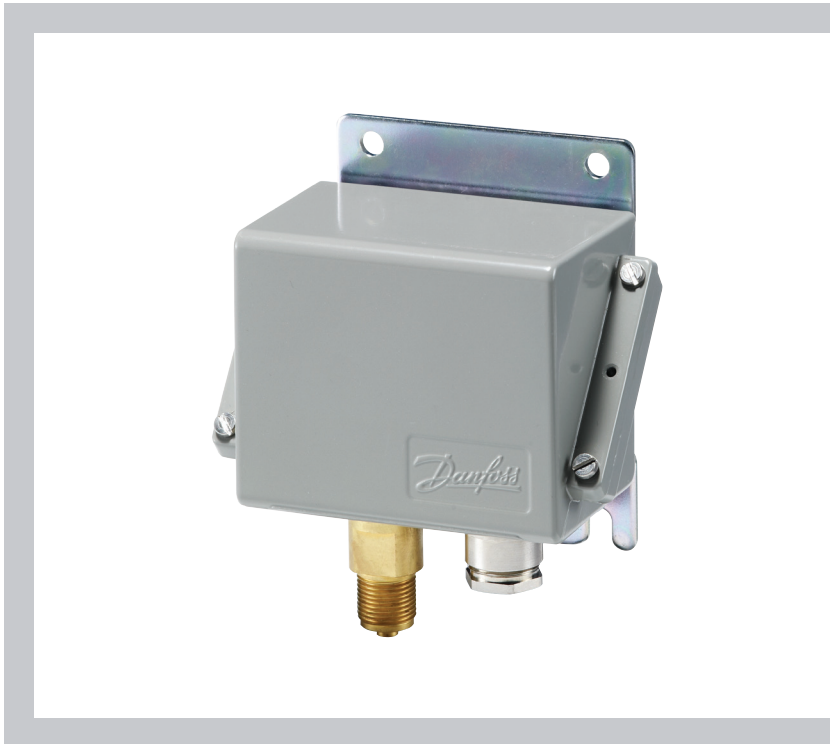




Data sheet

Pressure and temperature control Type KPS



The KPS Series consists of a series of pressure and temperature controlled switches. In this series, special attention has been given to meeting demands for a high level of enclosure, robust and compact construction, and resistance to shock and vibration.

For KPS pressure controls the position of the contacts depends on the pressure in the inlet connection and the set scale value.

For KPS temperature controls the position of the contacts depends on the temperature of the sensor and the set scale value.

The series covers most outdoor as well as indoor application requirements and is suitable for use in monitoring alarm and control systems in factories, diesel plants, compressors, power stations and on board ships.

Features

- A high level of enclosure
- Adjustable differential
- Robust and compact construction
- Resistance to shock and vibration
- Available with all major marine approvals

Approvals

CE-marked in accordance with:
– LVD 2006/95/EC
(EN 60947-1, EN 60947-4-1, EN 60947-5-1)

Underwriters Laboratories Inc., US-UL
China Compulsory Certificate, CCC

Ship approvals

American Bureau of Shipping, ABS
Det Norske Veritas, DNV
Germanischer Lloyd, GL
Registro Italiano Navale, RINA (KPS 43, KPS 45, KPS 47, KPS 76, KPS 77, KPS 79, KPS 80, KPS 81, KPS 83)
Maritime Register of Shipping, RMRS

Nippon Kaiji Kyokai, NKK (KPS 31, KPS 33, KPS 35, KPS 37, KPS 39, KPS 43, KPS 45, KPS 47)
China Classification Society, CCS
Bureau Veritas, BV
Korean Register of Shipping, KR (KPS 35, KPS 37, KPS 39, KPS 43, KPS 45, KPS 47)
Lloyds Register of Shipping, LR

Overview

1. Standard pressure controls

[bar]								Range P _e [bar]	Type	Further information page
-1	0	10	20	30	40	50	60			
								0 – 2.5	KPS 31	3
								0 – 3.5	KPS 33	3
								0 – 8	KPS 35	3
								6 – 18	KPS 37	3
								10 – 35	KPS 39	3

2. Pressure controls for high pressure and strongly pulsating media

[bar]								Range P _e [bar]	Type	Further information page
-1	0	10	20	30	40	50	60			
								1 – 10	KPS 43	3
								4 – 40	KPS 45	3
								6 – 60	KPS 47	3

