



## Temperature and Pressure Controls for Industrial Applications

# Alco Controls

Preferred products are marked by **bold letters**.  
Normally they are available from stock.

## Introduction

ALCO CONTROLS is a worldwide supplier of components for refrigeration, air conditioning and industrial applications. Manufacturing plants are located in USA, Mexico, Germany and the Czech Republik. Sales offices and wholesalers are located throughout the world.

This catalogue contains only temperature and pressure controls for industrial applications. The complete product range includes:

1. Temperature and pressure controls for industrial applications and refrigeration / air conditioning:
  - Single and dual pressostats
  - Differential pressostats
  - Thermostats
  - Pressure transmitters
  - Differential pressure transmitters
  - Pressure actuated motor speed controls
  - Pressure or humidity activated electr. controllers
2. Components for refrigeration/air conditioning:
  - Electrical Control Valves
  - Thermo-Expansion Valves
  - Electronic Expansion Valves
  - Solenoid Valves
  - Mechanical Pressure Regulators
  - Controllers and Monitoring Server for Commercial Refrigeration
  - Filters and Filter-Driers
  - Moisture Liquid Indicators
  - Oil Management Components
  - Oil Separators, Oil Filters, Oil Receivers
  - Suction Accumulators
  - Ball Valves
  - Shut-off Valves and Adapters for Compressors, Receivers and Tubing

Technical data are correct at time of printing. Updates may occur and should you need confirmation of a specific value please contact ALCO CONTROLS stating clearly the information required.

ALCO CONTROLS cannot be held responsible for errors in capacities, dimensions etc., stated herein. Products, specifications and data in this literature are subject to change without notice.

## Other ALCO Documentation:

- **Catalogue Components for the Refrigeration Industry**
- **Binder with datasheets for Air-Conditioning**

If you need copies of these catalogues or more information please contact your local ALCO CONTROLS wholesaler or download from internet:

[www.eCopeland.com/alcoliterature.cfm](http://www.eCopeland.com/alcoliterature.cfm).

## European and North American Standards

All our components are developed and manufactured in accordance with the regulations of the European Community. EC Declarations of Conformity are available from your local distributor for all applicable components. The main specifications for refrigeration and air conditioning applications are:

- Machinery Directive (MD) 89/392/EEC Appendix 2C
- Low Voltage Directive (LVD) 73/23/EEC, 93/68/EEC
- Electro Magnetic Compatibility (EMC) 89/336/EEC, 92/31/EEC
- CE per Pressure Vessel Directive CE 97/23 / EC

In addition our products are approved to various national standards e.g. UL, CUL-approval. Some products comply with the standards of ship classification organizations, others are released for fire-fighting equipment. See the detailed product specifications in this catalogue for more information, or contact your local ALCO CONTROLS wholesaler.

The information given herein is based on data and tests which ALCO CONTROLS believes to be reliable and which are in accordance with today's technical knowledge. It is intended for use by persons having the appropriate technical knowledge and skill, at their own discretion and risk. Since conditions of use are outside ALCO's control we cannot assume liability for results obtained or any damages which may occur due to improper application.

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# Alco Controls

## Pressure Controls

### Basic Terms and Technical Information

#### Pressure dependent switches

ALCO pressostats can be divided into four groups:

1. **Pressure switches** control or actuate a switching action upon pressure rising above or falling below a preset value.
2. **Safety pressure limiters** switch-off a process, when the pressure exceeds a preset limit and automatically switch-on again, when the pressure decreases below a specific differential.
3. **Safety pressure cut-outs** switch-off a process, when the pressure exceeds a preset limit. Reset must be activated manually. The reset system is an integral part of the cut-out.

4. **Differential pressure controls** compare two pressure inputs. A specified difference between the two pressures will operate a switch.

#### Mode of Operation

ALCO pressostats contain a pressure sensor, which actuates a snap-action electrical switch (SPDT). Contact pressure of the switch is maintained until the changeover. This minimises contact bouncing and provides high resistance to vibration.

Various materials are used for the pressure sensor element, giving optimum behaviour at low or high pressure conditions and for different media. See medium selection guide in this catalogue.

### Pressostats Selection Guide

Series	FF 4	PS1	PS3
Pressure range (bar)	.11...250	-.75 ... 31	-0,6...43
Min difference (bar)	see spec	0.25	0.3
Protection per IEC 529	IP 54/65	IP 44	IP 30/65
Contacts	1	1	1
Nominal currents (230V/AC)			
Non inductive load (AC 1)	16 A	24 A	5 A
Inductive load (AC 15)	6 A	10 A	3 A
Motor current	10 A	24 A	8 A
Number of levels	1	1	1
Special versions:			
TÜV approved	X	X	X
UL approved	X	X	X
Marine applications	X	-	-
Marine applications (Germanischer Loyd GL-approved)	X	-	-
VdS approved (for fire fighting applications released from insurance community)	X	-	-
Applications:			
Refrigeration and air conditioning	-	X	X
Industrial applications	X	X	X
Optional gold plated contacts for electronic applications	X	X	X
Adjustable			
maximum pressure	X	X	-
pressure difference	-	X	-
minimum pressure	X	-	-
Minimum order quantity	1	1	100
Boxes	20	20	100

## Media Compatibility Guide

Pressure sensing elements of ALCO pressostats might be built as diaphragms, bellows or plungers. The materials used are beryllium bronze, stainless steel, Perbunan, Viton or plastic.

Based on many years of experience the suitability of these materials with various media at room temperature

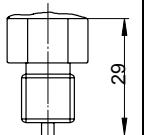
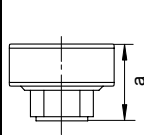
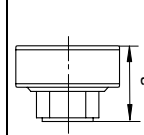
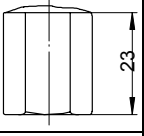
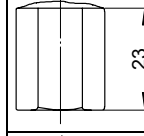
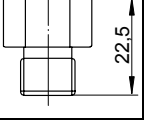
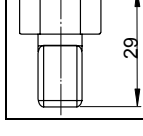
is shown in the table below. As chemical behaviour of media changes with temperature and when mixed with other chemicals we recommend to test for compatibility before use.

X = Recommended; d = Dry

Medium name	Chemical Formula	Bronze	Stainless steel	Perbunan	Viton	Plastic
Acetone	CH <sub>3</sub> COCH <sub>3</sub>	X	X			
Acetylene	HC = CH		X	X	X	X
Air	-	X	X	X	X	X
Benzene	Sulphur-free	X	X		X	
Butane	C <sub>4</sub> H <sub>10</sub>	X	X	X	X	X
Butyl acetate	CH <sub>3</sub> COOC <sub>4</sub> H <sub>9</sub>	X	X			
Butyl alcohol	CH <sub>3</sub> -CH <sub>2</sub> -CH <sub>2</sub> -CH <sub>2</sub> -OH	X	X			
Carbon dioxide	CO <sub>2</sub>	X	X	X	X	X
Carbonic acid	H <sub>2</sub> CO <sub>3</sub>	X	X	X	X	X
Chlorine	Cl <sub>2</sub>				X	
Crude oil	-	X	X	X	X	X
Diesel oil	See fuels	X	X	X	X	X
Ethyl acetate	CH <sub>3</sub> OOOC <sub>2</sub> H <sub>5</sub>	X	X			
Fuels	Diesel oil, Petrol	X	X	X	X	X
	Leaded petrol	X	X	X	X	X
	Benzene	X	X		X	
Glycerine	CH <sub>2</sub> OH-CHOH-CH <sub>2</sub> OH	X	X	X	X	X
Glycol	CH <sub>2</sub> OH- CH <sub>2</sub> OH	X	X	X	X	X
Heating fuel oil	See also oils	X	X	X	X	X
Hydrogen	H <sub>2</sub>	X	X	X		X
Inert gases	-	X	X			
Methanol	CH <sub>3</sub> OH	X	X			
Methyl chloride	CH <sub>3</sub> Cl	X	X			
Natural Gas	-	X	X	X	X	X
Nitrogen	N <sub>2</sub>	X	X	X	X	X
Oils	Mineral	X	X	X	X	X
Oils	Vegetable	X	X	X	X	
Oxygen	O <sub>2</sub>	X	X		X	
Ozone	-		X		X	
Perchlorethylene	CCl <sub>2</sub> =CCL <sub>2</sub>	d	X		X	
Petrol	All types	X	X	X	X	X
Phenolic acid	C <sub>6</sub> H <sub>5</sub> (OH)		X			
Propane	C <sub>3</sub> H <sub>8</sub>	X	X	X	X	X
Sulphur dioxide	SO <sub>2</sub>		X		d	
Toluene (Methyl benzene.)	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	X	X		X	
Trichlorethylene	CHCl=CCl <sub>2</sub>	d	X		X	
Water	Steam/vapor	X	X	X	X	
Water	Distilled, de-aerated	X	X	X	X	X
Water	Sea water		X	X		X
Xylene	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	X	X		X	

## Pressure Connectors

Contact your local ALCO CONTROLS wholesaler for availability of these pressure connectors with the pressostat of your choice.

