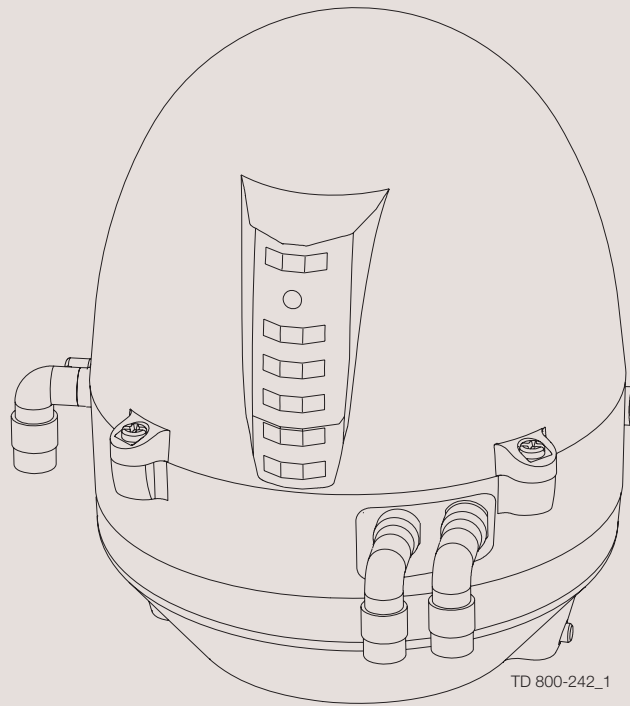![Alfa Laval logo]

Instruction Manual

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

TD 800-242_1

Patented Sensor System
Registered Design
Registered Trademark

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 designating company

Alfa Laval
_____
Company Name

Albuen 31, DK-6000 Kolding, Denmark
_____
Address

+45 79 32 22 00
_____
Phone No.

hereby declare that

Top Unit for Valve Control & Indication   ThinkTop Basic AS-Interface
_____ _____ _____
Denomination   Type   Year

is in conformity with the following directives with amendments:
- Low Voltage Directive (LVD) 2006/95/EF
- EMC Directive 2004/108/EF
- ROHS Directive 2002/95/EEC

Manager, Product Centres, Compact   Bjarne Søndergaard
Heat Exchangers & Fluid Handling
_____ _____
Title   Name

Alfa Laval Kolding
_____ _____
Company   Signature

Designation

C E

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 severe 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 Safety

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.

2.3 Safety precautions

Installation

Always read the technical data thoroughly.

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.

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.

3.1   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 Technical specifications

4.1 ThinkTop Basic AS-Interface

"No Touch" sensor system
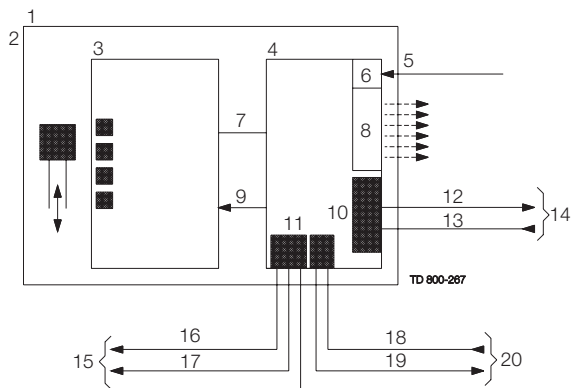
1. Sensor board	11. Terminals
2. PLC, feedback	12. ASI +
3. Sensor unit	13. ASI -
4. PLC interface board	14. Bus Connection
5. N/A	15. Internal connections
6. N/A	16. Solenoid signals (DC)
7. Serial link	17. Solenoid common
8. LEDs	18. N/A
9. +5 V	19. N/A
10. Terminals	20. N/A

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

Features
- Easy and simple set-up, using locally pushbottons.
- 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 ± 0.1mm. Note that the distance to the indication pin can be 5 mm ± 3 mm.

Feedback signals
The sensor system can be used for 2 feedback signals.

Electrical connection
Direct main cable gland entry (hard wired) PG11 (ø4 - ø10 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).

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 (ø4 - ø10 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).

