



Operating Instructions

VARICOMP®
Compensator VC/8

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English

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Table of Contents

Notes for the Reader	5
Binding Character of These Operating Instructions	5
Notes on the Illustrations	5
Symbols and Highlighting	6
Abbreviations and Terms	7
Safety	9
Safety Note	9
Operator's Duties	9
Qualification of Staff	10
Supplementary Regulations	11
Instructions for the Safe Operation	12
• General Principles	12
• Installation	12
• Commissioning/Setup Mode	12
• Setting into Operation	13
• Operation	13
• Shutting down	13
• Maintenance and Repair	13
• Disassembly	14
• Environmental Protection	14
Intended Purpose	15
Designated Use	15
Requirements for the Operation	15
Improper Operating Conditions	15
Conversion Work	15
Transport and Storage	17
Scope of Supply	17
Transport	17
Storage	17
Design and Function	18
Design	18
Function	19
Installation and Commissioning	20
Notes on Installation	20
Design Notes	20
• Data Required	20
• Calculation of dimension AFL	21
Dimensions for spacer	21
Maintenance	22
Inspections	22
Maintenance Intervals	22
Prior to Disassembly	23
Disassembly	23

Assembly and Maintenance	24
Disposal	26
Technical Data	27
General Data	27
Resistance of Sealing Materials	27
Tensile forces	28
Tools	29
Lubricant	29
Spare Parts List	30
Compensator VC/8	30
Dimension Sheet	33
Compensator VC/8	33

Notes for the Reader

The present operating instructions are part of the user information for the compensator. The operating instructions contain all the information you need to transport, install, commission, operate and carry out maintenance for the compensator.

Binding Character of These Operating Instructions

These operating instructions contain the manufacturer's instructions to the owner of the compensator and to all persons who work on or use the compensator regarding the procedures to follow.

Carefully read these operating instructions before starting any work on or using the compensator. Your personal safety and the safety of the compensator can only be ensured if you act as described in the operating instructions.

Store the compensator in such a way that they are accessible to the owner and the operating staff during the entire life cycle of the compensator. When the location is changed or the compensator is sold make sure you also provide the operating instructions.

Notes on the Illustrations

The illustrations in these operating instructions show the compensator in a simplified form. The actual design of the compensator can differ from the illustration. For detailed views and dimensions of the compensator please refer to the design documents.

Symbols and Highlighting

In this operating instructions, important information is highlighted by symbols or special formatting. The following examples illustrate the most important types of highlighting.

DANGER

Warning: Fatal injuries.

Failure to observe the warning can cause serious damage to health, or even death.

- The arrow identifies a precautionary measure you have to take to avoid the hazard.

EXPLOSION HAZARD

Warning: Explosions.

Failure to observe the warning may result in a severe explosion.

- The arrow identifies a precautionary measure you have to take to avoid the hazard.

WARNING

Warning: Serious Injuries.

Failure to observe the warning note can result in serious damage to health.

- The arrow identifies a precautionary measure you have to take to avoid the hazard.

CAUTION

Warning: Injuries.

Failure to observe the warning note can result in minor or moderate damage to health.

- The arrow identifies a precautionary measure you have to take to avoid the hazard.

NOTE

Warning: Damage to Property.

Non-observance of the warning note can cause serious damage to the compensator or in the vicinity of the compensator.

- The arrow identifies a precautionary measure you have to take to avoid the hazard.

Carry out the following steps: = Start of instructions for a task.

1. First step in a sequence of operations.
 2. Second step in a sequence of operations.
 - ↪ Result of the previous operation.
- ✓ The operation is complete, the goal has been achieved.

TIP

Further useful information.

Abbreviations and Terms

Abbreviation	Explanation
a/f	Indicates the size of spanners width across flats
approx.	approximately
BS	British Standard
bar	Unit of measurement of pressure [bar] All pressure ratings [bar/psi] stand for over pressure [bar _g /psi _g] if this is not explicitly described differently.
Cv value	flow coefficient [US gallons per minute] 1 Cv = 1,17 x Kv
°C	Unit of measurement of temperature [degree Celsius]
dm ³ _n	Unit of measurement of volume [cubic decimetre] Volume (litre) at standard temperature and pressure
DN	DIN nominal width
DIN	German standard issued by DIN (Deutsches Institut für Normung e.V, German Institute for Standardization)
EN	European Standard
EPDM	Material designation Short designation according to DIN/ISO 1629: Ethylene Propylene Diene Rubber
°F	Unit of measurement of temperature [degree Fahrenheit]
FKM	Material designation, short designation according to DIN/ISO 1629: Fluorine rubber
h	Unit of measurement of time [hour]
HNBR	Material designation Short designation according to DIN/ISO 1629: Hydrogenated Acrylonitrile Butadiene Rubber
IP	Protection class
Inch	Unit of measurement of length [inch]
Inch OD	Pipe dimension acc. to British standard (BS), Outside Diameter
Inch IPS	US pipe dimension Iron Pipe Size
ISO	International standard issued by the International Organization for Standardization
kg	Unit of measurement of weight [kilogram]