	<b>Code: C</b> G 1/4 A male steel DIN ISO 228/1		<b>Code: I</b> G 1/2 female silumin DIN ISO 228/1		<b>Code: H</b> G 3/8 female steel or polyamid DIN ISO 228/1
	<b>Code: G</b> G 1/4 female brass DIN ISO 228/1				<b>Code: F</b> 1/4-18 NPTF female ANSI B 1.20.3 - 1976
	<b>Code: R</b> G 1/4 A male brass DIN ISO 228/1				<b>Code: N</b> 1/4-18 NPTF male ANSI B 1.20.3 - 1976

### Features

- Large space for cable mounting
- Easy to adjust
- Separate screw for upper and lower switching-point setting
- Accurate scale
- Transparent, UV-resistant cover
- Protection class: IP54 (IP65 with cable gland)
- Worldwide approvals
- High repeatability of set switch-points
- Cover can be lead-sealed

### Applications

- Air compressors
- Water pumps
- Booster pumps
- Fire-fighting equipment
- Oil supply equipment
- High-pressure cleaning apparatus

ALCO FF 4 series of pressostats are suitable for a wide range of industrial and commercial applications. Their functions, as pressure switches, limiters or cut-outs can be utilized for:

- Monitoring and controlling the pressure of liquid or gaseous media in pipelines, tanks, vats, pressure vessels and apparatus.
- Duties in process control, cooling, pneumatics and hydraulics.
- Pressure monitoring of cooling circuits and lubrication systems on various types of machinery.
- Automatic switching of pump and compressor motors for supplying water to dwellings, booster pumps, fire-fighting equipment and on compressed air systems.

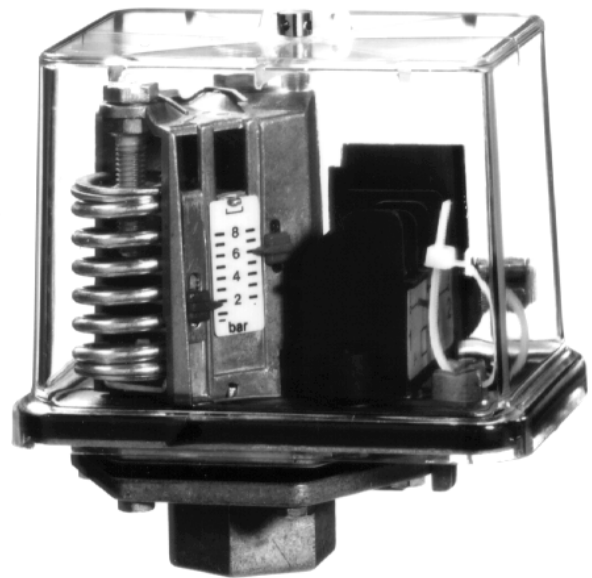
### Mode of operation

The pressure of the monitored medium operates against a flat diaphragm, bellows or a plunger (depending on pressure range). A system of levers and springs works on a snap-action cascade switch of high resistance to vibration, ensuring flutter-free switching.

Low pressure on the diaphragm closes contact 1-2. This can be used as a "RUN" signal for a pump or compressor motor.

If pressure exceeds the upper switching-point, contact 1-2 opens and contact 1-4 closes. The applied motor will be switched off. Contact 1-4 is often used to indicate the "off" condition.

Contact 1-2 will close again, when the pressure on the diaphragm has decreased below the set lower switch-point.



Upper and lower switch points can be adjusted independently of each other using a screwdriver. The two switch points are indicated on the scale inside the unit.

### Construction

Pressure connection, pressure sensing element, switch mechanism and electrical terminals are fitted on a die-cast aluminium-alloy base. The scale and switch are protected against environmental effects by an impact-resistant, transparent polycarbonate cover, which is creepage resistant (CTI 200/100M) and can be lead-sealed.

Pressure connector "Y", made out of plastic for demineralised water applications.

### Options upon request

- Gold plated contacts
- Cable gland Pg 13,5 for higher protection IP 65
- Indicator lamp for switching condition
- Viton diaphragm for aggressive media
- Manual reset
- GL -approved versions
- UL-/CSA-approved versions
- Throttle section H138-043 for FF 4-2 to FF 4-32
- Other pressure connectors. Contact your local ALCO CONTROLS wholesaler for availability
- Special screw for lead seal cover

## Pressure Controls 0.11 to 250 bar

## Series FF 4

## Included in standard units:

- Rubber grommet with hole for cable entry
- Nylon strap to secure cable
- Installation and operating instructions

Type	Order Nr.	Upper switch point adjustable from ... to bar	Lower switch point adjustable from ... to bar	Smallest differential at lower ... higher end of range	max. operating pressure bar	max. test pressure bar	Standard settings bar
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## Pressure controls with perbunan diaphragm

VDE 0660, EN 60947-5-1

for mineral oils, water and air.

Pressure connector: H (G  $\frac{3}{8}$  female, DIN ISO 228/l).

FF 4-2 DAH	0 182 129	0.11 ... 2	0.04 ... 1.89	0.07 0.11	20	40	0.5 / 1.5
FF 4-4 DAH	0 182 131	0.22 ... 4	0.07 ... 3.75	0.15 0.25	24	40	1 / 3
FF 4-8 DAH	0 182 143	0.5 ... 8	0.2 ... 7.5	0.3 0.5	30	40	2 / 6
FF 4-16 DAH	0 182 156	1 ... 16	0.4 ... 15	0.6 1	36	48	4 / 12
FF 4-32 DAH	0 182 168	2 ... 32	0.8 ... 30	1.2 2	52	64	10 / 20

## Pressure controls with perbunan diaphragm

VDE 0660, EN 60947-5-1

and plastic pressure connector for demineralised water.

Pressure connector: Y (G  $\frac{3}{8}$  female, DIN ISO 228/l).

FF 4-2 DAY	0 714 440	0.11 ... 2	0.04 ... 1.89	0.07 0.11	6	12	0.5 / 1.5
FF 4-8 DAY	0 714 442	0.5 ... 8	0.2 ... 7.5	0.3 0.5	12	16	2 / 6
FF 4-16 DAY	0 714 443	1 ... 16	0.4 ... 15	0.6 1	20	24	4 / 12

## High pressure controls with plastic plunger

VDE 0660, EN 60947-5-1

These pressure switches operate with a plastic plunger, which is resistant to detergents, de-greasing and polish-removal agents. The **FF 4-60 PAH ... FF 4-250 PAH** pressostats are thus **particularily suitable for use on**

**high-pressure cleaning apparatus**. Throttle screw H 115-115.001 is fitted as standard inside the pressure connection on these units. This must be removed for use with viscous media.

Pressure connector: H (G  $\frac{3}{8}$  female, DIN ISO 228/l)

FF 4-60 PAH	0 183 412	8 ... 60	4 ... 52	4 8	100	120	20 / 40
FF 4-120 PAH	0 183 424	16 ... 120	8 ... 104	8 16	200	240	20 / 80
FF 4-250 PAH	0 083 594	30 ... 250	14 ... 226	12 24	400	500	100 / 200

## Alco Controls

### Pressure Controls 1½ to 3625 psig with UL-approval

### Series FF 4

#### Pressure controls with perbunan diaphragm

VDE 0170/0171/0660, EN 60947-5-1

Flat diaphragm, resistant to mineral oils. UL-file: E 85 974

Pressure connector: F (¼"-18 NPTF per ANSI B 1.20.3 - 1976)

Type	Order Nr.	Upper switch point adjustable from ... to P.S.I.G	Lower switch point adjustable from ... to P.S.I.G	Smallest differential at lower ... higher end of range		max. operating pressure P.S.I.G	max. test pressure P.S.I.G	Standard settings P.S.I.G
FF 444-V2 DAF	0 097 309	3 ... 58	1 ... 54	2	4	348	580	14 / 44
FF 444-V3 DAF	0 097 310	7 ... 116	3 ... 109	4	7	435	580	29 / 87
FF 444-V4 DAF	0 097 311	15 ... 232	6 ... 217	9	14	522	696	58 / 174
FF 444-V5 DAF	0 097 312	29 ... 464	12 ... 435	17	29	754	928	145 / 290

#### Pressure controls with perbunan diaphragm and manual reset.

Manual reset is possible, when pressure decreased below lower switch point. Pressure connector: F (¼"-18 NPTF per ANSI B 1.20.3 - 1976)

FF 444-V3 DRF	0 097 058	7 ... 116		4	7	435	580	87
FF 444-V4 DRF	3 332 400	15 ... 232		9	14	522	696	174

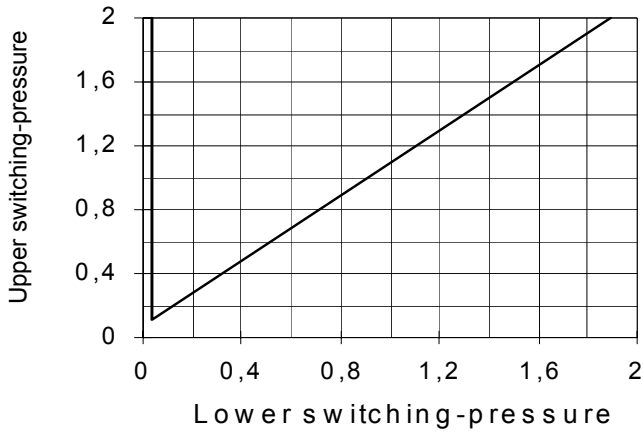


Pressure Controls 0.11 to 250 bar

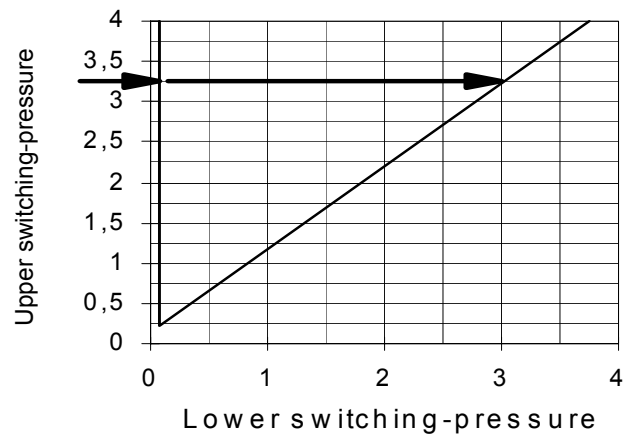
Series FF 4

Switch Point Diagrams (all units in bar)

