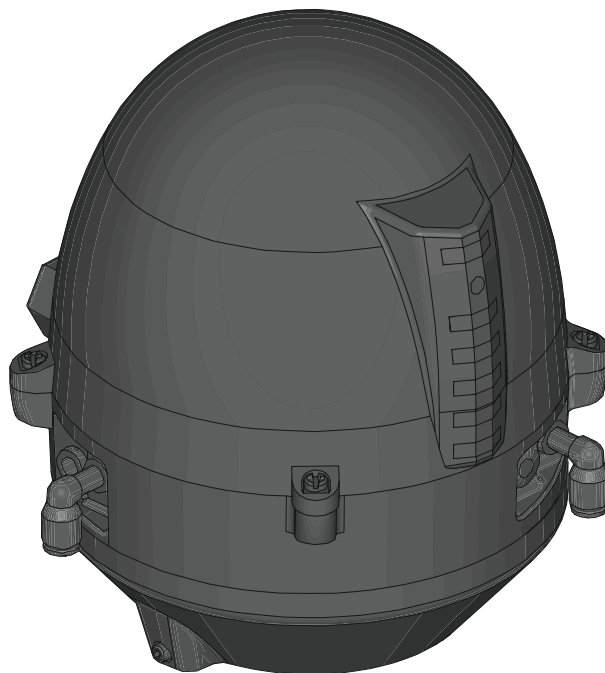


Alfa Laval ThinkTop® Basic Intrinsically Safe

Sensing and control



2055-0004

Lit. Code

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Instruction Manual

Published by
Alfa Laval Kolding A/S
Albuen 31
DK-6000 Kolding, Denmark
+45 79 32 22 00

The original instructions are in English

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Contents

1	Declaration of Conformity	5
1.1	EU Declaration of Conformity.....	5
1.2	UK Declaration of Conformity.....	6
2	Safety	7
2.1	Safety Signs.....	8
2.2	Safety Precautions.....	8
2.3	Warning Signs in Text.....	9
2.4	Requirements of Personnel.....	10
2.5	Recycling Information.....	11
3	Introduction	13
4	General information	15
4.1	ThinkTop Basic Intrinsically Safe at a glance.....	15
5	Installation	17
5.1	Installation on air actuators.....	17
5.2	Air connections.....	20
5.3	Electrical connection, internal.....	21
6	Maintenance	23
6.1	Dismantling of ThinkTop Basic Intrinsically Safe.....	23
6.2	Assembly of ThinkTop Basic Intrinsically Safe.....	26
6.3	Diagrams for ThinkTop Basic Intrinsically Safe.....	28
7	Technical specifications	29
8	Spare Parts	31
8.1	Ordering Spare Parts.....	31
8.2	Alfa Laval Service.....	31

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1 Declaration of Conformity

1.1 EU Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Top Unit for Valve Control and Indication

Designation

ThinkTop® Basic Intrinsically Safe

Type

is in conformity with the following directives with amendments:

- EMC Directive 2014/30/EU
- RoHS Directive 2011/65/EU and amendments
- Equipment Explosive Atmospheres (ATEX) Directive 2014/34/EU

EN IEC 60079 - 0:2018 Explosive atmospheres - General requirements

EN 60079-11:2020 Explosive atmospheres - Equipment protection by intrinsic safety "i"

Intrinsically Safety

The electrical energy available in circuits and equipment, is limited to a level too low to ignite the most easily ignitable mixtures in a hazardous area. Intrinsically safe barriers are installed in the circuit to limit current and voltage in the hazardous areas to avoid sparks or hot spots under fault conditions.

The assembly must be installed strictly in accordance with the installation instruction supplied by the manufacturer. Think Top Basic Intrinsically Safe is suitable for use in hazardous area zone 1 and 2 for gas and zone 21 and 22 for dust.

Marking:



Gas: Ex II 2G Ex ib IIC T6 Gb

Dust: Ex II 2D Ex ib IIIC T85 Db

Certificate: DTI 22ATEX0201X

The person authorised to compile the technical file is the signer of this document.

