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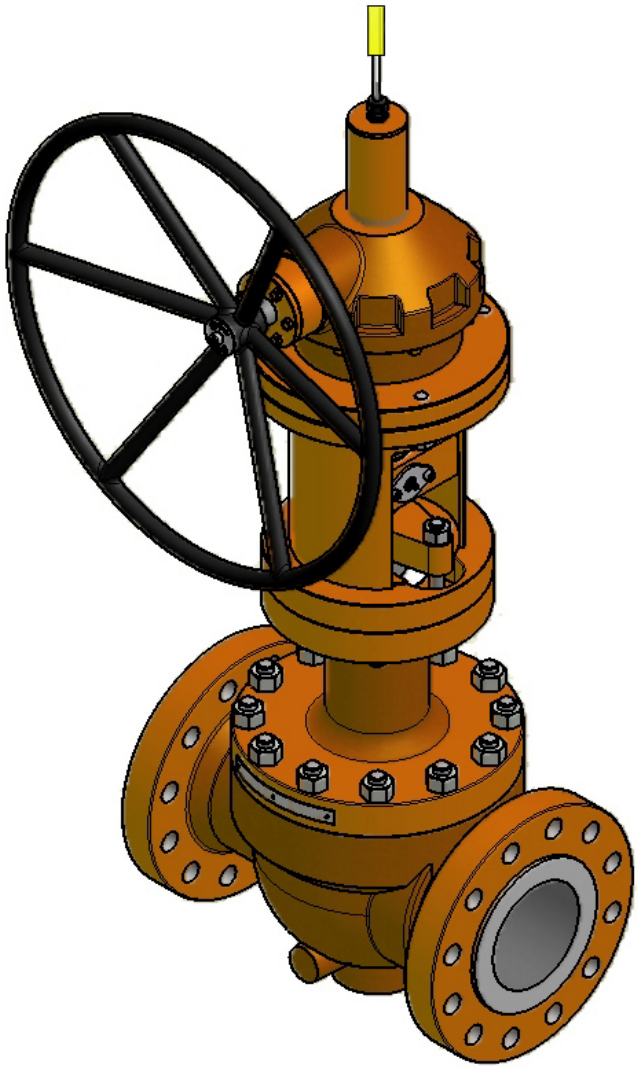
CATALOGUE

NON CONTACT RISING STEM BALL VALVE



INDEX

INTRODUCTION OF OUR COMPANY

Nether Seal B.V. has been founded in 2005.

The Company is privately owned by the Management who has more than 20 years of experience in the designing and manufacturing Non Contact Rising Stem Ball Valves and Dual Expanding Double Block & Bleed Plug Valves.

The employees of Nether Seal are highly skilled and well introduced in working with the International Engineering & Procurement Companies and End Users in the Gas and Oil Industry

The Nether Seal production facilities and offices are located in the Netherlands. Generally, all main raw materials such as valve castings and forged parts are obtained from countries within the European Union.

Nether Seal Engineering Department is always equipped with the latest software packages.
Amongst others INVENTOR® and ANSYS ® programs are used to perform calculations and design for machining and production of the valves to the latest technologies and International Standard such API, ANSI, ISO etc.

To control the order processing and evaluate performances towards Customers and Sub Suppliers Nether Seal has integrated a professional Enterprise Resource Planning.
This ERP is operational for all business management functions including Order Processing, Inventory, Manufacturing, Financials and many more.

The Nether Seal Company Policy is to supply the best quality valves and satisfy our Customers beyond their demands.

INTRODUCTION OF OUR COMPANY

The employees of Nether Seal have over 20 years experience in designing and manufacturing Rising Stem Ball Valves and Double Block and Bleed Plug Valves.

Hanno Groos, Hans Kurver and
Jan van der Plas founded Nether Seal.

In September 2006
Nether Seal achieved ISO and PED certification. Lloyd's Business Development Manager hands over Certificates to Nether Seal QA/QC Manager Tazelaar.

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RISING STEM BALL VALVES

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DOUBLE BLOCK AND BLEED PLUG VALVES

