Alfa Laval ThinkTop® Digital

Leave Surveillance to the Top

Concept

The ThinkTop® is a uniform modular control unit that consists of a proven no-touch, set-and-forget sensor system with light-emitting diodes (LEDs), solenoid valves and valve control sensor board for connection to any PLC (Programming Logic Controller) system with one of the three interfaces; Digital, AS-Interface and DeviceNet. ThinkTop is offering a solution that utilizes all the features available on Alfa Laval butterfly, single-seat and Mixproof valves and is designed for use in the dairy, food and beverage, and biopharm industries; ThinkTop provides real-time information about valve operating status 24/7 while helping to improve production performance and secure traceability.

Working principle

The ThinkTop is an automated control unit that can be fitted with up to three solenoid valves and who convert the electrical PLC and sensor signals into mechanical energy to open or close the air-operated valve, using the physical stimulus of an indication pin mounted on the valve stem. ThinkTop fits onto all Alfa Laval hygienic actuators equipped with mushrooms. Installation is straightforward; no special expertise, adapters or tools are required. To initiate manual setup, simply press the push-button startup sequence. Or set up without dismantling the control head using the optional IR keypad for remote control.

TECHNICAL DATA

Communication

Interface	Digital PNP/NPN
Supply voltage	8-30VDC

Sensor board

Max current consumption	45mA
Feedback signal #1	Closed valve
Feedback signal #2	Open valve
Feedback signal #3	Seat-lift 1
Feedback signal #4	Seat-lift 2
Feedback signal #5	Status
Valve tolerance band options	5
Default tolerance band	± 0.2”
Sensor accuracy	± 0.004”
Stroke length	0.004”- 3.15”

Solenoid valve

Max current consumption	45mA
Air supply	(40 - 130 PSI)
Type of solenoids	3/2-ways or 5/2-ways
Numbers of solenoids	0-3
Manual hold override	Yes
Throttle, Air in/out 1A, 1B	0-100 %
Push-in fittings	ø6 mm or 1/4”

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PHYSICAL DATA

Materials

Steel parts	Stainless steel and Brass
Plastic parts	Blue Nylon PA 12
Seals	Nitrile (NBR) rubber

Environment

Working temperature	(-4°F to +185°F)
Protection class	IP66 and IP67
Protection class equivalent	NEMA 4.4x and 6P

Cable connection

Main cable gland	PG11 (0.16” - 0.39”)
Max wire size	AWG 19
Optional cable gland	PG7 (0.16” - 0.27”)

Note!

For further information: See also ESE00353

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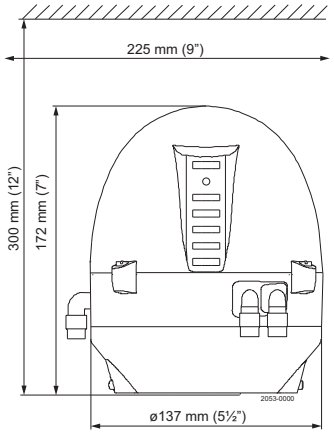
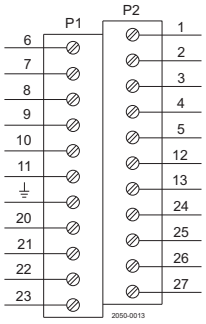
Options
- Solenoid valve configuration
- Pneumatic tubing interface

Accessories
- Various cable options
- Threaded plate for indication pin on SRC, SMP-BC valves
- Special indication pin for Unique 7000-LS, Unique 7000 High Pressure valves
- Adaptor for Unique 7000 small single seat valves

Dimensions



Electrical connection



6	Solenoid 1	1	Closed valve
7	Solenoid 2	2	Open valve
8	Solenoid 3	3	Seat-lift 1
9	Supply +	4	Seat-lift 2
10	Supply -	5	Status
11	Solenoid com	12	NPN/PNP Jumper
Earth	Earth	13	NPN/PNP Jumper
20	Solenoid common grey	24	Seat-lift 1 “upper”
21	Solenoid 1, grey	25	Seat-lift 2 “lower”
22	Solenoid 2, grey	26	Supply +
23	Solenoid 3, grey	27	Supply -

