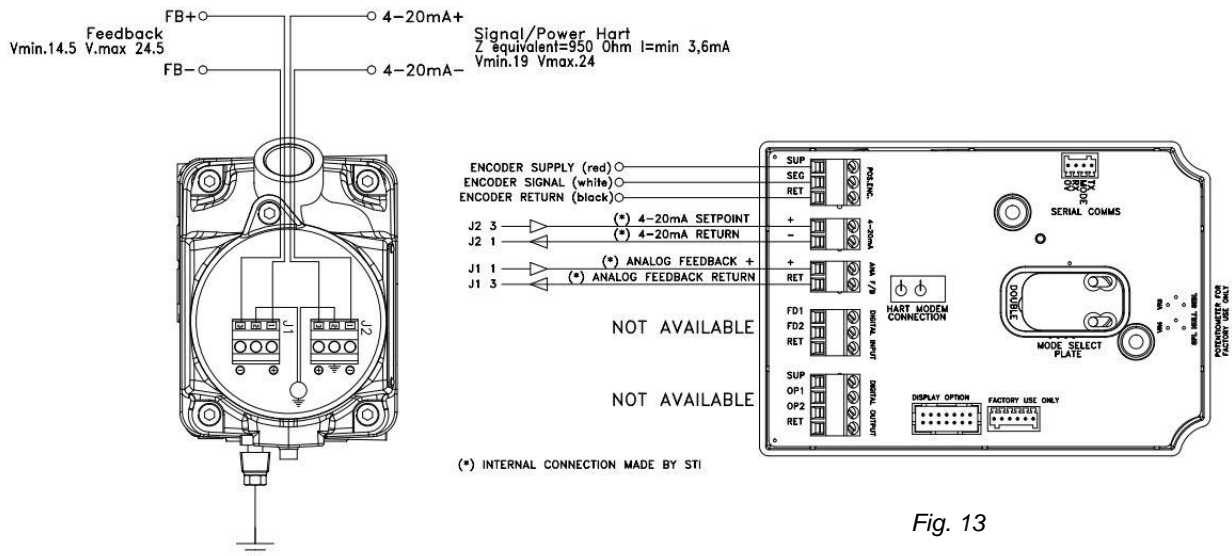


Fig. 13

The zener barrier must be connected to the earth path in order to work properly. By fixing the earth wire to the earth terminal. Do not remove the two yellow/green wires (that are connected to the enclosure) in pins J1/2 and J2/2.

WARNING

Minimum earth section cable is 4 mm².

The field barrier type ID external earth terminal must be provided with a high integrity insulated earth connection equivalent to a 4 mm² copper conductor, which has a resistance of less than 1 ohm to the supply star point and which must not rely on any plug and socket connections.

The metallic enclosure is directly connected to earth and therefore the electrical circuits are not capable of withstanding the 500V insulation to earth or frame requirement of EN60079-11. This must be taken into account in any installation.

For more information see instruction manual 4035 for explosion proof execution. See also dedicated certificate.



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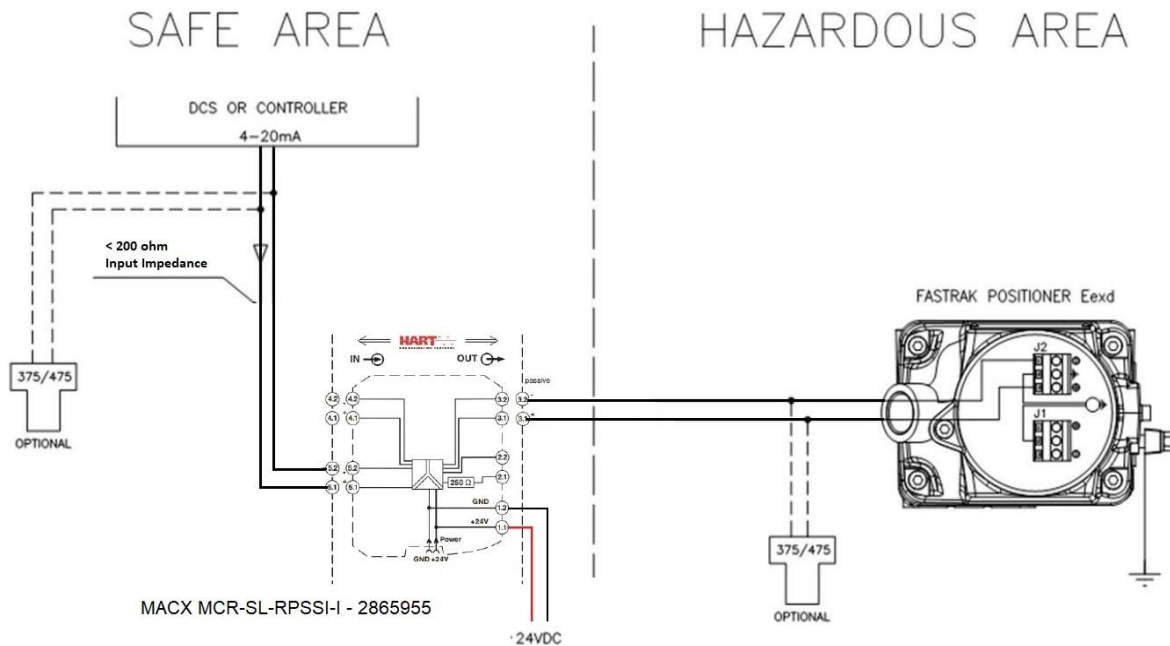
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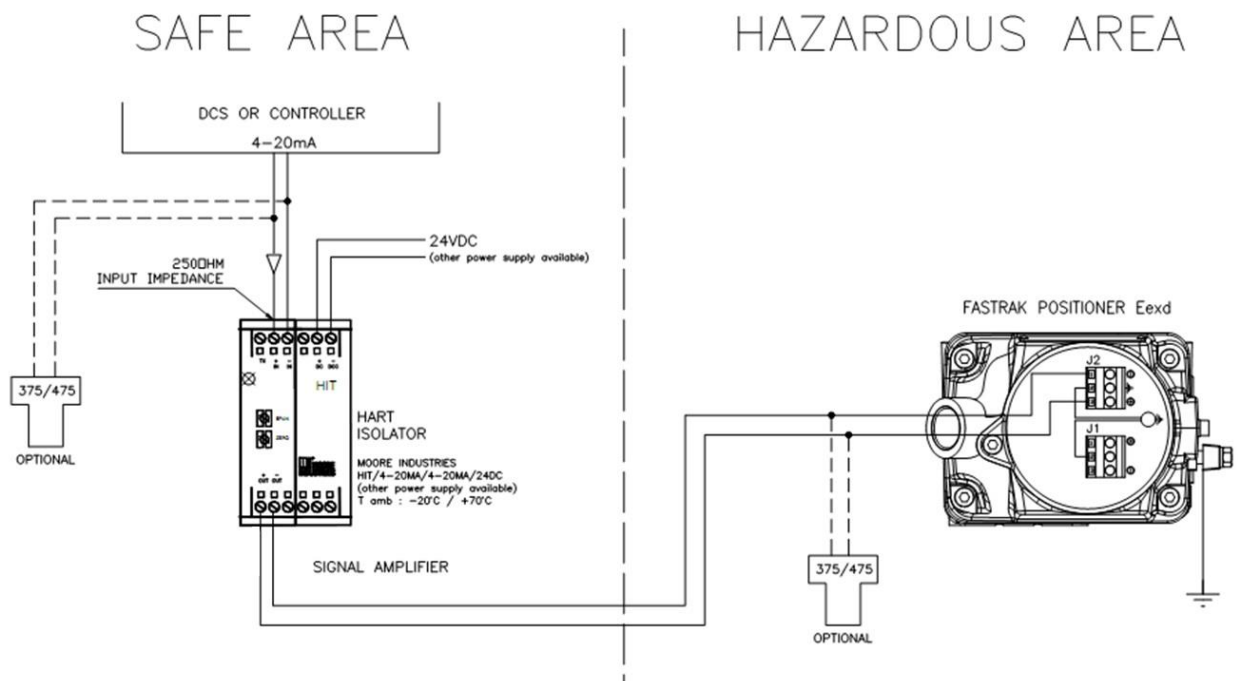
NOTE

