Alfa Laval Rotacheck+ & Rotacheck Basic

Cleaning validation

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Instruction Manual

BRITISH ENGLISH

Published by
Alfa Laval Kolding A/S
Albuen 31
DK-6000 Kolding, Denmark
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The original instructions are in English

Contents

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

Rotacheck+ & Rotacheck Basic

Designation

Unit for rotation validation of tank cleaning machines

Type

is in conformity with the following directives with amendments:

- EMC Directive 2014/30/EU
- RoHS Directive 2011/65/EU and amendments
- ATEX Directive 2014/34/EU. EN IEC 60079-0:2018, EN IEC 60079-7:2015/A1:2018, EN 60079-11:2012, EN 60079-26:2015 and EN 60079-31:2014

EC Type Examination Certificate number IBExU12ATEX1125 X

Marking: II 1/3G Ex ia/nA IIB T4/T3 Ga/Gc
II 1/3D Ex ia/tc IIIB T40ºC Da/Dc

IBExU Institut für Sicherheitstechnik GmbH, Certification Body number 0637. Fuchsmühlenweg 7, 09599 Freiberg, Germany

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	2025-05-15
Place	Date (YYYY-MM-DD)

Signature

DoC Revison_ 01_052025 / This Declaration of Conformity replaces Declaration of Conformity dated 2022-10-01

1.2 UK Declaration of Conformity

The designated company

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

Company name, address and phone number

Hereby declare that

Rotacheck+ & Rotacheck Basic

Designation

Unit for rotation validation of tank cleaning machines

Type

is in conformity with the following directives with amendments:

- The Electromagnetic Compatibility Regulations 2016
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
- The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016. EN IEC 60079-0:2018, EN IEC 60079-7:2015/A1:2018, EN 60079-11:2012, EN 60079-26:2015 and EN 60079-31:2014

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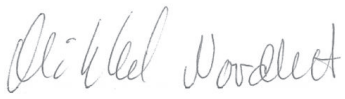
Signed on behalf of: Alfa Laval Kolding A/S.

Title	Name
Vice President BU Hygienic Fluid Handling Head of Product Management	Mikkel Nordkvist

Place	Date (YYYY-MM-DD)	Signature
Kolding, Denmark	2025-05-15	

DoC Revison_ 02_052025

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

Mandatory action signs

	General mandatory action sign.
	Refer to instruction manual.

Warning signs

	General warning.
	Corrosive substance.
	Electricity.
	Hot surface.
	ATEX warning

2.2 Safety Precautions

All warnings in the manual are summarised on these pages. Pay special attention to the instructions below so that severe personal injury and/or damage to the Supplied Alfa Laval Product is avoided.

Transportation

	**Always** remove the protective cap directly before starting assembly to avoid damaging the Rotacheck. The delivered protective cap has to be stored. **Always** place the protective cap on the Rotacheck again immediately after disassembly. **Always** make sure that all connections are disconnected before attempting to remove the Rotacheck from the installation. **Always** ensure adequate fixing of the Rotacheck during transportation – if specially designed packaging material is available it must be used.

Installation

	**Always** read *Technical Data* on page 31 thoroughly.
	**Always** use a power supply that complies with IEC/EN60950-1 or IEC/EN61010-1 standard and limited-energy circuit requirements.
	Before installing the Alfa Laval Rotacheck+ & Rotacheck Basic and setting it into operation, carefully read section *Safety* on page 7 and section *Specific Conditions for Safe Use in accordance with ATEX Certification* on page 18 and take all necessary precautions according to your application and local regulations.

Operation

	**Always** read *Technical Data* on page 31 thoroughly.
	**Never** touch the Rotacheck or the connected equipment when processing hot liquids or when sterilizing.
	**Always** handle lye and acid with great care.

Storage

Alfa Laval recommend:

- Store the supplied Alfa Laval product as supplied in original packaging
- Port opening(s) should be protected against any ingress
- Bare steel (not stainless) should be lightly oiled/greased
- Store in a clean, dry place without direct sunlight or UV light
- Temperature range -5 °C to 40 °C (23 °F - 104 °F)
- Relative humidity less than 60%
- No exposure to corrosive substances (including contained air)

Safety check

A visual inspection of any protective device (shield, guard, cover or other) on the supplied Alfa Laval product shall be carried out at least every 12 months. If the protective device is lost or damaged, especially when this leads to deterioration of safety performance, it shall be replaced. The fixing of the protective device should only be replaced with fixings of the same or an equivalent type.

