



## ***Instruction Manual***

### ***DG20***

***Sight Glass, Tubular Type with Flange Connections***



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## Safety Information

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### General Instructions

To ensure safe operation, the device should only be operated according to the specifications in the instruction manual. The requisite Health & Safety regulations for a given application must also be observed. This statement also applies to the use of accessories.

Every person who is commissioned with the initiation or operation of this device must have read and understood the operating instructions and in particular the safety instructions!

The work safety instructions in this manual as well as the safety, accident prevention and environmental protection regulations generally valid for the work area must be observed.

The liability of the manufacturer expires in the event of damage due to improper use, non-observance of this operating manual, use of insufficiently qualified personnel and unauthorized modification of the device.

### Proper Usage

The sight class of the DG20 series are used for the optical control monitoring of liquids. Any other use of the device is prohibited and outside the scope of application.

The tubular sight glasses shall only be used as intended. Any applications beyond this will be considered to be usage not according to the intended purpose, and the manufacturer will not be liable for any resulting damage. Users will bear any risks in that case.

Any unauthorized mechanical or structural modifications of the tubular sight glasses will exclude manufacturers liability for damage resulting from the modifications.

The intended use also includes compliance with manufacturer information for the intended installation, operation and maintenance (operating manual) as well as the consideration of foreseeable misconduct.

In particular, applications in which shock loads occur (for example, pulsed operation) should be discussed and checked in advance with our technical staff.

The devices of the DG20 series should not be used as sole monitoring devices in order to detect or even avoid dangerous operating states in plants and machines. The plant or machine itself must be planned and constructed in such a way that critical conditions which pose a danger to man and the environment are excluded from the outset

### ***Basic Safety Information***

The statutory accident prevention regulations, as well as the other generally recognised safety and occupational health rules and the accident prevention regulations for power-driven work equipment must be observed. The manufacturer is not liable for any damage resulting from this!

Any work on tubular sight glasses may only be performed during a shutdown of the system or when lines are free from any media. In places where lines can be opened or filled, signs must be set up which indicate clearly that work is being performed on the tubular sight glasses.

After any maintenance work all disassembled protective devices must be properly reassembled. Protective devices and their protective effects must be checked by a qualified person before start-up of the machine.

### **NOTICE**

Damages must be reported immediately after detection and repaired without delay. The tubular sight glasses must be marked accordingly. Non-compliance will invalidate the warranty.

### ***Dangerous substances***

For dangerous media such as e.g. Oxygen, Acetylene, flammable or toxic substances as well as refrigeration systems, compressors, etc. must comply with the relevant regulations beyond the general rules.

### ***Qualified Personnel***

The devices of the DG20 may only be installed by trained, qualified personnel who are able to mount the devices correctly. Qualified personnel are persons, who are familiar with assembling, installation, placing in service and operating these devices and who are suitably trained and qualified.

### ***Inward Monitoring***

Please check directly after delivery the device for any transport damages and deficiencies. Additional with reference to the accompanying delivery note the number of parts must be checked.

Claims for replacement or goods which relate to transport damage can only be considered valid if the delivery company is notified without delay.

## ***Transport and storage***

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The tubular sight glasses are to be packaged properly and transported and stored in a way to protect them against dirt and moisture. In particular, the glass tubes must be protected against external impact and scratching.

Storage: Between 0°C and +40°C in a clean and dry room.

Storage time: Depending on gasket material

In case of longer storage, a new pressure test may be necessary! Improper storage will invalidate the warranty.

## ***Product description and purpose***

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The tubular sight glasses are screwed between existing flanges. They are used to enable the operator of the System to visually check the quality and quantity of the medium flowing through. For this purpose, the fitting is equipped with a glass tube. This offers the possibility of visual process observation with 360° all-round visibility.

The dimensions and materials can be found in the corresponding data sheets.

All fittings are subjected to a pressure test in accordance with the requirements of the DGRL and the AD2000 regulations before leaving our factory. The maximum test pressure corresponds to 1.5 times the maximum permissible pressure (or corresponding special agreements).

The operator/manufacturer of the pipeline or other assemblies is responsible for the design and testing of these in accordance with the applicable technical regulations (e.g. AD2000 leaflets).

