

## Data Sheet

# Pressure switch and Thermostat Type **KP** and **KPI**

For industrial applications



The KP and KPI pressure switches and thermostats are used for control, monitoring and alarm systems in a wide variety of industry applications.

KP pressure switches are mainly used for gaseous fluid whereas KPI pressure switches are more for liquid and gaseous fluid. The products are available in IP30 enclosure as well as IP55 enclosure.

The KP pressure range include special designed pressure switches and limiters for steam boilers and other heating applications.

For water pump control and protection (dry run) the dual pressure switch KP44 is suitable and secure improved life time of the water pump.

## Features

### Features

- Wide setting range
- Shock and impact resistant
- Snap action electrical contacts minimize chatter, bounce, and wear, and ensure long term electrical and mechanical reliability
- Small dimensions - space saving and easy to install in panels
- Electrical connection from front of the unit makes rack mounting easier and also saves space
- Suitable for alternating current and direct current
- Single pressure switches and thermostats are fitted with a single pole double throw contact system (SPDT)
- Can be used for both liquids and gases (KPI)
- Manual trip function enables electrical connections verification without any tools or pressure changes in the application
- Versions with automatic and manual reset available
- For demineralized water, there are special KP models with wetted parts made of stainless steel (AISI 316L)

## Functions

### KP and KPI Pressure switch

Figure 1: Key sketch of KP pressure switch

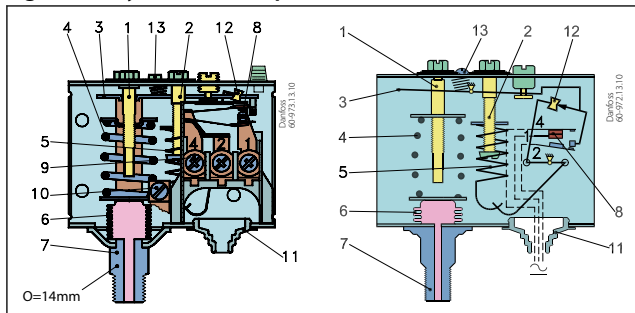


Figure 2: Key sketch of KPI pressure switch

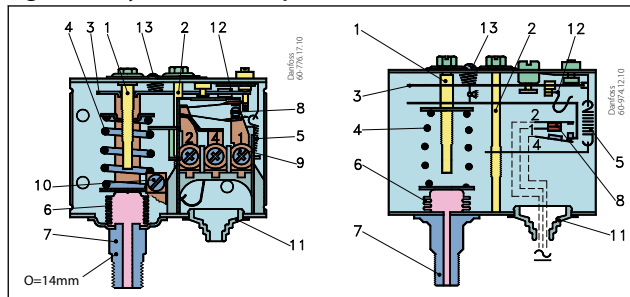
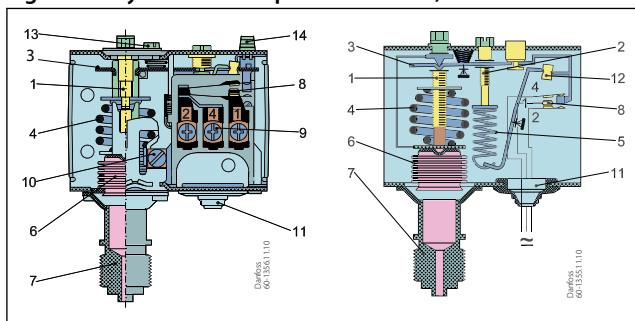


Figure 3: Key sketch of KP pressure switch, boiler version



|   |                              |    |                      |
|---|------------------------------|----|----------------------|
| 1 | Setting spindle              | 8  | Contact system       |
| 2 | Differential setting spindle | 9  | Connection terminals |
| 3 | Main arm                     | 10 | Earth terminal       |
| 4 | Main spring                  | 11 | Cable entry          |
| 5 | Differential spring          | 12 | Omega spring (KPI)   |
| 6 | Bellows                      | 12 | Tumbler (KP)         |
| 7 | Pressure connector           | 13 | Locking screw        |
|   |                              | 14 | Manual reset         |

The contact system in KP pressure switches has a snap function. This means that the bellows is active only when the cut-in or cut out value is reached.

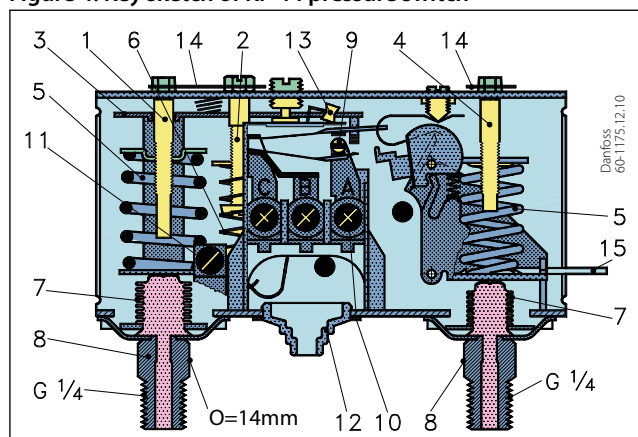
The bellows is connected to the pressure of the controlled plant via the connector.

Danfoss KPI pressure switches are designed so that the bellows moves in the same proportion as the pressure switches change.

To ensure a snap function on contact change over, an omega spring is located between bellows and contact system.

## KP 44 pressure switch

Figure 4: Key sketch of KP 44 pressure switch



|   |                                    |    |                |
|---|------------------------------------|----|----------------|
| 1 | Lefthand pressure setting spindle  | 9  | Contact system |
| 2 | Differential setting spindle       | 10 | Terminal       |
| 3 | Main arm                           | 11 | Earth terminal |
| 4 | Righthand pressure setting spindle | 12 | Cable entry    |
| 5 | Main spring                        | 13 | Tumbler        |
| 6 | Differential spring                | 14 | Locking plate  |
| 7 | Bellows                            | 15 | Impulse lever  |
| 8 | Pressure connections               |    |                |

### Water supply from reservoir or well

The contact system in the KP 44 has a snap-action function and allows the bellows moves only when the cut-in or cut-out value is reached.

