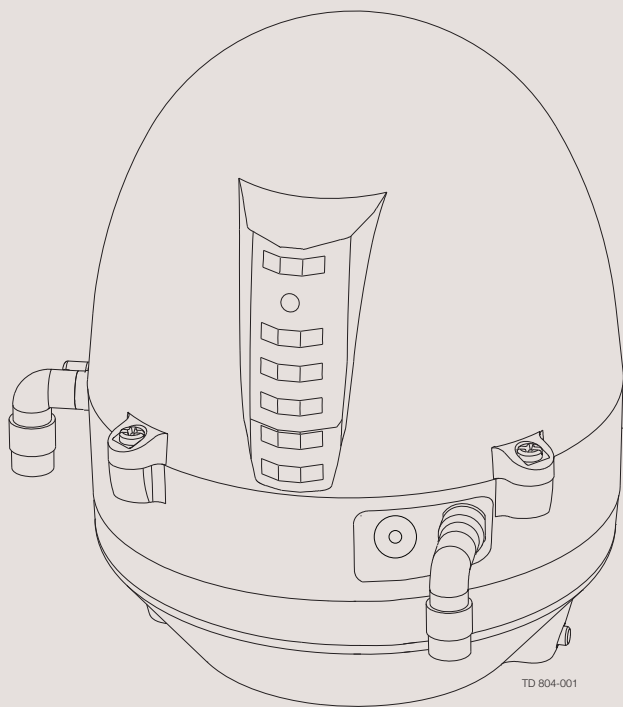




Instruction Manual

ThinkTop® Basic Intrinsically Safe



TD 804-001

Registered Design
Registered Trademark

ESE00810-EN3 2014-12

Original manual

The information herein is correct at the time of issue but may be subject to change without prior notice

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1 EC Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S

Company Name

Albuen 31, DK-6000 Kolding, Denmark

Address

+45 79 32 22 00

Phone No.

hereby declare that

Top Unit for Valve Control and Indication

Designation

ThinkTop® Basic Intrinsically Safe

Type

is in conformity with the following directive with amendments:

- Low Voltage Directive (LVD) 2006/95/EC
- EMC Directive 2004/108/EC
- RoHS2 Directive 2011/65/EU
- Directive 94/9/EC for Equipment intended for use in Potentially Explosive Atmospheres (ATEX).
- Think Top Basic Intrinsically Safe is suitable for use in hazardous area zone 1 and zone 21 Marking: Ex II 2D/G EEx ia IIC T6

The following harmonised Standards and Regulations have been applied:

- EN 1127-1:1997 Explosive Atmospheres – Basic concept & methodology
- EN 12100-1/2: Basic terminology and methodology - Technical principles
- EN 13463-1: Non-electrical equipment - Basic method and requirements
- EN 13463-5: Non-electrical equipment - Protection by constructional safety
- EN 14121-1: Safety of machinery - Risk assessment, principles

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 zone 21

Marking: Ex II 2D/G EEx ia IIC T6

The Notified Body NB.0044 will retain this Declaration of Conformity TÜV-Nord technical file no.: TÜV 08 ATEX 8000365231

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

QHSE Manager, Quality, Health and safety & Environment

Title

Annie Dahl

Name

Kolding

Place

2009-04-01

Date



Signature



*Unsafe practices and other important information are emphasized in this manual.
Warnings are emphasized by means of special signs. All warnings in the manual are summarized on this page.
Pay special attention to the instructions below so that severe personal injury or damage to the top unit are avoided.*

2.1 Important information

Always read the manual before using the top unit!

WARNING

Indicates that special procedures must be followed to avoid serious personal injury.

CAUTION

Indicates that special procedures must be followed to avoid damage to the ThinkTop®.

NOTE

Indicates important information to simplify or clarify procedures.

2.2 Warning signs

General warning:



Caustic agents:



2.3 Safety precautions

Installation:

Always read the technical data thoroughly

Never install the ThinkTop Basic Intrinsicly Safe before valve or relay is in a safe position

If welding close to the ThinkTop Basic Intrinsicly Safe: **Always** earth close to the welding area

Disconnect the ThinkTop Basic Intrinsicly Safe



Always have the ThinkTop Basic Intrinsicly Safe electrically connected by authorized personnel



The ThinkTop Basic Intrinsicly Safe must be installed in an inherently safe circuit, according to the corresponding regulations.

