

Pressure switch type DG

Product documentation



Piston-type pressure switch

Operating pressure p_{\max} :

700 bar



© by HAWE Hydraulik SE.

The reproduction and distribution of this document, as well as the use and communication of its contents to others without explicit authorization, is prohibited.

Offenders will be held liable for the payment of damages.

All rights reserved in the event of patent or utility model applications.

Brand names, product names and trademarks are not specifically indicated. In particular with regard to registered and protected names and trademarks, usage is subject to legal provisions.

HAWE Hydraulik respects these legal provisions in all cases.

HAWE Hydraulik cannot provide individual guarantees that the stated circuits or procedures (including in part) are not subject to the intellectual property rights of third parties.

Printing date / document generated on: 2022-11-17

Table of Contents

1	Overview of pressure switch type DG.....	4
2	Available versions.....	5
2.1	Basic type.....	5
2.2	Electrical connection.....	6
2.3	Adjustment devices.....	6
2.4	Hydraulic connection.....	7
3	Parameters.....	8
3.1	General data.....	8
3.2	Weight.....	9
3.3	Electrical data.....	10
3.4	Characteristic lines.....	11
4	Dimensions.....	13
4.1	Type DG 1.....	13
4.2	Type DG 3.....	16
5	Installation, operation and maintenance information.....	18
5.1	Intended use.....	18
5.2	Assembly information.....	18
5.2.1	Preparing the base plate for DG 3.....	18
5.3	Operating instructions.....	18
5.4	Maintenance information.....	19
6	Other information.....	20
6.1	Accessories, spare and individual parts.....	20

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 advantages

- Compact design
- Option of integration with the HAWE modular system
- Switching current up to 2 A
- 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

Circuit symbol



Ordering 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

2.4 "Hydraulic connection"

2.3 "Adjustment devices"

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

2.2 "Electrical connection"

2.1 "Basic type"

2.1 Basic type

Type	Description	Pressure setting (bar)		Operating pressure (bar)
		PS-min	PS-max	Pmax
DG 1 R	Pipe connection, scale	20 - 600		600
DG 1 RF	Pipe connection, scale, front ring for control panel installation			
DG 1 RU	Pipe connection, scale mounted with 180° rotation (for "suspended" installation)			
DG 1 RUF	Pipe connection, scale mounted with 180° rotation (for "suspended" installation), front ring for control panel installation			
DG 33	Manifold mounting	200 - 700		700
DG 34		100 - 400		
DG 35 *		20 - 250		
DG 36		4 - 12		
DG 364 *		4 - 50		
DG 365		12 - 170		

* DG 35 and DG 364 in version -X, -KB have different hydraulic data depending on the temperature, see Chapter 3.1, "General data"

2.2 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 RUFS	DG 3
without coding	Terminal connection	IP 54	●		
	Line connector EN 175 301-803 A	IP 65		●	●
-X -X1	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			●

2.3 Adjustment devices

Coding	Version
without coding	<ul style="list-style-type: none"> ▪ 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
DG 3.. only	
R	Adjustable by hand (wing bolt and wing nut)
V	Turn knob
H	<ul style="list-style-type: none"> ▪ 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).

2.4 Hydraulic connection

Suitable for DG 1 R..

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

Coding	Connection type
without coding	Directly using a type-B pipe screw connection in accordance with DIN 3852-2 Connection thread G 1/4 or G 1/2 A (ISO 228-1)
	With a DIN 16283 union nut (pressure gauge screw fitting, e.g. DIN 16270)

Suitable for DG 3..