Vice President BU Hygienic Fluid Handling

Head of Product Management

Mikkel Nordkvist

Title

Name

Kolding, Denmark

2024-04-01

Place

Date (YYYY-MM-DD)

Signature

DoC Revison_ 01_042024 / This Declaration of Conformity replaces Declaration of Conformity dated 2022-06-01



1.2 UK Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Top Unit for Valve Control and Indication

Designation

ThinkTop® Basic Intrinsically Safe

Type

is in conformity with the following directives with amendments:

- The Electromagnetic Compatibility Regulations 2016
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
- The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

BS EN IEC 60079 - 0:2018 Explosive atmospheres - General requirements

BS EN 60079-11:2012 Explosive atmospheres - Equipment protection by intrinsic safety "i"

Intrinsically Safety

The electrical energy available in circuits and equipment, is limited to a level too low to ignite the most easily ignitable mixtures in a hazardous area. Intrinsically safe barriers are installed in the circuit to limit current and voltage in the hazardous areas to avoid sparks or hot spots under fault conditions.

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Marking:



Gas: Ex II 2G Ex ib IIC T6 Gb

Dust: Ex II 2D Ex ib IIIC T85 Db

Certificate: ExVeritas 22UKEX1227X

Signed on behalf of: Alfa Laval Kolding A/S.

Vice President BU Hygienic Fluid Handling
Head of Product Management

Mikkel Nordkvist

Title

Name

Kolding, Denmark

2024-04-01

Place

Date (YYYY-MM-DD)

Signature

DoC Revison_ 01_042024



2 Safety

Read this first



This Instruction Manual is designed for operators and service engineers working with the supplied Alfa Laval product.

Operators must read and understand the **“Safety, Installation and Operating Instructions”** of the supplied Alfa Laval product before carrying out any work or before you put the supplied Alfa Laval product into service!

Not following the instructions can result in serious accidents.

This documentation describes the authorized way to use the supplied Alfa Laval product. Alfa Laval will take no responsibility for injury or damage if the equipment is used in any other way.

This Instruction Manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the supplied Alfa Laval product.

The operator shall always read the **“Safety”** chapter first. Hereafter the operator can skip to the relevant section for the task to be carried out or for the information needed.

Always read the **“Technical Data”** thoroughly.

This is the complete Instruction Manual for the supplied Alfa Laval product.




NOTE

The illustrations and specifications in this Instruction Manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify the Instruction Manual without prior notice or any obligation.

The English version of the Instruction Manual is the original manual. Alfa Laval cannot be held responsible for incorrect translations. In case of doubt, the English version applies.

2.1 Safety Signs








Warning Signs

	General warning.
	Electricity.
	Corrosive substance.




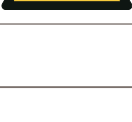

2.2 Safety Precautions

All warnings in the manual are summarised on this page. Pay special attention to the instructions below so that severe personal injury and/or damage to the supplied Alfa Laval product is avoided.

Installation

	Always read the technical data thoroughly
	Never install the ThinkTop before the valve or relay are in a safe position
	If welding close to the ThinkTop: Always perform earthing close to the welding area
	Disconnect the ThinkTop
	Always ensure the ThinkTop is electrically connected by authorised personnel
	The ThinkTop must be installed in an inherently safe circuit, according to the corresponding regulations.
	The Valve Controller is primarily for indoor mounting – if mounted outside - it must be protected from sunlight.

Maintenance

	Always read the technical data carefully.
	Always fit the seals between the valve and ThinkTop correctly.
	Never install the ThinkTop before the valve or relay are in a safe position.
	Never service the ThinkTop with the valve/actuator under pressure.
	Never clean the ThinkTop with high pressure cleaning equipment.
	Never use cleaning agents when cleaning the ThinkTop. Check with cleaning agent supplier.

2.3 Warning Signs in Text

Pay attention to the safety instructions in this Instruction Manual.

Below are definitions of the four grades of warning signs used in the text where there is a risk for injury to personnel or damage to the supplied Alfa Laval product.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate damage to the supplied Alfa Laval product.



Indicates important information to simplify or clarify procedures.

2.4 Requirements of Personnel

Operators

The operators shall read and understand this Instruction Manual.

Maintenance personnel

The maintenance personnel shall read and understand this Instruction Manual. The maintenance personnel or technicians shall be skilled within the field required to carry out the maintenance work safely.

Trainees

Trainees can perform tasks under the supervision of an experienced employee.

People in general

The public shall not have access to the supplied Alfa Laval product.