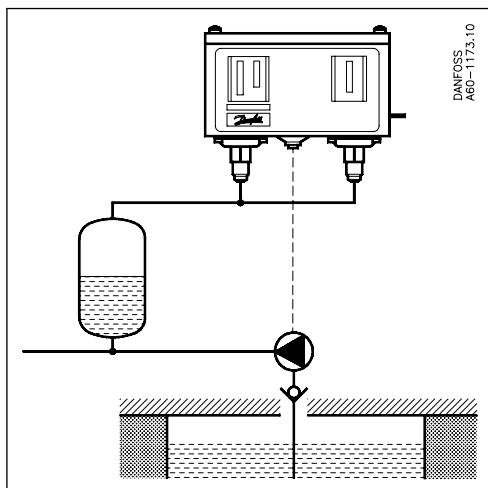
If water is running short in the well or reservoir, the pump will no longer be able to increase the pressure to the cut-out value. Consequently the pump will keep running - perhaps without water. However, the KP 44 pressure switch will stop the pump as soon as the righthand bellows pressure drops below the safety cut-out setting.

The pump can be started again by lifting the impulse lever. The pump will continue to operate when the impulse lever is released, provided that the righthand bellows pressure is higher than the safety cut-out setting plus a fixed differential of 1 bar. If this is not the case, the pump will cut-out again indicating insufficient water supply.

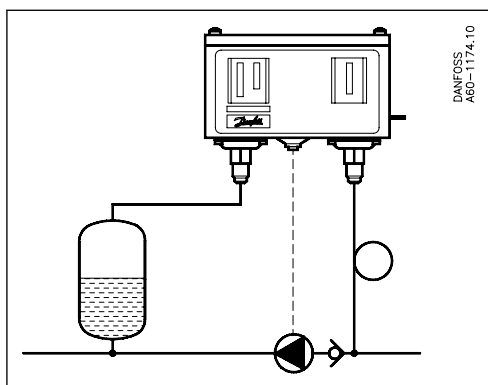
### Pressurized water supply direct to pump

When water supply fails on the inlet side, the pump will no longer be able to boost the pressure to the cut-out value. Consequently the pump will keep running - perhaps without water. However, the KP 44 pressure switch will stop the pump as soon as the pressure in the pump suction line drops below the safety cut-out setting. The pump will automatically start again when the pump suction pressure has reached the level of 1 bar above the safety cut-out setting.

Automatic start-up will only take place if the righthand bellows is connected to the pump suction line. Air pockets should be avoided to prevent the pump from starting up on air pressure rise, without the presence of water.



In a hydrophore system where water is pumped from a well or an open tank, both bellows are connected to a pressure outlet on the air side in the pump pressure line, if possible.



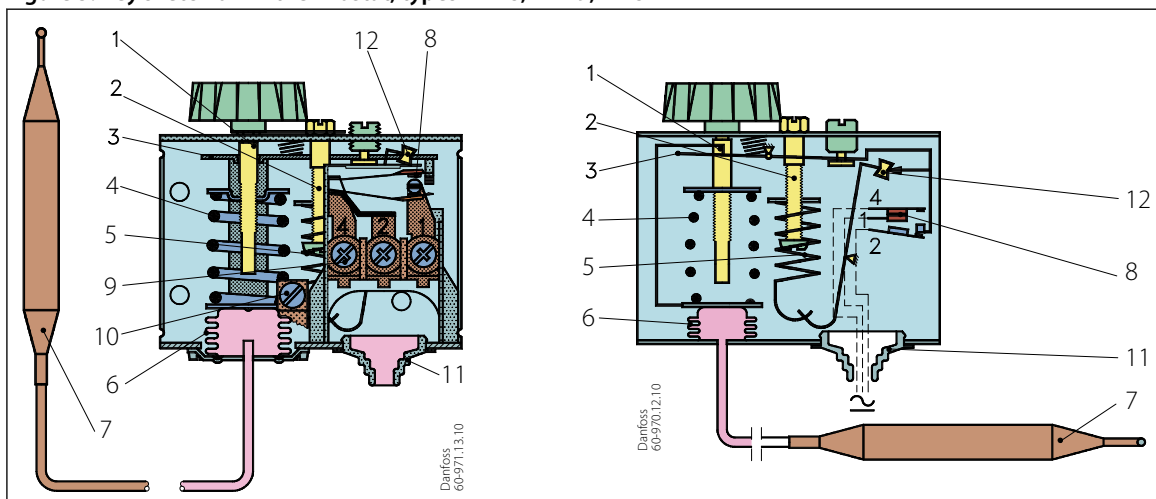
In a booster system receiving pressurized water the righthand bellows is connected

- to the low pressure side of the pump for automatic start-up
- to the high pressure side of the pump for manual start-up

The lefthand bellows is always connected to the high pressure side of the pump.

## KP thermostat

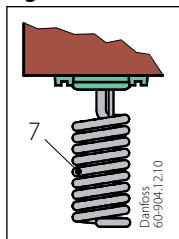
Figure 5: Key sketch of KP thermostat, types KP 78, KP 79, KP 81



## Pressure switch and Thermostat, Type KP and KPI

|   |                              |    |                      |
|---|------------------------------|----|----------------------|
| 1 | Temperature setting spindle  | 7  | Sensor               |
| 2 | Differential setting spindle | 8  | Contact system       |
| 3 | Main arm                     | 9  | Connection terminals |
| 4 | Main spring                  | 10 | Earth terminal       |
| 5 | Differential spring          | 11 | Cable entry          |
| 6 | Bellows                      | 12 | Tumbler              |

Figure 6: KP 75 room sensor



The contact system in KP thermostats has a snap function. This means that the bellows is active only when the cut-in or cut-out value is reached.

