

## GATE VALVE GENERAL INFORMATION

It is a type of valve to be used for general purpose which consists of a long, flat or oval body, a disc inside it, a spindle and a spindle nut to operate the disc.

Gate valves are not used only for clean water but also can be used for sewage as long as materials of components are selected correctly.

Disc is drawn into the bonnet. It is an advantage that when valve is open, pipe line is fully clear without any obstacle; flow path is not interrupted. This advantage gives the possibility of "pigging" for cleaning of pipe line.

When valve is fully closed, disc sits on the seat surface completely. Bottom side of disc is narrower than top side. As a result of this feature, the contact between seat surfaces is interrupted and disc travels by sliding on body and bonnet guides while valve is opening. Seat surfaces are never in contact while valve is opening or closing. So, they are not worn or scratched due to friction; they are long lasting.

Gate valves, that have an operation system consists of spindle and nut, shall not be used for throttling purpose but can be used as isolation valve for on-off duty.

Gate valves are manufactured as rising spindle type or non-rising spindle type depending on usage area and selecting correct shaft material accordingly.

Installation Position, Valve should be installed as spindle in vertical position. For horizontal installation, valve should be equipped with guides and slippers.

### Common Accessories for All Type of Gate Valves,

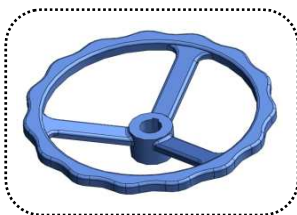
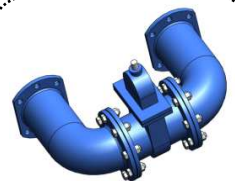
#### By-pass,

It is a "U" shaped equipment fixed on body, which connects outlet of valve to inlet from outside of main pipe line. There is a gate valve between two elbows.

In closed position of disc, by-pass valve is used to transfer the fluid from outlet side to inlet side. If chamber of pump is emptied, fluid can be transferred into the pump by opening by-pass valve.

It is difficult to open big diameter gate valves and valves under high differential pressure. Before opening main valve, by-pass valve opens; pressure difference on different faces of disc is balanced or decreased. It helps to open main valve with less torque requirement; valve opens easily without any damage on seats.

By-pass is applied for valves comply with EN558-1 S19 and S15 face-to-face standard.

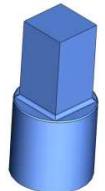


Hand wheel,

It is a wheel to open and close the valve manually.

Cap-Top,

It is an accessory allows using T-key to open and close valve.



Headstock, Product Code, HS

If valve is installed at first floor but operational equipments are at second floor, headstock and operational equipments are placed at second floor. Extension shafts and guide brackets are between valve and headstock. So, it is not needed to be next to valve to operate it.

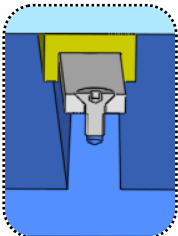


Chain wheel, If valve is installed at a high point, chain wheel is more practical to use than hand wheel. Chain is used to operate the valve.



Guides and Slippers,

They are used to achieve a smoother disc travel and longer valve life. Guides on body are made of stainless steel and slippers on disc are made of bronze. Disc travels on that guide-slipper system. For horizontally installed valves, that accessory is strongly recommended.



Jacking Screw,

It is located inside the valve, at the bottom of body. It is a mechanism used to move the disc upwards if there is a sticking problem. It is applied upon request.



Bevel Gearbox (1:1 Rated), Product Code, B

This is a bevel type gearbox with 1:1 ratio and 90 degrees angle between axes of input and output gears. It can be fitted on top of gearbox of any type of valve in place of hand-wheel. While fitting, four holes on connection flange are used. So, four different positions for operation are available.



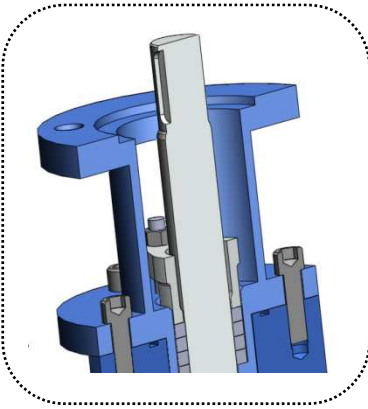
## NON RISING SPINDLE GATE VALVE with PACKING DESIGN

Threaded section of valve spindle is inside valve chamber.

When spindle is operated, spindle nut, which is located in the groove of disc, also travels on spindle. Disc is drawn into the bonnet and valve opens. To close the valve, direction of operation is changed.

Gate valve should not be used for sea water and sewage media that includes very aggressive chemicals.

Installation Position, Valve should be installed as spindle in vertical position. For horizontal installation, valve should be equipped with guides and slippers.

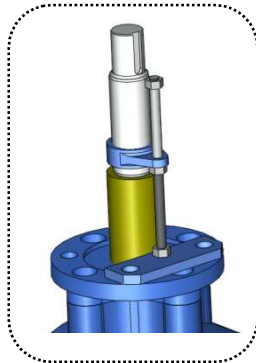


Non-asbestos packing or other special items are used for shaft sealing.

That design is applicable for all diameters and pressure ratings of gate valves.

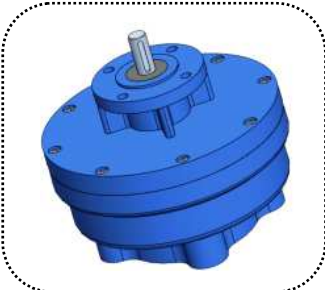


### Accessories of Non-Rising Spindle Gate Valve,



#### Mechanical Indicator,

It is mechanical equipment that shows position of disc of gate valve installed in pipe-line. It slides on a pin according to operation of spindle.

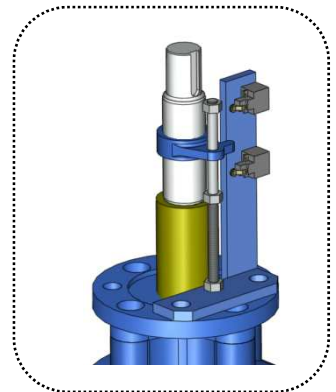


#### Planet Gearbox, Product Code, GGB-P,

It is used for operation of non-rising spindle gate valve.

#### Indicator with Switch,

It is the same mechanical indicator which additionally has limit switches fixed on. Signals, indicating fully open and fully closed positions of valve, are sent to panel at operation room.