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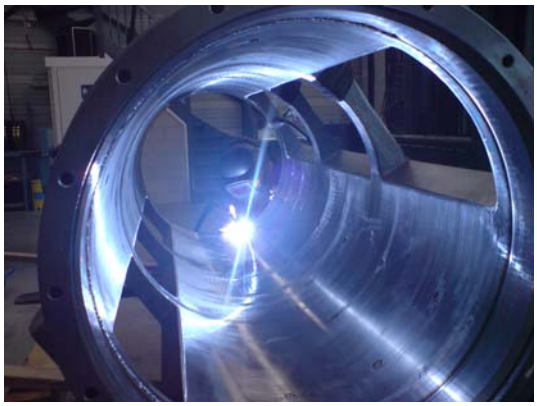
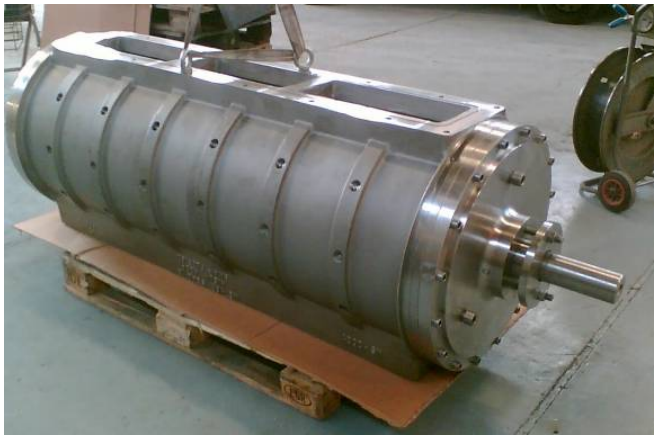
ROTARY FEEDER VALVES





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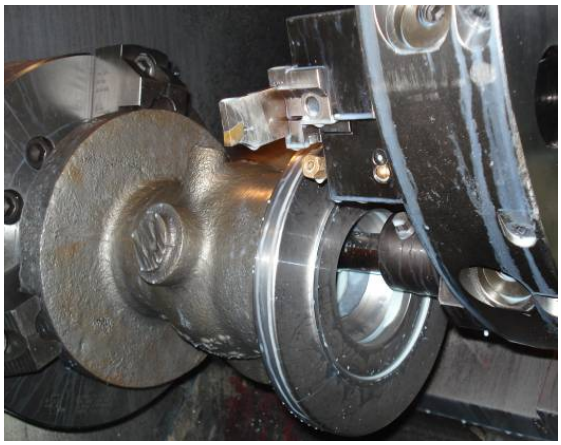
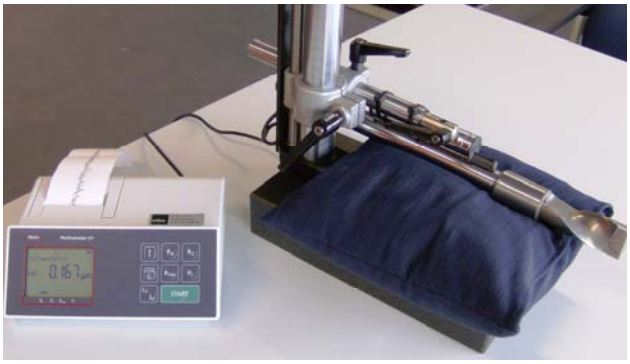
PRODUCTION AND INSPECTION





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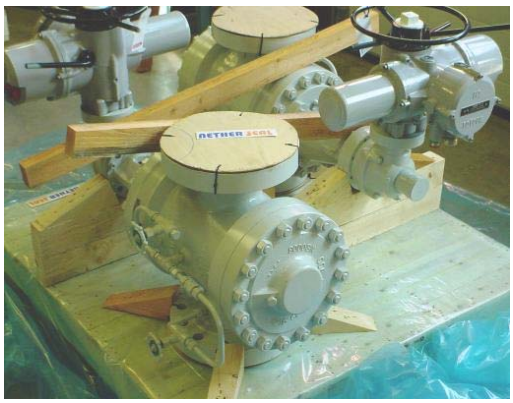
PRESSURE TESTING

PACKING AND TRANSPORT



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CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

Nether Seal B.V.
Nieuwkoop, The Netherlands

has been approved by Lloyd's Register Quality Assurance to the following Quality Management System Standards:

ISO 9001 : 2008

The Quality Management System is applicable to:

Design and manufacturing of rising stem ball, double block and bleed, axial flow, gate, globe, check, needle, ball, plug, bottom, sampling, rotary star, safety and special valves.

Approval Certificate No:
RQA661201

Original Approval	:	1 September 2006
Current Certificate	:	1 September 2009
Certificate Expiry	:	31 August 2012

Issued by: Lloyd's Register Nederland B.V. for and on behalf of Lloyd's Register Quality Assurance Limited

MGMT. SYS.
RvA C 010

This document is subject to the provision on the reverse
Weena-Zuid 170, 3012 NC Rotterdam, The Netherlands
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.

