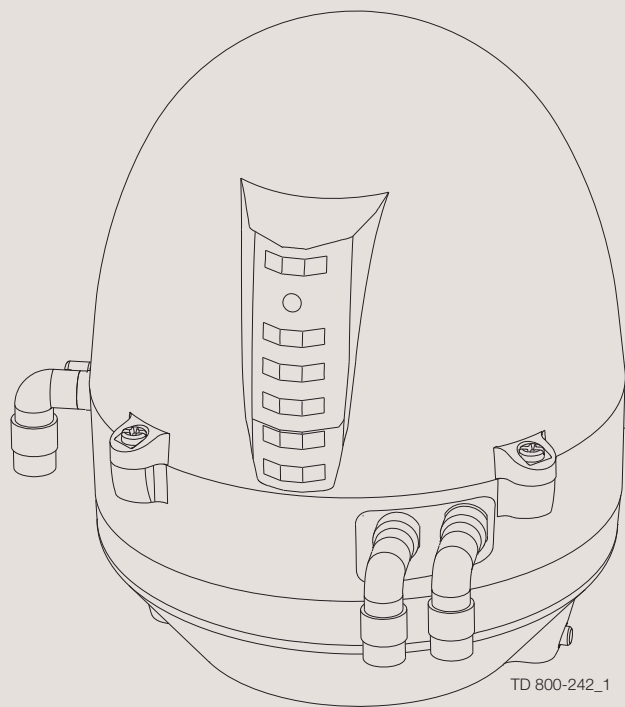




Instruction Manual

ThinkTop® Basic AS-Interface v.3.0 (62 nodes) 29.5 - 31.6 VDC



Patented Sensor System
Registered Design
Registered Trademark

ESE01516-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 AS-Interface

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

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

2010-03-01

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 Basic AS-Interface.

NOTE

Indicates important information to simplify or clarify procedures.

2.2 Warning signs

General warning:



Dangerous electrical voltage:



Caustic agents:



2.3 Safety precautions

Installation:

Always read the technical data thoroughly (See chapter 6 Setup diagram)

Never install the ThinkTop Basic AS-Interface before valve or relay is in a safe position

If welding close to the ThinkTop Basic AS-Interface: **Always** earth close to the welding area

Disconnect the ThinkTop Basic AS-Interface.



Always have the ThinkTop Basic AS-Interface electrically connected by authorized personnel



Maintenance:

Always read the technical data thoroughly (See chapter 6 Setup diagram)

Always fit the seals between valve and ThinkTop Basic AS-Interface correctly

Never install the ThinkTop Basic AS-Interface before valve or relay is in a safe position

Never service the ThinkTop Basic AS-Interface with valve/actuator under pressure

Never clean the ThinkTop Basic AS-Interface with high pressure cleaning equipment



Never use cleaning agents when cleaning the ThinkTop Basic AS-Interface. Check with cleaning agent supplier.



3 General information

3.1 ThinkTop Basic AS-Interface in general

The ThinkTop Basic AS-Interface is designed to ensure valve control in conjunction with Alfa Laval sanitary valves and it is compatible with all major PLC systems (Programmable Logic Controller).

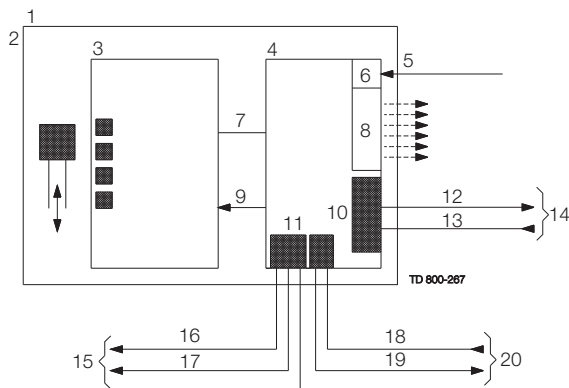
The ThinkTop Basic AS-Interface can be equipped with 0-3 solenoid valves. The solenoids are electrically controlled via the AS-Interface and when activated the compressed air is activating the air actuator. All solenoid valves have build-in manual hold override function which means that it is possible to manually open and close the actuator and seat lifts.

Visual LED lights are constantly indicating the status of the unit: Valve positions, solenoid energized, setup and local fault indication etc.

The ThinkTop Basic AS-Interface is characterized by a simple and modular design.