Abbreviation	Explanation
kN	Unit of measurement of force [kilonewton]
L	Unit of measurement of volume [litre]
max.	maximum
mm	Unit of measurement of length [millimetre]
µm	Unit of measurement of length [micrometre]
M	metric
Nm	Unit of measurement of work [newton metre] UNIT OF TORQUE 1 Nm = 0.737 lbft Pound-Force (lb) + Feet (ft)
PA	Polyamide
PE-LD	Low-density polyethylene
psi	Anglo-American Unit of measurement of pressure [Pound-force per square inch] All pressure ratings [bar/psi] stand for over pressure [bar _g /psi _g] if this is not explicitly described differently.
SET-UP	Self-learning installation During commissioning and maintenance, the SET-UP procedure carries out all the necessary settings for the generation of messages.
TIG	Welding method Tungsten inert gas welding
T.VIS	Tuchenhagen Valve Information System
V AC	Volt alternating current
V DC	Volt direct current
W	Unit of measurement of power [Watt]

Safety

Safety Note

The compensator is operationally reliable. It was built according to state-of-the art standards.

Nevertheless, the compensator can pose dangers, especially if

- the compensator is not used in accordance with its intended use,
- the compensator is not used correctly,
- the compensator is operated under impermissible operating conditions.

Operator's Duties

In your capacity as operator of the facility you bear a particular responsibility for the proper and safe handling of the compensator in your facility. Only use the compensator when it is in perfect condition to prevent danger to persons and property.

These operating instructions contain the information you and your staff need for the safe and reliable operation during the entire service life of the compensator. Be sure to read these operating instructions carefully and ensure that the measures described here are observed.

The operator's duty of care includes planning the necessary safety measures and monitoring that these measures are observed. The following principles apply:

- Only allow qualified staff to work on the compensator.
- The operator must authorize the staff to carry out the relevant tasks.
- Working areas and the entire environment of the compensator must be neat and clean.
- The staff must wear suitable work clothing and personal protective equipment. As the operator of the facility make sure that work clothing and personal protective equipment are used.
- Instruct the staff with regard to any properties of the product which might pose a health risk and the preventative measures to be taken.
- Have a qualified first-aider on call during the operation, who can initiate the necessary first-aid measures in case of an emergency.
- Clearly define processes, lines of authority and responsibilities associated with the compensator. Everybody must know what to do in case of an emergency. Instruct the staff in this respect at regular intervals.
- The signs relating to the compensator must always be complete and legible. Check, clean and replace the signs as necessary at regular intervals.

TIP

Carry out regular checks. This way you can ensure that these measures are actually observed.

Qualification of Staff

This section contains information about the qualifications that staff working on the compensator must have.

Operating and maintenance staff must

- have the necessary qualification to carry out their tasks,
- be instructed with regard to possible dangers,
- know and observe the safety instructions given in the documentation.

The following minimum qualifications are required:

- Vocational training as a skilled worker who can work on the compensator independently.
- Sufficient instruction to work on the compensator under the supervision and direction of a qualified specialist.

Each member of staff must meet the following requirements to be allowed to work on the compensator:

- Personal qualification for the relevant task.
- Sufficient professional qualification for the relevant task.
- Instructed with regard to the function of the compensator.
- Instructed with regard to the operating sequences of the compensator.
- Familiar with the safety devices and their function.
- Familiar with this Operating Instructions, especially with the safety instructions and the information which is relevant for the task on hand.
- Familiar with the basic regulations with regard to occupational health and safety and accident prevention.

For work to be carried out on the compensator the following user groups are distinguished:

User groups

Staff	Qualifications
Operating staff	<p>Adequate instruction and sound knowledge in the following areas:</p> <ul style="list-style-type: none"> • Function of the compensator • Compensator operating sequences • What to do in case of an emergency • Lines of authority and responsibilities with respect to the task.
Maintenance staff	<p>Adequate instruction as well as sound knowledge of the design and function of the compensator.</p> <p>Sound knowledge in the following areas:</p> <ul style="list-style-type: none"> • Mechanical equipment • Electrical equipment • Pneumatic system <p>Authorization with regard to safety engineering standards to carry out the following tasks:</p> <ul style="list-style-type: none"> • Setting devices into operation • Earthing of devices • Marking of devices <p>The relevant certificate of qualification must be submitted before work can be carried out on ATEX certified machines.</p>

Supplementary Regulations

In addition to the instructions in this documentation the following also has to be observed:

- pertinent accident prevention regulations,
- generally accepted safety rules,
- national regulations applicable in the country of use,
- work and safety instructions applicable in the facility,
- installation and operating regulations for use in potentially explosive areas.

Instructions for the Safe Operation

Dangerous situations during the operation can be avoided by safety-conscious and proactive behaviour of the staff.

