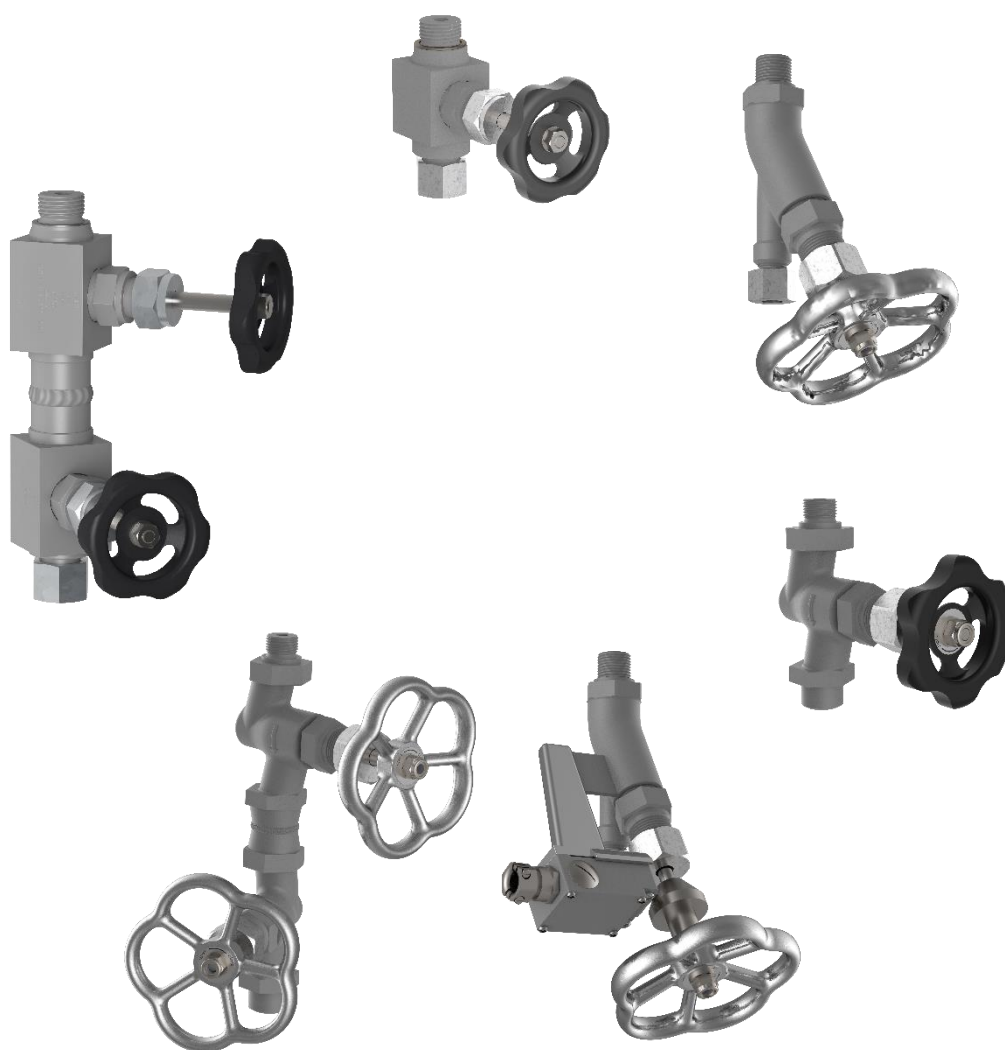




Drain valves

Single and double drain valves



Version: 10/2024

D-09-B-62825-EN-01

Installation and operating instructions

(English translation)

Table of Contents

1	About this document	1
1.1	Introduction _____	1
1.2	Product identification _____	1
1.3	Marking of safety and warning information _____	2
1.4	Copyright _____	2
2	Safety Instructions	3
2.1	Requirements for personnel _____	3
2.2	Safety at work _____	3
2.3	Intended use _____	5
2.4	Damage to the product _____	5
3	Contents of the packaging	6
3.1	Included _____	6
3.2	Optional versions _____	6
4	System Description	7
4.1	General _____	7
4.2	Function _____	7
5	Construction	8
5.1	AV250/ AV255 / AV320 _____	8
5.2	AV500 / AV505/ AV520 / AV525 _____	9
5.3	AV540 / AV550 _____	10
5.4	AV580 / AV585 _____	10
5.5	AV251 _____	10
5.6	AV560 / AV 570 _____	10
6	Technical data	11
6.1	Limitations of use _____	11
6.2	Dimensions _____	12
6.3	Position switch for AV580 / AV585 _____	16

7	Assembly	17
7.1	Version with flange_____	17
7.2	Version with welding sleeve_____	17
7.3	Threaded version_____	18
7.4	Drain tubing _____	18
8	Commissioning	19
8.1	Before commissioning _____	19
8.2	Commissioning at the same time as the boiler_____	20
8.3	Commissioning under pressure and temperature loads_____	20
9	Case of damage	21
9.1	Replacing the drain valve_____	23
9.2	Spindle / gland packing leaks _____	24
9.3	Replacing packing _____	24
9.4	Spindle change _____	26
9.5	Seat change_____	27
10	Spare parts	28
10.1	AV250 / AV320/ AV251 _____	28
10.2	AV500 / AV520 _____	29
10.3	AV540 / AV550 _____	29
11	Decommissioning and disposal	30
11.1	Dismantle valve _____	30
11.2	Disposal _____	31

1 About this document

1.1 Introduction

The Installation and operating instructions is part of the Drain valves. It must be made available to the responsible departments "Incoming goods, transport, assembly, commissioning and maintenance". The Installation and operating instructions must be stored in such a way that the specialist personnel has access to them at all times. If the gauge is passed on to a third party, these Installation and operating instructions must also be included in the national language of the third party.



NOTE



Safe and trouble-free operation of Igema GmbH Drain valves is not possible without precise knowledge.

- Installation and operating instructions Note installation and operating instructions
- Familiarise yourself with all relevant documents.

The Installation and operating instructions contain important information for the proper use and safe operation of Drain valves. Please also note important information on the repair, maintenance, care, safety and value preservation of your measuring and control system.

If the Installation and operating instructions or the accompanying documents are partially not available or have become unusable, a replacement operating instructions for the gauge can be obtained by specifying the document number on the cover page. It is also possible to download the operating instructions after scanning the QR code shown on the back.

1.2 Product identification

The gauge and the associated valves are described in the documents accompanying the delivery. This allows the operating instructions to be assigned to the valves.

The valves are usually part of a gauge. The operating instructions for the gauge therefore refer to the applicable documents for the mounted valves. It must be ensured that these operating instructions are described as an applicable document and apply to the drain valves fitted.

1.3 Marking of safety and warning information

In the following Installation and operating instructions, safety instructions are marked with the following symbols:

	SIGNAL WORD	SYMBOL(S)
Nature and source of danger Consequences of non-compliance Instructions for action to avoid the danger		

	This symbol with the signal word DANGER and a background warning colour indicates a danger that will result in death or serious injury if not avoided.
	This symbol with the signal word WARNING and a background warning colour indicates a danger that can lead to death or serious injury if not avoided.
	This symbol with the signal word CAUTION and a background warning colour indicates a danger that can lead to injuries if not avoided.
	This symbol with the signal word NOTICE and a background colour indicates a danger that can lead to property damage if not avoided.
	This symbol with the signal word ENVIRONMENT and a background colour indicates a danger that can lead to environmental pollution if not avoided.
	This symbol with the signal word TIP and a background colour indicates a user tip that provides additional and useful tips.

1.4 Copyright

This operating manual contains texts and drawings that may not be reproduced, distributed or otherwise communicated in whole or in part without the express permission of the manufacturer.

The copyright of the operating instructions remains with:

Igema GmbH

Antwerpener Str. 1

48163 Münster

Germany

Violations oblige you to pay compensation.

2 Safety Instructions

2.1 Requirements for personnel

NOTE

Property damage caused by incorrect installation, commissioning, maintenance and operation



Only qualified persons who are familiar with the measurement and control systems are allowed to carry out work

Igema GmbH can be commissioned for the installation and maintenance.



CAUTION

Risk of injury due to external influences



External influences can lead to injuries in the absence of protective equipment

- Put on personal protective equipment according to category II

2.2 Safety at work



WARNING

Risk of injury due to leaking medium



Inflammatory, irritating and harmful substances can escape from the gauge and lead to skin injuries and burns. This danger is also to be expected in the case of an unpressurised cooled system.

- Wear protective clothing including safety glasses.
- Check the danger posed by the medium and, if necessary, wear respiratory protection or support.
- Observe the order of work.
- Perform work only when the gauge is depressurized and emptied.
- In principle, do not consider any system to be depressurised.

Risk of injury due to high temperatures

Surfaces of the gauges and areas near the gauges heat up to the maximum permissible temperature and can cause severe burns if touched.

- Check the danger of the medium.
- Wear protective clothing including safety glasses.
- Before carrying out maintenance and dismantling work, wait until the system is adjusted to the atmospheric conditions.

Danger of suffocation due to dangerous gases

Escaping gases can lead to suffocation.

- Check the danger of the medium.
- Wear protective clothing including safety glasses and respiratory protection.
- Before carrying out maintenance and dismantling work, wait until the system is adjusted to the atmospheric conditions.

Risk of injury due to corrosive liquids

Corrosive liquids can cause serious injuries in case of skin contact

- Check the danger of the medium.
- Wear protective clothing including safety glasses.

**CAUTION****Risk of injury due to unsecured work area**

An unsecured work area can endanger working and bystanders.

