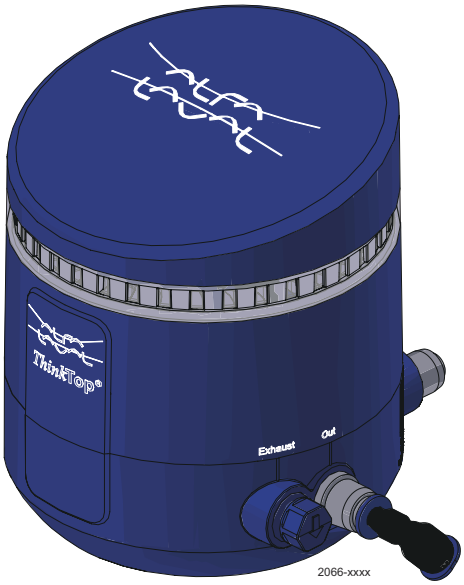
Alfa Laval ThinkTop® V40

Sensing and control



Lit. Code 200016737-1-EN-GB

Instruction Manual

BRITISH ENGLISH

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

The original instructions are in English

Contents

This page is intentionally left blank.

1 Declarations 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® V40

Type

0 to 10.000.000

Serial number

is in conformity with the following directives with amendments:

- EMC Directive 2014/30/EU
- RoHS Directive 2011/65/EU and amendments

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	2025-05-01	
Place	Date (YYYY-MM-DD)	Signature

DoC Revison_ 01_052025

CE

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® V40

Type

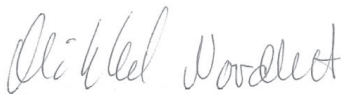
0 to 10.000.000

Serial number

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

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	2025-05-01	
Place	Date (YYYY-MM-DD)	Signature

DoC Revison_ 01_052025

UK CA

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 chapter ***Safety*** 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 chapter ***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

Maintenance

 	**Always** read the technical data carefully. **Always** fit the seals between the valve and ThinkTop correctly. **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.

DANGER

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

WARNING

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

CAUTION

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

NOTE

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.

This page is intentionally left blank.

3 Introduction

Get process reliability with the Alfa Laval ThinkTop V40. This user-friendly, resource-smart control top for butterfly and single seat valves enhances product safety and uptime. Advanced communication protocols provide valve status in real time, streamlining operations and ensuring efficiency across the dairy, food, beverage, and home and personal care industries.

3.1 About ThinkTop

ThinkTop is a valve-top control unit that provides surveillance and control of valves during the fluid handling process. The control unit has been developed with user friendliness and robustness in mind.

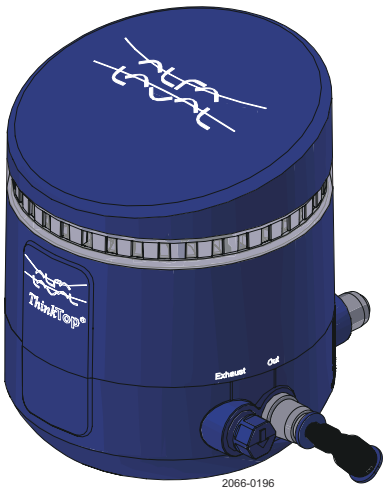
ThinkTop comes with a control board for connection to any PLC system. There are two types of communication interfaces available:

- Digital-IO 24 VDC
- AS-Interface v3.0

When the ThinkTop receives a signal from the PLC system to open the valve, a built-in solenoid valve shifts the connected valve into position. The position is detected through a sensor target attached to the valve stem through a touch-free sensor system. The position is then evaluated and if valid, the corresponding feedback is returned to the automation system via the communication interface.

3.2 About this manual

In this manual, you will find detailed descriptions of how to install and setup the different ThinkTop variants as well as detailed information about fault finding and maintenance. We recommend that you familiarize yourself with the content of the manual before you begin installation.



