OPERATING/INSTALLATION INSTRUCTIONS

(Translation)

Inline sight glass

Sight glass

Inline sight glass unit

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Operating/Installation Instructions for

– Inline sight glass:	Type: DN10 – DN65 / PN10 DN80 / PN8 DN100 – DN150 / PN7 1" – 2 1/2" / PN10 3" / PN9 4" / PN7 1" – 2 1/2" / PN10 (SMS FR) 3" / PN9 (SMS FR) 4" / PN7 (SMS FR)
– Sight glass	Type: DN25 – DN125 / PN10 DN 150 / PN8 1" – 4" / PN10 1" – 4", / PN10 (SMS FR)
– Inline sight glass unit	Type: DN25 – DN125 / PN10 DN 150 / PN8

NOTE

These operating/installation instructions are part of the fitting and must be available to operating and maintenance personnel at all times. The safety precautions contained therein must be observed.

If the fitting is sold on, the operating/installation instructions must be included in the delivery or downloaded from the following Internet page: http://www.awh.eu/de/downloads.

Translation

The operating instructions must be written in an official European Community language acceptable to the manufacturer of the machinery in which the fitting will be assembled, or to his authorized representative. If any discrepancies arise in the translated text, the original operating instructions (German) are to be consulted for clarification, or the manufacturer is to be contacted.

Contents

List of Pictures

1 Introduction

These operating/installation instructions (referred to henceforth as the manual) applies for

- the inline sight glass,
- the sight glass and
- the inline sight glass unit.

The manual provides you with all the information you need for untroubled operation of the inline sight glass and the sight glass (with inline sight glass unit). The inline sight glass and the sight glass (with inline sight glass unit) are referred to henceforth as the fitting.

In principle, this manual applies to all designs. In the event of differences between the designs, this will be clearly pointed out.

The manual must be read, understood, and applied by all persons assigned with the assembly, maintenance, cleaning and troubleshooting of the fitting. This applies in particular to the listed safety notes.

After studying the manual, you will be able to

- Assemble and operate the fitting safely
- Clean and service the fitting correctly
- Take the correct measures if a fault occurs

In addition to this manual, generally valid, statutory and other binding regulations in regard of accident prevention and in regard of environmental protection in the country of use must also be observed.

The manual must always be kept or made available at the place of use of the fitting. Download the instructions if necessary from the http://www.awh.eu/de/downloads Internet page.

1.1 Means of Presentation

As an instruction and for directly warning against danger, statements where special attention needs to be paid are identified as follows in this manual:

DANGER

This warning notice describes a hazard with a high level of risk that will result in death or serious injury if not avoided.

WARNING

This warning notice describes a hazard with a medium level of risk that could result in death or serious injury if not avoided.

CAUTION

This warning notice describes a hazard with a low level of risk that could result in minor or moderate injury if not avoided.

NOTE

This warning notice describes a hazard with a low level of risk that could result in damage to property if not avoided.

The info symbol provides useful information.

Embedded Warnings

The embedded warnings apply to specific actions and are integrated directly into the action before the specific action step.

– **DANGER / WARNING / CAUTION**

– ***NOTE***

The following means of presentation are also used:

– Texts which follow this mark, are bulleted lists.

• Texts following this mark describe activities that need to be carried out in the specified order.

“ ” Texts in quotation marks are references to other chapters or sections.

Symbols Used

Crushing hazards are indicated by this symbol.

Burn hazards are indicated by this symbol.

“Observe manual” is indicated by this symbol.

“Isolate from voltage before work” is indicated by this symbol.

“Secure against power being switched back on” is indicated by this symbol.

Environmental measures are indicated by this symbol.

Warning about substances which are a water hazard

1.2 Abbreviations

ATEX	“**At**mosphère **ex**plosible”; includes measures to be taken for explosive atmospheres / explosion protection
AWH	Armaturenwerk Hötensleben GmbH
CIP	Cleaning in place
D	Diameter
DN	Nominal width
E	Thread diameter
EEA	European Economic Area
EEC	European Economic Community
EPDM	Ethylene propylene diene monomer rubber (sealing material)
FKM	Fluorinated rubber (sealing material)
FR	Version for France (with SMS)
G/G	Thread/thread (connection variant)
G/K	Thread/cone (connection variant)
Item	Item number
K/K	Cone/cone (connection variant)

L	Length
NBR	Acrylonitrile butadiene rubber (sealing material)
PN	Nominal pressure
PTFE	Polytetrafluoroethylene (sealing material)
Ra	Average roughness value (dimension for the surface roughness)
Rd	Round thread
SMS	Swedish Manufacturing Standard
TIG	Welding process with tungsten electrode and inert gas
VMQ	Silicone rubber (sealing material)
W/W	Weld/weld (weld-on ends; connection variant)

1.3 Guarantee, Warranty and Liability

Guarantee

If the fitting is used as intended, a guarantee is provided according to the statutory warranty obligation. Exceptions to this are wear parts.
Increased wear due to abrasive media is not a product defect. Any claims resulting from this cannot be taken into account as part of the warranty.

Warranty and Liability

The commitments agreed in the contract of supply and delivery, the general terms and conditions and the terms of delivery of the Armaturenwerk Hötensleben GmbH (referred to hereinafter as AWH) and the statutory regulations valid at the time the contract was concluded shall apply.

Warranty and liability claims in the case of personal injury and damage to property shall be excluded in particular if these can be attributed to one or more of the following causes:

- Improper or incorrect use of the fitting.
- Incorrect assembly, commissioning, operation and maintenance of the fitting.
- Failure to observe the instructions in the manual in terms of assembly, commissioning, operation and maintenance of the fitting.
- Structural modifications to the fitting (conversions or other modifications to the fitting must not be carried out without previous written approval from Armaturenwerk Hötensleben GmbH. In case of infringement, the fitting will lose its EC conformity and the operating license.),
- Use of spare parts that are not in accordance with the specified technical requirements,
- Improperly performed repairs,
- Disasters, the effects of foreign objects and force majeure.

Disclaimer

AWH reserves the right to make alterations to this document at any time and without prior notice. AWH provides no guarantee (neither expressed nor implied) with regard to all information in this document, including but not limited to the implied warranty of merchantability and suitability for a particular purpose.

2 Safety

The fitting has been built in accordance with state-of-the-art technology and the recognized rules of safety. Nevertheless, use of the fitting may represent a danger to the life and limb of the user and third parties or a risk of impairments to the device and other objects of material value as a result of its function.

The following basic safety notes are intended to prevent injury to personnel and material damage. The owner/operating company must ensure that the basic safety instructions are observed and adhered to.

These instructions contain basic notes on installation, operation, maintenance and servicing of the fitting which must be complied with.

Anyone involved in assembly, operation, maintenance and servicing must have read and understood these instructions.

The safety systems and safety notes described in these instructions must be adhered to.

WARNING

Failure to comply with these instructions, incorrectly performed installation and repair work or incorrect operation could lead to malfunctions on the device and to dangerous situations!

There is a risk of death or severe physical injuries.

- *Have all work performed on the fitting carried out only by an **expert** and in compliance with*
  - *the corresponding detailed operating and installation instruction(s),*
  - *the warning and safety signs on the device,*
  - *regulations and requirements specific to the facility and*
  - *national/regional regulations for safety and the prevention of accidents.*
- *Never install damaged fittings or components.*

The pictures in these instructions are for basic understanding and are primarily representations of the principles involved. They may differ from the actual design of the fitting.

2.1 Intended Use

WARNING

In the event of improper use, there is a risk of serious injury.

This fitting was designed exclusively for the purposes described below. Any other use beyond that described here or alteration of the fitting without written approval from AWH is considered contrary to the intended use. AWH accepts no liability for damages arising from this. The owner/operating company is solely responsible for the risk. The fitting may only be commissioned once it is certain that all the safety systems are fully functioning, and the facility in which the fitting is installed meets the safety requirements of all relevant EC directives.

NOTE

The fitting may only be installed by an ***expert****.*

The work described in this manual is described in a way intended to be understood and carried out by experts ***only***
(see section "2.6 Qualification Requirements to Be Met by the Personnel").

Inline sight glasses are intended for installation in pipelines.
Sight glasses are intended for mounting on pipelines and containers.
They are used for the visual monitoring of a flow of fluid in commercial and industrial operations (food, chemical and pharmaceutical industries and low-germ processes).

Suitable flow media include water, steam, mineral oil, food, and liquids from the chemical and pharmaceutical industry, as well as pasty media, which are subject to a hygienic standard.

The intended use also includes compliance with this manual, including the maintenance conditions.

2.2 Labeling the Fitting

The information in these operating instructions only applies to the fittings of the type and version specified on the title page (title page and rear side).

If you have any queries, specify the following correctly

- The nominal width,
- The sealing material,
- The housing material.

This is the only way to ensure quick and efficient processing.

2.3 Danger Warnings

The safety systems and safety notes described in these instructions must be adhered to.

Operation is performed from the control room of the higher-level facility or from the local control point.

2.3.1 Dangers

DANGER

Risk of injury due to splinters and shards of glass flying around!

Risk of burns due to hot media!

