



ThinkTop® Basic

ThinkTop® Basic Digital 10 - 30 VDC PNP/NPN

Application

The ThinkTop® Basic is designed to ensure optimum valve control in conjunction with Alfa Laval sanitary valves and it is compatible with all major PLC systems (Programmable Logic Controller) with a digital PNP/NPN interface. It is for use in food, dairy and brewery installations and in biopharmaceutical applications. The ThinkTop® Basic fits all air operated valves from Alfa Laval.

Working Principle

The ThinkTop® Basic is a basic control head including sensor board and solenoid valves to control processing valves. It is used to control and supervise pneumatic valves and is mounted on top of the valve. It receives signals from a PLC to control the solenoid valve and it sends the valve status feedback signals back to the PLC. To adapt the sensor board to the specific valve, the users make a simple set-up by using local keys.

Sensor System

The sensor system is the well known and approved "No Touch" principle from the ThinkTop® platform without any mechanical sensor adjustments.

A magnet (Indication pin) is mounted on the valve stem and the magnetic field (axial) is detected by built in sensor chips inside the sensor board. The measuring angle from each chip is used in calculations to locate the current position of the valve stem. There can be programmed 2 PNP or 2 NPN feedback signals. The selection of PNP or NPN is done by a jumper on the sensor board itself. The LEDs are constantly indicating the status of the unit: Valve position, solenoids energized, set-up and local fault indication.

Feedback Signals

Output signals from the sensor board to the connected digital interface (PLC).

Nominal voltage: Same as connected to the
ThinkTop® Basic.

Load current: 50 mA typical, 100 mA max.

Voltage drop: Typical X V at 50 mA.

Sensor Detection System

Sensor accuracy +/- 0,1 mm.

Tolerance band: +/- 5 mm.

Distance to indication pin: 5 +/- 3 mm.

Stroke length: 0,1-80 mm.

PNP/NPN Polarity

PNP (sourcing) or NPN (sinking) function is selected by a jumper in terminals 9 and 10. Jumper present = PNP (standard). If changing to NPN remove the jumper and make a power recycle. A power recycle is always required when changing this function.



ThinkTop® Basic

Standard Design

The ThinkTop® has a simple, modular and robust design which ensures a quick and easy assembly/disassembly. It consists of a base containing a sensor board with LEDs, an indication pin, terminals for internal electrical connection, solenoid valves and a shell. See also Fig. 1 "Basic Design". It is prepared for upgrading and is exchangeable. The design is hygienic and easy to clean.



Solenoid Valves

0 to 3 solenoid valves in each unit possible.

- Type: 3/2 or 5/2 port (only possible with one 5/2 port).
- Air supply: 300-900 kPa (3-9 bar).
- Filtered air, max. particles of dirt: 0,01 mm.
- Max. flow: 180 l/min.
- Throughput: ø 2,5 mm.
- Max. oil content: 1,0 ppm.
- Max. water content: 0,0075 kg/kg air.
- Manual hold override: Yes.
- External air tube connection: ø 6 mm or ¼". (Select when ordering).
- Silencer/filter**): Connection possible via ø 6 mm or ¼".
- Nominal voltage: 24 VDC.
- Nominal power: 1.0 W.

**): Filter recommended in tropical regions.

Technical Data

Materials

- Plastic parts: Nylon PA 6.
- Steel parts: Stainless steel ASI 304/316.
- Air fitting: Special coated brass (FDA approved).
- Seals: Nitrile (NBR).
- Gore Vent. membrane PBT plastic.

Power Supply - DC

The ThinkTop® Basic is designed to be part of the PLC's Input/Output (I/O) system. It should be supplied from the same protected power supply as the other I/O devices. The I/O power supply should not be used for other kinds of loads. The unit is reverse polarity and short circuit protected. The power supply must meet the requirements of EN 61131-2.

- Supply voltage: 10-30 VDC.
- Supply voltage nominal: 24 VDC (+20% - 15%) - pr. EN 61131-2.
- Max. ripple: 5% of nominal supply voltage.
- Supply voltage absolute max.: 30 VDC.
- Supply voltage absolute min.: 10 VDC.
- Supply current*): Max. 45 mA (for sensor board alone, excluding solenoids).

*): The initial current during power-on is higher. The actual shape of the current pulse depends on the power supply used. Typical values are 150 mA RMS during 13 ms (regulated PS) to 350 mA RMS during 8 ms (unregulated PS).

The fulfilling of the UL requirements in UL 508 requires that the unit is supplied by an isolating source complying with the requirements for class 2 power units (UL 1310) or class 2 and 3 transformers (UL1585).