In some cases, specially skilled personnel may need to be hired (i.e. electricians, welders). In some cases the personnel has to be certified according to local regulations with experience of similar types of work.

2.5 Recycling Information

Unpacking

Packing material may consist of wood, plastics, cardboard boxes and in some cases metal straps.



- Wood and cardboard boxes can be reused, recycled or used for energy recovery
- Plastics should be recycled or burnt at a licensed waste incineration plant
- Metal straps should be sent for material recycling

Maintenance

During maintenance, oil (if used) and wear parts in the supplied Alfa Laval product should be replaced.

- Oil and all non-metal wear parts must be disposed of in accordance with local regulations
- Rubber and plastics should be burnt at a licensed waste incineration plant. If not available they should be disposed of in accordance with local regulations
- Bearings and other metal parts should be sent to a licensed handler for material recycling
- Seal rings and friction linings should be disposed of to a licensed land fill site. Check your local regulations
- All metal parts should be sent for material recycling
- Worn out or defected electronic parts should be sent to a licensed handler for material recycling

Scrapping

At end of use, the equipment must be recycled in accordance with the relevant local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company.

How to contact Alfa Laval

Contact details for all countries are continually updated on our website.

Please visit www.alfalaval.com to access the information directly.

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3 Introduction

The Alfa Laval ThinkTop® Basic Inherently Safe is a modular, explosion-safe automated valve control unit that offers cost-effective operation and standard functionality for automated sensing and control of hygienic valves. It provides real-time information about valve operating status 24/7 while boosting productivity.

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4 General information

4.1 ThinkTop Basic Intrinsically Safe at a glance

The ThinkTop Basic Intrinsically Safe is designed to ensure optimum valve control in conjunction with Alfa Laval valves.

The ThinkTop Basic Intrinsically Safe can be equipped with 0-2 solenoid valves. The solenoids are electrically controlled by the Digital PLC and, when activated, the compressed air is activating the air actuator. The solenoids are also equipped with a manual hold override.

The ThinkTop Basic Intrinsically Safe does not support Unique SSV Long Stroke and SRC-LS valves.

Important! The end user is responsible for performing the explosion risk assessment and classifying the group and the corresponding zone (dust or gas) in accordance with the Directive 1999/92/EC.

The following table shows the ATEX evaluated Alfa Laval sanitary valves as ThinkTop Basic Intrinsically Safe can be installed on and in accordance with ATEX Directive 2014/34/EU.

Consult the valve instruction manuals for further specific safety notes.

Valve / actuator type	ATEX evaluation notes
Unique SSV ATEX	Non-electric equipment with no own ignition source which can be used within equipment-group II 2 G/D or II 3 G/D
Unique Mixproof	Non-electric equipment with no own ignition source which can be used within equipment group II 2 G/D or II 3 G/D if removing the blue plastic cover on bottom of Mix-proof valve
SRC SMP-SC SMP-TO SMP-BC LKLA-T Koltek MH SBV	Non-electric equipment with no own ignition source which can be used within equipment-group II 2G/D or II 3G/

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5 Installation

5.1 Installation on air actuators



Always read the technical data carefully.

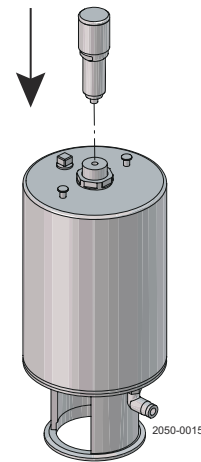


Always ensure the ThinkTop is electrically connected by authorised personnel.

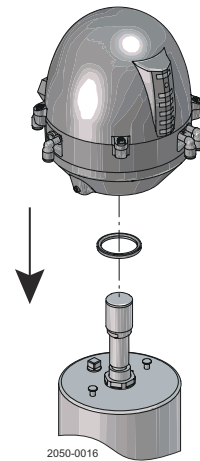


Never install the ThinkTop in the presence of a potentially explosive atmosphere.

- 1
- Fit the air fittings on actuator if not mounted.
 - Fit the activator on the stem and tighten carefully with a spanner.



- 2
- Place the ThinkTop Basic Intrinsically Safe on top of the actuator.
 - Make sure X-ring is mounted.

