Data sheet



Pressure switch

KP

Description

The KP pressure switches can be used as safety switches against too low a suction pressure and / or too high a discharge pressure in refrigeration and air conditioning systems. They can also be used to start / stop compressors and fans for air-cooled condensers.
They are available in both single and dual versions and include a single pole double throw (SPDT) switch.

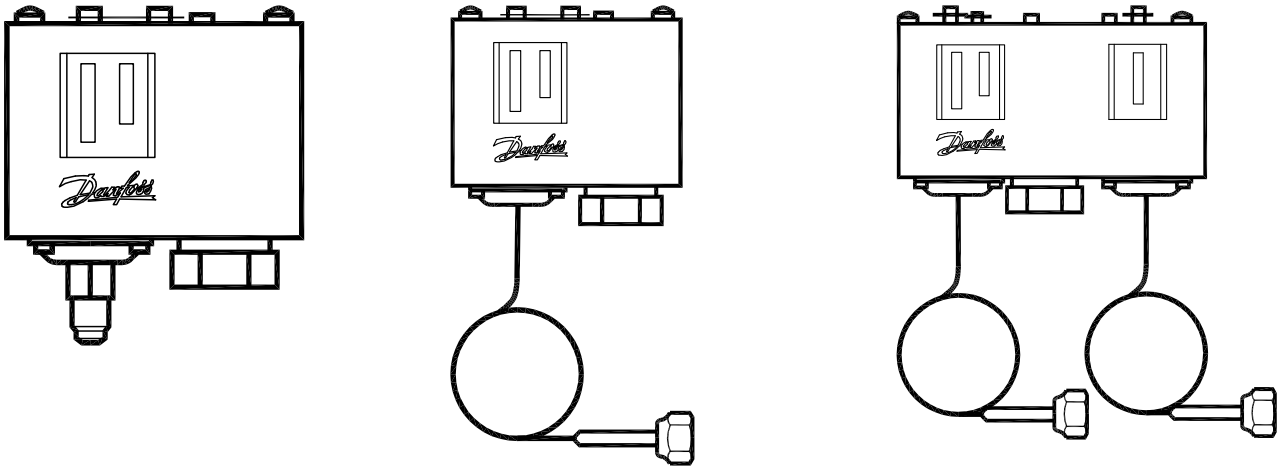
Features & benefits

- Ultra-short bounce time thanks to snapaction function (reduces wear to a minimum and increases reliability)
- Available with gold-plated contacts
- SPDT switch design offers open or close switching action on pressure rise or fall
- Fail safe double bellows prevent refrigerant loss and system contamination - standard on KP 7 and KP 17 pressure switches
- Convenient manual trip feature to test electrical contact function - no tools needed
- Pressure wire connectors for easy electrical wiring
- No spade or lug terminals required
- Integral ½ NPSM swivel cable connector allows direct attachment of ½ in male pipe thread connector
- Lockplate prevents tampering with range and differential settings
- Universal mounting hole patterns

Ordering

Product code numbers

Figure: Ordering



For R22, R134a, R404A, R407A, R407C, R407F, R422B, R422D, R448A, R449A, R450A, R452A, R507A, R513A

For complete list of approved refrigerants, visit www.products.danfoss.com and search for individual code numbers, where refrigerants are listed as part of technical data.