Coding	Connection type
without coding	Manifold mounting
- 1/4	Pipe connection G 1/4
- Y1	Tapped journal G 1/4 A
- Y2	Tapped journal M12x1.5
- Y3	Tapped journal G 1/8
- 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 data

Designation	Pressure switch			
Design	Spring-loaded piston-type pressure switch			
Model	Pipe connection, manifold mounting			
Material	<ul style="list-style-type: none"> ▪ DG 1: Galvanised steel housing ▪ DG 3: Zinc die casting housing 			
Tightening torque	see Chapter 4, "Dimensions"			
Installation position	<ul style="list-style-type: none"> ▪ DG 1 R.. = Vertical, sideways scale, hydraulic part at the bottom ▪ DG 3.. = As desired 			
Hydraulic fluid	Hydraulic fluid, according to DIN 51 524 Parts 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity range: 4 - 1500 mm ² /s Optimal operating range: 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 21/18/15...19/17/13			
Temperatures	Environment: approx. -40 to +80 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range. Start temperature: down to -40 °C is permissible (take account of the start viscosities!), as long as the steady-state temperature is at least 20 K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.			
Hydraulic data Type DG 35 -X..-KB Type 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 _S -min - p _S -max	DG 35	80 - 250 bar	20 - 250 bar
		DG 364	35 - 50 bar	12 - 50 bar
	Operating pressure p _{max}	DG 35	500 bar	500 bar
DG 364				

3.2 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

3.3 Electrical data

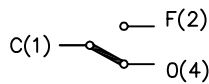
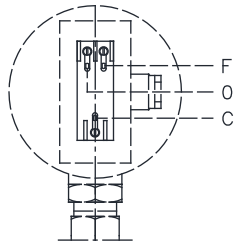
Switching operations

Reference values approx. 2000/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

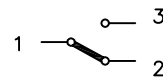
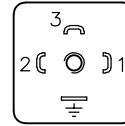
DG 1 R
DG 1 RF
DG 1 RU

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



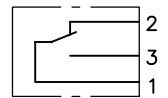
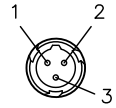
DG 1 RS
DG 1 RFS
DG 1 RUFS
DG 3. - X

EN 175 301-803 A
3-pin



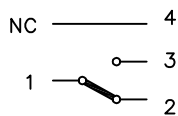
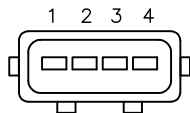
DG 3. -S

3-pin



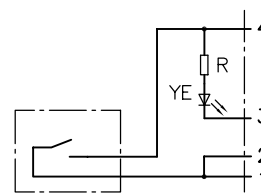
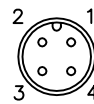
DG 3. - AMP

AMP Junior Timer
4-pin



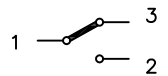
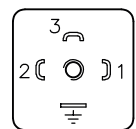
DG 3. - M

4-pin



DG 3. - X1

EN 175 301-803 A
3-pin



Pressure switch

Type	DG 1..	DG 3..
Micro switch type	X 04-Z 25	XCG 3
Mechanical lifetime approx./switching cycles	10 x 10 ⁶	10 x 10 ⁶
Maximum supply voltage U _{max}	< 50 V AC or 75 V DC	
Switching current I _{max}	2 A	
Switching current I _{min}	To ensure a safe contact, the current must not fall below certain minimum values: <ul style="list-style-type: none"> ▪ 24 V DC = I_{min} = 10 mA ▪ 12 V DC = I_{min} = 100 mA Type DG 3..-X..-KB : <ul style="list-style-type: none"> ▪ 24 V DC = I_{min} = 5 mA ▪ 12 V DC = I_{min} = 100 mA 	

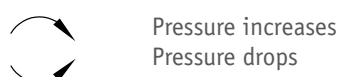
3.4 Characteristic lines

Adjustability

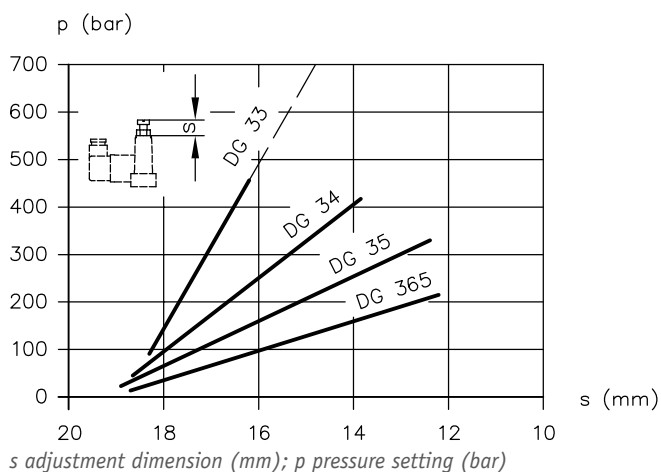
When deactivating pumps directly, be aware of a potential afterrun caused by mass action. Also available for delivery with preset pressure.