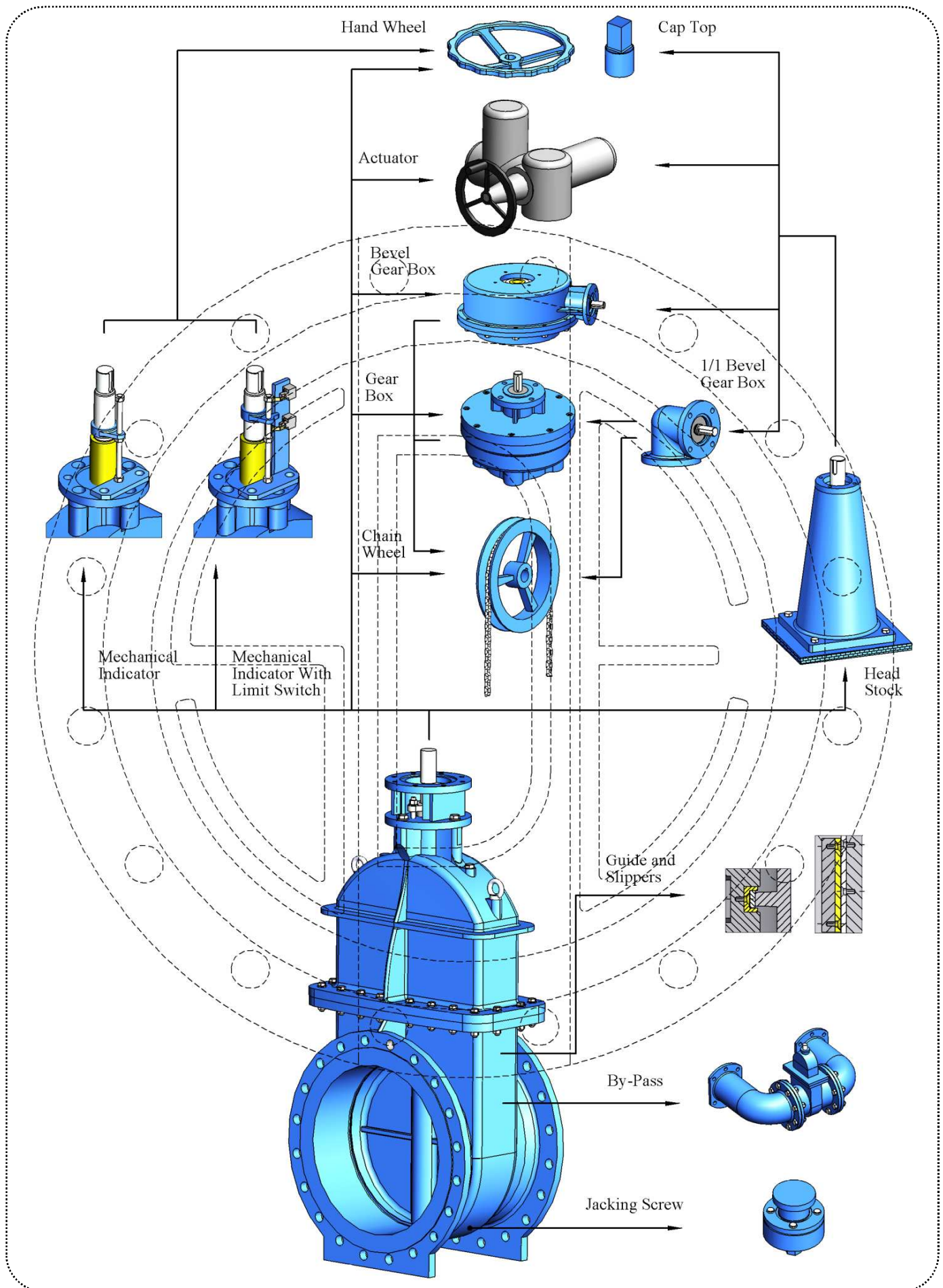


### Maintenance,

In case of a problem at top group sealing, more packing can be added or replaced totally even valve is installed in the pipe-line. To do this, disc is opened fully to prevent water pass through shaft hole.

If there is a gearbox mounted on valve, gears are lubricated. If valve is uninstalled, cleaning of valve is advised, only.

**S.D.E.**  
**ACCESSORIES OF**  
**NON RISING SPINDLE GATE VALVE with PACKING DESIGN**



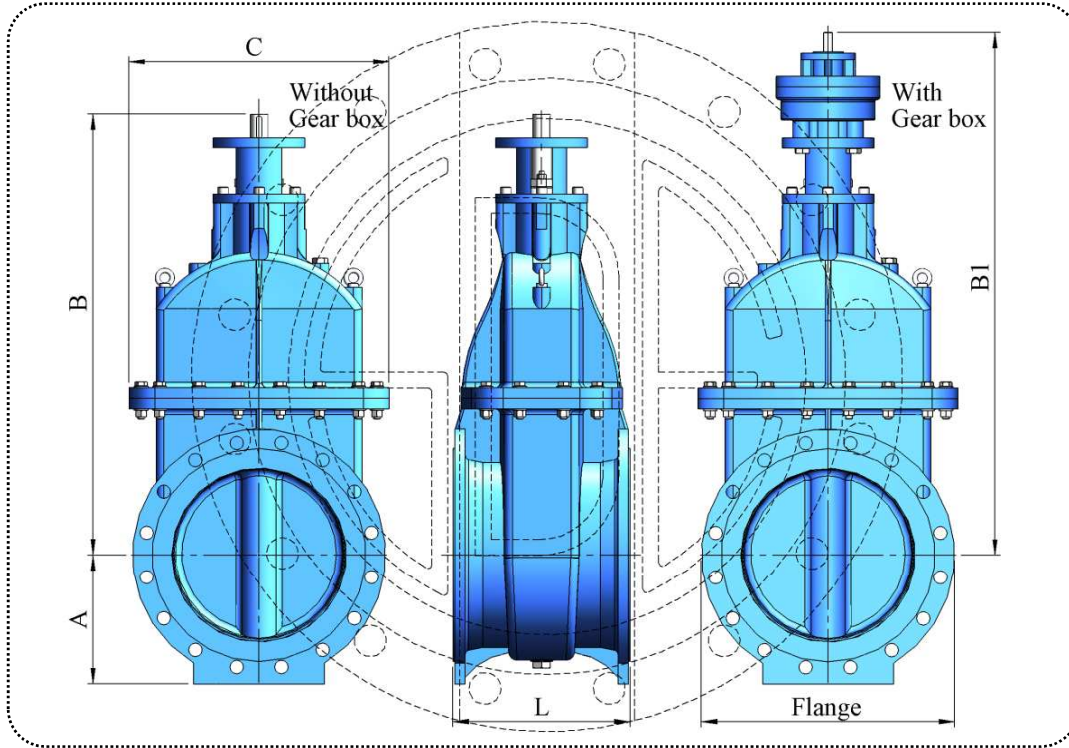


## GATE VALVE NON RISING SPINDLE with PACKING DESIGN PN 16

Body Length Standard : EN 558-1, S 3, By-Pass applicable.

Valve Standard : EN 1171

Maximum allowable working temperature for all types of our valves is 80 degrees Celcius.