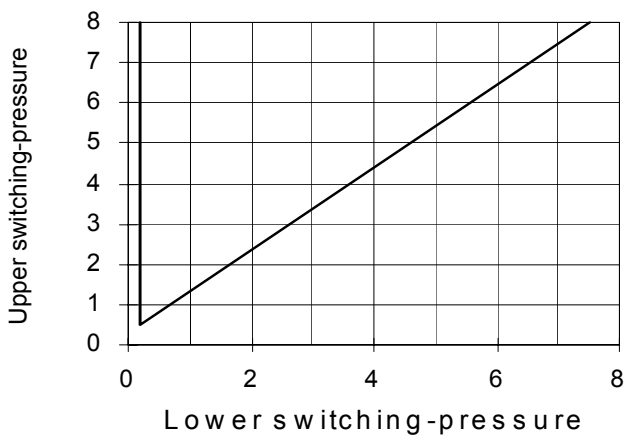
FF 4-2



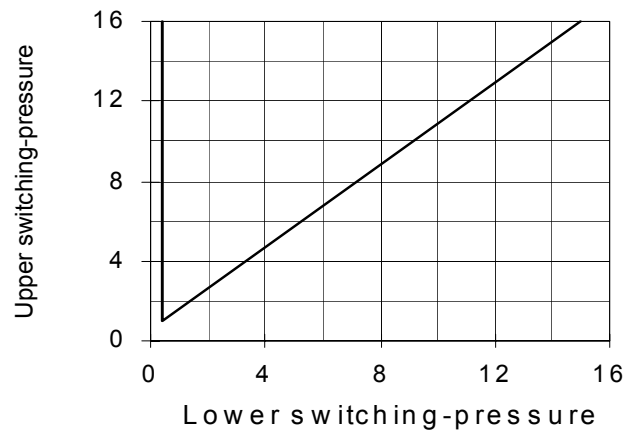
FF 4-4



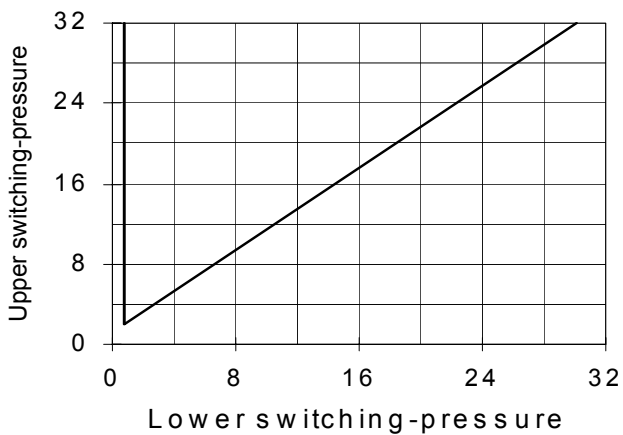
FF 4-8



FF 4-16



FF 4-32



Above charts show the smallest adjustable differential.

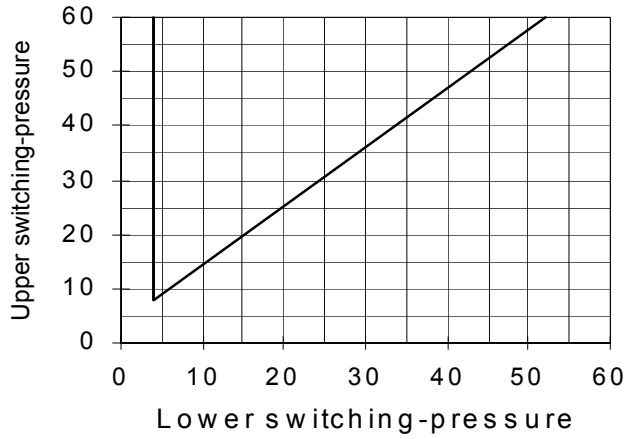
**Example per figure FF 4-4:** If upper setting is at 3.25 bar, lower setting can be adjusted between 0.07 and 3.0 bar (see arrows in the drawing).

Pressure Controls 0.11 to 250 bar

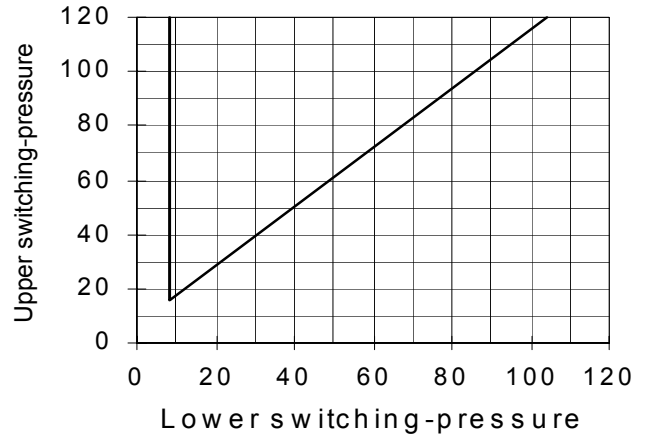
Series FF 4

Switch Point Diagrams (all units in bar)

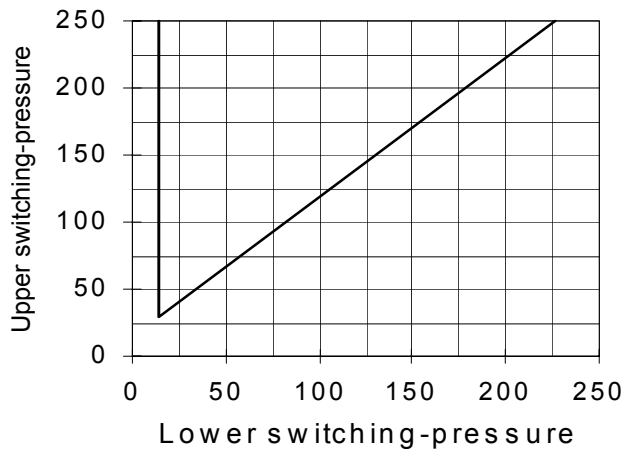
FF 4-60



FF 4-120



FF 4-250



Above charts show the smallest adjustable differential.

**Example per figure FF 4-4** (previous page): If upper setting is at 3.25 bar, lower setting can be adjusted between 0.07 and 3.0 bar (see arrows in the drawing).

Pressure Controls 0.11 to 250 bar

Series FF 4

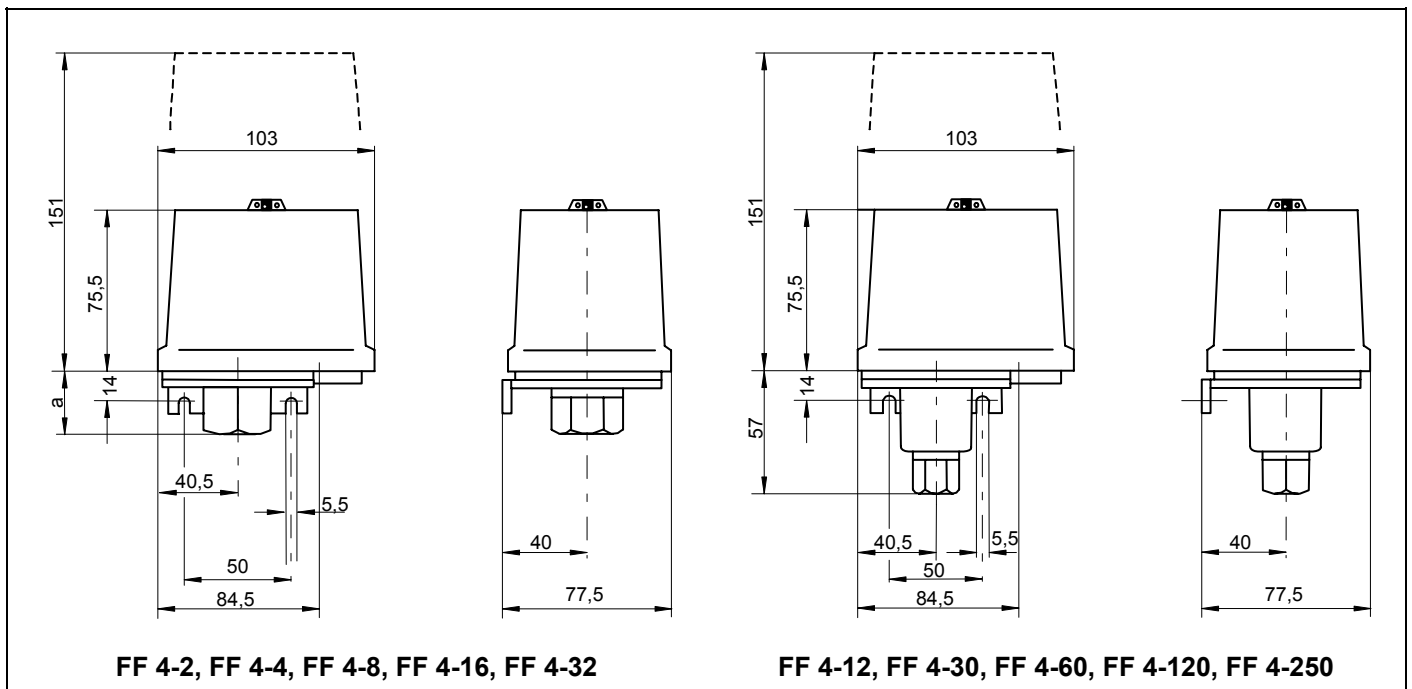
Technical data

Rated operational current at 230 V	
Non-Inductive Amp. (AC1)	16 A
Inductive Amp. (AC15)	6 A
Inductive Amp. (DC11)	0.1 A
Motor rating, Full load Amp. (FLA)	10 A
Motor rating, Locked rotor Amp. (LRA)	60 A