4.1 ThinkTop Basic AS-Interface

“No Touch” sensor system



- | | |
|------------------------|---------------------------|
| 1. Sensor board | 11. Terminals |
| 2. PLC, feedback | 12. ASI + |
| 3. Sensor unit | 13. ASI - |
| 4. PLC interface board | 14. Bus Connection |
| 5. N/A | 15. Internal connections |
| 6. N/A | 16. Solenoid signals (DC) |
| 7. Serial link | 17. Solenoid common |
| 8. LEDs | 18. N/A |
| 9. +5 V | 19. N/A |
| 10. Terminals | 20. N/A |

Type: Alfa Laval “No Touch” System. For wire connections: See 5.3 Electrical connection, internal“.

Features

- Easy and simple set-up, using locally pushbuttons.
- No manual sensor adjustments at all.
- No sensor "movements" due to vibrations.
- Modular and hygienic design with exchangeabilities.
- Clear LED's for visual status indication.
- Setup saved at power shutdown.

Sensor System

Unique “No Touch” sensor system without any mechanical sensor adjustments. A magnet (indication pin) is mounted on the valve stem and the magnetic field (axial) is detected by sensor chips inside the sensor unit. The measuring angle from each chip is used to locate the current position of the valve stem with an accuracy of $\pm 0.1\text{mm}$. Note that the distance to the indication pin can be $5\text{ mm} \pm 3\text{ mm}$.

Feedback signals

The sensor system can be used for 2 feedback signals.

Electrical connection

Direct main cable gland entry (hard wired) PG11 ($\phi 4 - \phi 10\text{ mm}$).

Terminals

The terminal row of the sensor board is equipped with screw terminals for both internal as well as external wires. The terminals are suitable for wires up to 0.75 mm^2 (AWG 19).

4 Technical specifications

Power Supply

The power supply to the complete unit is taken from the AS-Interface loop. The unit is reverse polarity protected.

Supply voltage: 29.5 - 31.6 VDC

Typical power consumption ThinkTop Basic AS-Interface

Test conditions = One ThinkTop Basic AS-Interface connected with 1 feedback active (on) and:

No solenoids on	Supply voltage 24 VDC	30 mA
1 solenoid active	Supply voltage 24 VDC	75 mA
2 solenoids active	Supply voltage 24 VDC	120 mA
3 solenoids active	Supply voltage 24 VDC	165 mA

The fulfilling of the UL requirements in UL508 requires that the unit is supplied by an isolating source complying with the requirements for class 2 power units (UL1310) or class 2 and 3 transformers (UL1585).

Technical specifications sensor system

Sensor accuracy: ± 0.1 mm.

Tolerance band: ± 5 mm.

Distance to indication pin: 5 ± 3 mm.

Stroke length: 0.1 - 80 mm.

Electrical connection: Direct cable gland entry
PG11 ($\phi 4 - \phi 10$ mm).

Slave profile v.3.0

Default slave address: 0

IO code: 7 (4 bit bi-directional)

ID code: A

ID1 code: 7

ID2 code: 7

Slave profile = 7.A.7.7

No. of slaves:

AS-Interface specification 3.0 for max. 62 ThinkTop Basic AS-Interface units on a single master/gateway

AS-Interface bits assignment:

For the AS-Interface version with 62 nodes, the following bit assignment will be used:

DI 0 Feedback # 1 De-Energized Position (closed position)

DI 1 Feedback # 2 Energized Position (open position)

DI 2 Feedback # 3 Not connected

DI 3 Feedback # 4 Status

DO 0 Not connected

DO 1 Solenoid valve 1

DO 2 Solenoid valve 2

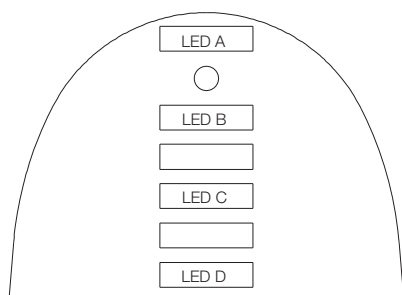
DO 3 Solenoid valve 3

Status signal (Feedback # 4) input bit 3

The status signal is used for two purposes:

- To indicate that the setup is ongoing (LED B).
- To indicate an error condition (LED B). (Flashing LED = software error), (steady LED = hardware error).

