

Pressure switch type DG

Product documentation



Piston-type pressure switch

Operating pressure p_{\max} :

700 bar



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1 Overview of pressure switch type DG

Pressure switches open and close an electrical contact at a previously defined pressure. As soon as the pressure is reached, a further work step is started or stopped by an electrical signal.

Features and benefits:

- Compact design
- Option of integration into the HAWE modular system
- Operating pressures up to 1000 bar

Intended applications:

- General hydraulic systems
- Machine tools



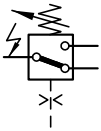
Pressure switch type DG 1



Pressure switch type DG 3

2 Available versions, main data

Circuit symbol:



DG 1



DG 3



Order coding example:

DG 1 RF					
DG 33				- YS 8	
DG 35		- KB			
DG 34	M		V		300 F

Pressure setting (factory-set, optional), bar

- Series: setting with increasing pressure
- Coding F: setting with decreasing pressure

Hydraulic connection ["Table 4"](#)

Adjustment devices ["Table 3"](#)

Low-temperature seal configurable only with DG 35 -X. and DG 364 -X.
Their micro switches are installed with gold contacts.

Electrical connection ["Table 2"](#)

Basic type ["Table 1"](#)

Table 1 Basic type

Basic type	Description	Pressure setting (range) (bar)	
		$p_{\min-\max}$	p_{\max}
DG 1 R	Scale, pipe connection	20 ... 600	600
DG 1 RF	Scale, front ring for control panel installation, pipe connection		
DG 1 RU DG 1 RUF	Scale mounted with 180° rotation, for "suspended" installation		
DG 33 DG 34 DG 35 * DG 36 DG 364 * DG 365	Manifold mounting	200 to 700 100 ... 400 20 to 250 4 to 12 4 to 50 12 to 170	700

* DG 35 and DG 364 in version -X.-KB have different hydraulic data depending on the temperature.
For further information, please look at [Chapter 3.1, "General and hydraulic"](#).

Table 2 Electrical connection

Coding	Electrical connection	Protection class (IEC 60529)	DG 1 R DG 1 RF DG 1 RU	DG 1 RS DG 1 RFS DG 1 RUF	DG 3
--	Terminal connection	IP 54	●		
--	Line connector DIN EN 175 301-803 A	IP 65		●	●
- X	DIN EN 175 301-803 A (without line connector)	IP 54			●
- X1	DIN EN 175 301-803 A (without line connector)	IP 54			●
- AMP	AMP Junior Timer	IP 67			●
- S	SCHLEMMER (bayonet PA 6)	IP 67			●
- M	M12x1 (in compliance with DESINA)	IP 67			●

Table 3 Adjustment devices

Coding	Version
No designation	- Turn knob for DG 1 R(S), DG 1 RF(S) - Adjusting screw for DG 3.. - DG 35.. - KB and DG 364.. - KB with gold contacts only have an adjusting screw
R	only DG 3.. : Adjustable by hand (wing bolt and wing nut)
V	only DG 3.. : Turn knob
H	only DG 3.. : - Lockable turn knob (BKS lock) - Key in line with factory specifications for the automotive industry; a key is included in the scope of delivery (with an additional key held by authorised plant personnel).

Table 4 Hydraulic connection

Suitable for DG 1 R..

For combination with various fittings, see [D 7065](#)

Coding	Connection type
No designation	Directly using a type-B pipe screw connection in accordance with DIN 3852-2 G 1/4 or G 1/2 A connection thread (ISO 228-1 (BSPP)) With union nut DIN 16283 (pressure gauge screw fitting, e.g. DIN 16270)

Suitable for DG 3..