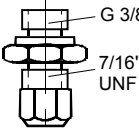
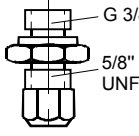
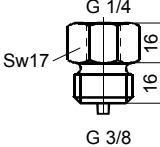
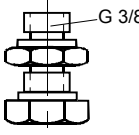
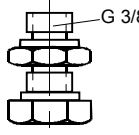
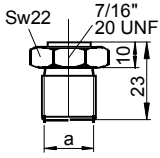
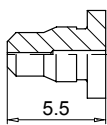
Protection to DIN 40 050/IEC 529	
with rubber grommet	IP 54
with cable gland Pg 13.5 or appliance socket	IP 65

Ambient temperature range	-20...+70°C
Resistance to vibration, 10 to 1000 Hz	4g

Dimensions:



Accessories

 <p><b>Brass gland for 6 x 1 copper tube</b> Type: R-7/16" UNF FN 262 Ms Order Nr. 0526842 Approx. weight: 0.18 kg</p>	 <p><b>Brass gland for 10 x 1 copper tube</b> Type: R-5/8" UNF FN 262 Ms Order Nr. 0526830 Approx. weight: 0.18 kg</p>	 <p><b>Nipple, Steel, G<sup>3</sup>/<sub>8</sub> - G<sup>1</sup>/<sub>4</sub> female</b> Type: H 124-141 Order Nr. 0136857 Approx. weight: 0.085 kg</p>
 <p><b>Steel Ermeto connector for Ø 6 mm steel pipe</b> Type: R-AD 6-FN 43 Order Nr. 0405466 Approx. weight: 0.1 kg</p>	 <p><b>Steel Ermeto connector for Ø 10 mm steel pipe</b> Type: R-AD 10-FN 43 Order Nr. 0405478 Approx. weight: 0.1 kg</p>	 <p><b>Nipple, Brass, G<sup>3</sup>/<sub>8</sub> - 7/16" -20 UNF, female</b> Type: H124-202.1 Order Nr. 0137051 Approx. weight: 0.05 kg</p>
 <p><b>Snapper for FF 4-2 ...-32</b> Type: H 138-043 plastic Order Nr. : 0021485 Approx. weight: 0.003 kg</p>		

## Pressure Controls -1 to 31 bar

## Series PS1

### Features

- Contacts with extremely low bounce provide high switching capacity and long operating life
- Continuous current 24 A, making current 144 A, suitable for direct start-up of single-phase motors up to 3 kW / 4 HP at 230 V AC
- Finger-protected terminals (VDE 0106, VBG 4)
- Generously dimensioned terminal area
- Scales marked both in bar and PSIG
- Overlapping setting ranges for easy selection
- Exact adjustment and high repeat accuracy
- Optional with "AUT - STOP" switch available
- Various pressure connections
- Self-retaining  $\pm$  screws to suit various tools
- Dual pressure controls with independent switch (SPDT) on each side available. Ask for datasheet of PS2.



### Application

Liquid or gaseous media in

- Process engineering plants
- Hydraulics
- Pneumatics
- Refrigeration and air conditioning

The PS1 series is a consistent product family, combining all features for industrial and commercial applications. The devices conform to many international standards, regulations and approvals. ALCO pressure controls are successful components for several decades.

### Mode of operation

Turning the setting knob  $P_{max}$  changes both the upper and the lower switch points. By turning the differential spindle  $\Delta_p$  only the lower switch point is adjusted, while the upper setting remains unchanged.

### Technical Data

Rated operational current at 230 V	
Non-Inductive Amp. (AC 1)	24 A
Inductive Amp. (AC 15)	10 A
Inductive Amp. (DC 13)	0,1 A
L/R = 50 ms	6 A, 12 V/DC
Motor rating, Full Load Amp.	24 A
Motor rating, Locked Rotor Amp.	144 A

### Standard models include:

- Adjusting key H 145-009.001
- Locking plate H 145-029 (to lock settings)
- Grommet PG 16 (for cable entry)
- Installation and operating instructions
- Individual packing

### Non-standard execution / Options

- Different pressure connections (see table)
- Pg 16 cable gland and brass nut
- Marine-type M 24 x 1.5 / PG 13.5 brass cable gland
- Special pressure settings
- With "AUTomatic - STOP" switch (Note: This option degrades protection to IP 30)
- Manual reset button

Protection to DIN 40050/IEC 529	IP 44
Ambient Temperature Range	-50° ... +70°C
Resistance to vibration (10 to 1000 Hz)	4 g

Contact on FF 115	SPDT
Cable entry	Grommet PG 16
Approximate weight	0.35 kg



## Pressure Switch

## Series PS3

### Features

- Compact size
- Fixed pressure setting
- TÜV approved versions with double diaphragm
- Precise setting and repeatability
- Panel mounting, with console on body
- Easy installation
- Protection: IP65 (with DIN plug)
- Worldwide approvals



### Description

PS3 are equipped with a SPDT snap action contact, switching from 1-2 to 1-4 on rising pressure and from 1-4 to 1-2 on falling pressure (see diagram). The PS3 is factory preset according to customers specification and it is not adjustable. Several models are available:

- Low pressure switch, with automatic or manual reset
- High pressure switch, with automatic or manual reset
- DIN/TÜV approved safety pressure limiter with automatic reset
- DIN/TÜV approved safety pressure cut-out, with manual reset

The TÜV approved high pressure versions have a double diaphragm. In case of a break of the inner diaphragm, pressure operates on the larger area of the outer diaphragm, causing to switch a compressor always off (safe position).

### Technical Data

#### Pressure sensing element (diaphragm)

Type of diaphragm	Max. medium temperature	Construction	Material	DIN/TÜV approval	Function code *	Pressure range
Standard diaphragm	+ 70° C	Single diaphragm	Bronze	no	A, D, R	1 ... 5
		Double diaphragm	Bronze	Yes	W, B, S	
High temperature diaphragm	+ 150° C	Double diaphragm	Nickel-Beryllium	Yes	X, C, T	

\*) See page 18 for more details.

**The PS3 is mainly designed for OEM use and manufactured in minimum batches of 100 pieces.**

### Options

- With high temperature diaphragm and snubber for direct mounting on the head of compressor
- OEM types according to customers specification (bulk pack), minimum batch size 100 pieces
- Factory wiring
- Available with micro-switch for narrow pressure differentials
- Gold plated contacts to drive electronic circuits
- Other pressure connectors

## Pressure Switch

## Series PS3

## Pressure ranges

Range code	Type of contact	Range (bar)	Proof pressure (bar)	Differential
1	Standard (SPDT)	-0.6 to 6	30	See charts on page 19
3		0.1 to 16		
4		6 to 32	36	
5		6 to 32		
1	Micro switch (SPDT)	-0.6 to 6	30	Approx. 0.2 to 0.3
3		0.1 to 16		Approx. 0.3 to 0.45
5		6 to 32	36	Approx. 0.4 to 0.6

## Tolerances (bar)

Range code	1	3	4	4 / 5 (DIN/TÜV approved)	5
Setting	±0.1	±0.25	±0.5	according to DIN 32733 (EN 12263)	±0.5
Repeatability	±0.06	±0.15	±0.3		±0.3

## Electrical rating

Type of contact	Standard (SPDT)	Micro switch (SPDT)
Inductive load (AC15)	3 A / 230 VAC	1.5 A / 230 VAC
Motor rating amps (FLA)	6 A / 230 VAC	2.5 A / 230 VAC
Locked rotor amps (LRA)	36 A / 230 VAC	15 A / 230 VAC
Rated current AC1	8 A / 230 VAC	5 A / 230 VAC

Resistance to vibration (at 10.....1000 Hz)	4 g
Medium compatibility depending on material of diaphragm	see table on page 5
Storage and transportation temperature	- 30 °C to 70 °C
Ambient temperature Note: Medium temperature of more than 70°C will derate ambient temperature	- 30 °C to 70 °C
Weight (approx.)	0.09 kg
Approvals	DIN/TÜV, UL, CUL

Protection class (IEC 529/DIN 40050)	
no cover	IP 00
with terminal cover	IP 30
with appliance socket	IP 65

Pressure Switch

Series PS3

Selection

The capabilities of factory switch point settings are shown on charts below. Use the recommended lower switch point in working envelope for optimum results.