Table: Ordering

Type	Pressure	Low pressure (LP)		High pressure (HP)		Reset		Contact function	Code no.	
		Regulating range	Differential Δp	Regulating range	Differential Δp	Low pressure	High pressure		connection	
		[inHg] [psig]	[psi]	[psig]	[psi]	[LP]	[HP]		¼ in flare	Cap. tube w. ¼ in flare nut 36 in
KP 1	Low	6 in – 108	10 – 58	–	–	Auto	–	SPDT	060-200191	–
KP 1	Low	6 in – 108	10 – 58	–	–	Auto	–	SPDT	–	060-205191
KP 1	Low	27 in – 100	10	–	–	Man. (Min.)	–	SPDT	–	060-205291[1]
KP 2	Low	6 in – 50	6 – 32	–	–	Auto	–	SPDT	–	060-206391
KP 5	High	–	–	115 – 465	25 – 85	–	Auto	SPDT	060-201491	–
KP 5	High	–	–	115 – 465	25 – 85	–	Auto	SPDT	–	060-206491
KP 7W[2]	High	–	–	115 – 465	58 – 140	–	Auto	SPDT	060-200391	–
KP 7W[2]	High	–	–	115 – 465	58 – 140	–	Auto	SPDT	–	060-205391
KP7B[2]	High	–	–	115 – 465	58	–	Man. (Max.)	SPDT	060-200491	–
KP7B[2]	High	–	–	115 – 465	58	–	Man. (Max.)	SPDT	–	060-205491
KP 15	Dual	6 in – 108	10 – 58	115 – 465	58	Auto	Auto	SPDT/w. L P signal	060-200891	–
KP 15	Dual	6 in – 108	10 – 58	115 – 465	58	Auto	Auto	SPDT/w. L P signal	–	060-205891
KP 15	Dual	6 in – 108	10 – 58	115 – 465	58	Auto	Man. (Max.)	SPDT/w. L P signal	–	060-205991
KP 15	Dual	6 in – 108	10 – 58	115 – 465	58	Man. (Min.)	Man. (Max.)	SPDT/w. L P signal	–	060-206091
KP 15	Dual	6 in – 108	10 – 58	115 – 465	58	Auto	Auto	SPDT/w. LP + HP signal	–	060-203191
KP 15	Dual	6 in – 108	10 – 58	115 – 465	58	Auto	Man. (Max.)	SPDT/w. LP + HP signal	060-202691	–
KP 17W[2]	Dual	6 in – 108	10 – 58	115 – 465	58	Auto	Auto	SPDT/w. LP + HP signal	–	060-202991

[1] With dial knob

[2] With fail safe double bellows - 060-205291

Metric conversions

1 psi = 0.07 bar

5/9 (t1 °F - 32) = t2 °C

Functions

Operation

Terminology

Reset

1. Manual reset: Units with manual reset can only be reset during operation by activation of the reset button.
2. Automatic reset: After operational stop, these units reset automatically.

Maximum working pressure

The Maximum working pressure is determined by the pressure that can be safely allowed in the refrigerating system or any of the units within it. The maximum working pressure is designated MWP.

Test pressure

The test pressure is the pressure used in strength tests and / or leakage tests on refrigerating systems or individual parts in systems. The test pressure is designated Pe.

"Snap function"

A certain contact force is maintained until irrevocable "snap" is initiated. The time during which the contact force approaches zero is thus limited to a very few milliseconds. Therefore contact bounce cannot occur as a result of, for example, slight vibrations, before the cut-out point. Contact systems with "Snap function" will change over even when micro-welds are created between the contacts during cut-in. A very high force is created during cut-out to separate the contacts. This force immediately shears off all the welds. Thus the cut-out point of the unit remains very accurate and completely independent of the magnitude of the current load.

Settings

Pressure switches with automatic reset – LP: Set the LP start pressure on the "CUT-IN" scale (range scale). One rotation of the low pressure spindle ~10 psi. Set the LP differential on the "DIFF" scale. One rotation of the differential spindle ~ 3 psi. The LP cut-out pressure is the LP cut-in pressure minus the differential.

NOTE:

The LP cut-out pressure must be above absolute vacuum pe = 30 in Hg. If compressor will not stop at low cut-out pressure, check whether the differential value is set at too high a value!

Metric conversions 1 psi = 0.07 bar

Pressure switches with automatic reset – HP: Set the HP cut-out pressure on the "CUT-OUT" scale. One rotation of the HP spindle ~ 33 psi. Set the HP differential on the "DIFF" scale.

One rotation of the differential spindle ~ 4 psi. The HP cut-in pressure is the HP cut-out pressure minus the differential. Pressure switches with manual reset. Set the cut-out pressure on "CUT-OUT" scale (range scale). Low pressure controls can be manually reset when the pressure is equal to the cut-out pressure plus the differential.

High pressure switches can be manually reset when the pressure is equal to the cut-out pressure minus the differential.

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

Product details

General data

Table: Technical data

Features	Values
Ambient temperature	-40 – 149 °F (175 °F for maximum 2 hours)
Maximum working pressure	LP: MWP = 245 psig
	HP: MWP = 465 psig
Maximum test pressure	LP: pe = 285 psig
	HP: pe = 510 psig
Switch	Single pole changeover switch (SPDT)
Contact load	120 V AC: 16 FLA, 96 LRA
	240 V AC: 8 FLA, 48 LRA
	240 V DC: 12 W pilot duty
Terminal D, dual switches	240 V, 50 VA

Cable entry
Integral ½ in female NPSM swivel cable connector allows direct attachment of ½ in male pipe thread connector.

Enclosure
~NEMA 1
This grade of enclosure 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.

