

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

INFINITY resilient seated gate valves

DN40/700, PN10/16, TYPE F4 (EN558 S14 - SHORT BODY) OR TYPE F5 (EN558 S15 - LONG BODY), BARE SHAFT FOR MANUAL OPERATION

SERIES 0140100 / 0140104 / 0140200 / 0140204 / 0140300 / 0140304



Table of contents

- 1 Safety and general aspects
- 2 Product and functional description
- 3 Transport, handling and lifting
- 4 Storage
- 5 Installation into the pipeline
- 6 Initial operation and commissioning
- 7 Maintenance
- 8 Hydraulic characteristics
- 9 CE marking
- 10 After sales service contact

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 over 18 years of age.



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.

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 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!

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 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.

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.



DANGER

Work at electric installations should only be carried out by trained electricians and only when the current is switched off.
Danger from high electric voltage!

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



WARNING

Before carrying out work on the valve, the inspection valve must be closed and the pipe section must be depressurised.

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 and EN1074-2.

INFINITY F4 (SHORT) BARE SHAFT FOR MANUAL OPERATION

Series 0140100 / 0140200 / 0140300

Face to face dimensions according to EN558-1 series 14, ISO5752 series 14, DIN3202 series F4,

Flange according to EN1092-2 PN10 or PN16, ISO 2531 PN10 or PN16,



INFINITY F5 (SHORT) BARE SHAFT FOR MANUAL OPERATION

Series 0140104 / 0140204 / 0140304

Face to face dimensions according to EN558-1 series 15, ISO5752 series 15, DIN3202 series F5,

Flange according to EN1092-2 PN10 or PN16, ISO 2531 PN10 or PN16,



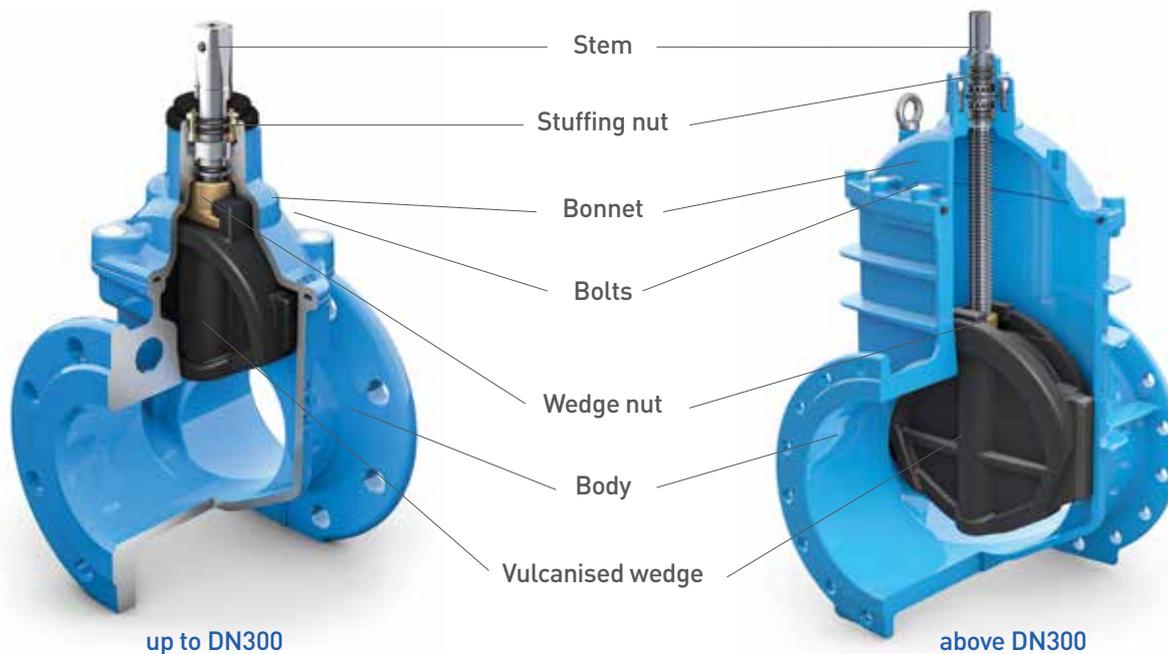
Series	Size	PN	PS max in bar	PFA in bar	PMA in bar	PEA in bar	Hydrostatic test pressure in bar for		Allowable operating pressure in bar at Working temperature max of 50°C***
							Body	Seal	
		EN1092-2	EN1171	EN1074-2					
For F4 (SHORT BODY) 0140100 0140200 0140300	40, 50, 65*, 80*, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600	10 16	10 16	10 16	12 20	17 25	15 24	10 16	10 16
For F5 (LONG BODY) 0140104 0140204 0140304	40, 50, 65*, 80*, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700**	10 16	10 16	10 16	12 20	17 25	15 24	10 16	10 16

[*]: on request: DN65 can be drilled to DN60 and DN80 can be drilled 4 holes.

