Technical leaflet

Pressure switch for boilers, type KP

Features

- Wide regulating range
- Small dimensions.
  Space-saving – easy to install in panels
- Shock and impact resistant
- Ultra-short bounce times.
  Limits wear to an absolute minimum and increases reliability
- Snap action electrical contacts
  minimize chatter, bounce, and wear, and ensure long term electrical and mechanical reliability
- Electrical connection from front of the unit
  Makes rack mounting easier and also saves space
- Suitable for alternating current and direct current
- Manual trip allows electrical function test without tools
- Versions with automatic and manual reset available

Description

Danfoss KP pressure switches are used for regulating, monitoring and alarm systems in industry. They provide automatic limit protection or manual reset limit protection for pressure systems.
Can be used with steam, air, gaseous and liquid media.

The pressure controls are fitted with single-pole changeover switch (SPDT). The position of the switch depends on the setting of the pressure control and the pressure in the connector.

Approvals

CE marked in accordance to EN 60947-4/05

Ordering

Pressure switches, type KP

Type	Range	Differential [bar]	Reset	Pressure connection [bar]	Max. operating pressure [bar]	**Code number**
KP 34	0.1 to 1	0.1 to 0.4	Automatic	G ½ A	4.0	**060-216466**
KP 34	0.1 to 1	0.2 fixed	Manual		4.0	**060-216366**
KP 35	0.4 to 3.4	0.4 to 2.2	Automatic		10	**060-216666**
KP 35	0.4 to 3.4	0.5 fixed	Manual		10	**060-216566**
KP 36	1 to 10	0.7 to 4	Automatic		17	**060-215966**
KP 36	1 to 10	0.7 fixed	Manual		17	**060-216066**
KP 37	4 to 20	1.8 to 3.1	Automatic		28	**060-216166**
KP 37	4 to 20	3.0 fixed	Manual		28	**060-216266**

Technical data

Ambient temperature
–40 to 65° C (+80°C for short period of time)

Media temperature
–40 to 100° C

Parts in contact with medium:
Bellows
Stainless steel

Pressure connection
Free-cutting steel, nickel plated

Enclosure
IP33 (IP44 with top plate)

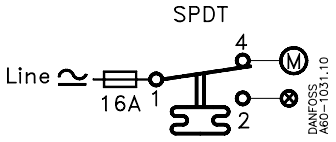
Contact system
Single pole changeover switch (SPDT)

Contact load
Alternating current
AC-1: 16 A, 400 V
AC-3: 16 A, 400 V
AC-15: 10 A, 400 V

Direct current
DC-13: 12 W, 220 V

Cable connection
Entry for 6 - 14 mm diameters

Contact system and application

Switch type - single pole double throw	Switch action	Application
	1. Terminals 1 - 4 close high and open low Terminals 1 - 2 can be used as low pressure alarm 2. Terminals 1 - 2 open high and close low Terminals 1 - 4 can be used as high pressure alarm	1. Low pressure cut-out 2. High pressure cut-out

Setting

Cut-in and cut-out pressures of the system should always be checked with an accurate pressure gauge.

Pressure setting for switches with automatic reset.
1. Set the cut-in pressure on the "CUT-IN" scale (range scale)
2. Set the differential on the "DIFF" scale.

Note:
For low pressure controls the restart pressure is equal to cut-out pressure plus differential value.

The cut-out pressure must be above absolute vacuum (pe = - 1bar.).
For high pressure controls the restart pressure is equal to cut-out pressure minus differential

Pressure switches with manual reset
Set the cut-out pressure on the "CUT-OUT" scale (range scale).
Low pressure limiters can be manually reset when the pressure is equal to the cut-out pressure plus the differential. High pressure limiters can be manually reset when the pressure is equal to the stop pressure minus the differential.

Terminology

Set point
A predetermined value to which a control is adjusted and at which it performs its intended function

Reset
1. Manual reset
   A unit with manual reset can only be restored to operational mode by activation of the external reset button.
2. Automatic reset
   A unit with automatic reset is restored to operational mode automatically.

Maximum working pressure
The maximum permissible pressure for safe functioning of a heating system or any of its parts.

Maximum test pressure
The maximum pressure applied in strength or leakage tests on heating system or components thereof.

Snap function

A specific contact force is maintained until snap is initiated. The time over which contact force reaches zero is a few milliseconds; therefore, contact bounce cannot occur as a result, for example, of slight vibrations before cut-out.

The snap-action contact system will continue to function even when micro-welds are created between the contacts during cut-in.

The force created to separate the contacts is strong, and instantly shears off all contact surface welds that have been created as the result of cut-in action.