Maintenance:

Always read the technical data thoroughly

Always fit the seals between valve and ThinkTop Basic Intrinsicly Safe correctly

Never install the ThinkTop Basic Intrinsicly Safe before valve or relay is in a safe position

Never service the ThinkTop Basic Intrinsicly Safe with valve/actuator under pressure

Never clean the ThinkTop Basic Intrinsicly Safe with high pressure cleaning equipment



Never use cleaning agents when cleaning the ThinkTop Basic Intrinsicly Safe. Check with cleaning agent supplier.



3 General information

3.1 ThinkTop Basic Intrinsically Safe in general

The ThinkTop Basic Intrinsically Safe is designed to ensure optimum valve control in conjunction with Alfa Laval valves and it is compatible with most PLC systems.


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!

It will be the responsibility of the end user to perform the explosion risk assessment and to classify the group and the corresponding zone (dust or gas) in accordance with the Directive 1999/92/EC.

The following table list show the ATEX evaluated Alfa Laval sanitary valves as ThinkTop Basic Intrinsically Safe can be installed on and in accordance with ATEX Directive 94/9/EC.

Valve / actuator type	ATEX evaluation notes
Unique SSV ATEX	 II 2 G D c T4
Unique Mixproof	Non electric equipment with no own ignition source which can be used within the equipment-group II 2 G/D or II 3 G/D if removing the blue plastic cover on bottom of the Mixproof valve
SRC SMP-SC SMP-TO SMP-BC LKLA-T Koltex MH SBV	Non electric equipment with no own ignition source which can be used within the equipment-group II 2 G/D or II 3 G/D

Note! Contact customer support to get the "ATEX Product Statement 2009" with listed valves inside/outside the scope of ATEX Directive 94/9/EC

Solenoid valves		
0 to 2 solenoid valves in each unit possible.		
Type		3/2 port.
Air supply		0.15 - 0.7 MPa (1.5-7 bar).
Filtered air, max. particles or dirt		5 mm 5-5 mg/m ³ .
Max. flow		180 l/min.
Max. oil content		1 mg/m ³ .
Max. water content		0.88 g/m ³ -20 °C compressed air.
Throughput		ø2.5 mm.
Manual hold override		Yes.
External air tube connection		ø6 mm or 1/4".
Silencer/filter		Connection possible via ø6 mm or 1/4". (Filter recommended in tropical regions).
Nominal voltage		12 VDC.
Nominal power		0.52 W.
Allowable voltage fluctuation		±10% of rated voltage
Certificate of conformity		KEMA 08 ATEX 0093 X
Inductive sensor		
Switching element function		NAMUR NC
Nominal voltage: U _o		8 V
Measuring plate not detected		3 mA
Measuring plate detected		1 mA
Indication of the switching state:		LED, yellow
EMC in accordance with		IEC / EN 60947-5-2:2004; NE 21
Standards		DIN EN 60947-5-6 (NAMUR)
Certificate of conformity		PTB 00 ATEX 2032 X
Materials		
Plastic parts		Nylon PA6, reinforced, stainless steel fibres.
Steel parts		Stainless steel AISI 304 and 316.
Air fitting		Special coated brass (FDA approved).
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	IEC 68-2-14
Vibration		
	10-55 Hz, 0.7 mm	IEC 68-2-6
	55-500 Hz, 10g	
	3 x 30 min, 1 octave/min	
Drop test		
		IEC 68-2-32
Humidity		
Constant humidity:	+40°C, 21 days, 93% R.H.	IEC 60068-2-78
Cyclic humidity:	+15°C/+45°C	EN 60068-2-30
	12 cycles	
(working)	93% R.H.	
Protection class		
	IP66 and IP67	EN 60529
Surface resistance		
	< 1G•	EN 60079-0
Type of Ex protection		
	Ex II 2G/D EEx ia IIC T6	ATEX directive 94/9/EC

5 Installation

5.1 Installation on air actuators

Step 1



Always read the technical data thoroughly.



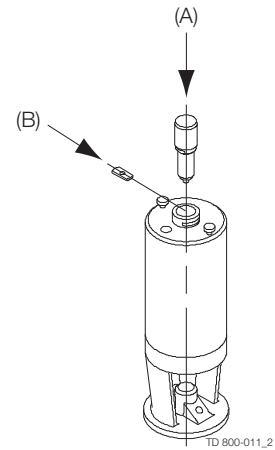
Always have the ThinkTop Basic Intrinsicly Safe electrically connected by authorised personnel.