Example:

Step 1: Select your desired upper switch point  $P_1$ . Draw a horizontal line to cross the upper switch point line.

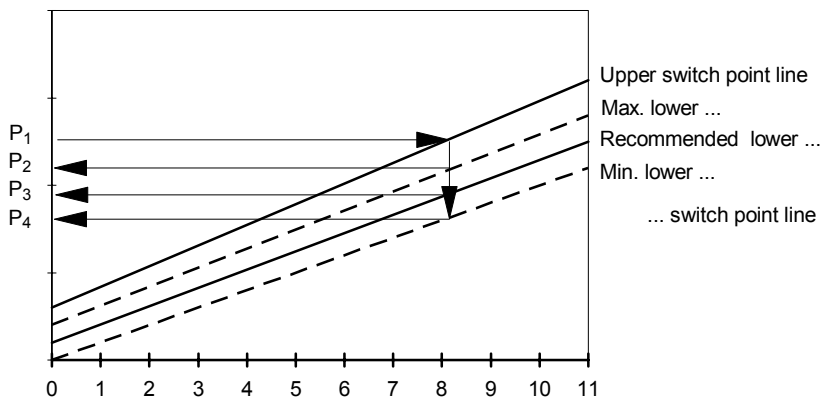
Step 2: Draw a vertical line from above mentioned intersection point.

Step 3: Select your desired switch point between  $P_2$  and  $P_4$ .

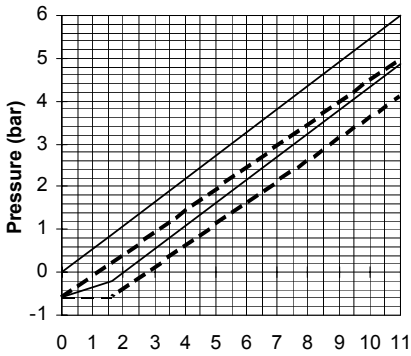
Notes:

1. Select  $P_1/P_3$  as switch points for optimum results
2. Specify always upper and lower switch points for pressure switch with automatic reset function.
3. Specify only cut-out switch point for pressure switch with manual reset function.

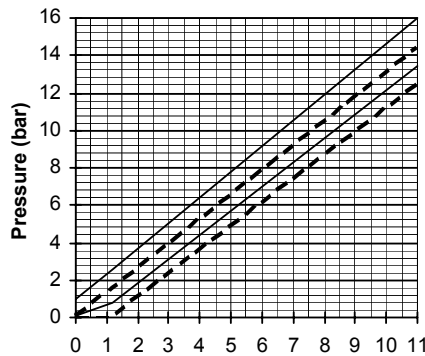
Example



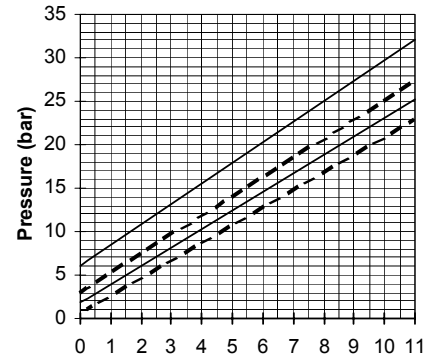
Range 1



Range 3



Range 5





**FOR SELECTION AND SAMPLE REQUEST PLEASE FILL OUT**

Note: Not each combination possible. Contact your local wholesaler for preferred types.

**Type code**

**PS3** -    - **xx/xx**

**Function**

- A** = Automatic low / high pressure
- D** = Low pressure with manual reset min
- R** = High pressure with manual reset max
- W** = Automatic safety high pressure cut-out, DIN/TÜV approved, Range 1-5 (high temperature, Range 6, O, F, X only)
- B** = Safety high pressure cut-out, external manual reset, DIN/TÜV Range 1-5 (high temperature, Range 6, O, F, X only)
- S** = Safety high pressure cut-out, internal manual reset, DIN/TÜV Range 1-5 (high temperature, Range 6, O, F, X only)

**Pressure connectors**

- R** = G ¼ male brass
- G** = G ¼ female brass
- Note: Range 6, O, F, X with pressure connector S = 7/16"-20UNF only

**Pressure Range / Contacts**

**Standard Contacts**

- 1:** lp max 6 bar
- 3:** lp max 16 bar
- 4:** hp max 30 bar
- 5:** hp max 30 bar
- 6:** hp max 43 bar

**Microswitch**

- J:** lp max 6 bar
- L:** lp max 16 bar
- M:** hp max 30 bar
- N:** hp max 30 bar
- O:** hp max 43 bar

**Gold Plated Contacts**

- A:** lp max 6 bar
- C:** lp max 16 bar
- D:** hp max 30 bar
- E:** hp max 30 bar
- F:** hp max 43 bar

**Microswitch (Gold Plated Contacts)**

- S:** lp max 6 bar
- U:** lp max 16 bar
- V:** hp max 30 bar
- W:** hp max 30 bar
- X:** hp max 43 bar

Note: Range 6, O, F, X with pressure connector S = 7/16"-20UNF only

**Other options (Please contact factory for feasibility)**

- Factory pre-wired
- Other setting tolerances
- Special packing
- DIN/TÜV approved, **low pressure** according to **DIN 8901(32733)**
- Additional label

**Cables with Plug for PS3**



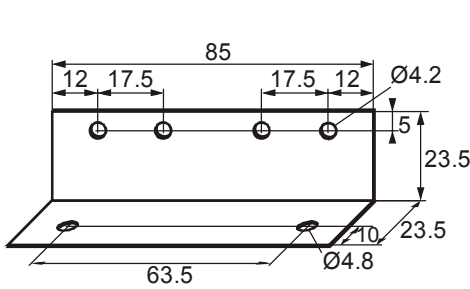
Type	PCN	No of leads	Diameter of leads	Temperature Range °C	Cable length mtr.
PS3-N15	804 580	3	0.75 mm <sup>2</sup>	-25/+80	1.5
PS3-N30	804 581				3.0
PS3-N60	804 582				6.0
PS3-L15	804 583	3	0.75 mm <sup>2</sup>	-50/+80	1.5
PS3-L30	804 584				3.0
PS3-L60	804 585				6.0

- Terminal cover H140-026.001 (cable entry from top) (PCN: 0 093 435)
- Terminal cover H140-026.002 (cable entry from side) (PCN: 0 093 447)

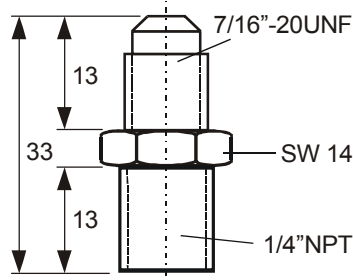
Pressure Switch

Series PS3

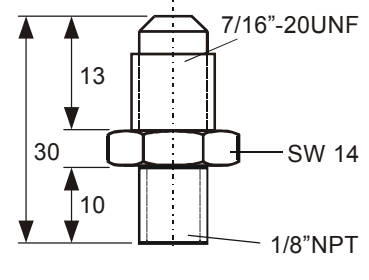
Other Accessories



Angle bracket (H140-046.001)  
for two PS3  
PCN: 803 772



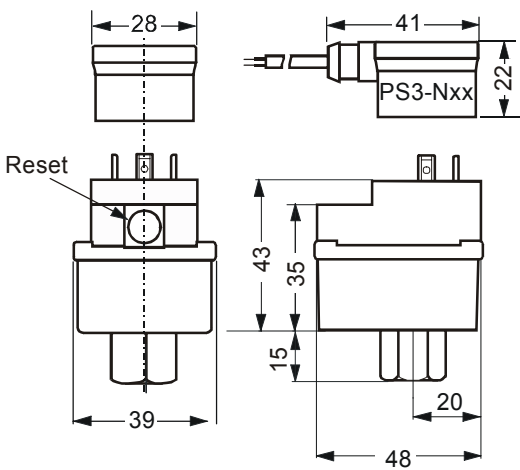
Adapter 1/4"NPT-male-7/16"-20UNF-  
male (for compressor direct  
mounting)  
PCN: 800 315



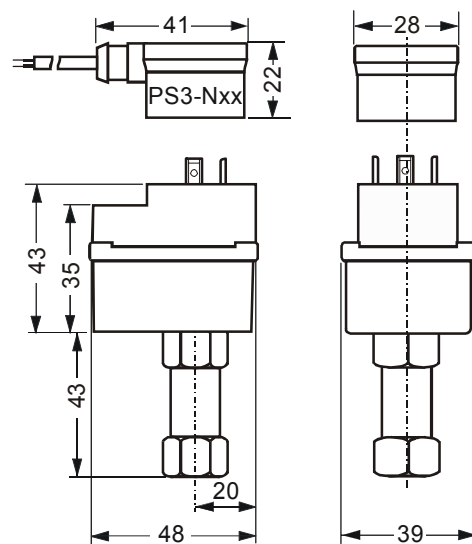
Adapter 1/8"NPT-male-7/16"-20UNF-  
male (for compressor direct  
mounting)  
PCN: 800 316

