

Alfa Laval ThinkTop[®] Basic[®] Intrinsically Safe

Sensing and control

Introduction

The Alfa Laval ThinkTop[®] Basic Intrinsically Safe is a modular, explosion-safe automated valve control unit that offers cost-effective operation and standard functionality for automated sensing and control of hygienic valves. It provides real-time information about valve operating status 24/7 while boosting productivity.

Application

The ThinkTop Basic Intrinsically Safe is designed to control the fluid handing process in hygienic applications across the dairy, food, beverage, biotechnology, pharmaceutical and many other industries.

Benefits

- Reliable valve sensing and control
- Proven and inherently safe design
- Low total cost of ownership
- Watertight design
- Easy to operate

Standard design

The ThinkTop Basic Intrinsically Safe valve sensing and control unit consists of a proven NAMUR feedback sensor system with light-emitting diodes (LEDs), low voltage solenoid valves, ready for connection to a electrical barriers and to any programmable logic controller (PLC) system with a digital interface. It fits on all Alfa Laval hygienic valves; no adaptor is required.

Working principle

By an indication pin mounted on the valve stem, the NAMUR feedback sensors detects valve stem movement, the position of the valve at any given time, with the adjusted accuracy of the feedback sensors.

The Alfa Laval ThinkTop Basic Intrinsically Safe is fitted with up to two solenoid valves that can convert compressed air and the electrical PLC signal into mechanical energy to activate or deactivate the pneumatic valve actuator.



Certificates



Technical Data

Inductive sensor

Switching element function:	NAMUR NC
Nominal voltage:	8 V
Indication of the state:	LED, yellow (Internally)
EMC in accordance with:	EN 60947-5-6 EN IEC 60947-5-2
Certificate of conformity:	PTB 00 ATEX 2032 X

Solenoid valve

Numbers of solenoids:	0-2
Type of solenoids:	3/2-ways
Air supply:	150-700 kPa / 22-100 psi / 1.5-7 bar
Manual hold override:	Yes
Push-in fittings:	Ø6 mm or 1/4"
Certificate of conformity:	DEKRA 11ATEX0273 X

Physical Data

Materials

Steel part:	Stainless steel and Brass
Plastic parts:	Black Nylon PA 6 with SS fibers
Seals:	Nitrile (NBR) rubber

Environment

Working temperature:	-10 °C to +45 °C / +14 °F to +113 °F
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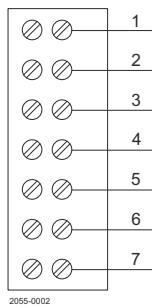
Options

- Solenoid valve configuration
- Pneumatic tubing interface

Accessories

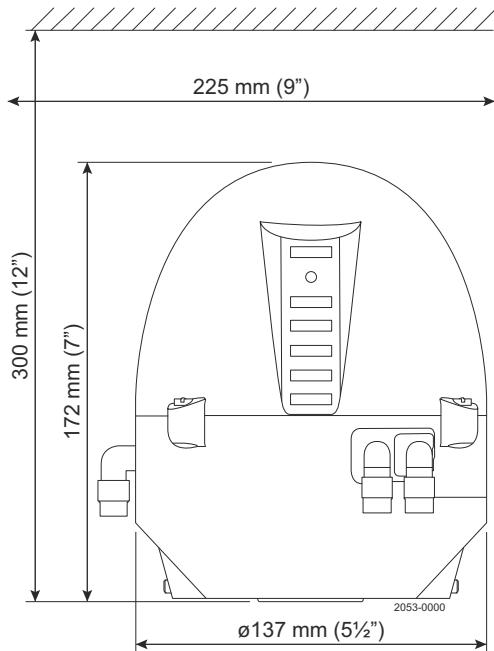
- Threaded plate for indication pin on SRC, SMP-BC valves
- Adaptor for Unique 7000 Small Single Seat valves

Electrical connection



1. Sensor 1 (blue) 8 VDC (-)
2. Sensor 1 (brown) (+)
3. Sensor 2 (blue) 8 VDC (-)
4. Sensor 2 (brown) (+)
5. Common; solenoids (black) 12 VDC (-)
6. Input; solenoid #1 (red) (+)
7. Input; solenoid #3 (red) (+)

Dimensions (inch)



ATEX evaluated Alfa Laval valves

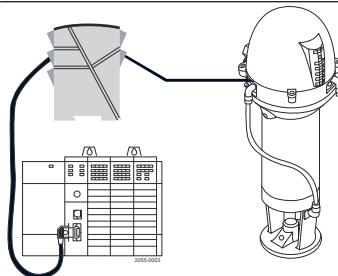
The following table list show the ATEX evaluated Alfa Laval valves which the ThinkTop Basic Intrinsically Safe can be installed on to be accordance with Atex Directive 2014/34/EU.

Valve / Actuator type	ATEX evaluation notes
Unique 7000 ATEX	Non-electric equipment with no own ignition source which can be used within equipment-group II 2 G/D or II 3 G/D
Unique Mixproof	Non electric equipment with no own ignition source which can be used within the equipment-group II 2 G/D or II 3 G/D if removing the blue plastic cover from the bottom of the Mixproof valve
SRC (except SRC-LS) SMP-SC, TO, BC	
LKLA-T	Non electric equipment with no own ignition source which can be used within the equipment-group II 2 G/D or II 3 G/D
Shutter valve	
SBV	

Electrical interface

To comply with the ATEX protective system all individual electrical signals from the control unit must be connected to an electrical barrier in the safe area to obtain the intrinsic safe circuit. The electrical barrier must comply with the standard EN 60079-14 and shall always be specified in accordance with the following maximum values as shown in the table below for sensor and solenoid valve (I/O signals).

Sensor	Solenoid valve		Safe Area	Hazardous area	
The two inductive NAMUR sensors must be connected to a certified intrinsically safe circuit (e.g. Zener barrier) for apparatus group II 2G/2D with the following maximum values:	The intrinsic safe solenoid valves must also be connected to a certified intrinsically safe circuit (e.g. Zener barrier) for apparatus group II 2G/2D with the following maximum values:		Electrical barrier		
Max. allowed Voltage (U_i)	16	V	Max. allowed Voltage (U_i)	28	V
Max. allowed Current (I_i)	76	mA	Max. allowed Current (I_i)	225	mA
Max. allowed Power (P_i)	242	mW	Max. allowed Power (P_i)	1	W
Max. Inductance (L_i)	100	μ H	Max. Inductance (L_i)	0	μ H
Max. Capacitance (C_i)	100	nF	Max. Capacitance (C_i)	0	nF



For inductive sensor Type NCN4-V3-NO safety data include 10 m cable.

The Entity Concept allows interconnection of an intrinsically safe apparatus with an associated apparatus not specifically examined in combination as a system when the approved values of U_o , I_o and P_o for the associated apparatus are less than or equal to U_i , I_i or P_i for the intrinsically safe apparatus and the values of C_o and L_o for the associated apparatus are greater than $C_i + C_{cable}$ and $L_i + L_{cable}$ respectively, for the intrinsically safe apparatus, where:

$$\begin{aligned} C_{cable} : &= 197 \text{ pF/m if unknown} \\ L_{cable} : &= 0.20 \text{ } \mu\text{H/ft if unknown} \end{aligned}$$

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