Destruction of the glass cylinder/sight glass could lead to death or severe cut injuries and burns.

- *Operate the fitting only with safety screen installed.*
- *Operate the fitting only at the permissible pressures and temperatures.*
- *Avoid rapid changes in temperature.*

WARNING

Risk of burns due to hot media!

There is a risk of burning during operation or maintenance if flow media have temperatures over +60 °C / +140 °F.

- *Let the flow medium cool down prior to cleaning work.*
- *Empty the pipelines prior to assembly or disassembly work.*
- *Wear work protective clothing, protective gloves and protective goggles when carrying out work on the fitting (see section “2.7 Personal Protective Equipment”).*

NOTE

Risk of damage to the fitting!

- *The fitting and the length and quality of the lines must meet the requirements.*
- *Assembly is to be carried out by **specialist personnel**.*
- *Make sure that only the media specified in the manual are used.*
- *The parameters listed in the manual must always be complied with (see chapter “4 Technical Data”).*

2.3.2 Hazardous Area of the Fitting

The hazardous area during setup, maintenance and repair work extends to 1 m around the fitting. Take into consideration the swing range of any switch cabinet doors that can open. The operator shall ensure that persons are prevented from entering the hazard area during motion sequences.

The area around the fitting shall be kept accessible to the operator.

2.3.3 Installation of Replacement Parts and Wearing Parts

Replacement and accessory parts not supplied by AWH have not been checked or approved by AWH. Installing and/or using this type of product can therefore negatively alter the structural properties of your facility, under certain circumstances. AWH is not liable for any damage arising from the use of non-original parts and non-original accessory parts. Standard parts can be obtained from specialist dealers.

2.3.4 Switch-off Procedure

WARNING

Risk due to escaping compressed air or media at high pressure!

Escaping compressed air or flow media at high pressure poses a risk of serious eye or skin injuries.

*Before cleaning, maintenance or repair work is carried out (by **specialist personnel** only), it is imperative that the following **switch-off procedure** be observed.*

- Disconnect the higher-level facility/machine from the power supply.
- Shut off the pneumatic system:
  - *Close the shut-off valve.*
  - *Check that the facility is depressurized.*
  - *Secure the shut-off valve against reopening.*
- Shut off the media supply:
  - *Relieve the pressure in the pipelines.*
  - *Afterwards, drain the pipelines (take particular care with hazardous materials).*
  - *Check that an media supply is prevented (insert dummy discs if necessary).*
- Observe a cooling down phase for media temperatures of over +60 °C / +140 °F.

2.4 Duties of the Owner/Operating Company

The fitting is used in the commercial sector. The owner/operating company is thus subject to the legal obligations of occupational safety.

In the EEA (European Economic Area), the national implementations of the framework directive (89/391/EEC) on carrying out measures for improving safety and protecting the health of employees during work, as well as the associated individual directives on the minimum specifications for safety and health protection of employees using work equipment, shall be observed and complied with in their current valid versions.

As a basic rule, the owner/operating company in Germany must observe the Industrial Safety Regulation (BetrSichV).

In other countries, the respective national guidelines, statutes and country-specific regulations regarding occupational safety and accident prevention are to be complied with. At the same time, the following, non-exhaustive instructions apply in particular:

- The owner/operating company must ensure that the fitting is only used as intended (see section “2.1 Intended Use”).
- The owner/operating company must find out about the locally applicable industrial safety regulations, and - in addition - use a risk assessment to determine the hazards resulting from the specific working conditions at the place of use of the fitting. This must then be implemented in the form of operating instructions for the operation of the fitting.
- When using hazardous materials, protective measures must be specified in accordance with the safety data sheets and operating instructions shall be compiled for hazardous materials. Personnel must be appropriately briefed about this.
  This also applies to hazardous substances that may arise during work processes.
- A continuous risk assessment must be carried out for workplaces, including temperature conditions for the medium and the place of use (falling). The measures must be recorded in operating instructions and personnel must be instructed accordingly.
- Supervisors must monitor compliance with the measures specified in the operating instructions.
- Throughout the entire operating period of the fitting, the owner/operating company must keep checking whether the operating instructions that they have compiled actually correspond with the current status of the regulations, and adjust the instructions if necessary.
- The operating company must clearly regulate and specify the responsibilities of personnel (for example, for operation, maintenance and cleaning).
- The owner/operating company must only allow sufficiently qualified and authorized personnel to work on the fitting.
- The owner/operating company must ensure that all employees handling the fitting have read and understood the manual.
  Furthermore, it must provide personnel with training at regular intervals with certification and inform them about the hazards.
- The owner/operating company must provide sufficient workplace lighting at the higher-level facility in accordance with the locally applicable regulations for occupational health and safety in order to prevent hazards occurring as a result of poor lighting.
- The owner/operating company must provide personnel with personal protective equipment and make sure that this is used (see section “2.7 Personal Protective Equipment”).

- The owner/operating company must make sure that no person works on the fitting whose ability to respond is impaired through drugs, alcohol, medication or similar.
- The owner/operating company must use appropriate measures to inform groups of persons who are not planned for direct contact with the fitting (for example, visitor groups) about the potential dangers involved.
- The owner/operating company is obliged to operate the fitting in perfect condition at all times.
- Wherever high pneumatic pressures occur, there is a possibility of sudden failure of or damage to the lines and connections. This poses a hazard. The owner/operating company must instruct operating and maintenance personnel at least once a year on the possible hazards.
- The constructor of the overall plant must install the switching and safety devices required for setting up, inspection, shutting down (including emergency shutdown), operating, maintenance, cleaning and repair, and provide proof of their installation.
- The operating company must provide fire safety devices, for example, the appropriate quantity of suitable hand-held fire extinguishers of the appropriate size, in easily accessible places and provide employees with training on fire safety.
- Warnings in the documentation for externally supplied assembly groups must be adhered to and incorporated into the risk assessments for the specific workplace.
- Before operating the machine with the fitting, the owner/operating company shall ensure that the local specifications were followed during assembly and commissioning, if these were carried out by the owner/operating company.

NOTE

Due to deviating operating conditions at the owner/operating company's site, additional safety measures may be required. They are then to be accordingly supplemented by the owner/operating company.

2.5 Safety Measures (to Be Implemented by Owner/Operating Company)

- The owner/operating company must ensure that unauthorized persons (not operating or maintenance personnel) are prevented from entering the hazardous area of the facility (in which the fitting is installed).
- The owner/operating company must empty the pipelines prior to assembly and maintenance work on the fitting.
- The owner/operating company must design the disconnection of the energy sources on the facility technically in such a way that the switch-off procedure described in section 2.3.4 can be adhered to.
- This manual must be retained for future reference.
  It must be available in the vicinity of the higher-level facility in which the fitting is installed.
- The operating company must define and adhere to the intervals for inspections and control measures in accordance with the environment and media used.
- The work described in the chapters Installation, Disassembly/Assembly, Maintenance/Cleaning, Malfunctions and Decommissioning/Disposal must only be carried out by experts.

2.6 Qualification Requirements to Be Met by the Personnel

The fitting may only be operated, serviced and repaired by persons who are qualified to do so. These persons must be familiar with these instructions and act in accordance with them. The respective authorizations for personnel must be clearly defined.

The following qualifications are designated in the instructions for various fields of activity:

Expert/Specialist Personnel

A person with appropriate training, suitable apprenticeship and experience who is in a position to identify risks and avoid dangers.

An expert is a person whose professional training, knowledge and experience, and whose knowledge of the relevant standards and regulations, enables them to carry out work on the fitting, identify potential risks independently and to avoid them.

Only personnel with the following specific knowledge may be employed for work on the fitting:

- **Assembly/disassembly:** Industrial mechanic or similar training, practical experience in the assembly/disassembly of fittings
- **Welding work:** Welder qualification in pipeline engineering or similar apprenticeship.
- **Electrical work:** Electrician; person with appropriate specialized training, knowledge and experience, enabling them to identify and prevent risks which may be caused by electricity.

2.7 Personal Protective Equipment

In order to minimize health risks, personal protective equipment must be worn when working on the fitting.

Protective work clothing

Protective work clothing is tight-fitting work clothing with low resistance to tearing, with close-fitting sleeves and without protruding parts. It is mainly used for protection against getting entangled in moving components.

Do not wear any rings, necklaces or other jewelry.

Safety shoes

Wear slip-resistant safety shoes for protection against heavy, falling objects or against slipping on slippery surfaces.

Protective gloves

Wear protective gloves to protect your hands against friction, grazes, getting pricked or deep cuts and against coming into contact with hot surfaces or chemical substances.

Protective goggles

Wear protective goggles for protection against media escaping at high pressure and against flying objects.

Hard hat

Wear a hard hat for protection against falling or flying objects.