Typical Power Consumption ThinkTop® Basic

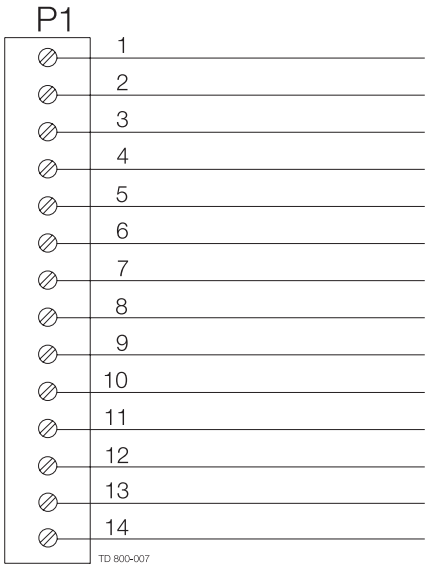
Test conditions = One ThinkTop® Basic connected with 1 feedback active (on) and:

No solenoids on:	Supply voltage 24 VDC	30 mA
1 solenoid active:	Supply voltage 24 VDC	75 mA
2 solenoid active:	Supply voltage 24 VDC	120 mA
3 solenoid active:	Supply voltage 24 VDC	165 mA

Note! "Power-on" current is higher. See power supply - DC.

Micro environment demand specifications:

Temperature		
Working:	-20°C to +85°C	IEC 68-2-1/2
Storage:	-40°C to +85°C	IEC 68-2-1/2
Temperature change:	-25°C to +70°C	IEC 68-2-14
Vibration	10-55 Hz, 0.7 mm 55-500 Hz, 10g 3 x 30 min, 1 octave/min	IEC 68-2-6
Drop test		IEC 68-2-32
Humidity		
Constant humidity:	+40°C, 21 days, 93% R.H.	IEC60068-2-78
Cyclic humidity: 12 cycles (working)	+25°C/+55°C IEC 68-2-30 93% R.H.	
Protection class	IP66 and IP67	EN60529
Input treshold		
Voltage/current:	Type 1 input requirements	EN 61131-2
Solenoid signals		
Isolating voltage	(1000 + 2 x 117) VAC rms/1min	EN 61131-2
EMC Directive	2004/108/EF	EN 61000-6-1, EN 61000-6-2
UL/CSA	10-30 VDC, Class 2 input, 45 mA max. output	UL508 - E203255



Electrical connections, internal

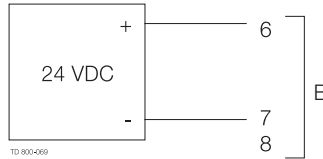
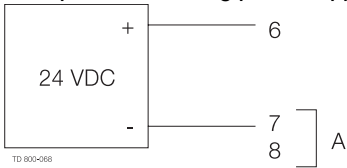
1. De-energized (PLC input)
2. Energized (PLC input)
3. Activation of solenoid # 1 (PLC output)
4. Activation of solenoid # 2 (PLC output)
5. Activation of solenoid # 3 (PLC output)
6. Supply voltage sensor (+) 10-30 VDC
7. Supply voltage sensor (0) 0 V
8. Common supply solenoids
9. PNP/NPN jumper*)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

*) Jumper present = PNP. If changing the function a power recycle is necessary. The selection NPN/PLC is done by the jumper.

Note! Remember to isolate wires that are not in use.

One power supply for sensor system and solenoid valves:

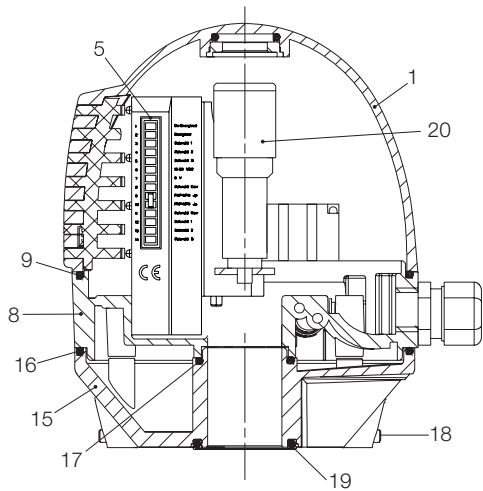
Example of connecting power supplies



A. Jumper if positive activation of solenoids

B. Jumper if negative activation of solenoids





1. Shell
2. Screw
3. Screw
4. Washer
5. Sensor unit
6. Solenoid valve
7. PT screw
8. Base
9. Special X-ring
10. Air fittings
11. Blow-off valve
12. Thread plug, PG7
13. Cable gland, PG11
14. Gore Vent. membrane
15. Adapter
16. Special X-ring
17. O-ring
18. Allen screw
19. Special X-ring
20. Indication pin