ThinkTop Basic AS-Interface Visual Indications LED Indications



LED A	"Energized" (Yellow)
-	-
LED B	"Setup/Fault" (Red)
-	-
LED C	"Solenoid" (Yellow)
-	-
LED D	"De-Energized" (Green)

Technical specifications solenoid valves

Internal connections

Terminals for wire connection of the solenoids mounted internally in the control head. The number of solenoids actually mounted in the control head could be 0 - 3.

Technical specifications	
0 to 3 solenoid valves in each unit.	
Type	3/2 or 5/2 valve (only possible with one 5/2 valve)
Air supply	300-900 kPa (3-9 bar)
Filtered air, max. particles or dirt	5 μ 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	\varnothing 2.5 mm
Manual hold override.	Yes
External air tube connection	\varnothing 6 mm or 1/4" (specify when ordering)
Silencer/filter	Connection possible via \varnothing 6 mm or 1/4". (Filter recommended in tropical regions)
Internal connections (solenoids)	
The power consumption of the solenoids is being reduced via PWM (Pulse Width Modulation). The PWM can be disabled by removing the jumper (terminal 3, 4)	
Nominal voltage	24 VDC
Nominal power	1.0 W
Load current	Max. 100 mA per solenoid Max. current from any number of energized output stages is 200 mA
Voltage drop	Max. 3 V at 50 mA
Activation time	60 \pm 10 ms (time with full power if PWM is enabled)
PWM duty cycle	40% (after activation time if PWM is enabled)
PWM frequency	2 - 5 kHz
Materials	
Plastic parts	Nylon PA6
Steel parts	Stainless steel AISI 304
Seals	Nitrile (NBR)
Gore vent. membrane	PBT plastic

4 Technical specifications

Micro environment demand specifications

Temperature		
Working:	-20°C to +85°C	IEC 68-2-1/2
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:	+25°C/+55°C	
	12 cycles	
(working)	93% R.H.	
Protection class		IEC 60529
	IP66 and IP67	
Input treshold		
Voltage/current:	Type 1 input requirements	EN 61131-2
EMC Directive		EN 61000-6-3, EN 61000-6-2
	2004/108/EF	
AS-Interface		EN50295
	Version 3.0*)	
UL/CSA		UL 508-E203255
	10-30 VDC, Class 2 input, 45 mA max. output	

*) Max. 62 ThinkTop Basic AS-Interface units on a single master/gateway.

5.1 Installation on air actuators

Step 1



Always read the technical data thoroughly.



Always have the ThinkTop Basic AS-Interface electrically connected by authorised personnel.



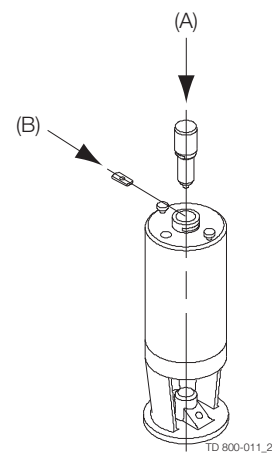
Never install the ThinkTop Basic AS-Interface before valve or relay is in a safe position.

Step 2

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

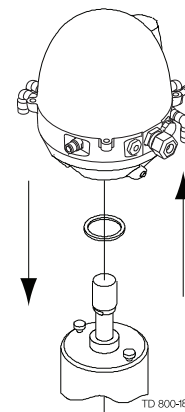
Note:

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



Step 3

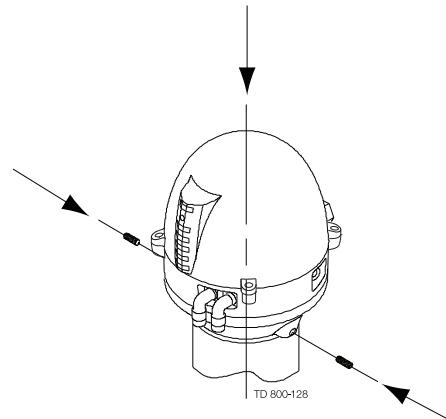
1. Place the ThinkTop Basic AS-Interface on top of the actuator.
2. Make sure X-ring is mounted.



5 Installation

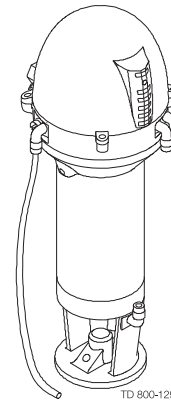
Step 4

1. Ensure that the unit is correctly mounted by **pressing** down on top of the ThinkTop Basic AS-Interface.
2. Tighten the two Allen screws **carefully** (1.50 Nm).
3. Turn the actuator to have LEDs in a front view.