Coding	Connection type
No designation	Manifold mounting
- 1/4	Pipe connection G 1/4 (BSPP)
- Y1	Tapped journal G 1/4 A (BSPP)
- Y2	Tapped journal M12x1.5
- Y3	Tapped journal G 1/8 (BSPP)
- YS 6 - YS 8	Tapered cone Ø6 and Ø8 for a cutting ring and union nut
- Y6 - Y8	Pipe bracket Ø6 and Ø8 for a pipe screw connection

3 Parameters

3.1 General and hydraulic

Description	Pressure switch		
Design	Spring-loaded piston-type pressure switch		
Model	Pipe connection, manifold mounting		
Material	DG 1: Galvanised steel housing DG 3: Zinc die casting housing		
Tightening torques	See Chapter 4, "Dimensions"		
Installation position	DG 1 R.. = Vertical, sideways scale, hydraulic part at the bottom DG 3.. = As desired		
Hydraulic fluid	Hydraulic oil: according to part 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity limits: min. approx. 4, max. approx. 1500 mm ² /s opt. operation approx. 10... 500 mm ² /s. Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C.		
Cleanliness level	ISO 4406 <u>21/18/15...19/17/13</u>		
Temperatures	Ambient: approx. -40 ... +80°C, Fluid: -25 ... +80°C, Note the viscosity range! Start temperature: down to -40°C is permissible (observe start viscosities!), as long as the steady-state temperature is at least 20K higher during subsequent operation. Biologically degradable pressure fluids: Observe manufacturer's specifications. By consideration of the compatibility with seal material not over +70°C.		
Hydraulic data of DG 35 -X.-KB and DG 364 -X.-KB	Temperature range	-30°C < x < 0°C	0°C < x < 50°C
	Speed of pressure change	< 6 bar/s	
	Pressure setting p _{min} to p _{max}	DG 35	80 ... 250 bar
		DG 364	35 ... 50 bar
	Maximum pressure p _{max}	DG 35	500 bar
		DG 364	

Weight

Type	
DG 1 R..	= 1.3 kg
DG 33	= 0.3 kg
DG 34	= 0.3 kg
DG 35	= 0.3 kg
DG 36	= 0.3 kg
DG 364	= 0.3 kg
DG 365	= 0.3 kg
DG 3.. - 1/4	= 0.4 kg
DG 3.. - Y..	= 0.4 kg

3.2 Electrical data

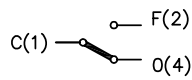
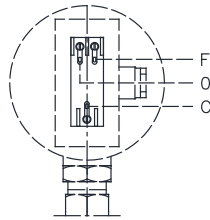
Switching operations/h

Reference values approx. 2000 switching operations/h max. (roughly equally distributed).
Note the number of possible switching cycles; see below. Switching accuracy ± 2 to 3%
(repeat accuracy for increasing pressure!)

Electrical connection

DG 1 R
DG 1 RF
DG 1 RU

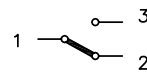
Terminal connection
Cable 3x0.75
See also the product assembly
instructions



DG 1 RS
DG 1 RFS
DG 1 RUFS
DG 3. - X

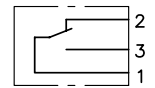
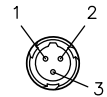
DIN EN 175 301-803 A

3-pole



DG 3. - S

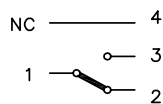
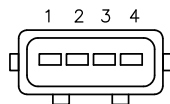
3-pole



DG 3. - AMP

AMP Junior Timer

4-pole

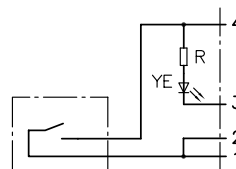


DG 3. - M

4-pole



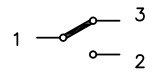
- 1 +24 V
- 2 PNP switching signal
- 3 GND
- 4 IO-Link

