



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

INFINITY resilient seated gate valves

DN40/300, PN10/16, TYPE PE, BARE SHAFT FOR MANUAL OPERATION

SERIES 0140160

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1- SAFETY AND GENERAL ASPECTS

1.1 Preface

Dear user, prior to initial operation, read these operating and maintenance instructions thoroughly to ensure safe and economical operation.



FOLLOW OPERATING INSTRUCTIONS!

The operating and maintenance instructions contain all information required for operation and maintenance of the valve.

These operating and maintenance instructions are part of the complete documentation.

Prior to commissioning the valve in the plant, all safety requirements must be complied with.

The valve shall only be operated by qualified and trained staff.



If maintenance work is neglected or carried out by untrained persons, our warranty obligation, according to our terms and conditions of delivery, will not apply.

Please use only original spare parts supplied by our company to ensure best quality and exchangeability.

The manufacturer prohibits the making of any modifications

to the valve. If the user modifies the valve, this may void the manufacturer's warranty.

We reserve the right to make technical modifications to the data and representations contained in these Operating and Maintenance Instructions for the purpose of improving the valves.



WARNING

In the event of non-compliance with these Installation, Operation and Maintenance manual, we shall not be liable for any damages or operating problems resulting therefrom.

Misuse, particularly on valves pressured by liquids, can result in personal injury and damage to property.

1.2 Basic safety instructions



WARNING

The following chapter "Basic safety instructions" has to be strictly observed in order to maintain health and safety of the operating and maintenance staff and to ensure operativeness of the valves. Non-compliance with these instructions may jeopardise the manufacturer's duty of guarantee and warranty.

1.2.1 Adherence to operating instructions

Prior to unloading, transport, commissioning and maintenance of the valve, the operating and maintenance instructions must be thoroughly read and strictly observed.

In the case of non-compliance with these Operating Instructions, we will not be liable for any damage or consequences resulting therefrom.

In addition to the operating and maintenance instructions and the regulations concerning prevention of accidents applicable in the user's country and place of installation, the approved technical rules for relevant worker qualifications and safety standards must also be adhered to.

The user's staff are responsible for ensuring that they are familiar with the local rules concerning safety and prevention of accidents.

The technical data pertaining to the ordered product(s) are binding for the type of design. Modifications can only be considered if they are specified to us in time before starting production. Every product is checked for completeness, performance, and tightness before leaving the factory.

1.2.2 Intended use

Due to their design and the materials used, our valves of standard design are approved for those media (concentration, pressure, temperature) which are indicated in the technical brochure and operating instructions specific to the product.

Deviating operating instructions and fields of application are subject to the manufacturer's approval.

1.2.3 Duties of the user

Whoever, on the user's premises is engaged in mounting, commissioning, operation and maintenance of this valve, should read the complete Operating Instructions (especially any referenced basic safety instructions) and understand them. This particularly applies to staff who work only occasionally at the plant.



FOLLOW OPERATING INSTRUCTIONS!



WARNING

It is strictly forbidden to modify, remove, by-pass or override the safety installations.

In the absence of prior written approval by the manufacturer, do not carry out any modifications to the accessories and equipment surrounding the valve which may jeopardise safety! Changes at the valve carried out on one's own authority void the manufacturer's liability for any damage resulting therefrom. This applies also to installation and setting of safety devices and valves, as well as welding at supporting parts.

1.2.4 Dangers when handling the valve

Our valves are designed to the state of the art and according to the approved safety rules. However, these valves can constitute a danger for persons and property especially when handled by untrained staff in an unskilled manner or when they are not used in accordance with their proper purpose. This may cause danger to life and limb of the user or third parties or damage to the valves and other property.

Access to the danger zone shall only be possible when the valve is out of operation and when it is ensured that the conveying units and the following units are shut down, in order to avoid danger to the operating and maintenance staff.

Whoever, in the user's facilities, is engaged in mounting, dismantling or remounting, operation and service (inspection, maintenance, repair) of the valves, must familiarise themselves with the applicable regulations in force locally.

Work at the valve site (as e.g. control, maintenance and repair work) shall only be carried out when the plant has been secured and shut down and when power to the valve/plant has been switched off.

Before removing safety devices and/or carrying out work on the valves, the pipe section must be made pressureless to avoid risk. Unauthorized, erroneous or unexpected operation, as well as dangerous movements caused by stored energy (compressed air, pressurized water, hydraulic system), must be avoided.

A copy of the operating and maintenance instructions must always be available on site and must be protected against oil and grease.

If necessary, or as specified by the rules, use suitable personal protective equipment!

Any instructions concerning safety and dangers at the plant must be observed and a written copy must be maintained in legible condition and periodically renewed or replaced, if necessary.

During operation, the gearbox and/or actuator is heated under constant regulating service. This may lead to temperatures >60°C. For protection against possible burns, the surface temperature must be checked before touching the surface and in all cases, protective gloves must be worn.

In the event of changes to the valve or its operating performance which might affect safety aspects, plant operation must be stopped immediately and the problem reported to the relevant department/person!

Before any maintenance operation on the valve, the network section where the valve is installed must be isolated upstream and downstream, and depressurized in order to relieve the valve free from pressure. Failure to comply with this recommendation will lead to a situation of danger to persons and property.

When maintenance and repair work at the valve has been finished prior to commissioning of the valve, check whether all safety devices and equipment have been remounted and make sure that they are operative.

If PLC (programmable logic control) software is included in the scope of supply, no changes must be carried out.

If work is carried out in the vicinity of the valve that may lead to soiling (e.g. concrete work, masonry, painting, sandblasting) the valve must be covered effectively.

1.2.5 Working conditions for operators (except for valves for buried service)

Take care that there is sufficient space available for operation, mounting and maintenance work. Access to this valve must be provided in such a way that this work can be carried out by using the appropriate technical means (tools, measuring instruments, etc.)

The operator should not work directly above the valve to prevent personal injury.

The user must provide adequate instructions in order to ensure that the working area is clean and suitably arranged.



WARNING

Observe the applicable rules concerning safety, and wear the necessary personal protective equipment. Risk of injury!

