Data sheet

Pressure Control Type KP

KP pressure controls are for use in refrigeration and air conditioning systems to give protection against excessively low suction pressure or excessively high discharge pressure.

KP pressure controls are also used for starting and stopping refrigeration compressors and fans on air-cooled condensers.

KP pressure controls are fitted with a single-pole double-throw (SPDT) switch. The position of the switch is determined by the pressure control setting and the pressure at the connector.

KP pressure controls are IP44. Versions for IP30 and IP55 are available on request.

Features

- Ultra-short bounce time thanks to snap-action function (reduces wear to a minimum and increases reliability)
- Manual trip function (electrical contact function can be tested without the use of tools)
- Vibration and shock resistant
- Compact design
- Fully welded bellows element
- High reliability both electrically and mechanically

Approvals

CE-marked in accordance with:
– LVD 2006/95/EC (EN 60947-1, EN 60947-4-1, EN 60947-5-1)
– PED 97/23/EC, category IV (EN 12263)

Underwriters Laboratories Inc., UL listed
China Compulsory Certificate, CCC

Ship approvals

Germanischer Lloyd, GL
Det Norske Veritas, Norway, DNV
Registro Italiano Navale, RINA

Bureau Veritas, BV
Lloyd's Register, LR
Russian Maritime Register of Shipping, RMRS

Materials in contact with the medium

Unit type	Material
KP 1, KP 5	Tinbronze, no. CW452K, EN 1652
	Nickel plated free cutting steel, no. 1.0737 / 1.0718, EN 10277

Technical data

Ambient temperature		-40 – 65 °C (80 °C for max. 2 hours)	
Max. working pressure		LP: PS/MWP = 17 bar	
		HP: PS/MWP = 32 bar	
Max. test pressure		LP: Pe = 20 bar	
		HP: Pe = 35 bar	
Contact load	**Alternating current**	AC1: 16 A, 400 V	
		AC3: 16 A, 400 V	
		AC15: 10 A, 230 V	
	Direct current	DC13: 12 W, 220 V control current	
Wire dimensions		solid / stranded	0.75 – 2.5 mm^2
		flexible, without ferrules	0.7 – 2.5 mm^2
		flexible, with ferrules	0.5 – 1.5 mm^2
Tightning torque		max. 2 NM	
Rated impulse voltage		4 kV	
Pollution degree		3	
Short circuit protection, fuse		16 A	
Insulation		400 V	
Enclosure		IP44	

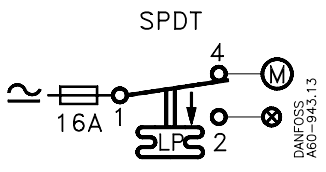
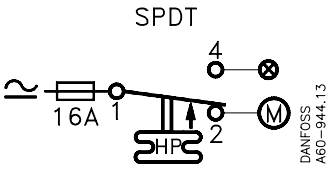
Cable connection
The cable entry can be used for 6 – 14 mm dia. cables. A Pg 13.5 screwed cable entry can also be used for 6 – 14 mm cable. With 8 – 16 mm cable a standard Pg 16 screwed cable entry can be used.

Enclosure
IP30 to EN 60529 / IEC 60529
Enclosure IP30 is obtained when the units without top cover are mounted on a flat surface or bracket. The bracket must be fixed to the unit so that all unused holes are covered.

IP44 to EN 60529 / IEC 60529
Enclosure IP44 is obtained when the units with top cover are mounted on a flat surface or bracket. The bracket must be fixed to the unit so that all unused holes are covered.

IP55 to EN 60529 / IEC 60529
IP55 is obtained when the KP pressure controls are mounted in an IP55 enclosure.
Enclosures must be ordered separately:
060-062866 transparent
060-033066 non-transparent enclosure.

Contact systems

Low pressure (LP)	High pressure (HP)
	

Ordering

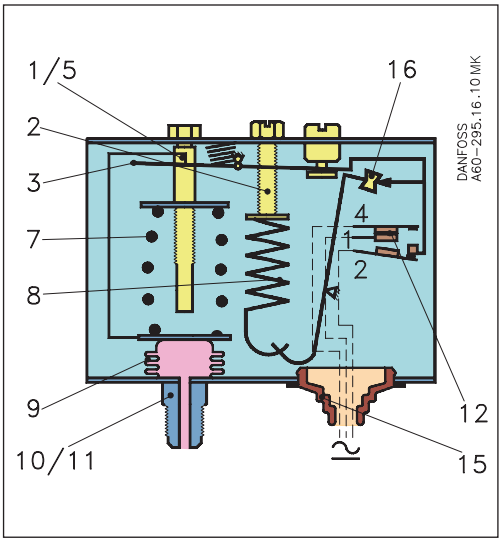
Pressure controls dedicated for market in Asia (PL01). For HCFC and non-flammable HFC refrigerants