3. Temperature controls

[°C]								Range P _e [°C]	Type	Further information page
-50	0	50	100	150	200	200				
								-10 – 30	KPS 76	11
								20 – 60	KPS 77	11
								50 – 100	KPS 79	11
								70 – 120	KPS 80	11
								60 – 150	KPS 81	11
								100 – 200	KPS 83	11

PRESSURE CONTROL

Technical data and ordering



KPS 31, KPS 33



KPS 35, KPS 37, KPS 39

1. Pressure controls

Type	Setting range P _e [bar]	Adjustable/ fixed differential [bar]	Permissible operating pressure P _e [bar]	Max. test pressure [bar]	Pressure connection	Code no.
KPS 31	0 – 2.5	0.1	6	6	G 1/4	060-311066
KPS 31	0 – 2.5	0.1	6	6	G 3/8 A	060-310966
KPS 33	0 – 3.5	0.2	10	10	G 1/4	060-310466
KPS 33	0 – 3.5	0.2	10	10	G 3/8 A	060-310366
KPS 35	0 – 8	0.4 – 1.5	12	12	G 1/4	060-310566
KPS 35	0 – 8	0.4 – 1.5	12	12	G 3/8 A	060-310066
KPS 35	0 – 8	0.4	12	12	G 1/4	060-310866
KPS 37	6 – 18	0.85 – 2.5	22	27	G 1/4	060-310666
KPS 37	6 – 18	0.85 – 2.5	22	27	G 3/8 A	060-310166
KPS 39	10 – 35	2.0 – 6	45	53	G 1/4	060-310766
KPS 39	10 – 35	2.0 – 6	45	53	G 3/8 A	060-310266

2. Pressure controls for high pressure and strongly pulsating media



KPS 43, KPS 45, KPS 47

Type	Setting range P _e [bar]	Adjustable diff. see also figs. 1, 2, and 3 [bar]	Permissible overpressure [bar]	Max. test pressure [bar]	Min. burst pressure [bar]	Pressure connection	Code no.
KPS 43	1 – 10	0.7 – 2.8	120	180	240	G 1/4	060-312066
KPS 45	4 – 40	2.2 – 11	120	180	240	G 1/4	060-312166
KPS 47	6 – 60	3.5 – 17	120	180	240	G 1/4	060-312266

When ordering, please state type and code number

Terminology

Range setting

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

Differential

The difference between make pressure and break pressure (see also fig. 5 & 6, page 6).

Permissible overpressure

The highest permanent or recurring pressure the unit can be loaded with.

Max. test pressure

The highest pressure the unit may be subjected to when, for example, testing the system for leakage. Therefore, this pressure must not occur as a recurring system pressure.

Min. bursting pressure

The pressure which the pressure-sensitive element will withstand without leaking.

Technical data and ordering
(continued)

Switch	Single pole changeover (SPDT)	Contact material: Gold-plated silver contact	
Contact load (when Au surface is burnt away)	Alternating current	Ohmic	10 A, 440 V, AC-1
		Inductive	6 A, 440 V, AC-3
			4 A, 440 V, AC-15
	Starting current	max. 50 A (locked rotor)	
	Direct current	12 W, 220 V, DC-13, see curve, fig. 4, page 5	
Ambient temperature	KPS 31 – 39	-40 – 70 °C	
	KPS 43 – 47	-25 – 70 °C	
Temperature of medium ¹⁾	KPS 31 – 39	-40 – 100 °C	
	KPS 43 – 47	-25 – 100 °C	
Vibration resistance	Vibration-stable in the range 2 – 30 Hz, amplitude 1.1 mm og 30 – 300 Hz, 4 g.		
Enclosure	IP67 to EN 60529 / IEC 60529. The pressure switch housing is enamelled pressure die cast aluminium (GD-ALSi 12). The cover is fastened by four screws which are anchored to prevent loss. The enclosure can be sealed with wire.		
Cable entry	Pg 13.5 for cable diameters from 5 – 14 mm.		
Identification	The type designation and code no. of the unit is stamped in the side of the housing.		

¹⁾ For water and seawater, max. 80 °C.