~ NEMA 2
This grade of enclosure 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

Materials

Table: Materials in contact with the medium

Control type	Material
KP 1, KP 2, KP 5, KP 7, KP 15, KP 17, KP 25	Tin bronze, no. CW452K, EN 1652 Nickel plated free cutting steel, no. 1.0737 / 1.0718 to EN 10277
KP with cap. tube	Copper SF-Cu, no. 2.0090 to DIN 1787

Table: Electrical wiring

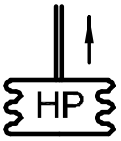
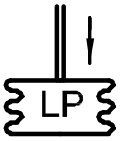
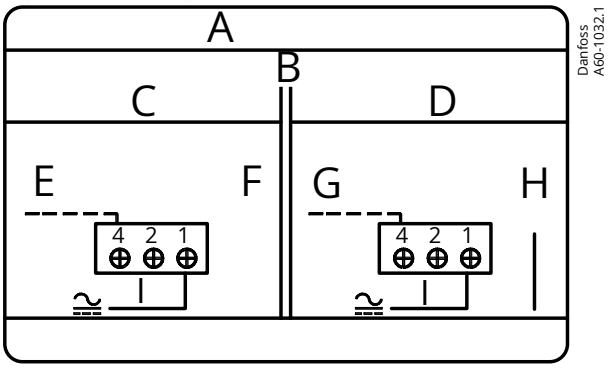
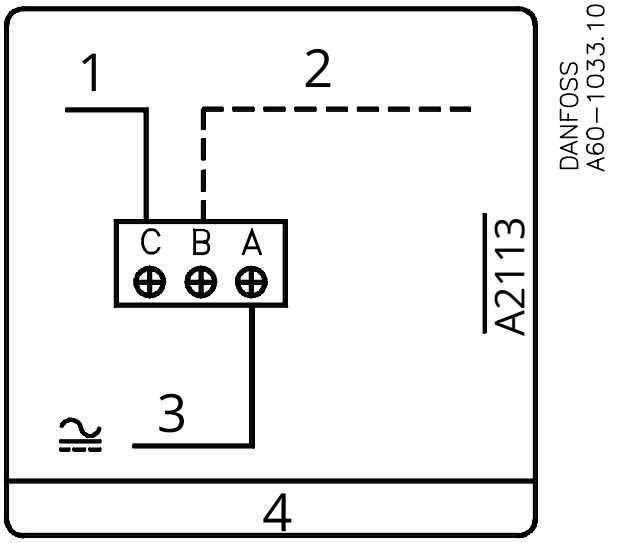
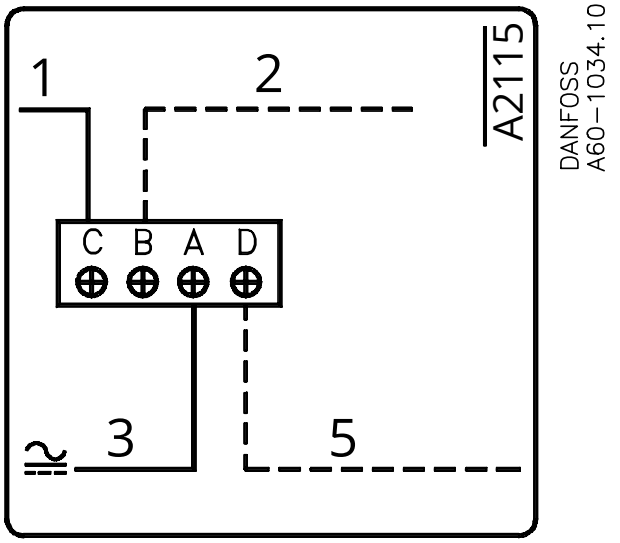
Load	Signal option	Bellows movement on pressure rise	Bellows movement on pressure drop
			