General Principles

To ensure the safe operation of the compensator the following principles apply:

- The Operating Instructions must be kept ready to hand at the compensator's place of use. It must be complete and in clearly legible form.
- Only use the compensator for its intended purpose.
- The compensator must be functional and in good working order. Check the condition of the compensator before starting work and at regular intervals.
- Wear tight-fitting work clothing for all work on the compensator.
- Ensure that nobody can get hurt on the parts of the compensator.
- Immediately report any faults or noticeable changes on the compensator to the person responsible.
- Observe the accident prevention regulations and all local regulations.

Installation

For installation, the following principles apply:

- Only properly qualified staff is allowed to install and set the compensator into operation.
- Ensure that adequate working and traffic areas are available at the place of installation.
- Observe the transport instructions and markings on the part(s) to be transported.
- Remove any nails protruding from transport crates immediately after opening the crate.
- Under no circumstances should anyone stand under a suspended load.
- The leakage hole must be aligned downwards.

Commissioning/Setup Mode

For commissioning, the following principles apply:

- The compensator must be completely assembled and correctly adjusted. All screw connections must be securely tightened.
- Reliably secure machine parts which have already been connected against inadvertently being switched on.
- Relubricate all lubricating points.
- Make sure lubricants are used properly.

Setting into Operation

For setting into operation, the following principles apply:

- Only allow properly qualified staff to set the compensator into operation.
- Remove any liquids that have escaped without leaving residues.

Operation

For operation, the following principles apply.

- Monitor the compensator during the operation.
- Structural alterations of the compensator are not permitted. Immediately report any changes on the compensator to the person responsible.
- Always keep danger zones clear. Do not leave any objects in the danger zone. Only allow persons to enter the danger zone when the machine is de-energized.
- Regularly check that all emergency stop devices are working correctly.

Shutting down

For shutting down, the following principles apply:

- For longer periods of standstill, observe the storage conditions, see Storage (Page 17).

Maintenance and Repair

For maintenance and repair, the following principles apply:

- Observe the intervals specified in the maintenance schedule.
- Only allow qualified staff to carry out maintenance or repair work on the compensator.
- Block access for unauthorized persons. Put up notice signs which draw attention to the maintenance or repair work going on.
- Do not climb on the compensator. Use suitable access aids and working platforms.
- Wear suitable protective clothing.
- Only use suitable and undamaged tools to carry out maintenance work.
- When replacing parts only use approved, fully functional load lifting devices and lifting accessories which are suitable for the intended purpose.
- Make sure lubricants are used properly.
- Check that all emergency stop devices are working correctly.

Disassembly

For disassembly, the following principles apply:

- Only allow qualified staff to disassemble the compensator.
- Disconnect all power and utility lines.
- Markings, e.g. on lines, must not be removed.
- Do not climb on the compensator. Use suitable access aids and working platforms.
- Mark the lines (if unmarked) prior to disassembly to ensure they are not confused when re-assembling.
- Protect open line ends with blind plugs against ingress of dirt.
- Pack sensitive parts separately.
- For longer periods of standstill, observe the storage conditions, see „Storage“ (Page 17).

Environmental Protection

Harm to the environment can be avoided by safety-conscious and proactive behaviour of the staff.

For environmental protection the following principles apply:

- Substances harmful to the environment must not be discharged into the ground or the sewage system.
- Always observe the pertinent regulations relating to waste avoidance, disposal and utilization.
- Substances harmful to the environment must be collected and stored in suitable containers. Clearly mark the containers.
- Dispose of lubricants as hazardous waste.

Intended Purpose

Designated Use

The purpose of the compensator is to compensate for changes in length in valve blocks and pipe systems which are caused by thermal expansion.

TIP

The manufacturer will not accept any liability for damage resulting from any use of the compensator which is not in accordance with the designated use of the compensator. The risk of such misuse lies entirely with the operator of the facility.

Requirements for the Operation

The prerequisite for the reliable and safe operation of the compensator is proper transportation and storage as well as professional installation and assembly. Operating the compensator within the limits of its designated use also involves adhering to the operating, inspection and maintenance instructions.

Improper Operating Conditions

The operational reliability of the compensator cannot be ensured under improper operating conditions. Therefore avoid improper operating conditions.

Operating the compensator is not permitted if

- Persons or objects are in the danger zone.
- Safety devices are not working or were removed.
- Malfunctions have been detected on the compensator.
- Damage has been detected on the compensator.
- Maintenance intervals have been exceeded.

Conversion Work

You should never make any technical modifications to the compensator. Otherwise you will have to undergo a new conformity process in accordance with the EC Machinery Directive on your own.

In general, only original spare parts supplied by GEA Tuchenhausen GmbH should be fitted. This ensures the reliable and economical operation of the compensator.

Transport and Storage

Scope of Supply

On receipt of the compensator check whether

- the details on the type plate correspond to the data in the order and delivery documents,
- the equipment is complete and all components are in good order.