Alfa Laval ThinkTop® AS-Interface

Leave Surveillance to the Top

Concept

The ThinkTop® is a uniform modular control unit that consists of a proven no-touch, set-and-forget sensor system with light-emitting diodes (LEDs), solenoid valves and valve control sensor board for connection to any PLC (Programming Logic Controller) system with one of the three interfaces; Digital, AS-Interface and DeviceNet. ThinkTop is offering a solution that utilizes all the features available on Alfa Laval butterfly, single-seat and Mixproof valves and is designed for use in the dairy, food and beverage, and biopharm industries; ThinkTop provides real-time information about valve operating status 24/7 while helping to improve production performance and secure traceability.

Working principle

ThinkTop is an automated control unit that can be fitted with up to three solenoid valves and who convert the electrical PLC and sensor signals into mechanical energy to open or close the air-operated valve, using the physical stimulus of an indication pin mounted on the valve stem. ThinkTop fits onto all Alfa Laval hygienic actuators equipped with mushrooms. Installation is straightforward; no special expertise, adapters or tools are required. To initiate manual setup, simply press the push-button startup sequence. Or set up without dismantling the control head using the optional IR keypad for remote control.

Technical data

Communication

Interface option 1	AS-Interface v2.1, 31 node
Supply voltage	29.5V - 31.6 VDC
Slave profile	7.F.F.F
Default slave address	0
Interface option 2	AS-Interface v3.0, 62 node
Supply voltage	29.5V - 31.6 VDC
Slave profile	7.A.7.7
Default slave address	0

Sensor board

Max current consumption	45mA
Feedback signal #1	Closed valve
Feedback signal #2	Open valve
Feedback signal #3	Seat-lift 1
Feedback signal #4	Seat-lift 2
Feedback signal #5	Status
Valve tolerance band options	5
Default tolerance band	± 0.02”
Sensor accuracy	±0.004”
Stroke length	0.004” - 3.15”

Solenoid valve

Max current consumption	45mA
Air supply	40 - 130 PSI
Type of solenoids	3/2-ways or 5/2-ways
Numbers of solenoids	0-3
Manual hold override	Yes
Throttle air in/out 1A, 1B	0-100 %
Push-in fittings	ø6 mm or 1/4”

Physical data

Materials

Steel parts	Stainless steel and Brass
Plastic parts	Blue Nylon PA 12
Seals	Nitrile (NBR) rubber

Environment

Working temperature	-4 °F to + 185 °F
Protection class	IP66 and IP67
Protection class equivalent	NEMA 4.4x and 6P

Cable connection

Main cable gland	PG11 (0.16” - 0.39”)
Optional main M12 plug	2 wire (A coded)
Max wire size	AWG 19
Optional cable gland	PG7 (0.16" - 0.27")

Note!

For further information: See also ESE00356

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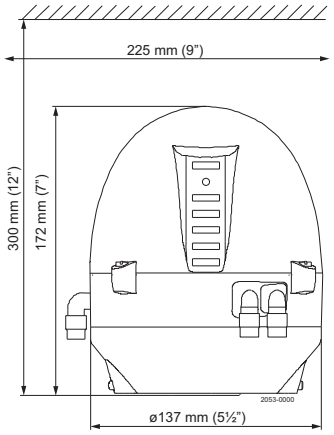
Options

- Communication interface
- Solenoid valve configurator
- Pneumatic tubing interface
- Main cable connection

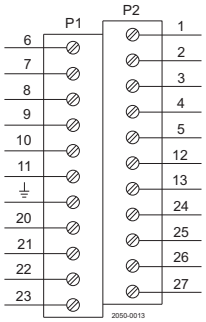
Accessories

- Various cable options
- Threaded plate for indication pin on SRC, SMP-BC valves
- Special indication pin for Unique 7000-LS, Unique 7000 High Pressure valves
- Adaptor for Unique 7000 Small Single Seat valves