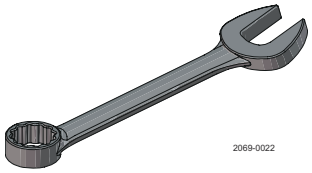
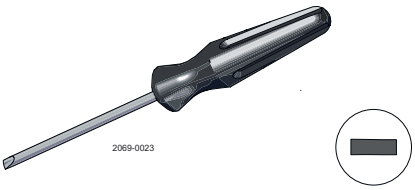
2066-0196

This page is intentionally left blank.

4 Installation

4.1 Tools

To carry out the installation, you need the following tools:

Tool	Size	Example
Hex key	2.5 mm	
Adjustable spanner or flat wrenches	14 and 19 mm	
Flathead screwdriver	0.5 x 3.0 mm	

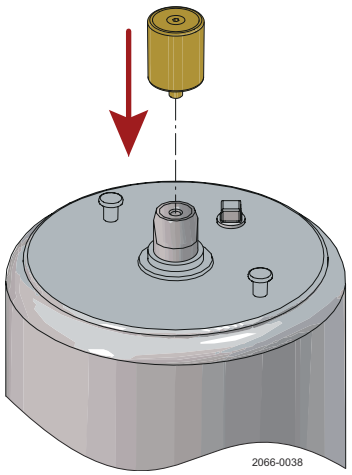
When using wire end ferrules for ease of electrical installation it is recommended to choose ferrules with a barrel length of 10 mm to ensure full engagement in the terminals.

4.2 Mechanical installation

Mechanical installation is a two-step process, where you mount the sensor target to the actuator stem and the ThinkTop to the actuator top.

1. Fit the yellow sensor target to the actuator stem.

   Tighten the sensor target by hand (1...2 Nm).



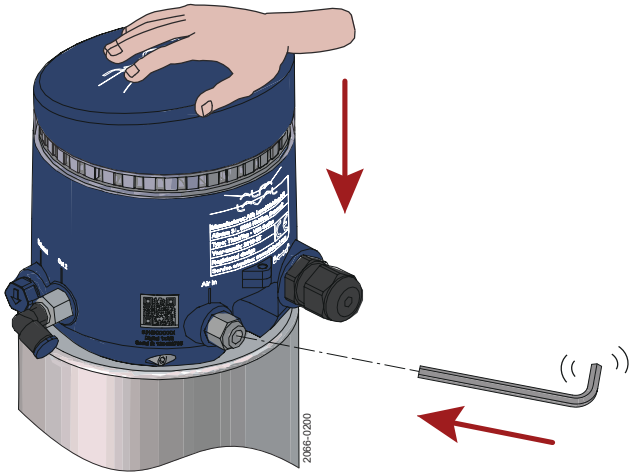
2. Mount the ThinkTop centred and flat against the actuator top.

   Hold the ThinkTop flat and steady against the actuator top.

   Use a 2.5 mm hex key to lightly tighten one of the two set screws.

   Tighten the second set screw (1...1.5 Nm).

   Tighten the first set screw (1...1.5 Nm).



CAUTION

The ThinkTop can be damaged when placed on a long stroke valve.

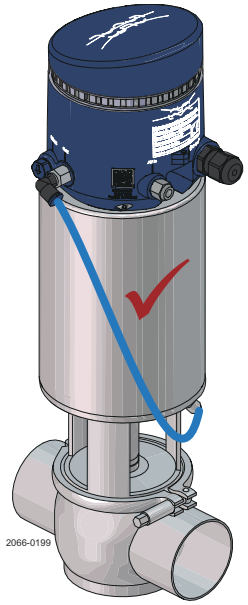
4.3 Pneumatic installation

Before you begin the pneumatic installation, cut the hoses to the preferred length.