How to manage input impedance in case your DCS has limited voltage output:

Option 1



Option 2





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4.3 Mechanical feedback linkage mounting

The FT has been designed to work on feedback rotation angle between 30° and 120°. Any feedback linkage must be able to generate a rotation angle between 30° and 120° on full actuator/valve stroke.

Any backlash, linearity error, elasticity of feedback linkage will affect the positioning performance.

The feedback shaft has about 120° max reading angle on 360°.

There are not any mechanical stops on to the shaft, there is not chance to damage the positioner by over-rotation during installation.

The feedback shaft is 8mm diameter fully cylindrical. It can be initially connected with any orientation to the feedback linkage. The alignment of linkage angle inside the 120° reading angle can be done by rotating the feedback shaft reference to linkage. The reading angle is shown on RC sw or displayed on the handheld digital interface.

- **By RC software:** on CFG panel looking position sensor window.

Unlock the connection between FT shaft and linkage.

If the valve/actuator is not on hard limit 0% signal position drive it pressurizing port B by position sensor adjustment verify that the valve/actuator move to 0% signal position.

WARNING

When the send button is pressed the system can move.

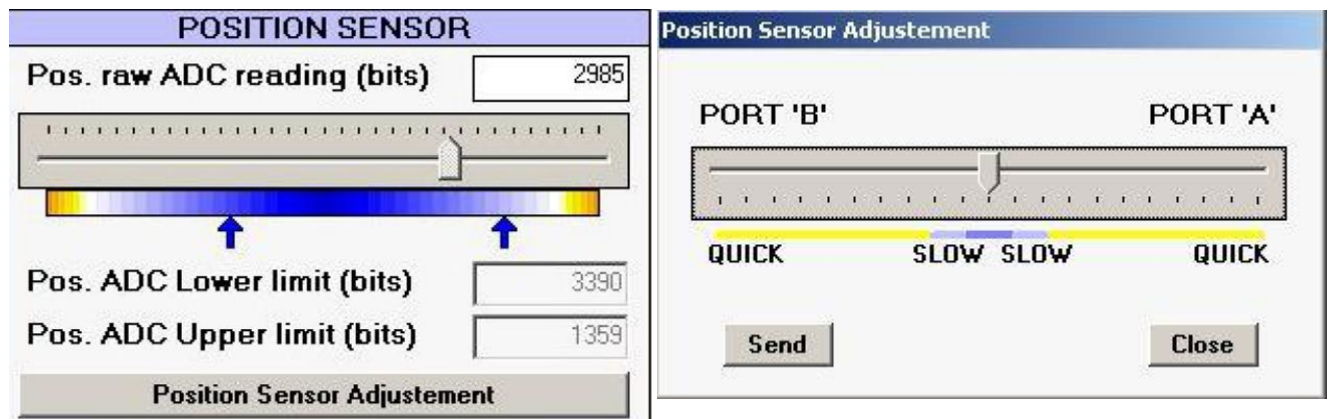


Fig. 14

Rotate the FT shaft slowly in the same direction (clockwise or counter-clockwise) that linkage would rotate to move valve/actuator.