Types	Scale accuracy	Mean value of snap point variation after 400 000 operations
	[bar]	[bar]
KPS 31	±0.2	±0.1
KPS 33	±0.3	±0.2
KPS 35	±0.5	±0.3
KPS 37	±1.0	±0.4
KPS 39	±3.0	±0.7
KPS 43	±1.0	±0.2
KPS 45	±4.0	±1.0
KPS 47	±6.0	±1.5

Materials in contact with the medium

Type	Materials	
KPS 31, KPS 33	Bellows capsule	Deep-drawn plate, material no. 1.0524 (DIN 1624)
	Bellows	Stainless steel, material no. 1.4306 (DIN 17440)
	Pressure connection	Steel C20, material no. 1.0420 (DIN 1652)
KPS 35, KPS 37, KPS 39	Bellows	Stainless steel, material no. 1.4306 (DIN 17440)
	Pressure connection	Brass, W. no. 2.0401 (DIN 17660)
KPS 43, KPS 45, KPS 47	Diaphragm capsule	Nickel-plated brass, DIN 50 968 Cu/Ni 5 (DIN 1756)
	Diaphragm	Nitrile-Butadien rubber

Technical data and ordering
(continued)

KPS 43

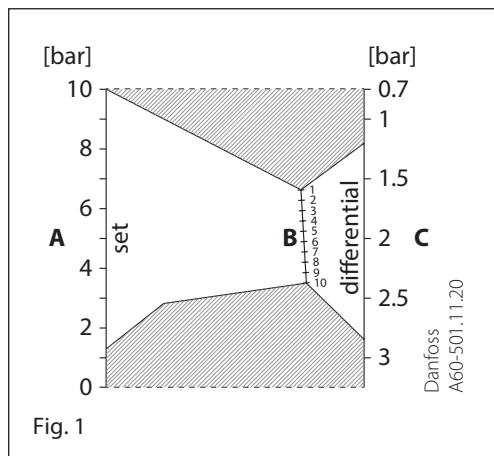


Fig. 1