Step 2

1. Fit the air fittings on actuator if not mounted.
2. Fit the activator stem and tighten **carefully** with a spanner (A).

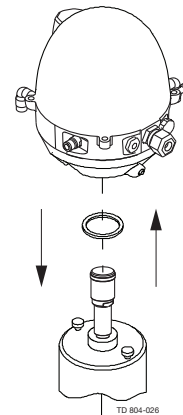
Note:

The threaded plate (B) is only used for the SRC and SMP valve types.



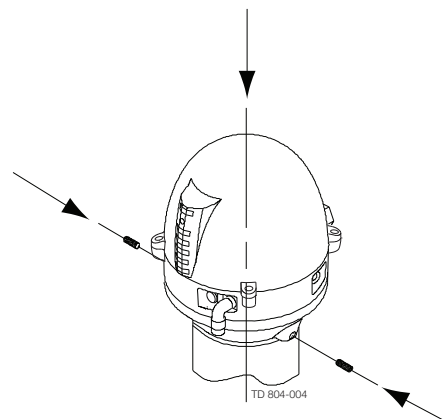
Step 3

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



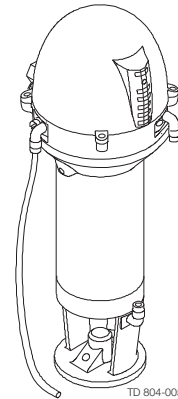
Step 4

1. Ensure that the unit is correctly mounted by **pressing** down on top of the ThinkTop Basic Intrinsicly Safe.
2. Tighten the two Allen screws **carefully** (1.50 Nm).



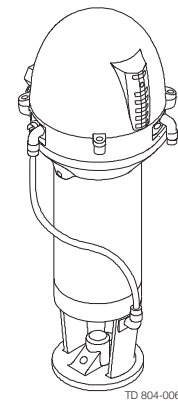
Step 5

Fit the $\varnothing 6$ mm (1/4") air tubes to ThinkTop Basic Intrinsically Safe.
(see drawing "Air connections" page 10).



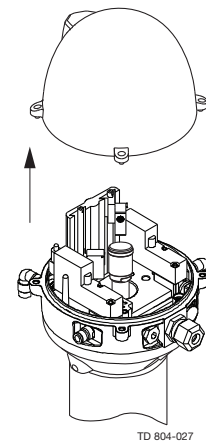
Step 6

Fit the air tubes to the actuator
(see drawing "Air connections" page 10).



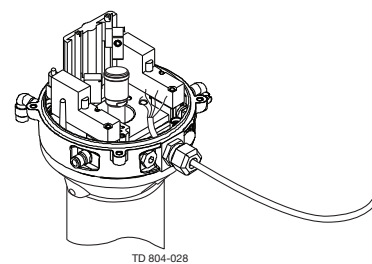
Step 7

Untighten the four screws and pull off cover of
ThinkTop Basic Intrinsically Safe.



Step 8

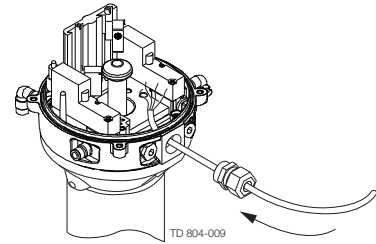
1. Install cable (if not present) through the cable gland.
2. Connect the ThinkTop Basic Intrinsically Safe electrically
(see page 11 "Electrical connection, internal").



5 Installation

Step 9

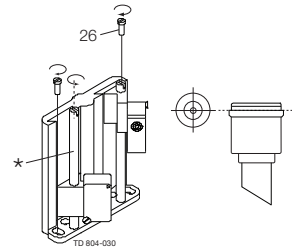
Make sure the cable gland is completely tightened.



Step 10

Positioning of the inductive proximity switches.

1. The two screws (26) holding the sensor frame shall be slightly tightened, enabling the frame to be moved back and forth.
2. Align the marking on the left proximity switch with the indication pin (20) by turning the left set screw.
3. Energize the valve.
4. Align the right proximity switch with the indication pin (20) by turning the right set screw.
5. The proximity switches must be close to the indication pin, but not touch. Shear the frame for correction.
6. Tighten the two screws holding the sensor frame (1 Nm).