***Sight glass without impact protection:***



***Sight glass with PETG impact protection:***

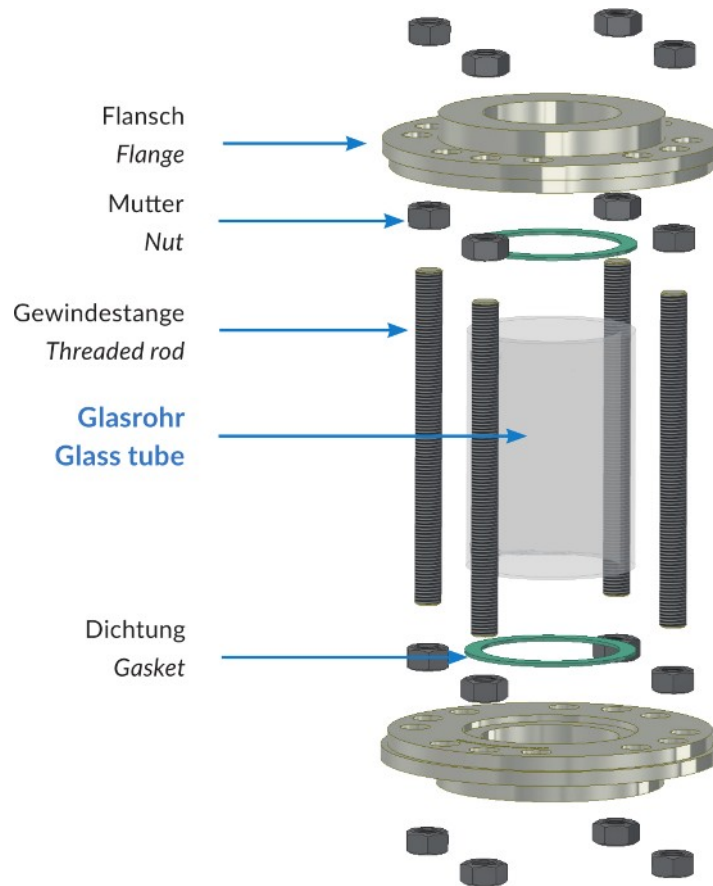


***Sight glass with stainless steel impact protection:***



## ***Exploded view:***

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## ***Pressure and temperature limits***

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The lowest value in the combination flange, gaskets and sight glass determines the maximum allowable operating conditions as far as temperature and pressure are concerned. All necessary data (TS, PS, etc.) can be found in the data sheets, drawings or order confirmations. In case of doubt: Contact us!

The specified pressure and temperature limits must not be exceeded under any circumstances, especially if the aggregate state (solid, liquid, gaseous) of the operating medium changes.

The tubular sight glasses of the type DG20 can be operated with the maximum operating pressure PS up to the maximum permissible temperature TS. If the tubular sight glasses are used in conjunction with standard flanges, the pressure-temperature operating limits of the respective standard must be observed.

## ***Installation:***

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Special care must be taken when handling tubular sight glasses. The applicable safety regulations - especially for pressurised and temperature-containing pipelines and their elements - must be observed.

Work on tubular sight glasses may only be carried out when the system is at a standstill or the pipes are free of media.

- Gaskets suitable for the sealing surfaces should be used. The gaskets must be free from contamination.
- The screw material should be equivalent to and higher than that of the sight glass body.
- Always use screws that match the bore pattern
- If possible, the screw thread and the screw head should be lubricated.
- When installing tubular sight glasses, any contact with the glass tubes must be avoided, especially when tightening the screw connection. Failure to observe this can lead to glass breakage!
- Remove the protective packaging
- Align the sight glass axis with the main axis of the pipe.
- Place the gaskets and tubular sight glass of the correct size and quality centrally. The gaskets should not protrude inwards into the flow passage.
- Carefully screw in the fastening screws and tighten them snug by hand. The gaskets and tubular sight glass must not be displaced! Threads and head contact surfaces of the fastening screws should be smeared with temperature resistant thread paste (e.g. OKS ANTI-Seize-Paste) beforehand to prevent friction welding and to ensure defined friction values.
- Tighten the flange screw connection gradually and crosswise to the same torque.

### **NOTICE**

The torques to be applied depend on the selected gasket geometry and the gasket material and must therefore be determined by the system operator.