Dimensions

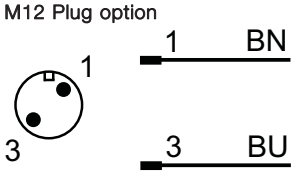


Electrical connection



6	ASI + (BN, Brown)	1	N/C
7	ASI - (BU, blue)	2	N/C
8	N/C	3	N/C
9	N/C	4	N/C
10	N/C	5	N/C
11	N/C	12	PWM Jumper
Earth	Earth	13	PWM Jumper
20	Solenoid common grey	24	Seat-lift 1 “upper”
21	Solenoid 1, grey	25	Seat-lift 2 “lower”
22	Solenoid 2, grey	26	Supply +
23	Solenoid 3, grey	27	Supply -

M12 Plug option



AS-Interface bits assignment

For AS-interface version with 31 and 62 node, the following bit assignment can be used.

DI0	Feedback #1 Closed valve
DI1	Feedback #2 Open valve
DI2	Feedback #3-4 Seatlift 1 or Seatlift 2
DI3	Feedback #5 Status
DO0	Out #1 Not connected
DO1	Out #2 Solenoid valve 1
DO2	Out #3 Solenoid valve 2
DO3	Out #4 Solenoid valve 3

Alfa Laval ThinkTop® DeviceNet™

Leave Surveillance to the Top

Concept

The ThinkTop® is a uniform modular control unit that consists of a proven no-touch, set-and-forget sensor system with light-emitting diodes (LEDs), solenoid valves and valve control sensor board for connection to any PLC (Programming Logic Controller) system with one of the three interfaces; Digital, AS-Interface and DeviceNet. ThinkTop is offering a solution that utilizes all the features available on Alfa Laval butterfly, single-seat and Mixproof valves and is designed for use in the dairy, food and beverage, and biopharm industries; ThinkTop provides real-time information about valve operating status 24/7 while helping to improve production performance and secure traceability .

Working principle

ThinkTop is an automated control unit that can be fitted with up to three solenoid valves and who convert the electrical PLC and sensor signals into mechanical energy to open or close the air-operated valve, using the physical stimulus of an indication pin mounted on the valve stem. ThinkTop fits onto all Alfa Laval hygienic actuators equipped with mushrooms. Installation is straightforward; no special expertise, adapters or tools are required. To initiate manual setup, simply press the push-button startup sequence. Or set up without dismantling the control head using the optional IR keypad for remote control.

TECHNICAL DATA

Communication

Interface	DeviceNet
Supply voltage	11 - 25 VDC
Class 4 messaging	2 byte Polling
Baud rates	125K, 250K, 500K
Default slave address	63

Sensor board

Max current consumption	45mA
Feedback signal #1	Closed valve
Feedback signal #2	Open valve
Feedback signal #3	Seat-lift 1
Feedback signal #4	Seat-lift 2
Feedback signal #5	Status
Valve tolerance band options	5
Default tolerance band	± 0.2”
Sensor accuracy	±0.004”
Stroke length	0.004” - 3.15”

Solenoid valve

Max current consumption	45mA
Air supply	40 - 130 PSI
Type of solenoids	3/2-ways or 5/2-ways
Numbers of solenoids	0-3
Manual hold override	Yes
Throttle, Air in/out 1A, 1B	0-100 %
Push-in fittings	ø6 mm or 1/4”

PHYSICAL DATA

Materials

Steel parts	Stainless steel and Brass
Plastic parts	Blue Nylon PA 12
Seals	Nitrile (NBR) rubber

Environment

Working temperature	-4 °F to +185 °F
Protection class	IP66 and IP67
Protection class equivalent	NEMA 4.4x and 6P

Cable connection

Main cable gland	PG11 (0.16” - 0.39”)
Max wire size	AWG 19
Optional cable gland	PG7 (0.16" - 0.27")

Note!