On each complete FT shaft turn the scroll bar index will move on 120° shaft rotation, moving always on the same direction (left to right or right to left). Rotate the FT shaft until the scroll bar index start to move outside of the red/orange zone. Lock the connection between FT shaft and linkage. Now using position sensor adjustment it is possible drive the valve/actuator to check that both hard limit are in the right position. Both have to be out of red/orange zone.

- **By digital interface.**

Unlock the connection between FT shaft and linkage.

If the valve/actuator is not on hard limit 0% signal position drive it pressurizing port B by position sensor adjustment (command 5).

Rotate the FT shaft slowly in the same direction (clockwise or counter-clockwise) that linkage would rotate to move valve/actuator.

On each complete FT shaft turn the variable will change between 0 and 4095 on 120° shaft rotation, moving always on the same direction (0 to 4095 or 4095 to 0).

If the variable move from 0 to 4095 rotate the FT shaft until the variable is 500 ± 250 than lock the connection between FT shaft and linkage.



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If the variable move from 4095 to 0 rotate the FT shaft until the variable is 3600 ± 250 than lock the connection between FT shaft and linkage.

Now using position sensor adjustment it is possible to drive the valve/actuator to check that both hard limit are in the right position. Both has to be between 250 and 3850.

Another alternative method to set the mechanical linkage in right position is:

1. With the positioner connected to the PC and without mechanical linkage rotate the FT shaft slowly until scroll bar index reaches the central position.
2. Evaluate the angle between the actual position and the position at 50% of stroke of the actuator, the angle is measured on seat of lever where the FT shaft will be mounted.
3. Rotate the FT shaft from central position to an angle about equal at angle measured to previous point with direction that bring the FT shaft in the position that it has the mechanical linkage is connected.
4. Connect the mechanical linkage to the FT shaft.
5. Now using position sensor adjustment it is possible to drive the valve/actuator to check that both hard limit are in the right position.



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5.0 Loop powered freeze in position on signal fail

This option is available only for intrinsically safe execution (not available for Ex d and natural gas). It allows to use the FT positioner with freeze position features. Digital I/O are not available.

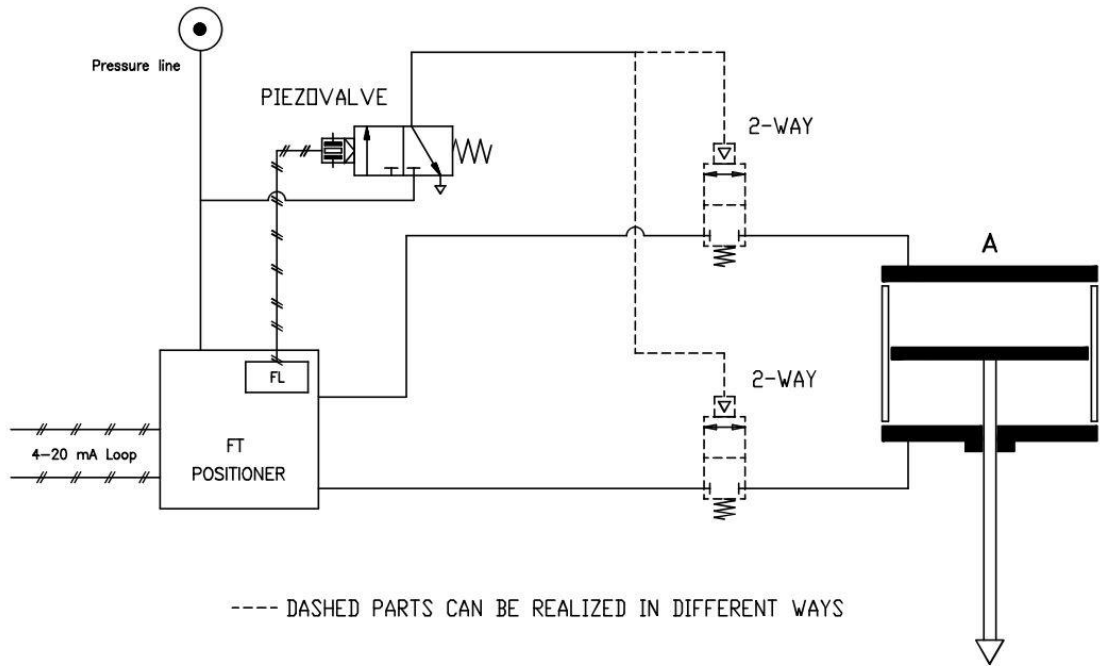


Fig. 15

Technical features	
Power supply (2 wire from signal)	Min 3.5 mA – 19-30 Vdc
Operating temperature	-25°C to +60°C
Protection	IP 65
Hazardous protection	Standard location or Ex ia intrinsically safe
Max operating pressure Piezovalve	8 bar

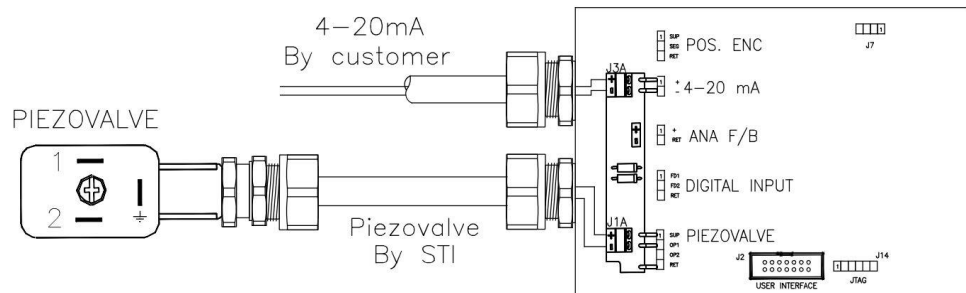


Fig. 16



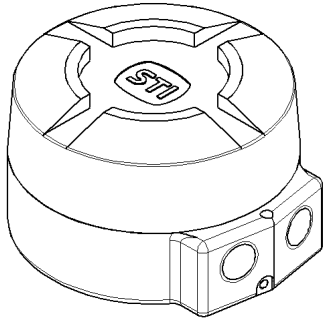
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6.0 FasTrak with remote sensor

FT Remote sensor is designed for harsh environment and is suitable for high vibration application.