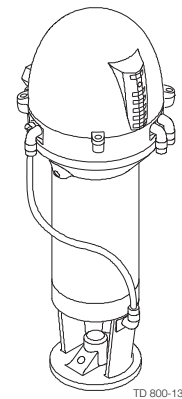
Step 5

Fit the $\varnothing 6$ mm (1/4") air tubes to ThinkTop Basic AS-Interface .
(see drawing "Air connections" page 13).



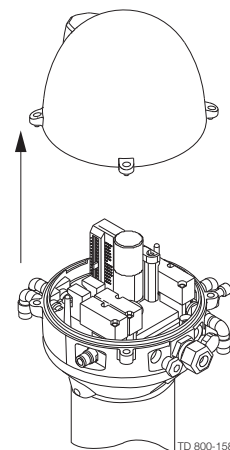
Step 6

Fit the air tubes to the actuator
(see drawing "Air connections" page 13).



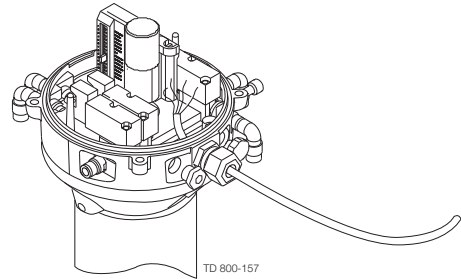
Step 7

Untighten the four screws and pull off cover of ThinkTop Basic AS-Interface.



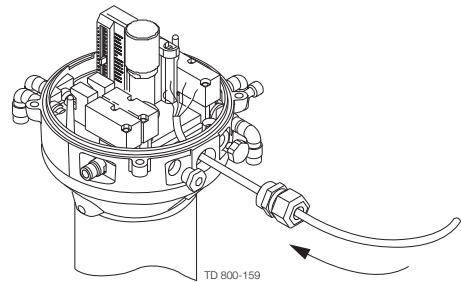
Step 8

1. Install cable (if not present) through the cable gland.
2. Connect the ThinkTop Basic AS-Interface electrically (see page 5.3 Electrical connection, internal).



Step 9

Make sure the cable gland is completely tightened.



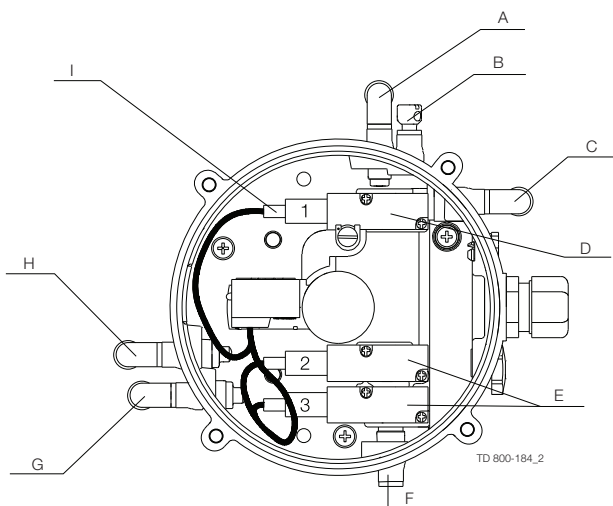
Step 10

Set up the ThinkTop Basic AS-Interface (see chapter 6 Setup diagram).

NOTE!

The unit can be set up by internal push buttons on sensor board. To energize the valve, use manual hold override on the solenoids valve or be in radio contact with the control room.

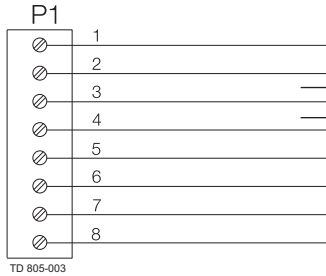
5.2 Air connections



- A. Air out 1A
- B. Air exhaust
- C. Air out 1B (5/2 port solenoid valve only)
- D. Solenoid 3/2 or 5/2
- E. Solenoid valve (3/2) only
- F. Air in
- G. Air out 3
- H. Air out 2
- I. Manual hold override

5 Installation

5.3 Electrical connection, internal



Electrical connections, internal

1. ASI +
2. ASI -
3. PWM jumper
4. PWM jumper
5. Solenoid common, internal connection (Brown)
6. Solenoid # 1, internal connection (Blue)
7. Solenoid # 2, internal connection (Blue)
8. Solenoid # 3, internal connection (Blue)

Note! Remember to isolate wires that are not in use.