1. Connect the air hoses between the air connectors on the ThinkTop and the air ports on the valve.

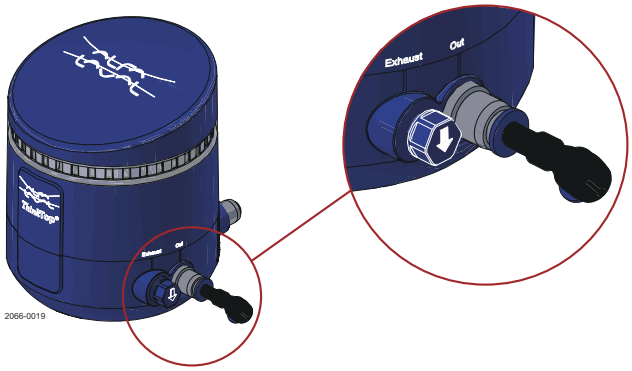
   Connect the air supply.

   Connect the supply air hose to the Air in connector and turn on the supply air.



2. Verify that the air exhaust plug points downwards as indicated by the arrow to avoid water ingress in the pneumatic system. You can rotate the exhaust plug until it points in the right direction.

   If the ThinkTop is oriented in a way which doesn't allow the exhaust plug to point down the part can be replaced with a downwards facing fitting instead.



Indication colour and air connections

On the ThinkTop, the marking, numbering and colour coding of air hoses, air fittings, visual feedback, and electrical feedback follow the same pattern.

4.4 Electrical installation, Digital-IO 24V

1

a) Remove the top cover by turning it counterclockwise and then lifting it upwards.

b) Connect the cable to the ThinkTop, and then connect the wires to the terminals according to the wiring diagram.

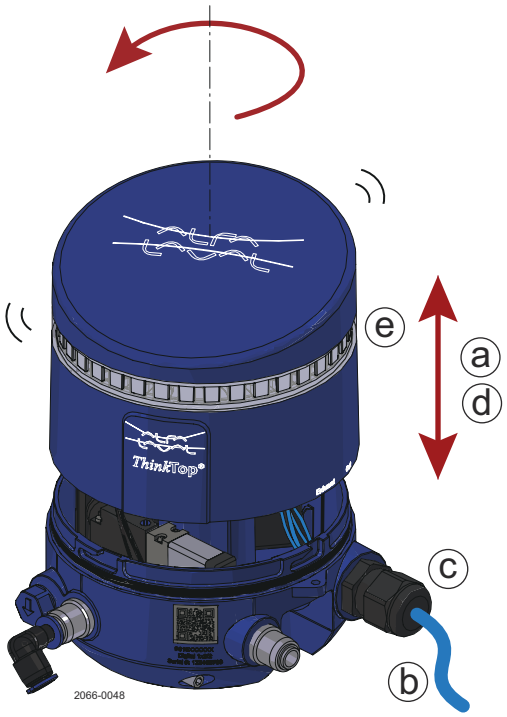
c) Tighten the cable gland using a 19 mm wrench (3 Nm).

Or tighten the M12 connector using a 14 mm wrench (0.6...1.5 Nm).

d) Put the top cover back in place.

e) Turn on the power supply.

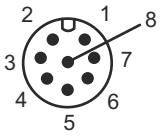
If installed correctly, the light guide flashes green.



Wiring diagrams

Terminals V40 Digital-IO 24V			
1	Power supply	24V	(brown) (M12, pin 1)
2[1]	Power supply	GND	(blue) (M12, pin 3[1])
3[1]	out (PLC in)	Valve de-energised (DE-EN)	(white) (M12, pin 2[1])
4	out (PLC in)	Main valve energised (EN)	(black) (M12, pin 4)
5		Not connected	(grey) (M12, pin 5)
6	in (PLC in)	Solenoid valve 1 for main valve (SV1)	(pink) (M12, pin 6)

[1] Please be mindful of the difference between the number sequence of the control board terminal and the M12 plug pins.



M12 option (8-pin A-coded plug).

Pin numbers and terminal numbers are aligned.

4.5 Electrical installation, AS-Interface

1

a) Remove the top cover by turning it counterclockwise and then lifting it upwards.

b) To allocate an address, use your preferred addressing device. See the device manual for more information.

c) Connect the cable to the ThinkTop, and then connect the wires to the terminals according to the wiring diagram.