Lloyd's Register

EC CERTIFICATE OF CONFORMITY

In accordance with the requirements of the Pressure Equipment Directive 97/23/EC and The Pressure Equipment Regulations 1999, UK Statutory Instrument 1999 No. 2001 and 2002 No. 1267

This is to certify that the Quality Management System of:

Nether Seal B.V.
Nieuwkoop, The Netherlands

has been assessed against the requirements of Annex III, **Module H** of the Pressure Equipment Directive 97/23/EC, and Schedule 4, Module H of The Pressure Equipment Regulations 1999 and conforms to the requirements for the products shown below:

Rising stem ball, double block and bleed, axial flow, gate, globe, check, needle, ball, plug, bottom, sampling, rotary star, safety and special valves, manufactured from casted carbon steel, low alloy steel or austenitic stainless steel and forged carbon steel, low alloy steel or austenitic stainless steel.

Approval is subject to the continued maintenance of the quality system in accordance with the requirements of the above Directive and Regulations.

Authorisation is hereby given to use the LRV Notified Body Identification Number in accordance with the requirements of the specified Directive and Regulations in relation to the products as identified above.

Certificate No:	0038/PED/RQA/661202
Original Approval:	1 September 2006
Current Certificate:	1 September 2009
Certificate Expiry:	31 August 2012

LRV Notified Body Number 0038

P. Fontijn on behalf of Lloyd's Register Verification

Lloyd's Register Verification Limited, 71 Fenchurch Street London EC3M 4BS UK

Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register Group'. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

A5138

NON CONTACT RISING STEM BALL VALVES

The Nether Seal Non Contact Rising Stem Ball Valves have been designed to pass the Fire Safe tests by independent inspection agencies according to API 6FA and British Standard 6755 part 2 successfully.

Nether Seal Non Contact Rising Stem Ball Valves are available with hand wheel / gearbox operator as well as electric, pneumatic or hydraulic actuators.

Advantages of the Nether Seal design are:

- Customized selection of corrosion and wear resistant Materials.

- Single Seat design.

- Friction free closing and opening, extended lifetime.

- Self cleaning closure members due to high velocity flow during opening and closing.

- In-line inspection and maintenance possible due to top-entry design.

- Linear movement of stem, no rotation.

- Non lubricated seal.

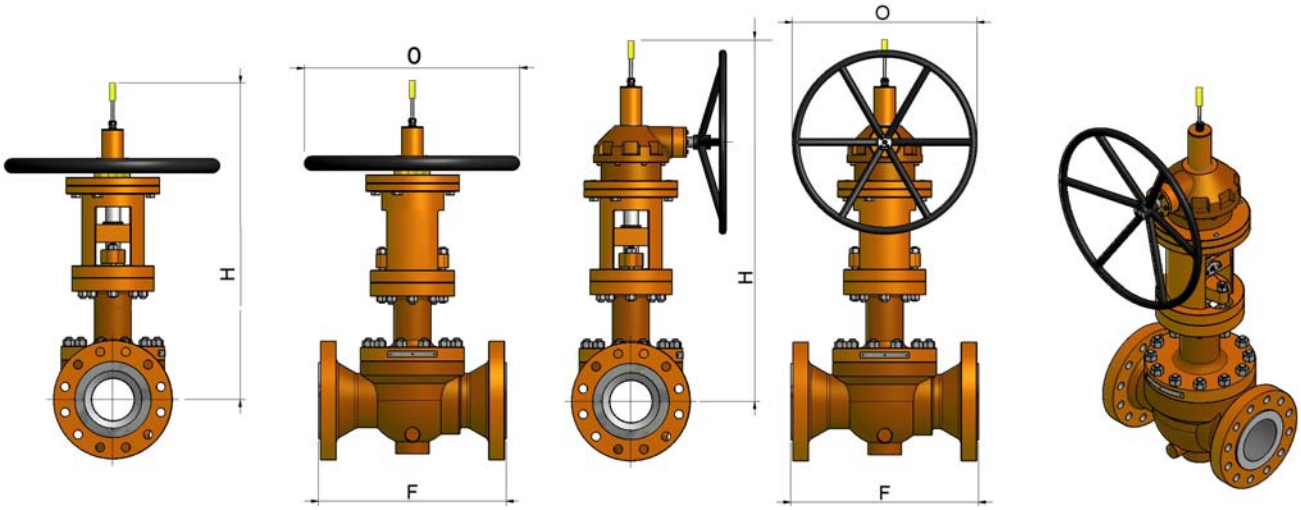
- Stem packing is adjustable while valve is in service no special tools are needed.

- Back seat is available in all valves, renewal of stem packing under pressure is possible.