[**]: Reduced bore of 600 mm. Valves produced from DN600/F4 with flanged conical adapters bolted on each side.

[***]: On request solution up to 70°C can be offered.

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 or High temperature EPDM
Wedge nut	Brass CW617N	Aluminium bronze CW307G
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 A2 or A4
Coating	Epoxy	Enamel or High temperature coating

2.2 Functional description and allowable operation

Operation of the gate valve is performed through rotating motion of the stem with an appropriate operating element (Handwheel, T-Key, ...). 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.

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.



Handwheel



Operating Key



Telescopic or fix extension set



Fix extension stem



Captop (square cap)

2.3 Dimensions

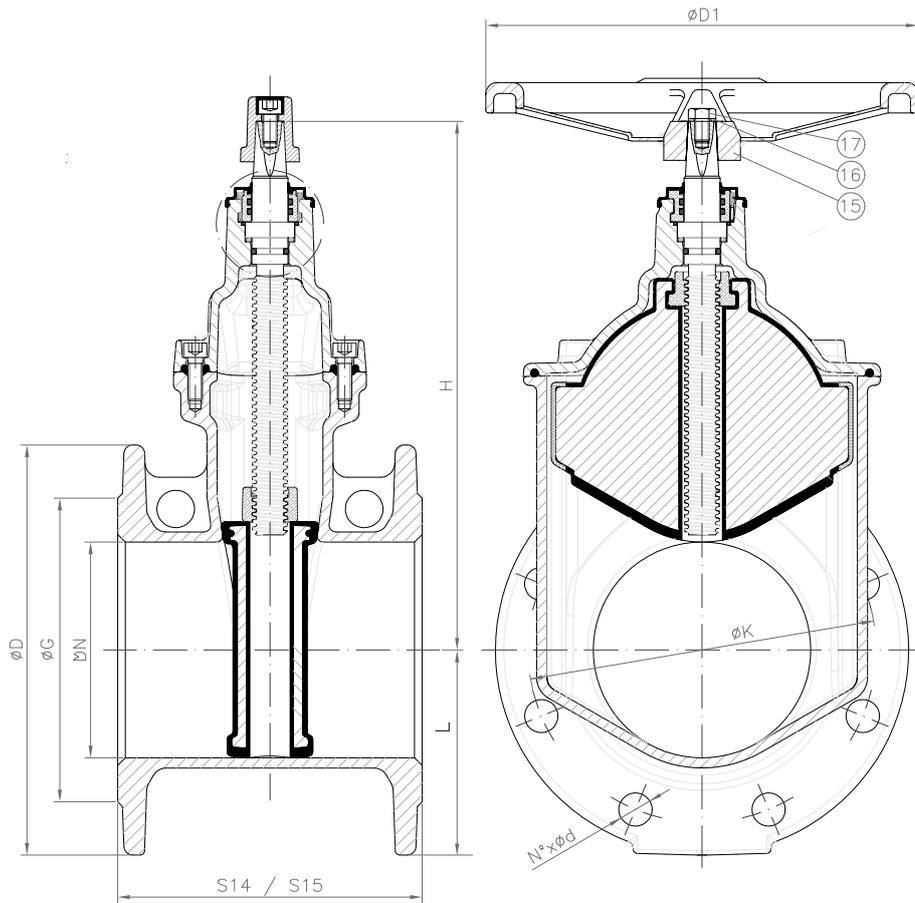


Figure 1: Drawings DN40 to 300

DN	øD (mm)	EN 1092-2 PN10			EN 1092-2 PN16			EN 558 (DIN 3202)		H (mm)	L (mm)	øD1 (mm)
		øK (mm)	øG (mm)	n° x ød	øK (mm)	øG (mm)	n° x d	S14 (F4) (mm)	S15 (F5) (mm)			
40	150	110	84	4x19	110	84	4x19	140	240	170	75	150
50	165	125	99	4x19	125	99	4x19	150	250	184,5	83	150
65*	185	145	118	4x19	145	118	4x19	170	270	227	93	150
80**	200	160	132	8x19	160	132	8x19	180	280	250	100	200
100	220	180	156	8x19	180	156	8x19	190	300	287	110	200
125	250	210	184	8x19	210	184	8x19	200	325	324	125	300
150	285	240	211	8x23	240	211	8x23	210	350	368	143	300
200	340	295	266	8x23	295	266	12x23	230	400	450	170	400
250	400	350	319	12x23	355	319	12x28	250	450	546	200	400
300	455	400	370	12x23	410	370	12x28	270	500	621	228	500

(*) DN60 drilling on request. (**) DN80 with 4 holes drilling on request.