1.2.6 Safety and protective equipment (graphics)



Use eye protection



Use protective gloves



Use ear muffs and helmet



Wear safety boots

1.2.7 Personal protective equipment

If operating problems or malfunctions can occur at the valve (e.g. risk caused by substances acting on the valve), the person at risk – if necessary or specified by rules – must use suitable personal protective equipment to avert hazards which may arise due to the valve being pressured with up to 16 bar.

1.2.8 Presentation and explanation of the danger symbols on the valve

The corresponding pictograms and explanations are included in the relevant operating instructions specific to the product and/or in the corresponding danger analysis.

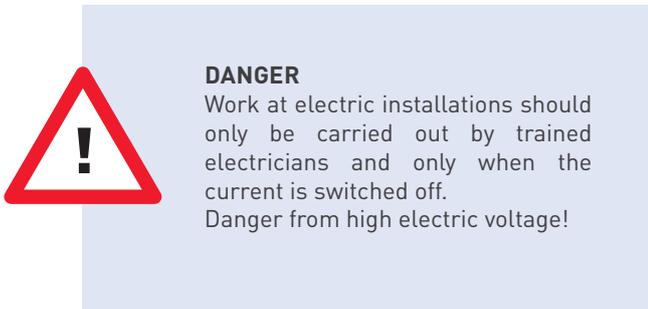
1.2.9 Safety measures during normal operation

When using the valves, observe the approved technical rules:

- European standards, and regulation in force. For plants which must be supervised, observe the relevant laws and regulations, e.g. trading regulations, regulations for prevention of accidents, steam boiler regulations, regulations for gas mains under high pressure, regulations for combustible liquids as well as technical regulation works instructions, etc,
- Law on emissions, technical instructions for protection against noise, disposal of working media according to Directive of the Council 75/439/EEC,
- Regulations specific to the country concerning approval for discharging substances hazardous to water into the collective sewage water system,
- Water resources laws that are specific to the country,
- Rules for accident prevention that are specific to the country,
- Safety regulations for hydraulic hose pipes.
- European Pressure Equipment Directive 2014/68/EU.

1.2.10 Dangers caused by electric energy

A potential danger may arise when the valve is connected to the electricity supply.

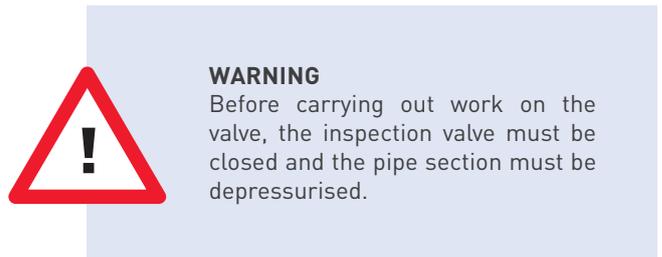


1.2.11 Particularly dangerous places

If the valve has been installed according to the instructions, there will be no immediate danger.

However, vibration may cause damage to seals and screwed connections. As a result, the flow medium may escape! Depending on the kind of flow medium, there may be a risk of fire or explosion caused by electric contact, open flame or by smoking. Moreover, there may be a danger of poisoning (by inhalation - danger to life!), scalding and biological or microbiological hazards.

1.2.12 Safety instructions concerning maintenance, repair, trouble shooting



1.2.13 Modification of valve design

Prior to any change to the design by the user, the manufacturer's approval must be obtained. Otherwise, the warranty becomes void.

1.2.14 Valve cleaning and waste disposal for environmental protection (flow media and lubricating agents)

The valve can be cleaned with water and soap at a max. temperature of 40°C.

When using high-pressure cleaning devices, maintain a minimum distance of 30 cm between the nozzle and the surface to be cleaned at 100 bars.

For disposal of flow media and lubricating agents, see operating instructions specific to the product.

1.2.15 Noise level at the valve

Unacceptable noise at the valve only occurs if the given operating conditions are out of control (cavitation or water hammer)

1.2.16 Emissions (radiation, dust, etc.)

Depending on the flow medium, danger may arise during dismantling or maintenance. The user must make sure that the corresponding substances can be collected and/or removed by suction.

2 - PRODUCT AND FUNCTIONAL DESCRIPTION

2.1 Product description

INFINITY are resilient-seated gate valves for "OPEN - CLOSED" operation only. They comply with the European standard EN1171 (category 3) and EN1074-2 (annex A).