KPS 45

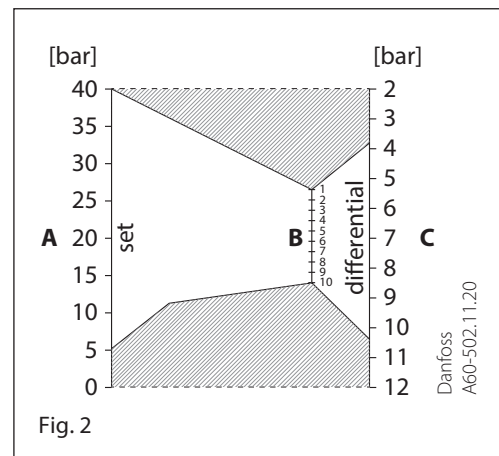


Fig. 2

KPS 47

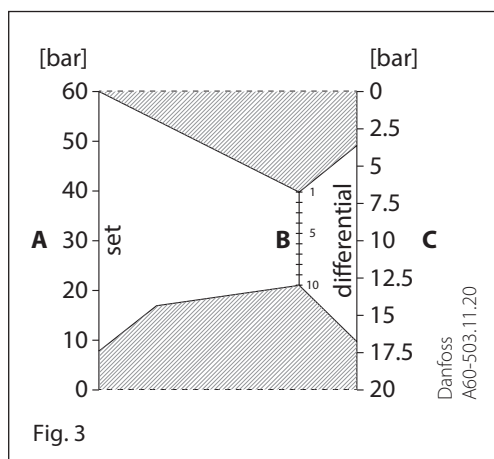


Fig. 3

A: Range setting
B: Differential scale
C: Obtained differential

Direct current (d.c.) -load

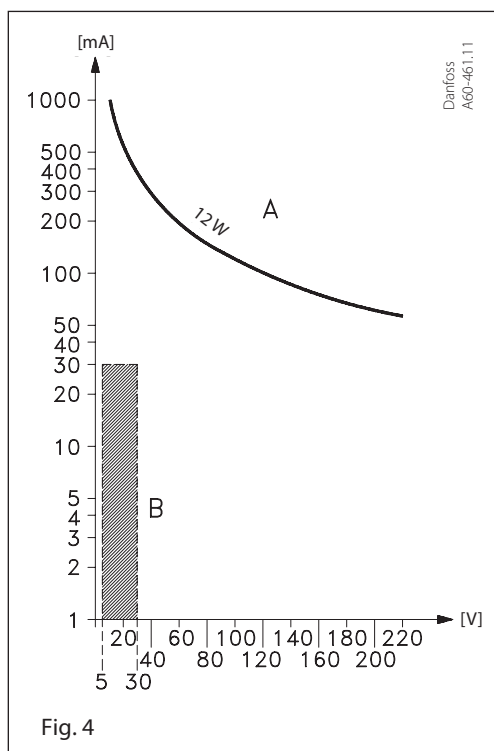


Fig. 4

Curve A:
gives the maximum load

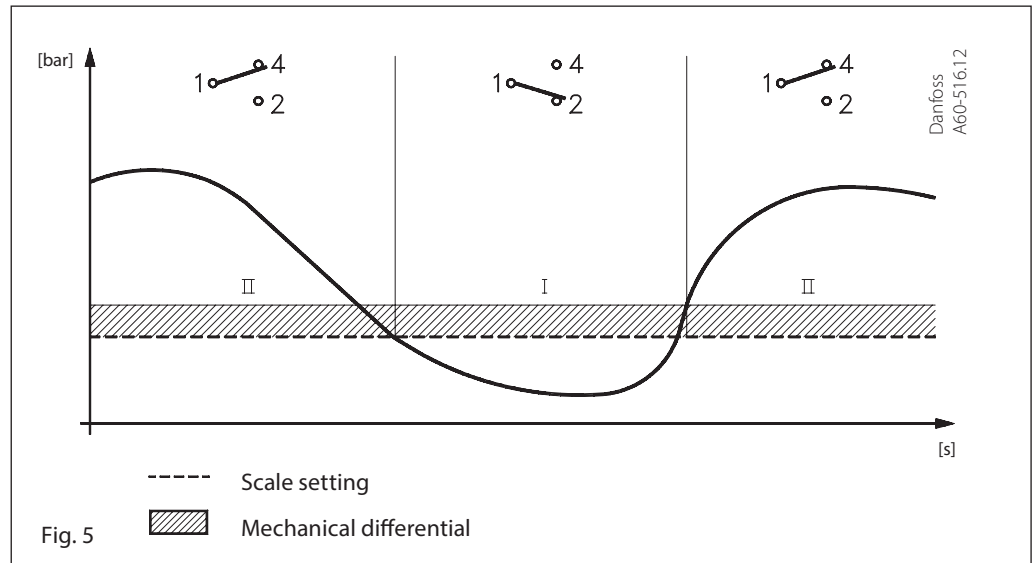
Hatched area B:
Acceptable load for the gold plating of the contact.

Function

1. KPS 31

Contacts 1-2 make and contacts 1-4 break when the pressure falls under the set range value. The contacts changeover to their initial position when the pressure again rises to the set range value plus the differential (see fig. 5).

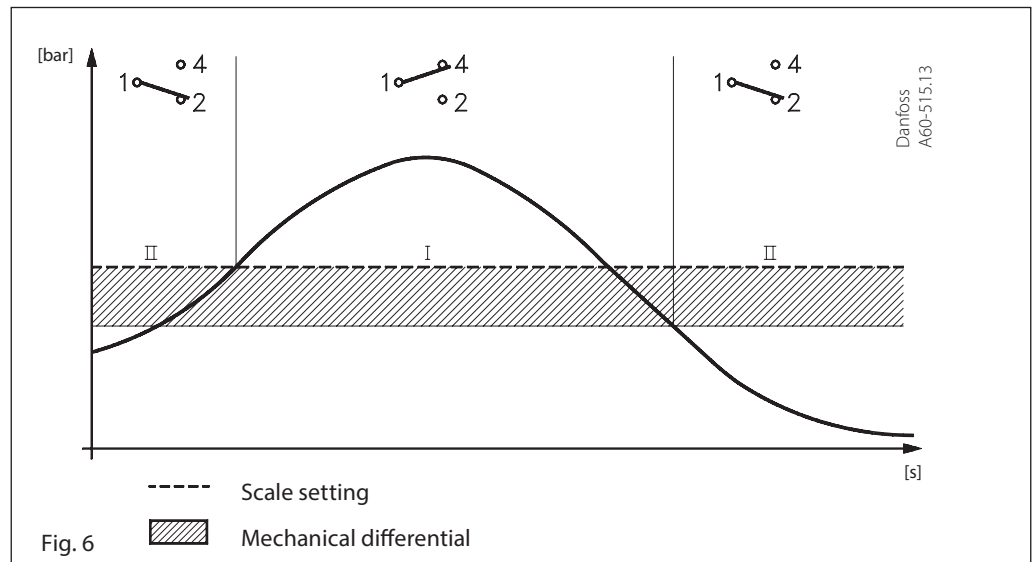
- I. Alarm for falling pressure given at the set range value.
- II. Alarm for rising pressure given at the set range value plus the differential.