Table 1: Dimensions DN40 to 300

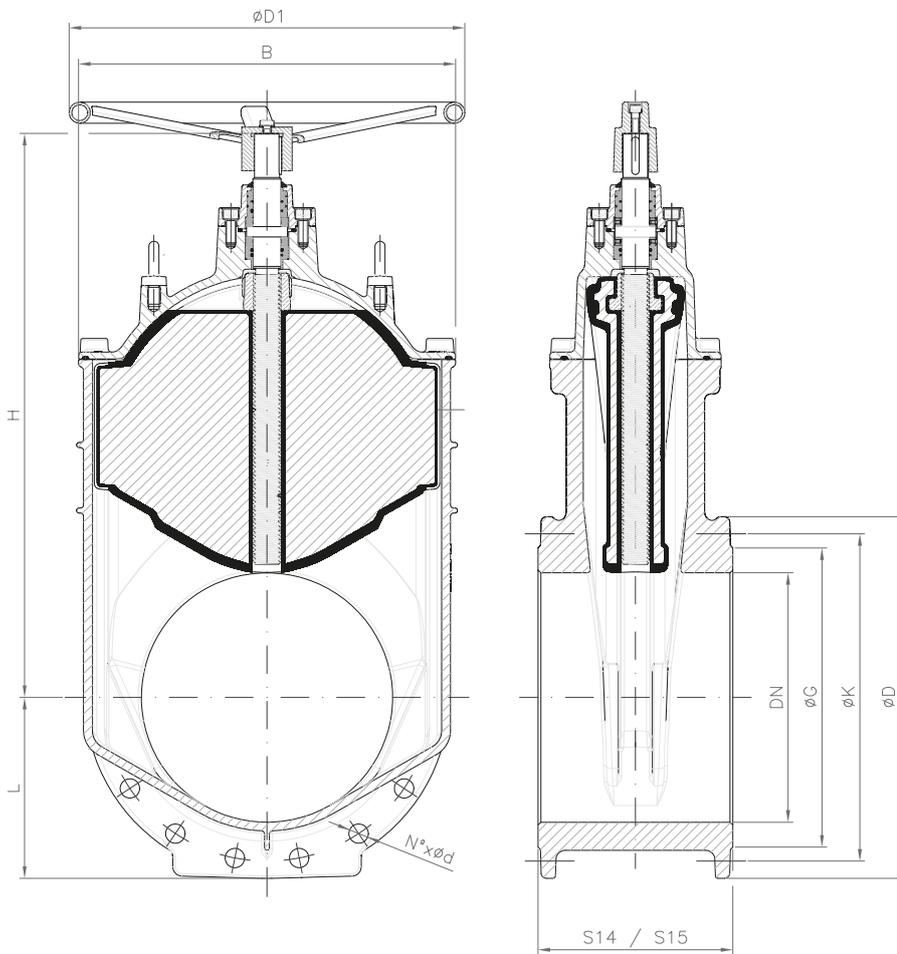


Figure 2: Drawings DN350 to 600

DN	EN 1092-2 PN 10				EN 1092-2 PN 16				EN 558 (DIN 3202)		H (mm)	L (mm)	B (mm)	$\phi D1$ (mm)
	ϕD (mm)	ϕK (mm)	ϕG (mm)	$n^{\circ} \times \phi d$	ϕD (mm)	ϕK (mm)	ϕG (mm)	no. x d	S14 (F4) (mm)	S15 (F5) (mm)				
350	520	460	429	16x23	520	470	429	16x28	290	550	812	260	506	600
400	580	515	480	16x28	580	525	480	16x31	310	600	905	290	606	800
450	640	565	530	20x28	640	585	548	20x31	330	650	1002	320	672	800
500	715	620	582	20x28	715	650	609	20x34	350	700	1054	358	748	800
600	780	725	682	20x31	840	770	720	20x37	390	800	1285	420**	955	800
700*	895	840	794	24x31	910	840	794	24x37	-	900	1285	455***	955	800

(*): Reduced bore of 600 mm. Valves produced from DN600/S14 with flanged conical adapters bolted on each side.

(**): L=390 mm for DN600 PN10.

(***): L=448 mm for DN700 PN10.

Table 2: Dimensions DN350 to 700

2.4 Intended use

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 3 for limits). On request solution up to 70°C can be offered (contact our technical department for applications with higher temperatures).

	European Standard EN1074-2	European Standard EN1171
Maximum Temperature	50°C	50°C (70°C on request)
Maximum Flow Velocity	3 m/s (PFA10) 4 m/s (PFA16)	5 m/s (PN10) 5 m/s (PN16)

Table 3: 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,
- Drilling type, if special or different than PN,
- 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 4). 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. between the two connecting flanges), respecting the center of gravity. Valves with eyebolts 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 in the flange holes, as this would be contrary to the relevant safety regulations.

DN	Weight F4/Short body (in Kg)		Weight F5/Long body (in Kg)	
	EN1092-2 PN10	EN1092-2 PN16	EN1092-2 PN10	EN1092-2 PN16
40	6,7	6,7	7,3	7,3
50	8,3	8,3	8,8	8,8
60 *	12,3	12,3	13	13
65	12,3	12,3	13	13
80 (4 holes)*	13,7	13,7	14,9	14,9
80	13,7	13,7	14,9	14,9
100	16,4	16,4	17,9	17,9
125	22,5	22,5	25,2	25,2
150	27,2	27,2	30,6	30,6
200	46,9	46,9	54,2	54,2
250	69,5	69,5	78,8	78,8
300	96,5	96,5	115	115
350	190	190	213	213
400	274	274	311	311
450	310	309	363	362
500	398	396	445	443
600	553	669	660	775
700	-	-	815	975

(*) special drilling only on request.