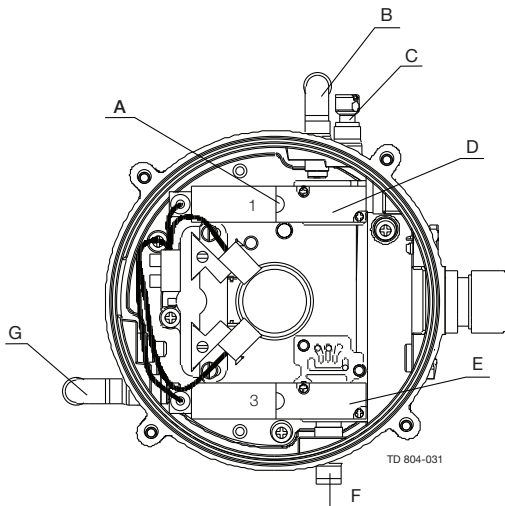


NOTE!

To energize the valve, use a separate air tube or be in radio contact with the control room.

7. Mount the cover of ThinkTop Basic Intrinsically Safe and tighten (0.6 Nm) the four screws.

5.2 Air connections



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

5.3 Electrical connection, internal

Electrical Connection

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

Sensor

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

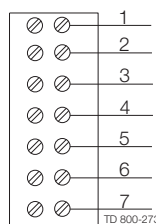
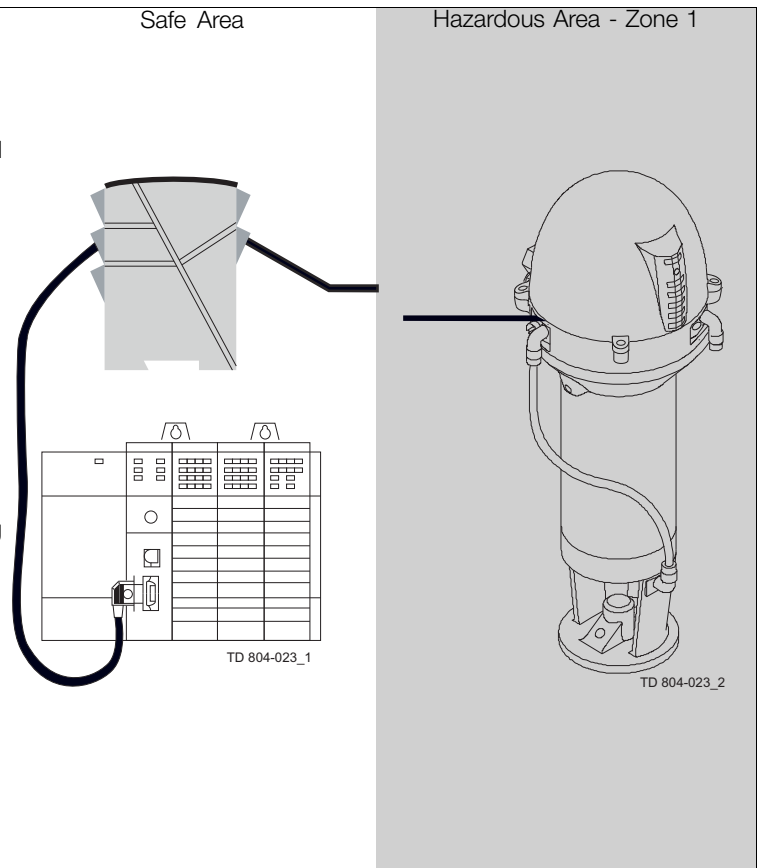
- $U_i = 15V$
- $I_i = 50mA$
- $P_i = 1W$
- $L_i = 100\mu H$
- $C_i = 100nF$

Solenoid valve

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

- $U_i = 28V$
- $I_i = 225mA$
- $P_i = 1W$
- $L_i = 0\mu H$
- $C_i = 0nF$

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



Electrical connections, internal

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

6 Maintenance

Study the instructions carefully.

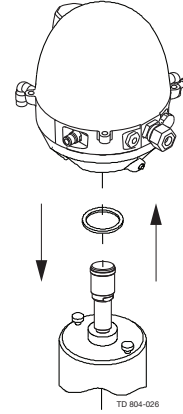
Handle scrap correctly.