### DIMENSIONS

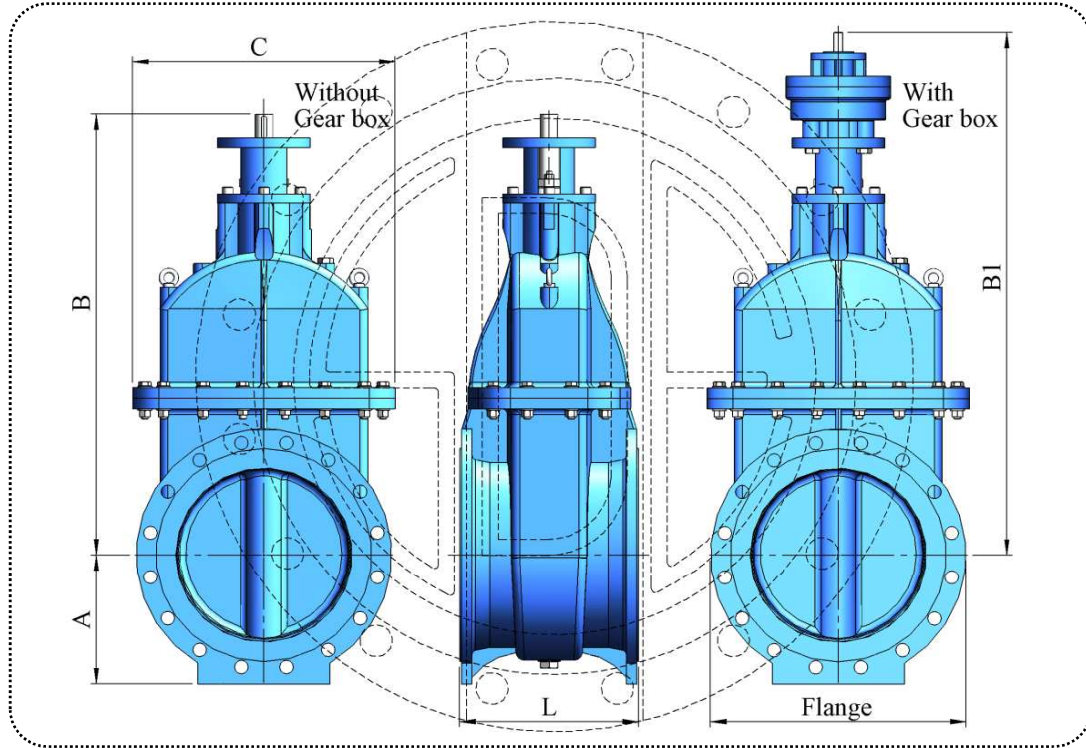
DN	A	B	B1	C	L	Kg			
						Bare Shaft	With Gear box		
							Ratio 1/4	Ratio 1/8	Ratio 1/16
300	235	780	930	471	356	263	298	298	307
350	265	920	1.120	535	381	331	384	384	397
400	295	1.010	1.210	599	406	410	463	463	477
450	325	1.120	1.340	663	432	492	572	572	592
500	363	1.218	1.438	744	457	599	679	679	699
550	394	1.339	1.589	811	483	774	854	854	874
600	425	1.430	1.680	877	508	918	1.040	1.040	1.070
650	443	1.508	1.758	915	560	1.108	1.230	1.230	1.260
700	460	1.585	1.835	952	610	1.251	1.373	1.373	1.403
750	490	1.695	1.965	1.017	635	1.487	1.608	1.608	1.639
800	518	1.783	2.053	1.075	660	1.738	1.924	1.924	1.970
900	568	1.953	2.223	1.182	711	2.153	2.338	2.338	2.385
1.000	633	2.138	2.408	1.321	811	2.702	2.888	2.888	2.934
1.050	658	2.253	2.553	1.375	811	3.283	3.468	3.468	3.515
1.100	683	2.338	2.638	1.428	811	3.763	4.048	4.048	4.119
1.200	748	2.523	2.823	1.568	838	4.288	4.573	4.573	4.644
1.300	798	2.693	2.993	1.675	1.120	6.191	6.476	6.476	6.547
1.400	848	2.893	3.223	1.782	1.120	7.857	8.296	8.296	8.406
1.500	915	3.080	3.410	1.926	1.200	9.717	10.156	10.156	10.266
1.600	970	3.255	3.585	2.044	1.200	11.345	11.784	11.784	11.894

## GATE VALVE NON RISING SPINDLE with PACKING DESIGN    PN 16

Body Length Standard : EN 558-1, S 19, By-Pass applicable.

Valve Standard : EN 1171

Maximum allowable working temperature for all types of our valves is 80 degrees Celcius.



### DIMENSIONS

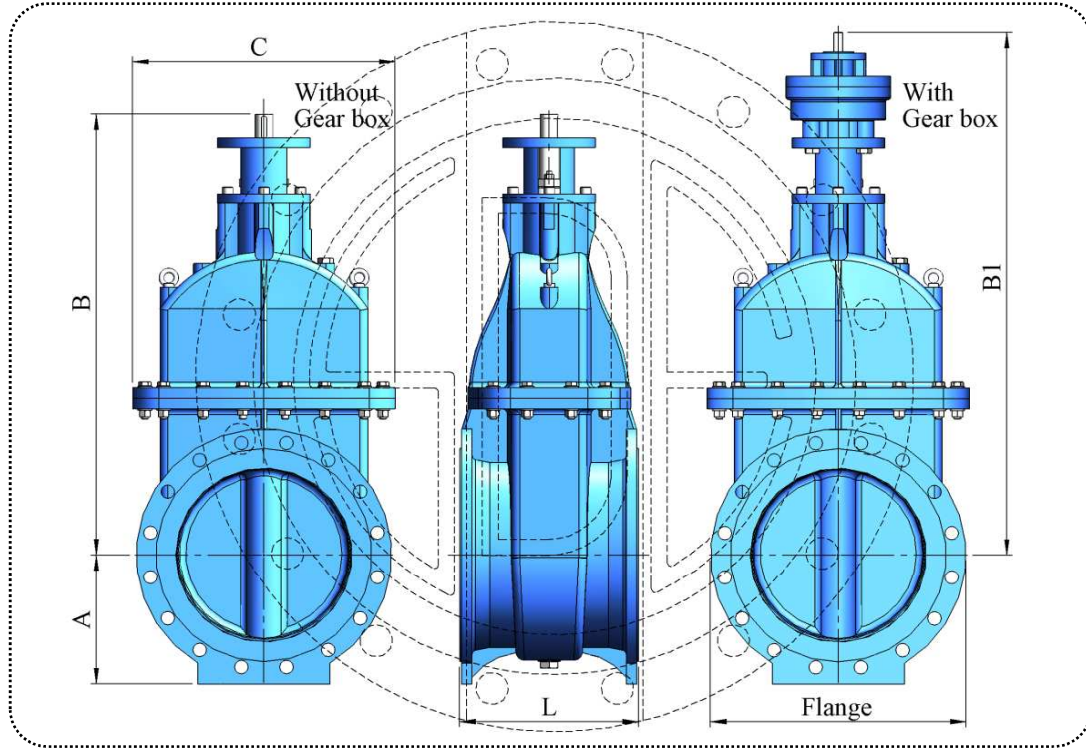
DN	A	B	B1	C	L	Kg			
						Bare Shaft	With Gear box		
							Ratio 1/4	Ratio 1/8	Ratio 1/16
300	235	780	930	471	502	320	356	356	365
350	265	920	1.120	535	572	402	455	455	468
400	295	1.010	1.210	599	610	508	561	561	575
450	325	1.120	1.340	663	660	615	695	695	715
500	363	1.218	1.438	744	711	748	829	829	849
550	394	1.339	1.589	811	750	965	1.046	1.046	1.066
600	425	1.430	1.680	877	787	1.140	1.262	1.262	1.292
650	443	1.508	1.758	915	800	1.323	1.445	1.445	1.475
700	460	1.585	1.835	952	810	1.447	1.568	1.568	1.599
750	490	1.695	1.965	1.017	810	1.684	1.805	1.805	1.836
800	518	1.783	2.053	1.075	810	1.935	2.121	2.121	2.167
900	568	1.953	2.223	1.182	838	2.353	2.539	2.539	2.585
1.000	633	2.138	2.408	1.321	1.000	3.026	3.212	3.212	3.258
1.050	658	2.253	2.553	1.375	1.050	3.713	3.898	3.898	3.945
1.100	683	2.338	2.638	1.428	1.100	4.299	4.584	4.584	4.655
1.200	748	2.523	2.823	1.568	1.200	5.044	5.329	5.329	5.400
1.300	798	2.693	2.993	1.675	1.300	6.711	6.996	6.996	7.067
1.400	848	2.893	3.223	1.782	1.400	8.815	9.254	9.254	9.364
1.500	915	3.080	3.410	1.926	1.500	10.844	11.283	11.283	11.393
1.600	970	3.255	3.585	2.044	1.600	12.958	13.397	13.397	13.507