Inspection acceptance criteria:

- It should not be possible to reach moving parts originally protected by a protective device
- The protective device must be securely mounted
- Ensure that screws for the protective device are securely tightened

Procedure in case of non-acceptance:

- Fix and/or replace the protective device

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

- 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

In principle, this device is maintenance-free. If desired, the housing of the device can be cleaned using a damp cloth and non-aggressive cleaning solutions, in switched-off state.

Depending on the measuring medium, however, the diaphragm may be polluted or coated with deposit. Is there a pollution tendency of the medium, the user has to determine the appropriate cleaning interval. After placing the device out of service correctly, the diaphragm can usually be cleaned carefully with a non-aggressive cleaning solution and a soft brush or sponge. If the diaphragm is calcified, it is recommended to send the device to Alfa Laval Tank Equipment for decalcification. Please note the chapter “Service/Repair” page *Spare Parts* on page 35.

NOTE

A false cleaning of the device can cause an irreparable damage on the diaphragm. Therefore never use pointed objects or pressured air for cleaning the diaphragm.

Scrapping

- At end of life, the equipment must be recycled according to the relevant, local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be taken into consideration 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.

Disposal

NOTE

The device has to be disposed of according to the European Directives 2002/96/EG and 2003/108/EG (on waste electrical and electronic equipment). It is prohibited to place electrical and electronic equipment in domestic refuse!

WARNING

Depending on the used medium, deposit on the device may cause danger for the user and the environment. Comply with adequate precautions for purification and dispose of it properly.

2.6 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.

3 Introduction

The Alfa Laval Rotacheck Basic and Alfa Laval Rotacheck Plus are intelligent sensors that validate the proper function of the Alfa Laval Rotary Jet Head during the cleaning operation for tanks used in hygienic applications. These sensors provide a proven, reliable validation method that increases quality assurance in tank cleaning.

The sensors accurately and precisely register, monitor and evaluate the rotation and impact of the rotary jet head. Whenever any deviation from the original rotation or impact pattern is detected, it automatically sends an error signal, enabling the control system as well as the operator to take remedial action to restore optimal operation.

Designed for use in all types of hygienic tanks, the Rotacheck Basic and Rotacheck Plus is approved to carry the 3-A symbol and designed according to European Hygienic Engineering & Design Group (EHEDG) guidelines.

The Rotacheck system may also be used with purified water (PW) and water for injection (WFI) as well as in systems that are pressurized during Cleaning-in-Place (CIP) up to 0.3 bar. Both are approved for use in potentially explosive environments in Zone 0/20 in the product-wetted area and Zone 2/22 in the non-product-wetted area.

3.1 Patents and Trademarks

This Instruction Manual is published by Alfa Laval Kolding A/S without any warranty. Improvements and changes may at any time be made by Alfa Laval Kolding A/S without prior notice. Such changes are incorporated in new editions.

The Rotacheck product has patents in the EPO member states and in other countries.

3.2 ATEX Marking

If ordered with ATEX certificate

The Alfa Laval Rotacheck+ & Rotacheck Basic are certified as category I components. The certification is carried out by the certified body IBExU Institut für Sicherheitstechnik GmbH, who has issued the certificate number IBExU12ATEX1125 X.

The marking on the ATEX certified Alfa Laval Rotacheck+ & Rotacheck Basic is as follows:

II 1/3G Ex ia/nA IIB T4/T3 Ga/Gc
II 1/3D Ex ia/tc IIIB T140 °C Da/Dc

Changes to the Alfa Laval Rotacheck+ & Rotacheck Basic are not allowed without approval by the person responsible for the ATEX certification at Alfa Laval Kolding A/S. If changes are made – or spare parts other than Alfa Laval original spare parts are used - the EC Type Examination certification (the ATEX Directive) is no longer valid.

NOTE **Important ATEX information:**

See also *Specific Conditions for Safe Use in accordance with ATEX Certification* on page 18 regarding specific conditions for safe use in accordance with the ATEX certification, Directive 2014/34/EU.

4 Installation

4.1 General Description

4.1.1 Concept

Rotacheck is a control and validation unit for tank cleaning machines, in particular Rotary Jet Heads. Communication is digital PNP to and from a PLC.

Rotacheck consists of a sensor unit with its sensing device located on the inside of a processing tank. The sensor is connected to a sensor board where the signal is processed and communicated to the PLC.

The Alfa Laval Rotacheck is ideal for validation of the cleaning process inside any hygienic tank cleaned with a Rotary Jet Head. It is available in two versions: Rotacheck+ with a built-in validation function and Rotacheck Basic with standard functionality.