For further information: See also ESE00355

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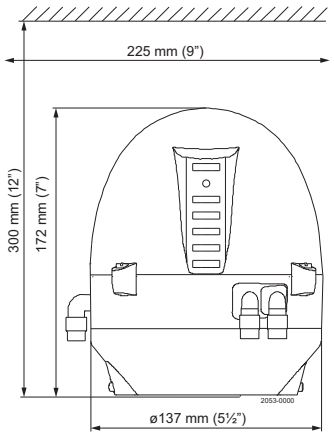
Options
- Solenoid valve configuration
- Pneumatic tubing interface
- When ordering please state if with pigtail

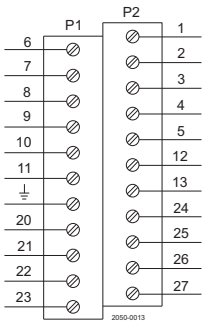
Accessories
- Various cable options
- Threaded plate for indication pin on SRC, SMP-BC valves
- Special indication pin for Unique 7000-LS, Unique 7000 High Pressure valve
- Adaptor for Unique 7000 Small Single Seat valves

Dimensions



DeviceNet features			
Generic		Master/scanner	
		I/O Slave messaging supported by ThinkTop® DeviceNet	
Explicit peer to peer messaging	No	• Bit strobe No	No
I/O peer to peer messaging	No	• Polling	Yes
Configuration consistency value	No	• Cyclic	No
Faulted node recovery	No	• Change of state (COS)	No
Configuration method	EDS fil, Top46-7j	ThinkTop before 2012	
	EDS fil, T-Top RTA	ThinkTop after 2012	

Electrical connection



6	N/C	1	Power bus V- (Black)
7	N/C	2	CAN_L (Blue)
8	N/C	3	Drain (Bare)
9	N/C	4	CAN_H (White)
10	N/C	5	Power bus V+ (Red)
11	N/C	12	N/C
Earth	Earth	13	N/C
20	Solenoid com (Grey)	24	Seat-lift 1 “upper”
21	Solenoid 1 (Grey)	25	Seat-lift 2 “lower”
22	Solenoid 2 (Grey)	26	Supply +
23	Solenoid 3 (Grey)	27	Supply-

DeviceNet bits assignment
For DeviceNet the following bit assignment can be used

Valve value		Valve command	
DI0	Feedback #1 Closed valve	DO0	Out #1 Not Connected
DI1	Feedback #2 Open valve	DO1	Out #2 Solenoid valve 1
DI2	Feedback #3 Seatlift 1	DO2	Out #3 Solenoid valve 2
DI3	Feedback #4 Seatlift 2	DO3	Out #4 Solenoid valve 3
DI4	Feedback #5 Status	DO4	Out #5 Not Connected
DI5	Feedback #6 Not Connected	DO5	Out #6 Not Connected
DI6	Feedback #7 Not Connected	DO6	Out #7 Not Connected
DI7	Feedback #8 Not Connected	DO7	Out #8 Not Connected

Alfa Laval ThinkTop® Basic Digital

Leave Surveillance to the Top

Concept

ThinkTop® Basic is a uniform modular control unit that consists of a proven no-touch, set-and-forget sensor system with light-emitting diodes (LEDs), solenoid valves and valve control sensor board for connection to any PLC (Programming Logic Controller) system with one of the two interfaces; Digital and AS-Interface.
ThinkTop offers a solution for Alfa Laval butterfly, single-seat and Mixproof valves and is designed for use in the dairy, food and beverage, and biopharm industries; ThinkTop provides real-time information about valve operating status 24/7 while helping to improve production performance and secure traceability.

Working principle

ThinkTop is an automated control unit that can be fitted with up to three solenoid valves and who convert the electrical PLC and sensor signals into mechanical energy to open or close the air-operated valve, using the physical stimulus of an indication pin mounted on the valve stem. ThinkTop Basic fits onto all Alfa Laval hygienic actuators equipped with mushrooms. Installation is straightforward; no special expertise, adapters or tools are required. To initiate manual setup, simply press the push-button startup sequence.