4 Technical specifications

ThinkTop Basic AS-Interface Visual Indications LED Indications

TD 800-030_1
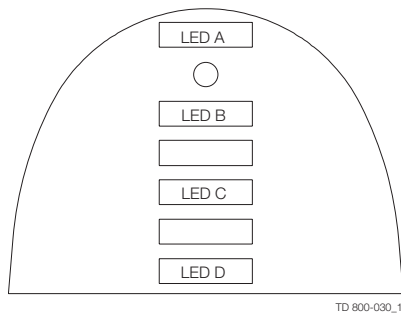
LED A	"Energized" (Yellow)
LED B	"Setup/Fault" (Red)
LED C	"Solenoid" (Yellow)
LED D	"De-Energized" (Green)

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 ºC compressed air
Throughput	ø2.5 mm
Manual hold override.	Yes
External air tube connection	ø6 mm or 1/4" (specify when ordering)
Silencer/filter	Connection possible via ø6 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 ± 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

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	IP66 and IP67	IEC 60529
Input treshold		
Voltage/current:	Type 1 input requirements	EN 61131-2
EMC Directive	2004/108/EF	EN 61000-6-3, EN 61000-6-2
AS-Interface	Version 3.0*)	EN50295
UL/CSA	10-30 VDC, Class 2 input,	
	45 mA max. output	UL 508-E203255

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

5   Installation

5.1   Installation on air actuators

Step 1

⚠️

Always read the technical data thoroughly.

⚡

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

SRC only

TD 800-011
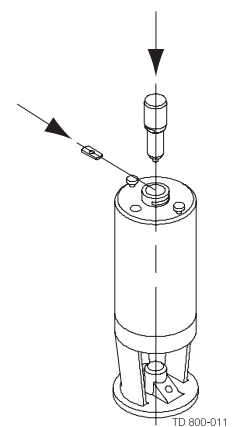
Step 3
1. Place the ThinkTop Basic AS-Interface on top of the actuator.
2. Make sure X-ring is mounted.

TD 800-185
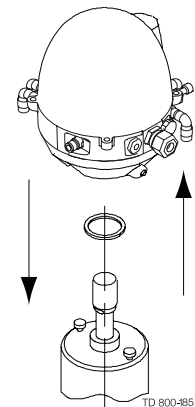
Step 4
1. Ensure that the unit is correctly mounted by **pressing** down on
   top of the ThinkTop Basic AS-Interface.
2. Tighten the two Allen screws **carefully** (1.50 Nm).
3. Turn the actuator to have LEDs in a front view.

TD 800-128
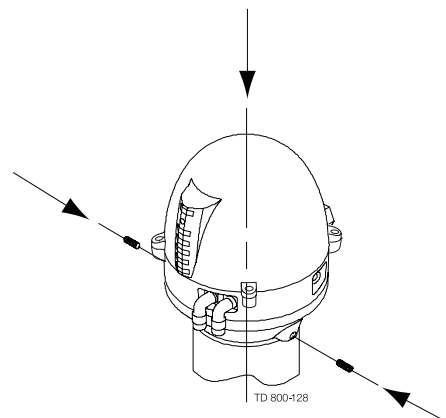
Step 5

Fit the ø6 mm (1/4") air tubes to ThinkTop Basic AS-Interface .
(see drawing "Air connections" page 15).

TD 800-129
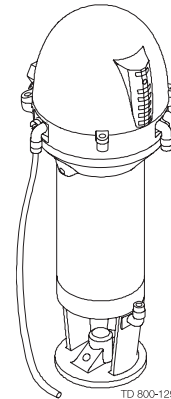
Step 6

Fit the air tubes to the actuator
(see drawing "Air connections" page 15).

TD 800-131
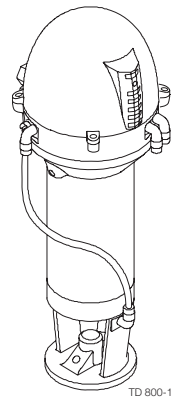
Step 7

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

TD 800-158
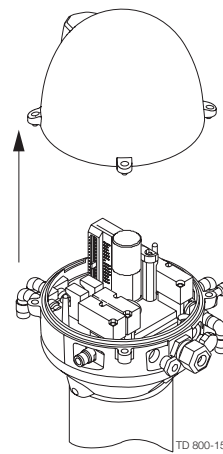
Step 8

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).