The hygienic installation is guaranteed by using the new Alfa Laval full flushable connection, certified by 3A and EHEDG.

Rotacheck is designed for use in Ex areas.

4.1.2 Working Principle

Rotacheck+

The Alfa Laval Rotacheck+ is based on an Alfa Laval invention which features unique teach-in and monitoring functions. The teach-in function is used during a reference CIP run. During this first CIP run the Rotacheck+ stores time and pressure data from the cleaning process.

In terms of cleaning jet intensity on the tank wall (hits) and the time between the hits from the water jet the reference data represents a unique pattern for the specific process. Status is shown by digital PLC output as well as a visual light indication.

Afterwards, during production, the feedback from the integrated pressure transducer is continuously compared to the stored acceptance window, and the Rotacheck+ digitally outputs a validated feedback. This digital feedback clearly indicates the state that the cleaning proces is in.

The system feedback has 3 different outputs.

- **Rotation OK output:** on when rotation is within acceptance window
- **Alarm output:** on when cleaning is out of teach-in acceptance window
- **IDLE output:** on when cleaning is not performed

Rotacheck Basic

The Rotacheck Basic registers when the sensor head is hit by the cleaning jet. Status is shown by digital PLC output as well as a visual light indication.

The system feedback has 3 different outputs.

- **Hit output:** on when sensor head is hit by cleaning jet
- **Alarm output:** on in case of unit failure or constant hit (cleaning device error)
- **IDLE output:** on when cleaning is not performed

4.2 Specific Conditions for Safe Use in accordance with ATEX Certification

Directive 2014/34/EU

Warning: Surface temperature

The surface temperature must not exceed 140 °C.

Warning: Use in explosive atmosphere

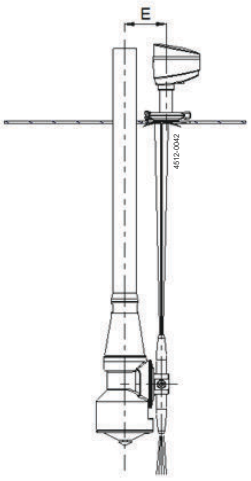
The device may be used in an explosive atmosphere, the apparatus of category 1 requires only operate if there are atmospheric conditions (temperature of -20 °C to +60 °C, pressure of 0.8 bar to 1.1 bar).

4.3 Mounting Position of Hygienic Tank Connection

In order to ensure optimum signal quality, the Rotacheck should be placed with an offset to the downpipe as close as possible to the offset of the jets nozzles of the tank cleaning machine in use.

Examples of different offset

Tank cleaning machine type	Offset (E)
Toftejorg TJ20G	75 mm
Toftejorg TJ40G	91 mm
Toftejorg TZ-74	78 mm
Toftejorg TZ-79	98 mm
Toftejorg MultiJet 65 with 4 nozzles	98 mm
Toftejorg TZ-89	50-90 mm[1]
Toftejorg TZ-750	115 mm
Toftejorg MultiJet 65 with 2 nozzles	115 mm



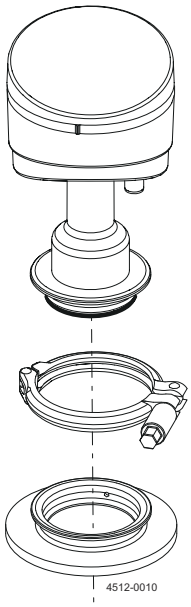
[1] Depending on size of mounting connection

Deviations from the above given positions may work, but will influence the signal quality.

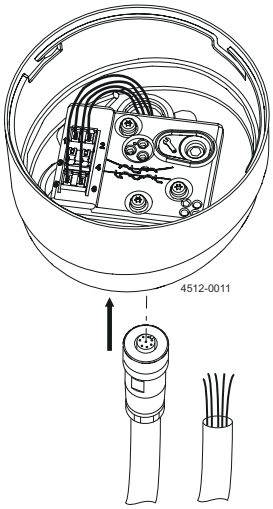
It is not recommended to go closer to the centerline, as there is a risk of having no signal. If the Rotacheck Sensor is placed further away from the centerline, the number of times it is directly hit by a jet is reduced.

4.4 Overview of Installation Instructions

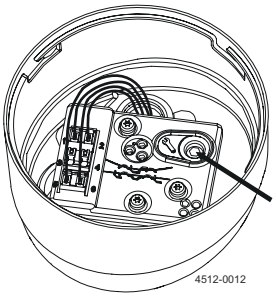
1. Mount Rotacheck on tank.