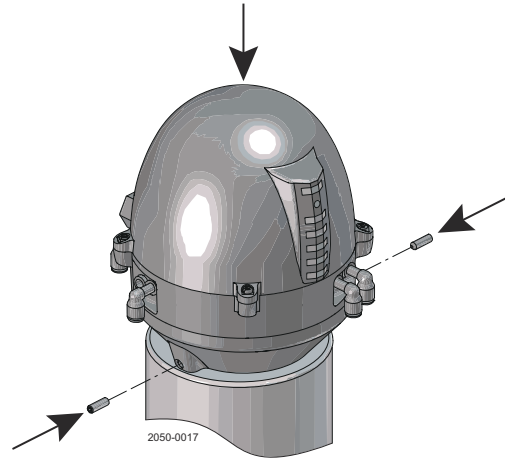


- 3 a) Ensure that the unit is correctly mounted by **pressing** down on top of the ThinkTop Basic Intrinsicly Safe.
- b) Cross-tighten the two Allen screws **carefully** in the two opposite directions (1...1.5 Nm).
- c) Turn the actuator so that LEDs are at front.

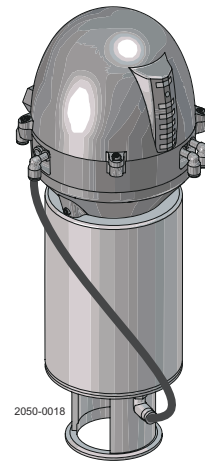
Note:

The Allen screws are part of the ground connection.

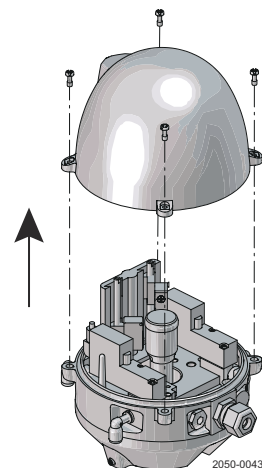
Ensure that they are properly fastened.



- 4 Install the air tubes with reference to the Air connections diagram on page 10.



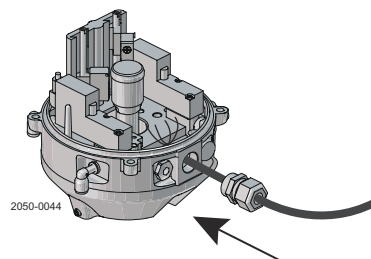
- 5 Untighten the four screws and pull off the cover of ThinkTop Basic Intrinsicly Safe.



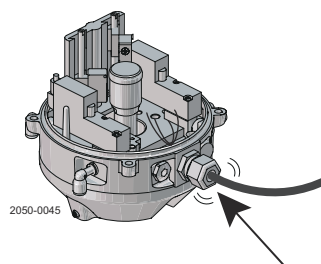
6 Always ensure that power is disconnected before starting the electrical installation.

a) Install cable (if not present) through the cable gland.

b) Connect the electrics of the ThinkTop Basic Intrinsically Safe (see [Electrical connection, internal](#) on page 21).



7 Make sure the cable gland is fully tightened to 3Nm.



8 **Positioning of the inductive proximity switches**

a) The two screws (26) holding the sensor frame shall be loosened slightly to enable the frame to be moved back and forth.

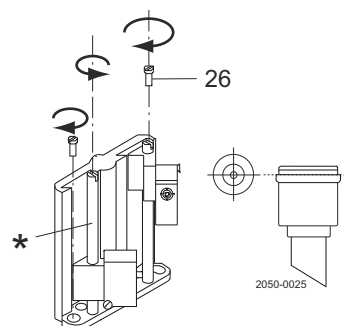
b) Align the marking on the left proximity switch with the indication pin by turning the left set screw.

c) Energise the valve.

d) Align the right proximity switch with the indication pin by turning the right set screw.

e) The proximity switches must be close to the indication pin, but not touch. Shear the frame for correction.

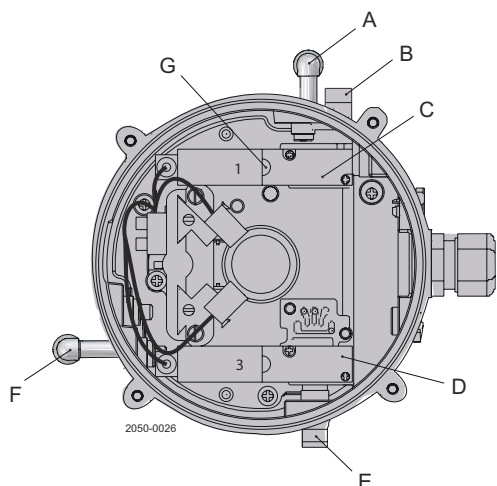
f) Tighten the two screws holding the sensor frame (1 Nm).