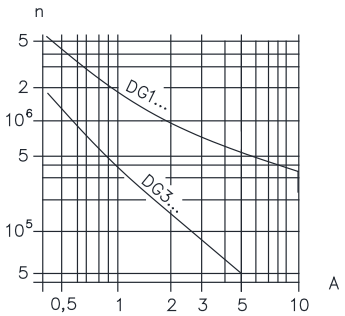


DG 3. - X1

DIN EN 175 301-803 A

3-pole

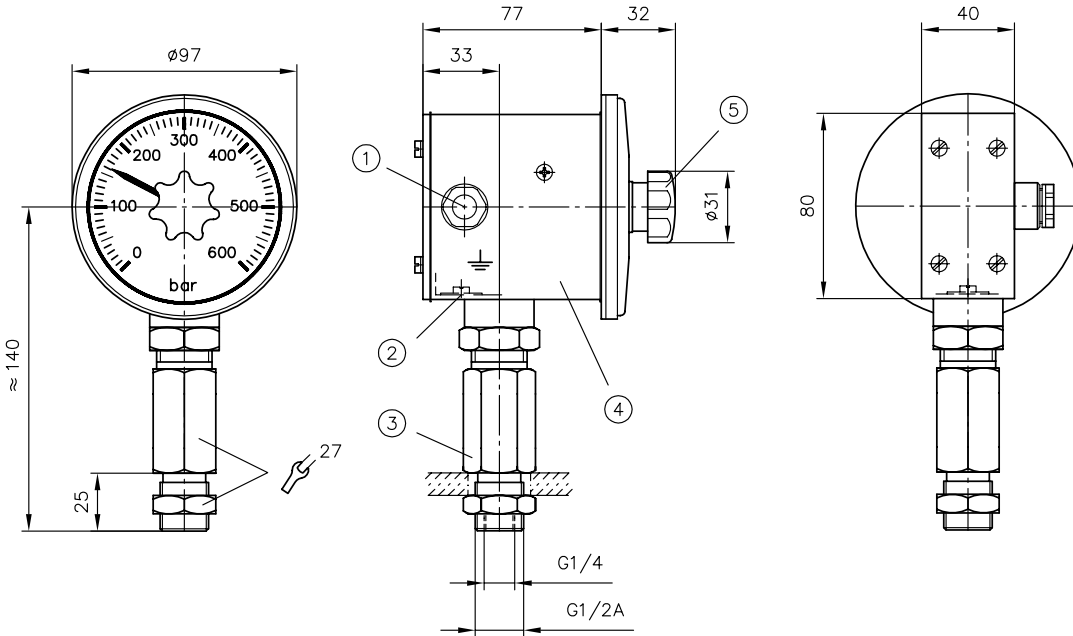


Pressure switch	DG 1..	DG 3..
Micro switch type	X 04-Z 25	XCG 3
Mechanical lifetime approx./switching cycles	10×10^6 For 12 V DC = 4 A and L/R = 10 ms 1×10^6	10×10^6 0.35×10^6
	For 230 V, 1 A and $\cos. \varphi = 0.3$	
	 <p>A current at 230 V AC; n switching cycles</p>	
Maximum supply voltage U_{max}	< 50 V AC or 75 V DC	
Switching current I_{min}	2 A	
	To ensure a safe contact, the current must not fall below certain minimum values: 24 V DC = $I_{min} = 10$ mA 12 V DC = $I_{min} = 100$ mA	
Version DG 3. -X. -KB		
Switching current I_{min}	To ensure a safe contact, the current must not fall below certain minimum values: 24 V DC = $I_{min} = 5$ mA 12 V DC = $I_{min} = 100$ mA	

4 Dimensions

All dimensions in mm, subject to change.

DG 1 R

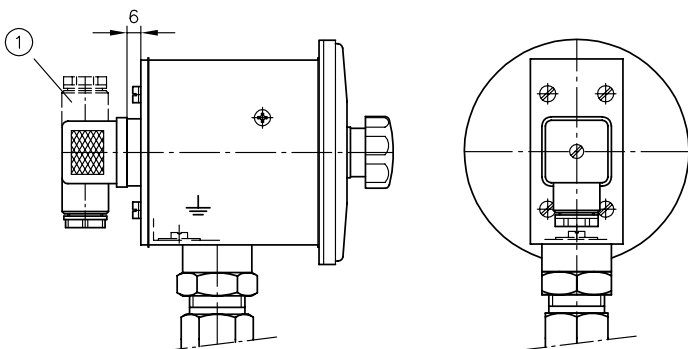


- 1 Cable fitting PG 9
- 2 Ground connection
- 3 Actuation cylinder
- 4 Scale housing
- 5 Setting knob for main switch

i NOTE

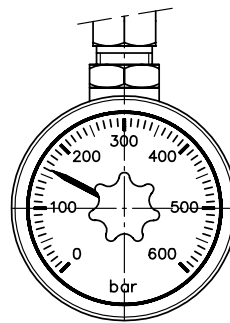
For types DG 1..., the scale housing ④ must not be twisted relative to the hex (width across flats 27) ③ for functional-technical reasons!