Table 4: 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 flange covers or packing should be kept up to the assembly phase.

The valves are designed for a storage temperature of - 20°C to +70°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 3.

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

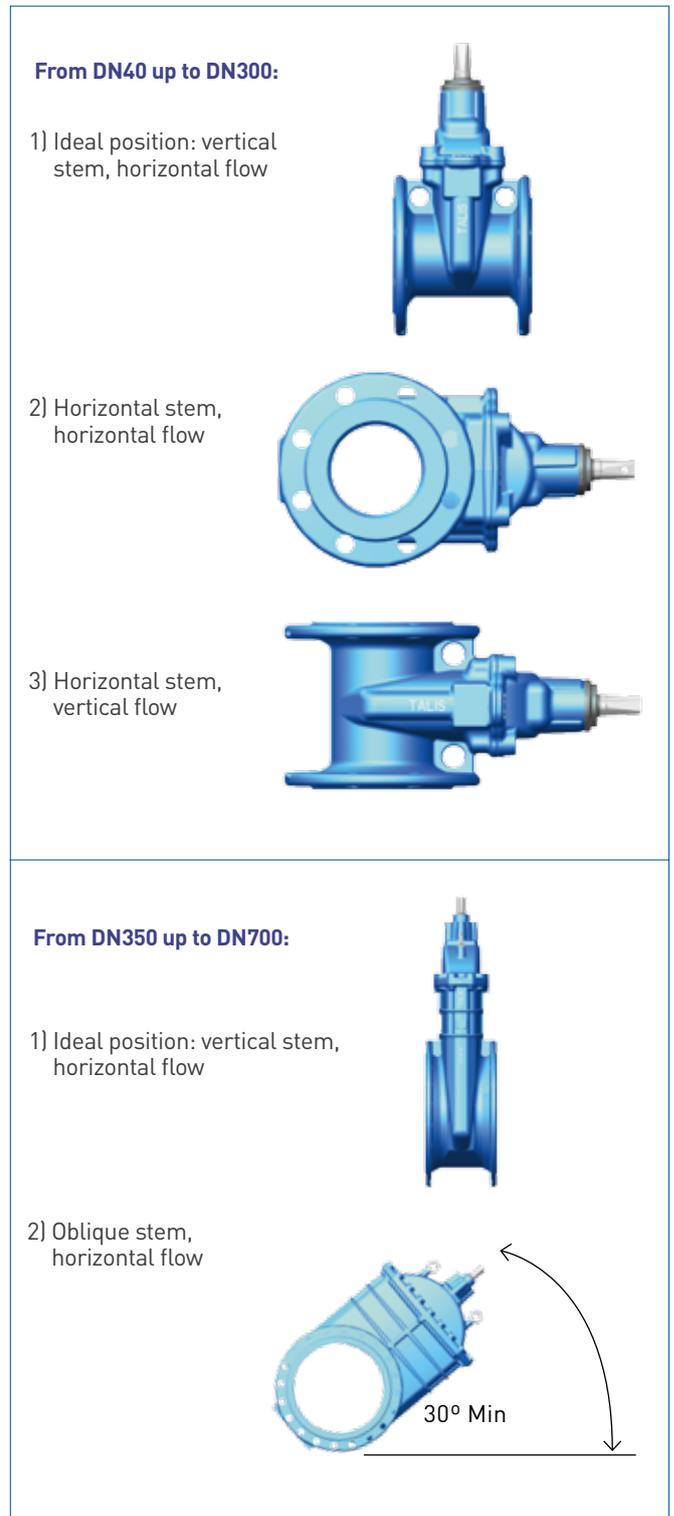


Figure 3: positions

5.3 Installation

Prior to installation:

- Remove all packing material from the valve, as well as the protective flange covers.
- 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 gaskets' seats on pipes and valves flanges are perfectly clean and free from stripes, which may prevent watertight fitting. If necessary, clean the pipe flanges to remove any particles of metal or residue of welding which may have been deposited there.
- Check that the pipe flanges are drilled in accordance with the same standards as the valves.
- The mating pipe flanges must be plain-parallel and concentric. Check the alignment of the pipes, parallelism and face to face distance of the pipe connection flanges. Do not rely on the valves to correct bad alignment. Errors in parallelism or gaps may subject flanges to stress, which could eventually cause valve breakage.
- Before installation of the valve, make sure that the distance between the pipe flanges exceeds the valve face-to-face dimension in order to avoid damage to the raised faces of the valves and ensure that the flange gaskets can be placed easily without damage.
- For use as flange seals, steel-reinforced rubber seals are recommended., In the case of slip-on flanges they are absolutely necessary (consider resistance to flow medium and temperature).
- 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.