## Product specification

### Technical Data

#### Single pressure switch

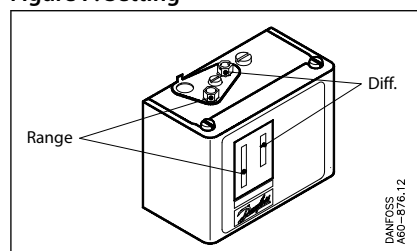
Table 1: Single pressure switch

| Description                           |                    | KP 35, KP 36                                                                                                                                    | KPI 35, KPI 36                                                                                                                                | KPI 38                                                                                                                                             | KP 34, KP 35, KP 36, KP 37 boiler version |
|---------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Ambient temperature [°C]              |                    | -40 – 65 °C (for max. 2 hours up to 80 °C)                                                                                                      |                                                                                                                                               |                                                                                                                                                    |                                           |
| Media temperature [°C]                |                    | -40 – 100 °C                                                                                                                                    |                                                                                                                                               |                                                                                                                                                    |                                           |
| Fluid                                 |                    | Gaseous media                                                                                                                                   | Gaseous media and liquids                                                                                                                     |                                                                                                                                                    | Steam, air, gaseous media & liquids       |
| Parts in contact with fluid           | Bellows            | Phosphor bronze or Stainless steel                                                                                                              | Phosphor bronze                                                                                                                               |                                                                                                                                                    | Stainless steel                           |
|                                       | Pressure connector | Free-cutting steel (nickel plated) or Stainless steel                                                                                           | Brass                                                                                                                                         | Free-cutting steel (nickel plated)                                                                                                                 |                                           |
| Contact system                        |                    | <div><p>SPDT</p><p>Line ~ 16A 1 2 4 3</p><p>Single-pole double throw (SPDT)</p></div>                                                           |                                                                                                                                               |                                                                                                                                                    |                                           |
| Contact load, Silver                  |                    | <b>Alternating current:</b><br>AC-1: 16 A, 400 V<br>AC-3: 16 A, 400 V<br>AC-15: 10 A, 400 V<br><br><b>Direct current:</b><br>DC-13: 12 W, 220 V | <b>Alternating current:</b><br>AC-1: 10 A, 440 V<br>AC-3: 6 A, 440 V<br>AC-15: 4 A, 440 V<br><br><b>Direct current:</b><br>DC-13: 12 W, 220 V | <b>Alternating current:</b><br>AC-1 : 16 A, 400 V<br>AC-3 : 16 A, 400 V<br>AC-15 : 10 A, 400 V<br><br><b>Direct current:</b><br>DC-13: 12 W, 220 V |                                           |
| Contact load, Gold plated contact set |                    | See <a href="#">Table 6</a>                                                                                                                     |                                                                                                                                               |                                                                                                                                                    |                                           |
| Enclosure, IP30 grade                 |                    | Unit must be mounted on a flat surface / a flat fitting and all unused holes covered                                                            |                                                                                                                                               |                                                                                                                                                    |                                           |
| Enclosure, IP44 grade                 |                    | Mounted as IP30 plus fitting of top cover, code no. 060-109766                                                                                  |                                                                                                                                               |                                                                                                                                                    |                                           |
| Enclosure, IP55 grade                 |                    | Unit mounted in a special IP55 enclosure, code no. 060-033066 or 060-062866                                                                     |                                                                                                                                               |                                                                                                                                                    |                                           |
| Cable entry                           |                    | Rubber cable gland entry for 6 – 14 mm diameter cables                                                                                          |                                                                                                                                               |                                                                                                                                                    |                                           |
| Mounted on back plate / wall bracket  |                    | Vibration proof in the range 0 – 1000 Hz, 4 g [1g = 9.81 m/s <sup>2</sup> ]                                                                     |                                                                                                                                               |                                                                                                                                                    |                                           |
| Mounted on angle bracket              |                    | Not recommended in areas where vibrations occur                                                                                                 |                                                                                                                                               |                                                                                                                                                    |                                           |

Table 2: Contact system and application

| Switch type – single pole double throw | Switch action                                                                               | Application           |
|----------------------------------------|---------------------------------------------------------------------------------------------|-----------------------|
| <p>SPDT</p> <p>Line ~ 16A 1 2 4 3</p>  | Terminal 1 – 4 close high and open low<br>Terminal 1 – 2 can be used as low pressure alarm  | Low pressure cut-out  |
| SPDT                                   | Terminal 1 – 2 open high and close low<br>Terminal 1 – 4 can be used as high pressure alarm | High pressure cut-out |

Figure 7: 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.

## Pressure switch and Thermostat, Type KP and KPI

- Set the cut-in pressure on the “CUT-IN” scale (range scale).
- Set the differential on the “DIFF” scale.

The cut-out pressure must be above absolute vacuum ( $p_e = -1$  bar).

For high pressure switches 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).

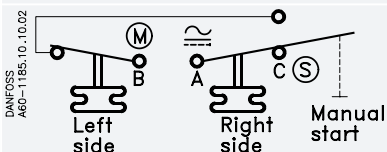
High pressure limiters can be manually reset when the pressure is equal to the stop pressure minus the differential.

#### **i** NOTE:

For low pressure switches the restart pressure is equal to cut-out pressure plus differential value.

## Dual pressure switch

**Table 3: Dual pressure switch**

| Temperature                          | Range                                                                                                                                           |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient temperature [°C]             | -40 – 65 °C (for max. 2 hours up to 80 °C)                                                                                                      |
| Media temperature [°C]               | Max. 100 °C                                                                                                                                     |
| Fluid                                | Liquids                                                                                                                                         |
| Parts in contact with fluid          | Bellows Phosphor bronze, CuSn6<br>Pressure connector Free-cutting steel (nickel plated)                                                         |
| Contact system                       |                                                               |
| Contact load, Silver                 | <b>Alternating current:</b><br>AC-1: 16 A, 400 V<br>AC-3: 16 A, 400 V<br>AC-15: 10 A, 400 V<br><br><b>Direct current:</b><br>DC-13: 12 W, 220 V |
| IP level                             | IP22                                                                                                                                            |
| Cable entry                          | Rubber cable gland entry for 6 – 14 mm diameter cables                                                                                          |
| Mounted on backplate or wall bracket | Vibration-proof in the range 0 – 1000 Hz, 4 g [ $1g = 9.81 \text{ m/s}^2$ ]                                                                     |
| Mounting on angle bracket            | Not recommended for areas where vibration occurs                                                                                                |

### Safety cut-out setting

The righthand bellows will automatically cut-out the pump at the safety cut-out setpoint. Automatic start-up, if any, will take place when the pressure has reached the level of 1 bar above the setpoint. Manual cut-in is made by lifting the impulse lever and releasing it again when the pressure has increased by min. 1 bar. The safety cut-out setpoint is normally determined by the static pressure (the water column). However, in order to avoid disturbing signal interaction, care should be taken to ensure that the safety cut-out setting is at least 1.5 bar lower than the control pressure cut-in setting. See table with pressure setting examples below

**Table 4: Pressure settings**

|                                  |           |           |           |                        |
|----------------------------------|-----------|-----------|-----------|------------------------|
| Required tap water pressure      | ≥ 2.3 bar | ≥ 4.0 bar | ≥ 5.0 bar | ≥ 8.0 bar              |
| Control pressure cut-out setting | 3.0 bar   | 5.0 bar   | 8.0 bar   | 12 bar                 |
| Differential                     | 0.7 bar   | 1.0 bar   | 3.0 bar   | 4.0 bar                |
| Control pressure cut-in setting  | 2.3 bar   | 4.0 bar   | 5.0 bar   | 8.0 bar                |
| Max. safety cut-out setting      | 0.8 bar   | 2.5 bar   | 3.5 bar   | 6.0 <sup>(1)</sup> bar |

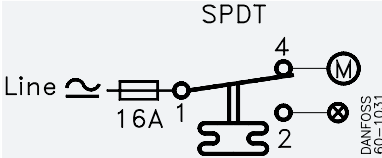
<sup>(1)</sup> 6.0 bar is the normal max. setpoint

### Control pressure settings

Control pressure cut-out setpoint is set on the lefthand pressure setting scale. The differential is set between 0.7 and 4 bar. The control pressure cut-in setting will be the cut-out control pressure less the differential.