## GATE VALVE NON RISING SPINDLE with PACKING DESIGN    PN 16

Body Length Standard : EN 558-1, S 15, By-Pass applicable.

Valve Standard : EN 1171

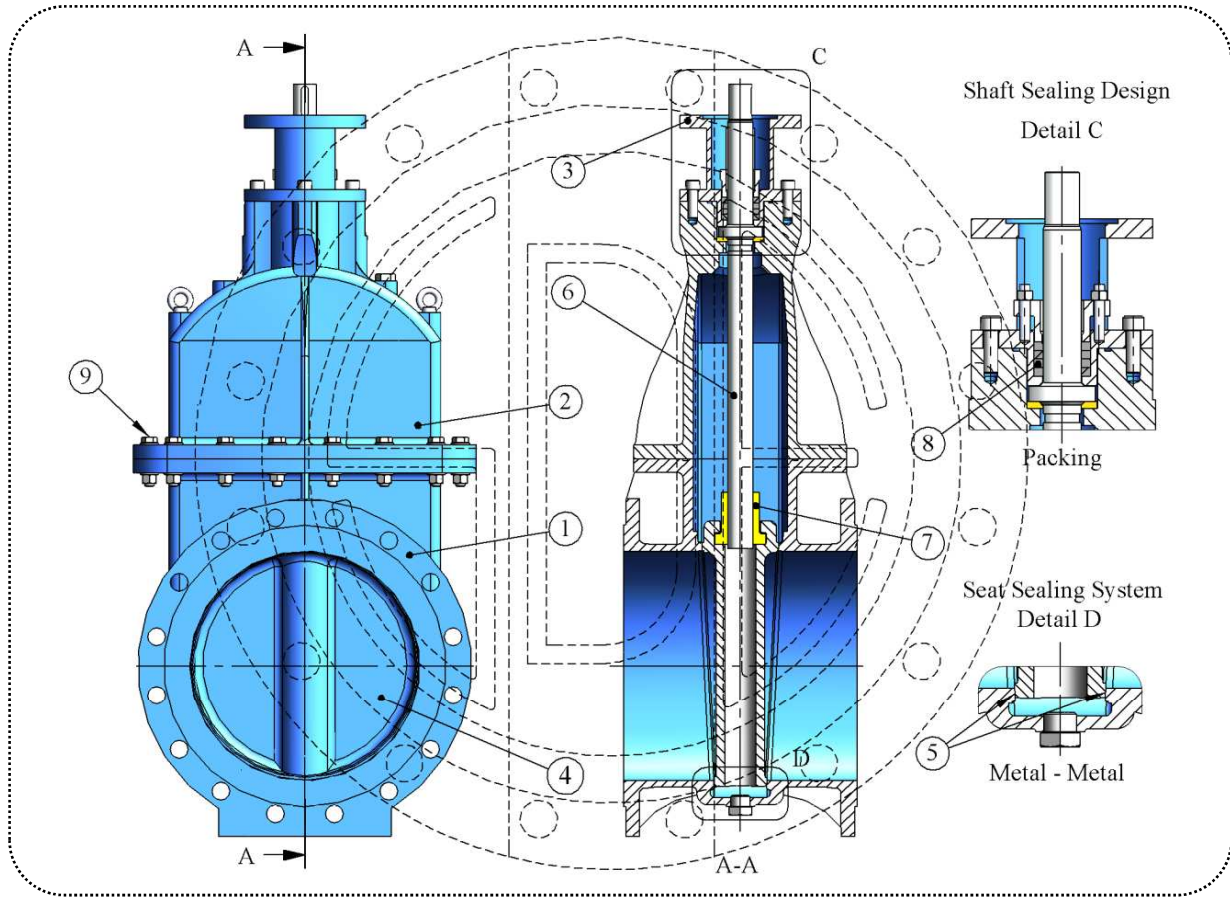
Maximum allowable working temperature for all types of our valves is 80 degrees Celcius.



### DIMENSIONS

DN	A	B	B1	C	L	Kg			
						Bare Shaft	With Gear box		
							Ratio 1/4	Ratio 1/8	Ratio 1/16
300	235	780	930	471	500	319	355	355	364
350	265	920	1.120	535	550	401	455	455	468
400	295	1.010	1.210	599	600	504	557	557	571
450	325	1.120	1.340	663	650	610	690	690	710
500	363	1.218	1.438	744	700	743	823	823	843
550	394	1.339	1.589	811	750	965	1.046	1.046	1.066
600	425	1.430	1.680	877	800	1.149	1.271	1.271	1.301
650	443	1.508	1.758	915	850	1.360	1.481	1.481	1.512
700	460	1.585	1.835	952	900	1.516	1.637	1.637	1.668
750	490	1.695	1.965	1.017	950	1.802	1.924	1.924	1.954
800	518	1.783	2.053	1.075	1.000	2.114	2.299	2.299	2.346
900	568	1.953	2.223	1.182	1.100	2.628	2.813	2.813	2.859
1.000	633	2.138	2.408	1.321	1.200	3.273	3.458	3.458	3.505
1.050	658	2.253	2.553	1.375	1.250	3.988	4.174	4.174	4.220
1.100	683	2.338	2.638	1.428	1.300	4.595	4.879	4.879	4.950
1.200	748	2.523	2.823	1.568	1.400	5.390	5.674	5.674	5.745
1.300	798	2.693	2.993	1.675	1.500	7.080	7.365	7.365	7.436
1.400	848	2.893	3.223	1.782	1.600	9.317	9.756	9.756	9.866
1.500	915	3.080	3.410	1.926	1.700	11.395	11.834	11.834	11.944
1.600	970	3.255	3.585	2.044	1.800	13.592	14.031	14.031	14.141