Select appropriate size of hexagonal head bolts, nuts and washers according to the pressure and type of the flanges (see table 3). For each flange's hole, washers shall be placed on both sides of the flange's assembly.

Tighten bolts gradually in a star-shaped pattern (see figure 4).

- Set up bolts,
- Tighten them by hand,
- Tighten bolts gradually in a star-shaped pattern (see figure 4 – order from 1 to 12).

At the end, tighten the connecting bolts evenly, without distortion and crosswise, applying the required torques defined by the flange gasket manufacturer, in the limit of tightening torques of the bolts. Tightening torques of the bolts are given in the table 6.

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.

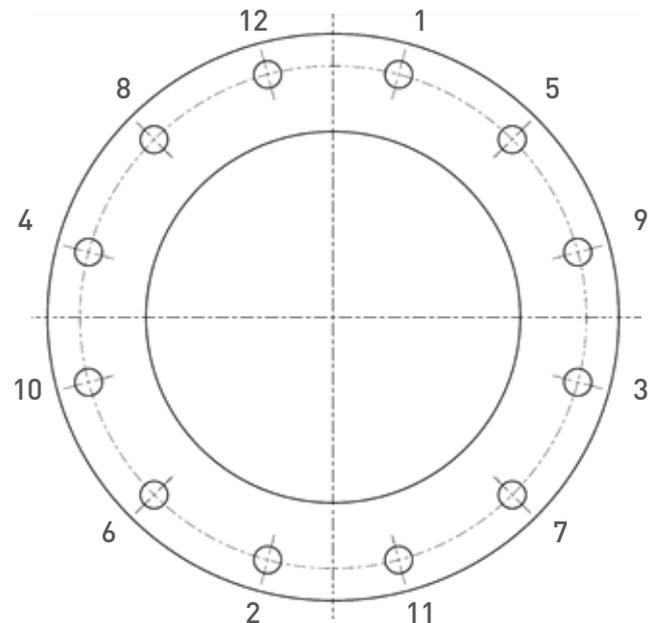


Figure 4: sample of flange DN300

DN	EN1092-2 PN10		EN1092-2 PN16	
	Quantity	Size	Quantity	Size
40	See EN1092-2 PN16		4	M16
50			4	M16
60 *			4	M16
65			4	M16
80 (4 holes)*			4	M16
80			8	M16
100			8	M16
125			8	M16
150			8	M20
200			8	M20
250	12	M20	12	M24
300	12	M20	12	M24
350	16	M20	16	M24
400	16	M24	16	M27
450	20	M24	20	M27
500	20	M24	20	M30
600	20	M27	20	M33
700	24	M27	24	M33

Table 5: size and quantity of bolts

(*) special drilling only on request.

SIZE		GRADE											
		3,6 (4 D)		5,6 (5 D)		6,9 (6 G)		8,8 (8 G)		10,9 (10 K)		12,9 (12 K)	
THREAD	NUT	PV	MA	PV	MA	PV	MA	PV	MA	PV	MA	PV	MA
	mm	N	Nm	N	Nm	N	Nm	N	Nm	N	Nm	N	Nm
M 2	4	284	0,12	378	0,16	731	0,31	863	0,37	1216	0,52	1461	0,63
M 2,3	4,5	407	0,2	544	0,26	1049	0,51	1245	0,6	1755	0,84	2099	1,01
M 2,6	5	525	0,28	701	0,37	1353	0,73	1598	0,86	2246	1,21	2697	1,45
M 3	5,5	726	0,44	966	0,59	1863	1,13	2207	1,34	3109	1,88	3727	2,26
M 3,5	6	971	6,8	1294	0,9	2501	1,74	2962	2,06	4168	2,89	5001	3,48
M 4	7	1255	1	1677	1,34	3226	2,6	3825	3,04	5374	4,31	6453	5,15
M 5	8 9	2059	1,96	2736	2,65	5286	5,1	6257	6,03	8806	8,48	10591	10,2
M 6	10	2903	3,43	3864	4,51	7453	8,73	8836	10,3	12405	14,71	14906	17,65
M 7	11 - 12	4237	5,59	5649	7,45	10885	14,22	12945	17,16	18191	24,52	21771	28,44
M 8	13 - 14	5315	8,24	7090	10,79	13680	21,57	16230	25,5	22752	35,3	27361	42,17
M 10	15 - 17	8473	16,67	11278	21,57	21771	42,17	25792	50,01	36285	70,61	43542	85,32
M 12	19 - 21	12356	28,44	16475	38,25	31773	73,55	37658	87,28	52956	122,58	63547	147,1
M 14	22 - 23	16966	45,11	22654	60,8	43640	116,7	51681	138,27	72668	194,17	87280	235,36
M 16	24 - 26	23340	69,63	31087	93,16	60017	178,48	71197	210,84	100028	299,1	120132	357,94
M 18	27	28341	95,13	37854	127,49	72962	245,17	86495	289,3	121603	411,88	146120	490,34
M 20	30	36481	135,33	48641	180,44	93850	348,14	111306	411,88	156417	578,5	187798	696,28
M 22	32	45601	182,4	60802	245,17	117190	470,72	139255	558,98	195644	784,54	234380	941,44
M 24	36	52564	230,46	70020	308,91	135333	598,21	160340	710,99	225554	1000,28	270665	1196,42
M 27	41	69235	343,23	92281	460,92	177992	887,51	210844	1049,32	296163	1480,81	355984	1775,01
M 30	46	84044	465,82	112287	622,73	215748	1206,23	255955	1421,97	359906	2010,38	432476	2402,64
M 33	50	104932	632,53	139746	848,28	269685	1627,91	319699	1931,92	449147	2716,46	539369	3265,63
M 36	55	123074	813,96	164263	1088,54	316757	2098,64	374616	2481,1	527601	3491,19	632533	4197,27
M 39	60	148081	1059,12	197115	1412,17	380500	2716,46	451109	3226,41	633513	4530,7	761001	5442,72
M 42	65	169166	1304,29	225554	1745,59	435418	3363,7	515833	3991,33	725697	5609,44	870836	6727,4
M 45	70	198096	1637,72	264781	2177,09	509949	4207,08	604093	4991,62	850242	7011,8	1019899	8414,16
M 48	75	222612	1980,96	297143	2638	573693	6060,55	679605	6021,32	956154	8473	1147385	10149,94
M 52	80	267723	2539,94	356964	3393,12	688431	6541,08	815918	7747,3	1147385	10885,45	1377843	13091,96
M 56	85	308911	3167,57	411882	4226,69	793363	8149,38	940463	9649,8	1323906	13582,29	1588687	16279,14
M 60	90	360887	3932,49	481509	5246,59	927715	10100,91	1098351	11964,19	1544557	16867,54	1853468	20201,82
M 64	95	407959	4786,64	544272	6305,71	1049318	12160,32	1245452	14415,86	1750498	20299,89	2098636	24320,64