- Ensure safe access.
- Delimit and mark the secured working area.
- Sufficiently illuminate the working area.

Risk of injury due to heavy loads

There is a risk of injury when handling large and/or heavy gauges.

- Observe the load handling regulation.
- Use lifting equipment to move heavy and bulky appliances.

Risk of injury due to heavy loads

There is a risk of injury when handling large and/or heavy gauges.

- Observe the load handling regulation.
- Use lifting equipment to move heavy and bulky appliances.

2.3 Intended use** NOTE****Property damage caused by irregular use**

- Use gauges exclusively as a gauge of filling levels on containers.
- Maintain maximum pressure and temperature ranges of all components.
- Ensure the suitability of the gauge for the planned use/application.
- Ensure the compatibility of the gauge and the medium.
- Observe the correct orientation and flow direction of the gauge.

2.4 Damage to the product** NOTE****Property damage caused by incorrect storage and transport**

Incorrect transport and storage can cause damage to the gauge.

- Avoid bumps and hard setdown.
- Store the gauge protected from environmental influences and in a dry place.
- Secure the gauge against damage.

3 Contents of the packaging

3.1 Included

In most cases, the valves are supplied as part of a gauge pre-assembled as a unit. Individual valves can also be supplied.

1. Valve in a pre-assembled unit **or** individual valve
2. Installation and operating instructions

3.2 Optional versions

These operating instructions apply to the drain valves in standard and customer-specific versions. Optional versions are, for example, the stainless steel valve body or the double drain valve version.

4 System Description

4.1 General

IGEMA drain valves are largely maintenance-free and allow for easy handling. All IGEMA valves have metal seals; the valve spindle is sealed with a stuffing box packing. The shut-off valve designs range from a simple shut-off to a double shut-off.

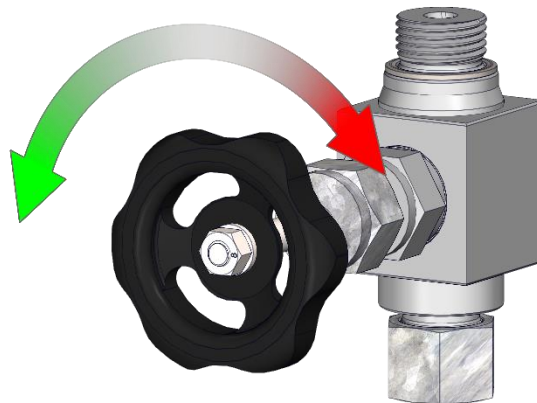
4.2 Function

Hand lever/handwheel rotated clockwise:

valve is **closed**.

Hand lever/handwheel rotated anticlockwise:

valve is **opened**.



Example: AV250



NOTE

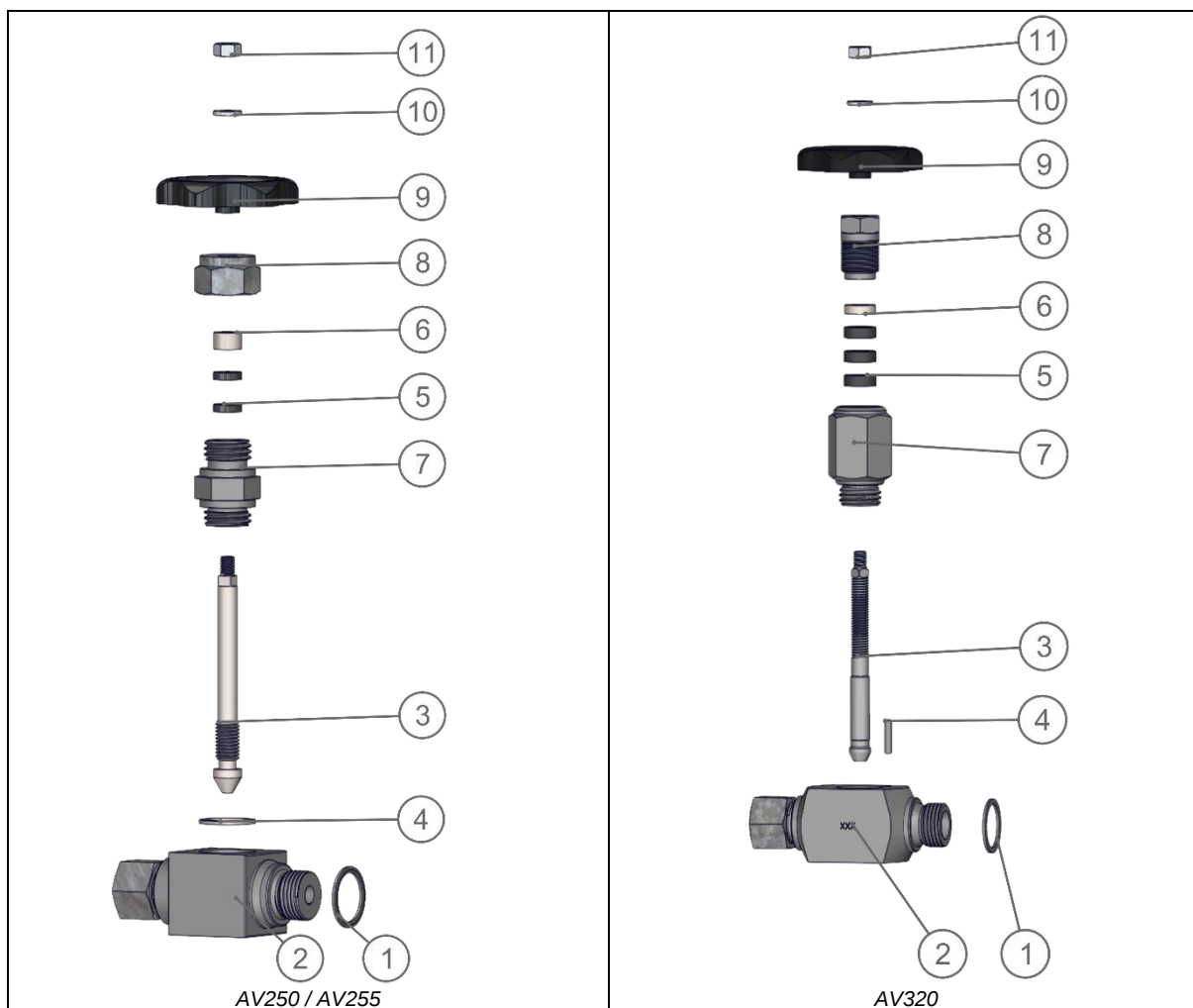
Material damage due to increased torques

Opening and closing the valves with excessive torques leads to leaks and damage.

- Open and close valves with manual torque.