Always keep spare X-rings in stock.

6.1 Dismantling of ThinkTop Basic Intrinsically Safe

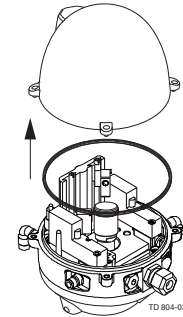
Step 1

1. Untighten the two Allen screws and remove the ThinkTop Basic Intrinsically Safe from the actuator.
2. Pull out X-ring (19) and replace it.



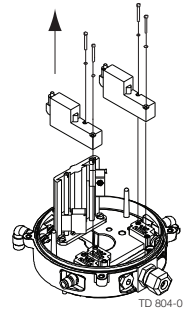
Step 2

1. Untighten the four screws.
2. Pull off cover of ThinkTop Basic Intrinsically Safe.
3. Remove X-ring (9) (grey).



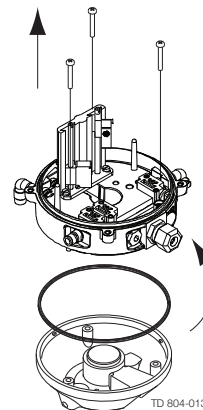
Step 3

1. Untighten screws.
2. Remove solenoid valves (up to two) and replace them with new ones.



Step 4

1. To dismantle the adapter (the lower part of the ThinkTop Basic Intrinsically Safe) from base (the middle part), unscrew the three screws.
2. Turn the lower part a little clockwise and pull.
3. Replace adapter if necessary.
4. Remove the black X-ring.

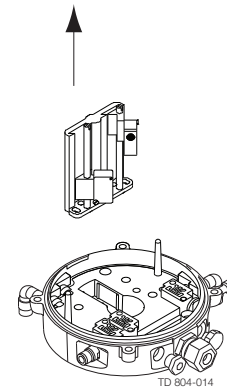


Note:
Turn banjo connection!

Study the instructions carefully.
Handle scrap correctly.
Always keep spare X-rings in stock.

Step 5

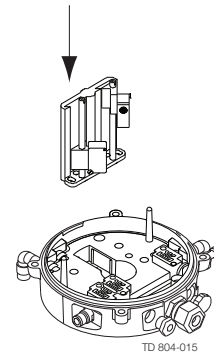
To remove the sensor frame unscrew the three screws and pull out the frame.



6.2 Assembly of ThinkTop Basic Intrinsically Safe

Step 1

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

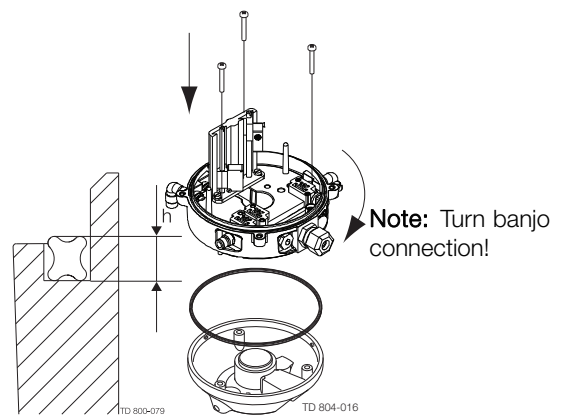


Step 2

1. Replace the black X-ring.
2. Assemble base with adapter by turning adapter slightly anticlockwise and tighten the four screws (1.9 Nm).

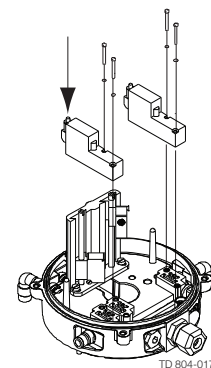
CAUTION!

Do NOT twist the X-ring in the groove!
The X-ring is not square.
The highest (h) part must be placed as fig.



Step 3

1. Replace solenoid valves (up to two) with new ones.
2. Tighten screws (0.2 Nm).



6 Maintenance

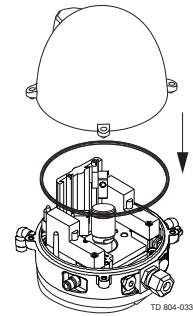
Study the instructions carefully.

Handle scrap correctly.

Always keep spare X-rings in stock.

