# Pressure switch type DG

## Product documentation

Piston-type pressure switch

Operating pressure $p_{max}$: 700 bar


D 5440
10-2022-1.3 en

HAWE HYDRAULIK

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# Table of Contents

# 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

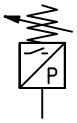
- General hydraulic systems
- Machine tools


*Pressure switch type DG 1*

*Pressure switch type DG 3*

# 2 Available versions

## Circuit symbol




## Ordering example

| | | | | | |
|---|---|---|---|---|---|
| DG 1 RF<br>DG 33<br>DG 35<br>DG 34 | -M | -KB | V | -YS 8 | 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)<br>$p_{S\text{-}min}$ - $p_{S\text{-}max}$ | Operating pressure (bar)<br>$p_{max}$ |
|---|---|---|---|
| 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<br>DG 34<br>DG 35 *<br>DG 36<br>DG 364 *<br>DG 365 | Manifold mounting | 200 - 700<br>100 - 400<br>20 - 250<br>4 - 12<br>4 - 50<br>12 - 170 | 700 |

* 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<br>DG 1 RF<br>DG 1 RU | DG 1 RS<br>DG 1 RFS<br>DG 1 RUFS | DG 3 |
|---|---|---|---|---|---|
| **without coding** | Terminal connection | IP 54 | ● | | |
| | Line connector<br>EN 175 301-803 A | IP 65 | | ● | ● |
| **-X**<br>**-X1** | EN 175 301-803 A<br>(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** | ▪ Turn knob for DG 1 R(S), DG 1 RF(S)<br>▪ Adjusting screw for DG 3..<br>▪ 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** | ▪ Lockable turn knob (BKS lock)<br>▪ 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<br>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**<br>**- YS 8** | Tapered cone ∅6 and ∅8 for a cutting ring and union nut |
| **- Y6**<br>**- Y8** | Pipe bracket ∅6 and ∅8 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** | ▪ **DG 1:** Galvanised steel housing<br>▪ **DG 3:** Zinc die casting housing |
| **Tightening torque** | see Chapter 4, "Dimensions" |
| **Installation position** | ▪ **DG 1 R..** = Vertical, sideways scale, hydraulic part at the bottom<br>▪ **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<br>Viscosity range: 4 - 1500 mm²/s<br>Optimal operating range: approx. 10 - 500 mm²/s<br>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**<br>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.<br>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.<br>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 $p_{S\text{-}min}$ - $p_{S\text{-}max}$ | 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 |

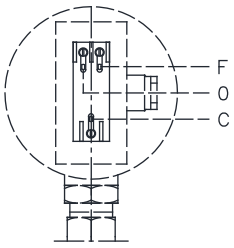
## 3.3 Electrical data

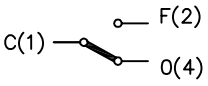
| | |
|---|---|
| **Switching operations** | Reference values approx. 2000/h max. (roughly equally distributed).<br>Note the number of possible switching cycles; see below.<br>Switching accuracy ± 2 to 3 % (repeat accuracy for increasing pressure!) |

**Electrical connection**

**DG 1 R**
**DG 1 RF**
**DG 1 RU**

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

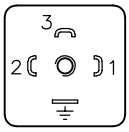


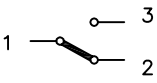




**DG 1 RS**
**DG 1 RFS**
**DG 1 RUFS**
**DG 3. - X**

EN 175 301-803 A

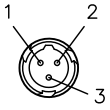
3-pin

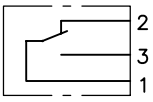



**DG 3. -S**

3-pin

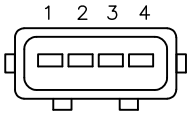


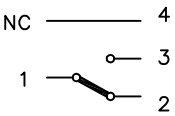




**DG 3. - AMP**

AMP Junior Timer

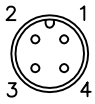
4-pin

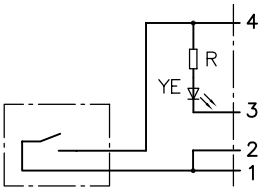



**DG 3. - M**

4-pin

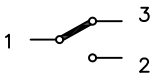



**DG 3. - X1**

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:<br>▪ 24 V DC = $I_{min}$ = 10 mA<br>▪ 12 V DC = $I_{min}$ = 100 mA<br>Type **DG 3..-X..-KB**:<br>▪ 24 V DC = $I_{min}$ = 5 mA<br>▪ 12 V DC = $I_{min}$ = 100 mA | |