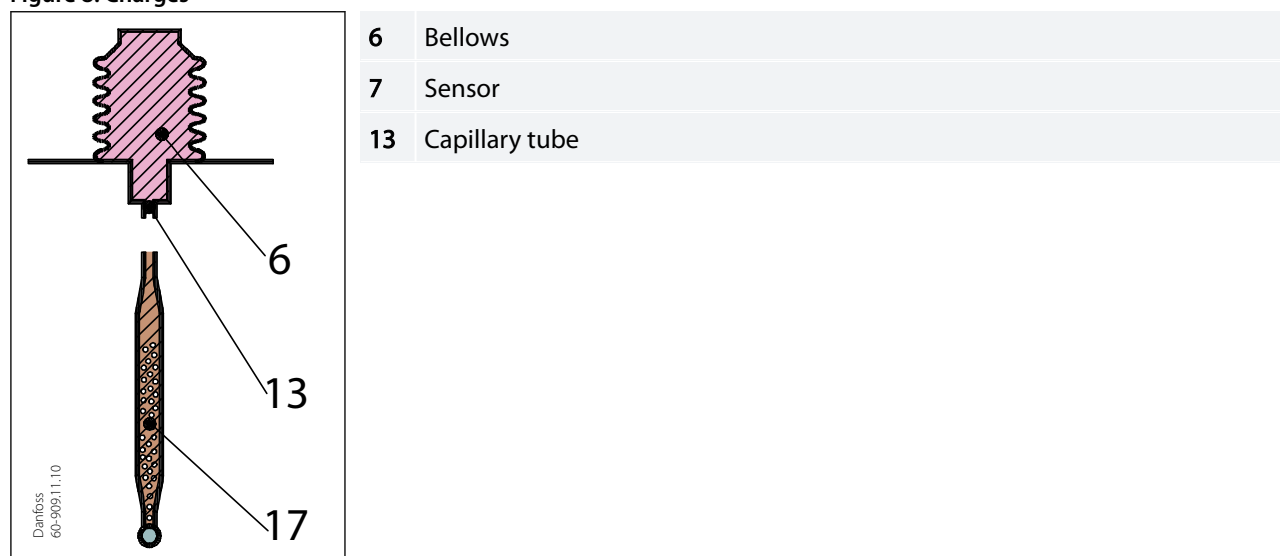
## Thermostat

**Table 5: Thermostat**

| Temperature                           | Range                                                                                                                                           |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient temperature [°C]              | -40 – 65 °C (for max. 2 hours up to 80 °C)                                                                                                      |
| Sensor material                       | Tinned copper Cu/Sn5                                                                                                                            |
| Contact system                        |  <p>Single-pole double throw (SPDT)</p>                        |
| Contact load, Silver                  | <b>Alternating current:</b><br>AC-1: 16 A, 400 V<br>AC-3: 16 A, 400 V<br>AC-15: 10 A, 400 V<br><br><b>Direct current:</b><br>DC-13: 12 W, 220 V |
| Contact load, Gold plated contact set | See <a href="#">Table 6</a>                                                                                                                     |
| Enclosure, IP30 grade                 | Unit must be mounted on a flat surface / a flat fitting and all unused holes covered                                                            |
| Enclosure, IP44 grade                 | Mounted as IP30 plus fitting of top cover, code no. 060-109766                                                                                  |
| Enclosure, IP55 grade                 | Unit mounted in a special IP55 enclosure, code no. 060-033066 or 060-062866. Exception: KP 75                                                   |
| Cable entry                           | Entry for 6 – 14 mm diameter cable                                                                                                              |
| Mounted on backplate or wall bracket  | Vibration-proof in the range 0 – 1000 Hz, 4 g [1 g = 9.81 m/s <sup>2</sup> ]                                                                    |
| Mounted on angle bracket              | Not recommended for areas where vibration occurs                                                                                                |

## Charges

**Figure 8: Charges**



## Absorption charge

The charge consists partly of a superheated gas and partly of a solid substance with a large absorption surface.

The solid substance is concentrated in the sensor, and consequently it is always the sensor that comprises the temperature-regulating part of the thermostatic element.

The sensor can be placed both warmer or colder than the thermostat housing and capillary tube. However, placing it in an ambient temperature higher or lower than 20 °C can affect the accuracy of the scale.

## Setting

### Thermostats with automatic reset

Set the upper limit temperature on the range scale. Then set the differential on the DIFF scale. The temperature set on the range scale is also the temperature at which contact changeover re-occurs on rising temperature. The contacts changeover when the temperature has fallen to a value lower than that set on the DIFF scale.

If at lower settings the plant will not start/stop, the reason might be that the differential has been set too high.

### Thermostats with minimum reset

Set the temperature on the range scale. The differential setting is fixed.

Min. reset units will restart after the temperature at the thermostat sensor has risen by a value greater than that of the fixed differential.

### Thermostats with maximum reset

Set the stop temperature on the range scale. The differential setting is fixed.

Max. reset units will restart after the temperature at the thermostat sensor has fallen by a value greater than that of the fixed differential.