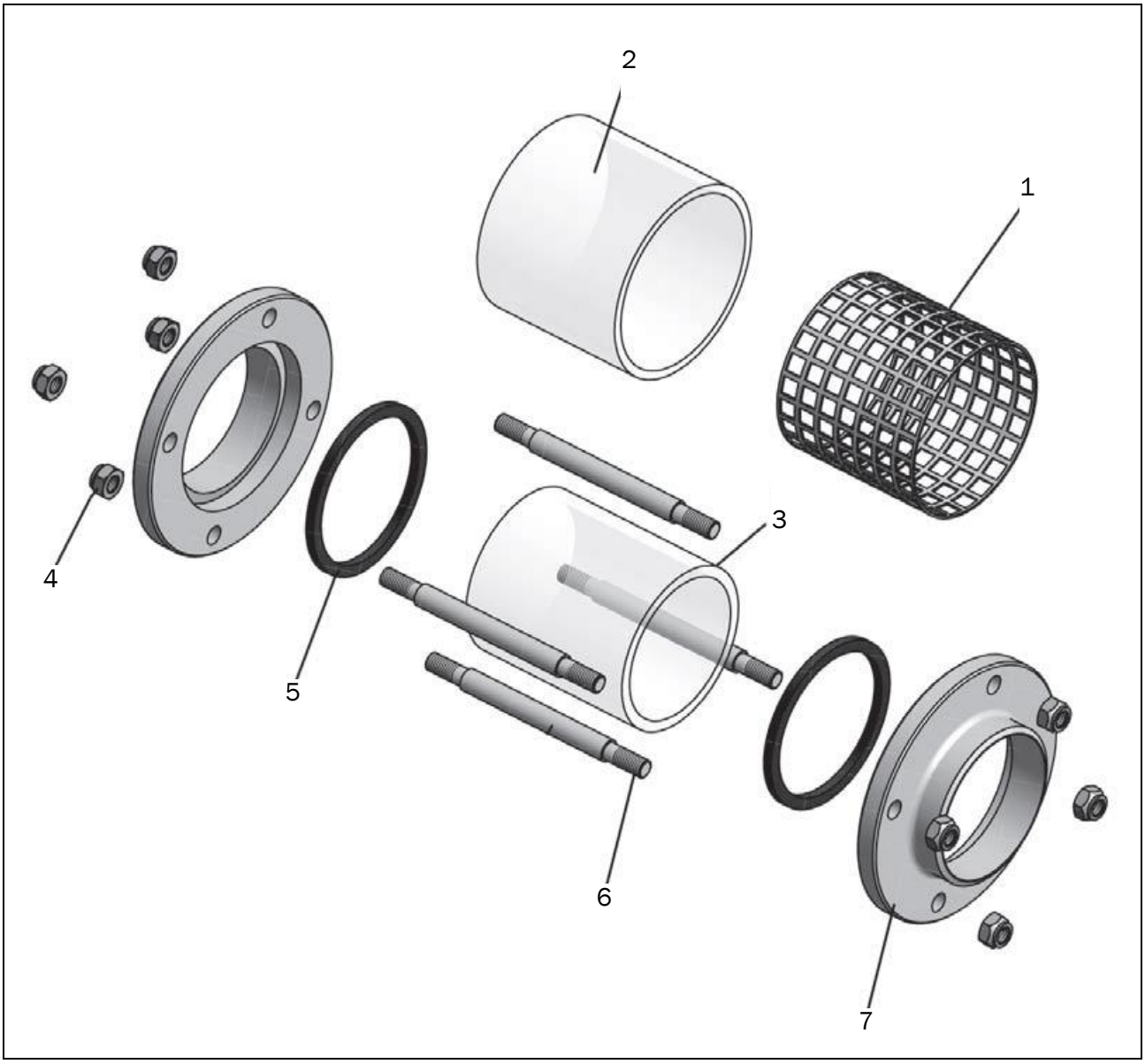
Welding mask

Wear a welding mask for protection from damage to the eyes or skin due to the welding arc and from burning caused by flying particles during welding.

Personal protective equipment must be provided by the user and must be in accordance with the valid requirements.
Furthermore, both the national regulations and, if necessary, the internal instructions from the owner/operating company, must be observed.

3 Overview and Structure

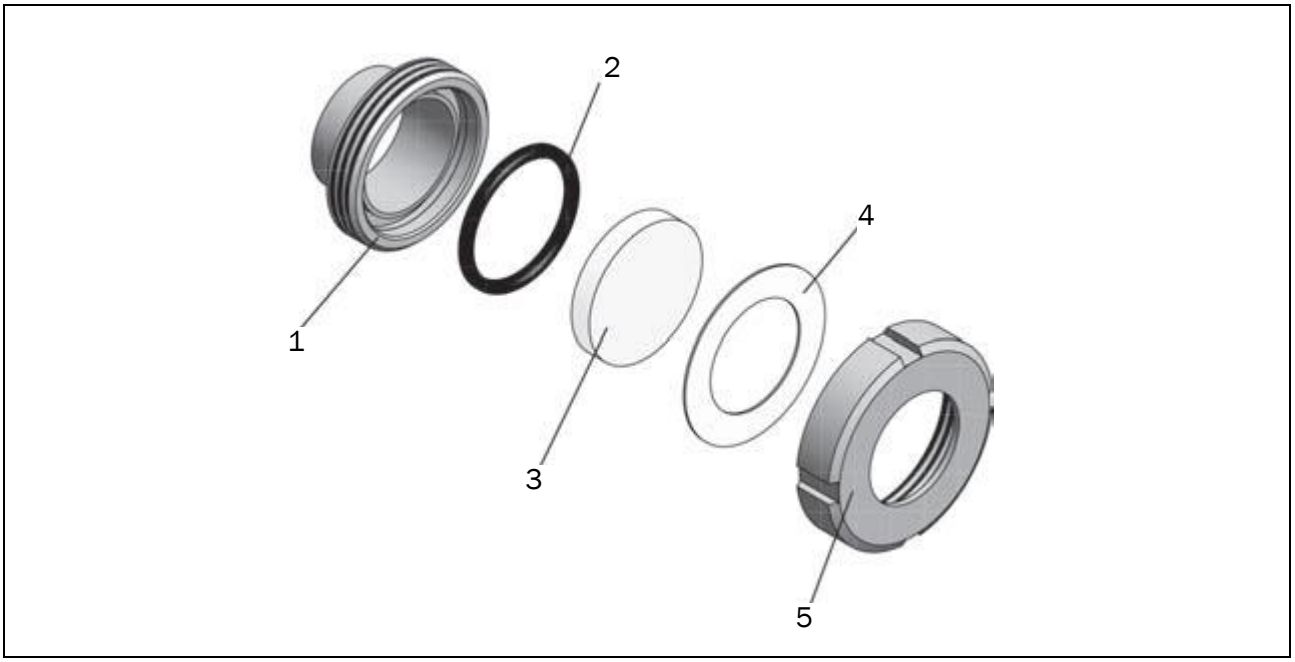
3.1 Inline sight glass



Pic. 3-1: Overview of inline sight glass

1 Perforated plate safety screen
2 Polycarbonate safety screen
3 Glass cylinders
4 Hexagonal nut
5 Gasket
6 Stud bolts
7 Flange

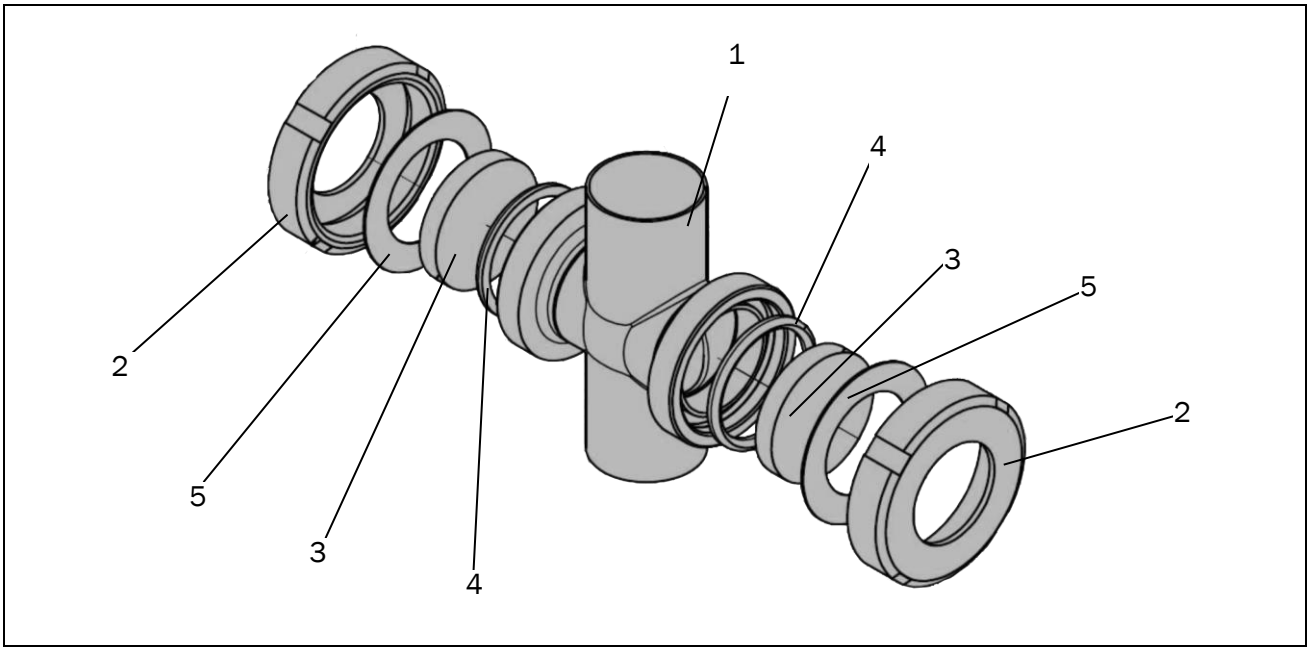
3.2 Sight glass



Pic. 3-2: Overview of sight glass

1 Males
2 Seal ring
3 Glass in sight glass (borosilicate glass)
4 Flange seal
5 Nut

3.3 Inline sight glass unit



Pic. 3-3: Overview of inline sight glass unit

1 Housing
2 Nut
3 Glass in sight glass
4 Seal ring DIN 11851
5 Flange seal

4 Technical Data

The fitting's area of application shall always be adjusted to the relevant operating conditions and the materials in contact with the product.