2. All other KPS pressure CONTROLS

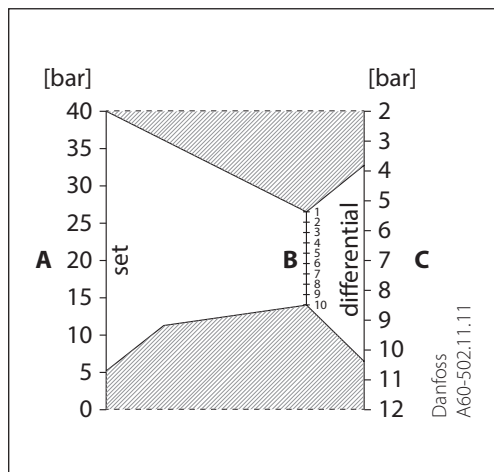
Contacts 1-4 make and contacts 1-2 break when the pressure rises above the set range value. The contacts changeover to their initial position when the pressure again falls to the range value minus the differential (see fig. 6).

- I. Alarm for rising pressure given at the set range value.
- II. Alarm for falling pressure given at the set range value minus the differential



Function
(continued)

KPS 45



Example 1

An alarm must be given when the lubricating oil pressure in an engine falls below 0.8 bar. The alarm is in the form of a lamp. Choose a KPS 31 (range 0 – 2.5 bar). The minimum permissible lubricating oil pressure of 0.8 bar must be set on the range spindle. The differential is fixed at 0.1 bar, i.e. the alarm will not cut out before the pressure rises to 0.9 bar. The lamp must be connected to terminals 1 and 2 in the pressure control.

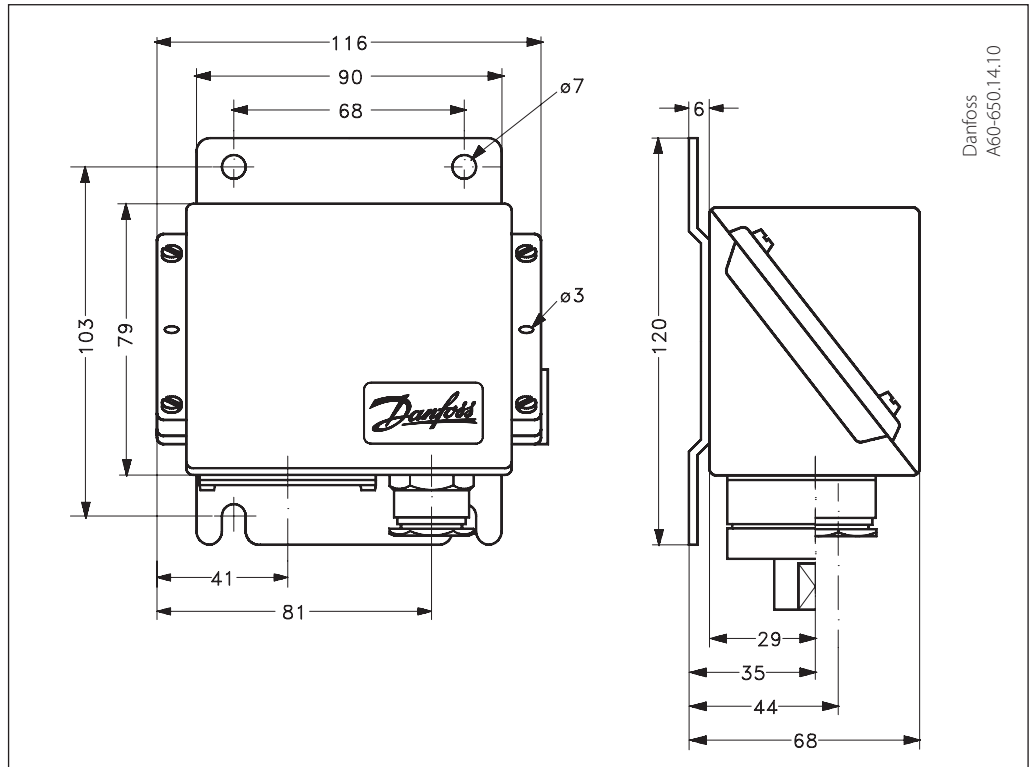
Example 2

An alarm must be given by a bell when the pressure in a boiler rises to 10 bar. The normal operating pressure is 9 bar. Choose a KPS 36 (range 6 – 18 bar). The range value of the pressure control must be set at 10 bar, the differential at 1 bar. The bell must be connected to terminals 1 and 4.