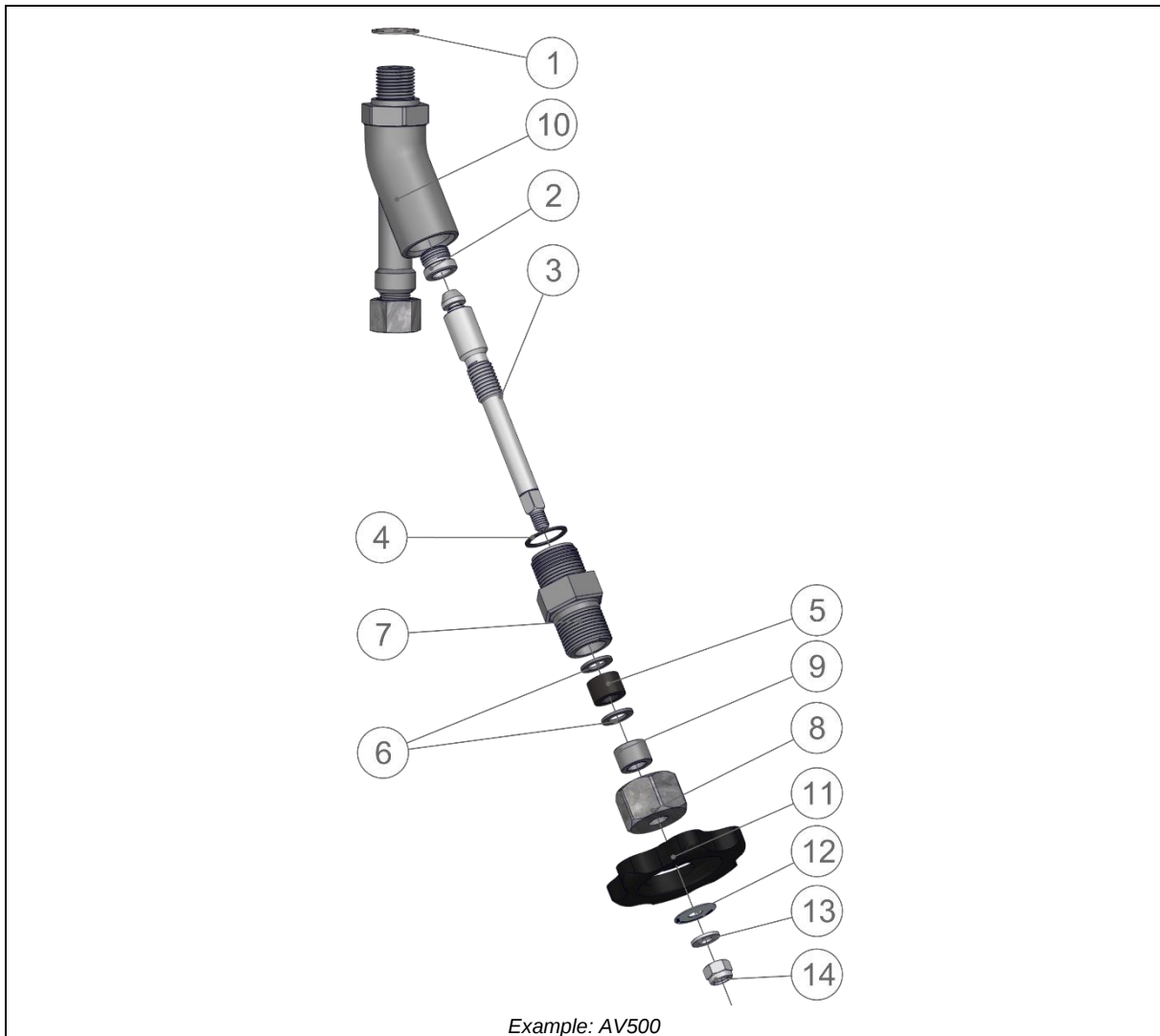
5 Construction

5.1 AV250/ AV255 / AV320



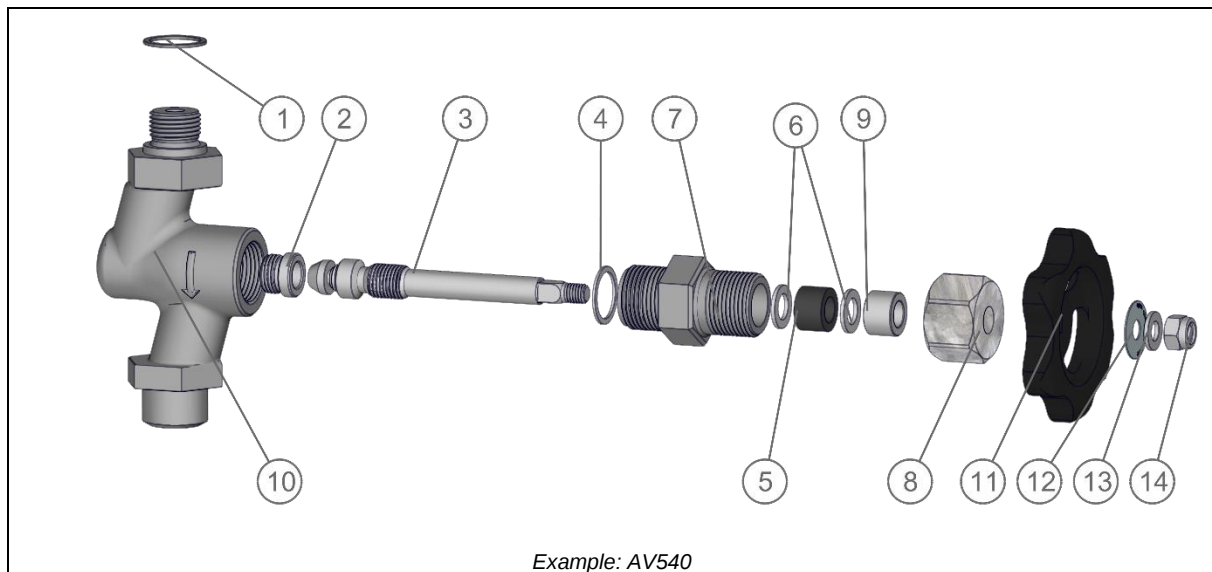
	AV250 / AV255	AV320
1	Sealing ring	
2	Valve body	
3	Valve spindle	
4	Sealing ring	Tension pin
5	Packing set	
6	Stuffing box	
7	Valve upper part	
8	Cap nut	Spindle guide
9	Handwheel	
10	Washer	
11	Hexagon nut	

5.2 AV500 / AV505/ AV520 / AV525



1	Sealing ring	8	Cap nut
2	Valve seat	9	Stuffing box
3	Valve spindle	10	Valve body
4	Sealing ring	11	Handwheel
5	Scraper rings	12	Open-close indicator disc
6	Packing set	13	Washer
7	Valve upper part	14	Hexagon nut

5.3 AV540 / AV550



1	Sealing ring	8	Cap nut
2	Valve seat	9	Stuffing box
3	Valve spindle	10	Valve body
4	Sealing ring	11	Handwheel
5	Scraper rings	12	Open-close indicator disc
6	Packing set	13	Washer
7	Valve upper part	14	Hexagon nut

5.4 AV580 / AV585

The drain valve types AV580 and AV585 are valves of the types AV500, AV505, AV520 or AV525 with modified valve spindle and welded-on bracket with attached position switch.

5.5 AV251

The drain valve type AV251 is a double drain valve consisting of two AV250 type valves positioned one above the other.

5.6 AV560 / AV 570

The drain valve types AV560 and AV570 are double drain valves consisting of two AV540 or AV550 valves positioned one above the other.

6 Technical data

6.1 Limitations of use

Application limits AV250 / AV251	Pressure / temperature assignment
	PN250 according to EN12516-1 Class 1500 according to ASME B16.34

Application limits AV320	Pressure / temperature assignment
	PN320 according to EN12516-1 Class 2500 according to ASME B16.34

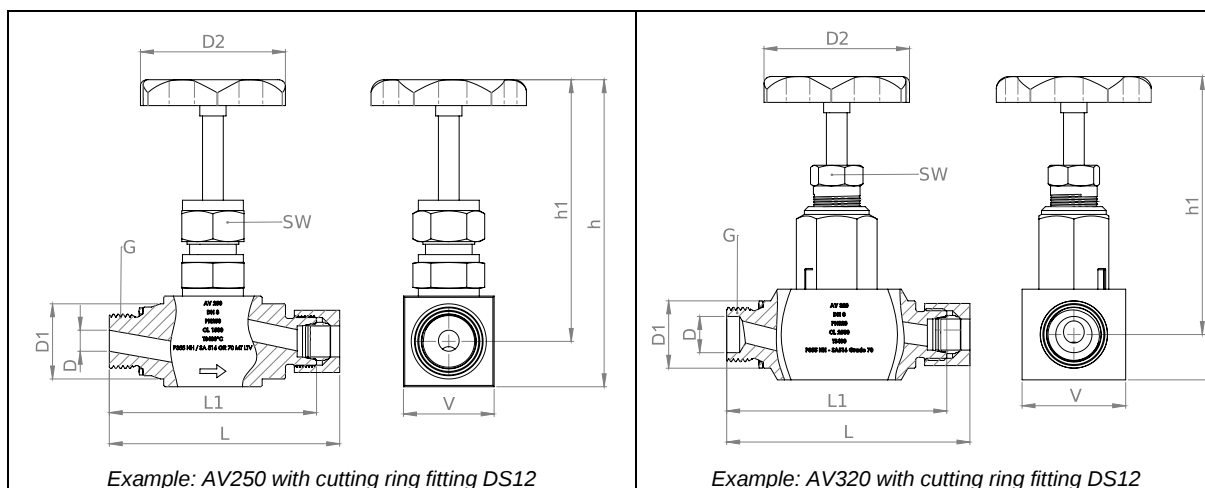
Limitations of use AV500 / AV505 AV540 / AV545 AV560	all. Pressure [PS]	all. Temperature [TS]
	32 bar 464 psig	239 °C 458 °F

Limitations of use AV520 / AV525 AV550 / AV555 AV570 / AV575 AV580 / AV585	all. Pressure [PS]	all. Temperature [TS]
	200 bar 2900 psig	366 °C 690 °F

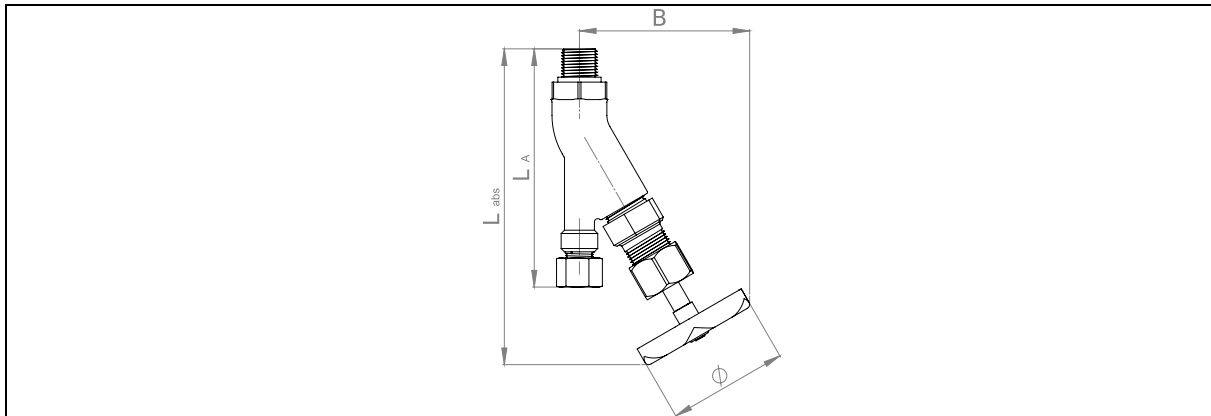
6.2 Dimensions

Drawings of the valves with specified connections are shown and dimensioned below. Customised connections are possible and have an effect on the connection dimensions and absolute lengths.