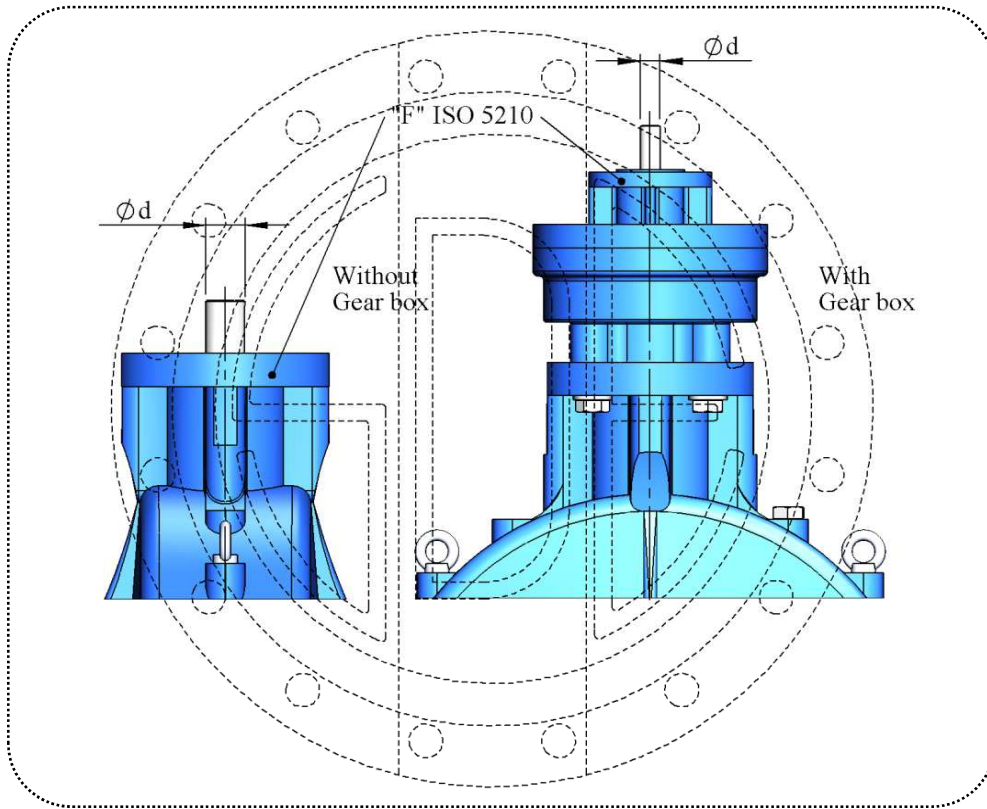
## GATE VALVE NON RISING SPINDLE with PACKING DESIGN



No	Item Name	Material	Description	EN Standard	Material No
1-2	Body - Bonnet	GGG 40	Ductile Iron	EN-GJS-450-15	0.7040
		GGG 50		EN-GJS-500-7	0.7050
		ST 37-2	Steel Construction	EN 10025	1.0037
3	Top Thrust Cover	GGG 50	Ductile Iron	EN-GJS-500-7	0.7050
4	Disc	GGG 40	Ductile Iron	EN-GJS-450-15	0.7040
		GGG 50		EN-GJS-500-7	0.7050
		304	Stainless Steel Casting	G - X6CrNi 18-9	1.4308
		316		G - X6CrNiMo 18-10	1.4408
		CC 331G-GS	Aluminium Bronze	CuAl10Fe2-C	2.0940.01
5	Seats	CuAl8	Aluminium Bronze Welding	14640 S Cu 6100	2.0921
6	Spindle	420	Stainless Steel	X20Cr13	1.4021
		304		X5CrNi 18-10	1.4301
		316		X5CrNiMo17-12-2	1.4401
		431		X17CrNi16-2	1.4057
7	Travelling Nut	Rg 10	Bronze	-	2.1086.01
8	Shaft Sealing	Packing	Non Asbestos	-	-
9	Bolts Nuts	Galvanized	Steel	-	-
		A 2 - A 4	Stainless Steel	-	-
Coating		WRAS approved fusion bonded epoxy, 300 microns dft as standard.			
Maximum allowable working temperature for all types of our valves is 80 degrees Celcius.					



OPERATION  
GATE VALVE NON RISING TYPE  
PN 16



DN	Bare Shaft, Ratio 1/1				Gear Box, Ratio 1/4				Gear Box, Ratio 1/8				Gear Box, Ratio 1/16			
	F	d	Torque Nm	Number of turn	F	d	Torque Nm	Number of turn	F	d	Torque Nm	Number of turn	F	d	Torque Nm	Number of turn
300	14	30	250	27	10	20	68	106	10	20	34	213	10	20	17	426
350	16	40	381	31	10	20	104	124	10	20	52	247	10	20	26	494
400	16	40	497	35	10	20	135	141	10	20	68	282	10	20	34	563
450	16	40	628	39	14	30	171	158	14	30	85	316	10	20	43	632
500	16	40	859	44	14	30	233	175	14	30	117	350	10	20	58	700
550	16	40	1.143	48	14	30	310	192	14	30	155	385	10	20	78	769
600	25	50	1.358	52	14	30	369	209	14	30	185	419	10	20	92	838
650	25	50	1.735	57	14	30	472	227	14	30	236	453	10	20	118	906
700	25	50	2.008	61	14	30	546	244	14	30	273	488	10	20	136	975
750	25	50	2.499	65	14	30	679	261	14	30	340	522	10	20	170	1.044
800	30	60	2.845	70	16	40	773	278	14	30	386	556	14	30	193	1.112
900	30	60	3.876	78	16	40	1.053	312	14	30	527	625	14	30	263	1.250
1.000	30	60	4.772	87	16	40	1.297	347	14	30	648	694	14	30	324	1.387
1.050	30	60	6.050	91	16	40	1.644	364	14	30	822	728	14	30	411	1.456
1.100	35	70	6.659	95	25	50	1.810	381	16	40	905	762	14	30	452	1.524
1.200	35	70	7.928	104	25	50	2.154	415	16	40	1.077	831	14	30	539	1.662
1.300	35	70	10.520	112	25	50	2.859	450	16	40	1.429	900	14	30	715	1.799
1.400	40	80	12.141	121	30	60	3.299	484	25	50	1.650	968	16	40	825	1.936
1.500	40	80	15.565	130	30	60	4.230	518	25	50	2.115	1.037	16	40	1.057	2.074
1.600	40	80	17.803	138	30	60	4.838	553	25	50	2.419	1.106	16	40	1.209	2.211



PLANET TYPE GEARBOX  
TO BE USED FOR NON-RISING SPINDLE GATE VALVES



It is a type of gearbox which consists of a body, a cover and gears.

Valves can be operated by means of a hand-wheel which is mounted at the top of spindle.

But, direct operation is not possible for valves that require high torque values. In that case, a suitable size gearbox is mounted at the top of valve and hand-wheel is mounted on gearbox pinion.

Number of turns is increased but smaller forces are capable to operate the valve.

Other advantage of gearbox is that if actuator operation is required for a valve, smaller size and cheaper actuator can be used.

Properties of Gearbox input force required to operate the valve can easily be applied by one person.

To achieve output force, suitable gear ratio is selected.

Input and output flanges and shafts are manufactured in accordance with ISO 5210 F standards.