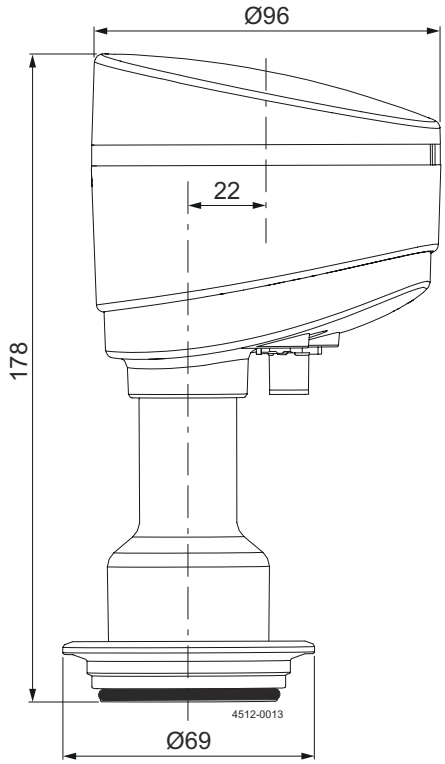
2. Connect electrical cable.



3. Calibrate.



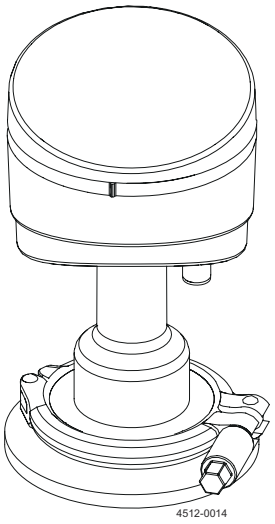
4.5 Product Dimensions



Weight: 0.6 kg / 1.32 lb

4.6 Mounting Rotacheck on Tank – step 1

1. Remove protective cap from sensor.
   Check that o-ring on sensor head is in place.
2. Mount Rotacheck on flange.
3. Tighten clamp ring.



4.7 Connect Electrical Cable - step 2

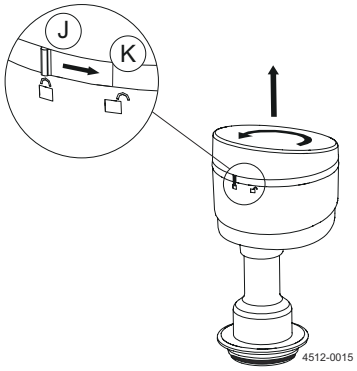
WARNING **Special considerations for use in hazardous areas**

For the installation, maintenance and cleaning of the device, you must absolutely observe the relevant regulations and stipulations on explosion protection (EN 60079-14 and EN60079-17) as well as the occupational safety provisions.

The device is designed acc. to standards:EN60079-0:2009, EN60079-11:2007, EN60079-15:2010, EN60079-26:2007 and EN60079-31:2009.

4.7.1 Cable Gland Version

1. Remove the prism/top cover by turning the prism/top cover counter-clockwise. Counterhold on the base part. When the mark on the prism (J) is aligned with the open padlock symbol (K), the prism/top cover can be lifted off.



2. Install the cable in the cable gland (M) and tighten nut.

NOTE

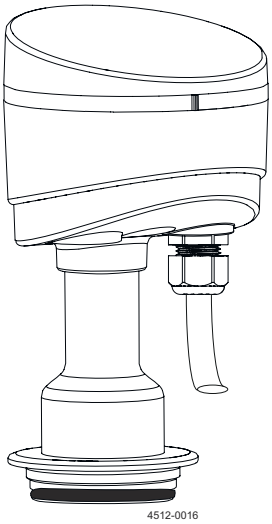
Cable connection:

M16 (Ø5-Ø8)

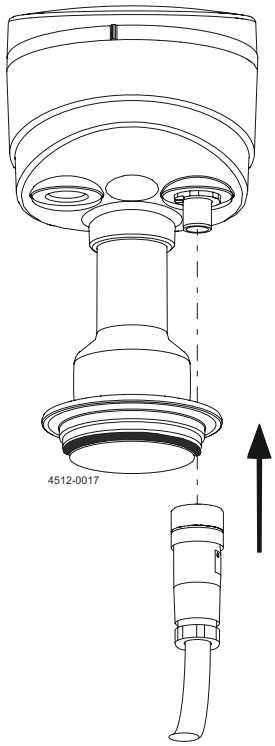
Max. wire diameter: 1.0 mm^2 (AWG 18)

WARNING

If the cable gland comes loose from the control head during installation, it must be secured with a tightening torque of 4 Nm.