INFINITY PE BARE SHAFT FOR MANUAL OPERATION

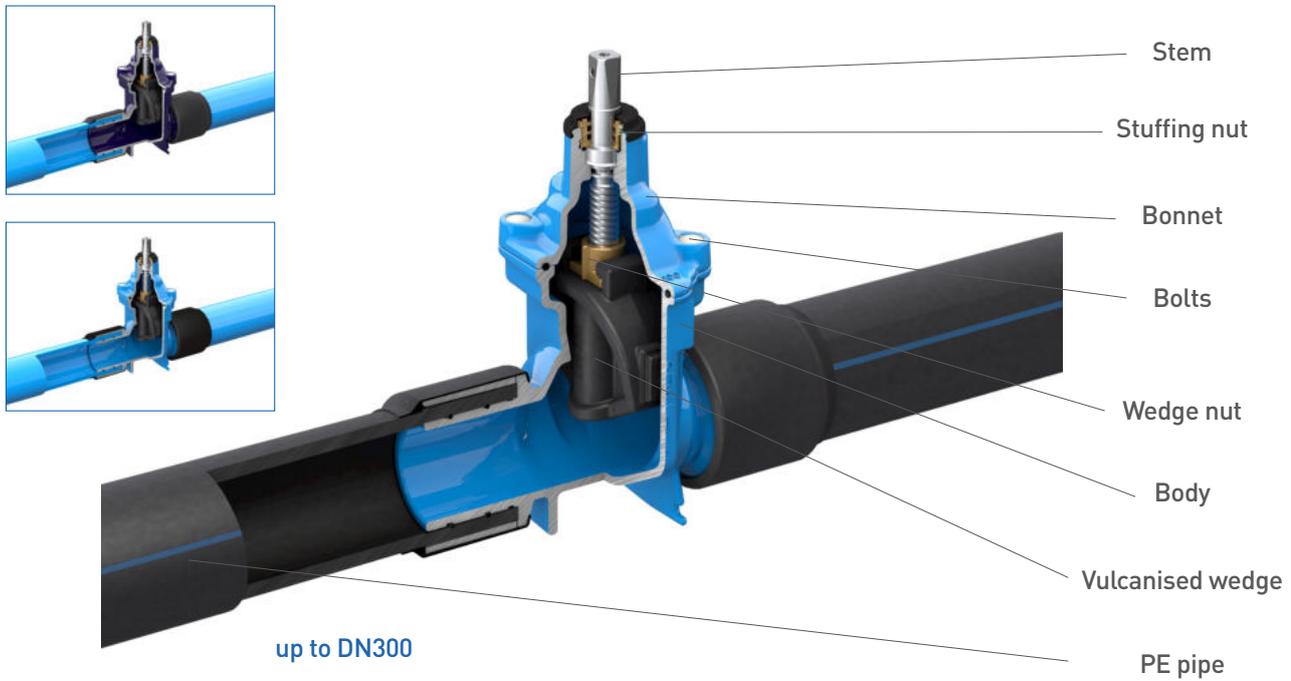
Series 0140160

PE pipe ends according to EN 12201-1 & 2.



Series	Size DN valve / OD PE pipe	Type of PE pipe	PS max in bar	PFA in bar	PMA in bar	PEA in bar	Hydrostatic test pressure in bar for		Allowable operating pressure in bar at Working temperature max of 50°C
							Body	Seal	
		EN12201-1 & 2	EN1171	EN1074-2					
0140160	40/50, 50/63, 65/75, 80/90, 100/110, 100/125, 125/140, 150/160, 150/180, 200/200, 200/225, 250/250, 300/315	SDR17	10	10	12	17	17	11	10
		SDR11	16	16	20	25	25	17,6	16

Each product are individually tested on production line before delivery. The strength and tightness of the gate valves are tested in the manufacturing factory according to EN 12266 and EN 1074-2.



Components	Standard Material	Optional Material
Body	Ductile cast iron EN-GJS-500-7	
Bonnet	Ductile cast iron EN-GJS-500-7	
Wedge	Ductile cast iron EN-GJS-500-7	
Wedge elastomer	EPDM	NBR
Wedge nut	Brass CW617N	Aluminium bronze CW307G or DZR brass CZ132
Stem	Stainless steel 1.4021	Stainless steel 1.4404 or 1.4057
Stuffing nut	up to DN300 : Aluminium bronze CW307G above DN300 : Plastic POM	
Bolts	Steel with geomet coating	Stainless steel A4
Coating	Epoxy	Enamel
Pe pipe	Polyethylen according to EN 12201-1 & 2.	

2.2 Functional description and allowable operation

Operation of each gate valve is performed through rotating motion of the stem with an appropriate operating element (Handwheel, T-Key,...). The appropriate operating element should only be used for the recommended torque values according to Table 7, otherwise the valve might be damaged. When turning the valve stem, the wedge moves up or downwards, along the threaded part of the stem, in order to open or close the passage. The use of "Ring key and bar", as defined in BS5163 / EN1074-2 / EN1171 standards, is strictly prohibited on this type of product.

Depending regions, countries or customers, the valve is closed by turning the operating element:

- To the right, i.e. in a clockwise direction.
- To the left, i.e. in an anti-clockwise direction.

In all cases, the closing direction is indicated on the valves.

Regarding square cap tops, a cap plug (1), inserted inside, indicates the closing direction. Blue color for clockwise closing direction, red color for anticlockwise closing direction.