Technical features		
Temp. range	-55°C to +100 °C	
Vibration	15g, 10-2000 Hz	
Protection	IP 65	
Material	Case	ASTM A356-T6 painted high thickness aluminium alloy
	Case (option)	Stainless steel 316
	Shaft	Stainless steel
Cable Port	2 x ½ NPT (Shielded cable 3 x AWG 24 or bigger, max 10 m)	

6.1 Installation

Wiring :

- 1) RED → Connect to – FT positioner – J4/1 Pos. Enc. SUP (Sensor power supply)
- 2) WHITE → Connect to – FT positioner – J4/2 Pos. Enc. SIG (Sensor signal)
- 3) BLACK → Connect to – FT positioner – J4/3 Pos. Enc. RET (Sensor gnd)

(Disconnect the original internal position sensor, isolate the old three wires and connect the new ones)

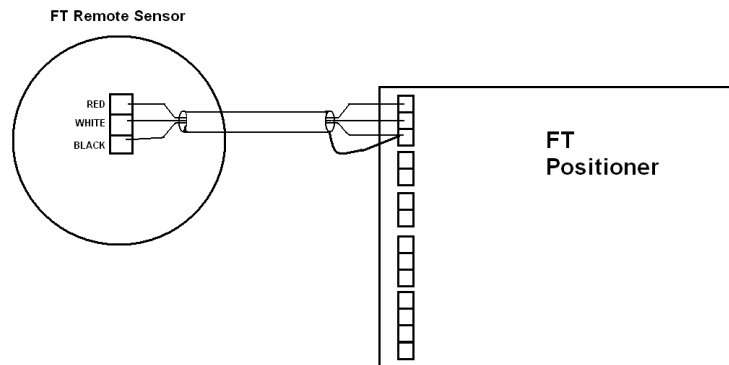
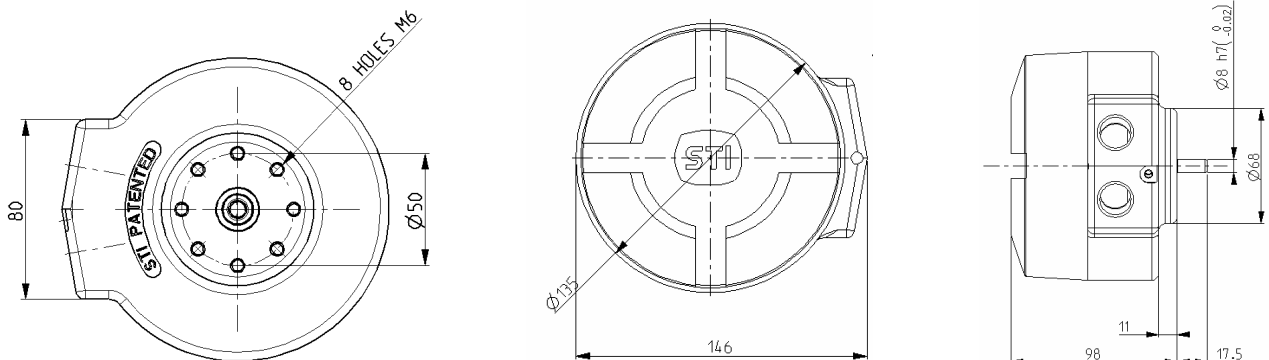


Fig. 17

6.2 Shield connection

Shield connection can be different based on electrical noise and earth gnd quality.

- *Basic solution:* connect the shield only in one side at J4/3.
- *Second solution:* connect the shield only at one side at earth screw on the FT.





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7.0 Display interface and push buttons option



Temperature range: -40° to +80°C (Class T4).