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!



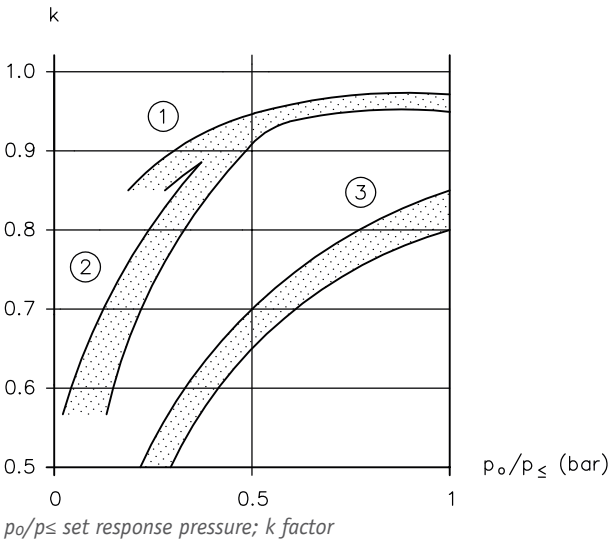
- **DG 1 R..:** Using a setting knob on the pressure selection scale (there may be slight deviations between the scale value and the pressure value measured with the pressure gauge).
- **DG 3..:** using an adjusting screw, after loosening the counter screw (spanner width across flats 10)

- **DG 3..R:** by hand with a wing bolt after loosening the wing nut
- **DG 3..V:** with turning knob
- **DG 3..H:** with turning knob after releasing (spanner)

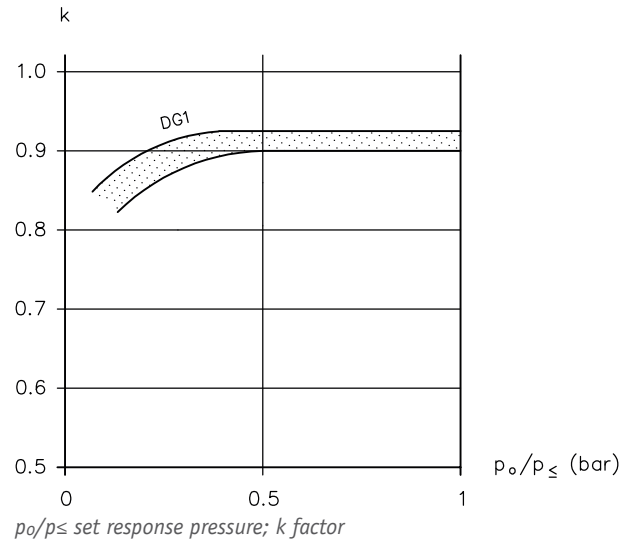
Switching pressures

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.