6.1 ThinkTop Basic AS-Interface setup

ThinkTop Basic Digital and AS-Interface

A printable "one page" version of ThinkTop Basic setup diagram is available on the Alfa Laval website and can easily be found by typing the document name "ThinkTop Basic setup diagram" in the search field.

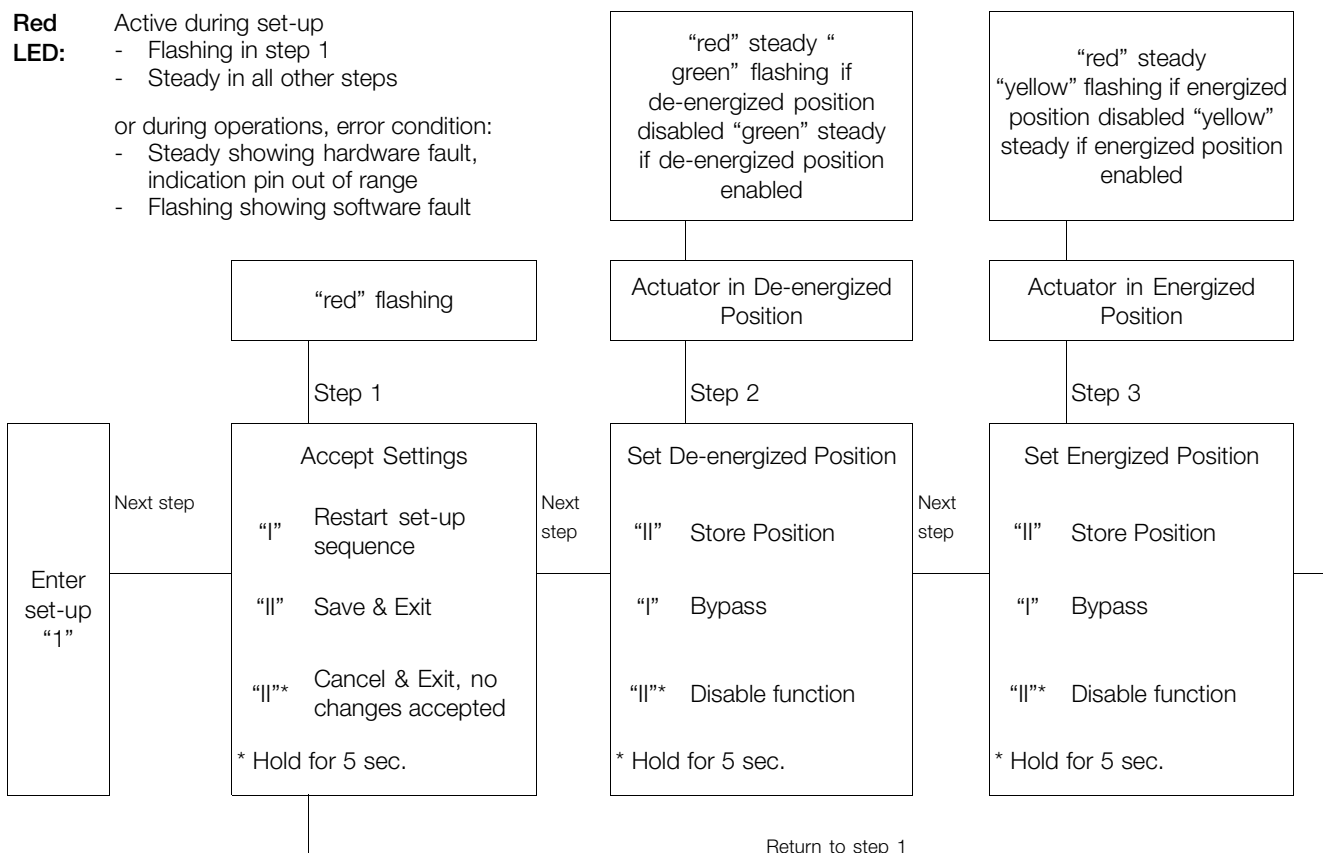
Time-out: A 60 second time-out is started as soon as any button(s) are released. If no button is pressed during the time-out period, go to normal condition (cancel & exit).