7.1 Maintenance

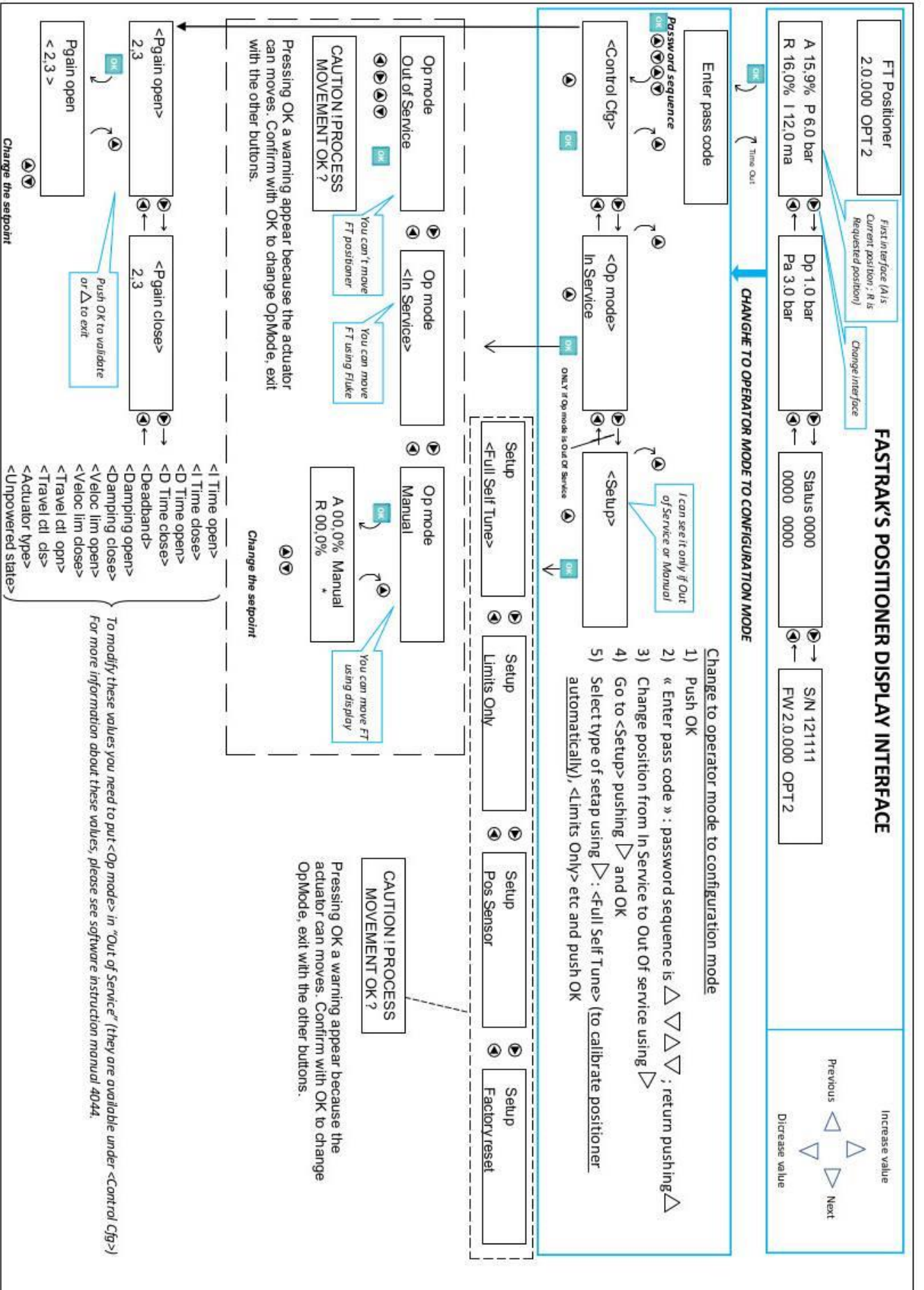
WARNING

Before open cover disconnect air and electrical connection to the positioner.

Partially unscrew “A” screws and completely unscrew “B” screws. Then open the cover rotating it to “A” screws.

After the maintenance, close the cover, fully screw “B” screws and then fully screw “A” screws (in order to keep the ingress protection rating).

The picture on next page shows all functions of FasTrak® positioner in display version.