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



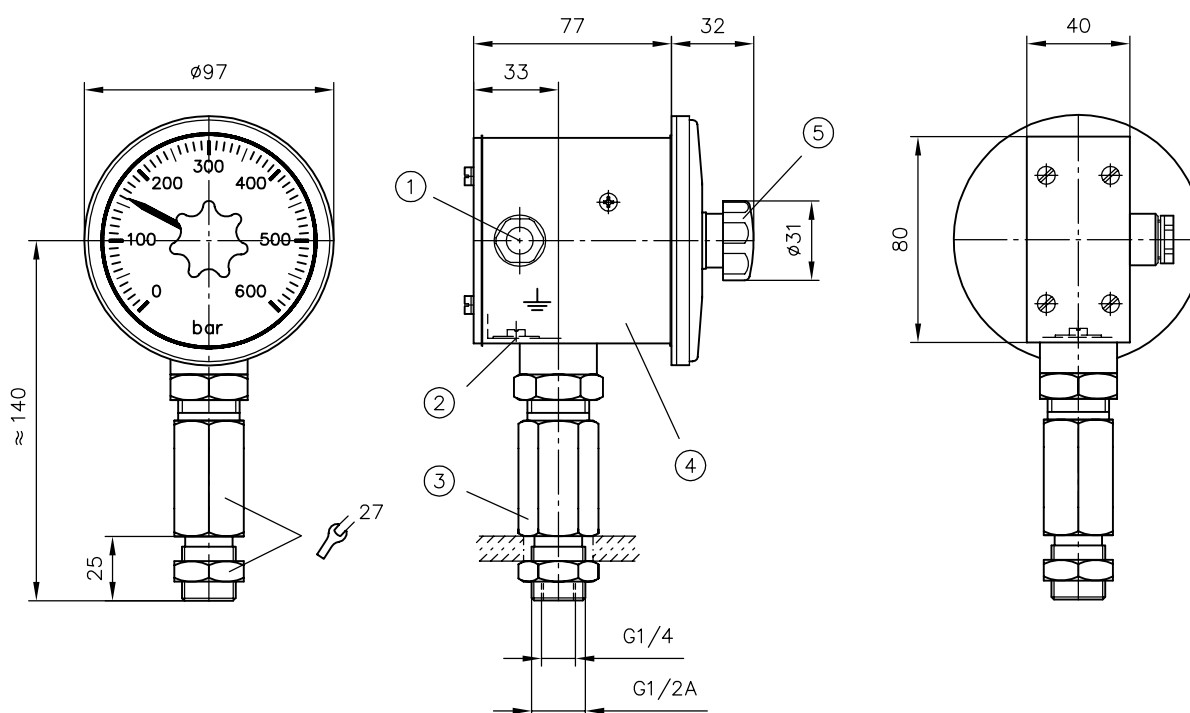
- p_o = Upper switching point at which the device jumps from its idle position to its switching position during a pressure increase (response pressure, adjustment range $p_{min} - p_{max}$), see Chapter 2.1, "Basic type"
- p_u = Lower switching point at which the device reverts from its switching position back to its idle position during a pressure drop
- p_{max} = Maximum pressure setting, see Chapter 2.1, "Basic type"

4 Dimensions

All dimensions in mm, subject to change.

4.1 Type DG 1

DG 1 R

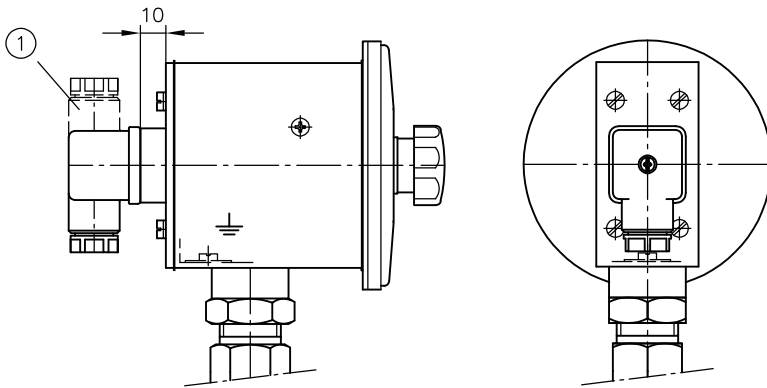


- 1 Cable fitting PG 9
- 2 Ground connection
- 3 Actuation cylinder
- 4 Scale housing
- 5 Setting knob for main switch

! NOTICE

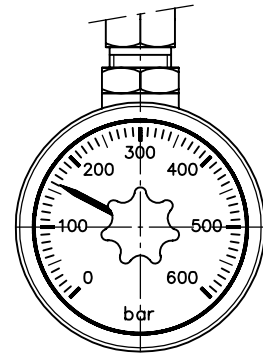
For types DG 1..., the scale housing ④ must not be twisted relative to the hex (width across flats 27) ③ for functional-technical reasons!