Figure: Low or high pressure

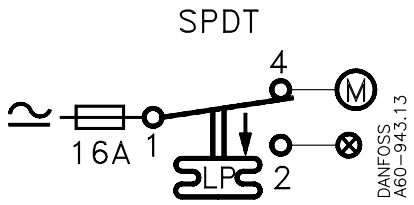
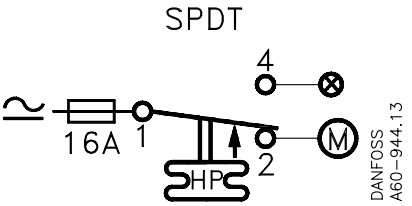
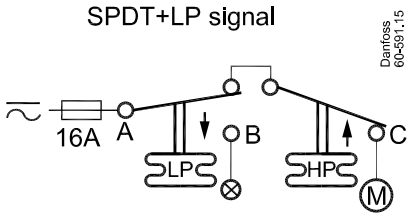
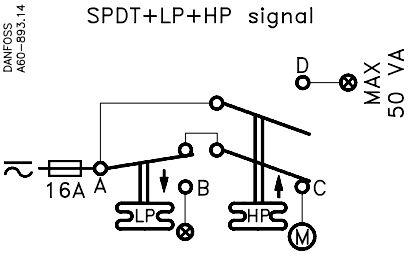


A	SPDT - signal pole double throw
B	Pressure / Temperature
C	Rise
D	Drop
E	Load Cut-in (term.1 – 4)
F	Load Cut-out (term.1 – 2)
G	Load Cut-out (term.1 – 4)
H	Load Cut-in (term.1 – 2)
I	Line

Dual (low and high) pressure, LP signal	Dual (low and high) pressure, LP and HP signal
	

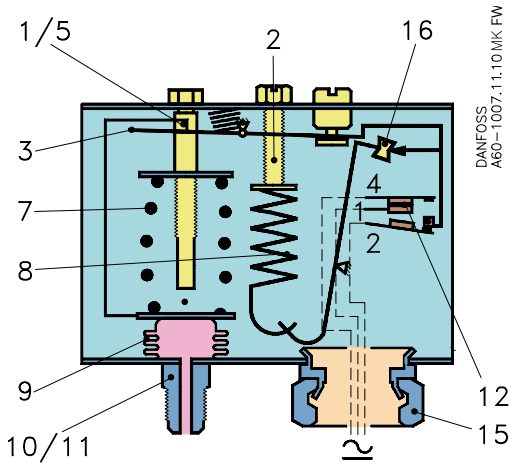
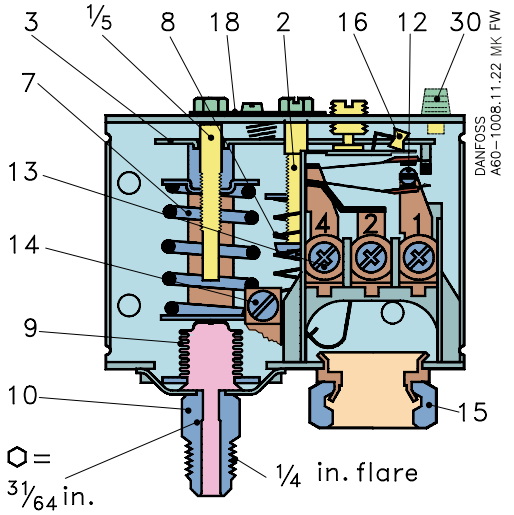
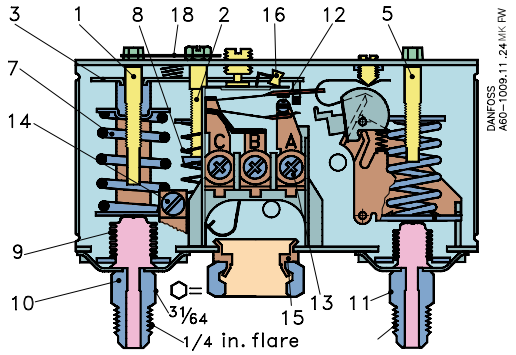
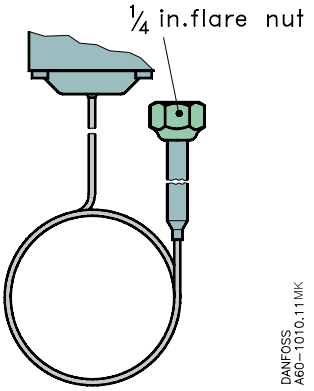
1.	Load
2.	LP - signal option
3.	Line

4.	Wiring instruction
5.	HP - signal option

Low pressure, LP: KP 1 and KP 2	High pressure, HP: KP 5, KP 7W and KP 7B
	
Dual (low and high) pressure: KP 15, KP 17W, KP 17B and KP 25	**Dual (low and high) pressure: KP 15, KP 17W, KP 17B and KP 25**
	