DG 1 RS



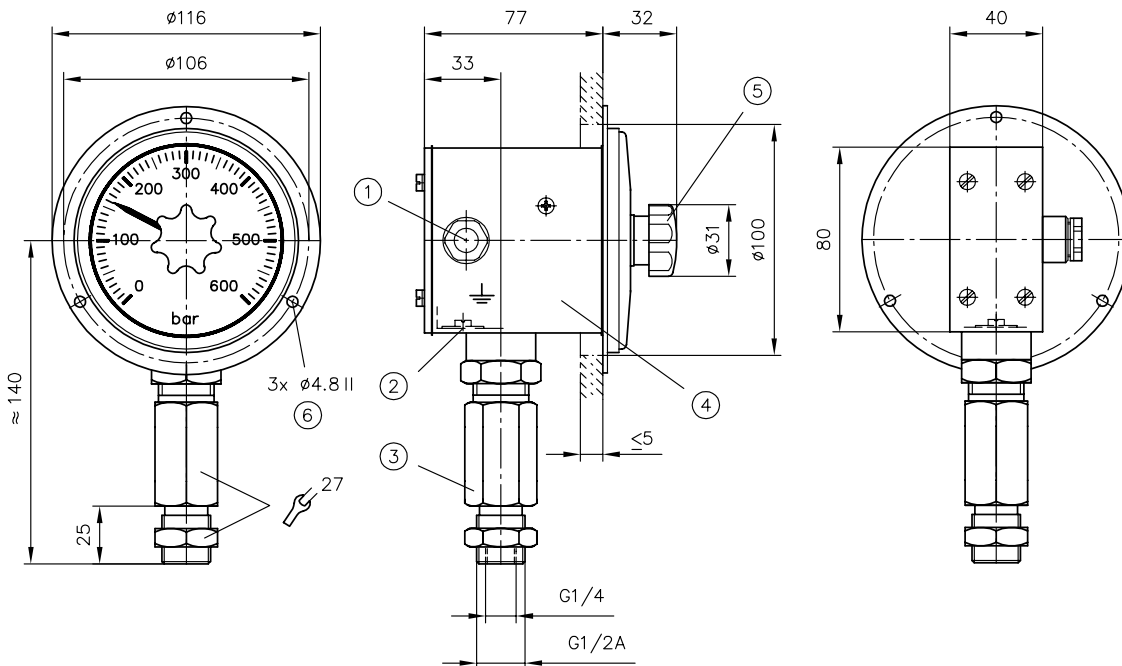
- 1 Line connector can be mounted offset by 4x90°

DG 1 RU



DG 1 RF

With front ring for switch panel installation

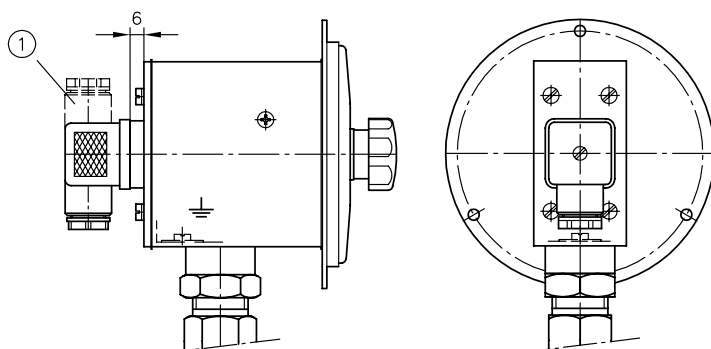


- 1 Cable fitting PG 9
- 2 Ground connection
- 3 Actuation cylinder
- 4 Scale housing
- 5 Setting knob for main switch
- 6 Fixing holes are rotated by 180° in version "U".

i NOTE

For types DG 1..., the scale housing ④ must not be twisted relative to the hex (width across flats 27) ③ for functional-technical reasons!