TD 800-157
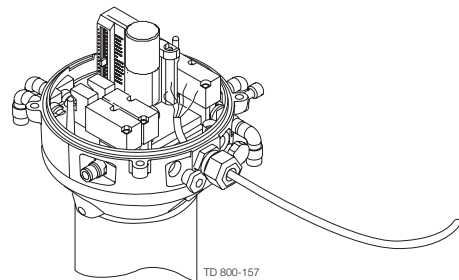
5   Installation

Step 9

Make sure the cable gland is completely tightened.

TD 800-159
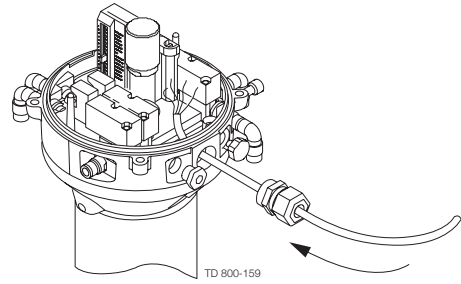
Step 10

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

NOTE!

The unit can be set up by internal push bottons 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

TD 800-184_1
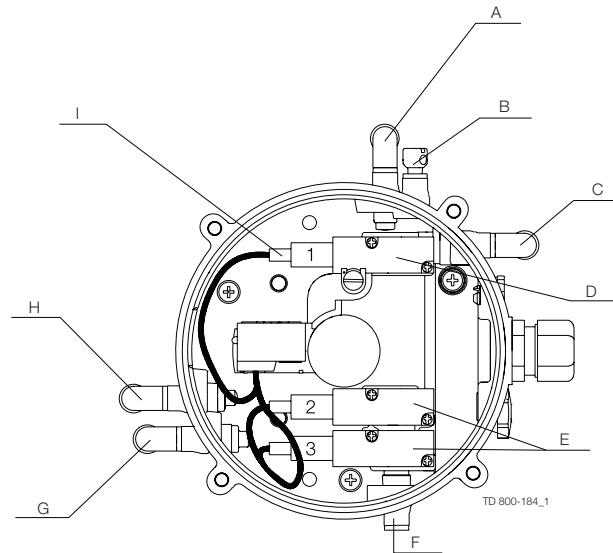
A. Air out 1A
B. Air exhaust
C. Air out 1B (5/2 port solenoid valve only)
D. Solenoid 3/2 or 5/2
E. Solenoid valve (3/2) only
F. Air in
G. Air out 3
H. Air out 2
I. Manual hold override

5 Installation

5.3 Electrical connection, internal

```
P1
  ⊘  1
  ⊘  2
  ⊘  3
  ⊘  4
  ⊘  5
  ⊘  6
  ⊘  7
  ⊘  8
TD 805-003
```

Note! Remember to isolate wires that are not in use.
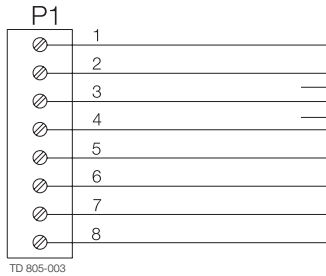
Electrical connections, internal

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)

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 be typing the document name "ThinkTop Basic setup diagram" in the searh 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

	"red" steady " green" flashing if de-energized position disabled "green" steady if de-energized position enabled	"red" steady "yellow" flashing if energized position disabled "yellow" steady if energized position enabled

"red" flashing	Actuator in De-energized Position	Actuator in Energized Position

Step 1 | Step 2 | Step 3

Enter set-up "1"	Accept Settings	Set De-energized Position	Set Energized Position
Next step	"I" Restart set-up sequence	"II" Store Position	"II" Store Position
	"II" Save & Exit	"I" Bypass	"I" Bypass
	"II"* Cancel & Exit, no changes accepted	"II"* Disable function	"II"* Disable function
	* Hold for 5 sec.	* Hold for 5 sec.	* Hold for 5 sec.