## 3.4 Characteristic lines

### Adjustability

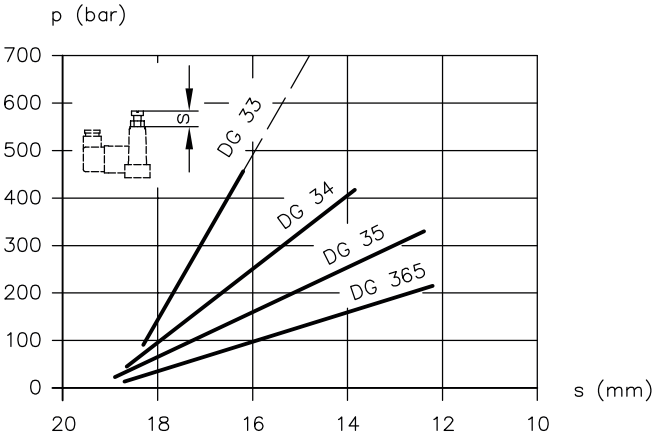
When deactivating pumps directly, be aware of a potential afterrun caused by mass action. Also available for delivery with preset pressure.

**Type coding, e.g.**

- DG 33–600 (setting for increasing pressure)
- DG 33–600 F (setting for decreasing pressure)

Pressure increases
Pressure drops

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




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

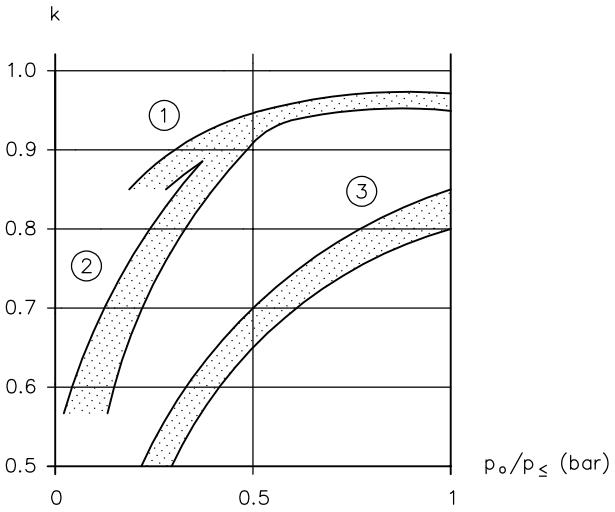
- **DG 1 R..:** Using a setting knob on the pressure selection scale (there may be slight deviations between the scale value and the pressure value measured with the pressure gauge).
- **DG 3..:** using an adjusting screw, after loosening the counter screw (spanner width across flats 10)

- **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)

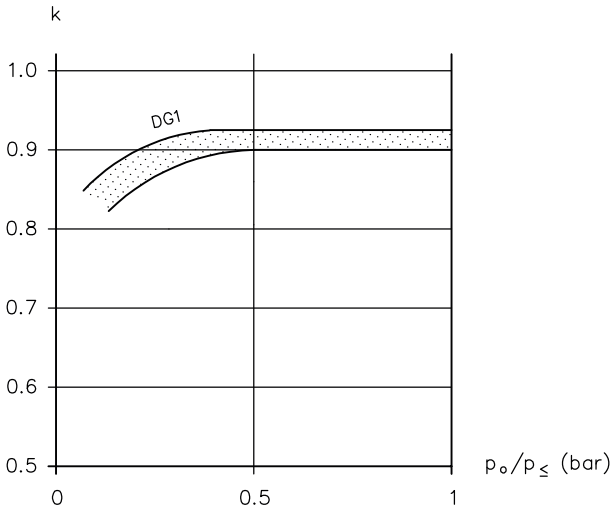
## Switching pressures

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.