DG 1 RFS (DG 1 RUFs)



- 1 Line connector can be mounted offset by 4x90°

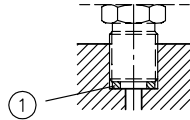
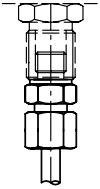
Hydraulic connection

G 1/4 (BSPP) thread
for pipe screw connection

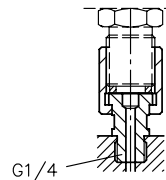
G 1/2 (BSPP) thread
e.g. pressure gauge screw fitting

G 1/2 (BSPP) thread
Fitting type X1 (example) from [D 7065](#)

DG.. can be fitted in any direction



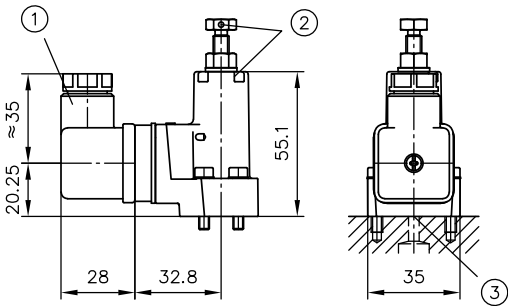
1 Cu sealing ring DIN 7603



G1/4

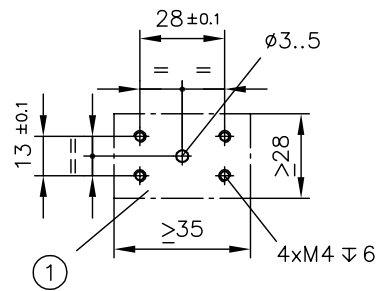
DG 3..

Series (adjustment device without designation)

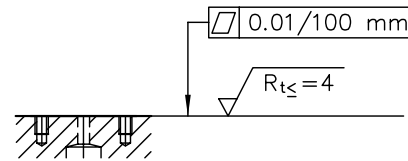


- 1 Plug can be mounted offset by 4x90°
- 2 Sealing option
- 3 Sealing with O-ring

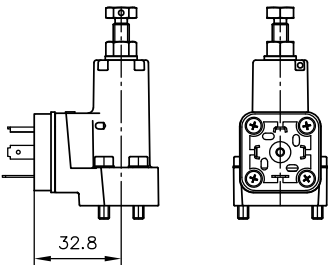
Base plate hole pattern



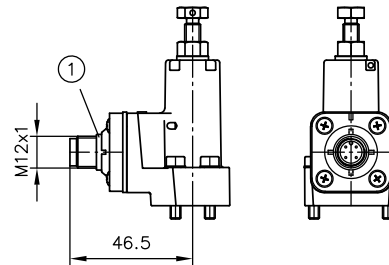
1 Hydraulic connection



DG 3..X

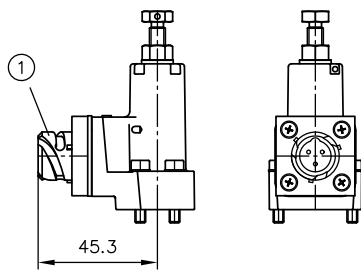


DG 3..M



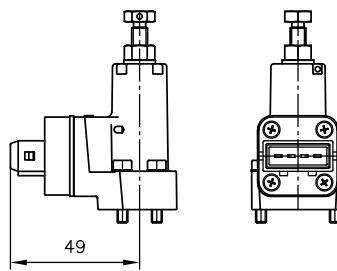
1 Light ring (yellow)

DG 3..S



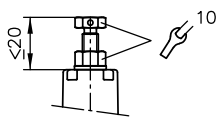
1 Bayonet PA 6 (Schlemmer)