Metric conversions
1 psi = 0.07 bar
5/9 (t_1 °F - 32) = t_2 °C

Design

Pressure switch, type KP	KP 1, KP 2, KP 5 FWF
	
KP 15, KP 25 flare	**KP 1, KP 2, KP 5, KP 15, KP 25, KP 7W, KP 7B, KP 17W, capillary tube**
	

1.	Low pressure setting spindle, (LP)
2.	Differential setting spindle
3.	Main arm
5.	High pressure setting spindle, (HP)
7.	Main spring
8.	Differential spring
9.	Bellows
10.	LP connection
11.	HP connection

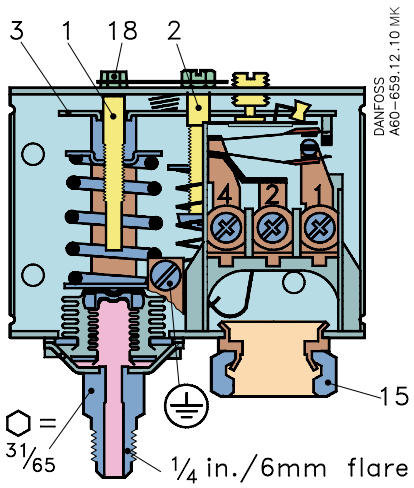
12.	Switch
13.	Terminals
14.	Earth terminal
15.	Cable entry
16.	Tumbler
18.	Locking plate
19.	Arm
30.	Reset button

The switch in the KP has a snap-action function where the bellows move only when the cut-in or cut-out value is reached.
The bellows are connected to the low or high pressure side of the system through connection (10) or (11).

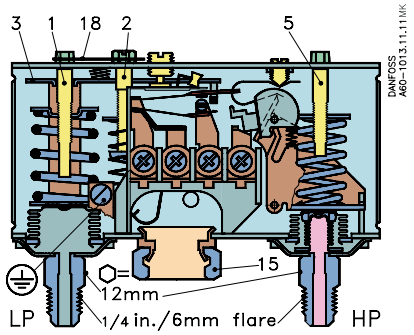
The design of the KP gives the following advantages:

- 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

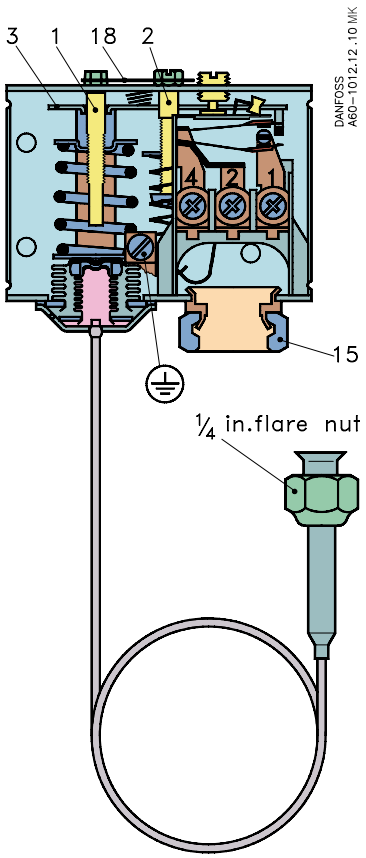
KP 7W (KP 7B), flare



KP 17W (KP 17B), flare



KP 7W (KP 7B), capillary tube



1.	Pressure setting spindle, (LP)
2.	Differential setting spindle
3.	Main arm

5.	Pressure setting spindle, (HP)
15.	Cable entry
18.	Locking plate

The KP with designations W or B have been tested and approved by TÜV (Germany) in accordance with EN 12263.

Versions with designation W will cut in automatically when the pressure has fallen to the setpoint minus the differential.

Versions with designation B can be cut in manually using the external reset button when:
KP 1 – the pressure has increased to 10 psi above the setpoint.
KP 7 – the pressure has fallen 58 psi below the setpoint.

KP 7 and KP 17 are equipped with fail-safe double bellows; a regulation bellows and an outer bellows. The double bellows system protects against loss of system charge in the event of a bellows rupture.

A rupture in the outer bellows will cause the control to trip approximately 43 psi lower than the actual control setting. This features provides a warning without a loss of charge.

All KP pressure switches, including those which are PED-approved, operate independently of changes in the ambient temperature around the control housing. Therefore the set cut-out pressure and differential are kept constant provided the permissible ambient temperatures are not exceeded.