Pressure	Type	Low pressure (LP)		High pressure (HP)		Reset		Contact system	Code no.
		Regulating range [bar]	Differential Δp [bar]	Regulating range [bar]	Differential Δp [bar]	Low pressure LP	High pressure HP		
Low	**KP 1**	-0.2 – 7.5	0.7 – 4.0	—	—	Auto	—	SPDT	**060-110191**
High	**KP 5**	—	—	8 – 32	1.8 – 6.0	—	Auto	SPDT	**060-117191**

Design / Function

1. Low pressure (LP) setting spindle
2. Differential setting spindle
3. Main arm
5. High pressure (HP) setting spindle
7. Main spring
8. Differential spring
9. Bellows
10. LP connection
11. HP connection
12. Switch
13. Terminals
15. Cable entry
16. Tumbler
18. Locking plate

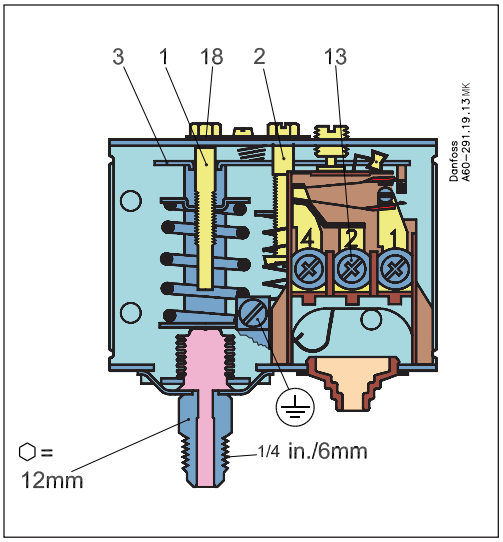
Pressure control, type KP



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

The bellows becomes connected to the low or high pressure side of the plant through connection (10) or (11).

KP 1, KP 5



The design of the KP affords the following advantages:
– high contact load
– ultra-short bounce time
– high resistance to pulsation
– vibration resistance up to 4 g in the range 0 – 1000 Hz
– long mechanical and electrical life

Terminology

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

Reset
KP controls have automatic reset thus the unit is restored to operational mode automatically.

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

Maximum test pressure
The maximum pressure applied in strength or leakage tests on refrigeration systems 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.

Setting

Low pressure controls
Set the LP start pressure on the "CUT-IN" scale (range scale).
One rotation of the low pressure spindle ~ 0.7 bar.
Set the LP differential on the "DIFF" scale. One rotation of the differential spindle ~ 0.15 bar.
The LP stop pressure is the LP start pressure minus the differential.

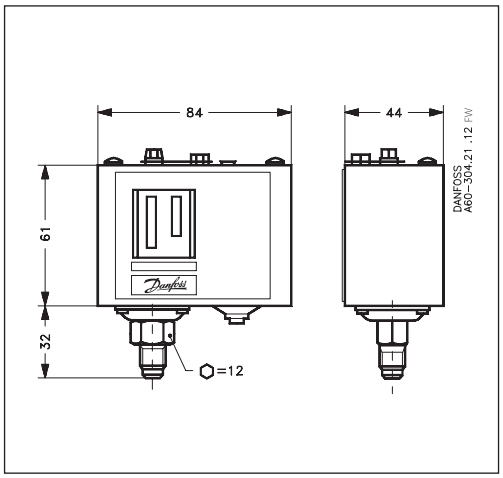
Note:
The LP stop pressure must be above absolute vacuum (p_e = -1 bar)!

If with low stop pressure the refrigeration compressor will not stop, check to ensure that the differential value has not been set too high!

High pressure controls
Set the HP pressure on the "CUT-OUT" scale.
One rotation of the HP spindle ~ 2.3 bar.
Set the HP differential on the "DIFF" scale.
One rotation of the differential spindle ~ 0.3 bar.
The HP start pressure is the HP stop pressure minus the differential.
Start and stop pressures for both the LP and HP sides of the system should always be checked with an accurate pressure gauge.

Dimensions [mm] and weights [kg]

Flare connection



KP with IP55 enclosure