3 Connect wires to board according to illustration number 4512-0018 on page *Digital Version - PNP* on page 23.



4.7.2 M12 Plug Version

1 Connect the electrical M12 plug to the connector on Rotacheck.

Tighten the knurled nut.

See wiring diagram in section *Digital Version - PNP* on page 23

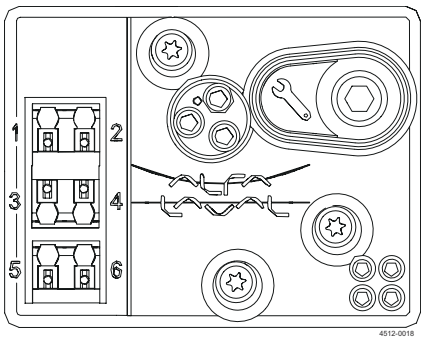
4.8 Digital Version - PNP

Supply voltage	
Supply voltage:	24 Vdc +/- 10%

Max. power consumption of the sensor unit	
Power consumption max.:	70 mA

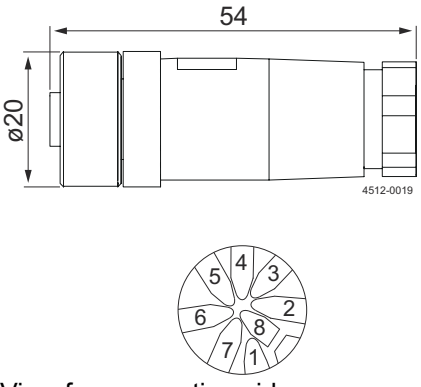
Output signals from the sensor unit to the connected digital interface (PLC)	
Outputs (HIT “Rotation OK”, Alarm, Idle):	Logic PNP
Max. current per output:	50 mA

Electrical connection on PCB



Sensor board

Designation	No.
Supply 24 VDC	1
Supply 0 VDC	2
Feedback Idle	3
Feedback Hit/Rotation OK	4
Alarm	5
Activate teach (Rotacheck+ only)	6



View from mounting side

M12 connector

Designation	No.
Supply 24 VDC	1
Supply 0 VDC	3
Feedback Idle	5
Feedback Hit/Rotation OK	2
Alarm	6
Activate teach (Rotacheck+ only)	4

Alfa Laval part number 9611995257 (not part of delivery)

4.9 Calibrate - step 3 - Rotacheck Basic

The Rotacheck Basic must be fully installed:

- Mechanically
- Electrically

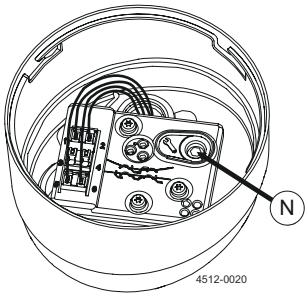
1 The unit will flash green on power up and perform an internal calibration after 5 sec.

The unit is ready to use when the green LED lights steadily.

Optional re-calibration

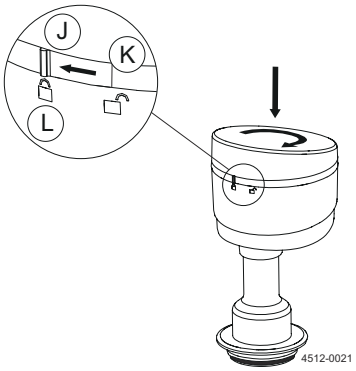
Push the blue button (N) on the sensor unit until you see a yellow flash.

The Rotacheck Basic will automatically re-calibrate.



2 (If unit has been opened)

Put the prism/top cover back on the base part by pushing it down when the mark on the prism (J) and the open padlock (K) are aligned. Then turn it clockwise towards the closed padlock (L) to secure. Counterhold on the base part.



Operating LED and PLC feedback

Rotacheck Basic status	LED feedback	PLC feedback
Calibration	Green, flashing	No feedback
Idle	Green, steady	On
Hit	Yellow, 1 sec	On, 1 sec
Alarm[1]	Red, steady	On

[1] Unit failure or constant hit (cleaning device error)

4.10 Calibrate - step 3 – Rotacheck+ (with TEACH)

The Rotacheck Basic must be fully installed:

- Mechanically
- Electrically

Usage before TEACH has been performed:

Rotacheck+ where TEACH has not yet been performed, will show similar functionality as Rotacheck Basic, except that Idle mode is indicated by a flashing (mostly on) green LED.