Table 6: Tightening torque and tensions

The torque (in Nm) and tensions indicated are standard levels for metric threads as per DIN-13. Dimensions as per DIN- 912, 931, 934, 6912, 7984 & 7990, using 90% of the yield strength (friction coeff. 0.14 - new, non-lubricated screws). We recommend reducing torque by 20% if lubrication is used, especially with cadmium plated surfaces.

6 - INITIAL OPERATION AND COMMISSIONING

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

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 key should be compatible with the maximum operating torque that the valve can support. According to EN1074-2 standard, maximum operating torque value (in Nm) of a valve is equal to the DN value (in mm) of the valve concerned (see table 7).

DN (in mm)	Maximum Operating Torque (MOT) according to EN1074-2 (in Nm)	Minimum Operating Torque (in Nm)	Number of turns for Opening or Closing (full stroke)
40	40	30	11,5
50	50	30	14
60 *	65	40	15
65	65	40	15
80 (4 holes)*	80	60	18
80	80	60	18
100	100	70	21,5
125	125	70	27
150	150	90	32
200	200	120	41,5
250	250	180	43
300	300	200	51
350	350	on request	51
400	400	on request	58
450	450	on request	65
500	500	on request	72
600	600	on request	87
700	700	on request	87

(*) Special drilling only on request.

Table 7: maximum operating torque and number of turns

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 7). 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

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 should be regularly monitored with a maximum interval of four (4) years (visual evaluation / functional and visual inspection / opening and closing over entire valve stroke / check for smooth operation and tightness to the maximum extent).

The maintenance visit intervals should be reduced to one year if the gate valves are used with water that tends to form deposits (limestone, etc) and incrustations, highly abrasive mediums, strong hydraulic demands or with strong environmental variations.

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! 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 !