*$p_o/p_{\leq}$ set response pressure; k factor*




*$p_o/p_{\leq}$ set response pressure; k factor*

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

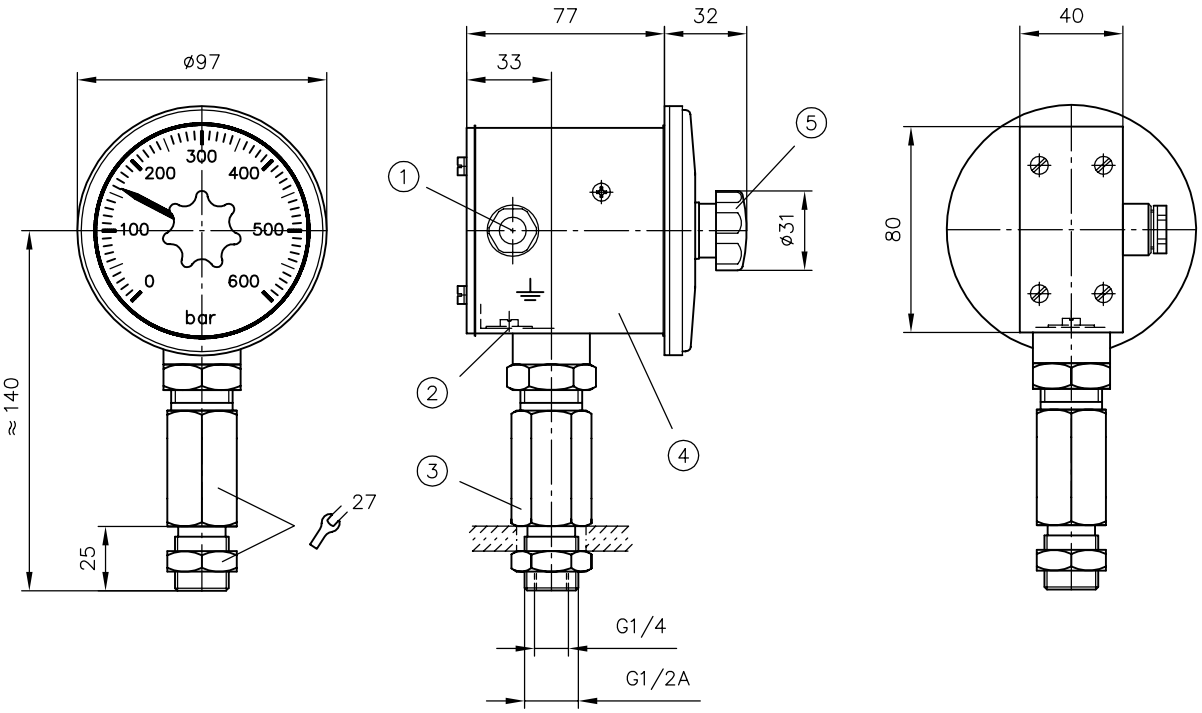
$p_{max}$ = Maximum pressure setting, see Chapter 2.1, "Basic type"

# 4 Dimensions

All dimensions in mm, subject to change.