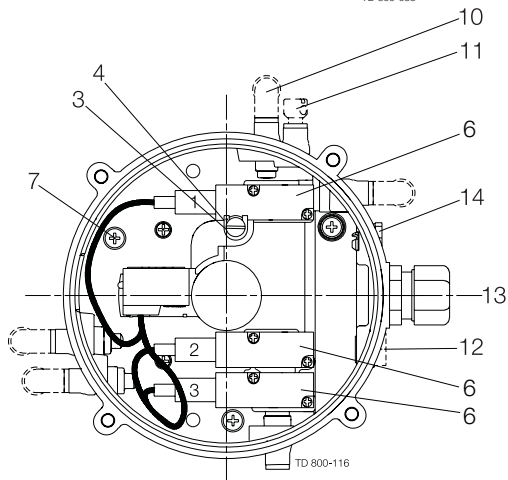
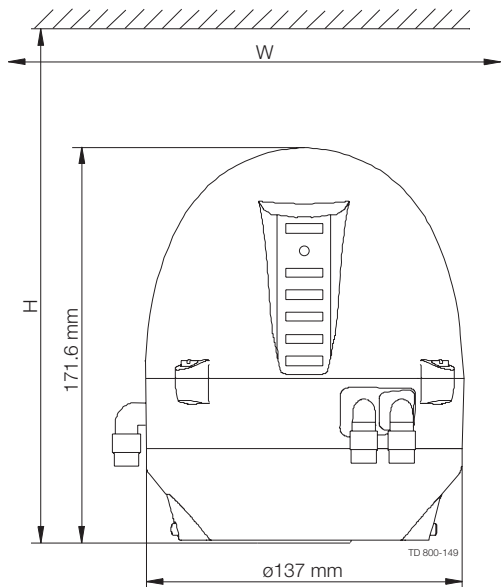


Fig. 1. Basic design, ThinkTop® Basic.





LED's

- A. Energized (yellow).
- B. Set-up/fault (red).
- C. Solenoids (yellow)
- D. De-energized (green)

Fig. 2. Dimensions.

Note! This is the basic design.

The clearance should be approximately:

H225 x W250 mm (Unique SSV NC, SMP-SC/-BC/-TO, Unique Mixproof, MH, SBV)

H225 x W320 (Unique SSV NO)

H225 x W300 (LKLA-T)

Ordering

Please state the following when ordering:

- ThinkTop® Basic
- Digital 10-30 VDC PNP/NPN.
- Number of solenoids (0-3).
- Type of solenoids (3/2 or 5/2 port).
- Air connection ø6mm or 1/4"
- Please state if for series 700 valves.
- For ThinkTop® Basic used on SRC-LS Stop valve size 63.5 - 101.6 mm/DN 65 - 100: Special indication pin must be used; 9612-6370-01.
- For ThinkTop® Basic used on Unique SSV-LS: Special indication pin must be used; 9613-1581-01.

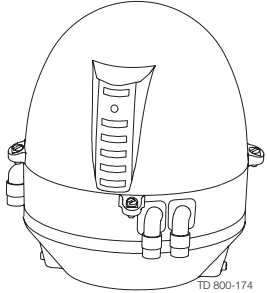
Note!

For further details, see also instruction manual ESE00225.



Top unit
Product code: 5403

Valves: Unique SSV, Unique Mixproof, SMP-BC, SMP-SC,
LKLA-T (LKB), Koltek MH, SBV.

Item No.	RCPL EUR	Supply sensor system	Solenoid No.	Supply solenoids	Ext. air tube connection	Valve type	
							ThinkTop®Basic 10-30 VDC PNP/NPN
9613-4198-01	341	10-30 VDC PNP/NPN	0				
9613-4198-02	470	10-30 VDC PNP/NPN	1	24 VDC	ø6 mm	3/2	
9613-4198-03	606	10-30 VDC PNP/NPN	2	24 VDC	ø6 mm	3/2	
9613-4198-04	743	10-30 VDC PNP/NPN	3	24 VDC	ø6 mm	3/2	
9613-4198-05	491	10-30 VDC PNP/NPN	1	24 VDC	ø6 mm	5/2	
9613-4198-52	470	10-30 VDC PNP/NPN	1	24 VDC	1/4"	3/2	
9613-4198-53	606	10-30 VDC PNP/NPN	2	24 VDC	1/4"	3/2	
9613-4198-54	743	10-30 VDC PNP/NPN	3	24 VDC	1/4"	3/2	
9613-4198-55	491	10-30 VDC PNP/NPN	1	24 VDC	1/4"	5/2	