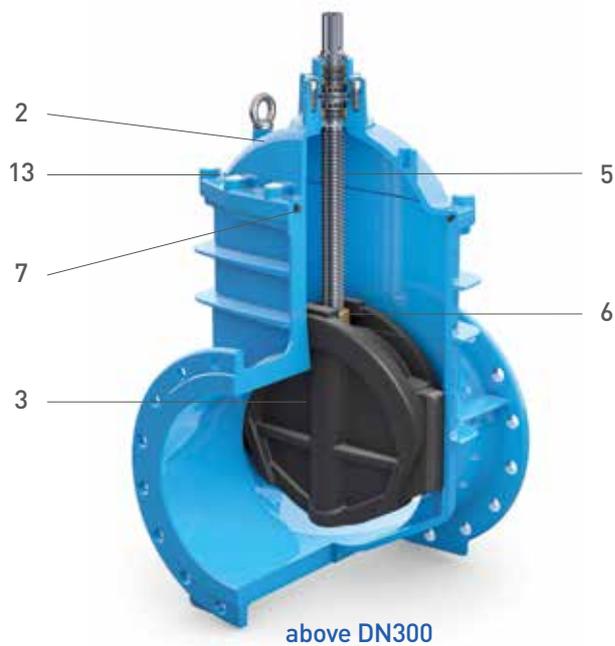
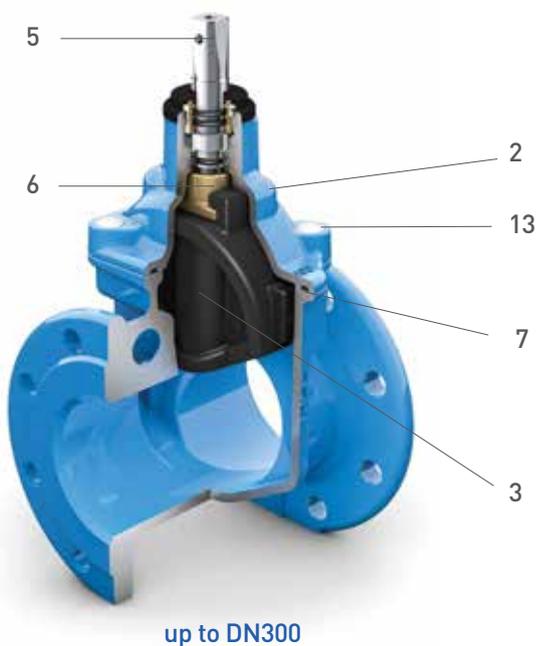


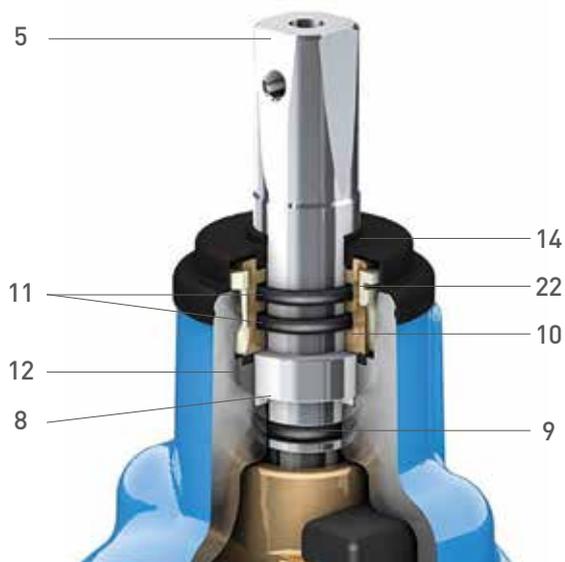
7.2 Trouble shooting guide

TROUBLE	ROOT CAUSE	SOLUTION
Leakage at the top of the bonnet around the stem	Stuffing nut in wrong position	Re-assemble correctly the stuffing nut
	Defective Stuffing nut	Change Stuffing nut
	Defective O-rings	Change O-rings
Leakage between the bonnet and the body	Defective gasket	Change the gasket between body and bonnet
	Defective wedge nut	Replace wedge nut
The valve is not closing	Foreign body under the wedge	Remove the foreign body
	Curved operating stem	Replace operating stem
	Large deposits and incrustations in the guiding areas	Clean the guiding area
	Defective wedge	Replace wedge
	Defective wedge nut	Replace wedge nut
The valve is not opening	Foreign body blocking the wedge	Remove the foreign body
	Curved operating stem	Replace operating stem
	Large deposits and incrustations in the guiding areas	Clean the guiding area
	Defective wedge	Replace wedge
	Defective wedge nut	Replace wedge nut

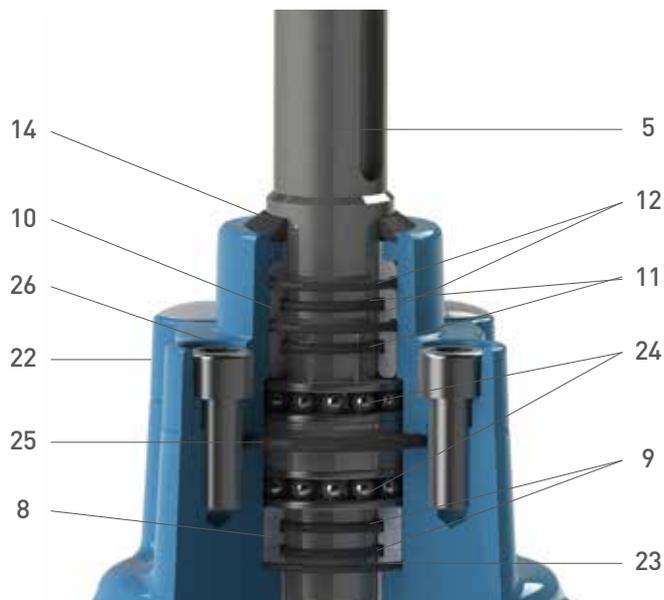
Table 8: Trouble shooting guide

7.3 Replacement





up to DN300



above 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 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.

Above DN300: remove hot melt glue's cap with a screw driver and carefully unscrew the bolts (26) with hex key.

- 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).