Transport

For transport, the following principles apply:

- Only use suitable lifting gear and slings for transporting the package units/compensators.
- Observe the pictograms on the package.
- Handle the compensator with care to avoid damage caused by impact or careless loading and unloading. The outside synthetic materials are susceptible to breaking.
- Only allow qualified staff to transport the compensator.
- Only use approved, fully functional load lifting devices and lifting accessories which are suitable for the intended purpose. Observe the maximum load-bearing capacities.
- Secure the compensator against slipping. Take the weight of the compensator into account and the position of the point of gravity.
- Under no circumstances should anyone stand under a suspended load.
- Take care when transporting the compensator. Do not grip sensitive parts of the cleaner to lift or push the compensator or to support yourself. Avoid putting the unit down with a jerk.

Storage

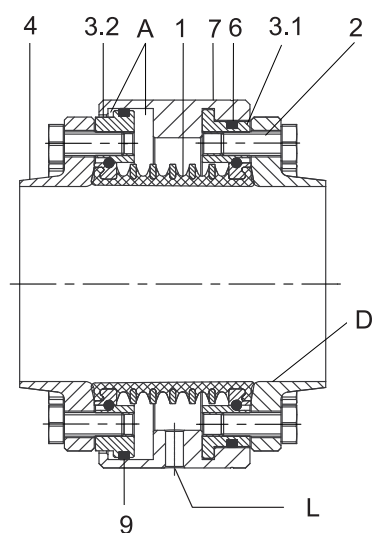
If, during transport or storage, the compensator is going to be exposed to temperatures $\leq 0^{\circ}\text{C}$, the compensator must be dried beforehand and suitable measures be taken to protect it from damage.

TIP

We recommend that the unit should be stored at a temperature of $\geq 5^{\circ}\text{C}$ for a period of 24 hours prior to any handling so that any ice crystals formed by condensation water can melt.

Design and Function

Design



No.	Designation
1	Compensator
2	Snap ring
3.1	Flange VC
3.2	Flange VC/8
4	Plain flange
6	O-ring
7	Clamp VC/8
9	O-ring
A	Metallic stop (compression)
D	Sealing edge
L	Leakage hole

Function

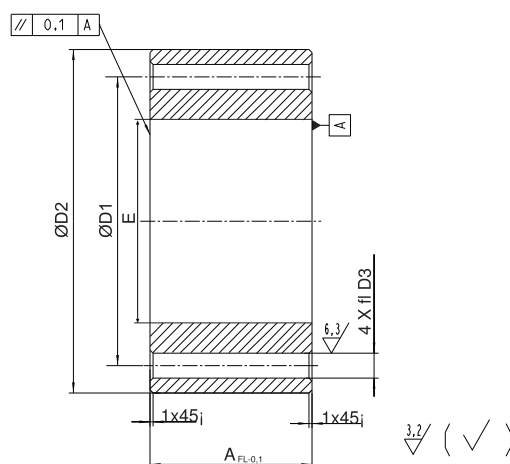
The compensator consists of a central rubber element with integral vulcanized metal rings, subsequently called compensation element (1).

The compensation element (1) compensates for the amount of expansion/contraction, referred to as compensation distance, and at the same time seals off the pipe (D). The snap rings (2) secure the compensation element (1) in position and transfer the sealing forces. A screw-type semi-annular clamp (7) clamps the compensator together. It is firmly fitted using flange (3.1). Flange (3.2), in conjunction with the clamp (7), restricts the compensation distance (stop A). The O-rings (6) seal the compensation element off from the outer environment; any leakage will be discharged to the outside (L). When the pipes expand, the compensation element is pressed together until it reaches the stop (A). This considerably reduces stresses in the valve block.

Installation and Commissioning

Notes on Installation

The compensator must be installed in such a way that a compensation distance (compression) of min. 7 mm is available. A spacer must be used for fitting and welding the flanges. The spacer determines the distance and the permissible angular and axial offset.

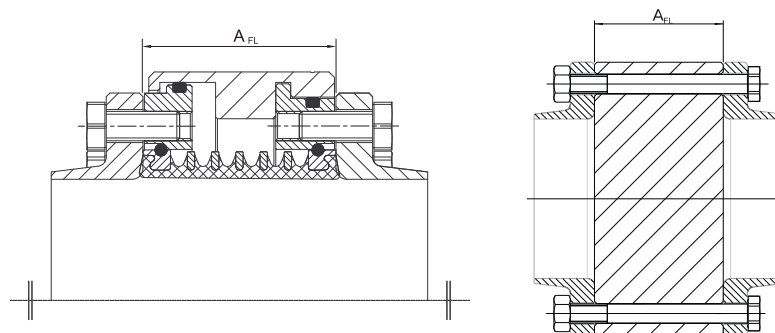


Spacer, material: 3.2315T6

GEA Tuchenhagen recommends using the TIG welding with pulse method for welding in the flange.

Design Notes

Data Required



Installation dimension AFL

To ensure proper function, dimension AFL, adjusted to the installation temperature t_{inst} , must be adhered to when fitting the compensator.