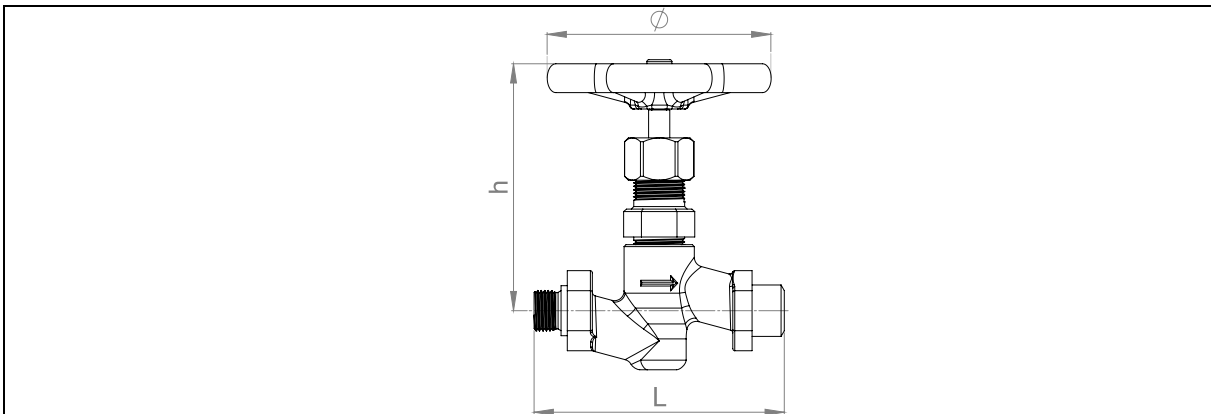
AV250/ AV255 / AV320



		AV250/ AV255		AV320	
		[mm]	[inch]	[mm]	[inch]
Connection thread	[G]	G 1/2" BSP		G 1/2" BSP	
Diameter	[D]	8	1/3	14	5/9
Connection diameter	[D1]	26	1	26	1
Handwheel diameter	[D2]	60	2 1/3	60	2 1/3
Height	[h]	117	4 3/5	117	4 3/5
Connection height	[h1]	100	4	100	4
Width across flats	[SW]	24	1	18	5/7
Square measure	[V]	□35	□1 3/8	□40 x 35	□1 4/7 x 1 3/8
Connection dimension	[L]1	80	3 1/7	85	3 1/3
Absolute length	[L]	89	3 1/2	94	3 5/7

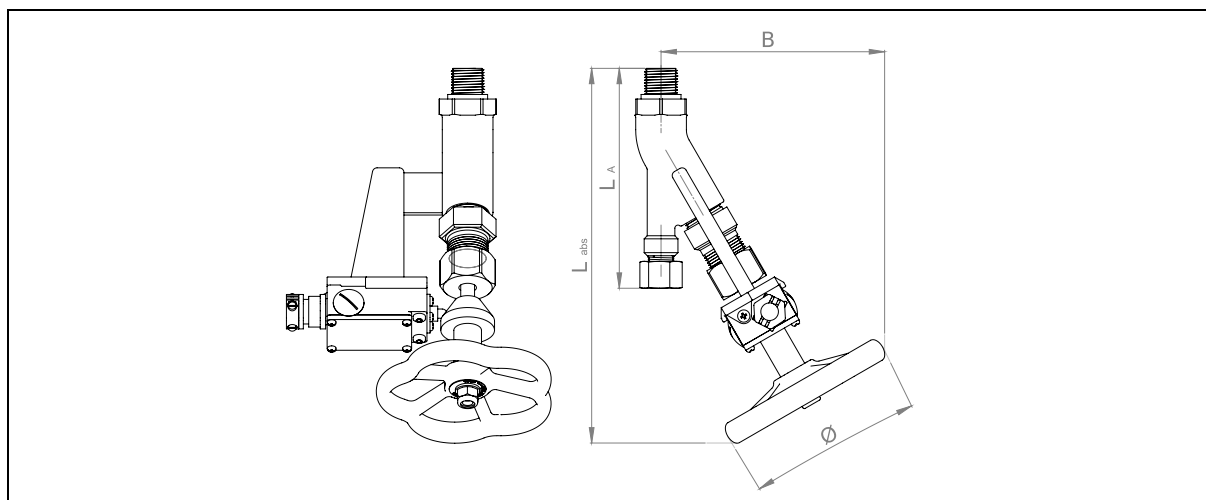
AV500 / AV505/ AV520 / AV525


		AV500 / AV505		AV520 / AV525	
		[mm]	[inch]	[mm]	[inch]
Absolute length	$[L_{abs}]$	190	7 $\frac{1}{2}$	203	8
Connection dimension	$[L_A]$	143	5 $\frac{5}{8}$	143	5 $\frac{5}{8}$
Width	$[B]$	102	4	122	4 $\frac{4}{5}$
Handwheel diameter	$[\phi_H]$	80	3 $\frac{1}{7}$	110	4 $\frac{1}{3}$

AV540/ AV545/ AV550 / AV555


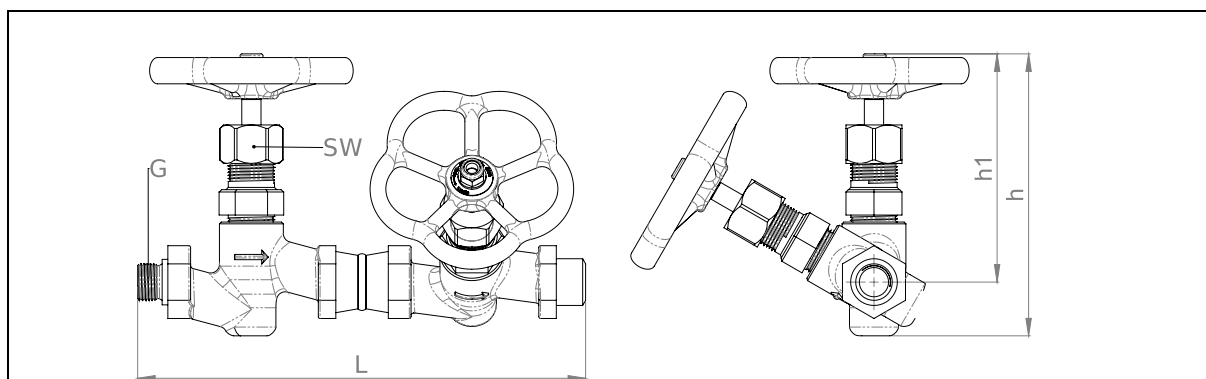
			[mm]	[inch]
Handwheel diameter	up to 32 bar/ 464 psig (AV540/ AV545)		80	3 $\frac{1}{7}$
	up to 200 bar / 2900 psig (AV550 / AV555)	$[\phi]$	110	4 $\frac{1}{3}$
Length		$[L]$	~130	~ 5 $\frac{1}{8}$
Depth		$[t]$	130	5 $\frac{1}{8}$

AV580/ AV585



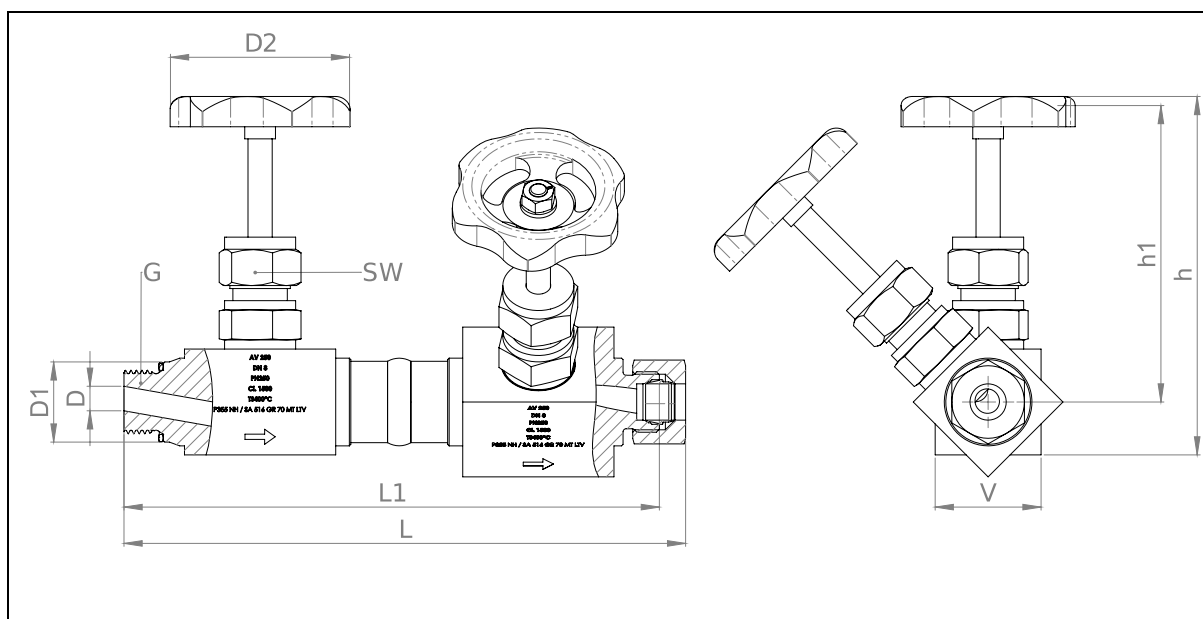
		AV580 / AV585	
		[mm]	[inch]
Absolute length	[L _{abs}]	~250	9 ⁵⁴ / ₆₄
Connection dimension	[L _A]	134	5 ¹⁸ / ₆₄
Width	[B]	~145	5 ⁵ / ₇
Handwheel diameter	[Ø _H]	110	4 ¹ / ₃