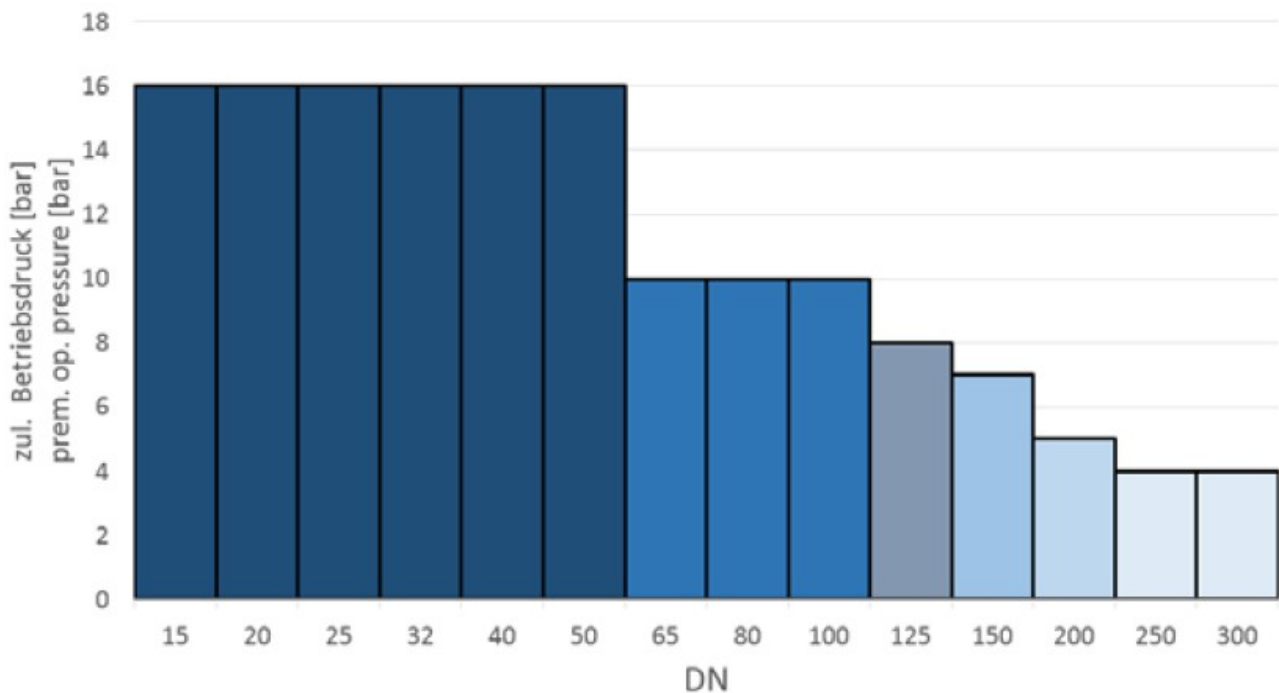
### **Caution:**

**Tubular sight glasses must be installed in such a way that no pipe forces (tension, compression and torsion), vibrations and pressure shocks can act on the fitting!**

## Permissible operating pressure

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The permissible operating pressure depending on the nominal diameter must always be observed.



DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300
PS [bar (g)]	16	16	16	16	16	16	10	10	10	8	7	5	4	4

## Commissioning:

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### Before operation

The torques of the flange bolting must be checked and corrected before each commissioning!

### After initial loading

Due to the effects of pressure and temperature, setting effects of the gasket can be expected. For this reason, we recommend to check the torques of the flange bolting again when cold and unpressurised and to correct them if necessary.



## ***Maintenance and care***

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Carry out all installation and maintenance work only when the appliance is unpressurised and cold.

Reliably shut off supply lines in the event of back pressure on drain lines.

### **ATTENTION:**

During operation, the tubular sight glasses are under internal pressure and are usually hot. If maintenance work is carried out during operation, there is a risk of severe burns and chemical burns due to escaping medium.

Tubular sight glasses should be checked at regular intervals for glass erosion, corrosion or damage such as scratches. Timely replacement protects against glass breakage.

If the tubular sight glasses are dirty on the outside, they can be carefully cleaned. The glass surfaces must not be scratched under any circumstances.

Apart from cleaning the glass tubes and retightening screw connections, no maintenance work is generally required.

## ***Glass erosion***

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As the temperature and pH value of the medium increase, the glass erosion also increases. Glass erosion can significantly impair operational safety. If noticeable glass erosion (e.g. becoming „milky“) is observed, the glass tubes with gaskets should therefore be replaced.

### **NOTICE**

We recommend replacing the tubular sight glasses annually, even if there is no visible glass erosion or other damage, as this is not always visible in detail. Even the smallest damage can reduce the strength!

# DG20

## Sight Glass, Tubular Type with Flange Connections

- for visual control of flow and level
- applicable for liquids and gases
- 360° all-round view
- flange connections on both sides according to DIN EN 1092-1, form B
- DN 15 to DN 200, PN 10/16  
ANSI ½" bis 8", 150 lbs
- glass: borosilicate glass  
Flanges: steel H111 or stainless steel
- intensive to contamination
- max. pressure 16 bar (depending on nominal size)
- max. temperature: 300 °C



### Description:

The sight glasses of the type series DG20 are extremely robust due to their design and can be used very functionally. They allow the inspection of filling and flow in pipelines.