These design features ensure that the cut-out point of the KP control remains very accurate and completely independent of the magnitude of the current load.

Current ratings:

AC - 1

The alternating current rating, in amperes, of the non-inductive, slightly inductive loads or resistive furnaces

AC – 3

The alternating current rating, in amperes, of the squirrel-cage motors: starting, plugging, inching

AC-15

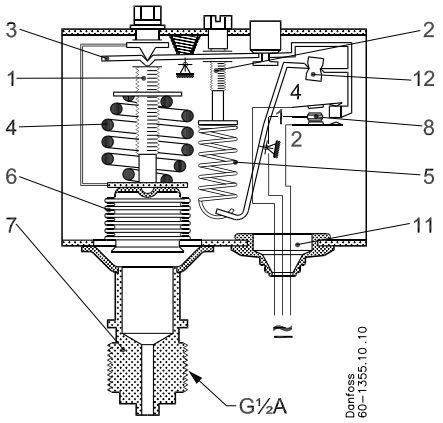
The alternating current rating, in amperes, of electromagnetic loads (>72VA)

DC – 13

The direct current rating, in amperes, of electromagnets

Design and function

1. Range setting spindle
2. Differential setting spindle
3. Main arm
4. Main spring
5. Differential spring
6. Bellows
7. Pressure connector
8. Contact system
9. Control terminals
10. Earth terminal
11. Cable entry: ½ in. female cable gland
12. Tumbler
13. Locking screw
14. Manual reset
15. Distance plate

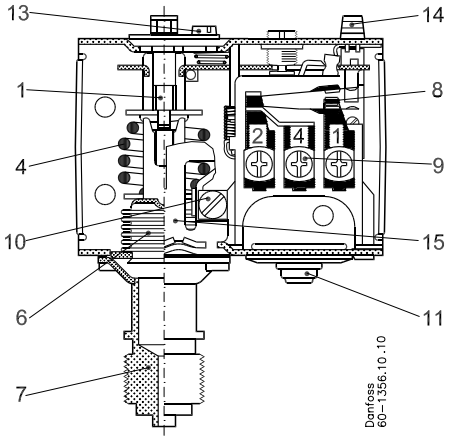


Key sketch of KP pressure control

The contact system of KP controls has a snap-action function and the bellows moves only when cut-in or cut-out set point is reached.

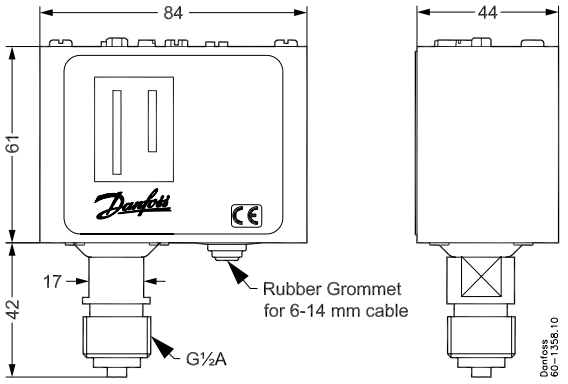
The design has the following advantages:

- higher contact load
- ultra short bounce time
- long mechanical and electrical lifetime
- high resistance to vibrations and pulsations



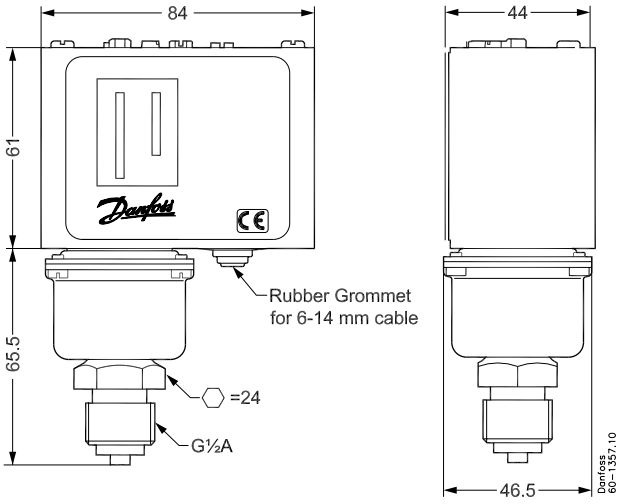
Simplified drawing of KP pressure control without front cover and scale.
Version with manual reset.

Dimensions and weights



KP 35, KP 36 and KP 36
(all dimensions in mm)

Weight: approx. 0.34 kg



KP 34 pressure control
(all dimensions in mm)

Weight: approx. 0.43 kg