## 4.1 Type DG 1

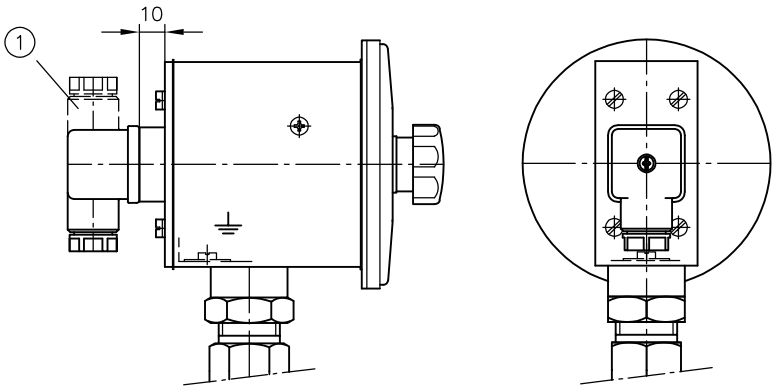
**DG 1 R**



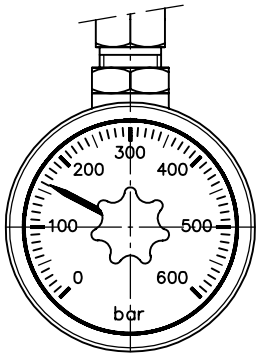

1 Cable fitting PG 9
2 Ground connection
3 Actuation cylinder
4 Scale housing
5 Setting knob for main switch

**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



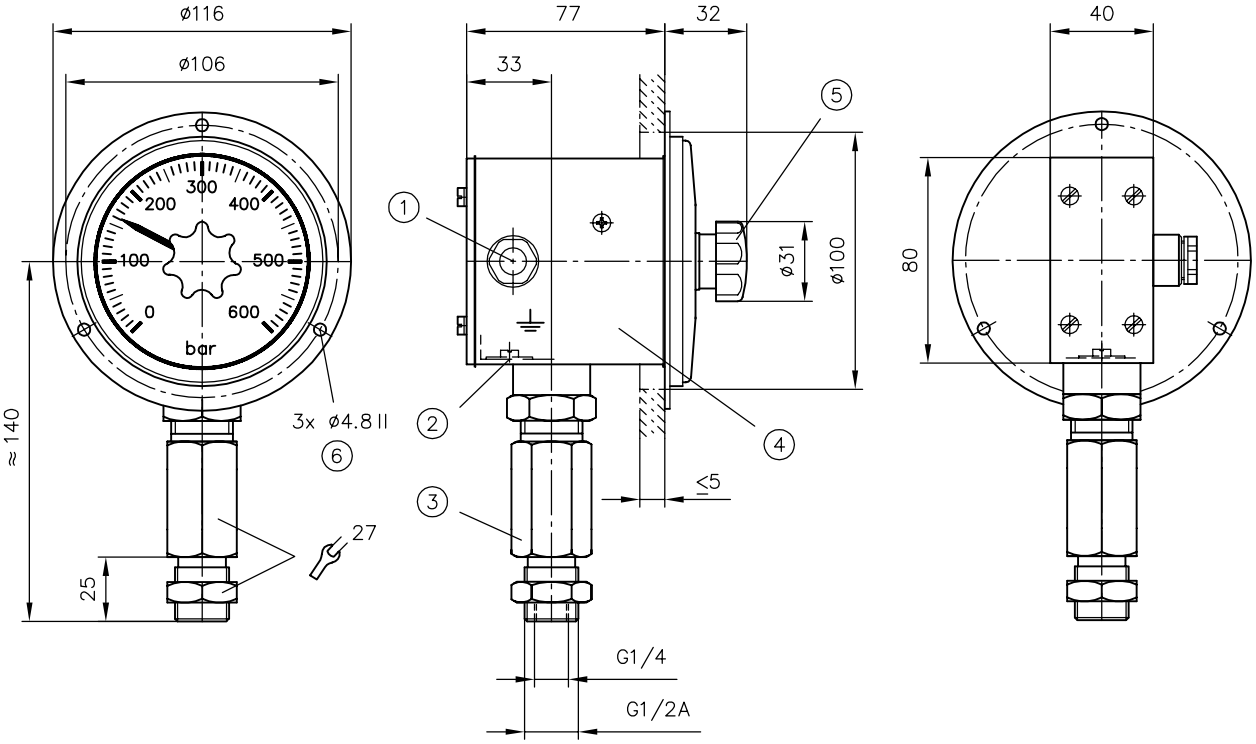

## DG 1 RU




1 Line connector can be mounted offset by 4x90°

## DG 1 RF

With front ring for control panel installation

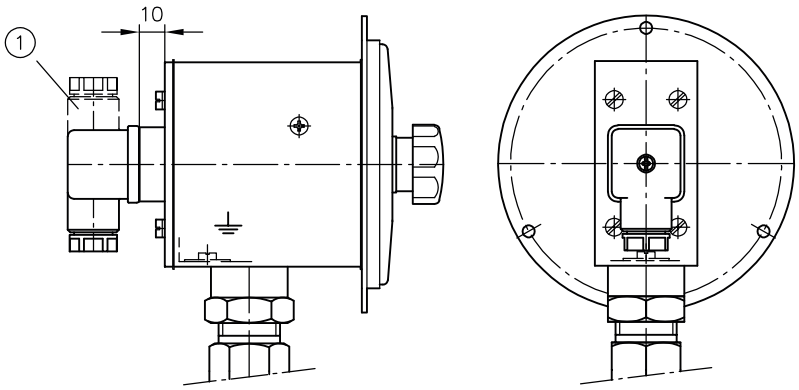



1 Cable fitting PG 9
2 Ground connection
3 Actuation cylinder
4 Scale housing
5 Setting knob for main switch
6 Fixing holes are rotated by 180° in version “U”.