2.3 Dimensions

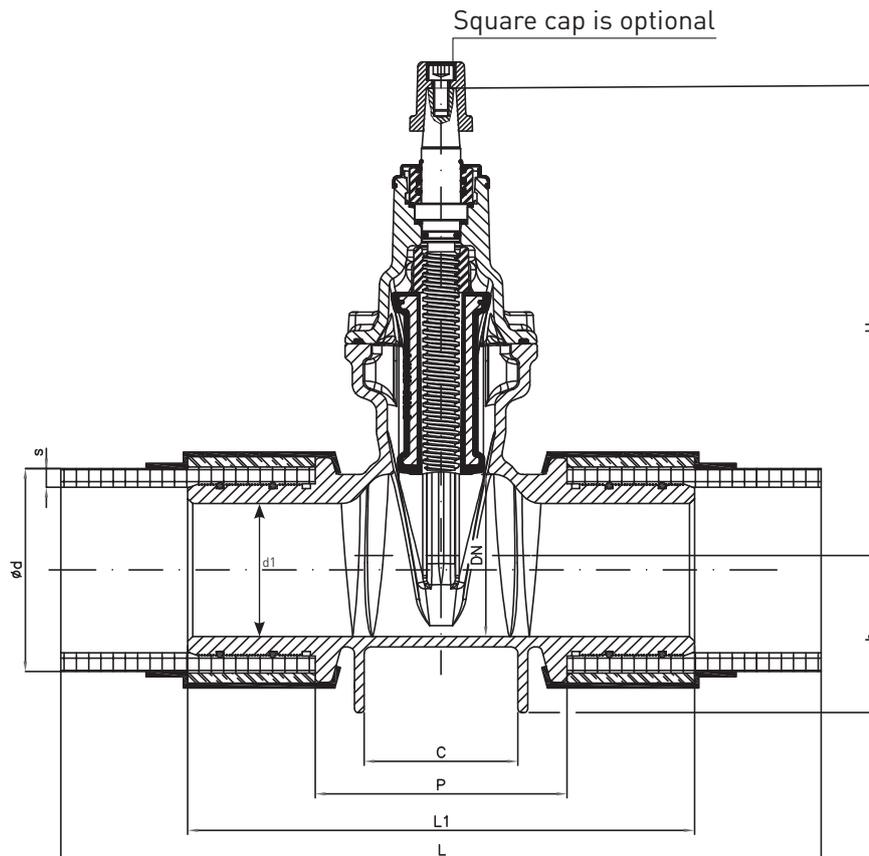


Figure 1: Drawings DN40 to 300

DN*	MAXIMUM WORKING PRESSURE OF 16 BAR (PFA16)									MAXIMUM WORKING PRESSURE OF 10 BAR (PFA10)								
	PE PIPE ød / SDR	s (mm)	L (mm)	L1 xød	P (mm)	C (mm)	H (mm)	h (mm)	d1 (mm)	PE PIPE ød / SDR	s (mm)	L (mm)	L1 xød	P (mm)	C (mm)	H (mm)	h (mm)	d1 (mm)
40	ø50 / SDR11	4,6	880	215	105	64	170	46	28									
50	ø63 / SDR11	5,8	880	220	110	64	184,5	60	38	ø63 / SDR17	3,7	880	220	110	64	184,5	60	38
65	ø75 / SDR11	6,8	900	230	120	74	227	68	47,5	ø75 / SDR17	4,5	900	230	120	74	227	68	47,5
80	ø90 / SDR11	8,2	900	237	127	79	250	75	60	ø90 / SDR17	5,3	900	237	127	79	250	75	60
100	ø110 / SDR11	10	900	310	154	82	287	91	74,5	ø110 / SDR17	6,5	900	310	154	94	287	97	82
100	ø125 / SDR11	11,4	975	310	154	94	287	97	82	ø125 / SDR17	7,4	975	310	154	94	287	97	82
125	ø140 / SDR11	12,8	1000	350	170	97	324	105	98	ø140 / SDR17	8,3	1000	350	170	97	324	105	98
150	ø160 / SDR11	14,6	1100	381	171	102	368	127	117	ø160 / SDR17	9,5	1100	381	171	102	368	130	129
150	ø180 / SDR11	16,4	1100	381	171	102	368	130	129	ø180 / SDR17	10,6	1100	381	171	102	368	130	129
200	ø200 / SDR11	18,2	1100	464	244	160	450	162	146	ø200 / SDR17	11,8	1100	464	244	160	450	162	146
200	ø225 / SDR11	20,5	1100	464	244	160	450	167	166	ø225 / SDR17	13,3	1100	464	244	160	450	167	166
250	ø250 / SDR11	22,8	1350	500	280	160	546	192	186	ø250 / SDR17	14,8	1350	500	280	160	546	192	186
300	ø315 / SDR11	28,7	1350	500	280	160	621	240	240	ø315 / SDR17	18,6	1350	500	280	160	621	240	240

*All gate valves with PE ends are reduced bore.

Table 1: Dimensions DN40 to 300

2.4 Intended use

INFINITY are resilient-seated gate valves for "OPEN - CLOSED" operation only.

By virtue of its design, and its different material options, INFINITY might be used:

- with EPDM elastomer: for potable water (only if material is approved according to water regulation of the country), water, raw water, sea water, and waste water without grease or oil.
- with NBR elastomer: for water, raw water, sea water, sewage water containing grease and oil, raw water, cooling water, potable water (only if material approved according to water regulation of the country) and to some extent weak acids and alkalis (compatibility must be checked case by case with our technical department).

Before installation, check configuration of the material in order to control the compatibility of the valve with the fluid that is going to flow inside and external environment.

If used with technically clean fluids (e.g. drinking water, depending on allowable operating pressure) flow speeds up to 5 m/s are allowed (see table 3 for limits), when the wedge is in fully opened position. They can be implemented in both flow directions.

Temperature of the medium shall not exceed max. 50°C (see table 2 for limits).

	European Standard EN1074-2	European Standard EN1171
Maximum Temperature	50°C	50°C
Maximum Flow Velocity	3 m/s (PFA10) 4 m/s (PFA16)	5 m/s (PN10) 5 m/s (PN16)

Table 2: Maximum temperature and flow velocity

Installation condition can be outdoors, buried in the ground, in valves' room, or in buildings.

All deviating operating instructions and deviating fields of application are subject to the manufacturer's approval.

As we do not have any control or prior knowledge of the quality and properties of the water, we recommend the installation of INFINITY gate valves with enamel coating when the water tends to form deposits or encrustations.

2.5 Unacceptable operation

Do not use the valves for regulating mode. Continuous operation in the flow-restricting position causes increased wear. This type of gate valves is suitable only for "OPEN-CLOSED" operation. Special types of valves are to be used for typically controlled operation.

Negative pressure levels (cavitation) are to be avoided at all events.

Extending the operating elements, e.g. with levers or similar devices is not allowed.

Do not exceed temperature limits for the flow media.

Do not exceed allowable operating pressure. The closed valve may only be loaded up to the allowable operating pressure.

If INFINITY gate valves are equipped with an EPDM seal, the EPDM parts must not be allowed to come into contact with any medium containing oil or grease, as EPDM swells.

Whatever the materials that constitute it, it is absolutely forbidden to use INFINITY with gaseous fluids such as propane, butane, natural gas or with hydrocarbon fluids like petrol, diesel, etc.



In some applications, risk of burns due to hot flow medium can occur; install thermal gate valve insulation on site.

2.6 Marking

The following information is casted into the body:

- Manufacturer name,
- DN,
- PN,
- Cast material.

The following information is shown on additional labels:

- Name of the range,
- Product number,
- Barcode,
- Operation direction if anti-clockwise closing direction,
- Approvals (if any),
- Date of manufacturing,
- Standard reference: EN1074-2, EN1171.
- Type of rubber in direct contact with the fluid.

3 - TRANSPORT, HANDLING AND LIFTING

Valve must be transported in the proper packaging to guarantee protection against external damage and bad weather. In case of severe climate conditions, special plastic sealed packaging with desiccant products must be used.

Transport must be carried out carefully in order to avoid shock and any kind of damage, especially to the coating. Careless handling may cause damage to the valve. Prior to mounting, such damage is to be repaired in an appropriate manner.

During the transport, the valve shall be slightly open in order to avoid unnecessary stress to the elastomer of the wedge.

Check the weight in the present document before any operations (table 3). Valves too heavy to be handled manually must be transported by means of a lifting device suitable for the weight involved (e.g. broad belts). Avoid use of chains and ropes in order to protect the valves from coating damage. The lifting device must be placed around the body (e.g. not on the PE pipes), respecting the center of gravity. Valves with eyebolts, lifting ring or lugs must be suspended by these devices in an appropriate manner.

It is forbidden to attach the lifting gear to the handwheel, the stem, the gearbox casing or on the PE pipes as this would be contrary to the relevant safety regulations.