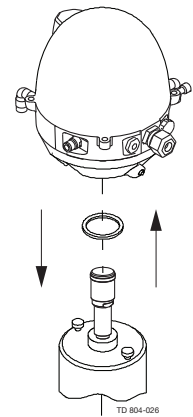
Step 4

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



Step 5

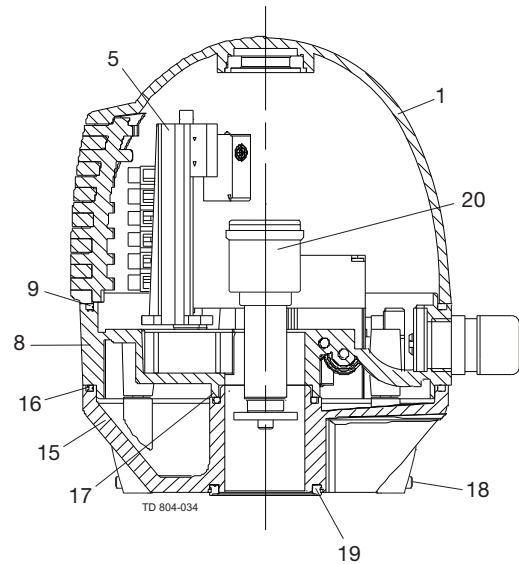
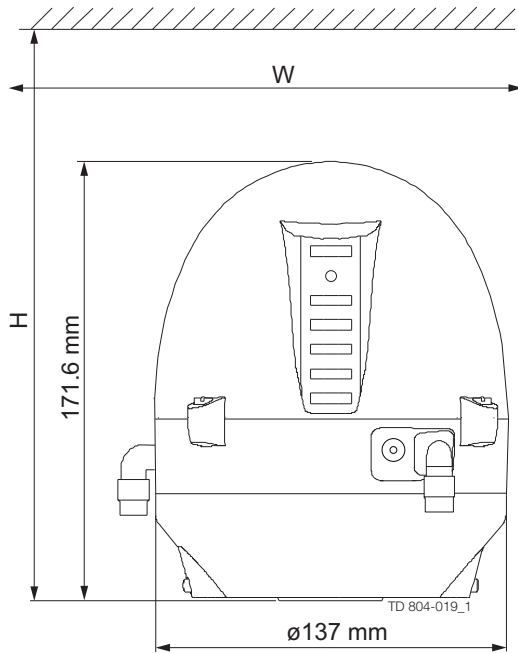
1. Replace the black X-ring.
2. Mount ThinkTop Basic Intrinsically Safe on actuator.



7 Parts list and service kits

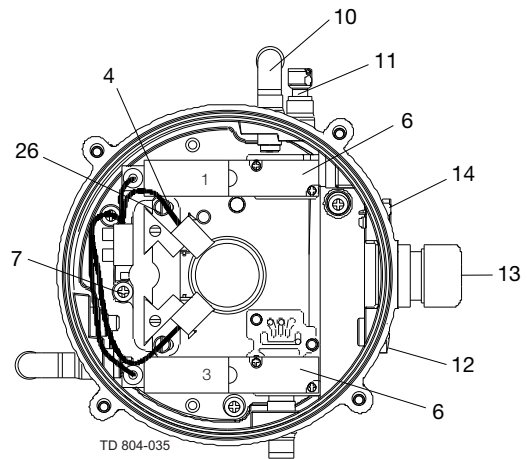
The drawings show ThinkTop Basic Intrinsically Safe.
The items refer to the parts lists in the following sections

7.1 Drawings for ThinkTop Basic Intrinsically Safe



Note! This is the basic design.