**NOTICE**

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

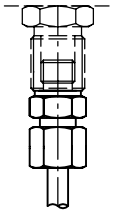
## DG 1 RFS (DG 1 RUFS)



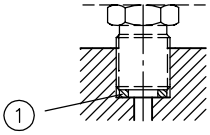

1 Line connector can be mounted offset by 4x90°

## Hydraulic connection

G 1/4 thread
for pipe screw connection



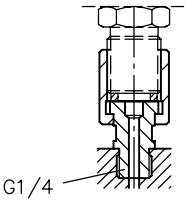
G 1/2 thread
e.g. pressure gauge screw fitting




1 Cu sealing ring DIN 7603

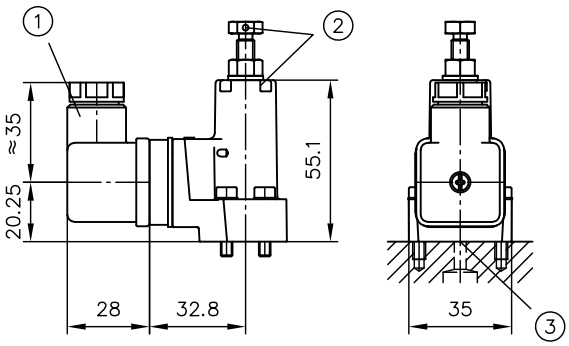
G 1/2 thread
Fitting type X1 (example) from D 7065

DG.. can be fitted in any direction



## 4.2 Type DG 3

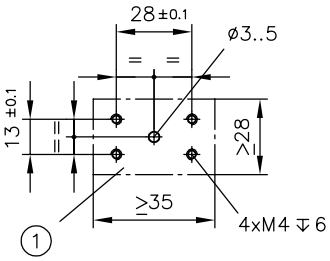
### DG 3..