TECHNICAL DATA

Communication

Interface	Digital PNP/NPN
Supply voltage	24 ± 10% VDC

Sensor board

Max current consumption	45mA
Feedback signal #1	De-energized valve
Feedback signal #2	Energized valve
Feedback signal #5	Status
Valve tolerance band options	1
Default tolerance band	± 0.2”
Sensor accuracy	± 0.004”
Stroke length	0.004” - 3.15”

Solenoid valve

Max current consumption	45mA
Air supply	40 - 130 PSI
Type of solenoids	3/2-ways or 5/2-ways
Numbers of solenoids	0-3
Manual hold override	Yes
Throttle, Air in/out 1A, 1B	0 - 100%
Push-in fittings	ø6 mm or 1/4”

PHYSICAL DATA

Materials

Steel parts	Stainless steel and Brass
Plastic parts	Black Nylon PA 6
Seals	Nitrile (NBR) rubber

Environment

Working temperature	-4 °F to + 185 °F
Protection class	IP66 and IP67
Protection class equivalent	NEMA 4.4x and 6P

Cable connection

Main cable gland	PG11 (0.16” - 0.39”)
Max wire size	AWG 19
Optional cable gland	PG7 (0.16” - 0.27”)

Note!

For further information: See also ESE00225

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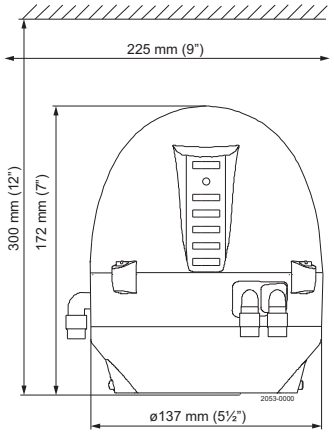
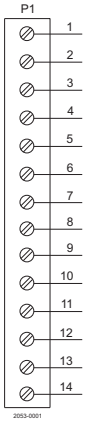
Options
- Communication interface
- Solenoid valve configuration
- Pneumatic tubing interface

Accessories
- Various cable options
- Threaded plate for indication pin on SRC, SMP-BC and i-SSV valves
- Special indication pin for Unique 7000-LS, Unique 7000 High Pressure valves
- Adaptor for Unique SSSV7000 Small Single Seat valves

Dimensions



Electrical connection



1	De-energized (PLC input)
2	Energized (PLC input)
3	Activation of solenoid # 1 (PLC output)
4	Activation of solenoid # 2 (PLC output)
5	Activation of solenoid # 3 (PLC output)
6	Supply votlage sensor (+) 10-30 VDC
7	Supply votlage sensor (+) 0 VDC
8	Common supply solenoids
9	PNP/NPN jumper
10	PNP/NPN jumper
11	Solenoid com.blue
12	Solenoid # 1, internal connection (Grey)
13	Solenoid # 2, internal connection (Grey)
14	Solenoid # 3, internal connection (Grey)

Alfa Laval ThinkTop® Basic AS-Interface

Leave Surveillance to the Top

Concept

ThinkTop® Basic is a uniform modular control unit that consists of a proven no-touch, set-and-forget sensor system with light-emitting diodes (LEDs), solenoid valves and valve control sensor board for connection to any PLC (Programming Logic Controller) system with one of the three interfaces; Digital and AS-Interface.
ThinkTop offers a solution for Alfa Laval butterfly, single-seat and Mixproof valves and is designed for use in the dairy, food and beverage, and biopharm industries; ThinkTop provides real-time information about valve operating status 24/7 while helping to improve production performance and secure traceability.