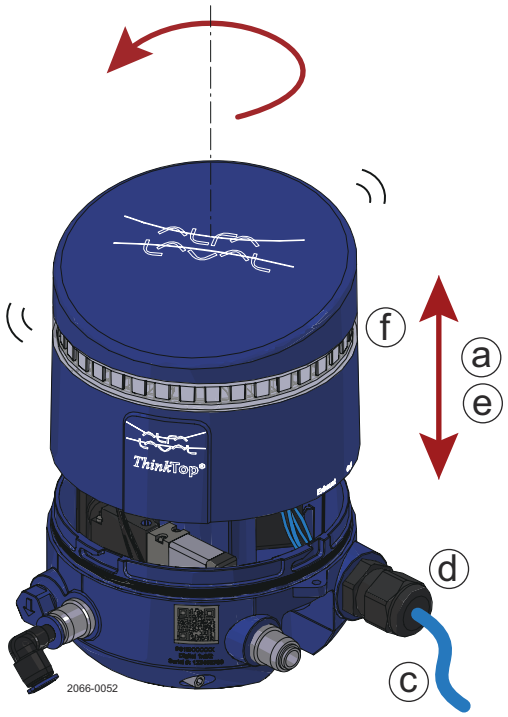
d) Tighten the cable gland using a 19 mm wrench (3 Nm).

Or tighten the M12 connector using a 14 mm wrench (0.6...1.5 Nm).

e) Put the top cover back in place.

f) Turn on the power supply.

If installed correctly, the light guide flashes green.



Wiring diagrams

Terminals V40 AS-Interface			
1	ASi supply	ASi +	(brown) (M12, pin 1)
2	ASi supply	ASi –	(blue) (M12, pin 3)

M12 option (4-pin A-coded plug)

Pin numbers and terminal numbers are aligned

This page is intentionally left blank.

5 Setup

NOTE

Initial position sensor target (top or bottom) is defined as De-Energized (DE-EN).

For Normally closed valves (NC) top position is DE-EN (Lights: Green).

For Normally open valves (NO) bottom position is DE-EN (Lights: Green).