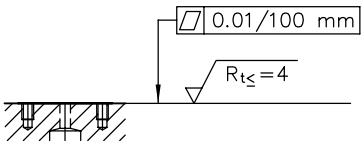

*With adjusting screw*

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

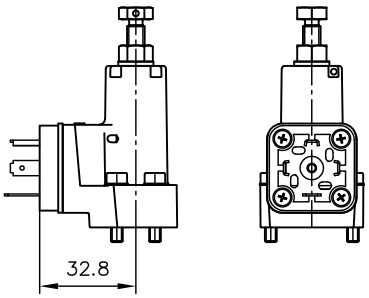
### Base plate hole pattern



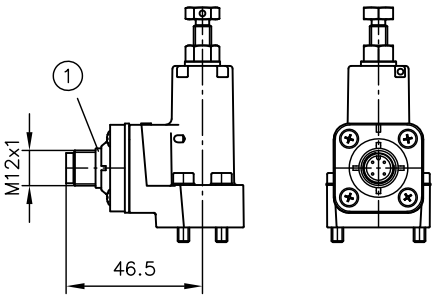

1 Hydraulic connection




### DG 3.. X

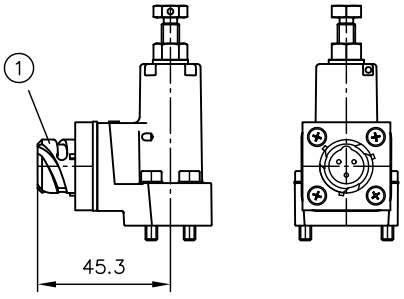



### DG 3.. M



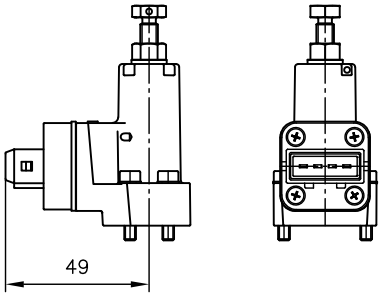

1 Light ring (yellow)

### DG 3.. S



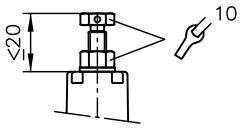

1 Bayonet PA 6 (Schlemmer)

### DG 3.. AMP

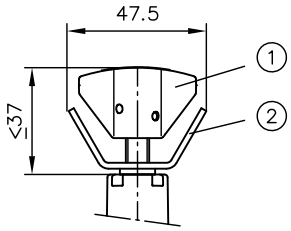


## Adjustment

No designation

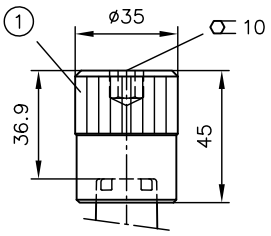



Coding **R**



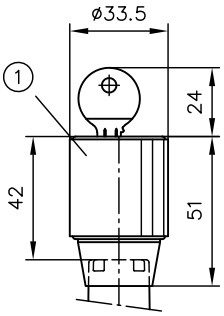

1 Wing bolt
2 Wing nut

Coding **V**




1 Turn knob

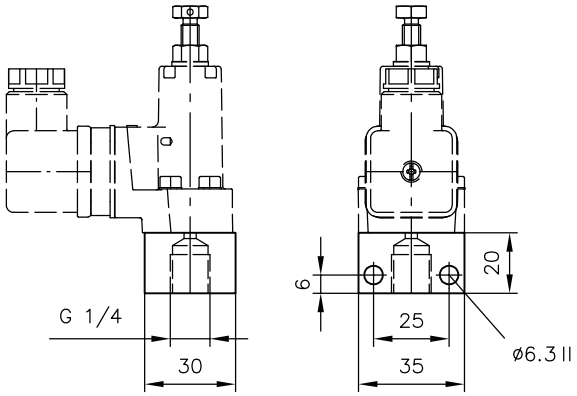
Coding **H**



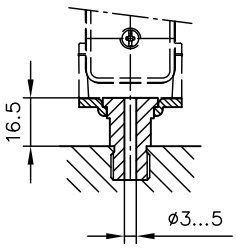

1 Turn knob

## Hydraulic connection

DG 3.. **- 1/4**

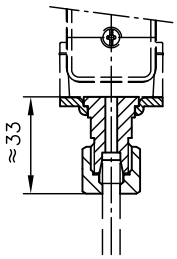



DG 3.. **- Y1** (G 1/4)
DG 3.. **- Y2** (M12x1.5)
DG 3.. **- Y3** (G 1/8)



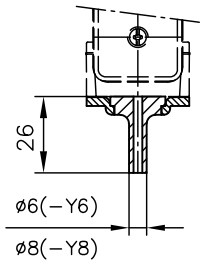

Tapped journal with sealing edge

DG 3.. **- YS6**
DG 3.. **- YS8**




Pipe connection with EO 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 Installation, operation and maintenance information

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<br>Straight plug for bayonet PA6 | 7846 010 A<br>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

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