DG 1 RS



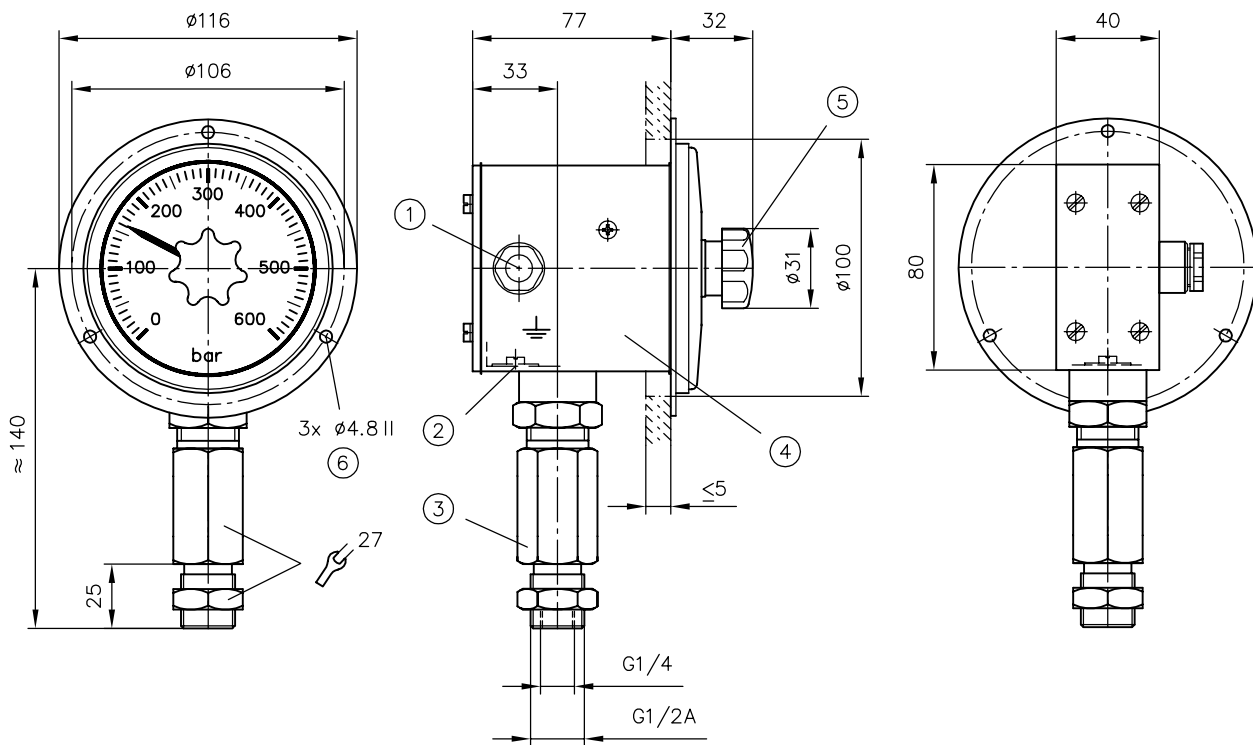
1 Line connector can be mounted offset by 4x90°

DG 1 RU



DG 1 RF

With front ring for control panel installation

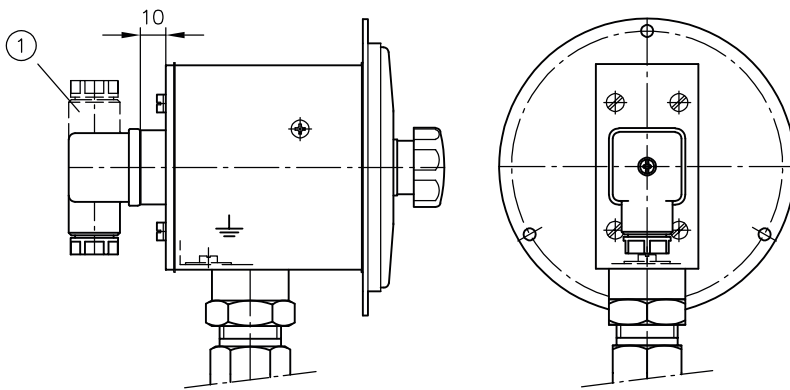


- 1 Cable fitting PG 9
- 2 Ground connection
- 3 Actuation cylinder
- 4 Scale housing
- 5 Setting knob for main switch
- 6 Fixing holes are rotated by 180° in version "U".