AV560 / AV565 / AV570 / AV575



		AV560 / AV565		AV570 / AV575	
		[mm]	[inch]	[mm]	[inch]
Connection thread	[G]	G 1/2" BSP			
Handwheel diameter	[D2]	80	3 ¹ / ₇	~115	4 ¹ / ₂
Height	[h]	~160	6 ² / ₇	~160	6 ² / ₇
Connection height	[h1]	~130	5 ¹ / ₈	~130	5 ¹ / ₈
Width across flats	[SW]	32	1 ¹ / ₄	32	1 ¹ / ₄
Total length	[L]	~256	~10	~256	~10

AV251



		[mm]	[inch]
Connection thread	[G]	G 1/2" BSP	
Diameter	[D]	8	1/3
Connection diameter	[D1]	26	1
Handwheel diameter	[D2]	60	2 1/3
Height	[h]	117	4 3/5
Connection height	[h1]	100	4
Width across flats	[SW]	24	1
Square measure	[V]	□35	□1 3/8
Connection length	[L1]	177	7
Total length	[L]	185	7 2/7

6.3 Position switch for AV580 / AV585

- Powder-coated die-cast aluminium housing
- Snap action, changeover contact with double break
- Cable gland with clamping jaws M16x1.5mm, nickel-plated
- Plunger actuator with recessed stainless steel ball

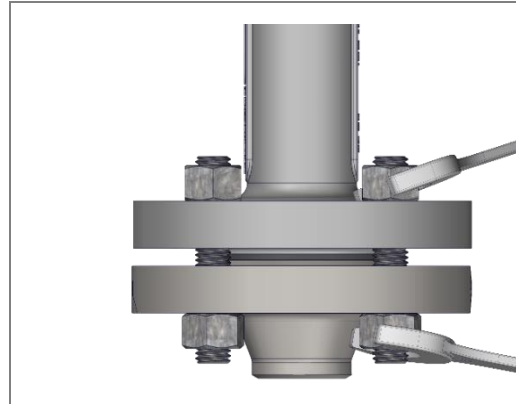


Protection class according to IEC/EN 60529	IP65
Switching elements	1 opener, 1 closer
Connection cross section	max. 2.5mm ²
Utilisation category	AC-15
Rated operating current/voltage [I_e/U_e]	6A / 400 VAC
Short-circuit protection	6A gG / gN fuse
Mechanical service life	>1 million switching cycles
Switching frequency	max 3600/h
ambient temperature	-20°C < T _{amb} < +80°C
Switching point accuracy with repeated switching	± 0.1mm

7 Assembly

7.1 Version with flange

- Observe the orientation of the gauge .
- Check sealing surfaces for cleanliness
- Assemble the flange connection between the gauge and the valve in accordance with the applicable standard



7.2 Version with welding sleeve



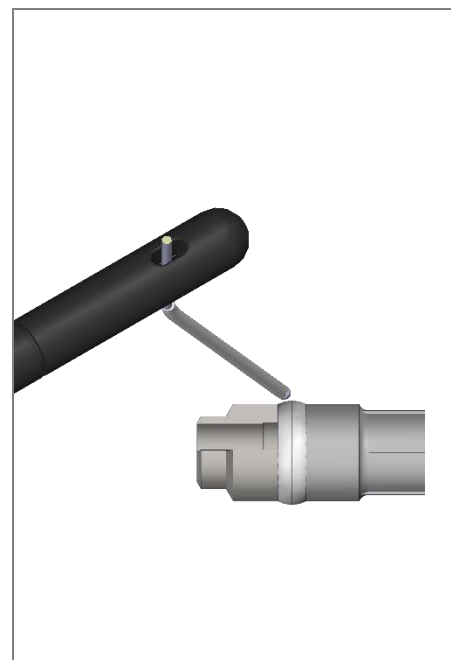
WARNING

Eye damage due to lack of personal protective equipment

Lack of eye protection during welding leads to eye damage in working and bystanders.

- Secure the work area.
- Wear a welding protective mask.

- Observe the orientation of the gauge.
- Remove protection caps. (Transportation lock)
- Assembly only by using welding process 111 (metal-arc welding with covered electrode) or 141 (inert-gas tungsten-arc welding).
- Check on an application-specific basis whether a subsequent heat treatment of the weld seams is required.



7.3 Threaded version

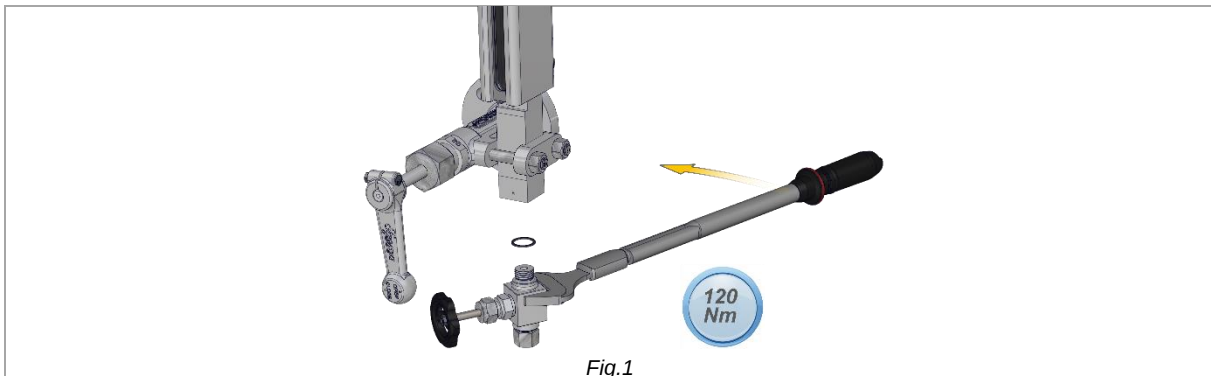


Figure 1:

- Screw the drain valve with seal into the gauge body with a torque of 120 Nm.

7.4 Drain tubing

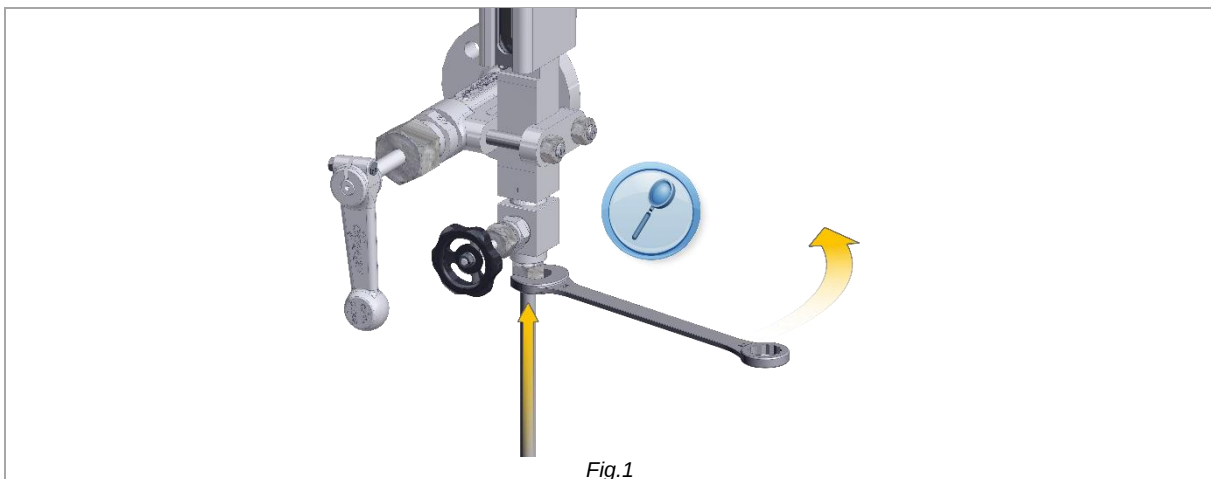


Figure 1:

- Mount tube Ø12x1mm (made of material P235GH) on site to the screw connection provided according to DIN 2353 (SW24)



ENVIRONMENT

Danger to the environment due to escaping medium

If media escape freely into the atmosphere, they can pose a risk to the environment.

- Secure the drain tubing against pressure surges
- Ensure that the drain tubing is tight against open atmosphere.

8 Commissioning



WARNING

Risk of injury due to leaking medium



Inflammatory, irritating and harmful substances can escape from the gauge and lead to skin injuries and burns. This danger is also to be expected in the case of an unpressurised cooled system.

- Wear protective clothing including safety glasses.
- Check the danger posed by the medium and, if necessary, wear respiratory protection or support.
- Observe the order of work.
- Perform work only when the gauge is depressurized and emptied.
- In principle, do not consider any system to be depressurised.

8.1 Before commissioning

Torque

All valves are pressure tested before delivery. In individual cases, material settlement can occur due to transport, long-term storage or during assembly. All screw connections must therefore be checked for tightness and appropriate torque.



NOTE

Leaks due to insufficient torques

- Check screw connections for appropriate torque and a tight fit.
- 24 hours after commissioning, check all screw connections again for the correct torque and possibly retighten.
- Check for leaks in the first few days after commissioning

Condition of the boiler water



NOTE

Property damage caused by contaminated medium

Impurities in the medium can cause leaks during commissioning and possible subsequent flushing.

- Ensuring the cleanliness of the medium in the best possible way

8.2 Commissioning at the same time as the boiler

TIP

This type of commissioning is recommended by Igema GmbH due to the lower stress on the components.

Commissioning at the same time as the boiler must be carried out in the same way for all gauge types. These steps describe the commissioning of a gauge of type LG40-CS with a drain valve of type AV250 as an example.