Dimensions

Range 1...5, A...E, J...N, S...W (in mm)



Range 6, F, O, X (in mm)



# Pressure Transmitter

## Series PT5

### Features

- Pressure sensitive piezo-based cell with strong primary output signal for precise operation
- Sealed gauge absolute pressure reference principle provides the regulation accuracy independent from atmospheric pressure variation
- Output signal 4 to 20 mA
- Easy install M12 electrical connection with pre-assembled cable assemblies available in various lengths
- Vibration, shock and pulsation resistant
- Protection class IP 65
- Pressure connector 7/16-20 UNF with Schrader valve opener
- Standard pressure ranges compatible with former PT4 ALCO pressure transmitters
- CE-mark per EMC-Directive



**PT5-xxM  
Pressure  
Transmitter**

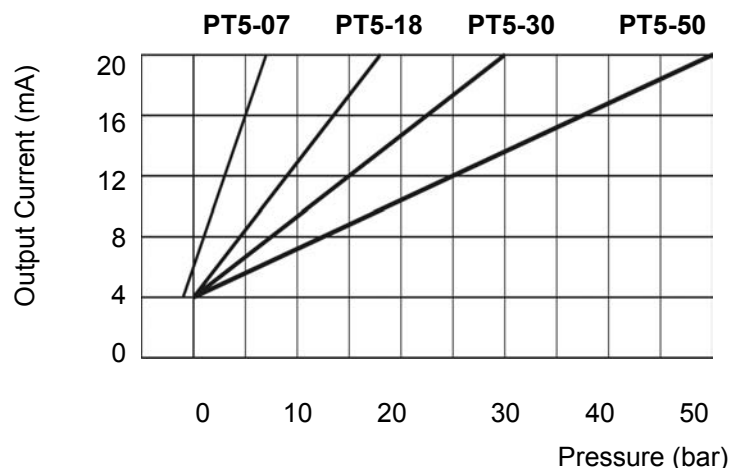
**PT4-Mxx  
Cable  
Assembly**

### Introduction:

The ALCO pressure transmitter PT5 is designed for pressure sensing and the generation of a linear electrical output signal. The standard 4 to 20 mA current output enables easy interfacing with the most common signal processing equipment. Various pressure ranges are available to match the operating pressures commonly encountered in refrigeration systems. The PT5 meets the requirements of the European EMC directive and is labelled with the CE-mark.

### Description:

Heart of the transmitter is a pressure sensitive piezo resistive cell. This is surrounded by an *oil cushion* enclosed by a Nickel diaphragm. The integrated electronic module conditions the output of the pressure cell to produce a temperature compensated signal of 4...20 mA.



The PT5 pressure transmitter can be applied in digital and analog electronic systems.

### Selection

Type	Part Code Number		Pressure range for signal output bar *	PS: Max. working pressure (bar)*	PT: Test pressure (bar)*	Burst pressure (bar) *	Pressure Connection
	Individually packaged	Multipack 20pcs					
PT5-07M	802 350	802 350M	-0.8 ... 7	27	30	150	7/16" – 20 UNF (with Schrader valve opener)
PT5-18M	802 351	802 351M	0 ... 18	45	50	250	
PT5-30M	802 352	802 352M	0 ... 30	45	50	250	
PT5-50M	802 353	802 353M	0 ... 50	72	80	400	

\*) Gauge/relative pressure

### Plug/Cable Assemblies

Type	Part Code Number		Length	Weight (grams/pcs)	Temperature range
	Individually packaged	Multipack 20pcs			
PT4-M15	804 803	804803M	1.5 m	50	-50 to +80°C static application -25 to +80°C mobile application
PT4-M30	804 804	804804M	3.0 m	80	
PT4-M60	804 805	804805M	6.0 m	140	

Note: Longer length of the electrical connection cable beyond 6.0m must be verified by user in term of output signal as well as EMC within installed system.

### Technical data

Supply voltage	
Nominal	24 VDC
Range (polarity protected)	7 ... 30 VDC
Operating current	4 to 20 mA output Maximum ≤ 24 mA
Load resistance	$R_L \leq \frac{U_b - 7.0V}{0.02A}$
Mounting position	Non position sensitive
Response time	1 ms
Temperatures	
Operating ambient housing	-25.....+80 °C
Medium	-40...+135 °C
Transport and storage	-25.....+80 °C

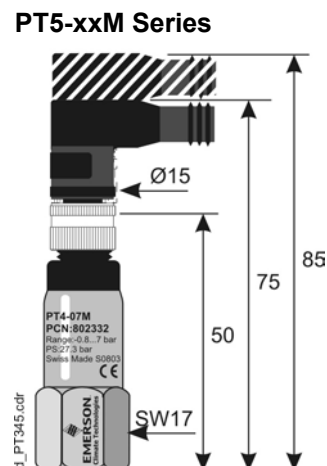
Sensor lifetime at full stroke at 25°C	≥ 10.000.000 cycles
Burst pressure	see selection chart
Approvals:	
CE marking according to PED	Not allowed (SEP)
CE marking according to EMC	CE marked
Medium compatibility	HFC, HCFC, CFC not suitable for ammonia and inflammable refrigerants!
Vibration at 10 ... 2000 Hz	max. 4 g
Protection class	IP65 (acc. to EN 60529)
Materials:	
Housing, pressure connector and diaphragm with medium contact	Stainless steel 1.4435 / AISI 316L
Weight approx. (without plug and cable assembly)	80 grams

### Accuracy performance

Type	Total error *	Temperature range
PT5-07M/T	≤ ±1% FS	-40 ... +80 °C
PT5-18M/T	≤ ±1% FS	-20 ... +60 °C
PT5-30M/T	≤ ±1% FS	0 ... +40 °C
	≤ ±2% FS	-20 ... +60 °C
	Typically ≤ ±2% FS	-40 ... +80 °C
PT5-50M/T	≤ ±1% FS	0 ... +40 °C
	≤ ±2% FS	-20 ... +60 °C
	Typically ≤ ±2% FS	-30 ... +80 °C

\*) Total error includes non-linearity, hysteresis, repeatability as well as offset and span drift due to the temperature changes.  
Note: %FS is related to Percentage of Full sensor Scale.

### Dimensions



# Thermostats

## Basic Terms and Technical Information

### Mode of operation

ALCO thermostats are electric circuit control devices which open or close an electric contact depending on temperature changes at the bulb.

### Description of bulb charges

The application range of thermostats is mainly determined by the charge. Accordingly various bulb shapes and sizes are necessary.

#### Vapour charge, bulb type A, E, P

The therosystem is filled with a medium in vapour phase. A thermostat with vapour charge operates in accordance with temperature changes at the bulb as long as the bulb is the coldest part in the whole system (bellows, capillary tube, bulb). ALCO thermostats are equipped with a bellows heater (82 k Ohm, 230 V) to avoid such conditions. On applications with low current the bellows heater has to be removed. Max. bulb temperature is 150°C (70°C for bulb type E). Response time is very fast.

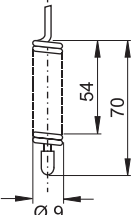
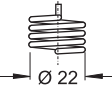
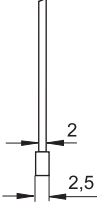
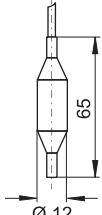
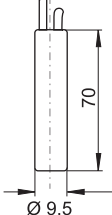
#### Liquid charge

Bulb type C: Bulb must be warmer than capillary tube and bellow (i.e. for heating purpose). Max. bulb temperature is 210°C. Response time is fast..

#### Adsorption charge, bulb type F

This charge only reacts on temperature changes at the bulb. Max. bulb temperature is 100°C. Response time is slow but perfectly suitable for common refrigeration systems.

## Bulb Sizes

A	E	P	C	F
				

# Alco Controls

## Thermostats

### Selection Guide for ALCO Temperature Controls

Series	TS1
Temperature range	-50°C...+60°C
Charges	Vapor, Adsorption
Protection	IP 43
Number of contact (SPDT)	1
Rated operational current at 230 V/AC:	
Non-inductive Amp. (AC1)	24 A
Inductive Amp. (AC15)	10 A
Motor rating, Full Load Amp (FLA)	24 A
Number of stages	1
Typical application:	
Refrigeration, air-conditioning, ventilation	•
Industrial	•
Electronics (optional gold plated contacts)	•
Adjustable	•
Minimum order quantity	-

#### Adjustment of Switching Points

A thermometer should always be used for comparison when adjusting the switching points on temperature controls. The setting scale on the device is intended to serve for orientation, showing the setting range of the upper switching point  $t_{max}$  in °C and °F and the value of the temperature differential  $\Delta t$  in K as difference between the upper switching point  $t_{max}$  and the lower switching point  $t_{min}$ . The upper switching point  $t_{max}$  has to be adjusted on the scale, whereas the lower switching point  $t_{min}$  is given by adjustment of the desired switching differential  $\Delta t$ . The formula is:

$$\text{Upper switching point} - \text{Differential} = \text{Lower switching point}$$

$$t_{max} - \Delta t = t_{min}$$

#### Important!

The differential  $\Delta t$  mentioned on the differential scale and in the technical data refers to the upper part of the setting range and the upper switching point.