Next step

Next step

Return to step 1

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

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

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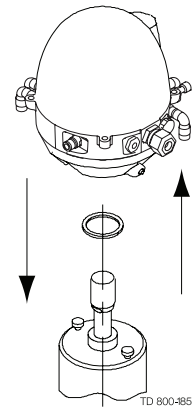
7   Maintenance

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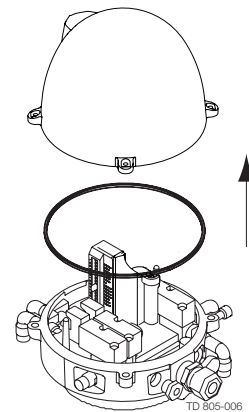*Always keep spare X-rings in stock.*

7.1   Dismantling of ThinkTop

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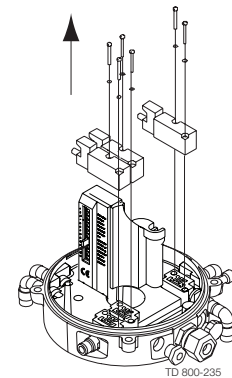2. Pull out X-ring (19) and replace it.

TD 800-185

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

TD 805-006

Step 3
1. Untighten screws.
2. Remove solenoid valves (up to three) and replace them with new ones.

TD 800-235

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.
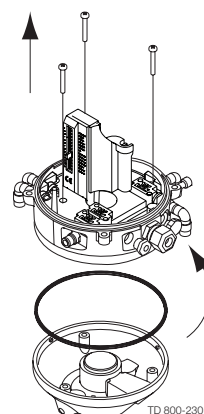
Note: Turn banjo connection!

TD 800-230

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.
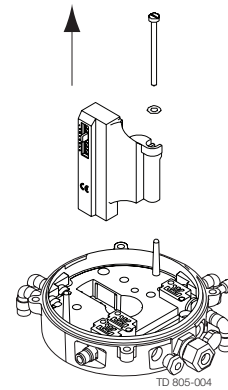
TD 805-004

7 Maintenance

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

7.2 Assembly of ThinkTop

Step 1

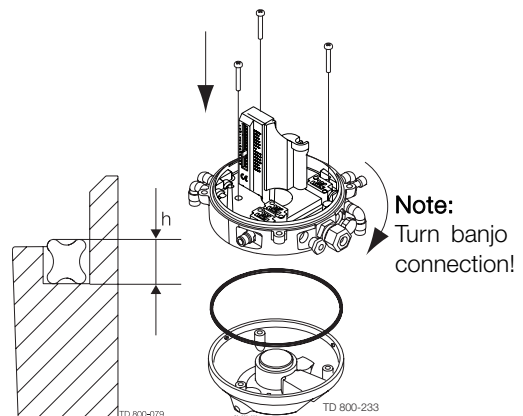Place sensor unit in base and tighten screw (torque: 1 Nm).

TD 805-005
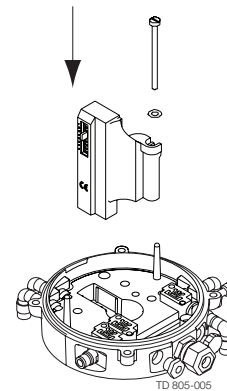
Step 2

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!
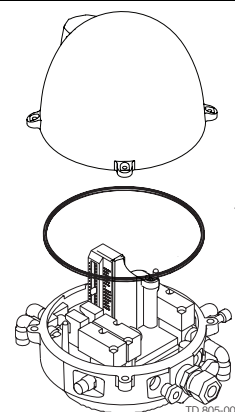The X-ring is not square; The highest (h) part must be placed as fig.

Note:
Turn banjo connection!

TD 800-079   TD 800-233

Step 3

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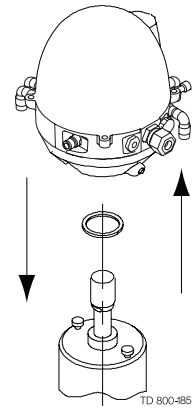2. Tighten screws (0.2 Nm).