The following data is necessary for the calculation:

- Max. operating temperature: t_{max} in °C
- Min. operating temperature: t_{min} in °C
- Installation temperature: t_{inst} in °C
- Allowance for length reduction due to welding, specified by the user: KfS in mm

Given data:

- Max. compensation distance: $\Delta l = 8$ mm
- Max. length of the compensator: $A_{FLmax} = 53.6$ mm

Calculation of dimension A_{FL}

$$AFL = A_{FLmax} - \frac{\Delta l (t_{inst} - t_{min})}{t_{max} - t_{min}} - KfS$$

$$\text{If}(AFL > A_{FLmax}) AFL = A_{FLmax} - KfS$$

Max. flange distance

$A_{FLmax} = 53.6$ mm corresponds to a compensation distance of 8 mm (compression)

Min. flange distance

$A_{FLmin} = 45.6$ mm corresponds to a compensation distance of 8 mm (tension)

Dimensions for spacer

Nominal width	Ø D1±0.15	Ø D2±0.1	Ø D3+0.1	E
DN 50	77	94	8.2	50
DN 65	95	113	8.2	66
DN 80	110	128	8.2	81
DN 100	137	159	10.2	100
DN 125	161	183	11.2	125
2" OD	77	94	8.2	47.5
2,5" OD	88	106	8.2	60
3" OD	101	119	8.2	73
4" OD	137	159	10.2	97.5
4" IPS	147	169	11,2	110
6" IPS	202	227	14,2	163

Maintenance

Inspections

The compensator must regularly be checked for damage.

The inner surfaces must regularly be inspected in accordance with the level of soiling on the compensator's outer surfaces. Schedule the inspection at least every 6 months, or more frequently if the level of soiling is higher.

Carry out the following steps:

1. Remove the clamps and visually inspect the guide groove and all inner surfaces
2. Remove dirt particles, especially from the guide groove.

✓ Done.

Maintenance Intervals

To ensure the highest operational reliability of the compensators, all wearing parts should be replaced at longer intervals.

The actual maintenance intervals can only be determined by the user since they depend on the operating conditions, for instance:

- daily period of use,
- type and temperature of the product,
- type and temperature of the cleaning solution,
- ambient conditions.

Maintenance Intervals

Applications	Maintenance Intervals (guideline values)
Media at temperatures of 60 °C to 130 °C 140 °F to 266 °F	approx. every 3 months
Media at temperatures of < 60 °C (< 140 °F)	approx. every 12 months

Prior to Disassembly

Requirement

- Make sure that during maintenance and repair work no process is in operation in the area concerned.

Carry out the following steps:

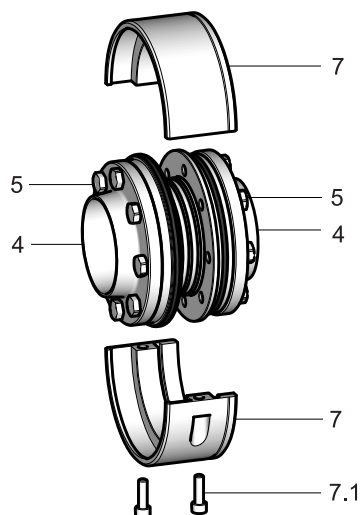
1. Drain all pipe system elements that lead to the compensator and, if necessary, clean or rinse them.
2. The pipe must be free of stress, i.e. allow the pipe or the valve block to cool down to room temperature.

✓ Done.

Disassembly

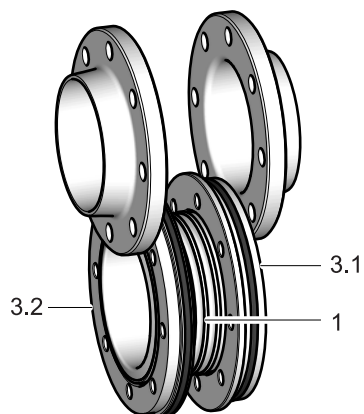
Carry out the following steps:

1. Release the head socket-head screws (7.1) using a hex. screwdriver (size 5) and take off the clamps (7). Use the screwdriver for lifting.

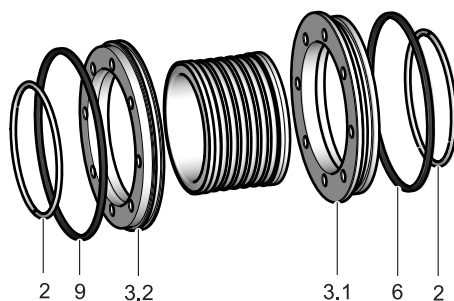


2. Release the hex. screws (5) on both plain flanges (4).

3. Loosen the compensator (1) and carefully take it out together with the flanges (3).



4. Remove both snap rings (2).



5. Pull off the flanges (3).

6. Remove the O-rings (6).

✓ Done.