Note:

To energise the valve, use the Manual hold override on the Solenoid valve.

5.2 Air connections



- A. Air out 1A
- B. Air exhaust
- C. Solenoid 3/2
- D. Solenoid 3/2
- E. Air in
- F. Air out 3
- G. Manual hold override

5.3 Electrical connection, internal

Electrical connection

The ThinkTop Basic Intrinsically Safe must always be installed in an intrinsically safe circuit.

Sensor

The two inductive NAMUR sensors must be connected to a certified intrinsically safe circuit (e.g. Zener barrier) for apparatus group II 2G/2D with the following maximum values:

$U_i = 15V$

$I_i = 50mA$

$P_i = 0.120W$

$L_i = 110\mu H$

$C_i = 80nF$

Solenoid valve

The intrinsic safe solenoid valves must also be connected to a certified intrinsically safe circuit (e.g. Zener barrier) for apparatus group II 2G/2D with the following maximum values:

$U_i = 28V$

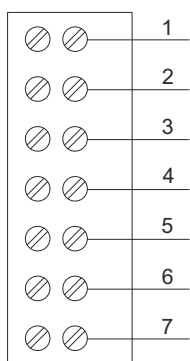
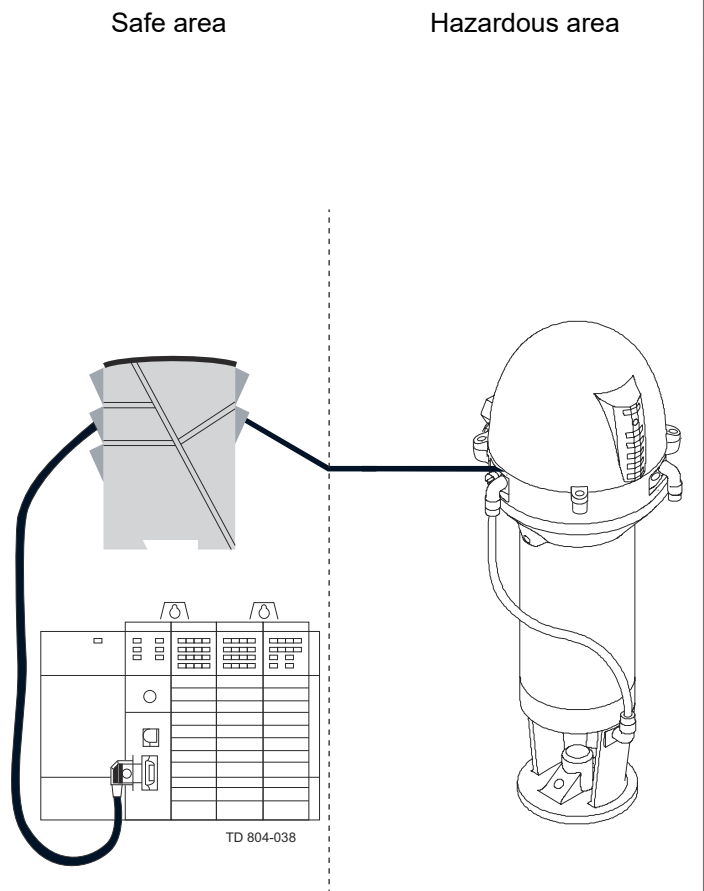
$I_i = 225mA$

$P_i = 1W$

$L_i = 0mH$

$C_i = 0nF$

The electrical installation of ThinkTop Basic Intrinsically Safe must be done according to standard EN 60079-14.