Working principle

ThinkTop is an automated control unit that can be fitted with up to three solenoid valves and who convert the electrical PLC and sensor signals into mechanical energy to open or close the air-operated valve, using the physical stimulus of an indication pin mounted on the valve stem. ThinkTop Basic fits onto all Alfa Laval hygienic actuators equipped with mushrooms. Installation is straightforward; no special expertise, adapters or tools are required. To initiate manual setup, simply press the push-button startup sequence.

TECHNICAL DATA

Communication

Interface	AS-Interface v3.0, 62 node
Supply voltage	29.5V - 31.6 VDC
Slave profile v3.0	7.A.7.7
Default slave address	0

Sensor board

Max current consumption	45mA
Feedback signal #1	De-energized valve
Feedback signal #2	Energized valve
Feedback signal #5	Status
Valve tolerance band options	1
Default tolerance band	± 0.2”
Sensor accuracy	± 0.004”
Stroke length	0.004” - 3.15”

Solenoid valve

Max current consumption	45mA
Air supply	40 - 130 PSI
Type of solenoids	3/2-ways or 5/2-ways
Numbers of solenoids	0-3
Manual hold override	Yes
Push-in fittings	ø6 mm or 1/4”

PHYSICAL DATA

Materials

Steel parts	Stainless steel and Brass
Plastic parts	Black Nylon PA 6 Reinforced
Seals	Nitrile (NBR) rubber

Environment

Working temperature	-4 °F to + 185 °F
Protection class	IP66 and IP67
Protection class equivalent	NEMA 4.4x and 6P

Cable connection

Main cable gland	PG11 (0.16” - 0.39”)
Max wire size	AWG 19
Optional main M12 plug	2 wire (A coded)
Optional cable gland	PG7 (0.16” - 0.27”)

Note!

For further information: See also ESE00356

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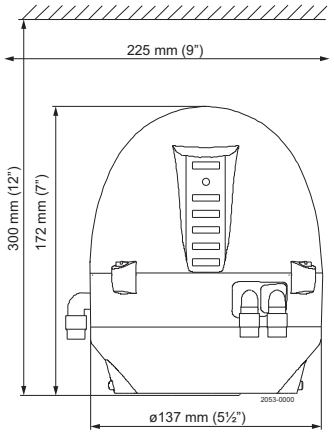
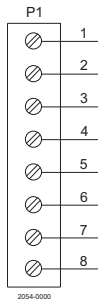
Options
- Communication interface
- Solenoid valve configuration
- Pneumatic tubing interface
- Main cable connection

Accessories
- Various cable options
- Threaded plate for indication pin on SRC, SMP-BC and i-SSV valves
- Special indication pin for Unique 7000-LS, Unique 7000 High Pressure valves
- Adaptor for Unique 7000 Small Single Seat valves

Dimensions

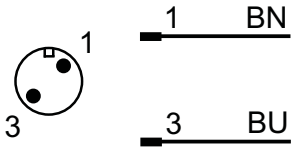


Electrical connection



1 ASI + (BN, brown)
2 ASI - (BU, blue)
3 PWM jumber
4 PWM jumber
5 Solenoid common, internal connection (Grey)
6 Solenoid # 1 internal connection (Grey)
7 Solenoid # 2internal connection (Grey)
8 Solenoid # 3internal connection (Grey)

M12 plug option



AS-Interface bits assignment

For AS-Interface version with 62 node, the following bit assignment can be used

DI0	Feedback #1 De-Energized valve
DI1	Feedback #2 Energized valve
DI2	Feedback #3 Not connected
DI3	Feedback #4 Status
DO0	Out #1 Not Connected
DO1	Out #2 Solenoid valve 1
DO2	Out #3 Solenoid valve 2
DO3	Out #4 Solenoid valve 3

Alfa Laval ThinkTop® Basic Intrinsically Safe

Leave Surveillance to the Top

Concept

The ThinkTop ® Basic is a uniform modular control unit that consists of a proven touch & set sensor system and by electrical barriers, solenoid valves and feedback sensors can be connected to any PLC (Programming Logic Controller) system with the interfaces; Digital.