Red LED: Active during set-up

- Flashing in step 1
- Steady in all other steps

or during operations, error condition:

- Steady showing hardware fault, indication pin out of range
- Flashing showing software fault



Quick set-up:
 Push: "1", enter setup and wait until red LED flashes.
 Push: "1", restart set-up.

Actuator in De-energized position
 Push: "11", store position

Actuator in energized position
 Push: "11", store position
 Push: "11", when red LED is flashing (save & exit)
 Set-up done.

7 Maintenance

Study the instructions carefully.

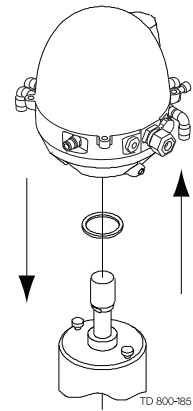
Handle scrap correctly.

Always keep spare X-rings in stock.

7.1 Dismantling the ThinkTop®

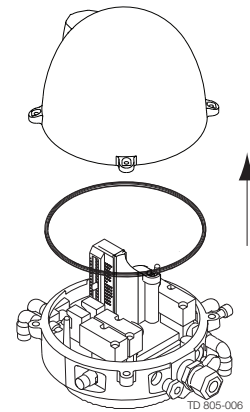
Step 1

1. Remove the ThinkTop Basic AS-Interface from the actuator.
2. Pull out X-ring (19) and replace it.



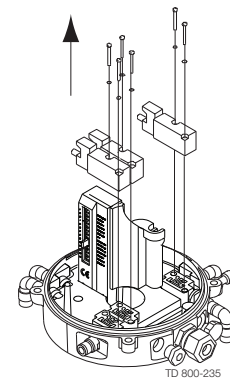
Step 2

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



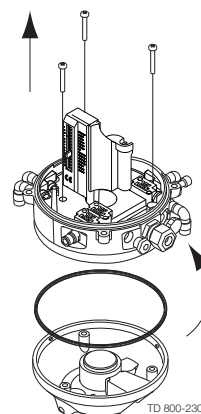
Step 3

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



Step 4

1. To dismantle the adapter (the lower part of the ThinkTop Basic AS-Interface) 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.

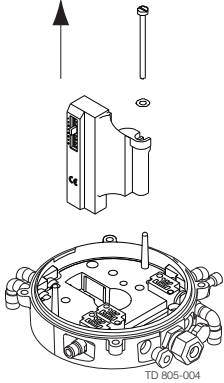


Note: Turn banjo connection!

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

Step 5

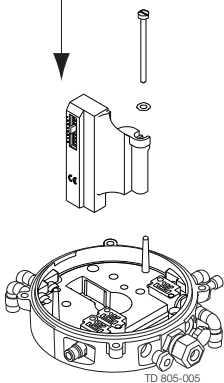
To remove the sensor unit untighten screw and pull out the sensor unit.



7.2 Assembling the ThinkTop®

Step 1

Place sensor unit in base and tighten screw (torque: 1 Nm).

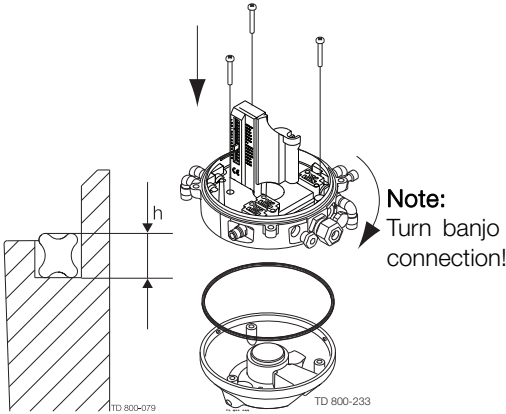


Step 2

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.



7 Maintenance

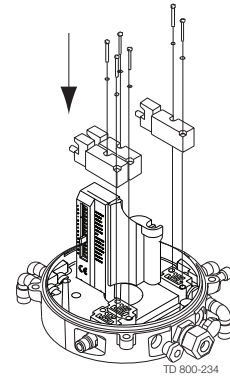
Study the instructions carefully.

Handle scrap correctly.

Always keep spare X-rings in stock.