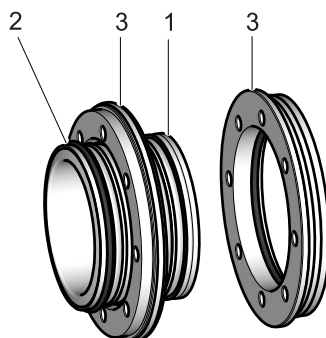
Assembly and Maintenance

Fitting snap ring
and O-rings

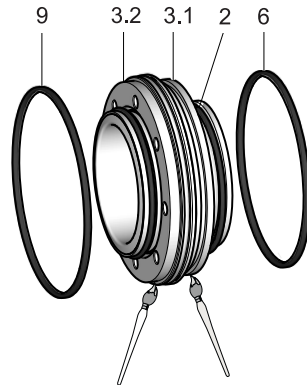


Carry out the following steps:

1. Fit the snap ring (2) on one side of the compensator (1).



2. Push both flanges (3) onto the compensator (1). Pay attention to the flange mounting direction, i.e. the grooves in the snap rings must face outwards (towards the pipe)!
3. Fit the second snap ring (2).

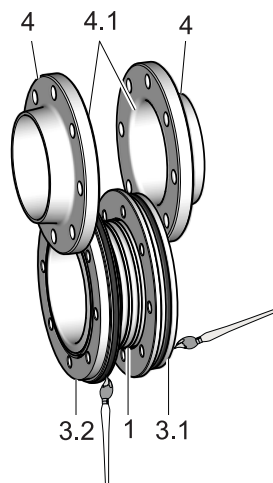


4. Fit the O-rings (6) into the flanges (3).

Checking and
lubricating the
sealing surfaces

Carry out the following steps:

1. Check the sealing surfaces (4.1) of the plain flanges (4) for soiling and damage, clean or repair if necessary.



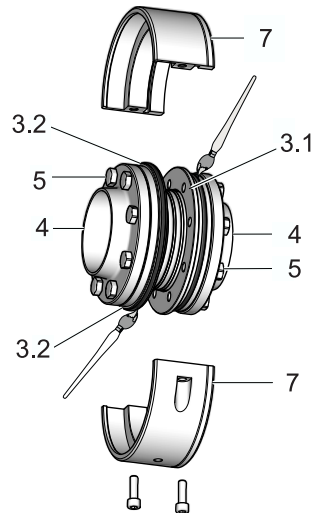
2. Lightly grease the sealing surfaces of the compensator (1).
 - ➔ GEA Tuchenhausen recommends Rivolta F.L.G. MD-2 and PARALIQ GTE 703. These lubricants are approved for foodstuff and are resistant to bear froth. They have the NSF-H1 (USDA H1) registration. PARALIQ GTE 703 can be ordered from GEA Tuchenhausen under part no. 413-064, Rivolta F.L.G. MD-2 can be ordered under part no. 413-071.

Fitting the flanges



Carry out the following steps:

1. Carefully push the compensator (1) and the flanges (3) between the plain flanges (4).
2. Align the flanges (4) with the welded-in plain flanges (4) and screw them in.
3. Working cross-wise, tighten the hex. screws (5) to prevent jamming.
4. Fit both parts of the clamp (7), position the leakage opening so that it faces down and tighten up the clamp.



✓ Done.

Disposal

Dispose of the machine at the end of its life cycle in an environmentally friendly manner. Observe the statutory waste disposal regulations applicable at the place of installation.

The compensator is made of the following materials:

- Metals
- Synthetic materials
- Electronic parts
- Lubricants containing oil and grease

Separate the different materials and dispose of them correctly sorted. Also observe the instructions regarding disposal in the operating instructions for the individual components.

Technical Data

General Data

Designation	Description
Size	DN 50 to DN 125 2 to 4" OD 4" and 6" IPS
Material of product contact parts	Stainless steel 1.4404 (AISI 316L) EPDM, FKM all conform to FDA requirements
Material of all non product contact parts	1.4301 (AISI 304) Screws made of A2-70
Surfaces	Inside Ra < 0.8 µm Outside Ra < 3.2 µm
Installation position	The leakage hole must be aligned downwards.
Product pressure DN50; DN65; 2"OD; 2.5"OD from DN 80/3"OD	PN 16 PN 10 Vacuum up to 50 mbar abs.
Axial compensation distance	8 mm compl. 7 mm compression, 1 mm tension
Angular offset	+/-3° in longitudinal direction
Axial offset	+/-0.25 mm with reference to the two pipe axes
Spring constant Compression Tension	326 N/mm 73.5 N/mm

Resistance of Sealing Materials

The resistance of sealing materials depends on the type and temperature of the medium conveyed. The exposure time can adversely affect the service life of the seals. The sealing materials comply with the regulations of FDA 21 CFR 177.2600 or FDA 21 CFR 177.1550.