NOTICE

For types DG 1..., the scale housing ④ must not be twisted relative to the hex (width across flats 27) ⑥ for functional-technical reasons!

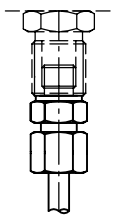
DG 1 RFS (DG 1 RUF5)



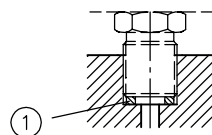
1 Line connector can be mounted offset by 4x90°

Hydraulic connection

G 1/4 thread
for pipe screw connection

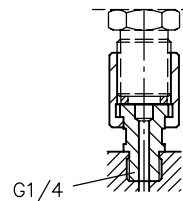


G 1/2 thread
e.g. pressure gauge screw fitting



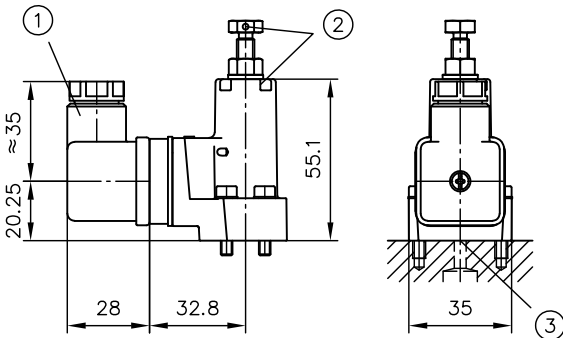
1 Cu sealing ring DIN 7603

G 1/2 thread
Fitting type X1 (example) from D 7065
DG.. can be fitted in any direction



4.2 Type DG 3

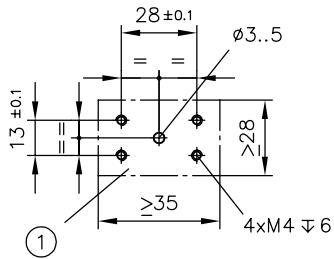
DG 3..



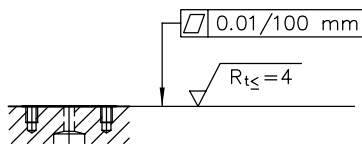
With adjusting screw

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

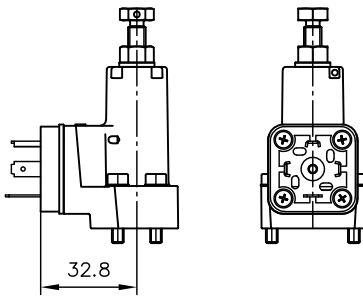
Base plate hole pattern



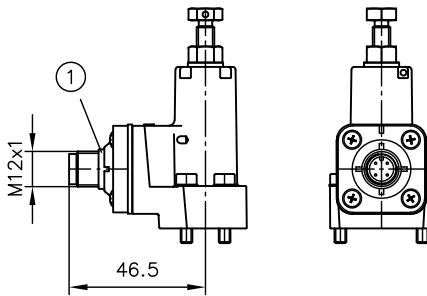
- 1 Hydraulic connection



DG 3.. X

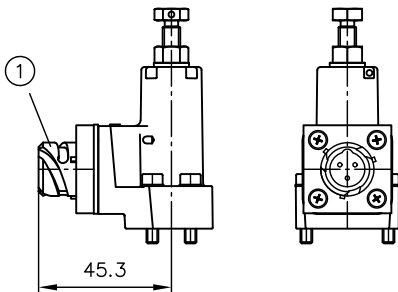


DG 3.. M



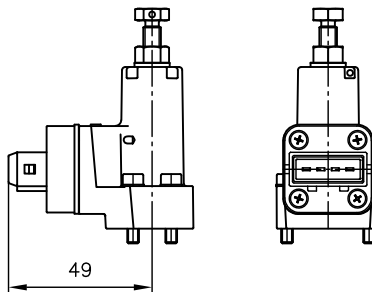
- 1 Light ring (yellow)

DG 3.. S



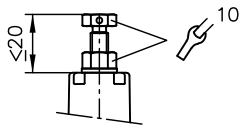
- 1 Bayonet PA 6 (Schlemmer)