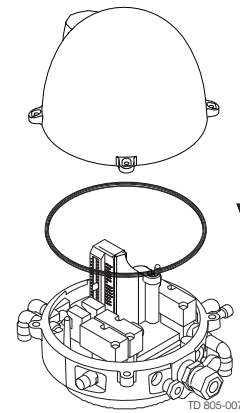
Step 3

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



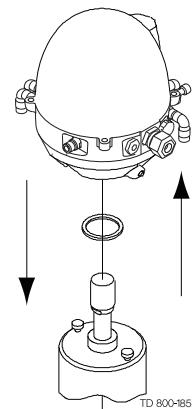
Step 4

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



Step 5

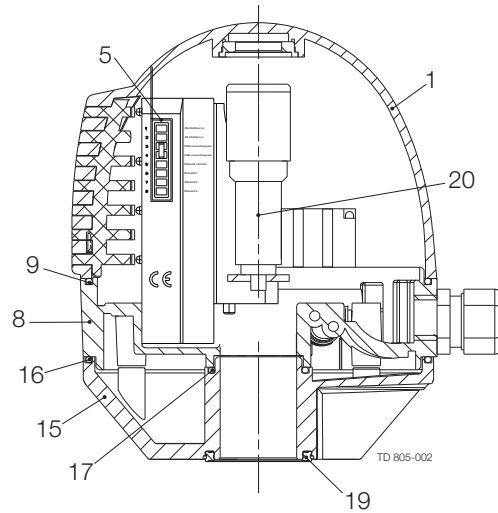
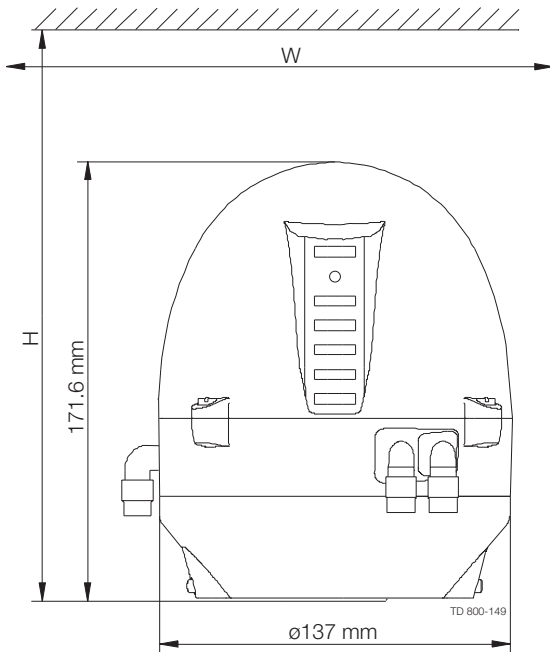
1. Replace the black X-ring.
2. Mount ThinkTop Basic AS-Interface on actuator.



8 Parts list and service kits

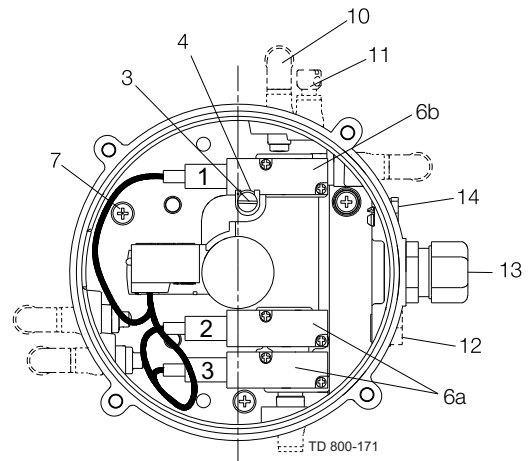
The drawings show ThinkTop Basic AS-Interface v.3.0 (62 nodes) 29.5 - 31.6 VDC.
The items refer to the parts lists in the following sections

8.1 Drawings for ThinkTop Basic AS-Interface



Note! This is the basic design.