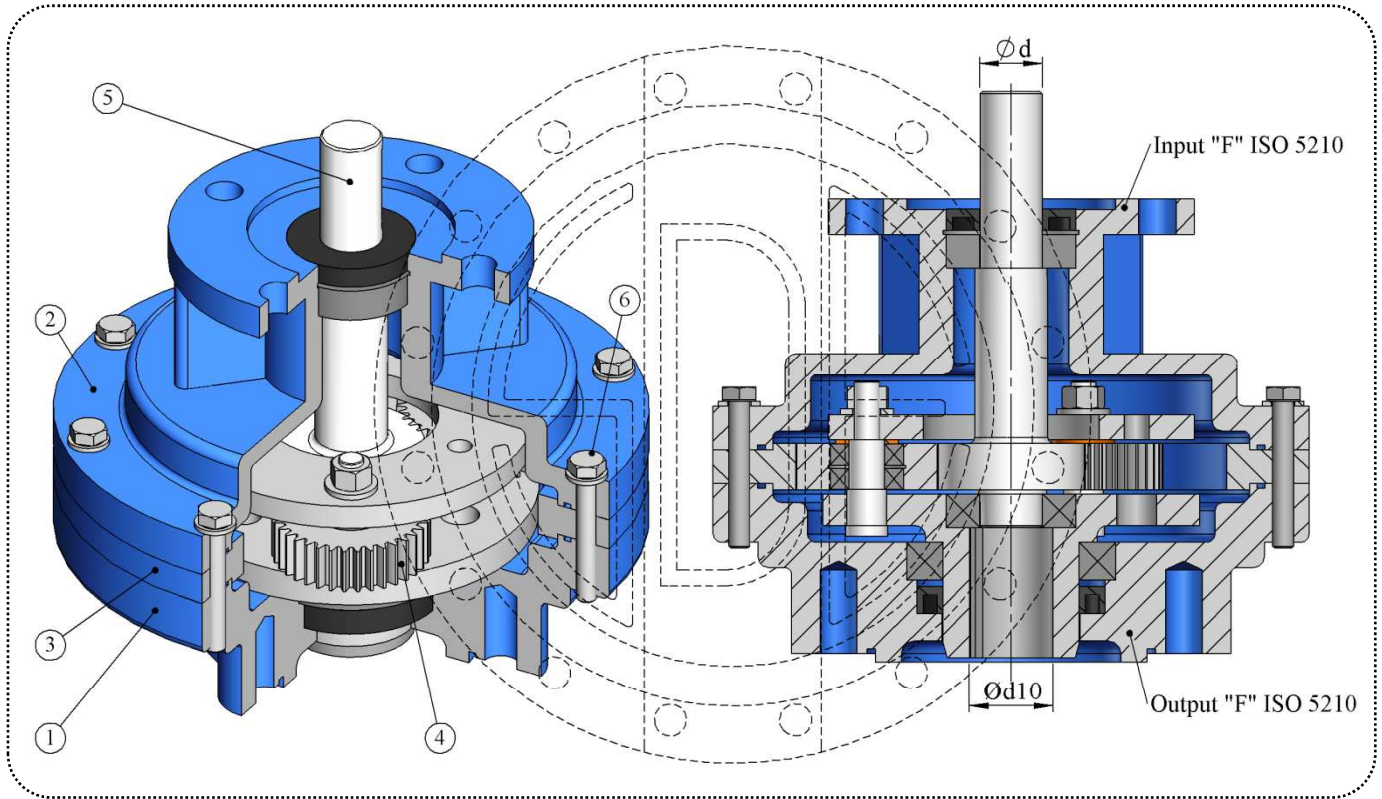
Thus, gearbox can be mounted to another valve with same size. Or gearbox can be removed and another brand can be mounted instead.

If required, a suitable size actuator can be fitted or existing one can be changed with another brand.

Maintenance,

No maintenance is needed except lubricating gears.

# GEARBOX, PLANET TYPE FOR NON RISING type GATE VALE



## PARTS

No	Item Name	Material	Description	EN Standard	Material No
1-2	Body - Cover	GGG 50	Ductlie Iron	EN-GJS-500-7	0.7050
3	Gear	1050	Steel	100083-3	1.1191
4	Gears	1050	Steel	100083-3	1.1191
5	Pinion Gear	420	Stainless Steel	X20Cr13	1.4021
		304		X5CrNi 18-10	1.4301
6	Bolts	Galvanized	Steel	-	-
		A 2, A 4	Stainless Steel	-	-
Coating		WRAS approved fusion bonded epoxy, 300 microns dft as standard.			
Maximum allowable working temperature for all types of our valves is 80 degrees Celcius.					

## TECHNICAL INFORMATION

No	Input Ratio 1/4				Input Ratio 1/8				Input Ratio 1/16				Output		
	F	d	Torque Nm	Kg	F	d	Torque Nm	Kg	F	d	Torque Nm	Kg	F	d	Torque Nm
1	10	20	68	24	10	20	34	24	10	20	17	30	10	25	250
2	10	20	136	36	10	20	68	36	10	20	34	45	12	30	500
3	10	20	272	53	10	20	136	53	10	20	68	67	14	40	1.000
4	14	30	543	80	14	30	272	80	10	20	136	100	16	40	2.000
5	14	30	1.359	121	14	30	679	121	10	20	340	152	25	50	5.000
6	16	40	2.717	185	14	30	1.359	185	14	30	679	232	30	60	10.000
7	25	50	5.435	285	16	40	2.717	285	14	30	1.359	356	35	70	20.000
8	30	60	10.870	439	25	50	5.435	439	16	40	2.717	549	40	80	40.000

**BEVEL GEARBOX  
TO BE USED FOR RISING SPINDLE GATE VALVES**



It is a type of gearbox which consists of a body, a cover and gears.

Valves can be operated by means of a hand-wheel which is mounted at the top of spindle.

But, direct operation is not possible for valves that require high torque values. In that case, a suitable size gearbox is mounted at the top of valve and hand-wheel is mounted on gearbox pinion.

Number of turns is increased but smaller forces are capable to operate the valve.

This is a bevel type gearbox where conical gears are used. The angle between these gears is 90 degrees. While fitting, according to size of gearbox, four or eight holes on connection flange are used. So, four or eight different positions for operation are available.

Other advantage of gearbox is that if actuator operation is required for a valve, smaller size and cheaper actuator can be used.

Properties of Gearbox, Input force required to operate the valve can easily be applied by one person.

To achieve output force, suitable gear ratio is selected.

Input and output flanges and shafts are manufactured in accordance with ISO 5210 F standards.

Thus, gearbox can be mounted to another valve with same size or gearbox can be removed and another brand can be mounted instead.