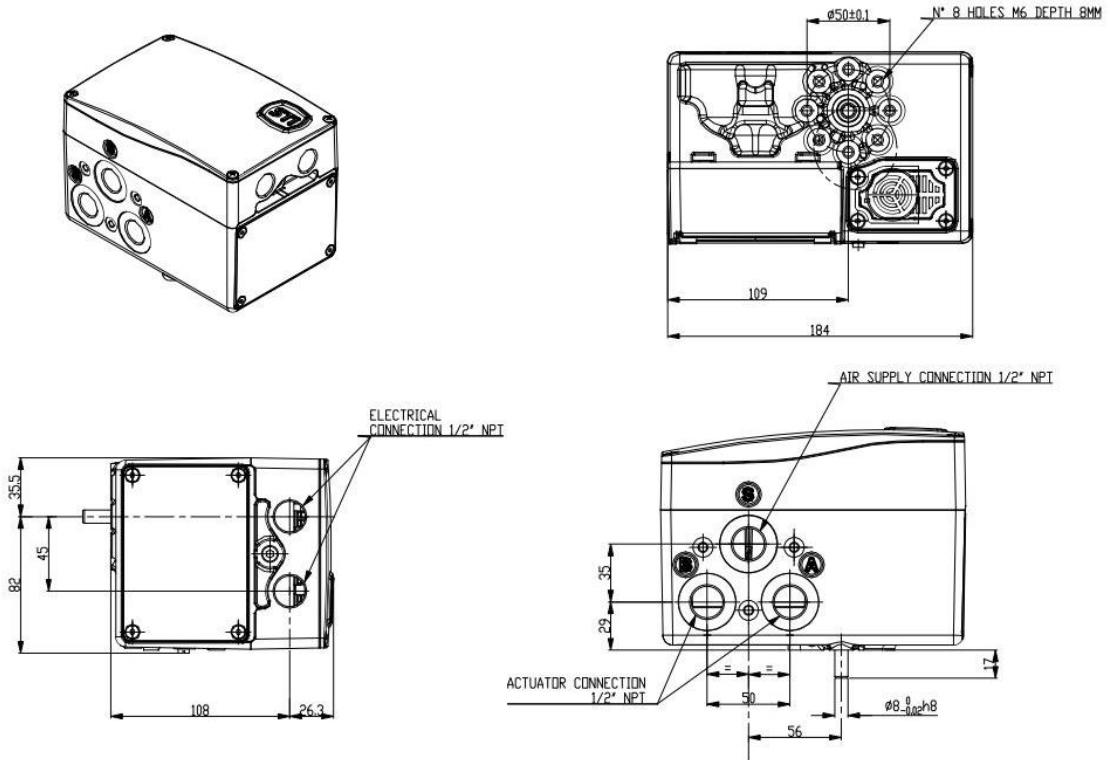
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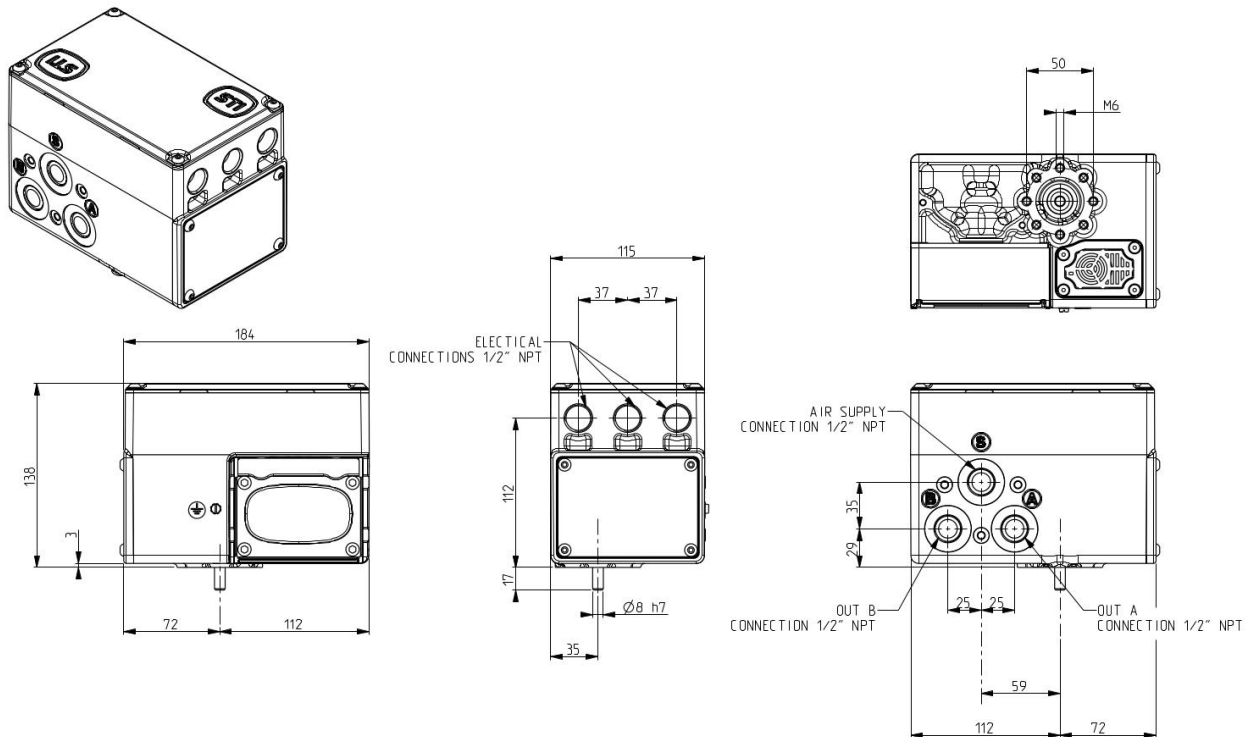


8.0 DIMENSIONAL DRAWINGS

8.1 Intrinsically safe (aluminum case)



8.2 Intrinsically safe (stainless steel 316 case)



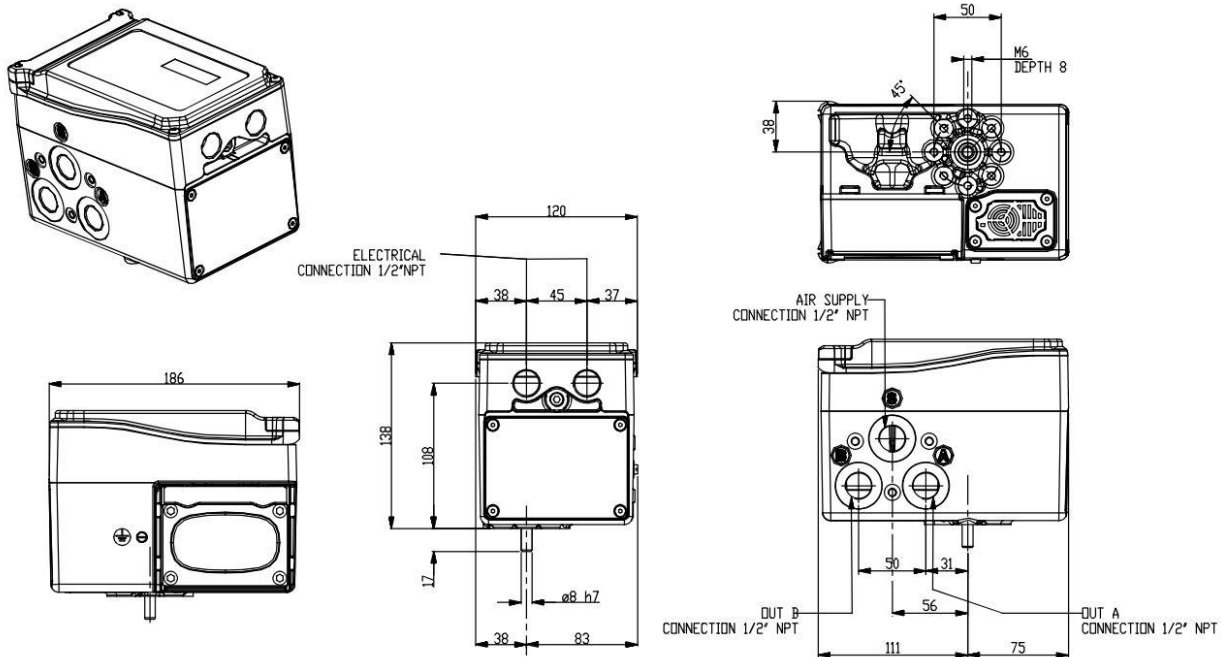


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8.3 Intrinsically safe (display and push buttons version)