The maximum continuous temperature is dependent on the media.

4.1 General Data

Max. permissible operating pressure with connection sizes	Inline sight glass (See Pic. 3-1)	Sight glass (See Pic. 3-2)	Inline sight glass unit (See Pic. 3-3)
DN10 – DN65	10 bar / 145 psi		
DN80	8 bar / 116 psi		
DN100 – DN150	7 bar / 102 psi		
1/2" – 2 1/2"	10 bar / 145 psi		
3"	9 bar / 131 psi		
4"	7 bar / 102 psi		
DN25 – DN125		10 bar / 145 psi	10 bar / 145 psi
DN150		8 bar / 116 psi	8 bar / 116 psi
1" – 4"		10 bar / 145 psi	
1" – 4" SMS		10 bar / 145 psi	

	Inline sight glass	Sight glass and inline sight glass unit
Max. permissible operating temperature: (depends on the sealing material and medium)	+80 °C / +176 °F	+80 °C / +176 °F

4.2 Materials in Contact with the Product

Position	Inline sight glass (see Pic. 3-1)	Sight glass (see Pic. 3-2)	Inline sight glass unit (see Pic. 3-3)
Housing (item 1)			1.4301 / 1.4307 / 1.4404 / 1.4435 / 304 / 304L / 316L
Flange (item 7)	1.4301 / 1.4307 / 1.4404 / 1.4435 / 304 / 304L / 316L		
Male (item 1)		1.4301 / 1.4307 / 1.4404 / 1.4435 / 304 / 304L / 316L	
Gasket (item 5)	Selected according to operating conditions		
Seal ring (item 2)		Selected according to operating conditions	
Seal ring (item 4)			Selected according to operating conditions
Nut (item 2)			1.4307 / 1.4404 / 304 / 304L / 316L
Glass in sight glass (item 3)		Borosilicate glass	Borosilicate glass
Glass cylinder (item 3)	Borosilicate glass		

Sealing Materials

	Inline sight glass	Sight glass	Inline sight glass unit
EPDM	x	x	x
FKM		x	x
NBR	x		
PTFE		x	x
VMQ		x	x

Surfaces

Exterior surface: metal bright/polished
Inner flanges in contact with the product: Ra ≤ 0.8 µm / ≤ 1.6 µm

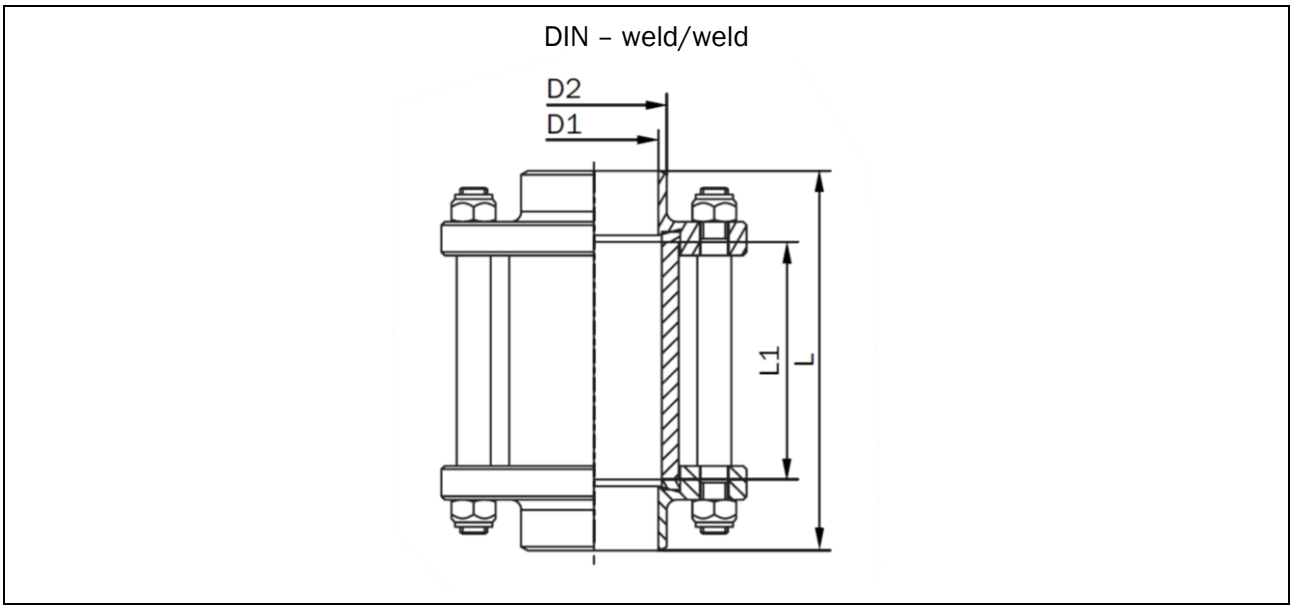
4.3 Connection Variants, Type Series, Dimensions

The dimensions in the table are in mm, except for the thread dimension, which is in inches, e.g. Rd 65 x 1/6".

The various connection variants for the fitting are listed below. The installation position can be freely selected.

4.3.1 Inline sight glass

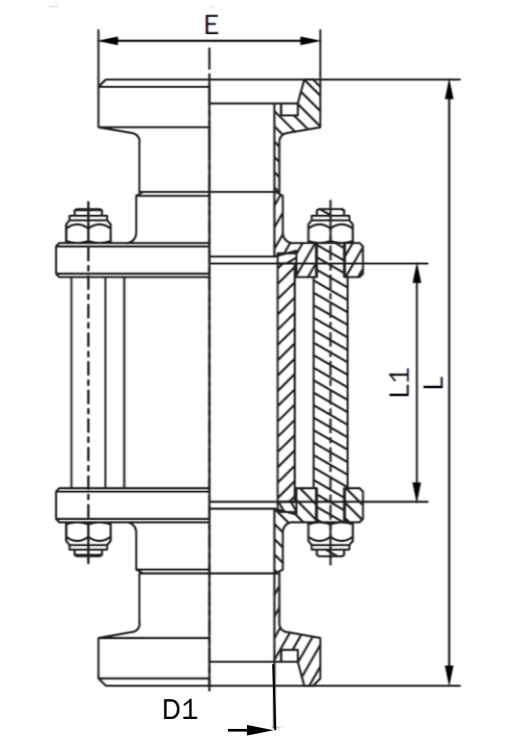
DIN Connection Variants



Pic. 4-1: Inline sight glass: Connection variants DIN S/S

DN	D1	D2	L	L1
10	10	15	88	60
15	16	21	88	60
20	20	25	88	60
25	26	31	98	70
32	32	37	104	70
40	38	43	112	70
50	50	55	112	70
65	66	72	127	85
80	81	87	135	85
100	100	106	169	115
125	125	132	202	160
150	150	157	216	170

DIN – Thread/Thread (G/G)