1 **Calibration - TEACH**

Method 1: Auto-TEACH

- Ensure that cleaning machine is commissioned, and its performance is approved by end-user
- Install Rotacheck+, ensure “green LED is flashing (mostly on)”
- Open top cap of Rotacheck+
- Start cleaning machine

Enable TEACH by pressing the blue button on sensor board for 1 sec and release after 1 yellow LED flash is seen.

Duration of TEACH is preset to 16 minutes.

- A red LED is flashing to indicate TEACH ongoing
- Let the cleaning process run for at least 16 minutes (the Rotacheck+ will teach-in cleaning pattern during this time)
- Every sensor hit during TEACH is indicated by a yellow LED flash
- Rotacheck+ will light up green when teach-in is finished

The TEACH sequence is terminated if no sensor hits are registered within a 4 min. interval.

> **NOTE**
>
> Longer TEACH intervals may be necessary in some cases, to secure proper calibration data. For example in case of unfavourable placement of Rotacheck, see guidelines for installation, page *Mounting Position of Hygienic Tank Connection* on page 18. In these cases manual calibration according to method 2 is recommended.

Method 2: Manual TEACH

- Ensure that cleaning machine is commissioned, and its performance is approved by end-user
- Install Rotacheck+, ensure “green LED is flashing (mostly on)”
- Start cleaning machine

Enable TEACH by activating input on sensor board, connector number 6, see table page *Digital Version - PNP* on page 23.

TEACH will be performed as long as the input is activated, up to maximum 60 minutes.

For proper calibration TEACH must run for sufficiently long time. This is application dependant and must be determined on-site.

- A red LED is flashing to indicate TEACH ongoing
- Let the cleaning process run for at least 16 minutes (the Rotacheck+ will teach-in cleaning pattern during this time)
- Every sensor hit during TEACH is indicated by a yellow LED flash
- Let the cleaning process run for sufficient time (the Rotacheck+ will teach-in cleaning pattern during this time)

- De-activate TEACH input on sensor board, terminal 6 after the desired time is elapsed.
- Rotacheck+ will light up green when teach-in is finished

2 Operation after TEACH

If TEACH is completed, Rotacheck+ will enter Idle mode.

- When cleaning is ongoing, Rotacheck+ compares cleaning parameters to the reference cycle.
- If parameters are within the calibrated values, a “Rotation OK” feedback is initiated
- If parameters are outside the calibrated values, the alarm function is entered.

NOTE

If it – due to special circumstances - proves too difficult to make a proper calibration, Rotacheck+ can be reset to “1st power up mode”.

This is done by pressing the Push Button for 10 seconds, and release when 3 yellow LED flashes are seen.

After Rotacheck+ is reset it will function similar to a Rotacheck Basic, but with a flashing green LED (mostly on), when idle.

4.10.1 Operating LED and PLC feedback

Enter the syntax information of your reference here (optional).

Unit status	LED feedback	PLC feedback
OPERATION		
Self calibration on 1st power up (0-5 sec.)	Green flashing(50/50 on /off)	No feedback
Idle (before TEACH)	Green flashing (mostly on)	Idle
Idle (after TEACH)	Green	
Sensor hit (before TEACH)	Yellow - 1 sec.	Hit/Rotation OK - 1 sec
Alarm	Red	Alarm
Alarm, sensor not connected	Red/Yellow flashing	Alarm
Rotation OK (after TEACH)	Yellow flashing (slowly)	Hit/Rotation OK
Sensor hit (after TEACH)	Yellow – 3 flashes	Hit/Rotation OK
End of cleaning sequence	Red - 3 sec.	Alarm - 1 sec.

[1] Constant sensor hit or max. tank pressure is exceeded If no sensor hits are recorded during the maximum interval set by TEACH function

Unit status	LED feedback	PLC feedback
TEACH		
TEACH ongoing	Red flashing	No feedback
Sensor hit during TEACH	Yellow - 1 sec.	No feedback
Termination of TEACH[1]	Yellow - 1 flash	No feedback

[1] Finalization of TEACH after preset time or if TEACH input is de-activated. Max. duration of TEACH is 20 min. where after Rotacheck+ automatically sets up reference data

Back to 1st power up mode (factory settings)

Rotacheck can be brought back to 1st power up mode by pressing the blue pushbutton for 10 seconds and release when 3 yellow LED flashes are seen.

Feedback test mode – Rotacheck+ (with TEACH) only

Feedback test mode is a function that can be enabled after installation to validate proper function of the external wiring. When the mode is entered, Rotacheck+ automatically switches PLC and LED outputs in 5 seconds intervals.