Dimensions

Table: Flare connection

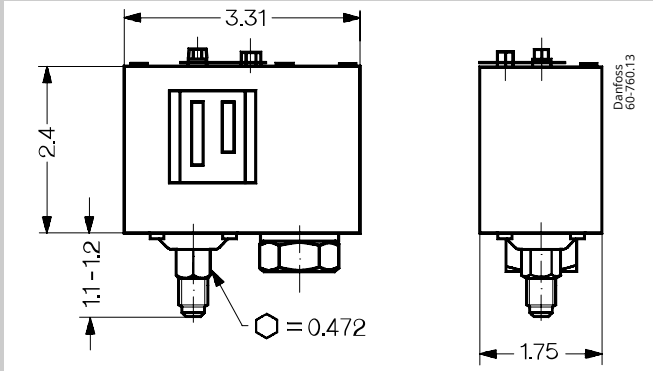
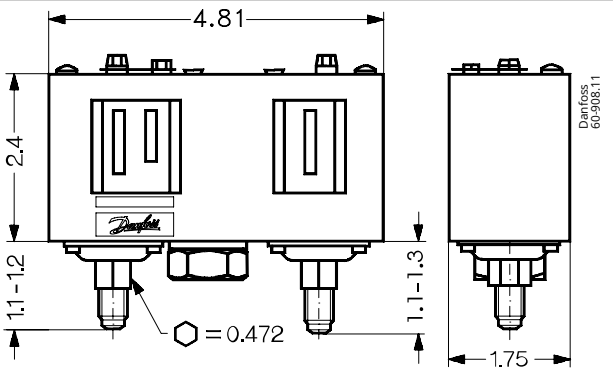
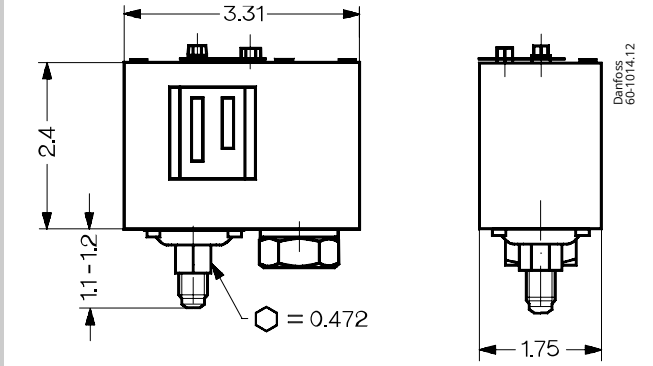
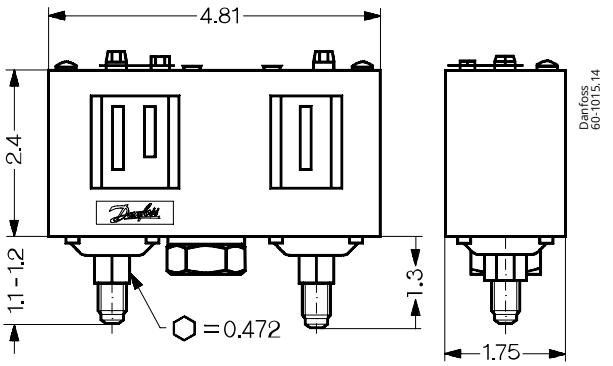
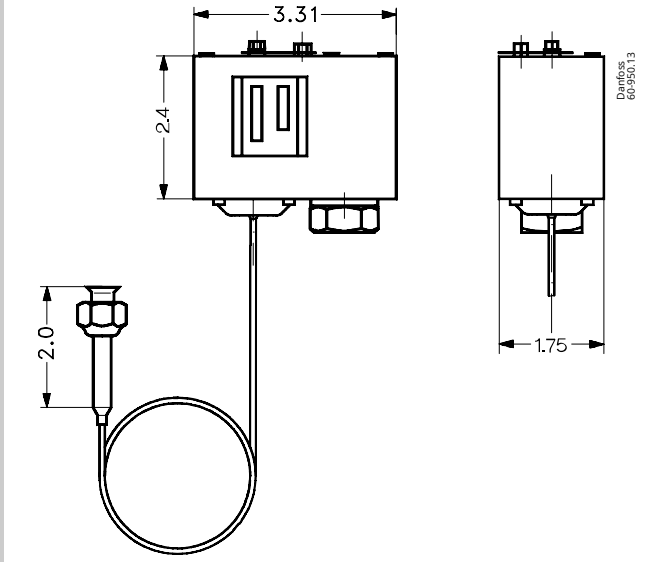
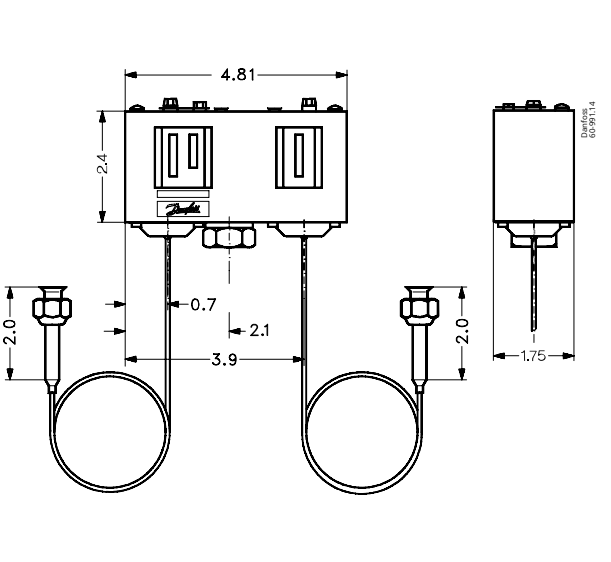
KP 1, KP 2 and KP 5	KP 15 and KP 25
	