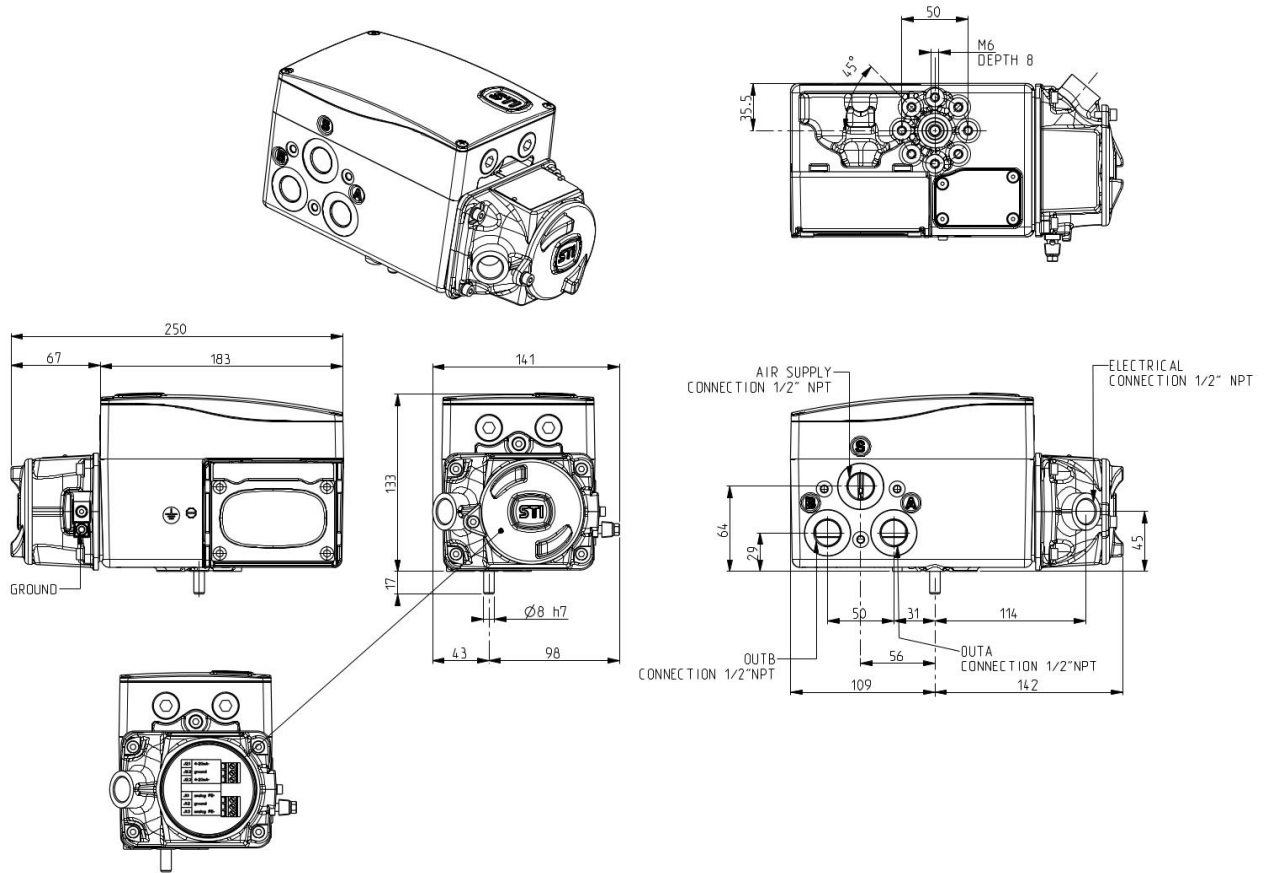


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8.4 Explosion proof (aluminum case)