In the lower part of the setting range an increase of the differential  $\Delta t$  can be expected. The lowest possible lower switching point  $t_{min}$  is mentioned in the selection tables and is helpful to select switching points with large differentials  $\Delta t$  in the lower temperature range..

Circuit diagram	Function	Temperature ..	Contact 1-2	Contact 1-4
	Thermostat, Safety Limiter	.. exceeds upper switch point .. falls below lower switch point	open closed	closed open
	Minimum temperature cut-out	.. falls below lower switch point .. raises min 2 K above upper switch point, then manual reset	closed open	open closed
	Maximum temperature cut-out	.. exceeds upper switch point .. falls min 2 K below lower switch point, then manual reset	open closed	closed open

# Thermostats -50 to +60°C

## Series TS1

### Features

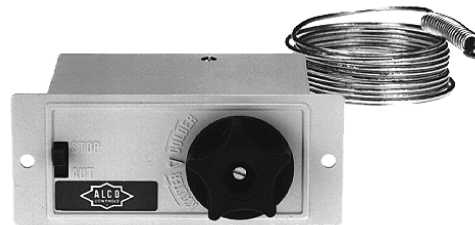
- Contacts with extremely low bounce provide high switching capacity and long operating life
- Continuous current 24 A, making current 144 A suitable for single-phase motors up to 3 kW at 230 V AC
- Finger-protected terminals (VDE 0106, VBG 4)
- Generously dimensioned terminal area
- Clear scales marked both in °C and °F
- Overlapping setting ranges for easy selection
- Exact adjustment and high repeat accuracy
- Self-retaining ± screws to suit various tools
- Capillary tube exit protected with strong steel spring
- Universal service thermostats with wide setting range from -30°C to +35°C



TS1-A or TS1-B  
Top adjustment



TS1-E or TS1-F  
Front adjustment



TS1-G or TS1-H flush mounting

### Overview

The TS1 Series is available in three convenient enclosure designs:

- Surface-mounting with front adjustment
- Surface-mounting with top adjustment
- With front plate for flush-mounting with front adjustment

For easy product selection we recommend that you choose mounting, adjustment and "AUT-STOP" per chart below. From there you are guided to the temperature- and Order number tables on the following pages.

**TS1 room thermostats** have no capillary tube. Sensor type E is mounted directly at the enclosure. To avoid

heat-bridge effects and to facilitate mounting, ALCO room thermostats are supplied with **insulation consoles H 133-075**.

Mode of operation and setting see Thermostats, Introduction on page 21 of this catalogue.

The TS1 Series can be delivered with a manual **"AUT-STOP" switch**. In the AUT position TS1 will switch depending from temperature, in STOP position TS1 will be always off.

Thermostats with vapor charge are equipped with **bellows heater** for 230 V (other voltages on request). See table **Characteristics of Charges and Sensors** on page 21 for more details.

### Selection Chart

Selection Chart		Surface mounting		Flush mounting
		Top Adjustment	Front Adjustment	Front Adjustment
Thermostat	with AUT-STOP	TS1-B... Page 24	TS1-F... Page 24	TS1-H... Page 25
	without AUT-STOP	TS1-A... Page 24	TS1-E... Page 24	TS1-G... Page 25

		Top Adjustment	Front Adjustment
Room thermostat Surface mounting	With AUT-STOP	TS1-B... Page 25	TS1-F... Page 25
	without AUT-STOP	TS1-A... Page 25	TS1-E... Page 25

## Thermostats -50 to +60°C

## Series TS1

## Thermostats for surface mounting and top adjustment

VDE 0660 VDE 0631

Capillary tube length: 2 m

Type	Order Nr.	Range		Lowest lower sw. point °C	Factory setting °C	Max. bulb temp. °C	Bulb charge and - style per page 29
		Upper sw. point °C	Differential K				

## Thermostats without "AUT-STOP" switch

TS1-A1A	4 351 500	-45...-10		-50	-18 / -20	+150	Vapor/A
TS1-A2A	4 351 600	-30...+15	1,5...16	-36	-1 / -6		
TS1-A3A	4 352 500	-10...+35		-23	+3 / -2		
<b>TS1-A4F</b> (Defrost- and universal thermostat)	<b>4 351 800</b>	-30...+35	2,8...20	-35	+5 / 0	+100	Adsorption/ F
TS1-A5F	4 458 400	+20...+60	3...10	+10	+35 / +30		

## Thermostats with "AUT-STOP" switch

TS1-B1A	4 366 700	-45...-10		-50	-18 / -20	+150	Vapor/A
<b>TS1-B2A</b>	<b>4 366 800</b>	-30...+15	1,5...16	-36	-1 / -6		
TS1-B3A	4 366 900	-10...+35		-23	+3 / -2		
<b>TS1-B4F</b>	<b>4 367 000</b>	-30...+35	2,8...20	-35	+5 / 0	+100	Adsorption/F

## Frost monitors without "AUT-STOP" switch

<b>TS1-C0P</b>	<b>4 352 100</b>	+4,5...+20	2,5 fix	+2	+4,5 / +2	+150	Vapour / P Capillary tube length: 6 m
TS1-D0P (Limiter)	4 352 200	+4,5...+20	man. reset min. appr. 2,5 fix	+2	+ 2		

## Thermostats for surface mounting and front adjustment

VDE 0660 VDE 0631

## Thermostats without "AUT-STOP" switch

TS1-E1A	4 361 000	-45...-10	2...16	-50	-18 / -20	+150	Vapour / A
<b>TS1-E2A</b>	<b>4 356 200</b>	-30...+10	1,5...15	-36	+4 / +2		
TS1-E3A	4 365 200	-10...+25	1,5...15	-23	+3 / -2		
<b>TS1-E4F</b> (Especially for defrost- termination)	<b>4 367 500</b>	-25...+30	2,8...20	-30	+5 / 0	+100	Adsorption/F
TS1-E5F	4 338 100	+20...+60	3...10	+10	+35 / +30	+100	Adsorption/F
TS1-E7F (Especially for milk- and beer coolers)	4 367 600	0...+10	2,5 fix	-2,5	+5,5 / +3		

## Thermostats with "AUT-STOP" switch

TS1-F1A	4 367 100	-45...-10	2...16	-50	-18 / -20	+ 150	Vapour / A
<b>TS1-F2A</b>	<b>4 367 200</b>	-30...+10	1,5...15	-36	-1 / -6		
<b>TSA-F2A</b>	<b>4 367 300</b>	-30...+10	1,5...15	-36	+4 / +2		
TS1-F3A	4 367 400	-10...+25	1,5...15	-23	+3 / -2		



## Thermostats -50 to +60°C

## Series TS1

## Thermostats for flush mounting and front adjustment

VDE 0660 VDE 0631

Capillary tube length: 2 m

Type	Order Nr.	Range		Lowest lower sw. point °C	Factory setting °C	Max. bulb temp. °C	Bulb charge and - style per page 29
		Upper sw. point °C	Differential K				

## Thermostats without "AUT-STOP" switch

TS1-G1A	4 364 700	-45...-10		-50	-18 / -20		
TS1-G2A	4 355 400	-30...+15	1,5...16	-36	+4 / +2	+150	Vapour / A
TS1-G3A	4 364 800	-10...+35		-23	+3 / -2		
<b>TS1-G4F</b> (Defrost- and universal thermostat)	<b>4 355 600</b>	-30...+35	2,8...20	-35	+5 / 0	+100	Adsorption/F
TS1-G7F (Thermostat especially for milk- and beer coolers)	4 356 000	0...+10	2,5 fix	-2,5	+5,5 / +3		

## Thermostats with "AUT-STOP" switch

TS1-H1A	4 364 600	-45...-10		-50	-18 / -20		
TS1-H2A	4 355 500	-30...+15	1,5...16	-36	-1 / -6	+150	Vapour / A
TSA-H2A	4 367 800	-30...+15		-36	+4 / +2		
TS1-H3A	4 367 900	-10...+35		-23	+3 / -2		
TS1-H4F	4 355 800	-30...+35	2,8...20	-35	+5 / 0	+100	Adsorption/F
TS1-H7F (Thermostat especially for milk- and beer coolers)	4 365 500	0...+10	2,5 fix	-2,5	+5,5 / +3		

## Room thermostats without "AUT-STOP" switch, top adjustment

VDE 0660 VDE 0631

TS1-A1E	4 362 800	-45...-10		-50	-18 / -20		
<b>TS1-A2E</b>	<b>4 355 200</b>	-30...+15	1,5...16	-36	+4 / +2	+70	Vapour / E
TS1-A3E	4 355 300	-10...+35		-23	+20 / +18		

## Room thermostats with "AUT-STOP" switch, top adjustment

TS1-B1E	4 344 300	-45...-10		-50	-18 / -20		
<b>TS1-B2E</b>	<b>4 344 400</b>	-30...+15	1,5...16	-36	+4 / +2	+70	Vapour / E
TS1-B3E	4 344 500	-10...+35		-23	+20 / +18		

## Room thermostats without "AUT-STOP" switch, front adjustment

TS1-E1E	4 365 300	-45...-10	2...16	-50	-18 / -20		
<b>TS1-E2E</b>	<b>4 356 800</b>	-30...+10	1,5...15	-36	+4 / +2	+70	Vapour / E
TS1-E3E	4 356 900	-10...+25	1,5...15	-23	+20 / +18		