Resistance:

- + = good resistance
- o = reduced service life
- – = not resistant

Table Resistance of Sealing Materials

Medium	Temperature	Sealing material (general operation temperature)	
		EPDM -40...+135°C -40...+275°F	FKM -10...+200 °C +14...+392°F
Caustics up to 3%	up to 80 °C (< 176°F)	+	o
Caustics up to 5%	up to 40 °C (< 104°F)	+	o
Caustics up to 5%	up to 80 °C (< 176°F)	+	—
Caustics at more than 5%		o	—
Inorganic acids up to 3%	up to 80 °C (< 176°F)	+	+
Inorganic acids up to 5%	up to 80 °C (< 176°F)	o	+
Inorganic acids up to 5%	up to 100 °C (< 212°F)	+	+
Water	up to 80 °C (< 176°F)	+	+
Steam	up to 135 °C (< 275°F)	+	o
Steam approx. 30 min	up to 150 °C (< 302°F)	+	o
Fuels/hydrocarbons		—	+
Product with a fat content of max. 35%		+	+
Product with a fat content of more than 35%		—	+
Oils		—	+
* depending on the installation position			

Tensile forces

Tensile forces depending on size

Nominal width	Max. permitted tensile force (kN)	For comparison perm. force on pipe, axial (kN) acc. to DIN 11866; 20°C	Max. force occurring at operating pressure, axial (kN)
DN 50	135	17.7	3.1
DN 65	159	31.1	5.4
DN 80	179	38.6	5.1
DN 100	221	47.9	7.8
DN 125	286	60.1	12.4
2" OD	135	18.4	2.8
2.5" OD	159	23.6	4.5
3" OD	179	28.8	4.2

Tensile forces depending on size (cont.)

Nominal width	Max. permitted tensile force (kN)	For comparison perm. force on pipe, axial (kN) acc. to DIN 11866; 20°C	Max. force occurring at operating pressure, axial (kN)
4" OD	221	49,2	7,8
4" IPS	319	60,8	12,4
6" IPS	355	102,2	24,9

Tools

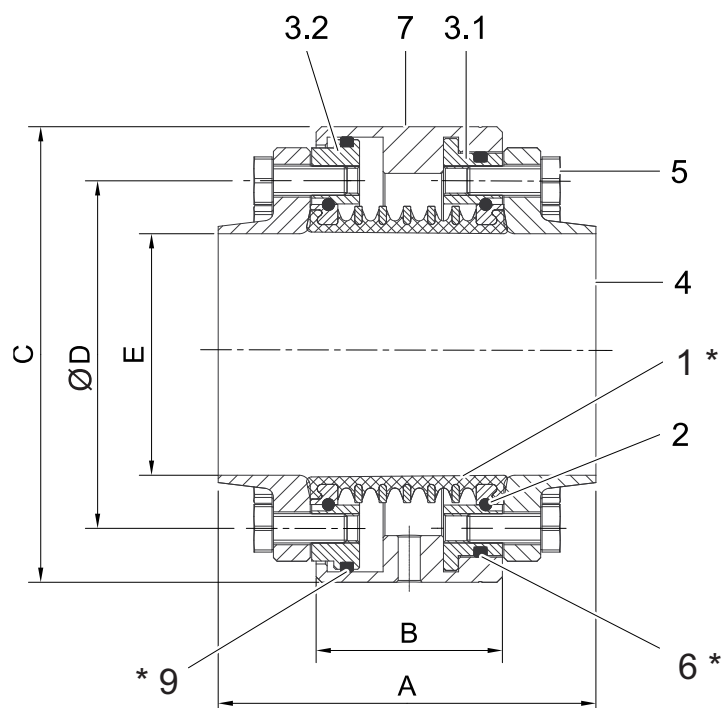
Tools	Material-Nr.
Hex screwdriver, size 5	
Screwdriver, blade width 5 mm	
Ring spanner a/f 13x17	408-036
Ring spanner a/f 16	

Lubricant

Lubricant	Part no.
Rivolta F.L.G. MD-2	413-071
PARALIQ GTE 703	413-064

Spare Parts List

Compensator VC/8



Material numbers, DN sizes

Item	Designation	Material	DN 50	DN 65	DN 80	DN 100	DN 125
Compensator VC/8 compl.		EPDM FKM	228-000126 228-000127	228-000091 228-000136	228-000132 228-000133	228-000092 228-000137	228-000115 228-000143
1 *	Compensator VC/8	1.4301/EPDM 1.4301/FKM	228-000124 228-000125	228-000006 228-000011	228-000008 228-000013	228-000009 228-000014	228-000053 228-000055
2	Snap ring	1.4301	917-212	917-175	917-177	917-178	917-186
3.1	Flange VC	1.4301	221-004188	221-000412	221-000506	221-000507	221-001266
3.2	Flange VC/8	1.4301	221-004192	221-003236	221-004232	221-003237	221-003956
4	Plain flange	1.4404	752-727	752-728	752-729	752-730	752-731
5	Hex screw	A2-70	901-046	901-046	901-046	901-092	901-095
6 *	O-ring	NBR	930-107	930-115	930-120	930-124	930-626

Material numbers, DN sizes(cont.)