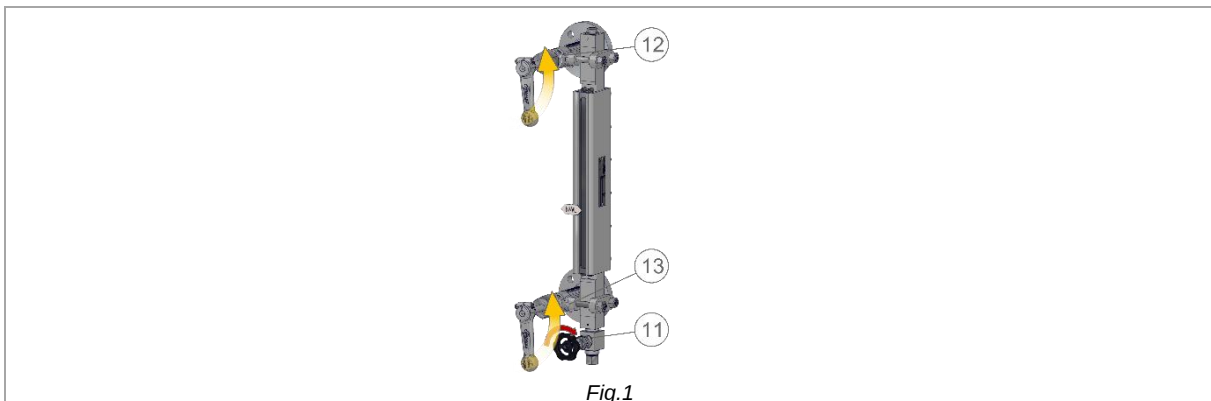


Figure 1:

- Close drain valve (pos. 11)
- Open the shut-off valves (pos. 12, 13) as far as they will go.

The commissioning of the pressure vessel/boiler with the gauge can now be carried out.

8.3 Commissioning under pressure and temperature loads

For this type of commissioning, the steps in the operating instructions for the gauge must be followed. If an action step includes the instruction to close or open the valve, this must be followed. (see chap.4.2)

TIP

Other commissioning for double drain valves

The handling instructions in the operating instructions for the gauges must always be carried out with both spindles in the case of double drain valves.

9 Case of damage



NOTE

Property damage caused by incorrect spare parts

Replaced spare parts that do not correspond to the characteristics of the original spare parts may cause damage to the gauge.

- Only use original parts from Igema GmbH for replacement.

Material damage due to insufficient or incorrect lubrication

Lubrication of components with inadequate or incompatible lubricants can lead to material damage.

- Ensure compatibility of lubricant and medium
- Ensure compatibility of lubricant and operating temperature.
- Keep spindle threads lubricated.

Property damage caused by damaged components

Apparently intact components can be damaged and lead to damage to the device when reinstalled or reused.

- Replace glasses and gaskets annually.
- After loosening the clamping tabs, install completely new seals.
- Create optimal operating conditions for the durability of the glasses and seals.



WARNING

Risk of injury due to leaking medium



Inflammatory, irritating and harmful substances can escape from the gauge and lead to skin injuries and burns. This danger is also to be expected in the case of an unpressurised cooled system.

- Wear protective clothing including safety glasses.
- Check the danger posed by the medium and, if necessary, wear respiratory protection or support.
- Observe the order of work.
- Perform work only when the gauge is depressurized and emptied.
- In principle, do not consider any system to be depressurised.



CAUTION

Cuts caused by sharp objects



During the maintenance of the device, sharp-edged parts may cause injuries.

- Always expect sharp-edged parts and shards due to glass breakage.
- Wear work gloves



TIP

The service life of the valve is increased by regularly checking for tightness.

Fault	Cause:	Remediation
Leaks at spindle/stuffing box packing	Wear and tear	Make repairs (<i>chapter 9.2</i>).
Persistent leaks after repair	Wear and tear	Replace the packing (<i>chap. 9.3</i>)
Leak in drain tubing	• Material settings • Wear and tear • Insufficient torque on screw connection	Carry out work as described in (<i>Chap. 7.4 Fig. 4</i>)
Permanent damage to valve type AV250, AV251, Av255, AV320	Wear and tear Damage	Replace valve (<i>chap. 0</i>)

9.1 Replacing the drain valve

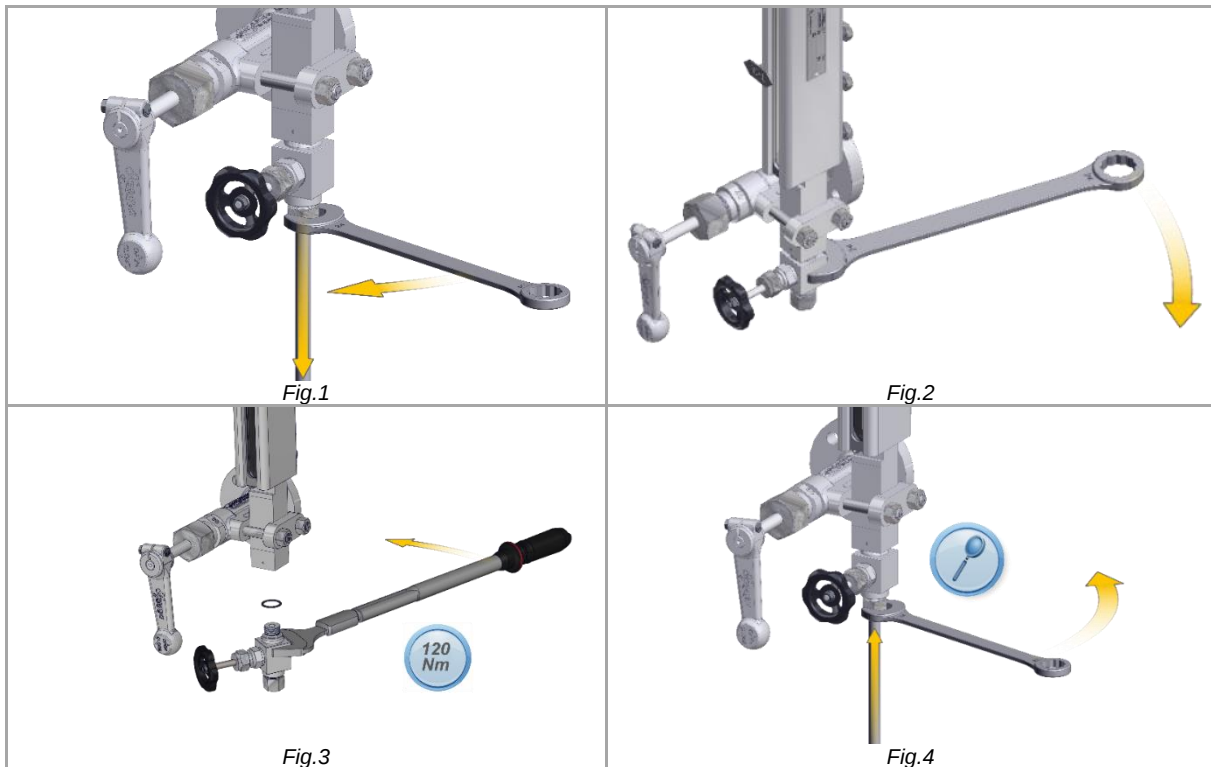


Figure 1:

- Unscrew the pipework fitting from the drain valve
- Pull off pipework

Valves and gauges that are firmly connected to each other (e.g. welded connections) must be separated from each other at the connection points. For this purpose, suitable tools must be selected according to the application and environment.

Figure 2:

- Unscrew the drain valve.

Figure 3:

- Screw in a new drain valve with a new sealing ring.

Figure 4:

- Screw the pipework to the shut-off valve.
- Check for leaks.
- In the event of leaks, retighten the screw connection.