DN	MAXIMUM WORKING PRESSURE OF 16 BAR (PFA16)		Weight F5/Long body (in Kg)	
	PE PIPE ød / SDR	Weight (kg)	PE PIPE ød / SDR	Weight (kg)
40	ø50 / SDR11	11,5		
50	ø63 / SDR11	14	ø63 / SDR17	14
65	ø75 / SDR11	15	ø75 / SDR17	15
80	ø90 / SDR11	18	ø90 / SDR17	18
100	ø110 / SDR11	21,5	ø110 / SDR17	21,5
100	ø125 / SDR11	21,5	ø125 / SDR17	21,5
125	ø140 / SDR11	27	ø140 / SDR17	27
150	ø160 / SDR11	32	ø160 / SDR17	32
150	ø180 / SDR11	32	ø180 / SDR17	32
200	ø200 / SDR11	41,5	ø200 / SDR17	41,5
200	ø225 / SDR11	41,5	ø225 / SDR17	41,5
250	ø250 / SDR11	43	ø250 / SDR17	43
300	ø315 / SDR11	51	ø315 / SDR17	51

Table 3: weight of the gate valve bare shaft



WARNING

Follow the applicable safety regulations and wear the required personal protective equipment. Risk of injury!



WARNING

Failure to use suitable load carrying devices for transport and installation of gate valves can cause health damage.

4 - STORAGE

The valve should be stored in a location that protects the valve from any pollution or contamination. Do not store the valves outdoors. During the storage period, the valves must be protected (e.g. by covering them with a tarpaulin) against outside influences and impurities like:

- Humidity and rain, to avoid corrosion,
- Wind and sand, to avoid the penetration of solid particles that could damage the guiding area and seat,
- Sunshine and heat, to prevent oxidation of the elastomer and coating due by ultraviolet light.

Take into account also that long storage under severe conditions can cause damage to the coating, elastomer and seals.

Leave the wedge slightly open in order to avoid long term compression of the elastomer. If it is closed completely, the rubber suffers an unnecessary compression.

Take care to not damage the coating. Ensure that the valve is stored in a stable position. Store valves standing on their feet. Store valves without feet, flat on their connecting flange by means of intermediate protecting boards.

If long-time storage is required, the place of storage should be selected in such a way that the following conditions are met: frost-protected - cool - dry - dust-free - dark (for elastomer UV-light is inadmissible). If it is impossible to comply with these conditions, the valves must be packed to meet the above mentioned requirements (e.g. they must be sealed inside dark plastic sheets).

The protective PE pipe covers or packing should be kept up to the assembly phase.

The valves are designed for a storage temperature of - 20°C to +50°C.

5 - INSTALLATION INTO THE PIPELINE

5.1 Location of installation

Warning! After installation, it is important that all around the valve there is free access for operation and maintenance.

If the valve is installed outdoors, protect the valves on site against direct exposure to weather conditions and also against frozen conditions.

5.2 Assembly positions

Our resilient seated gate valves are watertight in both directions, there are no preferential directions for installation. For clean media, we recommend the position describe in figure 2.

For other assembly positions, the manufacturer will not be able to guarantee proper operation of the valve.

5.3 Installation

Prior to installation:

- Remove all packing material from the valve, as well as the protective covers of the PE pipes.

From DN40 up to DN300:

- 1) Ideal position: vertical stem, horizontal flow

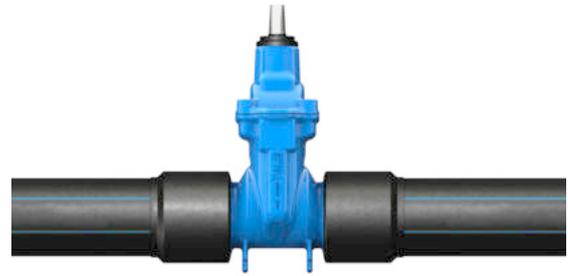


Figure 2: positions

- Check configuration of the material in order to control the compatibility of the valve with the fluid that is going to flow inside and the external environment.
- By turning the operating stem, open the valve to check its integrity (valve's seat area) and ensure that it works properly. If it does not, or if any damage is observed, inform us immediately.
- While the valve is open, clean off any dirt which may have settled on the sealing surface during transport or storage. Check if there are foreign bodies that could prevent correct operation.
- Check the pipeline for impurities and foreign matter and clean it if necessary.
- Check that the PE ends of the valve are compatible with the PE pipes on which the valve will be connected.
- Check that the valve with PE ends are fully alined on both sides with the PE pipes. No anglular deflection can be tolerate.
- Before installation of the valve, make sure that the distance between the pipe flanges exceeds the valve face-to-face dimension in order to ensure proper distance for assembly operation by mirror butt welding or with electrofusion fittings.
- Should the valve be installed in a pedestrian area, there is a risk of stumbling. The valve or the pipeline area must be secured by appropriate means.

The assembly of the valve in the pipe is independent of the flow direction.

When connecting the valve to the pipe, avoid the transmission of stresses from the pipe to the valve body. Any pipe or pipe sections or valves not yet finally clamped in place, must be provisionally supported to prevent abnormal stress on one or both sides of the valve.

In some configurations, for valves of larger nominal sizes, robust stability has to be ensured, by external support if necessary. It may be necessary to provide supports to the valve if the weight of the latter exerts excessive stress on the piping.

In any case, the pipeline mustn't by any means be pulled to the valve.

Once the valve is assembled, the threads of the bolts/rods should be greased with a brush or spray. MOLYCOTE or a similar graphite based waterproof grease should be used to prevent corrosion and facilitate subsequent dismantling operations.

The connection with INFINITY PE can be done through two different methods:

- But welding with heating mirror,
- Use of electrofusion fittings.

In both case, for the connection implementation, we recommend to strictly follow the instruction given by the manufacturers of these two different methods in their respective IOM manual.

6 - COMMISSIONING AND OPERATION

Before the valve is commissioned and installed, it must be subject to visual check, and more particularly that all connections have been done properly.

Each valve must be operated in respect of the operating torque by means of an appropriate operating element: handwheel or square cap top. In the latter case, a purpose-designed operating key must be used.

Dimension of the handwheel or operating T key should be compatible with the maximum operating torque (MOT) required. If it is not possible, a torque limiting device will have to equip the operating tool in order to avoid over torque on the valve. According to EN standards, you will find in the table below the Maximum Operating Torque (MOT) and Minimum Strength Torque (MST) in Nm for gate valves to be operated by handwheel or T-Key (see table 4). Operation by "Ring key and bar" is strictly prohibited.