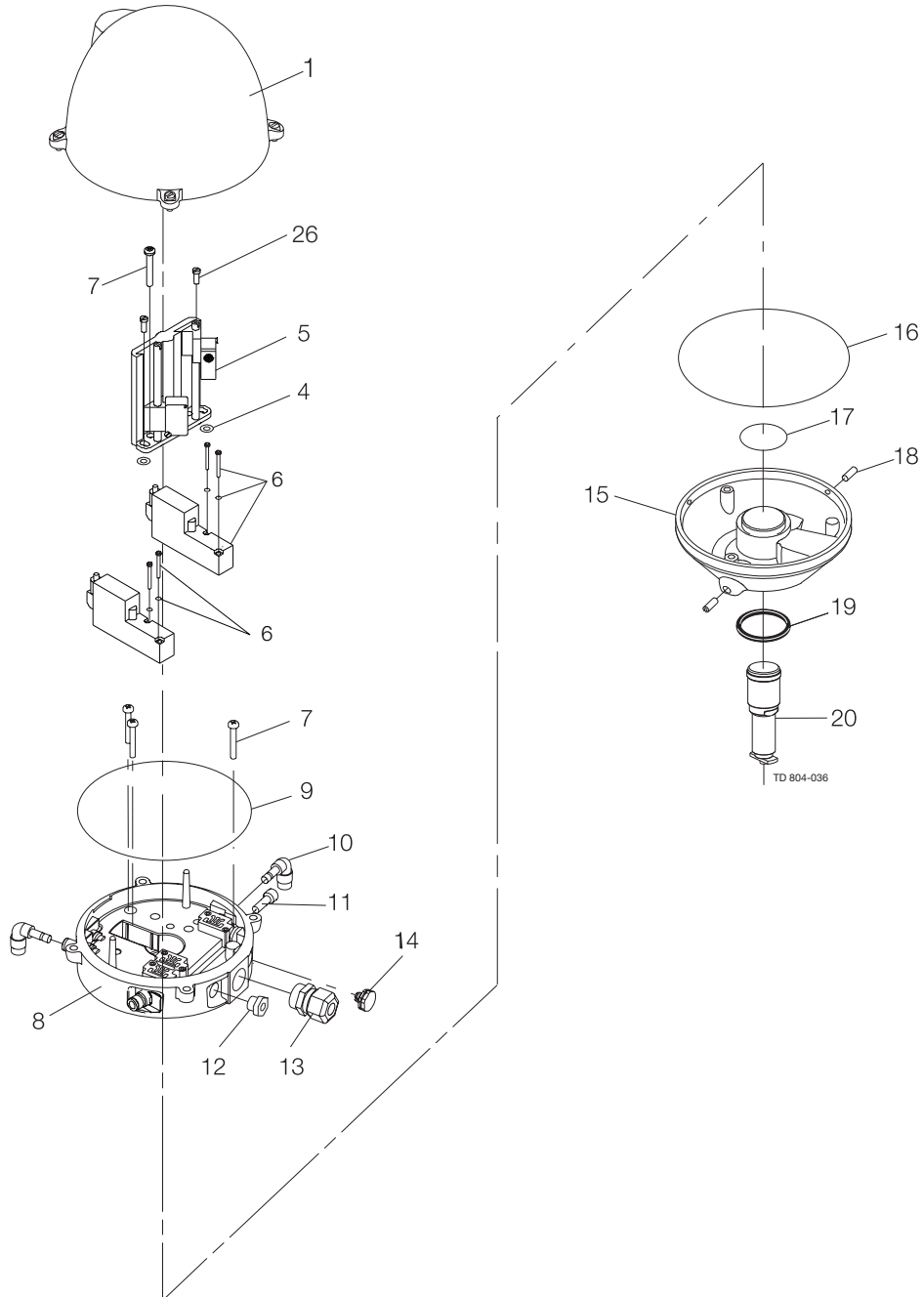
Valve Type	H	W
Unique SSV ATEX NC	225	250
SRC NC	225	250
SMP-SC/-BC/-TO	225	250
Unique Mixproof	225	250
Koitek MH	225	250
SBV	225	250
Unique SSV ATEX NO	225	320
SRC NO	225	320
LKLA-T	225	300



7 Parts list and service kits

The drawings show ThinkTop Basic Intrinsically Safe.
The items refer to the parts lists in the following sections

7.2 ThinkTop Basic Intrinsically Safe



7 Parts list and service kits

*The drawings show ThinkTop Basic Intrinsically Safe.
The items refer to the parts lists in the following sections*

Parts list

Pos.	Qty	Denomination
1	1	Shell, complete
4	2	Washer
5	1	Frame cpl. with sensors
6	1-2	Solenoid valve (3/2)
7	4	PT screw
8	1	Base
9	1	Special X-ring, grey
10	1	Air fitting elbow
11	1	Blow-off valve
12	1	Thread plug, PG7
13	1	Cable gland, PG11
14	1	Gore vent
15	1	Adapter complete
16	1	Special X-ring, black
17	1	O-ring
18	2	Allen screw
19	1	Special X-ring
20	1	Indication pin
26	2	Screw

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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