TD 800-234
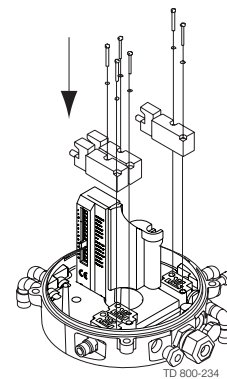
Step 4

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

TD 805-007

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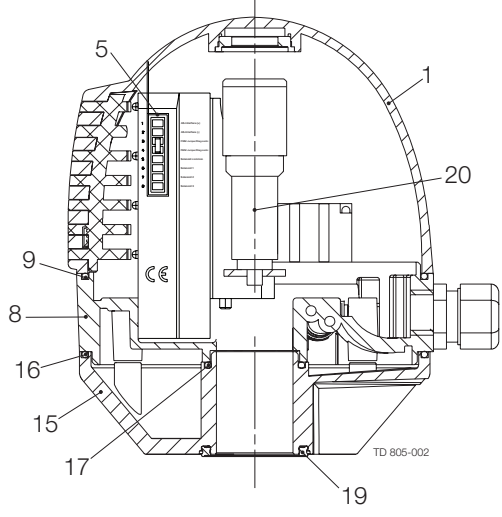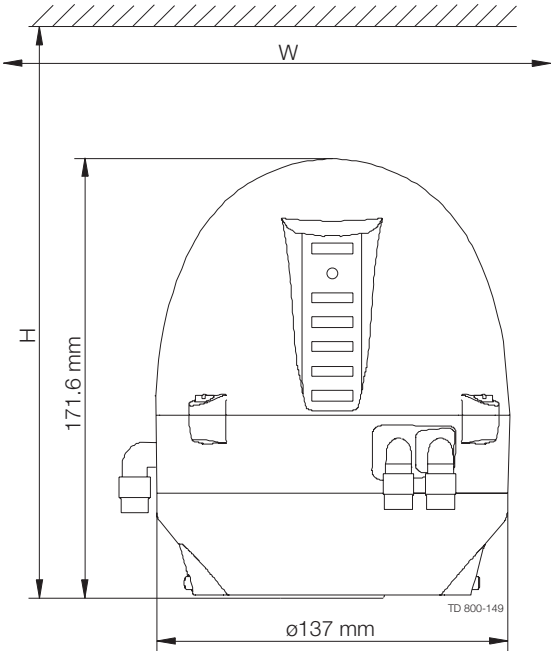*Always keep spare X-rings in stock.*

Step 5
1. Replace the black X-ring.
2. Mount ThinkTop Basic AS-Interface on actuator.
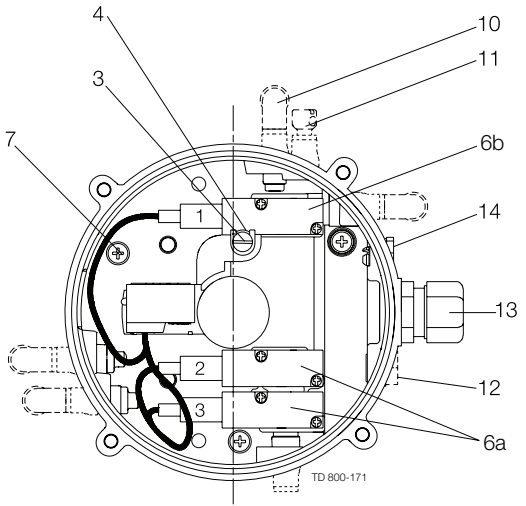
TD 800-185