Enter Feedback test mode:

Press the blue button on the sensor board and release after 5 seconds when 2 Yellow LED flashes are seen.

This mode can only be entered from 1st power-up or Idle modes.

Exit Feedback test mode:

Feedback test mode automatically terminates after 3 minutes.

The function can also be terminated by shortly pressing the blue button on the sensor board.

Exit is indicated by 2 yellow flashes.

Unit status is returned to previous state before feedback test mode was enabled.

Feedback test mode LED and PLC feedback

Unit status FEEDBACK TEST MODE	LED feedback	PLC feedback
Step 1 (0-5 sec.)	Red	Alarm
Step 2 (5-10 sec)	Yellow	Hit/Rotation OK
Step 3 (10-15 sec.)	Green	Idle
Loop until aborted or timeout after 3 mins.	Yellow – 2 flashes on termination	

5 Troubleshooting

5.1 No Light

- Check that the unit is connected to electrical power
- Press the blue button on the sensor board shortly to restart unit
- Power down the unit and reconnect power again after 5 seconds
- If problem persists, please contact Alfa Laval

5.2 Red Light

Constant red LED light is an indication of an alarm condition. Such condition can be “Rotation not OK” (Rotacheck+), or if there is a constant jet impact on the sensor (Rotacheck Basic, Rotacheck+).

- Check if there is a problem with the cleaning process
- Check if the tank pressure is exceeding the max. rating
- Alternatively restart unit by shortly pressing the blue button on the sensor board
- Recalibrate TEACH (Rotacheck+) if necessary by following the instructions
- If problem persists, please contact Alfa Laval

5.3 Red/Yellow Flashing Light

Red/Yellow flashing light indicates sensor malfunction or lost internal connection between sensor board and sensor.

- Press the blue button on the sensor board shortly to restart unit, or power down the unit and reconnect power again after 5 seconds
- If problem persists, please contact Alfa Laval

5.4 Other Failure Modes

- Check the unit for visible damage
- Press the blue button on the sensor board shortly to restart unit
- Power down the unit and reconnect power again after 5 seconds
- Recalibrate TEACH (Rotacheck+) if necessary by following the instructions
- If problem persists, please contact Alfa Laval

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6 Technical Data

NOTE

Technical data must be observed during installation, operation and maintenance.

All personnel should be informed about the technical data.

6.1 Technical Data

Pressure	
Pressure overload on diaphragm:	15 bar / 217 PSI
Max. working pressure in tank while performing monitoring:	0.3 bar / 4.35 PSI

Electrical data	
Power supply:	24 Vdc +/- 10 %
Power consumption max.:	70 mA
Outputs (HIT “Rotation OK”, Alarm, Idle):	Logic PNP
Max. current per output:	50 mA
Electrical connection:	M12 plug (8 poles) or M16 cable gland
Short circuit and brownout protection:	EN 61131-2
Surges immunity	EN 61000-4-5

Cable and wire diameter	
• for Cable gland (M16):	ø5-ø8 mm, max. 1.0 mm^2 (AWG 18)
• for M12 connector	ø6-ø8 mm, max. 0.5 mm^2 (AWG 20)

The integrated electronics features short circuit and high temperature protection.

Special conditions for use in hazardous areas

Rotacheck is approved in accordance with ATEX directive 94/9/EC, for use in Zone 0/20 in the product wetted area and Zone 2/22 in the non-product wetted area.

WARNING

Rotacheck must not be separated when energized.

Ex identification
II 1/3G Ex ia/nA IIB T4/T3 Ga/Gc
II 1/3D Ex ia/tc IIIB T130 °C Da/Dc

Special conditions for safe use:	
T4 for media temperatures:	<85°C
T3 for media temperatures:	<140°C

Special conditions for safe use:	
Fall height:	Fall height 40 cm is utilized in impact test of Rota-check with M12 cable connector plug.
Permissible temperatures for environment for use in Zone 0 (Patm 0,8 to 1,1 bar):	-10°C to 60°C

6.2 Physical Data

Materials	
Wetted parts:	AISI 316L
Fieldhousing:	Polymer PA12
Product wetted elastomer:	EPDM
Other elastomer:	NBR

Operating temperature	
Wetted parts:	-40°C to 110°C (< 140°C in 1 hour) -40°C to 230°F (< 284°F in 1 hour)
Field house:	-10°C to 60°C / 14°F to 140°F