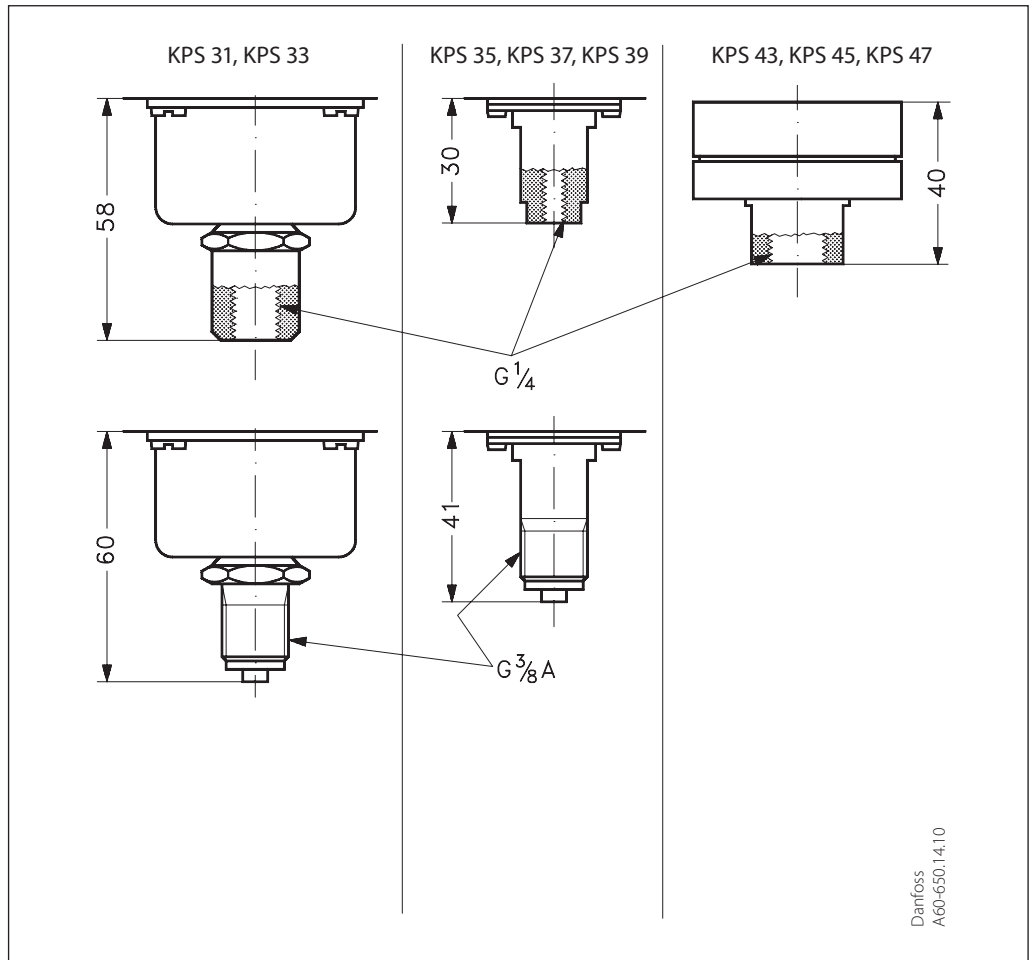
Example 3

The pressure in a start air reservoir must be regulated with a compressor controlled by a KPS pressure switch so that it lies between 30 and 36 bar. Choose a KPS 45 (range 4 – 40 bar). The range value must be set at 36 bar. The differential of 6 bar must be set in accordance with the nomogram, fig. 7, at approx. 2 on the differential scale. The required start function is obtained by connection to terminals 1 and 2 in the pressure control.

Dimensions [mm]
and weights [kg]



Danfoss
A60-650.14.10



Danfoss
A60-650.14.10

Net weight:
KPS 31 – 39 approx. 1.0 kg
KPS 43 – 47 approx. 1.3 kg