Above DN300: Remove the upper bonnet (22) and carefully extract the upper packing bushing (10) in plastic. The parts to be replaced are:

- The two O-rings (11) inside and also the 2 O-rings (12) outside this upper packing bushing. Remove them with a punch or screwdriver, taking care not to damage the housings, and fit new sets. Lubricate all O-rings with a small amount of appropriate grease.
- The O-ring (25) between the upper bonnet 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.

- 6 Re-assemble the valve, repeating these operations in reverse order.

7.3.2 Replace all stem seals and bearings:

- 1 Depressurize the gate valve,
- 2 Slightly open the gate valve,
- 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.
Above DN300: remove hot melt glue's cap with a screw driver and carefully unscrew the bolts (26) with hex key.
- 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. 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).

Above DN300: Remove the upper bonnet (22) and carefully extract the upper packing bushing (10) in plastic. Remove the upper axial ball bearing (24) as well as the stem (5), taking care not to remove the wedge nut (6) from its housing. Extract the lower axial ball bearing (24), and the lower packing bushing (8). The parts to be replaced are:

- The two O-rings (11) inside and also the 2 O-rings (12) outside this upper packing bushing. Remove them with a punch or screwdriver, taking care not to damage the housings, and fit new sets. Lubricate all O-rings with a small amount of appropriate grease.
- The O-ring (25) between the upper bonnet 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 two O-rings (9) inside the lower packing bushing. Remove them with a punch or screwdriver, taking care not to damage the housings, and fit the new set. Lubricate the two O-rings with a small amount of appropriate grease.
- The O-ring (23) underneath the lower packing bushing, between the lower packing bushing 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 2 axial ball bearings (24) below and above the thrust-bearing collar. Lubricate them with a small amount of appropriate grease.

- 6 Re-assemble the valve, repeating these operations in reverse order.

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

- 1 Depressurize the gate valve,
- 2 open slightly the gate valve,
- 3 Release the handwheel or square cap from its anchor point by loosening the screw holding it down,
- 4 Remove hot melt glue's cap with a screw driver and carefully unscrew the bolts (13) with hex key,
- 5 Remove bonnet (2),
- 6 Replace damaged wedge (3) and/or wedge nut (6) and in all cases the body/bonnet gasket (7),
- 7 Lubricate the stem (5) and wedge nut (6), body/bonnet gasket (7) and wedge (3) sealing face with a small amount of appropriate grease,
- 8 To re-assemble the valve, repeating these operations in reverse order.

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

7.4.2 INFINITY gate valves DN350 to DN700

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	Lower packing bushing	1	Specify DN
9	O-ring (Inside lower packing bushing)	2	specify type of elastomer and DN
10	Upper packing bushing	1	Specify DN
11	O-ring (Inside upper packing bushing)	2	Specify DN
12	O-ring (Outside upper packing bushing)	2	Specify DN
13	Bolts (Bonnet)	Acc/ DN	Specify DN
14	Dust guard	1	Specify DN
23	O-ring (Outside lower packing bushing)	1	specify type of elastomer and DN
24	Axial ball bearing	2	Specify DN
25	O-ring (Upper bonnet)	1	Specify DN
26	Bolts (Upper bonnet)	Acc/ DN	Specify DN

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
60 *	760
65	760
80 (4 holes)*	1160
80	1160
100	1910
125	3140
150	4580
200	8260
250	13730
300	19400
350	27710
400	36200
450	46940
500	59270
600	87530
700	87530

(*) Special drilling only on request.

Table 9: 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.*
350	16	2		Cat 1	Yes
400	16	2		Cat 1	Yes
450	16	2		Cat 1	Yes
500	16	2		Cat 1	Yes
600	16	2		Cat 1	Yes
700	16	2		Cat 1	Yes
500	16	2		Cat 1	Yes
600	16	2		Cat 1	Yes
700	16	2		Cat 1	Yes

(*) 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 10: 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.

TALIS Management Holding

Postfach 1280
D-89502 Heidenheim
Meeboldstraße 22
D-89522 Heidenheim

Telefon: +49 7321 320-0
Telefax: +49 7321 320-491

info@talis-group.com
www.talis-group.com



www.talis-group.com

TALIS is the undisputed Number One for water transport and water flow control. TALIS has the best solutions available in the fields of water and energy management as well as for industrial and communal applications. We have numerous products for comprehensive solutions for the whole water cycle – from hydrants, butterfly valves and knife gate valves through to needle valves. Our experience, innovative technology, global expertise and individual consultation processes form the basis for developing long-term solutions for the efficient treatment of the vitally important resource “water”.



TALIS Management Holding

Postfach 1280

D-89502 Heidenheim

Meeboldstrasse 22

D-89522 Heidenheim

PHONE +49 7321 320-0

FAX +49 7321 320-491

E-MAIL info@talis-group.com

INTERNET www.talis-group.com

 **TALIS**

Note: Information and specifications may be changed without notification at any time.
Copyright: No copying without express written permission of TALIS
TALIS is a Registered Trademark.