KP 7W and KP 7B	**KP 17W and KP 17B**
	

Table: Capillary tube connection

KP 1, KP 2, KP 5, KP 7W and KP 7B	KP 15, KP 17W, KP 17B and KP 25
	

Net weight:
KP 1, KP 2, KP 5 and KP 7:
approx. 0.7 lbs.
KP 15, KP 17 and KP 25:
approx. 1.1lbs.

Metric conversions:
1 in = 25.5 mm

1 lb = 0.454 kg

Table: KP switches, rear side

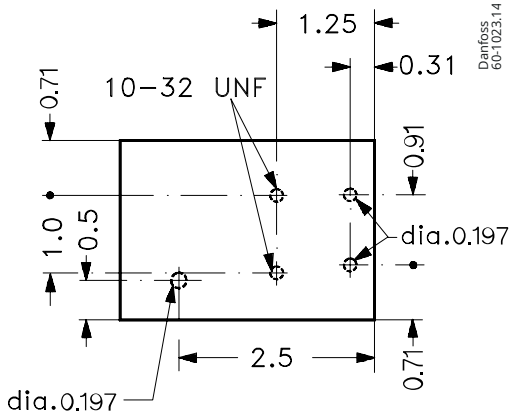
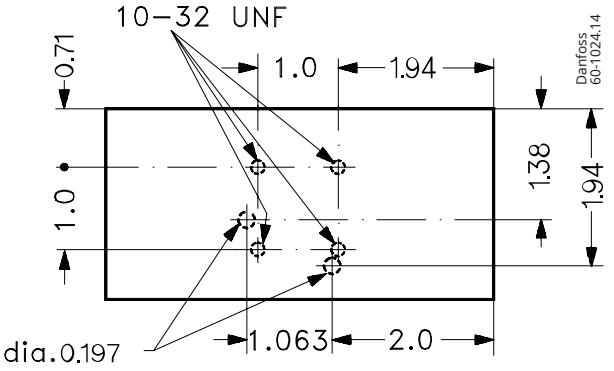
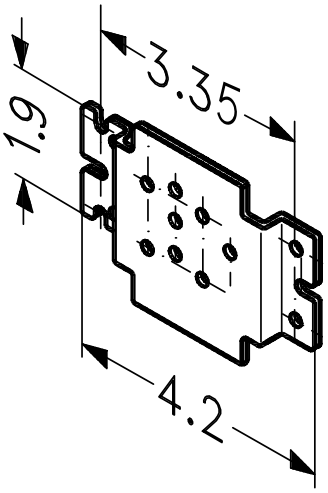
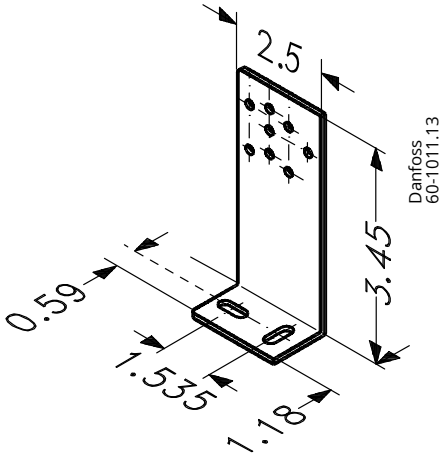
Single switches	Dual switches
	