After closing or opening operation, the valve must be:

- fully open and the stem released from stress
- or fully closed with at maximum the MOT stated in the table.

DN/OD PE PIPE (in mm)	Normal Closing Torque ⁽²⁾ (in Nm)	Maximum Operating Torque (MOT) according to EN1074-2 ⁽¹⁾ (in Nm)	Minimum Strength Torque (MST) according to EN1171 ⁽¹⁾ (Nm)	Number of turns for Opening or Closing (full stroke)
40/50	30	40	180	11,5
50/63	30	50	180	14
65/75	40	65	300 ⁽³⁾	15
80/90	60	80	300 ⁽³⁾	18
100/110	70	100	300	21,5
100/125	70	100	300	21,5
125/140	70	125	375	27
150/160	90	150	450	32
150/180	90	150	450	32
200/200	120	200	600	41,5
200/225	120	200	600	41,5
250/250	180	250	750	43
300/315	200	300	900	51

(1) For gate valves to be operated by Handwheel or T-Key, "Ring key and bar" excluded.
 (2) The values are the normal closing torque values of our resilient seated gate valves with clean water and at room temperature, for a product delivered.
 They are given for information and can vary depending on the typical manufacturing variables. For other fluids and temperature please contact us.
 (3) Values from NF197 quality mark (exceeds values from EN1171).

Table 4: torques and number of turns



WARNING

Excessive torque may damage the valve body and result in uncontrolled water leakage of up to 16 bar. In this case, further work on the valve must be stopped immediately and a safe distance to the valve must be maintained, especially directly above the valve. Otherwise the valve stem may come loose when the closing mechanism is actuated further and escape together with pressured water up to 16 bar.

If the torque necessary to close a valve is above MOT values, plan a maintenance phase on the valve.

In case of over torque applied on the valve, a proper maintenance must be done including changes of the damaged components.

After installation into the pipeline, ensure the easy operation of the valve several times by moving it over the whole stroke (OPEN - CLOSED) by means of the operating element (see table 4).

The nominal pressure in the pipeline should not exceed the allowable operating pressure that the valve can support.

Flush the newly installed piping systems in order to evacuate all foreign matter (residues or dirt in the piping might affect the operation of the Valve or even block it).

Take care to not affect valve materials when using cleaning / disinfecting products. After installation, perform a pressure test before the trench is closed.

7 - MAINTENANCE

7.1 Maintenance recommendations

If they are used correctly, INFINITY gate valves are maintenance-free. However, the performance and operating conditions of parts of the system must be checked at regular intervals. The function, and tightness at MOT values should be regularly monitored with a maximum interval of one (1) year as described:

- Visual inspection to the maximum extent.
- Functional inspection by opening and closing the valve over entire stroke.
- Check for smooth operation and tightness at MOT values maximum.

If the torque necessary to close or open the valves are above MOT values, a proper maintenance must be done including changes of the damaged components.

The operating/maintenance visits must be increased to an adapted frequency if the gate valves are used with water that tends to form deposits (limestone, etc) and incrustations, or in the case of: highly abrasive mediums, strong hydraulic demands, strong environmental variations, sewage or industrial applications.

Lubricant/grease must be approved for potable water application, and must be appropriate to the functions it must fulfill. Recommended lubricants for all type of maintenance (see paragraph 7.3) and for flow medium water are: Klüber Unisilikon L641 for wedge nut, stem bearing and O-rings, or Klüber Synth VT 69-252 for wedge guide, wedge nut, stem bearing and O-rings.

If silicone-free lubricant is requested, then we recommend only Klüber Synth VR 69-252 as unique grease.



WARNING

Before starting the maintenance work, all pressurised pipes must be depressurised and secured against being switched back on again!

In the event of leakage at the top of the bonnet around the stem, stop operating the valve, consult paragraph 7.2 (Trouble shooting guide) and follow the instructions before any other operation.

After completing the maintenance work, check all connections for tightness and secure fit before the new commissioning.



DANGER

If harmful liquids, substances, gases or vapours escape, the plant must be immediately shut down, the responsible supervisor informed and appropriate repair work carried out.

Personal protective equipment must be used according to the health & safety regulations of the country concerned.

Depending on the flow medium, there is a risk of poisoning and contamination, caustic burns, scalds, harm due to biological and microbiological substances as well as a fire and explosion hazard !



7.2 Trouble shooting guide



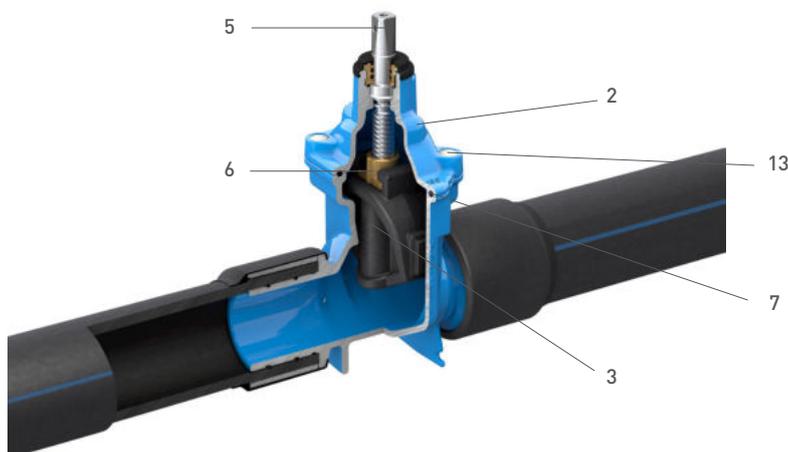
WARNING

Excessive torque may damage the valve body and result in uncontrolled water leakage of up to 16 bar. In this case, further work on the valve must be stopped immediately and a safe distance to the valve must be maintained, especially directly above the valve. Otherwise the valve stem may come loose when the closing mechanism is actuated further and escape together with pressured water up to 16 bar.