Operating temperature	
Wetted parts:	-40°C to 110°C (< 140°C in 1 hour) -40°C to 230°F (< 284°F in 1 hour)
Field house:	-10°C to 60°C / 14°C to 140°F

Process connection
Alfa Laval Hygienic Tank Connection (HTC)

Other physical data	
Protection class:	IP66 and IP67
Pressure rating of sensor Pressure overload on diaphragm:	15 bar
Max. working pressure in tank while performing monitoring:	0.3 bar
Surface roughness, product wetted parts:	Ra 0.5 µm
Weight:	Approx. 600 gr / 1.32 lb

7 Short Functional Guide

7.1 LED Signals

Colour	Signal	Explanation
Green	Flashing (50/50%)	Initial calibration
Green	On	Idle
Green	On/off (95/5%)	First power-up (Rotacheck+ before Teach)
Yellow	Yellow LED flash (1s)	Sensor hit (Rotacheck basic or Rotacheck + before Teach)
Yellow	On/off (50/50%)	Operation In window (Rotacheck+)
Yellow	3 short flashes	Sensor hit during operation In window (Rotacheck+)
Yellow	1 short flash	Termination of Teach (Rotacheck+)
Red	Steady on	Alarm
Red/Yellow	Flashing	Sensor alarm
Red/Yellow/Green	Switching every 5 seconds	Feedback Test mode (Rotacheck+)

7.2 Push Button (PB) Operation

PB Operation	Signal	Explanation
Press shortly	Flashing green LED (5s)	System restart
Press 1 second	1 Yellow LED flash	Enable Teach (Rotacheck+)
Press 5 seconds	2 Yellow LED flashes	Enable feedback test mode (Rotacheck+)
Press 10 seconds	3 Yellow flashes	Back to first power up mode (Rotacheck+)

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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.

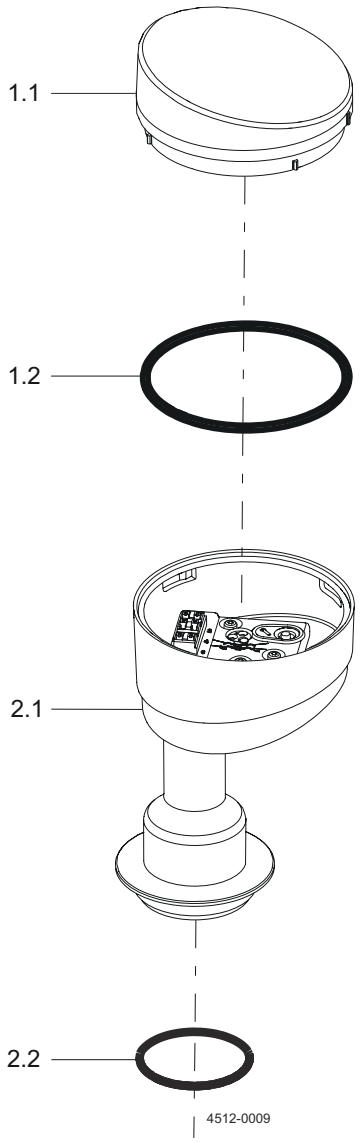
Liability and warranty are excluded:

- 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

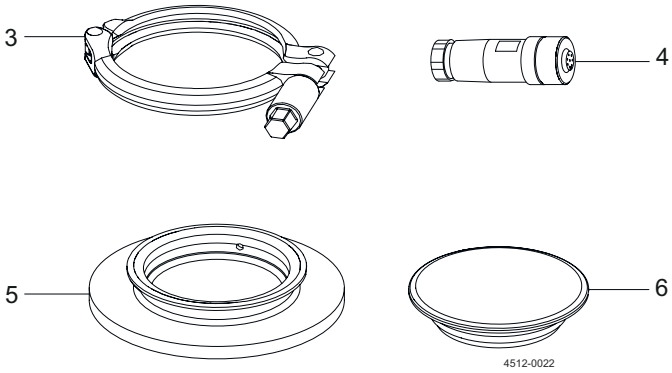
9.1 Parts drawing and list



Pos.	Qty.	Denomination
1	1	Top cover/prism and o-ring assembly
1.1	-	Top cover/prism assembly
1.2	-	O-ring for top cover

Pos.	Qty.	Denomination
2	1	Sensor unit with o-ring
2.1	-	Sensor unit
2.2	-	O-ring

9.2 Optional Parts



Pos.	Qty.	Denomination
3	1	Clamp ring
4	1	M12 connector

Pos.	Qty.	Denomination
5	1	Tank flange, Hygienic tank connection HTC
6	1	Blind cap with o-ring