Table: Bracket dimensions

Wall bracket	Angle bracket
	

Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
Manufacturer's Declaration	Danfoss MD 060-9638.AA	Danfoss	China RoHS
CCC Declaration	Danfoss CCC 2020970305003385	Danfoss	CCC
Mechanical Safety Certificate	UL MH27572	UL - Underwriters Laboratories inc.	
Marine Certificate	LR21358064TA	LR - Lloyd's Register	
CCC Declaration	Danfoss CCC 2020970305003384	Danfoss	
Pressure Safety Certificate	TÜV 01 202 969/B-22-0003_01	TÜV Rheinland - Technischer ÜberwachungsVerein	Pressure
Electrical Safety Certificate	EAC KZ 7100841.01.01.01391	EAC - Eurasian Customs Union	EMC
Pressure Safety Certificate	TÜV 0879-PESR-B(P)-21484-7-DE	TÜV NORD - Technischer ÜberwachungsVerein	Pressure
UA Declaration	Danfoss UA 2023-01-10 Regulators PL01 PL04	Danfoss	Pressure
Pressure Safety Certificate	LLC CDC EURO-TYSK UA.TR.089.1015.05-22	LLC CDC EURO TYSK - Ukraine	Pressure
Marine Certificate	DNV GL TAA00001VZ Rev. 1	DNV	
UA Declaration	Danfoss UA 2024-07-25 cooling sensors	Danfoss	LVD
CCC Declaration	Danfoss CCC 2024010305686618	CCC - China Compulsory Certification	CCC
CCC Declaration	Danfoss CCC 2024010305641303	CCC - China Compulsory Certification	CCC
EU Declaration	Danfoss EU 060-9650AF	Danfoss	LVD
Export Control Declaration	Pressure switches & Thermostats	Danfoss	
Marine Certificate	BV 03650-L0 BV	BV - Bureau Veritas	
Quality Assurance Certificate	TÜV 0045 202 9120 Z 00544 25 D 000 00	TÜV NORD - Technischer ÜberwachungsVerein	Pressure

Electrical Safety Certificate	Certificate UL-US-L31024-13-30303891-3	UL - Underwriters Laboratories inc.	UL-CSA
EU Declaration	Danfoss EU 060-9653.AL	Danfoss	LVD
Marine Certificate	RINA ELE282125XG	RINA - Registro Italiano Navale	
Electrical Safety Certificate	UL 60730	UL - Underwriters Laboratories inc.	

Contact details

Online support

Danfoss offers a wide range of support along with our products, including digital information, software, mobile apps and expert guidance. See the possibilities below.

The Danfoss Design center

Discover the Design Center, our advanced digital platform that streamlines product selection. With integrated tools and enhanced type pages, it's simpler than ever to access product information and documentation, and to select the right products. Check the availability of Danfoss products at partner locations and enjoy seamless transitions from selection to purchase with our basket-to-basket functionality. Whether you're buying from our distributors or directly from the Product Store, the Design Center simplifies your experience. Learn more at: designcenter.danfoss.com.

The Danfoss product store

The Danfoss Product Store is a one-stop shop available 24/7 for our customers, no matter where you are in the world or what area of industry you work in. Browse our catalog, check product details and documentation, view your prices and product availability, and quickly finalize your purchase. Start browsing at: store.danfoss.com.

Danfoss Partner Portal/Product Data tool

Designed to support you with easy access to product data extracts, essential resources, tools, and information. The Partner Portal provides a centralized hub for product documentation, training materials, marketing assets, and technical support, ensuring you have everything you need to succeed and grow your business with Danfoss. The Partner Portal is available 24/7 at: partner.danfoss.com and is ready to support your business.

Find technical documentation

Find technical documentation you need to get your project up running. Get direct access to our official collection of data sheets, certificates and declarations, manuals and guides, 3D models and drawings, case stories, brochures, and much more. Start searching now at: documentation.danfoss.com.

Danfoss Learning

Danfoss Learning is a free online learning platform. It features courses and materials specifically designed to help engineers, installers, service technicians, and wholesalers better understand the products, applications industry topics, and trends that will help you do your job better. Find your local Danfoss website here: learning.danfoss.com.

Get local information and support

Local Danfoss websites are the main sources for help and information about our company and products. Find product availability, get the latest reginal news, or connect with a nearby expert - all in your own language. Find your local Danfoss website here: danfoss.com.

Danfoss A/S

Climate Solutions . danfoss.com . +45 7488 2222

Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues description, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the products. All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.