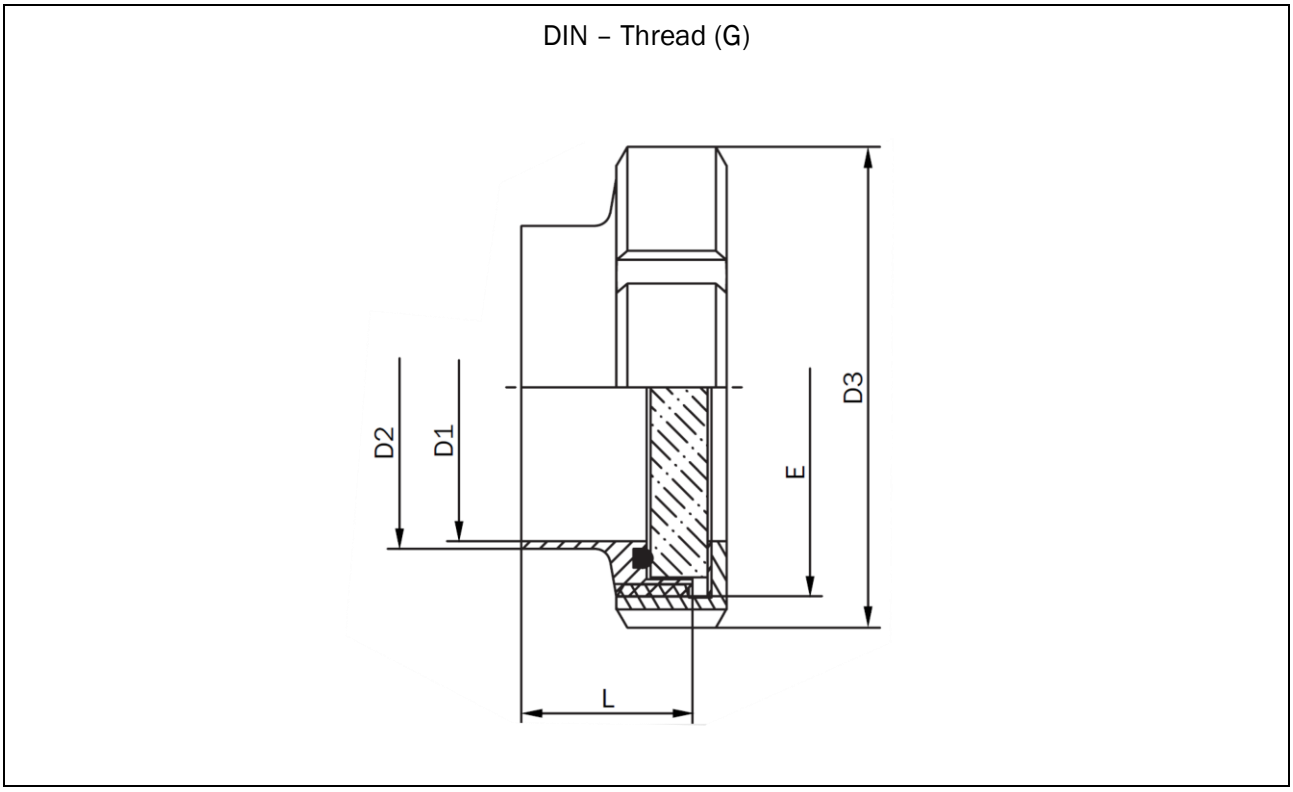
Pic. 4-2: Inline sight glass: Connection variant DIN G/G

DN	D1	L	L1	E
10	10	122	60	Rd 28 x 1/8"
15	16	122	60	Rd 34 x 1/8"
20	20	124	60	Rd 44 x 1/6"
25	26	142	70	Rd 52 x 1/6"
32	32	154	70	Rd 58 x 1/6"
40	38	164	70	Rd 65 x 1/6"
50	50	168	70	Rd 78 x 1/6"
65	66	191	85	Rd 95 x 1/6"
80	81	209	85	Rd 110 x 1/4"
100	100	257	115	Rd 130 x 1/4"
125	125	270	160	Rd 160 x 1/4"
150	150	290	170	Rd 190 x 1/4"

For additional connection variants, please refer to the product pages of the current AWH "Strainers and Sight Glasses" catalog.

4.3.2 Sight glass

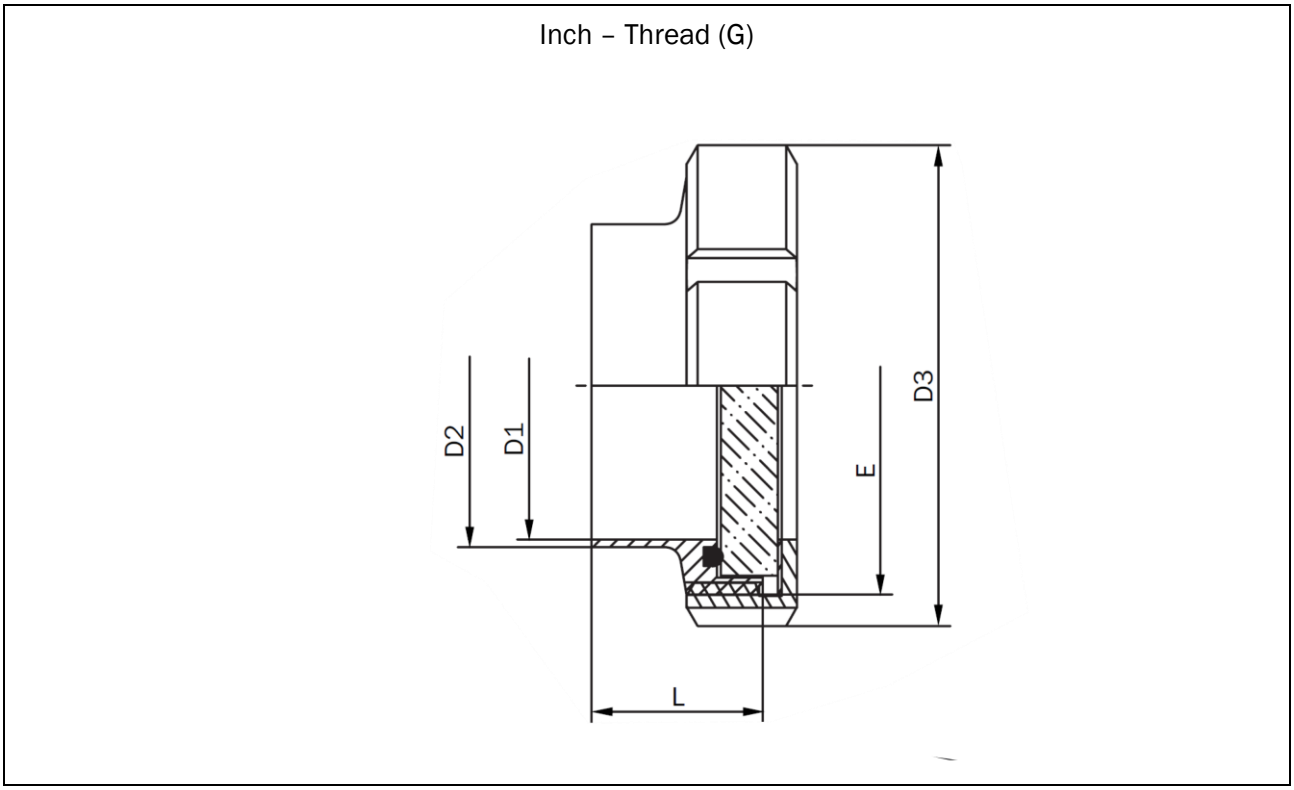
DIN Connection Variant



Pic. 4-3: Sight glass: Connection variants DN25 – DN150

DN	D1	D2	D3	E	L
25	25	29	63	Rd 52 x 1/6"	37
32	32	35	70	Rd 58 x 1/6"	40
40	38	41	78	Rd 65 x 1/6"	41
50	50	53	92	Rd 78 x 1/6"	43
65	66	70	112	Rd 95 x 1/6"	48
80	81	85	127	Rd 110 x 1/4"	54
100	100	104	148	Rd 130 x 1/4"	64
125	125	129	178	Rd 160 x 1/4"	58
150	150	154	210	Rd 190 x 1/4"	60

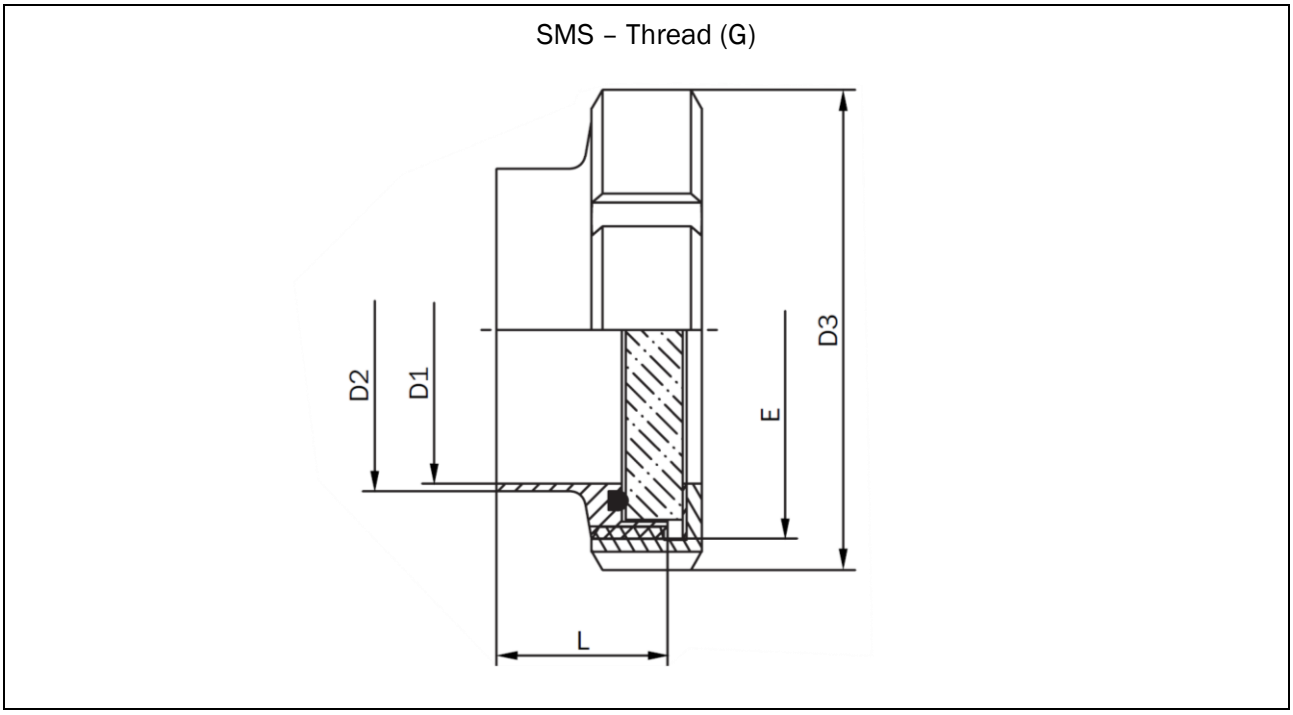
Inch connection variant



Pic. 4-4: Sight glass: Inch connection variant 1" - 4"