The sight glass with flange connection is installed in the piping system with the appropriate sealing surfaces and enables reliable 360° monitoring of the function and performance of individual apparatus as well as of entire plants.

The DG20 sight glass is designed with flanges on both sides to suit DIN EN 1092-1, form B (PN 10/16) or ANSI.

Depending on the nominal size, pressures up to 16 bar are permissible.

The flow sight glass has no dead spaces, so that when the product is changed, the flow sight glass can be flushed / cleaned together with the pipeline.

There are almost no sediments in the sight glass when the pipeline is drained because the inside diameter of the sight glass corresponds to the inside diameter of the pipeline.

### Typical Applications:

The sight glasses can be used in almost all pipelines. The borosilicate glass used allows the devices to be used for chemically very aggressive media. They are insensitive to contamination, as the inner surface is always rinsed by the flowing medium.

The sight glasses are therefore also excellently suited for sterile and antiseptic applications.

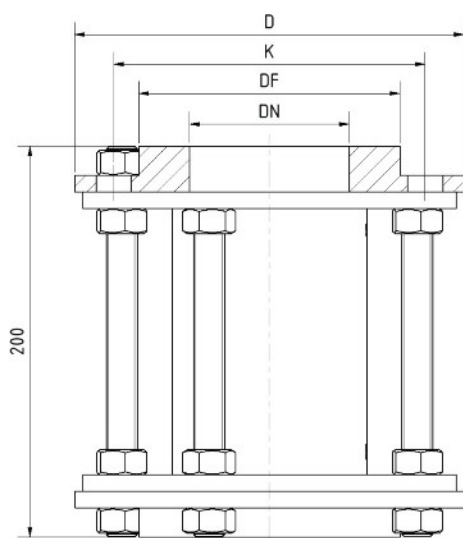
## Technical Data:

<b>Max. temperature:</b>	300 °C
<b>Max. Pressure:</b>	Up to DN 50: 16 bar DN 65 up to DN 100: 10 bar DN 125: 8 bar DN 150: 7 bar DN 200: 5 bar

## Materials:

<b>Flanges:</b>	St. steel 1.4571	Steel H II (1.0425)
<b>Screws (strength):</b>	A4-70	5.6 zinc plated
<b>Glass tube:</b>	Borosilicate glass (DURAN)	
<b>Gaskets:</b>	FKM, PTFE, Klingersil, NBR, graphite	

## Dimensions DIN Flange:



Nominal size	D [mm]	d [mm]	LK [mm]	Screws	Weight [kg]
DN 15	95	41	65	4	2,1
DN 20	105	54	75	4	2,5
DN 25	115	64	85	4	2,9
DN 32	145	74	100	4	5,6
DN 40	150	84	110	4	6,4
DN 50	175	98	125	4	7,5
DN 65	195	118	145	4	8,9
DN 80	200	134	160	4	9,6
DN 100	225	154	180	4	11,5
DN 125	250	184	210	8	12,3
DN 150	295	208	240	8	19,5
DN 200	345	264	295	8	26,2

## Order Code:

**Order number:** DG20. D. 15. 1. F. 0. 2. 0

**Sight glass, tubular type with flange connections**

### Process connection:

D = DIN flange (DIN EN 1092-1), form B, PN 10/16  
A = ANSI flange, 150 lbs

### Nominal size:

15 = DN 15 / 1/2"  
20 = DN 20 / 3/4"  
25 = DN 25 / 1"  
32 = DN 32 / 1 1/4"  
40 = DN 40 / 1 1/2"  
50 = DN 50 / 2"  
65 = DN 65 / 2 1/2"  
80 = DN 80 / 3"  
100 = DN 100 / 4"  
125 = DN 125 / 5"  
150 = DN 150 / 6"  
200 = DN 200 / 8" (other sizes on request)

### Flange material:

1 = Steel H II (P265GH)  
2 = Stainless steel 1.4571

### Gaskets:

F = FKM (max. 200 °C)  
P = PTFE, (max. 200 °C)  
K = C4400 Klingersil (max. 175 °C)  
N = NBR (max. 80 °C)  
G = Graphite: (max. 300 °C)

### Protection jacket:

0 = without protection jacket  
1 = with protection jacket of acrylic glass (max. 70 °C)  
2 = with protection jacket of stainless steel perforated plate

### Length:

2 = 200 mm (Standard)

### Option:

0 = without  
9 = please specify in plain text

## Protection Jacket:

An impact protection jacket made of Plexiglas or stainless steel perforated plate can be used to protect the sight glass. The elastic plastic used is particularly UV-resistant and insensitive to impact and aging.