DG 3..AMP

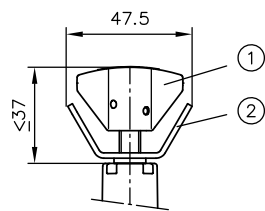


Adjustment

No designation

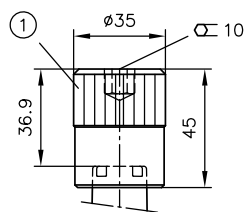


Coding R



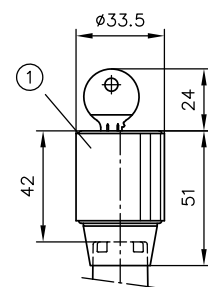
- 1 Wing bolt
- 2 Wing nut

Coding V



- 1 Turn knob

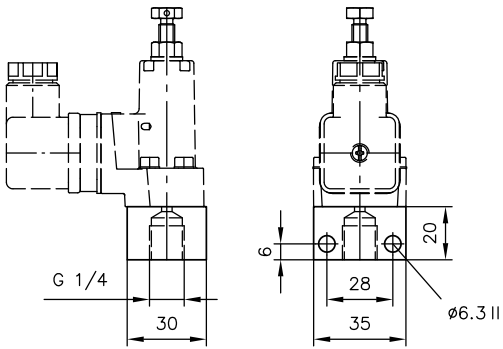
Coding H



- 1 Turn knob

Hydraulic connection

DG 3.. - 1/4

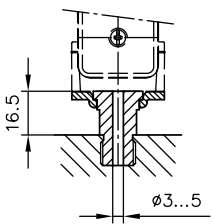


DG 3.. - **Y1** (G 1/4 (BSPP))

DG 3.. - **Y2** (M12x1.5)

DG 3.. - **Y3** (G 1/8 (BSPP))

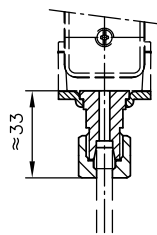
Tapped journal with sealing edge



DG 3.. - **YS6**

DG 3.. - **YS8**

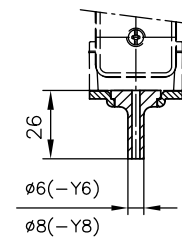
Pipe connection with E0 progressive ring and union nut



DG 3.. - **Y6**

DG 3.. - **Y8**

Pipe connection pieces



DG 3.. can be rotated in any direction around the pipe axis after loosening the clamping plate (by loosening M4).

5 Assembly, operation and maintenance recommendations

5.1 Intended use

This product is exclusively intended for hydraulic applications (fluid engineering).

The user must observe the safety measures and warnings in this documentation.

Essential requirements for the product to function correctly and safely:

- All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- The product must only be assembled and put into operation by qualified personnel.
- The product must only be operated within the specified technical parameters. The technical parameters are described in detail in this documentation.
- All components must be suitable for the operating conditions in the event of application in an assembly.
- The operating and maintenance manual of the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
- ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to dismantling (in particular in combination with hydraulic accumulators).



DANGER

Risk to life caused by sudden movement of the hydraulic drives when dismantled incorrectly!

Risk of serious injury or death.

- Depressurise the hydraulic system.
- Perform safety measures in preparation for maintenance.

5.2.1 Preparing the base plate for DG 3

See description in [Chapter 4, "Dimensions"](#).

5.3 Operating instructions

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the hydraulic component. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Metal chips
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

i NOTE

New hydraulic fluid from the manufacturer does not necessarily have the required level of purity. The hydraulic fluid must be filtered during filling.

Pay attention to the cleanliness level of the hydraulic fluid to maintain faultless operation. (Also see cleanliness level in [Chapter 3, "Parameters"](#)).

Additionally applicable document: [D 5488/1](#) Oil recommendations

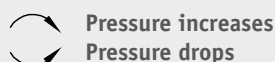
5.4 Maintenance information

Conduct a visual inspection at regular intervals, but at least once per year, to check if the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the device surface of dust deposits and dirt at regular intervals, but at least once per year.