DN	D1	D2	D3	E	L
1"	22.9	35.1	63	Rd 52 x 1/6"	29
1 1/2"	35.1	38.5	78	Rd 65 x 1/6"	33
2"	47.8	51.5	92	Rd 78 x 1/6"	35
2 1/2"	60.5	63.5	112	Rd 95 x 1/6"	40
3"	72.9	76.1	127	Rd 104 x 1/6"	40
4"	100	104	148	Rd 130 x 1/4"	54

SMS connection variant

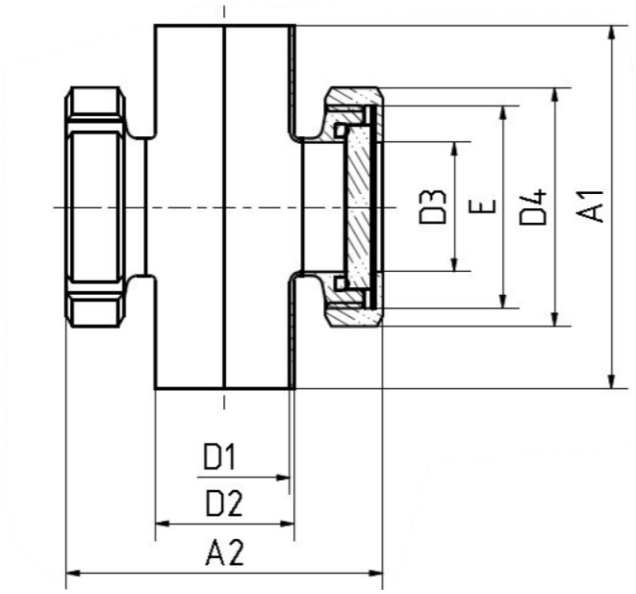


Pic. 4-5: Sight glass: Inch connection variant 1" - 4" SMS

DN	D1	D2	D3	E	L
1"	22.5	25	63	Rd 40 x 1/6"	37
1 1/2"	35.5	38	78	Rd 60 x 1/6"	40
2"	48.5	51	92	Rd 70 x 1/6"	41
2 1/2"	60.5	63.5	112	Rd 85 x 1/6"	43
3"	72.9	76.1	127	Rd 96 x 1/6"	48
4"	100	104	148	Rd 125 x 1/4"	54

4.3.3 Inline sight glass unit

Connection dimensions



Pic. 4-6: Inline sight glass unit: Connection dimensions

DN/ Dimension	A1	A2	D1	D2	D3	D4	E
25	100 100	91 91	25 26	28 29	26 26	63 63	Rd 52 x 1/6" Rd 52 x 1/6"
32	110 110	98 98	31 32	34 35	32 32	70 70	Rd 58 x 1/6" Rd 58 x 1/6"
40	120 120	105 105	37 38	40 41	38 38	78 78	Rd 65 x 1/6" Rd 65 x 1/6"
50	140 140	121 121	49 50	52 53	50 50	92 92	Rd 78 x 1/6" Rd 78 x 1/6"
65	160	145	66	70	66	112	Rd 95 x 1/6"
80/65	180	160	81	85	66	127	Rd 95 x 1/6"
100/65	200	182	100	104	66	148	Rd 95 x 1/6"
125/100	375	227	125	129	100	178	Rd 130 x 1/4"
150/100	450	259	150	154	100	210	Rd 130 x 1/4"

5 Installation

5.1 Scope of Delivery

The detailed scope of delivery can also be consulted in the order confirmation.

5.2 Transport and Packaging

Products from AWH are carefully checked and packed before shipping. However it is still possible the product may become damaged during transport.

CAUTION

When setting down the packaging, there is a risk of minor injury being caused by crushing!

- *When transporting the packaging, proceed with particular care.*
- *Wear safety shoes and protective gloves (see section "2.7 Personal Protective Equipment").*

5.2.1 Delivery (including Spare and Replacement Parts)

Incoming Goods Inspection

- Check that the product was delivered in complete form against the delivery note.
- Check for visible damage to the packaging.

Unpacking

- Remove the protective caps from the pipe connections (if present).
- Remove the packaging residue.

Damage

- Check the delivery for damage (visual inspection).

Complaints

If the delivery was damaged during transport:

- Contact the last shipping agent immediately.
- Retain the packaging (for possible inspection by the shipment agent or for return delivery).

Packaging for return delivery

If possible, use the original packaging and the original packaging material. If neither is available any more, request a packaging company with specialist personnel. Consult AWH if you have any questions regarding packaging and transport security.

5.2.2 Temporary Storage

Storage in a Closed Room

Storage conditions:
- Temperature: +10 °C to +45 °C / +50 °F to +113 °F
- Humidity: < 60%

5.3 Installation

DANGER

Risk of injury due to splinters and shards of glass flying around!

Risk of burns due to hot media!

The installation of a defective piece of glass could lead to the destruction of the glass during operation. This could result in death, serious cut injuries and burns.

- *Install only undamaged glass (without breakage, cracks or dents).*
- *Tensile and compression stresses must be ruled out.*

WARNING

Risk of serious injury due to leaking flange connections and pipe connections!

- *The installation of the fitting may be carried out only by an **expert**.*
- *Make sure that the flange connections and pipe connections are leak-proof.*
- *After installation, tensile and compressive stress must be ruled out.*

The fitting is installed in accordance with the structural layout of the pipe system and the technical data for the connection variants (see section 4.3). See the dimensional drawings for the installation dimensions. Make sure sufficient space is available for operation and maintenance (1 m around the fitting).

5.3.1 Installation Welding

Welding Instructions

Welding shall be carried out in pipes acc. to DIN EN 10357 series A, DIN 11866 series A and C, SMS standard (France).

Welding method: TIG or orbital welding

Seam type: Butt weld joint acc. to DIN EN 29692

Installed condition

The fitting must be removed before welding (see chapter “6 Disassembly/Assembly”).

Weld Seam Preparation

The weld-on ends must fit flush and be welded without a gap.

- Cut the ends of the pipes level and right-angled.
- Remove burrs from the interfaces.
- Align the housing weld-on ends with the pipeline so they are level radially and axially.

Filler Materials

Base Material	Suitable Filler Material
1.4301 (304)	1.4302 / 1.4316 / 1.4551 (308LSi)
1.4404 (316L)	1.4430 / 1.4455 / 1.4576 (316LSi)
1.4435 (316L)	1.4430 / 1.4440 (316LSi)

NOTE

Unusable, leaking connection!

When welding the inline sight glass on, take care to ensure that the screw holes are flush in the flanges.

Welding

- Connect forming gas before welding.
- Affix 3 to 4 tack welds before welding.

Welding Post-Treatment

No treatment is necessary on the interior after welding.

Accessible points can be improved by grinding.

Finishing can be applied to the exterior afterwards by staining, brushing, grinding and polishing.

Cleaning

- Clean all welded parts before assembly.

5.3.2 Installation of the inline sight glass with G/G, K/K, G/K connection

NOTE

Risk of damage to the thread during installation!

The thread could become damaged when using the nut to fasten the fitting.

Use a nut wrench.

When installing the inline sight glass, ensure that the connection fittings and nuts conform to the same standard (e.g. DIN 11851 Series 2).
Before installation, check the seal ring on the male for damage and to ensure that it is installed in the correct position. Replace if necessary.

6 Disassembly/Assembly

DANGER

Risk of injury due to splinters and shards of glass flying around!

Risk of burns due to hot media!

The installation of a defective piece of glass could lead to the destruction of the glass during operation. This could result in death, serious cut injuries and burns.

- *Install only undamaged glass (without breakage, cracks or chips).*
- *Tensile and compression stresses must be ruled out.*

WARNING

Risk of serious injury due to incorrect disassembly/assembly!

When using harmful or toxic media or media which are hazardous in any other way, there is a risk of intoxication or chemical burns!

- *Work must be performed only by an* ***expert****.*
- *Always adhere to the* ***switch-off procedure*** *without fail before all assembly, maintenance and repair work (see section 2.3.4).*
- *Wear work protective clothing, protective gloves and protective goggles when carrying out the work (see section "2.7 Personal Protective Equipment").*
- *If in doubt, contact a specialist company or AWH.*

WARNING

Risk of burns due to hot media!