DG 3.. AMP

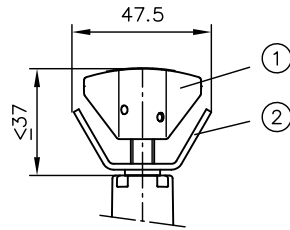


Adjustment

No designation

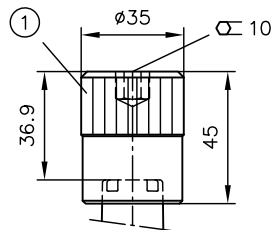


Coding R



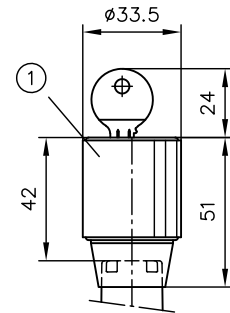
- 1 Wing bolt
- 2 Wing nut

Coding V



- 1 Turn knob

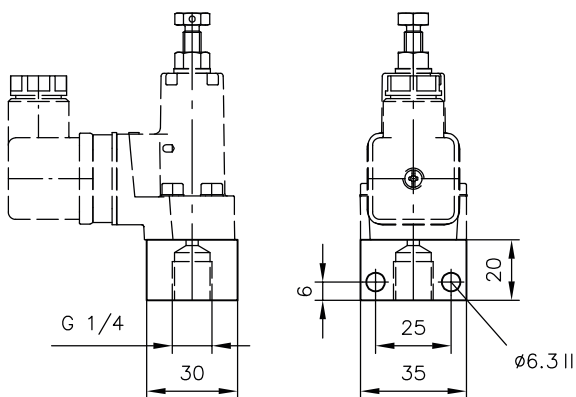
Coding H



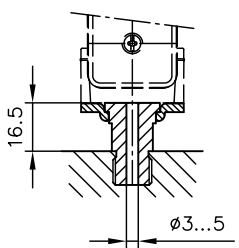
- 1 Turn knob

Hydraulic connection

DG 3.. - 1/4

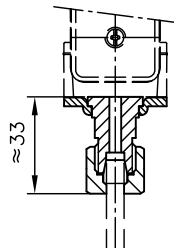


DG 3.. - Y1 (G 1/4)
DG 3.. - Y2 (M12x1.5)
DG 3.. - Y3 (G 1/8)



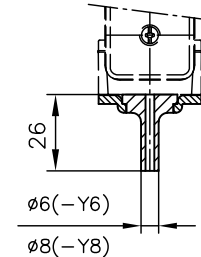
Tapped journal with sealing edge

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).

Observe the document B 5488 "General operating instructions for assembly, commissioning, and maintenance."

5.1 Intended use

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

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

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 specialist personnel.
- ▶ The product must only be operated within the specified technical parameters described in detail in this document.
- ▶ All components must be suitable for the operating conditions when using an assembly.
- ▶ The operating instructions for 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 disassembly (in particular in combination with hydraulic accumulators).



DANGER

Sudden movement of the hydraulic drives when disassembled 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 Chapter 4.2, "Type DG 3"

5.3 Operating instructions

Observe product configuration and pressure/flow rate.

The statements and technical parameters in this document must be strictly observed.

The instructions for the complete technical system must also always be followed.



NOTICE

- ▶ Read the documentation carefully before usage.
- ▶ The documentation must be accessible to the operating and maintenance staff at all times.
- ▶ Keep documentation up to date after every addition or update.

⚠ CAUTION**Overloading components due to incorrect pressure settings.**

Risk of minor injury.

- Pay attention to the maximum operating pressure of the pump, valves and fittings.
- Always monitor the pressure gauge when setting and changing the pressure.

Purity and filtering of the hydraulic fluid

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

Examples of fine contamination include:

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

! NOTICE**New hydraulic fluid from the manufacturer may not have the required purity.**

Damage to the product is possible.

- ▶ Filter new hydraulic fluid to a high quality when filling.
- ▶ Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level see [Chapter 3, "Parameters"](#)).

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

5.4 Maintenance information

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

6 Other information

6.1 Accessories, spare and individual parts

To purchase spare parts, please see [HAWE Hydraulik interactive contact map](#).

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

References

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