2055-0002

Electrical connections, internal

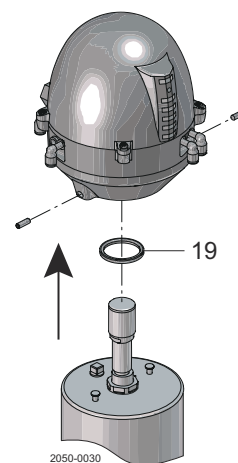
1. Sensor 1 (blue) 8 VDC (-)
2. Sensor 1 (brown) (+)
3. Sensor 2 (blue) 8 VDC (-)
4. Sensor 2 (brown) (+)
5. Common; solenoids (black) 12 VDC (-)
6. Input; solenoid #1 (red) (+)
7. Input; solenoid #3 (red) (+)

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6 Maintenance

6.1 Dismantling of ThinkTop Basic Intrinsically Safe

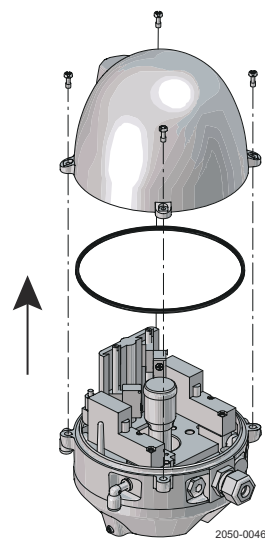
- 1 a) Untighten the two Allen screws and remove the ThinkTop from the actuator.
b) Remove X-ring and replace it.



Never dismantle the ThinkTop in the presence of a potentially explosive atmosphere.

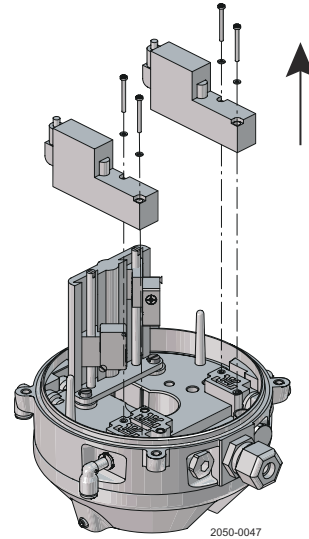


- 2 a) Untighten the four screws.
b) Remove cover of ThinkTop.
c) Remove X-ring (grey).



3

- a) Untighten screws.
- b) Remove solenoid valves (up to two) and replace them with new ones.



Always ensure that power is disconnected before untightening electrical connections.

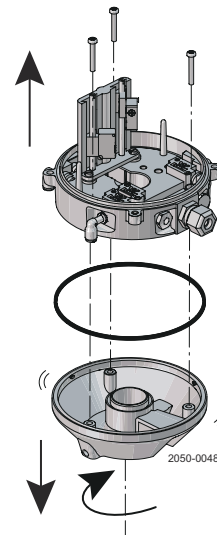


4

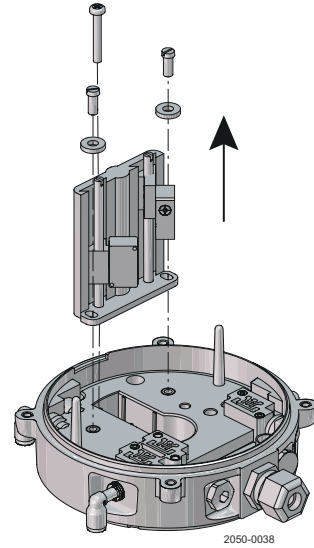
- a) To dismantle the adapter (the lower part of the ThinkTop bracket from base (the middle part), unscrew the three screws.
- b) Turn the lower part clockwise slightly and pull.
- c) Replace adapter if necessary.
- d) Remove the black X-ring.

Note:

Turn banjo connection!

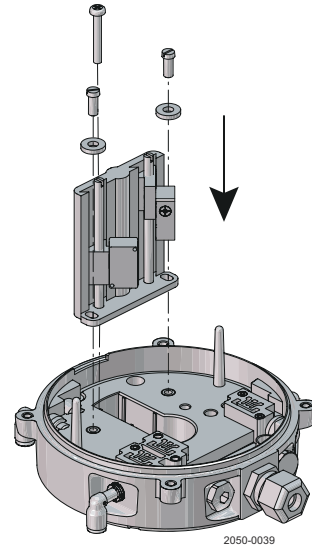


- 5 To remove the sensor frame, unscrew the three screws and pull out the frame.



6.2 Assembly of ThinkTop Basic Intrinsically Safe

- 1 Place sensor frame in base on top of the four washers, two under each side, and tighten screws (torque: 1 Nm).



- 2
 - a) Replace the black X-ring.
 - b) Assemble base with adapter by turning adapter slightly anticlockwise and tighten the four screws (2 Nm).