## Dimensions [mm] and weights [kg]

### Single pressure switch, type KP and KPI

Figure 9: KP 35, 36, KPI 35, 36, 38, Net weight 0.3 kg

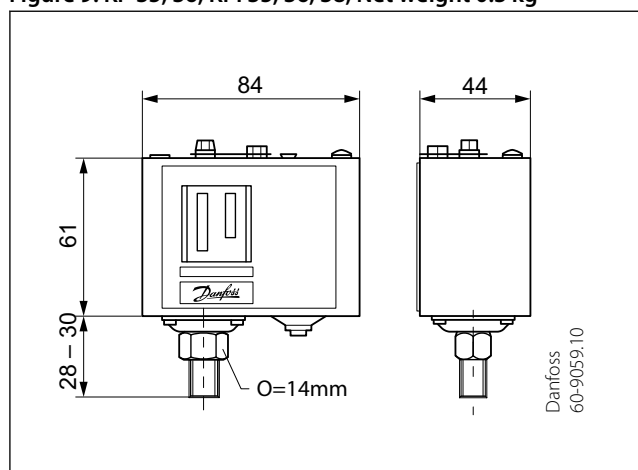


Figure 10: IP55 enclosure

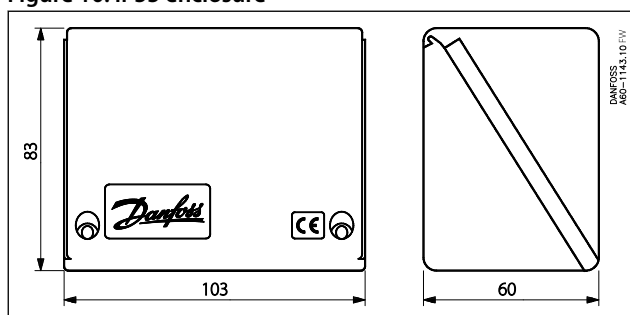


Figure 11: Wall bracket

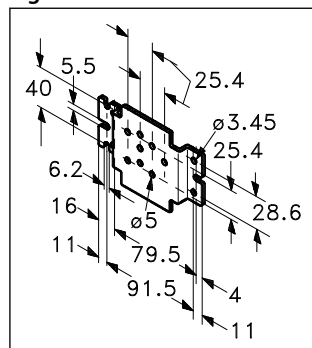
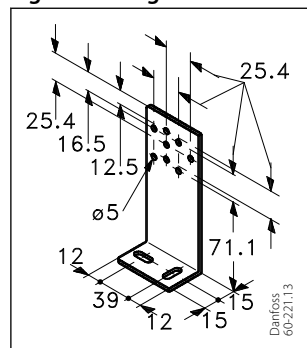


Figure 12: Angle bracket



## Single pressure switch, type KP (Boiler version)

Figure 13: KP 35, 36 (net weight approx. 0.34 kg)

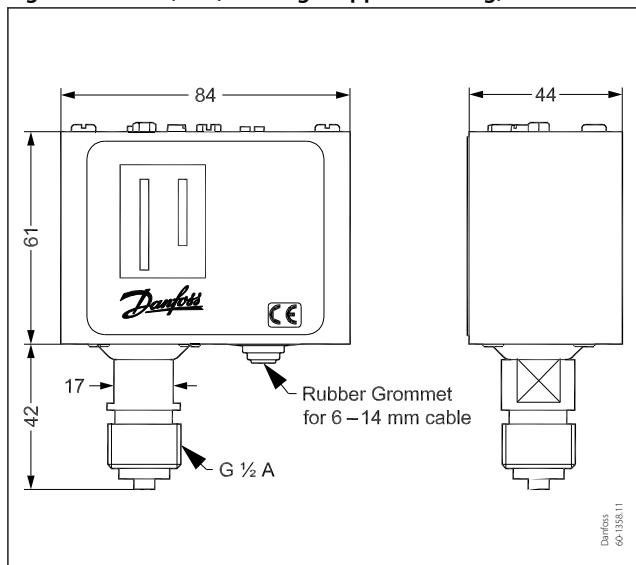
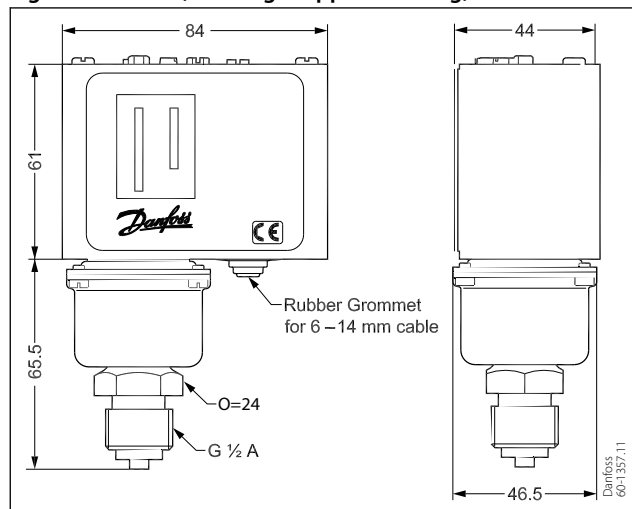
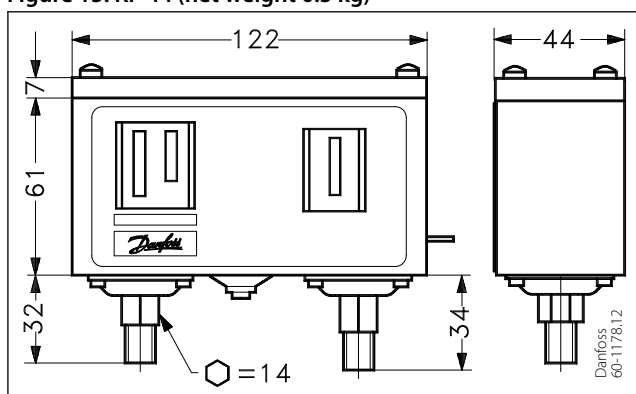


Figure 14: KP 34 (net weight approx. 0.43 kg)



## Dual pressure switch, type KP 44

Figure 15: KP 44 (net weight 0.5 kg)



## Thermostat, type KP

Figure 16: KP 75, 78, 79, 81 (net weight 0.4 kg)

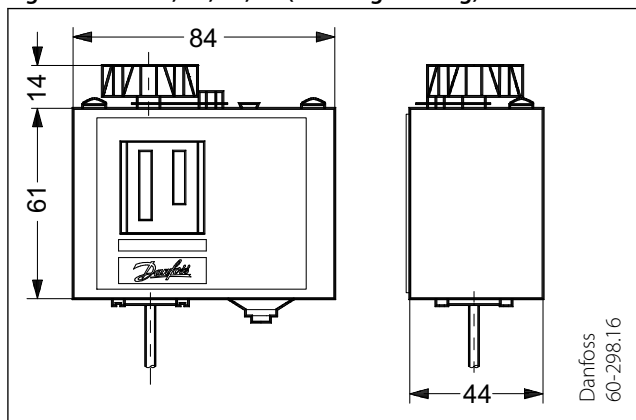


Figure 17: IP55 enclosure

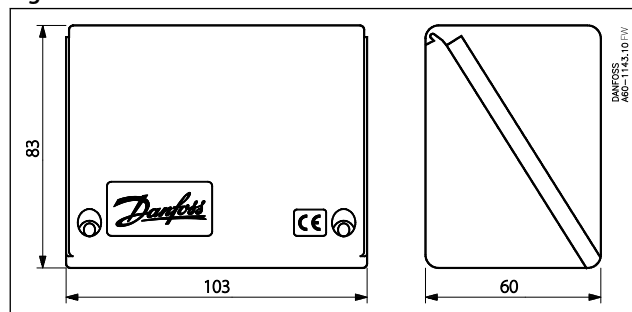


Figure 18: KP 75 Sensor: Tinned copper Cu/Sn 5      Figure 19: KP 78, 79, 81 Sensor: Tinned copper Cu/Sn 5