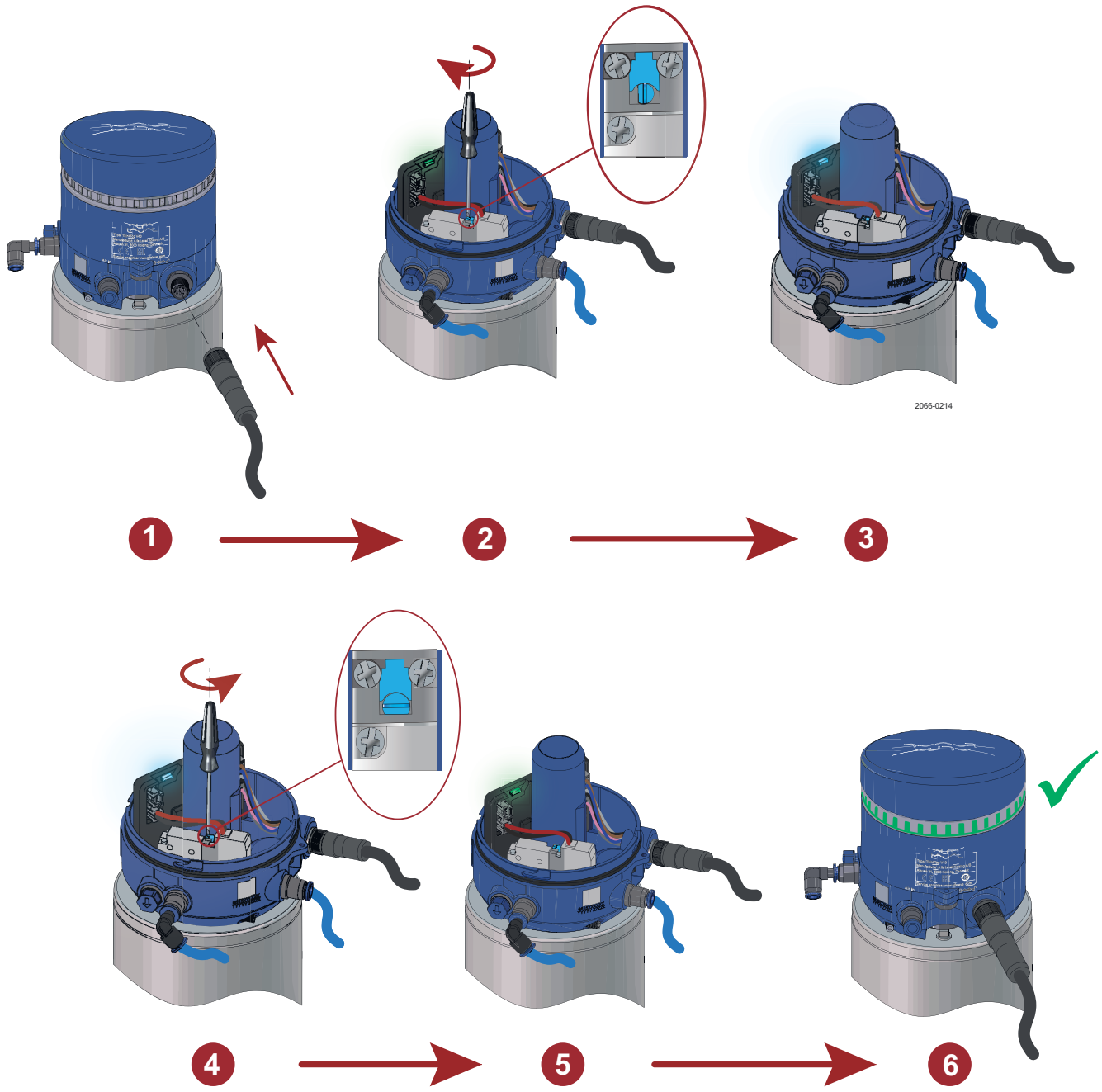
Mechanical installation on page 16,

Pneumatic installation on page 17 and either

Electrical installation, Digital-IO 24V on page 18 or

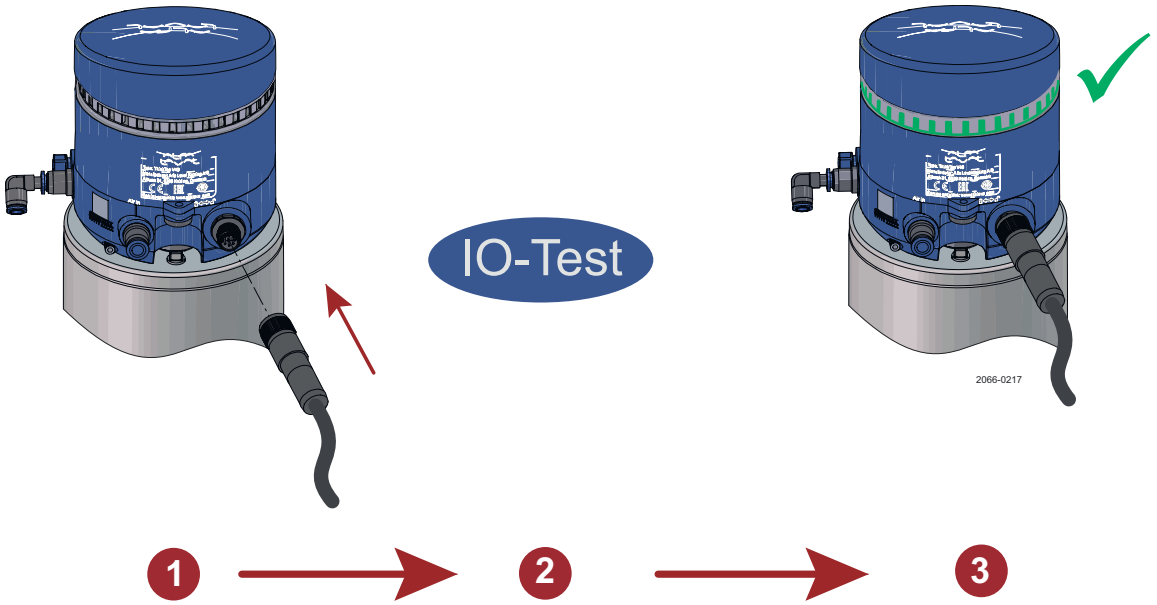
Electrical installation, AS-Interface on page 19 must completed before starting setup.