There is a risk of burning if flow media have temperatures over +60 °C / +140 °F.

- *Let the flow medium cool down prior to work.*
- *Empty the pipelines prior to assembly or disassembly work.*

NOTE

Risk of damage to the fitting during disassembly/assembly

- *Work must be performed only by an* ***expert****.*
- *Proceed carefully and meticulously.*
- *Do not use sharp-edged objects.*

6.1 Inline sight glass

6.1.1 Disassembly from the higher-level facility

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system.

⚠ **WARNING** Risk of burns due to hot media!

There is a risk of burning if flow media have have temperatures over +60 °C / +140 °F.

- Let the flow medium cool down prior to work.
- Drain the pipe system.
- Undo the hexagonal nut (Pic. 3-1, item 4).
- Separate the flanges (Pic. 3-1, item 7).
- Remove the glass cylinder (Pic. 3-1, item 3) together with the gasket (Pic. 3-1, item 5) and safety screen (Pic. 3-1, items 1 and 2) from the flange.

6.1.2 Assembly with Glass Cylinder Replacement

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system.

⚠ **WARNING** Risk of burns due to hot media!

There is a risk of burning if flow media have have temperatures over +60 °C / +140 °F.

- Let the flow medium cool down prior to work.
- Drain the pipe system.
- Check the seals (Pic. 3-1, item 5) and the glass cylinder (Pic. 3-1, item 3) for damage.
- Clean the installation space and check for any damage.
- Clean the glass cylinder (Pic. 3-1, item 3) and the safety screen (Pic. 3-1, items 1 and 2).
- Place the seal (Pic. 3-1, item 5) in the flange (Pic. 3-1, item 7).
- Position the glass cylinder (Pic. 3-1, item 3) in the flange (Pic. 3-1, item 7) so that the glass cylinder is not in contact with any metal.
- Push the safety screen (Pic. 3-1, items 1 and 2) over the glass cylinder (Pic. 3-1, item 3).
- Carefully set the counter flange on the flange (Pic. 3-1, item 7) without damaging the seal (Pic. 3-1, item 5) and screw it in place in a diagonal sequence.
- While screwing it in place, check the alignment of the glass cylinder between the flanges and adjust it if necessary.
- Tighten the hexagonal nuts in a diagonal sequence.
- Perform a leak test under operating conditions.

6.2 Sight glass

6.2.1 Disassembly from the higher-level facility

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system.

⚠ **WARNING** Risk of burns due to hot media!

There is a risk of burning if flow media have have temperatures over +60 °C / +140 °F.

- Let the flow medium cool down prior to work.
- Drain the pipe system.
- Unscrew the nut (Pic. 3-2, item 5) from the male (Pic. 3-2, item 1) of the housing.
- Remove the glass in sight glass (Pic. 3-2, item 3) from the housing.
- Also carefully remove the seal ring (Pic. 3-2, item 2) from the slot if necessary.
- Take the flange seal (Pic. 3-2, item 4) out of the nut (Pic. 3-2, item 5).

6.2.2 Assembly with Gasket Replacement

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system.

⚠ **WARNING** Risk of burns due to hot media!

There is a risk of burning if flow media have have temperatures over +60 °C / +140 °F.

- Let the flow medium cool down prior to work.
- Drain the pipe system.
- Check the flange seal (Pic. 3-2, item 4) and the seal ring (Pic. 3-2, item 2) for damage.
- Clean the glass of the sight glass (Pic. 3-2, item 3) and inspect it for signs of damage such as cracks, “stone chips”, damage to the edges, deep scratches.
- Clean the installation space and check for any damage.
- Replace cloudy glass in sight glass.
- Place the seal ring (Pic. 3-2, item 2) in in the slot. The flat surface of the seal ring must lie in the bed of the slot.
- Place the flange seal (Pic. 3-2, item 4) in in the nut (Pic. 3-2, item 5).
- Position the glass in sight glass (Pic. 3-2, item 3) in the housing in such a way that it is not in contact with any metal.
- Screw the completed nut(Pic. 3-2, item 5) onto the male (Pic. 3-2, item 1) of the housing.
  Ensure that the seal ring (Pic. 3-2, item 2) is not so severely pressed that the glass comes into contact with the male.

6.3 Inline sight glass unit

6.3.1 Disassembly from the higher-level facility

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system.

⚠ **WARNING** Risk of burns due to hot media!

There is a risk of burning if flow media have have temperatures over +60 °C / +140 °F.

- Let the flow medium cool down prior to work.
- Drain the pipe system.
- Unscrew the nut (Pic. 3-3, item 2) from the housing (Pic. 3-3, item 1).
- Remove the glass in sight glass (Pic. 3-3, item 3) from the housing (Pic. 3-3, item 1).
- Carefully remove the seal ring (Pic. 3-3, item 4) from the slot.
- Take the flange seal (Pic. 3-3, item 5)from the nut (Pic. 3-3, item 2).

7 Maintenance/Cleaning

WARNING

Risk of serious injury due to incorrect maintenance!

When using harmful or toxic media or media which are hazardous in any other way, there is a risk of intoxication or chemical burns!

- *Work must be performed only by an* ***expert****.*
- *Adhere to the* ***switch-off procedure*** *without fail before all cleaning, maintenance and repair work (see section 2.3.4).*
- *Wear work protective clothing, protective gloves and protective goggles when carrying out the work (see section "2.7 Personal Protective Equipment").*
- *If in doubt, contact AWH.*

WARNING

Risk of burns due to hot media!

There is a risk of burning if flow media have temperatures over +60 °C / +140 °F.

- *Let the flow medium cool down prior to work.*
- *Empty the pipelines prior to cleaning, maintenance or repair work.*
- *Wear work protective clothing, protective gloves and protective goggles when carrying out the work (see section "2.7 Personal Protective Equipment").*

7.1 Cleaning/Maintenance Intervals

To ensure proper operation of the fitting, it must be cleaned and maintained at regular intervals.

- Define the cleaning intervals depending on the operating environment and the type of flow medium used.
- Define the inspection intervals for seals depending on the operating environment and the type of flow medium used.
- The fitting is subject to vibrations during operation, which can loosen the screwed and clamp connections. To prevent damage, check the fitting for loose connections at regular intervals (recommended interval for single-shift operation: 3 months).

Refer to the relevant manufacturer's instructions for details on cleaning and maintenance work for supplier components.

7.2 Notes on Cleaning

WARNING

Risk of injury due to incorrect handling of cleaning agents!

- *Store the cleaning agents in accordance with the relevant safety guidelines.*
- *When handling cleaning agents, follow the safety instructions on the cleaning agent manufacturer's data sheet.*
- *Always wear rubber gloves and protective goggles when cleaning (see section "2.7 Personal Protective Equipment").*
- *Take care not to touch the fitting or pipeline when processing hot media or during the sterilization process.*

To clean the product when installed, simply wash the surfaces that come into contact with the media (CIP cleaning).

Cleaning agents:	3% nitric acid	max. +60 °C / + 140 F
	3% caustic soda	max. +80 °C / +176 F

Please observe the following:

- Use only clean and chlorine-free water.
- Measure the quantities carefully to avoid overly strong concentrations of cleaning agent.
- Rinse with plenty of clean water after cleaning.

Sterilization

Sealing Material

EPDM	Sterilization temperature: short-term max. 140 °C / 284 °F
FKM, NBR, VMQ	Sterilization temperature: short-term max. 130 °C / 266 °F

7.3 Spare Parts Stock

When requesting spare parts, the type of fitting must always be specified.

Important for all spare part requests or questions are the following details:

- Nominal width
- Sealing Material
- Housing material
- Connection type (DIN 11851, DIN 11864, welding, etc.)
- Accessories

Only use genuine spare parts since only these will guarantee perfect functioning.

Spare parts and the associated spare part numbers can be found in the Strainers and Sight Glasses catalog (available on Internet page http://www.awh.eu/de/downloads).

8 Faults

8.1 Safety Notes

WARNING

Risk of serious injury due to incorrectly performed repair work!

When using harmful or toxic media or media which are hazardous in any other way, there is a risk of intoxication or chemical burns!

- *Troubleshooting work should be carried out only by* ***specialist personnel****.*
- *Always adhere to the* ***switch-off procedure*** *prior to repair work (see section 2.3.4).*
- *Wear work protective clothing, protective gloves and protective goggles when carrying out the work (see section "2.7 Personal Protective Equipment").*
- *If in doubt, contact AWH.*

WARNING

Risk of burns due to hot media!

There is a risk of burning if flow media have temperatures over +60 °C / +140 °F.