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
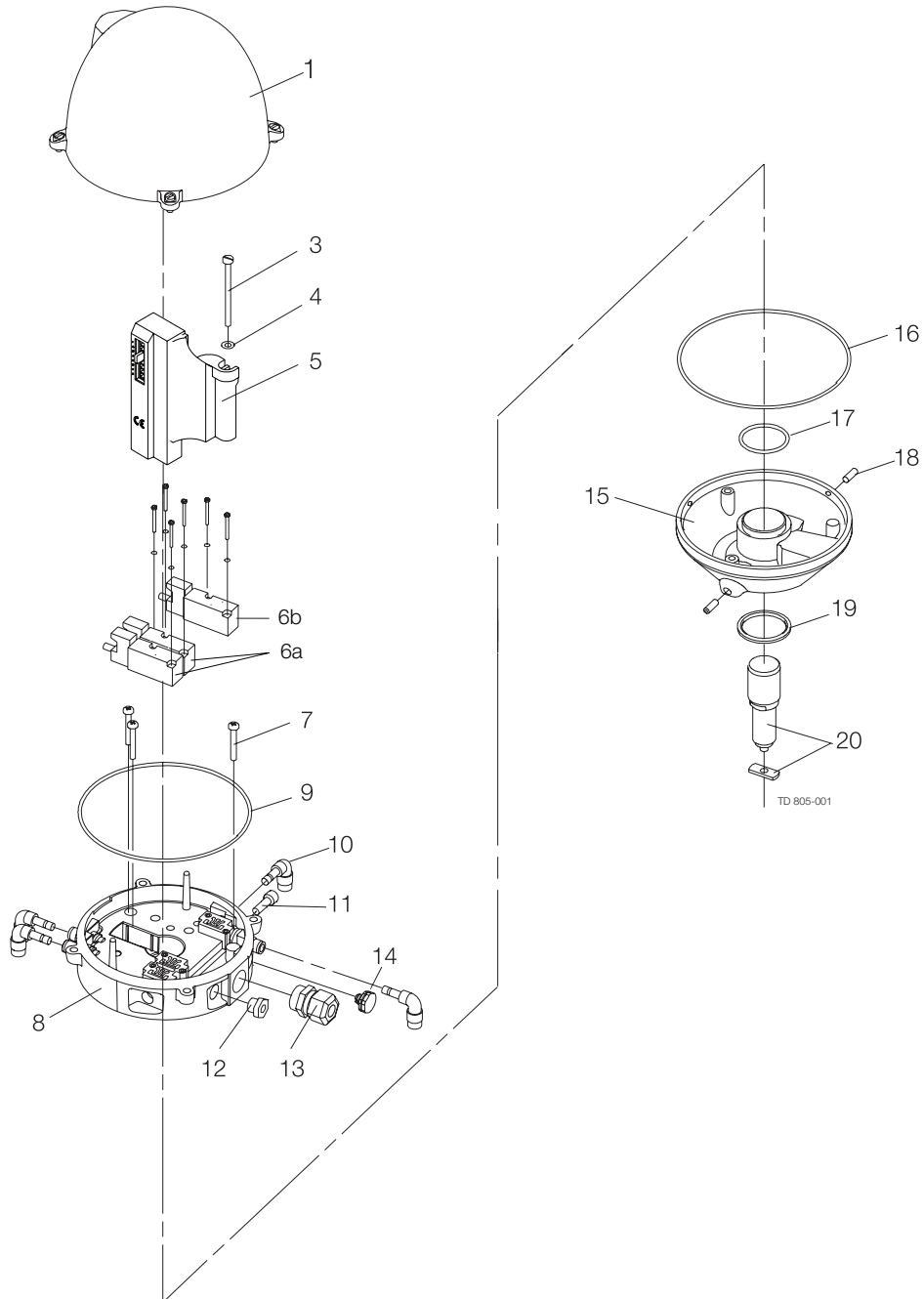

Note! This is the basic design.		
Valve Type	W	H
Unique SSV NC	225	250
SMP-SC/-BC/-TO	225	250
Unique Mixproof	225	250
MH	225	250
SBV	225	250
Unique SSV NO	225	320
LKLA-T	225	300

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

TD 805-001

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 AS-Interface
6a	1-3	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 ø3-ø6.5 mm
13	1	Cable gland, PG11 ø4-ø10 mm
14	1	Gore vent High airflow
15	1	Adapter complete (Pos. 17,18,19 included)
16	1	Special X-ring, black
17	1	O-ring
18	2	Allen screw
19	1	Special X-ring
20	1	Indication

Service kits

Sensor board AS-Interface 9613-4754-01

Solenoid valve 3/2, 24 VDC 9611-99-4635

Solenoid valve 5/2, 24 VDC 9611-99-3327

Indication pin 9612-5623-01

Special indication pin, SRC-LS 9612-6370-01

Special indication pin, Unique SSV-LS: only stop valves size
63.5 - 101.6 mm/DN65-100 9613-1581-01

Special indication pin, Unique SSV High Pressure Valve size
76.1 - 101.6 mm/DN80-100 9613-1581-01

Air fitting, Ø6 mm 9611-99-3405

Air fitting, 1/4" 9611-99-3433

Gore vent 9611-99-4722

X-ring, pos. 9 9613-4564-01

X-ring, pos. 16 9612-9994-01

X-ring, pos. 19 9612-5696-01

TD 900-565

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 direct.