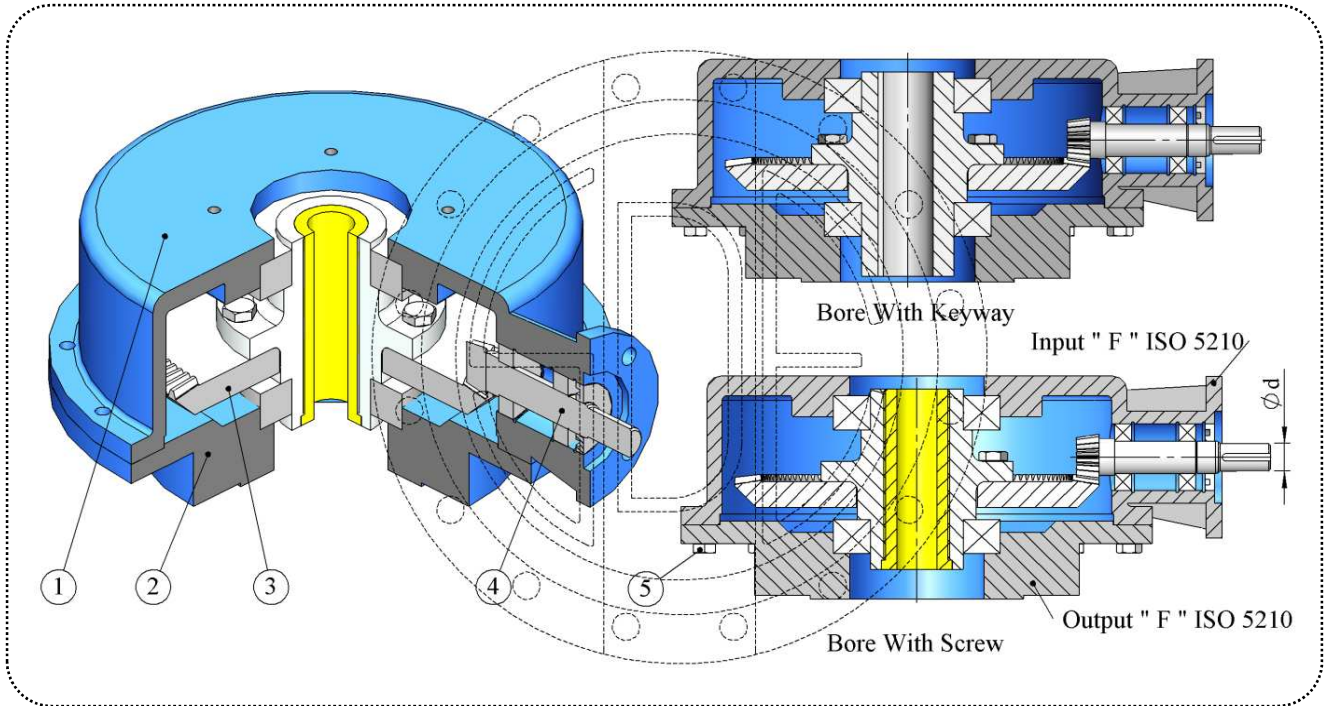
If required, a suitable size actuator can be fitted or existing one can be changed with another brand.

Maintenance,

No maintenance is needed except lubricating gears.



## BEVEL GEARBOX FOR RISING TYPE GATE VALVE



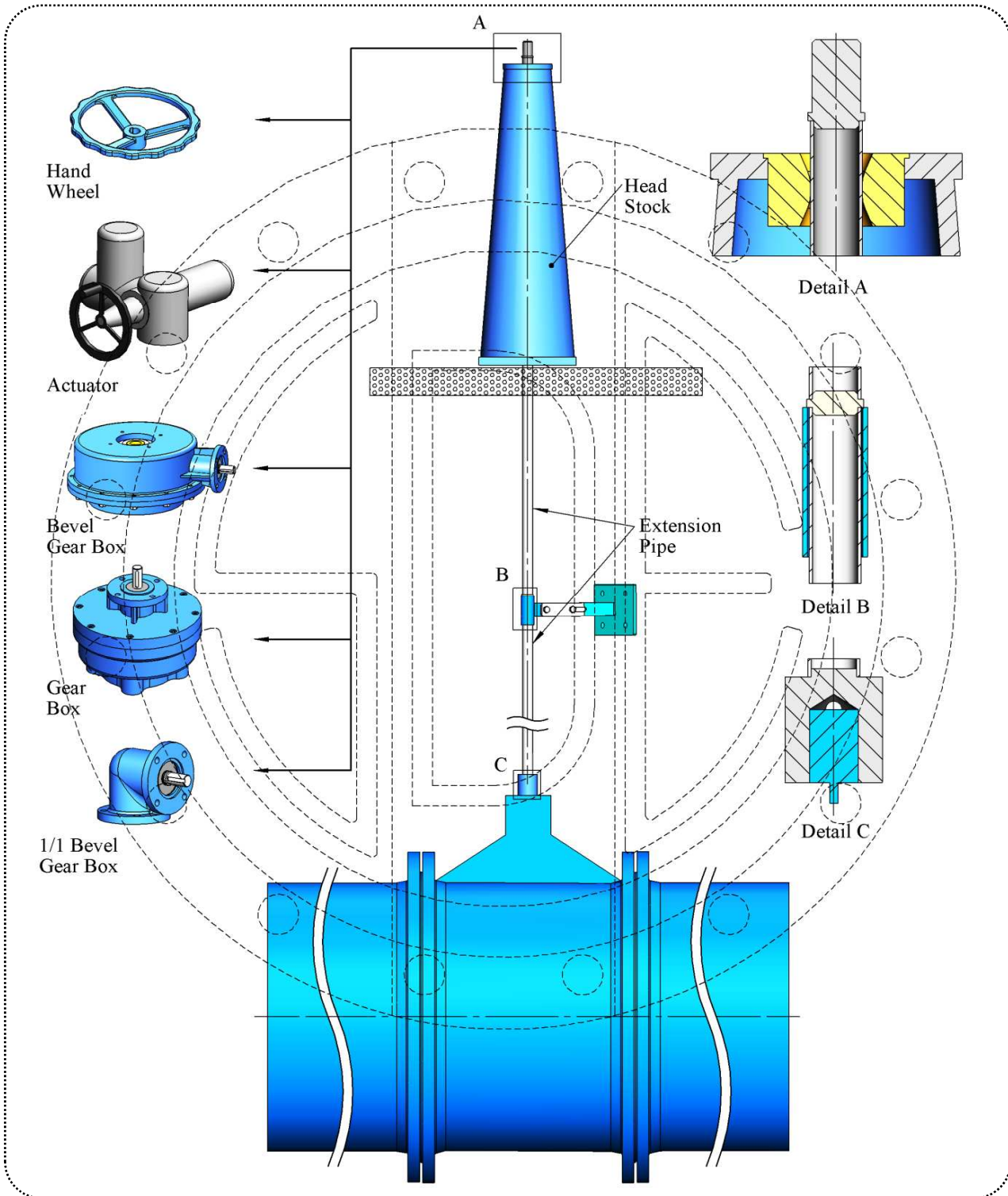
### PARTS

No	Item Name	Material	Description	EN Standard	Material No
1-2	Body - Cover	GGG 50	Ductile Iron	EN-GJS-500-7	0.7050
3	Gear	1050	Steel	100083-3	1.1191
4	Pinion Gear	420	Stainless Steel	X20Cr13	1.4021
		304		X5CrNi 18-10	1.4301
5	Bolts	Galvanized	Steel	-	-
		A 2, A 4	Stainless Steel	-	-
Coating		WRAS approved fusion bonded epoxy. 300 microns dft as standard.			
Maximum allowable working temperature for all types of our valves is 80 degrees Celcius.					