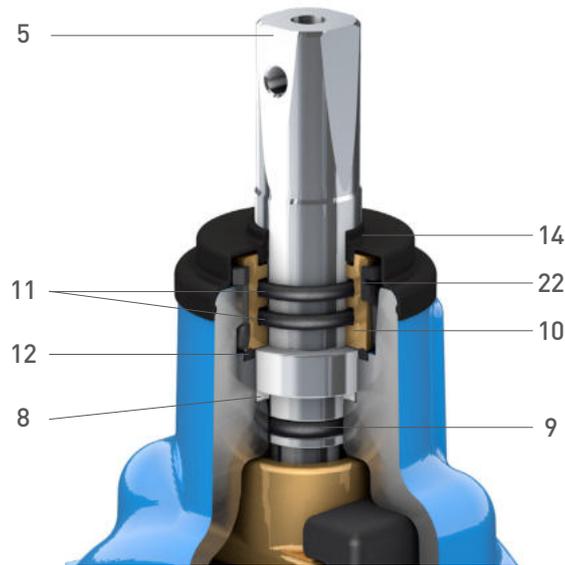
TROUBLE	ROOT CAUSE	SOLUTION
Leakage at the top of the bonnet around the stem	Stuffing nut in wrong position	Stop to operate the valve and change the complete Bonnet (see the paragraph 7.3.1)
	Defective Stuffing nut	Stop to operate the valve and change the complete Bonnet (see the paragraph 7.3.1)
	Defective O-rings	Change O-rings (see the paragraph 7.3.2)
Leakage between the bonnet and the body	Defective gasket	Change the gasket between body and bonnet (see the paragraph 7.3.4)
The valve is not closing	Defective wedge nut or wedge	Replace wedge nut or wedge (see the paragraph 7.3.4)
	Foreign body under the wedge	Remove the foreign body
	Curved operating stem	Replace operating stem (see the paragraph 7.3.3)
	Large deposits and incrustations in the guiding areas	Clean the guiding area
	Stuffing nut in wrong position	Stop to operate the valve and change the complete Bonnet (see the paragraph 7.3.1)
	Defective Stuffing nut	Stop to operate the valve and change the complete Bonnet (see the paragraph 7.3.1)
The valve is not opening	Defective wedge nut or wedge	Replace wedge nut or wedge (see the paragraph 7.3.4)
	Foreign body blocking the wedge	Remove the foreign body
	Curved operating stem	Replace operating stem (see the paragraph 7.3.3)
	Large deposits and incrustations in the guiding areas	Clean the guiding area
	Stuffing nut in wrong position	Stop to operate the valve and change the complete Bonnet (see the paragraph 7.3.1)
	Defective Stuffing nut	Stop to operate the valve and change the complete Bonnet (see the paragraph 7.3.1)

Table 5: Trouble shooting guide

7.3 Replacement



up to DN300



up to DN300

INFINITY gate valves are maintenance free. In the event that it is necessary to replace any part of the valve, follow these instructions. Starting from the upper side of the valve:

7.3.1 Replace complete bonnet (spare kit including bonnet with packing and stem):

- 1 Isolate the network section where the valve is installed (upstream and downstream).
- 2 Depressurize the network section where the valve is installed and the gate valve.
- 3 Open slightly the gate valve.
- 4 Release the handwheel or square cap from its anchor point by loosening the screw holding it down.
- 5 Remove hot melt glue's cap with a screwdriver and carefully unscrew the bolts (13) with hex key.
- 6 Remove bonnet (2).
- 7 Remove the wedge (3) together with the wedge nut (6) from the stem and tread it in the new spare kit Bonnet.
- 8 Replace the body/bonnet gasket (7). The body/bonnet gasket (7) shall be positioned in the bonnet (2) hold by the bolts (13), not in the body surface, to ensure it is not pinched.
- 9 Lubricate the stem (5) and wedge nut (6), body/bonnet gasket (7) and wedge (3) sealing face with a small amount of appropriate grease (see in the paragraph 7.1).
- 10 Re assemble the valve by threading the bolts in cross
 - Screw all the bolts in the order described on figure 3 without tightening them.
 - Tighten the bolts in the order shown on figure 3, with the recommended torques given in the table 6.



WARNING

Excessive torque may damage the valve body and result in uncontrolled water leakage of up to 16 bar. In this case, further work on the valve must be stopped immediately and a safe distance to the valve must be maintained, especially directly above the valve. Otherwise the valve stem may come loose when the closing mechanism is actuated further and escape together with pressured water up to 16 bar.

DN	Bolts Type	Recommended Torques*
40 to 150	M10	70 Nm
200 to 300	M12	110 Nm

(*): for Stainless Steel A4-80 and Steel 12.9 with geomet coating.

Table 6: Recommended torques for the bonnet bolts



Figure 3: Assembly order for body/bonnet bolts

7.3.2 Replace stem seals (can be replaced under pressure with the valve fully opened):

- 1 Check that the valve is fully opened,
- 2 Release the handwheel or square cap from its anchor point by loosening the screw holding it down,
- 3 Remove dust guard (14),
- 4 Up to DN300: Use a screwdriver to pull the 3 plastic locking tabs (22) out of their position between the bearing bush and

bonnet. These 3 plastic locking tabs must be discarded and replaced by 3 new ones.

- 5 Up to DN300: The stuffing nut (10) is unlocked by pushing it downwards while at the same time turning it 1/4 turn. Then, it can be pulled off from above. The parts to be replaced are:
 - The two O-rings (11) inside this stuffing nut. Remove them with a punch or screwdriver, taking care not to damage the housings, and fit a new set. Lubricate the O-rings with a small amount of appropriate grease.
 - The O-ring (12) under the stuffing nut, between the stuffing nut and the bonnet. When replaced, this O-ring must lie in the shoulder provided cleanly against the outer diameter. Lubricate the O-ring with a small amount of appropriate grease.
 - The 3 plastic locking tabs (22).
- 6 Re-assemble the valve, repeating these operations in reverse order.