- *Let the flow medium cool down prior to work.*
- *Empty the pipelines prior to repair work.*
- *Wear work protective clothing, protective gloves and protective goggles when carrying out the work (see section "2.7 Personal Protective Equipment").*

8.2 Malfunctions and Remedial Action

Fault	Cause	Remedy
Glass is cloudy	Abrasive media	Replace glass cylinder/glass in sight glass
	Unsuitable media or cleaning agents	Replace glass cylinder/glass in sight glass
Glass has broken	Pressure surge/water hammer	Replace glass cylinder/glass in sight glass Avoid pressure surges in the future
	Temperature changed too rapidly	Replace glass cylinder/glass in sight glass Avoid rapid temperature changes in the future
	Seals faulty or missing	Replace glass cylinder/glass in sight glass and seals
Fitting is leaking	Seal/seal ring faulty, worn or missing	Replace seals
	Hexagonal nuts not fully tightened (inline sight glass) Nut not screwed tight (sight glass/inline sight glass unit)	Tighten nuts fully in a diagonal sequence Tighten nut

8.3 How to Act in Case of an Emergency

– Activate the emergency stop function on the higher-level facility (for example, by pressing the emergency stop switch).

– Shut off the media supply.

9 Decommissioning/Disposal

9.1 Decommissioning and Disassembly

- Perform the switch-off procedures for the higher-level facility (see section 2.3.4).
- Observe the steps listed in chapter 6 Disassembly/Assembly.

WARNING

Risk of serious injury due to incorrect disassembly!

When using harmful or toxic media or media which are hazardous in any other way, there is a risk of intoxication or chemical burns!

- *Disassembly work should be carried out only by **specialist personnel**.*
- *Always adhere to the **switch-off procedure** prior to disassembly work (see section 2.3.4).*
- *Wear work protective clothing, protective gloves and protective goggles when carrying out the work (see section "2.7 Personal Protective Equipment").*
- *If in doubt, contact AWH.*

WARNING

Risk of burns due to hot media!

There is a risk of burning if flow media have temperatures over +60 °C / +140 °F.

- *Let the flow medium cool down prior to work.*
- *Empty the pipelines prior to disassembly work.*
- *Wear work protective clothing, protective gloves and protective goggles when carrying out the work (see section "2.7 Personal Protective Equipment").*

9.2 Disposal

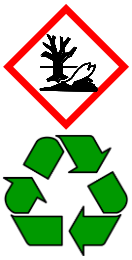
CAUTION

Danger of injuries from harmful liquids which are a health hazard

When performing disposal, there is a risk of injury from contact with harmful liquids.

- *Wear appropriate personal protective equipment (e.g. protective goggles, protective gloves, see section "2.7 Personal Protective Equipment").*

NOTE



Risk of environmental damage as a result of improper disposal!

- *The fitting is mainly made of stainless steel (except for glass and sealing material) and should be disposed of in accordance with the applicable local environmental regulations.*
- *Oils and cleaning agents are NOT permitted to flow into ground water, bodies of waters or in the sewer system and must be disposed of in accordance with local regulations and in compliance with the information contained in the cleaning agent manufacturer's safety data sheets.*
- *Contaminated cleaning tools (such as brushes, cloths etc.) must be disposed of in accordance with the manufacturer's specifications.*
- *Packaging material must be disposed of in accordance with the environmental regulations and supplied for recycling.*

10 Declarations

On the following pages, declarations can be found for the following variants:

- Inline sight glass and
- inline sight glass unit.

Declarations for Fittings within the Meaning of the Pressure Equipment Directive 2014/68/EU

Fittings that come under the application area of Directive 2014/68/EC receive an EC Declaration of Conformity and a CE mark pursuant to that directive.

The fittings that come under Article 4, Paragraph 3 receive no EU Declaration of Conformity and no CE mark within the meaning of that guideline.

10.1 Inline sight glass DN10 - DN125 / 1" - 4" / SMS 1" - 4"

Armaturenwerk Hötensleben GmbH
Schulstraße 5-6
39393 Hötensleben, Germany

Declaration (Translation)

Manufacturer's declaration within the meaning of the EU Pressure Equipment Directive 2014/68/EU

We hereby declare that the design of

Name: **Inline sight glass**

Type: **DN10 – DN125 / 1" – 4" / SMS 1" – 4"**

DN	10	15	20	25	32	40	50		65		80	100	125
				1"	1 1/4"	1 1/2"	2"	2 1/2"		3"		4"	
PN [bar]	10									9	8	7	

is consistent with the following directives and standards in its delivered version:

Guideline/Standard	Title	Version	Comments
2014/68/ EU	EU Pressure Equipment Directive	05/2014	
DIN EN 12516-2	Industrial valves - shell design strength - Part 2: Calculation method for steel fitting shells	10/2004	
AD 2000 information sheets	Regulations for pressure equipment (national standards)		
The fittings are designed for fluids in fluid group 1 and for gases in fluid group 2. According to this, the nominal widths DN10–DN125, 1"- 4", SMS 1"- 4" are categorized in accordance with Article 4 (3).			

If any modifications are made to the fitting without our agreement, this declaration is void.

Commissioning is prohibited until it is determined that the overall facility fulfills the provisions of the guidelines. For information about proper use of the fittings, see the operating/installation instructions.

Hötensleben, Germany, on 5. May 2017

Thomas Erhorn (CEO)

Person authorized to compile the technical documentation:
Armaturenwerk Hötensleben GmbH
Mr. Guth, Schulstr. 5/6, 39393 Hötensleben, Germany

10.2 Inline sight glass DN150

Armaturenwerk Hötensleben GmbH
Schulstraße 5-6
39393 Hötensleben, Germany

Declaration (Translation)

EU Declaration of Conformity pursuant to the EU Pressure Equipment Directive 2014/68/EU

We hereby declare that the design of

Name: **Inline sight glass**

Type: **DN150 / PN7**

is consistent with the following directives and standards in its delivered version:

Guideline/Standard	Title	Version	Comments
2014/68/EU	EU Pressure Equipment Directive	05/2014	Module A
DIN EN 12516-2	Industrial valves - shell design strength – Part 2: Calculation method for steel fitting shells	10/2004	
AD 2000 information sheets	Regulations for pressure equipment (national standards)		
The fittings are designed for fluids in fluid group 1 and for gases in fluid group 2. DN150 nominal widths are classified according to Category I.			

If any modifications are made to the fitting without our agreement, this declaration is void.

Commissioning is prohibited until it is determined that the overall facility fulfills the provisions of the guidelines. For information about proper use of the fittings, see the operating/installation instructions.

Hötensleben, Germany, on 5. May 2017

Thomas Erhorn (CEO)

Person authorized to compile the technical documentation:
Armaturenwerk Hötensleben GmbH
Mr. Guth, Schulstr. 5/6, 39393 Hötensleben, Germany

10.3 Sight glass/inline sight glass unit DN25 – DN100

Armaturenwerk Hötensleben GmbH
Schulstraße 5-6
39393 Hötensleben, Germany

Declaration (Translation)

Manufacturer's declaration within the meaning of the EU Pressure Equipment Directive 2014/68/EU

We hereby declare that the design of

Name: **Sight glass/inline sight glass unit**

Type: **DN25 – DN100 / 1" – 4" / SMS 1" – 4" PN10**

is consistent with the following directives and standards in its delivered version:

Guideline/Standard	Title	Version	Comments
2014/68/ EU	EU Pressure Equipment Directive	2014	
DIN EN 12516-2	Industrial valves - shell design strength - Part 2: Calculation method for steel fitting shells	10/2004	
AD 2000 information sheets	Regulations for pressure equipment (national standards)		
The fittings are designed for fluids in fluid group 1 and for gases in fluid group 2. According to this, the nominal widths DN25–DN100, 1"- 4", SMS 1"- 4" are categorized in accordance with Article 4 (3).			

If any modifications are made to the fitting without our agreement, this declaration is void.

Commissioning is prohibited until it is determined that the overall facility fulfills the provisions of the guidelines. For information about proper use of the fittings, see the operating/installation instructions.

Hötensleben, April 5. May 2017

Thomas Erhorn (CEO)

Person authorized to compile the technical documentation:
Armaturenwerk Hötensleben GmbH
Mr. Guth, Schulstr. 5/6, 39393 Hötensleben, Germany

10.4 Sight glass/inline sight glass unit DN125 – DN150

Armaturenwerk Hötensleben GmbH
Schulstraße 5-6
39393 Hötensleben, Germany

Declaration (Translation)

EU Declaration of Conformity pursuant to the EU Pressure Equipment Directive 2014/68/EU

We hereby declare that the design of

Name: **Sight glass/inline sight glass unit**

Type: **DN125 / PN10**

DN150 / PN8

is consistent with the following directives and standards in its delivered version:

Guideline/Standard	Title	Version	Comments
2014/68/EU	EU Pressure Equipment Directive	05/2014	Module A
DIN EN 12516-2	Industrial valves - shell design strength – Part 2: Calculation method for steel fitting shells	10/2004	
AD 2000 information sheets	Regulations for pressure equipment (national standards)		
The fittings are designed for fluids in fluid group 1 and for gases in fluid group 2. Accordingly, the nominal widths DN125 - DN150 are classified according to Category I.			

If any modifications are made to the fitting without our agreement, this declaration is void.

Commissioning is prohibited until it is determined that the overall facility fulfills the provisions of the guidelines. For information about proper use of the fittings, see the operating/installation instructions.

Hötensleben, Germany, on 5. May 2017

Thomas Erhorn (CEO)

Person authorized to compile the technical documentation:
Armaturenwerk Hötensleben GmbH
Mr. Guth, Schulstr. 5/6, 39393 Hötensleben, Germany

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