### TECHNICAL INFORMATION

GGB-B No	Input 1/4				Input 1/8				Input 1/16				Output		
	F	d	Torque	Kg	F	d	Torque	Kg	F	d	Torque	Kg	F	d	Torque
			Nm				Nm				Nm				Nm
1	10	20	68	34	10	20	34	34	10	20	17	43	10	25	250
2	10	20	136	59	10	20	68	59	10	20	34	73	12	30	500
3	10	20	272	102	10	20	136	102	10	20	68	128	14	40	1.000
4	14	30	543	181	14	30	272	181	10	20	136	226	16	40	2.000
5	14	30	1.359	324	14	30	679	324	10	20	340	405	25	50	5.000
6	16	40	2.717	588	14	30	1.359	588	14	30	679	735	30	60	10.000
7	25	50	5.435	1.079	16	40	2.717	1.079	14	30	1.359	1.349	35	70	20.000
8	30	60	10.870	2.003	25	50	5.435	2.003	16	40	2.717	2.504	40	80	40.000

## HEADSTOCK



Headstock consists of a cast body, extension spindles and guide brackets holding the spindles.

According to usage area of valve, it can be installed at first floor but operational equipments can be at second floor.

Valve can be in a dirty or humid environment and operational equipments may not be requested to be at the same place.

For such conditions, headstock accessory can be used for any kind of valve.

Valve is located where it has to be, but operational equipments are located at a clean area.

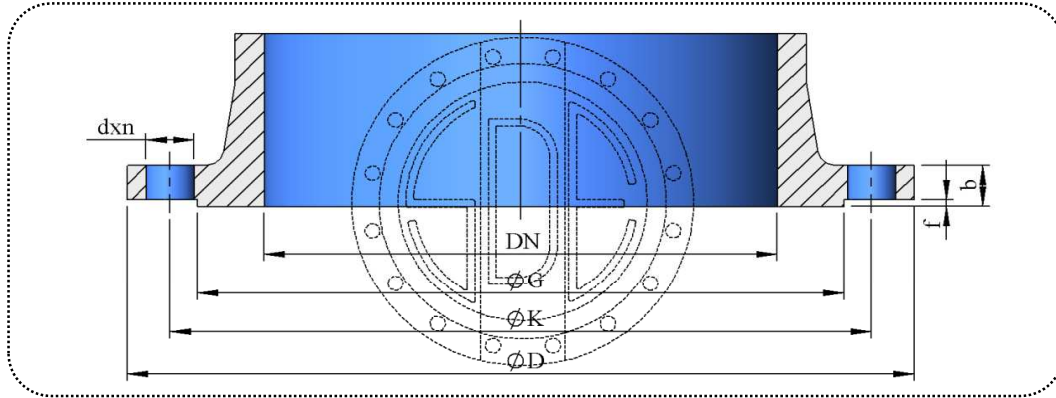
Headstock is fixed on floor by screws. Extension spindles are between valve and headstock.

If space between valve and headstock is more than 3 meters, guide brackets are used to hold spindle and eliminate oscillation.

It is advised to use one guide bracket for each 3 meters.

Upon request, extension spindles can be made of plain carbon steel or stainless steel.

## FLANGE DIMENSIONS



Nominal Dia	Outside Dia	Raised Face		Flange Holes			Flange Thickness	Outside Dia	Raised Face		Flange Holes			Flange Thickness
		Dia	Height	Circle Dia.	Dia	Num ber			Dia	Height	Circle Dia.	Dia	Num ber	
DN	D	G	f	K	d	n	b	D	G	f	K	d	n	b
PN 10								PN 16						
100	220	158	3	180	19	8	19	220	158	3	180	19	8	19
125	250	188	3	210	19	8	19	250	188	3	210	19	8	19
150	285	212	3	240	23	8	19	285	212	3	240	23	8	19
200	340	268	3	295	23	8	20	340	268	3	295	23	12	20
250	395	320	3	350	23	12	22	405	320	3	355	28	12	22
300	445	370	4	400	23	12	25	460	378	4	410	28	12	25
350	505	430	4	460	23	16	25	520	438	4	470	28	16	27
400	565	482	4	515	28	16	25	580	490	4	525	31	16	28
450	615	532	4	565	28	20	26	640	550	4	585	31	20	30
500	670	585	4	620	28	20	27	715	610	4	650	34	20	32
600	780	685	5	725	31	20	30	840	725	5	770	37	20	36
700	895	800	5	840	31	24	33	910	795	5	840	37	24	40
800	1.015	905	5	950	34	24	35	1.025	900	5	950	41	24	43
900	1.115	1.005	5	1.050	34	28	38	1.125	1.000	5	1.050	41	28	47
1.000	1.230	1.110	5	1.160	37	28	40	1.255	1.115	5	1.170	44	28	50
1.200	1.455	1.330	5	1.380	41	32	45	1.485	1.330	5	1.390	50	32	57
1.400	1.675	1.535	5	1.590	44	36	46	1.685	1.530	5	1.590	50	36	59
1.500	1.785	1.640	5	1.700	44	36	48	1.820	1.640	5	1.710	57	36	63
1.600	1.915	1.760	5	1.820	50	40	49	1.930	1.750	5	1.820	57	40	65
1.800	2.115	1.950	5	2.020	50	44	52	2.130	1.950	5	2.020	57	44	69
2.000	2.325	2.150	5	2.230	50	48	55	2.345	2.150	5	2.230	62	48	73
2.200	2.550	2.370	5	2.440	57	52	59	2.555	2.360	5	2.440	62	52	80
PN 25								PN 40						
100	235	162	3	190	23	8	19	235	162	3	190	23	8	19
125	270	188	3	220	28	8	19	270	188	3	220	28	8	24
150	300	218	3	250	28	8	20	300	218	3	250	28	8	26
200	360	278	3	310	28	12	22	375	285	3	320	31	12	30
250	425	335	3	370	31	12	25	450	345	3	385	34	12	35
300	485	395	4	430	31	16	28	515	410	4	450	34	16	40
350	555	450	4	490	34	16	30	580	465	4	510	37	16	44
400	620	505	4	550	37	16	32	660	535	4	585	41	16	48
450	670	548	4	600	37	20	34	685	560	4	610	41	20	50
500	730	615	4	660	37	20	37	755	615	4	670	44	20	52
600	845	720	5	770	41	20	42	890	735	5	795	50	20	58
700	960	820	5	875	44	24	47	995	840	5	900	50	24	63
800	1.085	930	5	990	50	24	51	1.140	960	5	1.030	57	24	68
900	1.185	1.030	5	1.090	50	28	56	1.250	1.070	5	1.140	57	28	73
1.000	1.320	1.140	5	1.210	57	28	60	1.360	1.180	5	1.250	57	28	80
1.200	1.530	1.360	5	1.420	57	32	69	1.575	1.385	5	1.460	62	32	88
1.400	1.755	1.570	5	1.640	62	36	74	1.795	1.600	5	1.680	62	36	98
1.500	1.865	1.680	5	1.750	62	40	75	1.910	1.700	5	1.790	70	40	102
1.600	1.975	1.790	5	1.860	62	40	81	2.025	1.815	5	1.900	70	40	108
1.800	2.195	2.000	5	2.070	70	44	88							
2.000	2.425	2.230	5	2.300	70	48	95							