9.2 Spindle / gland packing leaks

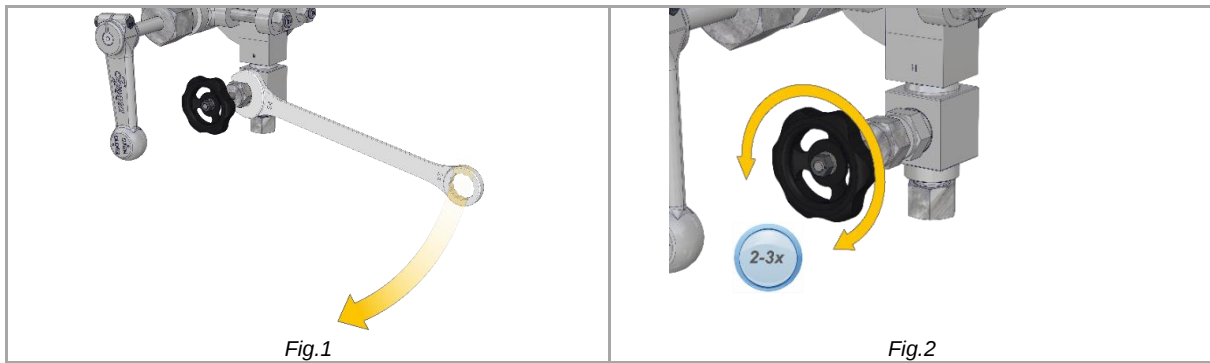


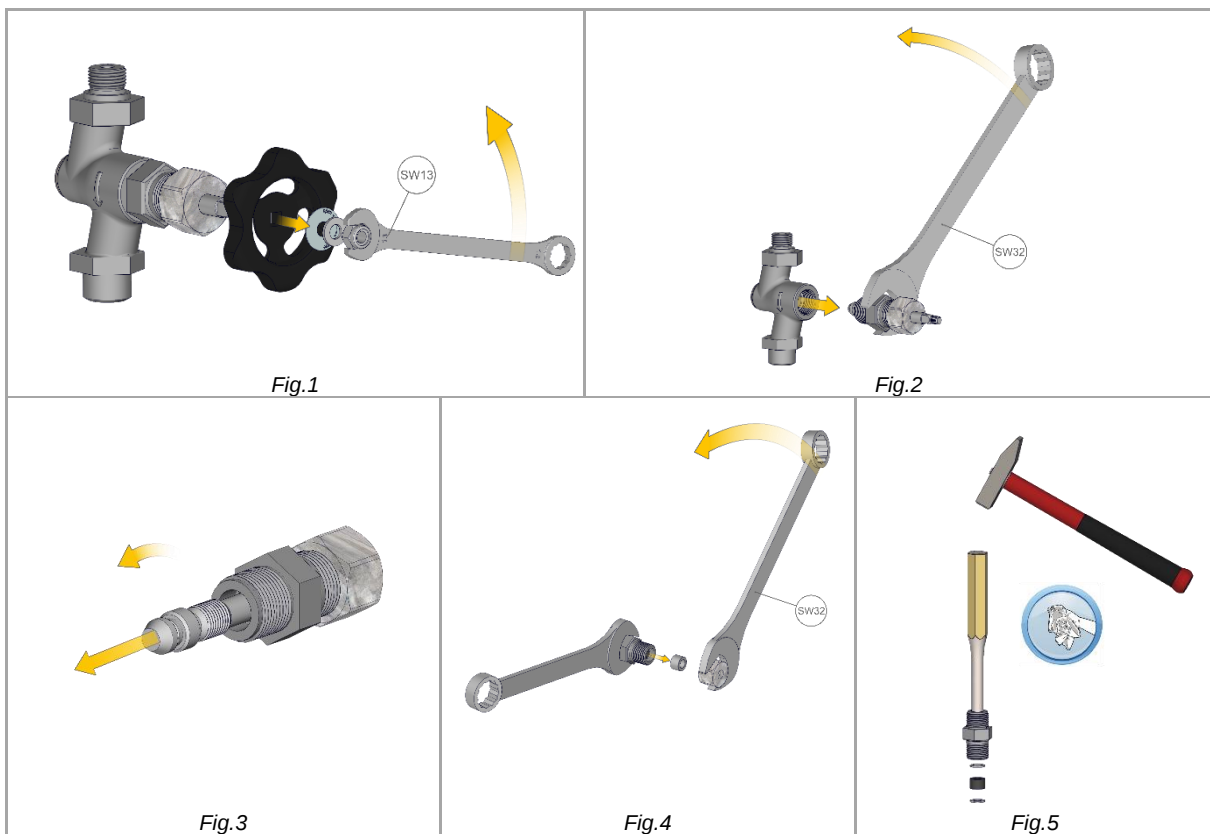
Figure 1:

- Tighten the union nut with a hexagon spanner

Figure 2:

- Open the drain valve 2-3 times.

9.3 Replacing packing



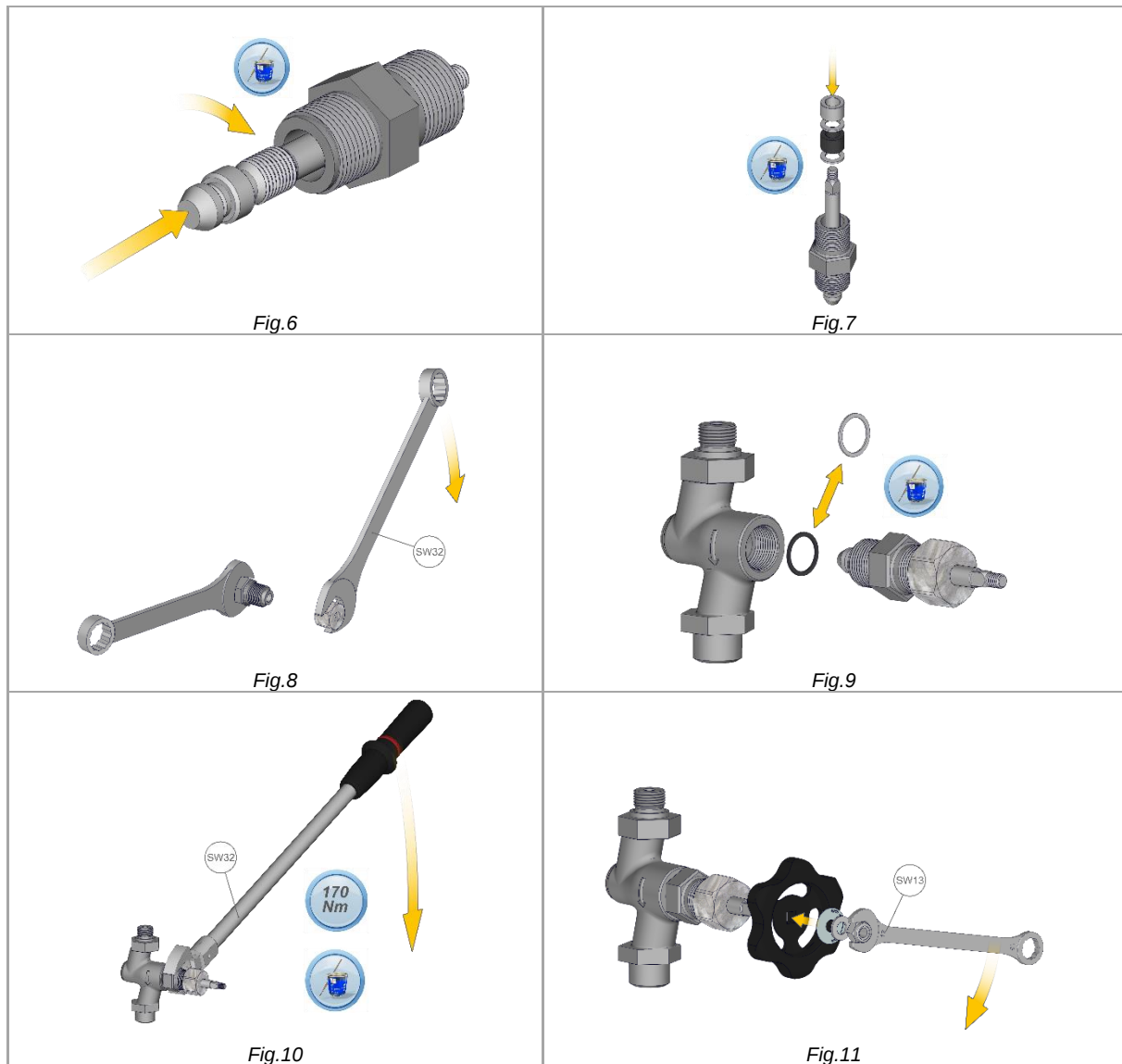


Figure 1:

- Loosen the hexagon nut with an SW13 hexagon spanner.
- Remove the washer, indicator disc and handwheel from the spindle.

Figure 2:

- Unscrew the valve upper part with installed parts from the valve body using an SW32 hexagon spanner.

Figure 3:

- Screw the valve spindle downwards out of the upper part of the valve.

Figure 4

- Unscrew the union nut with an SW32 hexagon spanner.
- Remove the stuffing box.

Figure 5:

- Knock out the packing set and wiper rings from the bottom of the valve upper part and clean the valve upper part

Figure 6:

- Grease the valve spindle and screw it into the valve upper part from below.

Figure 7:

- Grease the new packing set and insert with wiper rings.
- Insert stuffing box.

Figure 8:

- Screw the union nut onto the valve upper part.

Figure 9:

- Grease and replace the new sealing ring.

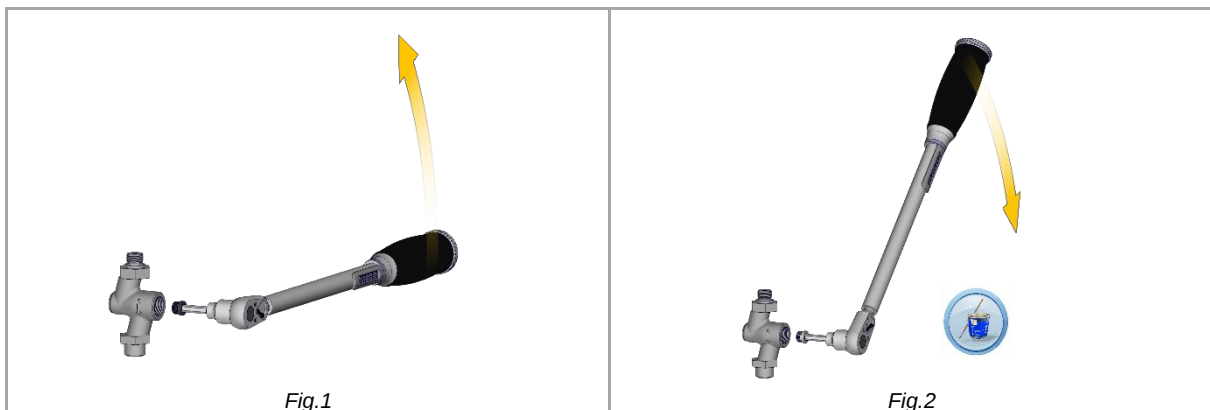
Figure 10:

- Grease the thread on the upper part of the valve and screw it into the valve body with a torque of 170 Nm.