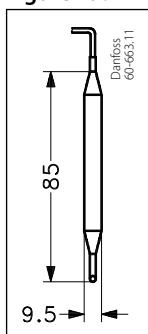
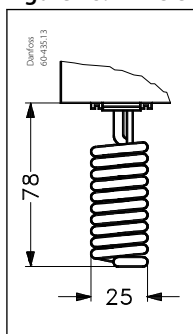


Figure 20: Wall bracket

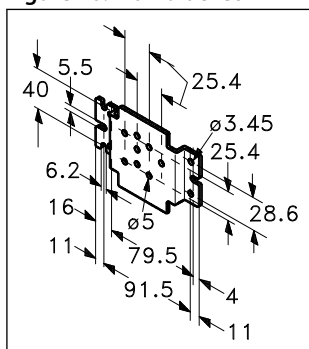
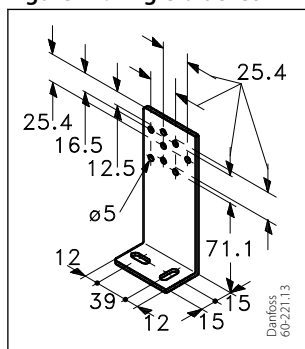


Figure 21: Angle bracket

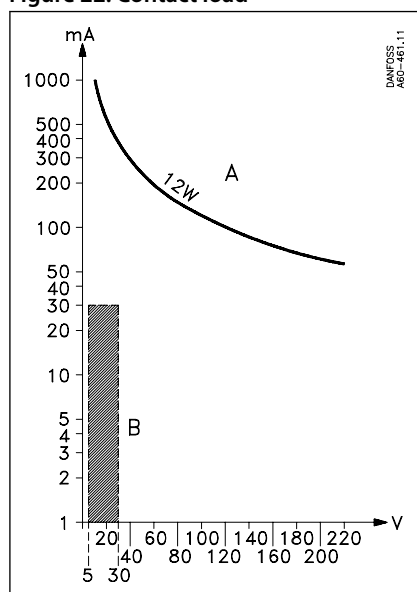


## General information gold contacts

Table 6: Gold contacts

| Contact material                             | Gold-plated silver                                                                                                                                                               |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact system                               | <p>SPDT</p> <p>Line</p> <p>1</p> <p>2</p> <p>4</p> <p>SPDT</p> <p>Single-pole double throw (SPDT)</p>                                                                            |
|                                              | <p><b>Alternating current:</b><br/>Ohmic load: AC-1: 10 A, 440 V<br/>Inductive load: AC-3: 6 A, 440 V and AC-15: 4 A, 440 V</p> <p><b>Direct current:</b> DC-13: 12 W, 220 V</p> |
| Contact load (when Au surface is burnt away) |                                                                                                                                                                                  |

Figure 22: Contact load



- |          |                                                             |
|----------|-------------------------------------------------------------|
| <b>A</b> | Gives the maximum load                                      |
| <b>B</b> | Acceptable load for the gold plating of the contact (DC-13) |

## Terminology

### Range setting / Set point

The pressure range within which the unit will give a signal (contact changeover).

### Differential

The difference between contact changeover on rising and falling pressure. The differential is a condition for stable automatic plant operation.

### Manual reset

A unit with manual reset can only be restored to operational mode by activation of the external reset button. Min. reset units will restart after the pressure has risen by a value greater than that of the fixed differential. Max. reset units will restart after the pressure has fallen by a value greater than that of the fixed differential.

### Automatic reset

Units with automatic reset restart automatically after stop.

### Permissible operating pressure

The highest permissible constant pressure or pressure variation the unit can be exposed to.

### Maximum test pressure

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

### Maximum working pressure

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

### 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:

## Pressure switch and Thermostat, Type KP and KPI

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|         |                                                                                                                  |
|---------|------------------------------------------------------------------------------------------------------------------|
| 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                                                         |

## Ordering

### Pressure switch, type KP and KPI

Table 7: Pressure switch, types KP 35 and KP 36

| Type  | Setting range P <sub>e</sub> | Differential | Permissible operating pressure P <sub>e</sub> | Max. test pressure | Pressure connection | Contact material | Code no.                                |
|-------|------------------------------|--------------|-----------------------------------------------|--------------------|---------------------|------------------|-----------------------------------------|
|       | [bar]                        | [bar]        | [bar]                                         | [bar]              |                     |                  |                                         |
| KP 35 | -0.2 – 7.5                   | 0.7 – 4.0    | 17                                            | 22                 | G ¼ A               | silver           | 060-113366<br>060-113391 <sup>(1)</sup> |
|       | -0.2 – 7.5                   | 0.7 – 4.0    | 17                                            | 22                 | G ¼ A               | gold-plated      | 060-504766                              |
|       | -0.2 – 7.5                   | 0.7 – 4.0    | 17                                            | 22                 | G ¼ A               | silver           | 060-538666 <sup>(2)</sup>               |
|       | -0.2 – 7.5                   | 0.7 – 4.0    | 17                                            | 22                 | G ¼ A               | silver           | 060-450366 <sup>(3)</sup>               |
| KP 36 | 2.0– 14.0                    | 0.7 – 4.0    | 17                                            | 22                 | G ¼ A               | silver           | 060-110866<br>060-110891                |
|       | 2.0– 14.0                    | 0.7 – 4.0    | 17                                            | 22                 | G ¼ A               | gold             | 060-113766                              |
|       | 2.0– 14.0                    | 0.7 – 4.0    | 17                                            | 22                 | G ¼ A               | silver           | 060-450166 <sup>(3)</sup>               |
|       | 2.0– 14.0                    | 0.7 – 4.0    | 17                                            | 22                 | G ¼ A               | silver           | 060-538766 <sup>(2)</sup>               |
|       | 4.0 – 12.0                   | 0.5 – 1.6    | 17                                            | 22                 | G ¼ A               | silver           | 060-122166                              |
|       | 4.0 – 12.0                   | 0.5 – 1.6    | 17                                            | 22                 | G ¼ A               | gold             | 060-114466                              |