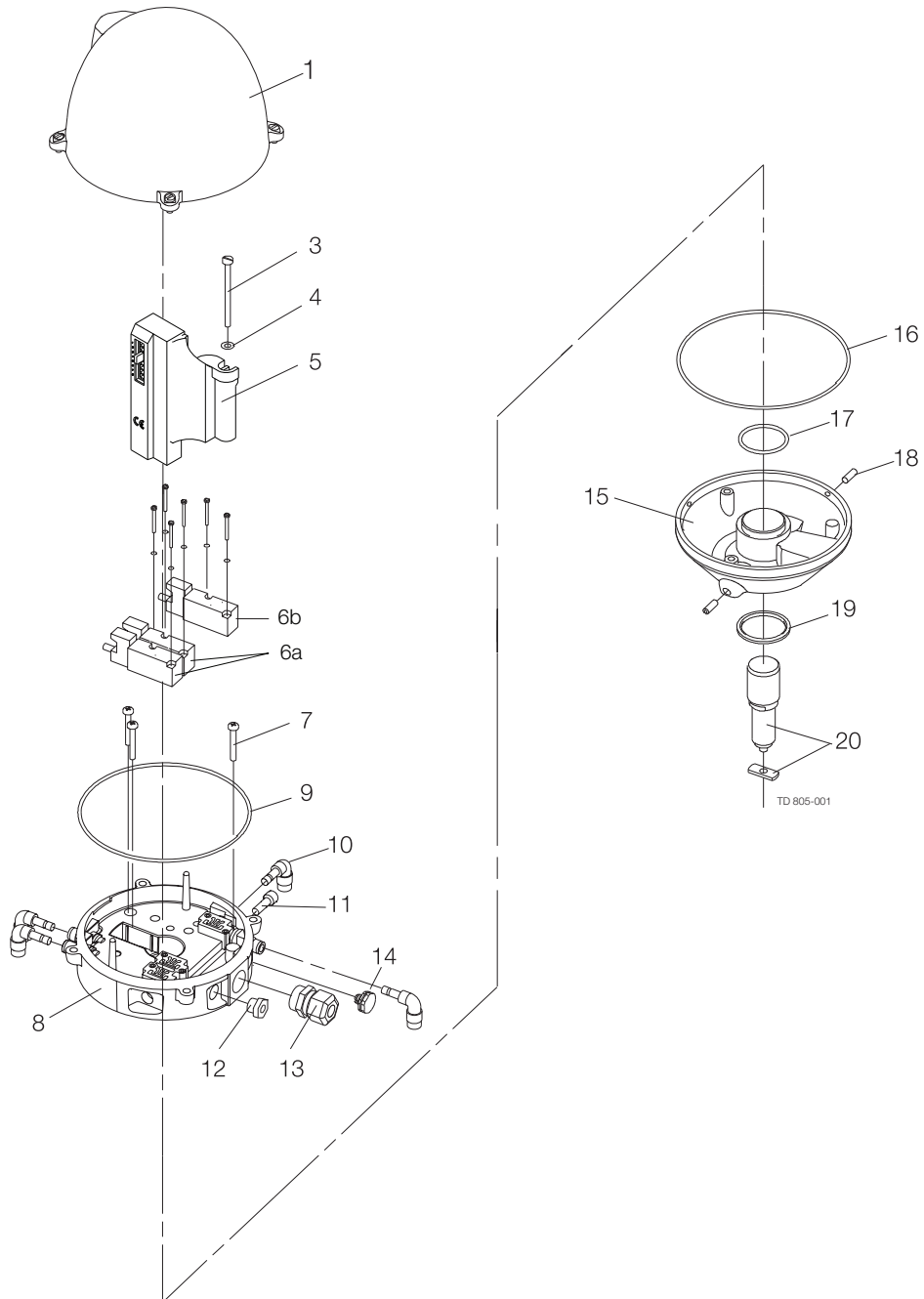
Valve Type	W	H
Unique SSV NC	225	250
SMP-SC/-BC/-TO	225	250
Unique Mixproof	225	250
MH	225	250
SBV	225	250
Unique SSV NO	225	320
LKLA-T	225	300



8 Parts list and service kits

The drawings show ThinkTop Basic AS-Interface v.3.0 (62 nodes) 29.5 - 31.6 VDC.
The items refer to the parts lists in the following sections

8.2 ThinkTop Basic AS-Interface



8 Parts list and service kits

The drawings show ThinkTop Basic AS-Interface v.3.0 (62 nodes) 29.5 - 31.6 VDC.

The items refer to the parts lists in the following sections

Parts list

Pos.	Qty	Denomination
1	1	Shell complete
3	1	Screw
4	1	Washer
5	1	Sensor board
6a	1-2	Solenoid valves (3/2)
6b	1	Solenoid valves (3/2 or 5/2)
7	3	PT screw
8	1	Base
9	1	Special X-ring, grey
10	1	Air fitting
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

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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