ThinkTop Basic offers a solution for Alfa Laval butterfly, single-seat and Mixproof valves and is designed for use in the dairy, food and beverage, and biopharm industries; ThinkTop provides real-time information about valve operating status 24/7 while helping to improve production performance and secure traceability.

Working principle

ThinkTop Basic is an automated control unit that can be fitted with up to two solenoid valves and who convert the electrical PLC and sensor signals into mechanical energy to open or close the air-operated valve, using the physical stimulus of an indication pin mounted on the valve stem. ThinkTop Basic fits onto all Alfa Laval hygienic actuators equipped with mushrooms. Installation is straightforward; no adapters or tools are required.

TECHNICAL DATA

Communication

Interface Intrinsic . . . . . Intrinsic

Sensor board

Feedback signal #1 . . . . . De-energized valve
Feedback signal #2 . . . . . Energized valve

Inductive sensor

Switching element function . . . NAMUR NC
Nominal voltage . . . . . 8 V
Indication of the state . . . . . LED, yellow (Internally)
EMC in accordance with . . . . IEC / EN 60947-5-2:2004; NE 21
Standards . . . . . DINEN60947-5-6 (NAMUR)
Certificate of conformity . . . . . PTB 00 ATEX 2032 X

Solenoid valve

Air supply . . . . . 22 - 100 PSI
Type of solenoids 3/2-ways
Numbers of solenoids 0-2
Manual hold override . . . . . Yes
Push-in fittings . . . . . ø6 mm or 1/4”
Certificate of conformity . . . . . KEMA 08 ATEX 0093 X

PHYSICAL DATA

Materials

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

Environment

Working temperature . . . . . 14 °F to 113 °F
Protection class . . . . . IP66 and IP67
Protection class equivalent . . . NEMA 4.4x and 6P
Ex classification code . . . . . II 2G/D EEx ia IIC T6

Cable connection

Main cable gland . . . . . PG11 (0.16” - ø0.39”)
Max wire size . . . . . AWG 19
Optional cable gland . . . . . PG7 (0.16" - 0.27")

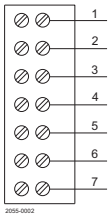
Note!

For further information: See also ESE00810

Options
- Solenoid valve configuration
- Pneumatic tubing interface

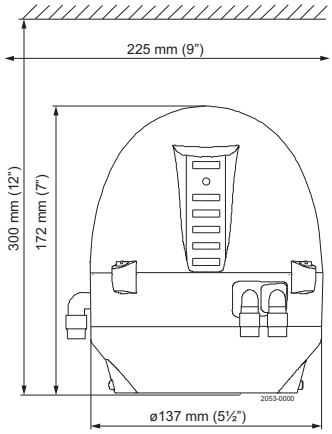
Accessories
- Various cable options
- Threaded plate for indication pin on SRC, SMP-BC valves
- Adaptor for Unique 7000 Small Single Seat valves

Electrical connection



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

Dimensions



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 94/9/EC.

Valve / Actuator type	ATEX evaluation notes
Unique 7000 ATEX	Ex !! 2 G D c T4
Unique Mixpeoof	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)	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
SMP-SC, TO, BC	
LKLA-T	
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
The two inductive NAMUR sensors must be connected to a certified intrinsically safe circuit (e.g. Zener barrier) for apparatus group IIC with the following maximum values:

Solenoid valve
The intrinsic safe solenoid valves must also be connected to a certified intrinsically safe circuit (e.g. Zener barrier) for apparatus group IIC with the following maximum values:

Max allowed Voltage (Ul)	15	V	Max allowed Voltage (Ui)	28	V
Max allowed Current (Ii)	50	mA	Max allowed Current (Ii)	225	mA
Max allowed Power Pi)	1	W	Max allowed Power (Pi)	1	W
Max Inductance (Li)	100	µH	Max Inductance (Li)	0	mH
Max Capacitance (Ci)	100	nF	Max Capacitance (Ci)	0	nF

Safe Area
Electrical barrier
Hazardous Area - Zone 1