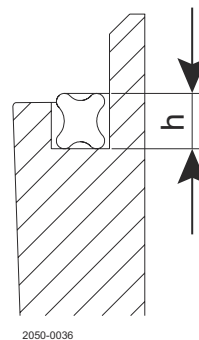
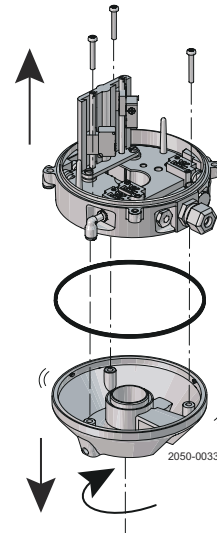
CAUTION!

Do NOT twist the X-ring in the groove!

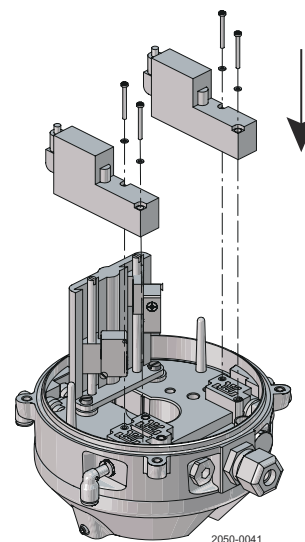
The X-ring is not square.

The highest (h) part must be positioned as shown.

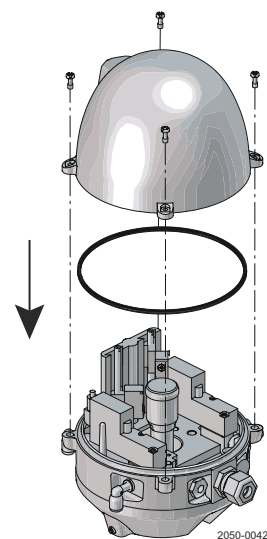
Note: Turn banjo connection!



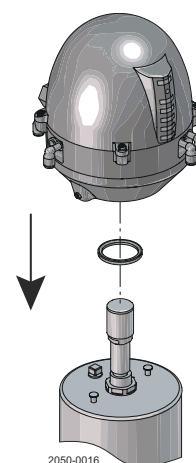
- 3**
- Replace solenoid valves (up to two) with new ones.
 - Tighten screws (0.2 Nm).



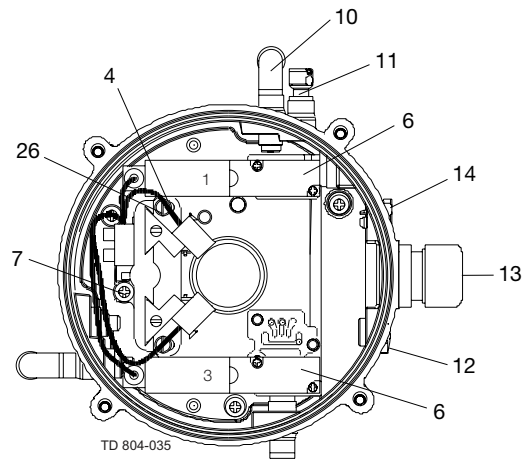
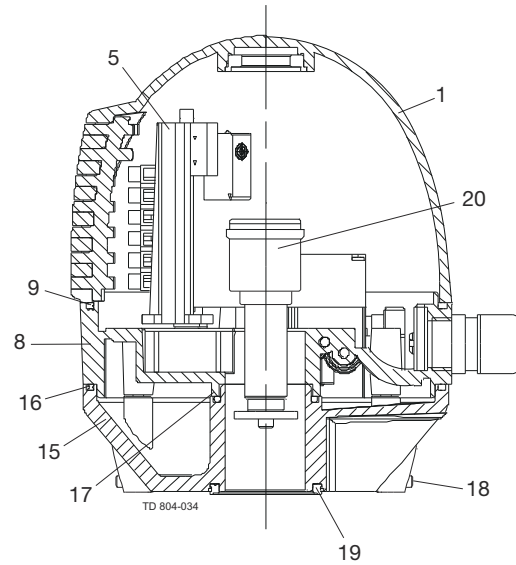
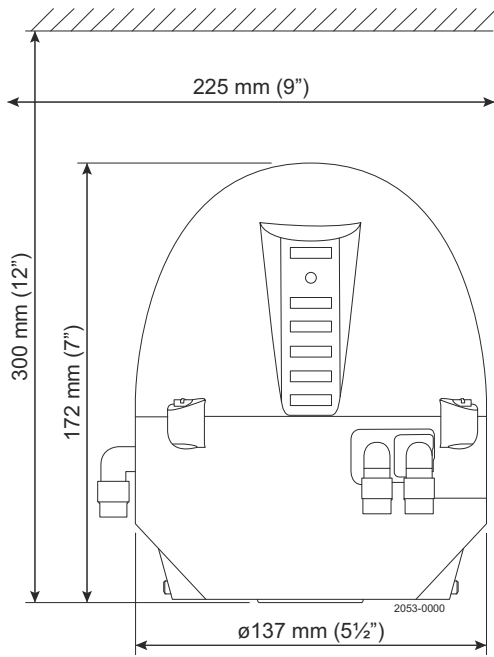
- 4**
- Replace the grey X-ring.
 - Replace cover of ThinkTop Basic Intrinsically Safe and tighten the four screws (0.6 Nm).