Figure 11:

- Push the handwheel, information plate and washer onto the valve spindle.
- Tighten the hexagon nut.

9.4 Spindle change



- These steps must be followed after unscrewing the complete valve upper part (chap. 9.3, fig. 1-2).

Figure 1:

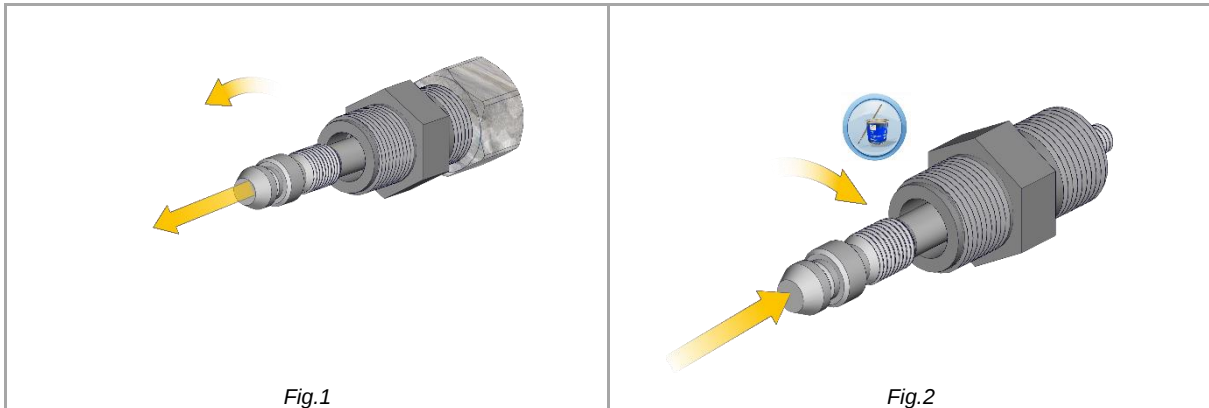
- Unscrew the old valve seat with an ISK8 Allen key.

Figure 2:

- Grease the new valve seat and screw it into the valve body.

The valve can now be reassembled. (chap.9.3, fig.9-11)

9.5 Seat change



- Follow these steps after unscrewing the complete valve upper part (chap. 9.3, fig. 1-2)

Figure 1:

- Screw the valve spindle downwards out of the upper part of the valve.

Figure 2:

- Grease the new spindle and screw it into the valve upper part from below.

The valve can now be reassembled. (Chapter 9.3, Fig. 9-11)

10 Spare parts

NOTE

Property damage caused by incorrect spare parts

Replaced spare parts that do not correspond to the characteristics of the original spare parts may cause damage to the gauge.

- Only use original parts from Igema GmbH for replacement.

10.1 AV250 / AV320/ AV251

If the drain valves of type AV250, AV251 or AV320 are damaged, the entire valve must be replaced. If the drain valve is dismantled for maintenance or other reasons, check the thread for damage before dismantling, apply a suitable lubricant (e.g. *Fuchs Lubritech PBC 1574 High Temperature Anti-Seize Paste*) and replace the sealing ring.

Pos.	Designation	Material	Size	Item no.	Quantity
1	Sealing ring	Soft iron	Ø21 x 26 x 1.5mm	40-00099	1
		Stainless steel		40-00128	



10.2 AV500 / AV520

Pos.	Item	Quantity	Item numbers	
1	Sealing ring Ø 21 x 26 x 1,5 mm	1	40-00099	
2	Seat	1	40-01864	
3	Spindle with cone	1	40-01866	
4	Sealing ring Ø 24 x Ø 19.5 x 1	1	40-01873	
5	Packing set	1	40-01867	
6	Scraper rings	2	40-02360	
2,3,4	Spare parts package for spindle replacement	1	15-18967	
5.6	Spare parts package Packing change	1	15-18968	

10.3 AV540 / AV550

Pos.	Item	Quantity	Item numbers	
1	Sealing ring Ø 21 x 26 x 1,5 mm	1	40-00099	
2	Seat	1	40-01953	
3	Spindle with cone	1	40-04135	
4	Sealing ring Ø24 x Ø20 x 1.5mm	1	40-01873	
5	Packing set	1	40-01867	
6	Scraper rings	2	40-02360	
2,3,4	Spare parts package for spindle replacement	1	15-18977	
5.6	Spare parts package Packing change	1	15-18968	

11 Decommissioning and disposal

11.1 Dismantle valve

Flange connections

During the following work, the individual components hang freely and must be secured against falling.

- Loosen nuts on flange connections.
- Removing bolts from flanges
- Secure the seal between the flanges against falling off

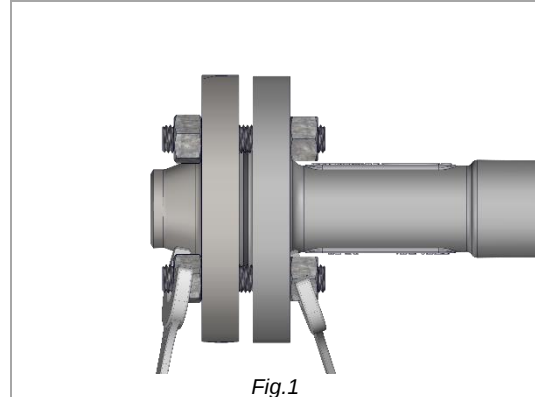


Fig.1

Fixed connections

Valves and gauges that are firmly connected to each other (e.g. welded connections) must be separated from each other at the connection points. For this purpose, suitable tools must be selected according to the application and environment.

Drain tubing

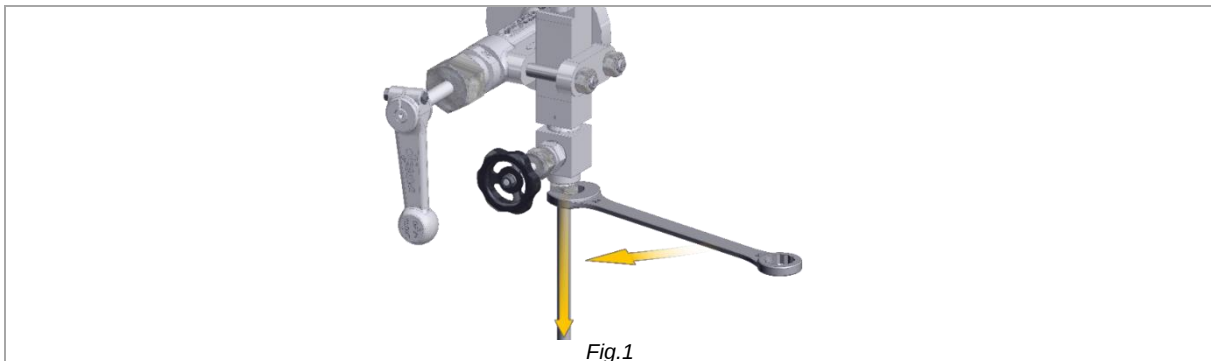


Fig.1

Figure 1:

- Unscrew the pipework fitting from the drain valve.
- Pull off pipework

Screw connections

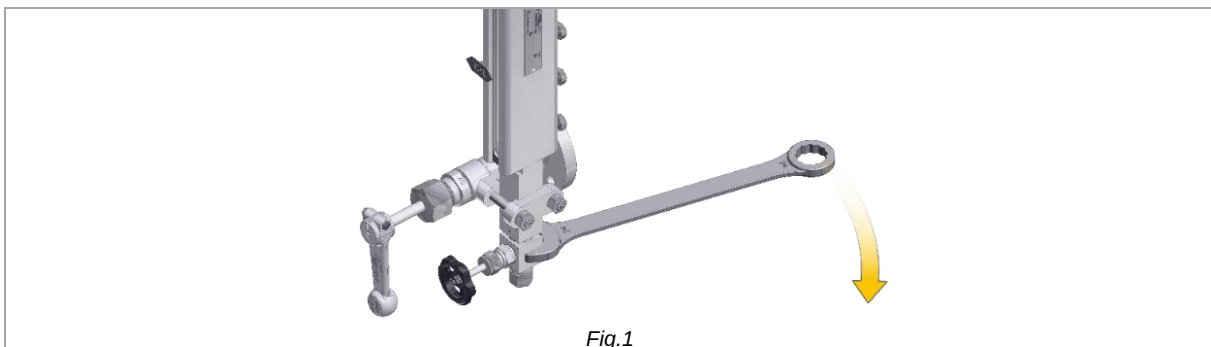


Fig.1

Figure 1:

- Unscrew the drain valve

11.2 Disposal

**ENVIRONMENT****Risk to the environment due to residues**

Residues on the gauge can pose a danger to the environment.

- For returns, observe the applicable safety and environmental laws according to GGVSEB [The Dangerous Goods Ordinance on Roads, Railways and Inland Waterways].
- Indicate possible dangers and take precautionary measures.
- Label possible residues and enclose the safety data sheet.
- Register hazardous substance with the logistics service provider.

Danger to the environment from waste materials

Incorrectly disposed waste materials cause damage to the environment.

- Separating waste materials.
- Comply with local and legal regulations for waste disposal.

**CAUTION****Health hazard due to dangerous residues**

Residues of hazardous substances pose a health hazard.

- Indicate possible dangers and take precautionary measures.



This high-quality IGEMA product was designed, manufactured and tested with the application of the QM System guidelines in accordance with DIN EN ISO 9001:2015.

If the device supplied indicates transport damage or gives cause for complaint in spite of our final quality check, please contact our SERVICE department on telephone +49 2501 92424-0 immediately.



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