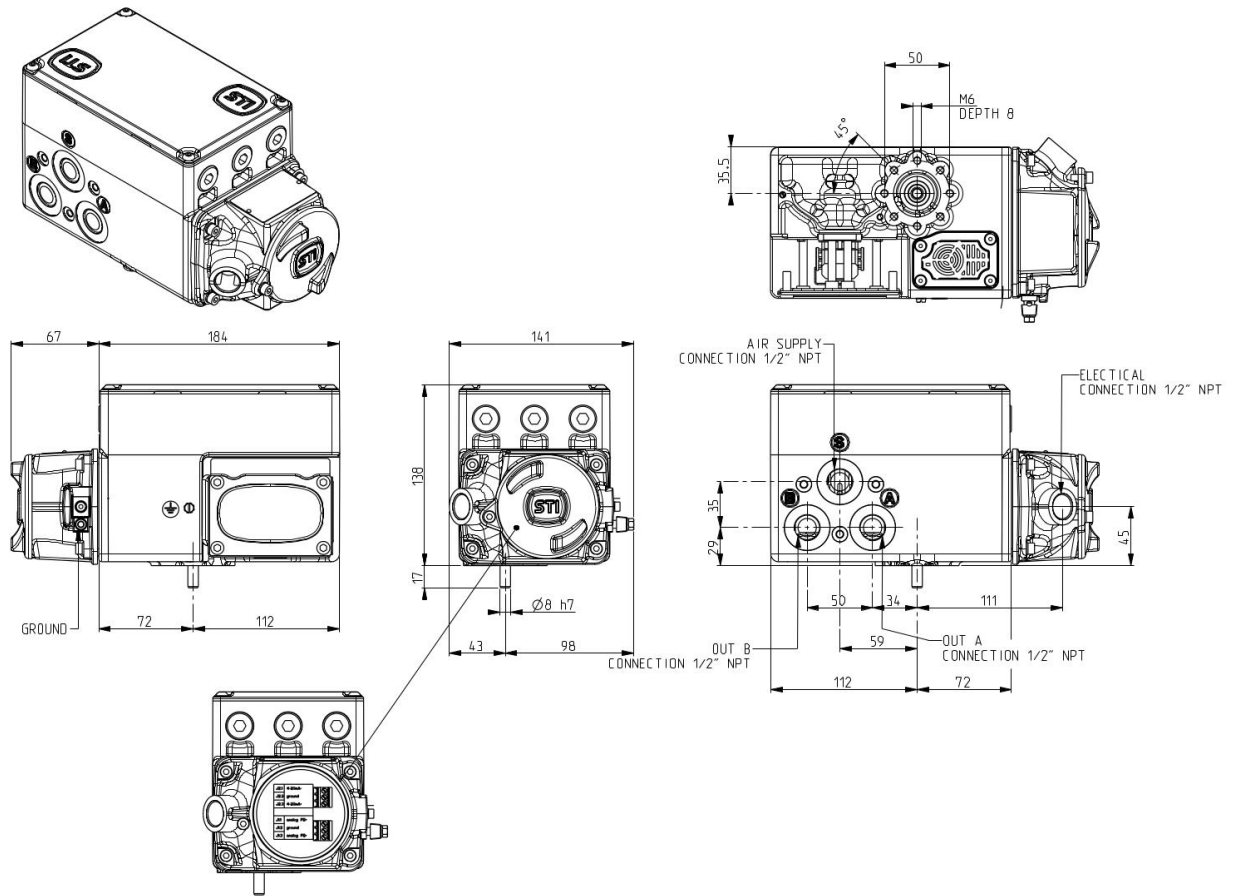


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8.5 Explosion proof (stainless steel 316 case)



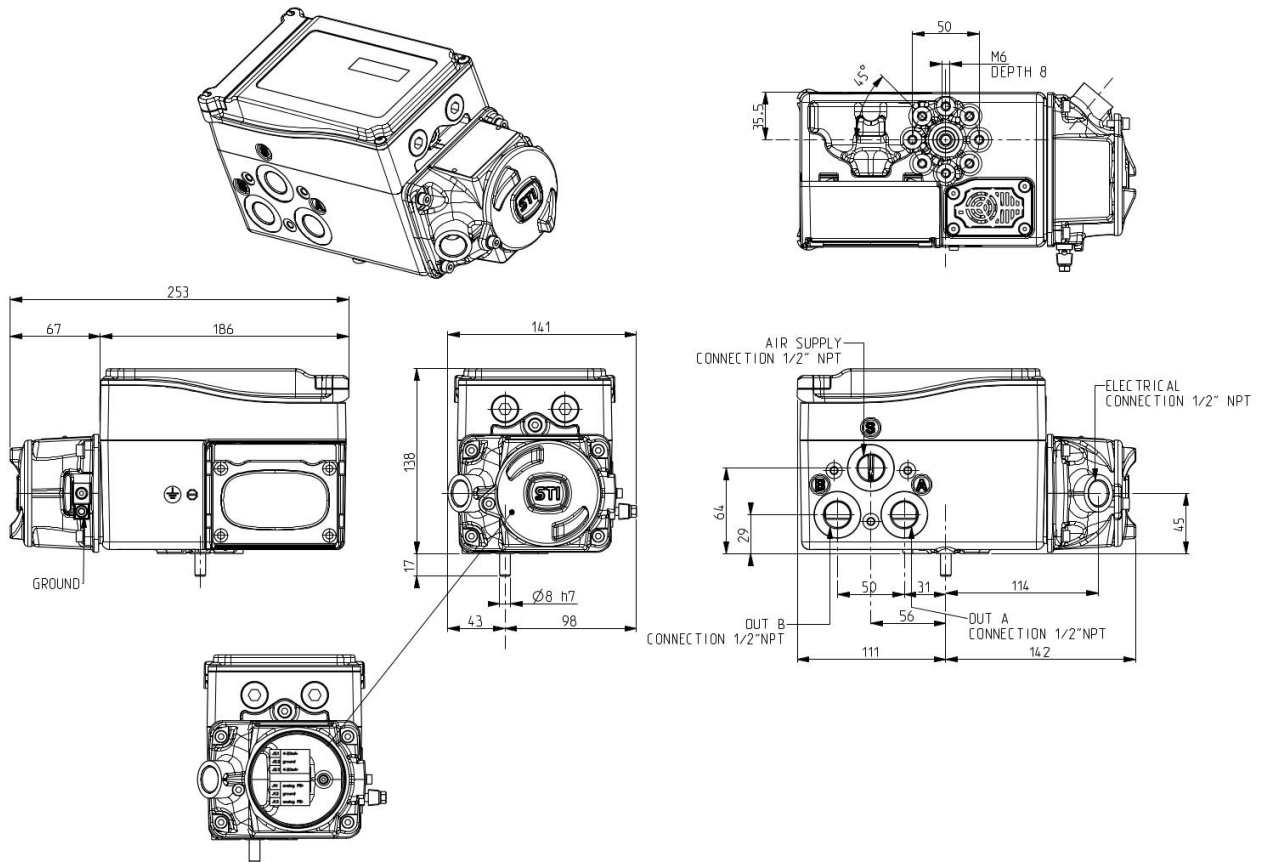


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8.6 Explosion proof (display and push buttons version)



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