5.1 Local live setup



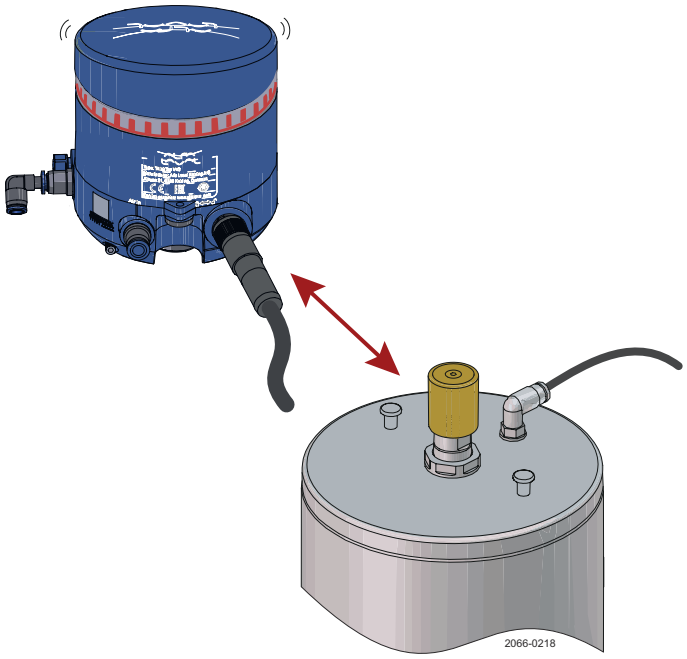
1	Electrical installation (LED Light: green, flashing).
2	Operate the solonoid valve manually by turning the override screw 90° clockwise.
3	Wait until the LED lights constantly white.
4	Operate the solonoid valve manually by turning the override screw 90° anticlockwise.
5	Wait until the LED lights constantly green.
6	Local live setup finished.

5.2 Remote Live Setup



1. Electrical installation (Light: flashing green).
2. IO-test (Light: steady white).
3. Correct setup (Light: steady green).

5.3 Reset



1. Remove the ThinkTop V40 from the valve and lift it away from the sensor target while the ThinkTop V40 is still powered.
2. When the ThinkTop V40 flashes red it has been reset.
3. Remove power
4. Re-install the ThinkTop V40 on the Actuator, see *Mechanical installation* on page 16.
5. Re-connect the electrical connection, see *Electrical installation, Digital-IO 24V* on page 18 or *Electrical installation, AS-Interface* on page 19.
6. The Thinktop V40 is now ready for setup , see *Local live setup* on page 22 or *Remote Live Setup* on page 23.

6 Troubleshooting

Red flashing

If the ThinkTop V40 is flashing red, it is an indication that the sensor target is missing:

- Verify that the yellow sensor target is mounted correctly

Missing feedback

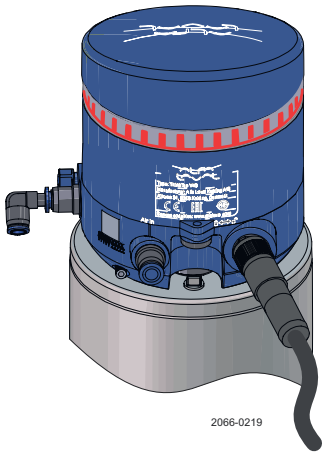
If no light or signal to the PLC is present:

- Check your cables and your power supply
- Verify that the valve is operating correctly
- Verify that the sensor target is not loose

Incorrect feedback

If you are not receiving correct feedback:

- Verify that the valve is operating correctly
- Verify that the air supply solenoid valve is working correctly
- If feedback from the ThinkTop V40 is opposite what it should be, perform a reset as shown in *Reset* on page 24, remove power from the ThinkTop then choose the appropriate setup from *Local live setup* on page 22 or *Remote Live Setup* on page 23



This page is intentionally left blank.