<sup>(1)</sup> Available only in Asia market

<sup>(2)</sup> IP55 transparent enclosure

<sup>(3)</sup> Stainless steel version, IP55 non-transparent enclosure

Table 8: Pressure switch, types KPI 35 – KPI 38

| Type   | Setting range P <sub>e</sub> | Differential | Permissible operating pressure P <sub>e</sub> | Max. test pressure | Pressure connection | Contact material | Code no.                  |
|--------|------------------------------|--------------|-----------------------------------------------|--------------------|---------------------|------------------|---------------------------|
|        | [bar]                        | [bar]        | [bar]                                         | [bar]              |                     |                  |                           |
| KPI 35 | -0.2 – 8.0                   | 0.4 – 1.5    | 18                                            | 18                 | G ¼ A               | silver           | 060-121766                |
|        | -0.2 – 8.0                   | 0.4 – 1.5    | 18                                            | 18                 | G ¼ A               | gold-plated      | 060-316466                |
|        | -0.2 – 8.0                   | 0.5 – 2.0    | 18                                            | 18                 | G ¼ A               | silver           | 060-121966                |
|        | -0.2 – 8.0                   | 0.4 – 1.5    | 18                                            | 18                 | G ¼ A               | silver           | 060-315766 <sup>(4)</sup> |
| KPI 36 | 4.0– 12.0                    | 0.5 – 1.6    | 18                                            | 18                 | G ¼ A               | silver           | 060-118966                |
|        | 4.0– 12.0                    | 0.5 – 1.6    | 18                                            | 18                 | G ¼ A               | gold-plated      | 060-113866                |
|        | 2.0 – 12.0                   | 0.5 – 1.6    | 18                                            | 18                 | G ¼ A               | silver           | 060-316966                |
|        | 2.0 – 12.0                   | 0.5 – 1.6    | 18                                            | 18                 | G ¼ A               | silver           | 060-319366 <sup>(5)</sup> |
| KPI 38 | 8.0 – 28.0                   | 1.8 – 6.0    | 30                                            | 30                 | G ¼ A               | silver           | 060-508166                |
|        | 8.0 – 28.0                   | 1.8 – 6.0    | 30                                            | 30                 | G ¼ A               | silver           | 060-541866                |

<sup>(4)</sup> IP55 transparent enclosure

<sup>(5)</sup> IP55 non-transparent enclosure

Table 9: Pressure switch, types KP 34 – KP 37, boiler version

| Type  | Setting range p <sub>e</sub> | Differential | Reset     | Pressure connection | Max. test pressure | Contact material | Code no.   |
|-------|------------------------------|--------------|-----------|---------------------|--------------------|------------------|------------|
|       | [bar]                        | [bar]        |           | [bar]               | [bar]              |                  |            |
| KP 34 | 0.1 – 1.0                    | 0.1 – 0.4    | Automatic | G ½ A               | 4.0                | silver           | 060-216466 |
|       | 0.1 – 1.0                    | 0.2          | Manual    | G ½ A               | 4.0                | silver           | 060-216366 |
| KP 35 | 0.4 – 3.4                    | 0.4 – 2.2    | Automatic | G ½ A               | 10                 | silver           | 060-216666 |
|       | 0.4 – 3.4                    | 0.5          | Manual    | G ½ A               | 10                 | silver           | 060-216566 |
| KP 36 | 1.0 – 10.0                   | 0.7 – 4.0    | Automatic | G ½ A               | 17                 | silver           | 060-215966 |
|       | 1.0 – 10.0                   | 0.7          | Manual    | G ½ A               | 17                 | silver           | 060-216066 |
| KP 37 | 4.0 – 20.0                   | 1.8 – 3.1    | Automatic | G ½ A               | 28                 | silver           | 060-216166 |
|       | 4.0 – 20.0                   | 3.0          | Manual    | G ½ A               | 28                 | silver           | 060-216266 |

## Pressure switch and Thermostat, Type KP and KPI

**Table 10: Pressure switch, type KP 44**

| Pressure range |              | Differential  |              | Permissible operating pressure p <sub>e</sub> [bar] | Max. test pressure [bar]        | Pressure connection | Contact material | Code no.   |
|----------------|--------------|---------------|--------------|-----------------------------------------------------|---------------------------------|---------------------|------------------|------------|
| Control [bar]  | Safety [bar] | Control [bar] | Safety [bar] |                                                     |                                 |                     |                  |            |
| 2.0 – 12.0     | 0.5 – 6.0    | 0.7 – 4.0     | 1.0          | Left side: 17<br>Right side: 17                     | Left side: 25<br>Right side: 19 | 2 × G ¼ A           | Silver           | 060-001366 |

## Thermostat, type KP

**Table 11: Thermostat, types KP 75 – KP 81**

| Type               | Setting range [°C] | Differential [°C] | Max. sensor temperature [°C] | Capillary tube length [m] | Contact material | Code no.   |
|--------------------|--------------------|-------------------|------------------------------|---------------------------|------------------|------------|
| KP 75              | 0 – 40             | 3 – 10            | 80                           | Room sensor               | silver           | 060L121266 |
| KP 75              | 0 – 40             | 3 – 10            | 80                           | Room sensor               | gold-plated      | 060L117166 |
| KP 78              | 30 – 90            | 5 – 15            | 150                          | 2                         | silver           | 060L118466 |
| KP 79              | 50 – 100           | 5 – 15            | 150                          | 2                         | silver           | 060L112666 |
| KP 81              | 80 – 150           | 7 – 20            | 200                          | 2                         | silver           | 060L112566 |
| KP 81              | 80 – 150           | 7 – 20            | 200                          | 3                         | silver           | 060L118366 |
| KP 81              | 80 – 150           | 7 – 20            | 200                          | 5                         | silver           | 060L117066 |
| KP 81 (max. reset) | 80 – 150           | 8 (max. reset)    | 200                          | 2                         | silver           | 060L115566 |

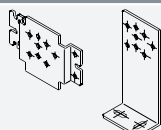
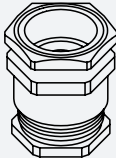
## Accessories for KP pressure switches