5.5 Adjustability and switching pressure

Adjustability



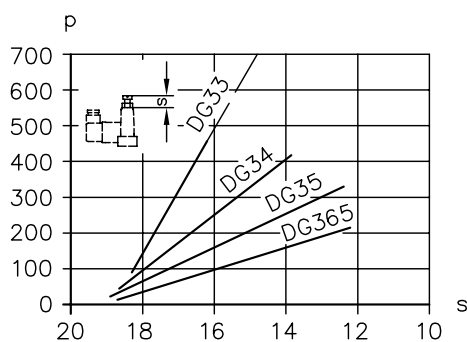
When deactivating pumps directly, be aware of a potential afterrun caused by mass action. Also available for delivery with preset pressure.

Type coding, e.g.

DG 33–600 (setting for increasing pressure)

DG 33–600 F (setting for decreasing pressure)

The tables only contain approximate reference values. Use a pressure gauge to establish a more accurate switching point!



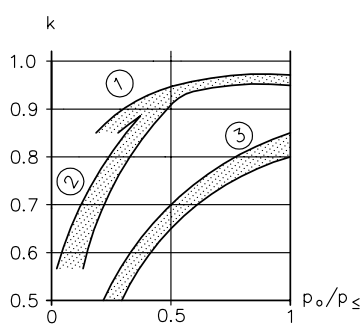
p pressure setting (bar); s adjustment dimension (mm)

- **DG 1 R..:** Using a setting knob on the pressure selection scale (there may be slight deviations between the scale value and the pressure value measured with the pressure gauge).
- **DG 3..:** With adjusting screw, after unfastening the counter screw (wrench, width across flats 10)
- **DG 3..R:** By hand with the wing bolt, after unfastening the wing nut
- **DG 3..V:** With the turn knob
- **DG 3..H:** With the turn knob, after unlocking (key)

Switching pressures

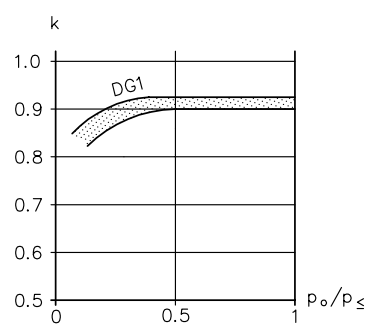
Switching differential between the upper switching point p_o as the pressure increases and the lower switching point as the pressure drops.

The calculated pressure value $p_u = k \cdot p_o$ can only be considered an approximate reference value.



p_o/p_s set response pressure; k factor

- 1 DG 33, DG 34
- 2 DG 35, DG 364, DG 365
- 3 DG 36



p_o/p_s set response pressure; k factor

p_o = Upper switching point at which the device jumps from its idle position to its switching position during a pressure increase (response pressure, adjustment range p_{min} to p_{max} "[Available versions, main data](#)", Table 1)

p_u = Lower switching point at which the device reverts from its switching position back to its idle position during a pressure drop

p_{max} = Max. pressure setting in accordance with "[Available versions, main data](#)", Table 1

6 Other information

6.1 Accessories, spare parts and separate components

Line connectors

Coding	Description	Order coding
G..	Line connector	MSD 3-309
L..	Line connector with LED	SVS 296100
L5K - DG	Line connector with LED, 5 m cable	L5K - DG
L10K - DG	Line connector with LED, 10 m cable	L10K - DG
S	Angled plug for bayonet PA6 Straight plug for bayonet PA6	7846 010 A 7846 010 B

Coding	Description
K	Kostel, 03888005
S	Schlemmer, cone with bayonet 10 SL
AMP	AMP, AMP Junior 2-pole code number 1

Further information

Additional versions

- Electronic pressure switch type DG 5: D 5440 E/1
- Electronic pressure switch type DG 6: D 5440 F
- Electronic pressure transducer type DT 2: D 5440 T/1
- Electronic pressure transducer type DT 11: D 5440 T/2