Item	Designation	Material	DN 50	DN 65	DN 80	DN 100	DN 125
7	Clamp VC/8	1.4305	221-004194	221-003235	221-004231	221-003238	221-003955
7.1	Cheese head screw	1.4301	902-106	902-106	902-106	902-106	902-106
9 *	O-ring	NBR	930-111	930-119	930-238	930-125	930-963

Material numbers, inch OD sizes

Item	Designation	Material	2" OD	2.5" OD	3" OD	4" OD
Compensator VC/8 compl.		EPDM FKM	228-000128 228-000129	228-000134 228-000135	228-000130 228-000131	228-000138 228-000139
1 *	Compensator VC/8	1.4301/EPDM 1.4301/FKM	228-000124 228-000125	228-000005 228-000010	228-000007 228-000012	228-000009 228-000014
2	Snap ring	1.4301	917-212	917-176	917-164	917-178
3.1	Flange VC	1.4301	221-004188	221-000508	221-000509	221-000507
3.2	Flange VC/8	1.4301	221-004192	221-004248	221-004234	221-003237
4	Plain flange	1.4404	221-004195	752-742	752-743	221-000622
5	Hex screw	A2-70	901-046	901-046	901-046	901-092
6 *	O-ring	NBR	930-107	930-115	930-120	930-124
7	Clamp VC/8	1.4305	221-004194	221-003235	221-004231	221-003238
7.1	Cheese head screw	1.4301	902-106	902-106	902-106	902-106
9 *	O-ring	NBR	930-111	930-119	930-238	930-125

Material numbers, IPS sizes

Item	Designation	Material	4" IPS	6" IPS
Compensator VC/8 compl.		EPDM FKM	228-000141 --	228-000142 --
1 *	Compensator VC/8	1.4301/EPDM 1.4301/FKM	228-000048 --	228-000049 --
2	Snap ring	1.4301	917-165	917-180
3.1	Flange VC	1.4301	221-000847	221-000848
3.2	Flange VC/8	1.4301	221-004249	221-004251
4	Plain flange	1.4404	752-738	752-734
5	Hex screw	A2-70	901-092	901-143
6 *	O-ring	NBR	930-125	930-643
7	Clamp VC/8	1.4305	221-004246	221-004247

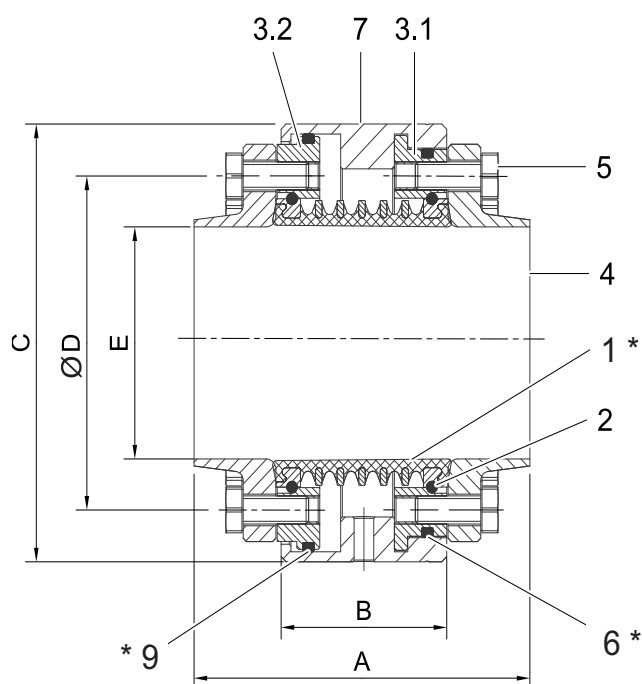
Material numbers, IPS sizes(cont.)

Item	Designation	Material	4" IPS	6" IPS
7.1	Cheese head screw	1.4301	902-106	902-106
9 *	O-ring	NBR	930-125	930-717

* The item marked with * are wear parts.

Dimension Sheet

Compensator VC/8



Max. axial compensation distance 8 mm.

Dimension	DN 50	DN 65	DN 80	DN 100	DN 125
A	102.6	102.6	102.6	102.6	102.6
B	52.6	52.6	52.6	52.6	52.6
ØC	109.5	124.5	139.5	171.3	203.3
ØD	77	95	110	137	161
ØE	50	66	81	100	125

Dimension	2" OD	2.5" OD	3" OD	4" OD	4" IPS	6" IPS
A	102.6	102.6	102.6	102.6	102.6	102.6
B	52.6	52.6	52.6	52.6	52.6	52.6
ØC	109.5	109.5	124.5	171.3	186.3	246.3

Dimension	2" OD	2.5" OD	3" OD	4" OD	4" IPS	6" IPS
ØD	77	88	101	137	147	202
ØE	47.5	60	73	97.5	110.1	162.7



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