

Alfa Laval Rotacheck Basic and Plus

Cleaning validation

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.

Application

The Alfa Laval Rotacheck is designed to fulfil the demands for tank cleaning validation in hygienic applications across the dairy, food, beverage, brewery, and pharmaceutical industries.

Benefits

- Safe, hygienic and validated tank cleaning
- Easy monitoring of rotary jet head operation
- Easy installation and maintenance
- Complies with 3-A standards and designed in accordance with EHEDG hygienic guidelines

Standard design

The Alfa Laval Rotacheck control and validation systems for tank cleaning machines consist of a sensor unit with top cover, O-rings and electrical cable and/or connector. The sensor unit has a sensing device located inside the processing tank and is connected to a sensor board, which processes and communicates the signal to the programmable logic controller (PLC).



The Alfa Laval Rotacheck system is available in two versions with output from the digital sensor via PNP interface to and from the PLC:

- Rotacheck Basic, where the validation happens in the PLC based on the digital signal from the sensor when the water jet hits the sensor
- Rotacheck Plus, an advanced system with a built-in function for validation of the rotary jet head performance. The validation occurs in the Rotacheck and the PLC receives a feedback on the tank cleaning

Alfa Laval Rotacheck Basic

The Rotacheck Basic registers the moment when the sensor is hit by the water jet from the cleaning head. The feedback from the Rotacheck can be:

- Hit: The moment in time when the water jet hits the sensor head
- Alarm: In case of unit failure or constant hit (cleaning device error)
- Idle: When the rotary jet head is not in use and cleaning is not being performed

Alfa Laval Rotacheck Plus

This advanced innovative system features unique built-in teach-in and monitoring functions to verify the proper rotation of the rotary jet head.

As the rotary jet head performs the first CIP cycle, the sensor registers time and pressure data from the cleaning process and stores them as reference data. The reference data represent a unique pattern for a specific cleaning process in terms of the water jet intensity on the tank wall (hits) and the time between the hits from the water jet.

During subsequent CIP cycles, the processor in the sensor board then compares actual values to the digitally stored reference values and alerts the operator if any deviation from the reference values occurs.

The status of rotary jet head operation is shown via digital PLC output as well as a visual light indication. System feedback includes three different outputs:

- Rotation OK: When the operation of the rotary jet head meets the values recorded during the initial CIP cycle, verifying the proper rotation of the jet head
- Alarm: When the rotation of the rotary jet head falls above or below the acceptable reference values recorded during the initial CIP cycle
- Idle: When the rotary jet head is not in use and cleaning is not being performed

Certificates

Q-doc (option)



NOTE! Product contacted parts only!



Authorized to carry the 3A symbol



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.



-
- 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 IIB T130 °C Da/Dc

Special conditions for safe use:

T4 for media temperatures:	<85°C
T3 for media temperatures:	<140°C
Fall height:	Fall height 40 cm is utilized in impact test of Rotacheck 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	

Physical Data

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

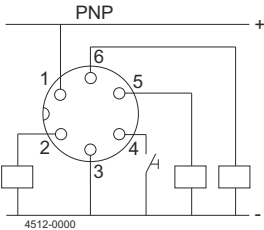
Operating temperature	
Wetted parts:	-40°C to 110°C (< 140°C in 1 hour) -40°C to 230°F (< 284°F in 1 hour)
Field house:	-10°C to 60°C / 14°F to 140°F

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	15 bar
Pressure overload on diaphragm:	
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

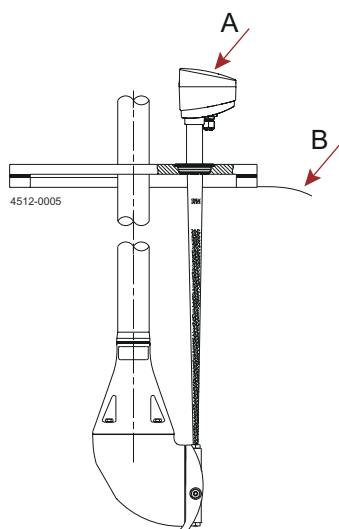
Electical connections



M12 Plug		M16 cable gland	
PIN 1:	+	1	+
PIN 2:	Output: Rotation OK/hit	2	-
PIN 3:	-	3	Output: Idle
PIN 4:	Input: Teach-in	4	Output: Rotation OK/hit
PIN 5:	Output: Idle	5	Output: Error
PIN 6:	Output: Alarm	6	Input: Teach-in

Dimensions

Installation of Alfa Laval Rotacheck



A = Rotacheck Sensor
B = Tank Top

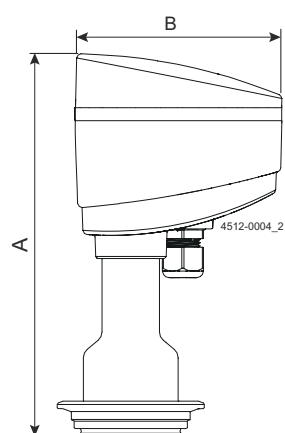


Figure 1. Rotacheck with M16 cable gland

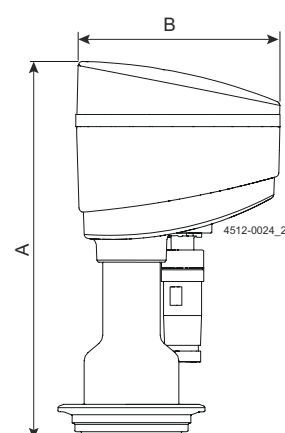


Figure 2. Rotacheck with M12 plug

A	B
mm / inch	mm / inch
178 / 7"	96 / 3.78"

This document and its contents are subject to copyrights and other intellectual property rights owned by Alfa Laval AB (publ) or any of its affiliates (jointly "Alfa Laval"). No part of this document may be copied, re-produced or transmitted in any form or by any means, or for any purpose, without Alfa Laval's prior express written permission. Information and services provided in this document are made as a benefit and service to the user, and no representations or warranties are made about the accuracy or suitability of this information and these services for any purpose. All rights are reserved.