7.3.3 Replace all stem seals and bearings:

- 1 Isolate the network section where the valve is installed (upstream and downstream)
- 2 Depressurize the network section where the valve is installed and the gate valve
- 3 Slightly open the gate valve,
- 4 Release the handwheel or square cap from its anchor point by loosening the screw holding it down
- 5 Remove dust guard (14)
- 6 Up to DN300: Use a screwdriver to pull the 3 plastic locking tabs (22) out of their position between the bearing bush and bonnet. These 3 plastic locking tabs must be discarded and replaced by 3 new ones.
- 7 Up to DN300: The stuffing nut (10) is unlocked by pushing it downwards while at the same time turning it 1/4 turn. Then, it can be pulled off from above. Remove the stem (5), taking care not to remove the wedge nut (6) from its housing, and extract the plastic washer (8). The parts to be replaced are:
 - The two O-rings (11) inside this stuffing nut. Remove them with a punch or screwdriver, taking care not to damage the housings, and fit a new set. Lubricate the O-rings with a small amount of appropriate grease.
 - The O-ring (12) underneath the stuffing nut, between the stuffing nut and the bonnet. When replaced, this O-ring must lie in the shoulder provided cleanly against the outer diameter. Lubricate the O-ring with a small amount of appropriate grease.
 - The O-ring (9) on the stem, below the thrust-bearing collar. Remove them with a punch or screwdriver, taking care not to damage the housings, and fit a new set. Lubricate the O-ring with a small amount of appropriate grease.
 - The plastic washer (8) below the thrust-bearing collar. Lubricate the plastic washer with a small amount of appropriate grease.
 - The 3 plastic locking tabs (22).
- 8 Re-assemble the valve, repeating these operations in reverse order.

7.3.4 Replace wedge or wedge nut or gasket between Body-Bonnet:

- 1 Isolate the network section where the valve is installed (upstream and downstream),
- 2 Depressurize the network section where the valve is installed and the gate valve,
- 3 Open slightly the gate valve,
- 4 Release the hand wheel or square cap from its anchor point by loosening the screw holding it down,
- 5 Remove hot melt glue's cap with a screwdriver and carefully unscrew the bolts (13) with hex key,
- 6 Remove bonnet (2).
- 7 Replace damaged wedge (3) and/or wedge nut (6) and in all cases the body/bonnet gasket (7). The body/bonnet gasket (7) shall be positioned in the bonnet (2) hold by the bolts (13), not in the body surface, to ensure it is not pinched.
- 8 Lubricate the stem (5) and wedge nut (6), body/bonnet gasket (7) and wedge (3) sealing face with a small amount of appropriate grease (see in the paragraph 7.1).
- 9 To re-assemble the valve, repeating these operations in reverse order. Re-assemble the bonnet (2) on the body by threading the bolts (13) in cross
 - Screw all the bolts in the order described on figure 3 without tightening them.
 - Tighten the bolts in the order shown on the on figure 3 below, with the recommended torques given in the table 6.

7.4 Spare parts

7.4.1 INFINITY gate valves DN40 to DN300

ITEM*	DESCRIPTION	Qty	COMMENTS
3	Wedge	1	Specify type of elastomer and DN
5	Stem	1	Specify type of material and DN
6	Wedge nut	1	Specify type of material and DN
7	Body-Bonnet gasket	1	Specify type of elastomer and DN
8	Plastic washer (Stem)	1	Specify DN
9	O-ring (Stem)	1	Specify type of elastomer and DN
10	Stuffing nut	1	Specify DN
11	O-ring (Inside stuffing nut)	2	Specify DN
12	O-ring (Outside stuffing nut)	1	Specify DN
13	Bolts (Bonnet)	Acc/DN	Specify type of material and DN
14	Dust guard	1	Specify DN
22	Plastic locking tab	3	Specify DN

Note: Items in the table above can't be sold individually, but are sold in the form of non dissociable kits. The table above is only dedicated to identify the necessary components. For more details about the constitution of kits, please contact us.

(*See illustrations in section 7.3 for items numbers.

8 - HYDRAULIC CHARACTERISTICS

At a temperature of 20°C, the head loss through the valves are defined by the following formula:

$$\Delta P = \left(\frac{Q}{Kv} \right)^2$$

With: ΔP = head loss of the valve in Bar,

Q = flow in the valve in m³/h,

Kv = head loss coefficient. See value by DN in the table below. "Kv" express the value of the flow (in m³/h), at a temperature of 20°C, that pass through the valve by generating a head loss of 1 Bar.

DN (in mm)	Kv*
40	270
50	450
65	760
80	1160
100	1910
125	3140
150	4580
200	8260
250	13730
300	19400

(*): Theoretical values. These Kv values concern flanged valves. They are given for information only.

Table 7: Head loss coefficient

9 - CE MARKING

European directive 2014/68/EU (PED) must be respected in all the countries of the European Union for all equipment under pressure. Valves which are subjected to this European directive are the object of a "CE" marking and also a CE declaration of conformity.

Are excluded from the scope of this directive the networks for the supply, distribution and discharge of water and associated equipment and headraces such as penstocks, pressure tunnels, pressure shafts for hydroelectric installations and their related specific accessories. In this context:

- "water" means: potable water, waste water and effluent, and sewage,
- "Networks and associated equipment" means: complete systems for the supply distribution and discharge of water. They extend up to the point of use in buildings, industrial sites and plants, and include equipment closely related to these networks such as water meter and line valves. Pressure vessels, such as expansion vessels, however are not considered to be part of such 'networks and associated equipment' and are therefore not excluded.

Within the scope of the directive, the requirements on resilient seated gate valves are given in the table below in the case of liquid from group 2. For the gate valves which are subjected to "CE" marking (see table below), the document of "CE" declaration of conformity is available on request.

DN	PS MAX (bar)	Fluid group	Fluid Type	CATEGORY	CE MARKING
40	16	2	Liquid having vapor pressure max at 1513 mbar, at 70°C max.	Art 4, Par 3	n.a.*
50	16	2		Art 4, Par 3	n.a.*
60	16	2		Art 4, Par 3	n.a.*
65	16	2		Art 4, Par 3	n.a.*
80	16	2		Art 4, Par 3	n.a.*
100	16	2		Art 4, Par 3	n.a.*
125	16	2		Art 4, Par 3	n.a.*
150	16	2		Art 4, Par 3	n.a.*
200	16	2		Art 4, Par 3	n.a.*
250	16	2		Art 4, Par 3	n.a.*
300	16	2	Art 4, Par 3	n.a.*	

(*): according to the max working pressure defined, max temperature defined, and fluid group defined, the "CE marking" is not necessary for DN40 to 300 in the present case.

Table 8: Category according to European directive 2014/68/EU (PED)

10 - AFTER SALES SERVICE CONTACT

For technical assistance, or all questions that concerns the product or IOM manual, please find the details of your closest contact on www.talis-group.com or send an email to info@talis-group.com.

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