- 5**
- Replace the black X-ring.
 - Mount ThinkTop Basic Intrinsically Safe on actuator.



6.3 Diagrams for ThinkTop Basic Intrinsically Safe



7 Technical specifications

Solenoid valves

Number of solenoid valves	0, 1 or 2
Type	3/2 port
Air supply	0.15 - 0.7 MPa (1.5-7 bar)
Filtered air, max. particles or dirt	5 µ 5-5 mg/m ³
Max. flow	180 l/min
Max. oil content	1mg/m ³
Max. water content	0.88 g/m ³ -20 oC compressed air
Throughput	ø2.5 mm
Air restriction (throttle function)	No
Manual hold override	Yes
External air tube connection	ø6 mm or 1/4". (specify when ordering) Connection possible via ø6 mm (Filter recommended in tropical regions)
Nominal voltage	12 VDC
Nominal power	0.52 W
Allowable voltage fluctuation	±10% of rated voltage
Certificate of conformity	DEKRA 11ATEX0273 X

Inductive sensor

Switching element function	NAMUR NC
Nominal voltage: U _o	8.2 V
Indication of switching state:	LED, yellow
EMC in accordance with	EN 60947-5-6
Certificate of conformity	Gas: PTB01ATEX2191 Dust: BVS04ATEXE153

Cable gland

Clamping range	ø5,5 - 8,5 mm
Wrench size	24 mm
Material	Nylon PA, reinforced, blue
Certificate of conformity	SEV 15 ATEX 0152 X

Materials

Plastic parts	Nylon PA6, reinforced, stainless steel fibres
Metal parts	Stainless steel and bras
Seals	Nitrile (NBR)
Gore vent. membrane	PBT plastic

Micro environment demand specifications

Temperature		
Working:	- 10°C to +45°C	EN 50020
Storage:	- 40°C to +85°C	IEC 68-2-1/2
Temperature change:	- 25°C to +70°C	EC 68-2-14
Vibration	10-55 Hz, 0.7 mm	
	55-500 Hz, 10g	IEC 68-2-6
	3 x 30 min, 1 octave/min	
Drop test		
Humidity	+ 40°C, 21 days, 93% R.H.	IEC 60068-2-78
Constant humidity:	+ 15°C/+45°C	EN 60068-2-30
	12 cycles	
(working)	93% R.H.	
Protection class		
	IP66 and IP67	EN 60529
Surface resistance	<1GΩ (ohm)	EN 60079-0

8 Spare Parts

For every delivered Alfa Laval Product, a spare part list is available.

This spare part list contains a range of the most common wear parts for the machinery. If any component not mentioned is required, please contact your local Alfa Laval representative for availability.

You can find our spare part catalogue at <https://hygienicfluidhandling-catalogue.alfalaval.com>.

Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

8.1 Ordering Spare Parts

When ordering spare parts, please always state:

1. Serial number (if available)
2. Item number/spare part number (if available)
3. Capacity or other relevant identification

8.2 Alfa Laval Service

Alfa Laval is represented in all larger countries of the world.

Do not hesitate to contact your local Alfa Laval representative, with any questions or requirement of spare parts for Alfa Laval equipment.