7 Technical Data

> **NOTE**
>
> Technical data must be observed during installation, operation and maintenance.
>
> All personnel should be informed about the technical data.

7.1 Technical Data

Material	
Plastic parts:	Nylon PA 12
Steel parts:	1.4301 / 304
Gaskets:	Nitril / NBR
Air fittings:	Nickel plated brass / Nylon PA6
M12 chassis connector:	Stainless steel / Gold plated pins

Environment	
Working temperature:	-10 °C to +60 °C / +14 °F to +140 °F
Protection class (IP):	IP69K
Protection class (NEMA):	4, 4X and 6

Control board	
Communication:	ASi 3.0, DIO 24 VDC
Sensor accuracy:	±1 mm / ±0.4"
Mean Time To Failure (MTTF):	224 years
Approvals:	UL/CSA Certificate: E174191

Solenoid valve	
Supply voltage:	24 VDC ± 10%
Nominal power:	0.3 W
Air supply:	300-700 kPa / 3-7 bar / 43.5-101.5 psi
Air quality:	ISO 8573-1:2010 [3:3:3]
Type of solenoids:	3/2-ways
Number of solenoids:	1
Manual hold override:	Yes
B10 data:	5 million cycles
Recommendation:	Operate once a month to prevent dry-out
NOTE **Throughout this document, SV is used as an abbreviation for a solenoid valve.**	

Air fitting	
Threaded air fitting G⅛:	Ø6 mm (Rim blue) or ¼" (Rim Grey)
Elbow push-in fittings:	Ø6 mm (Rim blue) or ¼" (Rim Grey)

Cable connection	
Main cable gland entry Digital:	M16 (Ø4-10 mm / 0.16-0.39")
Main cable gland entry AS-Interface:	M16 (Ø2-7 mm / 0.08-0.28")
Max. wire diameter:	0.75 mm² (AWG20)

M12 chassis connector	
AS-Interface V40:	2 wire, 4-pin series
Digital interface V40:	6 wire, 8-pin series

Vibration	
Vibration:	18 Hz-1kHz @ 7.54 g RMS
Shock:	100 g

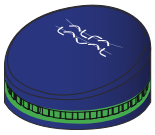
Humidity	
Constant humidity:	+40 °C / +140 °F, 21 days, 93% RH
Cyclic humidity:	-25 °C, +55 °C / -13 °F, +131 °F, 93% RH, 12 cycles

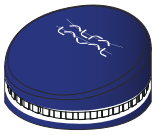
Accessories by functionality	
Valve “opening” speed reduction:	0-100%. Outlet air fitting on ThinkTop
Valve “closing” speed reduction:	0-100%. Inlet air fitting on actuator
Valve “closing” speed increase:	Quick air exhaust, Ø6 mm or ¼"

7.2 Operational Data

ThinkTop LED indication

ThinkTop features a 360° light guide. When the sensor target is within the respective setup position band, the corresponding colour lights up.





Valve position					
ThinkTop Mode	Actuator		De-energized		Energized
	Factory setting		Green flashing		N/A
	Operation		Green		White

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.

8.3 Warranty - Definition

WARNING

The rules of Intended use are absolute. Use of the supplied Alfa Laval product is allowed only when in compliance with the technical data supplied with the Intended use.

Differing utilisation, other than agreed with Alfa Laval Kolding A/S, exclude any liability and warranty.

No modification or alteration of the supplied Alfa Laval product is allowed, unless explicit permission is granted by Alfa Laval Kolding A/S.