## Room thermostats with "AUT-STOP" switch, front adjustment

TS1-F1E	4 368 000	-45...-10	2...16	-50	-18 / -20		
<b>TS1-F2E</b>	<b>4 368 100</b>	-30...+10	1,5...15	-36	+4 / +2	+70	Vapour / E
TS1-F3E	4 368 200	-10...+25	1,5...15	-23	+20 / +18		
TS1-F4E	4 465000	0...+40	2...16	-7	+20 / +18		

Thermostats -50 to +60°C

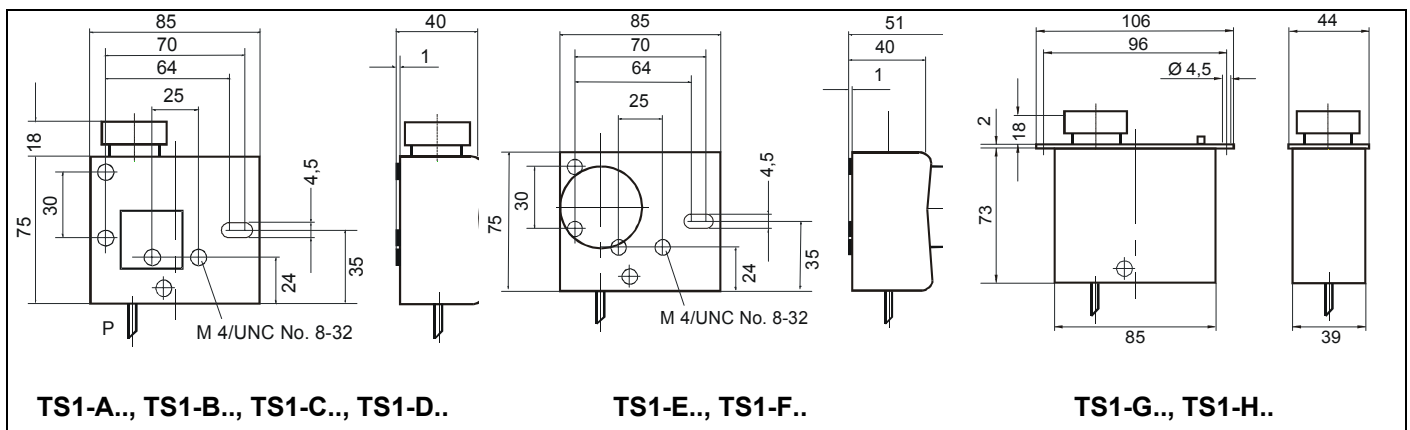
Series TS1

Technical data TS1

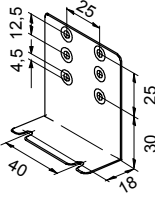
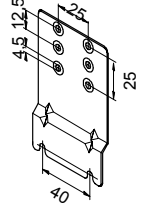
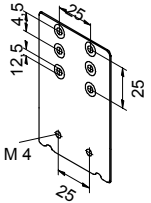
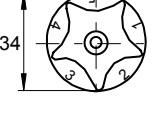
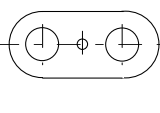
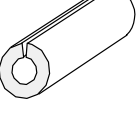
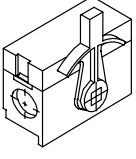
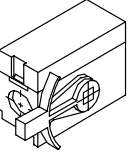
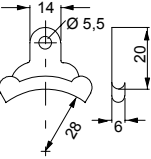
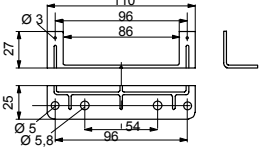
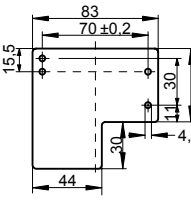
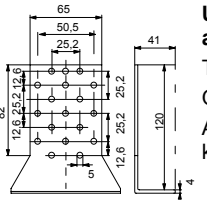
Rated operational current at 230 V	
Non-Inductive Amp. (AC 1)	24A / 230V
Inductive Amp. (AC 15)	10A / 230V
Inductive Amp. (DC 13) L / R = 50 ms	0,1A / 230V 6A, 12V/DC
Motor rating, Full Load Amp.	24 A / 230V
Motor rating, Locked Rotor Amp.	144 A / 230V

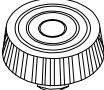
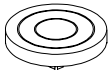
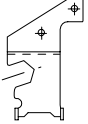
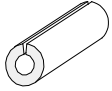
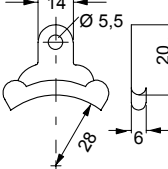
Type of contacts	SPDT
Protection to DIN 40 050 / IEC 529	
without "AUT-STOP" switch	IP 44
with "AUT-STOP" switch	IP 30
Ambient Temperature Range	-50° ... +70°C
Vibration resistance (10 to 1000 Hz)	4 g
Cable entry	Grommet PG16
Approximate weight	0.35 kg

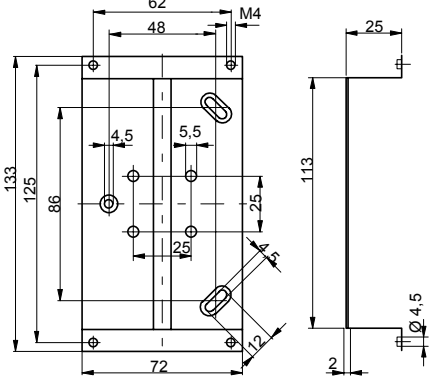
Dimensions



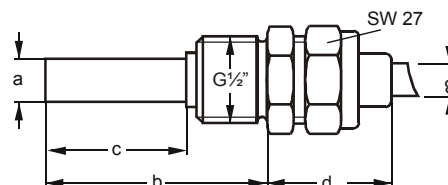
# Accessories

 <p><b>Mounting angle</b> Type: H 129g041 Order Nr.: 803 799 Approx. weight: 0.1 kg</p>	 <p><b>Mounting plate for units with hood</b> Type: H 129g041.001 Order Nr.: 803 801 Approx. weight: 0.1 kg</p>	 <p><b>Extension plate</b> Type: H 129g041.002 Order Nr.: 803 800 Approx. weight: 0.1 kg</p>
 <p><b>Adjusting knob</b> Type: H 145g055.001 Order Nr.: 0163 189 Approx. weight: 0.01 kg</p>	 <p><b>Blocking piece</b> Type: H 145-029.001 Order Nr.: 0 712 276 Approx. weight: 0.01 kg</p>	 <p><b>Protecting slit PVC, 1 m</b> Type: H 115-129 Order Nr.: 0400 174 Weight: 0.065 kg/m</p>
 <p><b>Selector switch STOP-AUT</b> for encl. types H, S, E, F Type: H 145 g 026.001 Order Nr.: 0014 025 Approx. weight: 0.015 kg</p>	 <p><b>Selector switch STOP-AUT</b> for encl. types M, C Type: H 145 g 026.002 Order Nr.: 0014 026 Approx. weight: 0.015 kg</p>	 <p><b>Capillary-tube holder</b> e.g. for frost monitor Type: H 130-040 Order Nr.: 803 778 Approx. weight: 0.01 kg</p>
 <p><b>Mounting angle for TS1-G, TS1-H</b> Type: H 117g95.001 Order Nr.: 803 805 Approx. weight: 0.04 kg</p>	 <p><b>Insulation console for Room Thermostats TS1-xxE</b> Type: H 133-075 Order Nr.: 803 777 Approx. weight: 0.02 kg</p>	 <p><b>Universal mounting angle</b> Type: H 145g045.001 Order Nr.: 803 798 Approx. weight: 0.15 kg</p>

 <p><b>Adjusting knob</b> Type: H 124-82 Order Nr.: 0 136 756 Approx. weight: 0.01 kg</p>	 <p><b>Blanking plug</b> Type: H 124-88 Order Nr.: 0 136 770 Approx. weight: 0.004 kg</p>
 <p><b>Sealing bracket</b> Type: H 124-90 Order Nr.: 0 402 014 Approx. weight: 0.005 kg</p>	 <p><b>Protecting slit PVC, 1 m</b> Order Nr.: 0 400 174 Approx. weight: 0.065kg/m</p>
 <p><b>Capillary-tube holder</b> Type: H 130-040 Order Nr.: 0 412 231 Approx. weight: 0.01 kg</p>	



**Console**  
Type: H 124g127  
Order Nr.: 0714 143  
Approx. weight: 0.115 kg



**Sensing bulb wells, European thread**

Thread d	Material:	Order Nr.	Weight	a	b	c	d	For sensor
G 1/2	Brass	803 809	0.4 kg	14	56	37	33	C
G 1/2		803 808	0.4 kg	14	66	47	33	A + C
G 1/2		803 810	0.4 kg	12	86	66.5	33	F

**Capillary-tube glands, brass. Pressure tight up to 15 bar. Max. temperature approx. 100°C**

Thread d	Order Nr.	Weight	a	b	c	d	For sensor
G 1/2	803 807	0.4 kg	-	-	19	27	A+C+D + D <sub>1</sub>

# Alco Controls

ALCO CONTROLS is not to be held responsible for erroneous literature regarding capacities, dimensions, applications, etc. stated herein. Products, specifications and data in this literature are subject to change without notice. The information given herein is based on technical data and tests which ALCO CONTROLS believes to be reliable and which

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