**Table 12: KP pressure switches**

| Part                                      | Symbol | Description                                                                                                                                                                                                              | Code no    |
|-------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Brackets with mounting screws and washers |        | Wall bracket for KP                                                                                                                                                                                                      | 060-105566 |
|                                           |        | Angle bracket for KP                                                                                                                                                                                                     | 060-105666 |
| Screwed cable entry                       |        | PG 13.5 with special nut For 6 – 14 mm diameter cables                                                                                                                                                                   | 060-105966 |
| Sealing screw                             |        | For sealing the setting on KP                                                                                                                                                                                            | 060-105766 |
| Top cover                                 |        | If a bracket is mounted on the backplate of the housing, the KP thermostats will have an IP44 grade of enclosure. The cover protects the setting spindles                                                                | 060-109766 |
| Protective cap                            |        | Protective cap for KP pressure switches and thermostats. To protect the unit against rain and humidity. Grade of enclosure: IP44 Material: Polyethylene Max. ambient temperature: 65 °C Min. ambient temperature: -40 °C | 060-003166 |
| IP55 nontransparent enclosure             |        | If the unit risk being exposed to heavy water influence a better grade of enclosure can be achieved when mounting product in a special IP55 enclosure                                                                    | 060-033066 |
| IP55 transparent enclosure                |        | If the unit risk being exposed to heavy water influence a better grade of enclosure can be achieved when mounting product in a special IP55 enclosure                                                                    | 060-062866 |

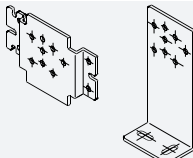
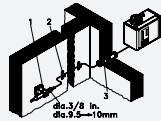
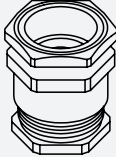
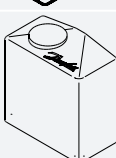
## Accessories for KP 44 pressure switches

Table 13: KP 44 pressure switches

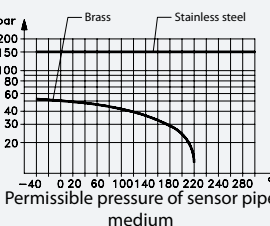
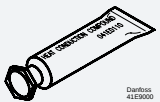
| Part                                      | Symbol                                                                            | Description                                            | Total | Code no.   |
|-------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------|-------|------------|
| Brackets with mounting screws and washers |  | Wall bracket                                           | 1     | 060-105566 |
|                                           |                                                                                   | Angle bracket                                          | 1     | 060-105666 |
| Screwed cable entry                       |  | PG 13.5 with special nut for 6 – 14 mm diameter cables | 1     | 060-105966 |
| Sealing screw                             |  | For sealing the setting on KP                          | 2     | 060-105766 |

## Accessories for KP thermostats

Table 14: Accessories

| Part                                      | Symbol                                                                              | Description                                                                                                                                                                                                              | Total | Code no.   |
|-------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|
| Brackets with mounting screws and washers |   | Wall bracket for KP                                                                                                                                                                                                      | 1     | 060-105566 |
|                                           |                                                                                     | Angle bracket for KP                                                                                                                                                                                                     | 1     | 060-105666 |
| Sensor holder                             |  | Sensor holder for wall mounting with four capillary tube clips and 9-off 12 mm pins                                                                                                                                      | 1     | 017-420166 |
| Screwed cable entry                       |  | PG 13.5 with special nut For 6 – 14 mm diameter cables A standard Pg 16 cable entry can be used for 8 – 16 mm diameter cables                                                                                            | 1     | 060-105966 |
| Sealing screw                             |  | For sealing the setting on KP                                                                                                                                                                                            | 2     | 060-105766 |
| Top cover                                 |  | If a bracket is mounted on the backplate of the housing, the KP thermostats will have an IP44 grade of enclosure. The cover protects the setting spindles                                                                | 1     | 060-109766 |
| Protective cap                            |  | Protective cap for KP pressure switches and thermostats. To protect the unit against rain and humidity. Grade of enclosure: IP44 Material: Polyethylene Max. ambient temperature: 65 °C Min. ambient temperature: -40 °C | 1     | 060-003166 |

## Pressure switch and Thermostat, Type KP and KPI

| Part                            | Symbol                                                                                                                                                                 | Description                                                                                                                                                    | Total | Code no.   |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|
| Sensor pocket                   | <br> | For all KP thermostats with cylindrical remote sensor. Sensor pocket, gasket and union for screwing into G½ connectors welded onto tubes, containers, etc.     |       |            |
|                                 |                                                                                                                                                                        | Int. diameter 9.6 mm, insert depth 112 mm (brass). Ext. diameter 11 mm.                                                                                        | 1     | 017-437066 |
|                                 |                                                                                                                                                                        | Int. diameter 9.6 mm, insert depth 112 mm (st 18/8). Ext. diameter 11 mm.                                                                                      | 1     | 017-436966 |
|                                 |                                                                                                                                                                        | Int. diameter 9.6 mm, insert depth 465 mm (brass). Ext. diameter 11 mm.                                                                                        | 1     | 017-421666 |
|                                 |                                                                                                                                                                        | Media temperature for sensor: 250 °C This temperature can be increased by applying a different gasket material                                                 |       |            |
| Heat-conductive aluminium paste | Tube                                                                                  | For KP and RT thermostats with sensor mounted in a sensor pocket.<br>Temperature range: -20 – 150 °C (short-lived 220 °C)<br><br>Tube with 6 g aluminium paste | 1     | 041E0115   |

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**Table 15: Certificates, declaration and approvals**

| Document name           | Document type                             | Document topic | Approval authority |
|-------------------------|-------------------------------------------|----------------|--------------------|
| BK_W_0862_01_2018       | Food and Health - Performance Certificate |                | PZH                |
| RU Д-ДК.ГА02.В.03367    | EAC Declaration                           | EMC            | EAC                |
| RU C-ДК.ВЛ08.В.00063_18 | Electrical - Safety Certificate           | EMC/LVE        | EAC                |
| ELE-086320XG-003        | Marine - Safety Certificate               |                | RINA               |
| UA.1O146.D.00075-19     | UA Declaration                            | EMCD/LVD       | LLC CDC EURO TYSK  |

- CE-marked in accordance with LVD 2014/35/EU: EN 60947-1, EN 60947-4-1, EN 60947-5-1
- Underwriters Laboratories Inc., UL
- China Compulsory Certificate, CCC (excluding boiler versions)

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