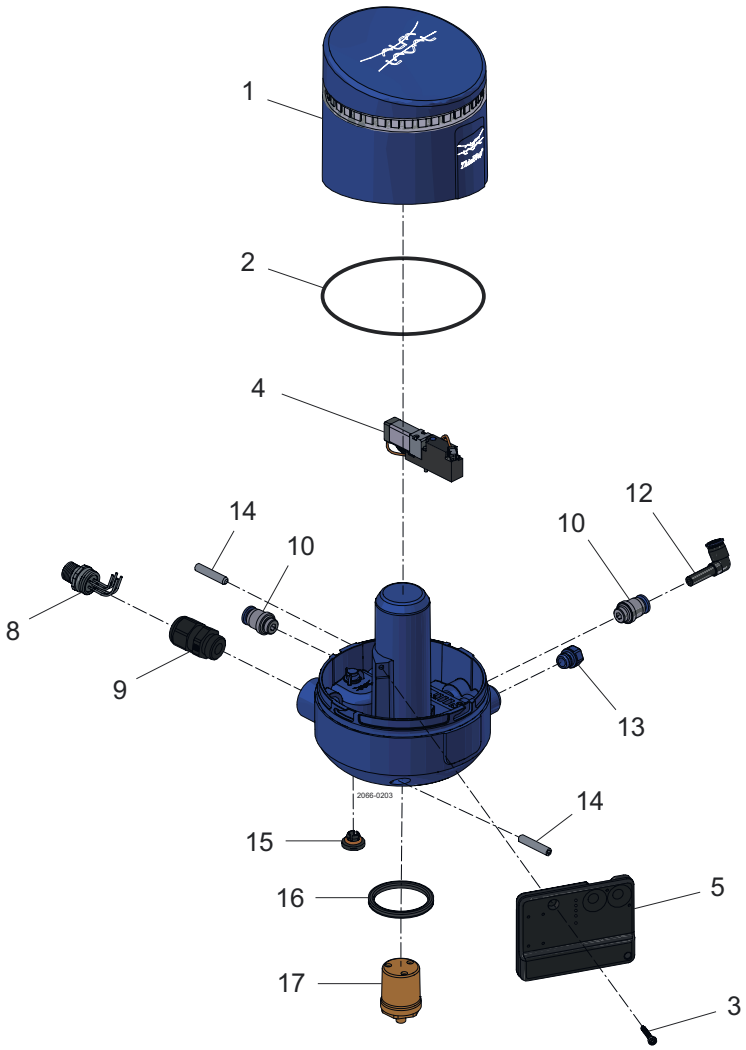
Liability and warranty are excluded:

- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied Alfa Laval product is modified by non-authorised persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see *Safety* on page 7)
- If protection equipment is not used and vessel process / ancillary equipment is not brought to a standstill
- If the supplied Alfa Laval product and ancillary parts are not properly maintained (to be executed in intervals and including fitting of prescribed replacement parts)

When exchanging parts, only original replacement parts, released from the manufacturer, must be used.

9 Parts Lists and Exploded Views

9.1 ThinkTop V40



Pos.	Qty.	Denomination
1	1	Top cover, complete
2	1	Base seal
3	1	Screw Torx 10
4	1	Solenoid valve
5.1	1	Control board digital
5.2	1	Control board ASi 3.0
8.1	1	M12 plug, DIO, 8 pins/6 wires
8.2	1	M12 plug, ASI, 4 pins/2 wires
9.1	1	Cable gland, M16x1.5, Ø4.5-10
9.2	1	Cable gland, M16x1.5, Ø2-7mm

Pos.	Qty.	Denomination
10.1	1	Air fitting, straight, 6 mm
10.2	1	Air fitting, straight, ¼"
12.1	1	Air fitting angle, 6 mm
12.2	1	Air fitting, anglet, ¼"
13	1	Exhaust plug
14	2	Screw set Hex 2.5
15	1	Gore vent
16	1	Lip seal
17	1	Sensor target