APPLICATIONS
NON CONTACT RISING STEM BALL VALVES

- Molecular Sieve Frequent Switching service
- De-Hydration of Gas and Re-Generation service
- Produced water service
- Sand-Slurry service
- Hot Oil service
- Steam service
- Hydrocarbons Wet gas service
- Fiscal Gas Metering
- Emergency Blow Down service
- Emergency Shut Down service
- High temperature service
- Lethal H2S (Bellow Seal) service
- High temperature service (+600 degrees C)
- Low temperature service (-196 degrees C)

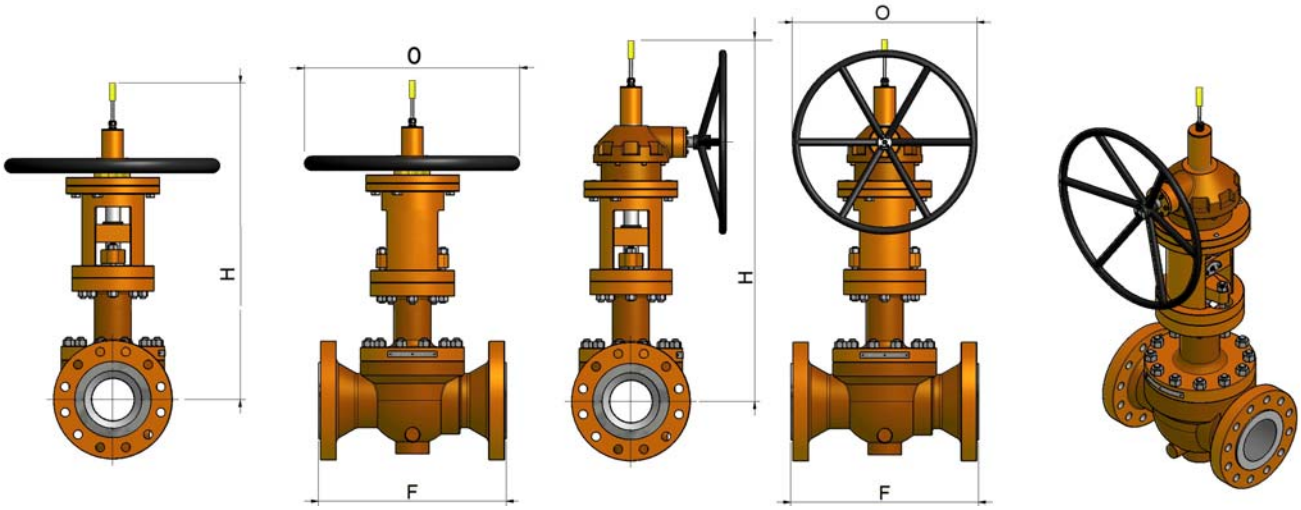
DIMENSIONAL DATA
ANSI Class 150 lbs
Reduced Port



Size	F	H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]	[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF							
2 x 1½	178	305	300	38	Handwheel	40	150	R2R15C150H
3 x 2	203	345	300	51	Handwheel	65	220	R3R2C150H
4 x 3	229	420	300	76	Handwheel	75	570	R4R3C150H
6 x 4	394	495	450	102	Handwheel	120	760	R6R4C150H
8 x 6	457	630	450	152	Gear-box	200	2045	R8R6C150G
10 x 8	533	770	650	204	Gear-box	315	4540	R10R8C150G
12 x 10	762*	900	650	254	Gear-box	710	7500	R12R10C150G
14 x 12	826*	1030	850	305	Gear-box	1150	13310	R14R12C150G
16 x 12	902*	1030	850	305	Gear-box	1260	11500	R16R12C150G
18 x 16	914*	1325	850	387	Gear-box	1910	21110	R18R16C150G
20 x 16	991*	1325	850	387	Gear-box	2200	17100	R20R16C150G
24 x 20	1170*	1570	850	489	Gear-box	3600	27000	R24R20C150G

NOTE:
- Dimensions are for information only. Certified dimensional drawings available on request.
* Dimension according Nether Seal standard.

DIMENSIONAL DATA
ANSI Class 300 lbs
Reduced Port



Size	F	H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]	[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF							
2 x 1½	216	350	300	38	Handwheel	45	160	R2R15C300H
3 x 2	282	405	300	51	Handwheel	70	240	R3R2C300H
4 x 3	305	500	300	76	Handwheel	85	620	R4R3C300H
6 x 4	403	590	300	102	Gear-box	200	760	R6R4C300G
8 x 6	502	855	450	152	Gear-box	265	1650	R8R6C300G
10 x 8	568	1030	450	204	Gear-box	350	4700	R10R8C300G
12 x 10	762*	1190	450	254	Gear-box	760	7600	R12R10C300G
14 x 12	826*	1355	850	305	Gear-box	1150	13310	R14R12C300G
16 x 12	902*	1355	850	305	Gear-box	1300	10200	R16R12C300G
18 x 16	914*	1605	850	387	Gear-box	1840	21200	R18R16C300G
20 x 16	991	1605	850	387	Gear-box	2000	15200	R20R16C300G
24 x 20	1143	1915	850	489	Gear-box	4500	25650	R24R20C300G

NOTE:
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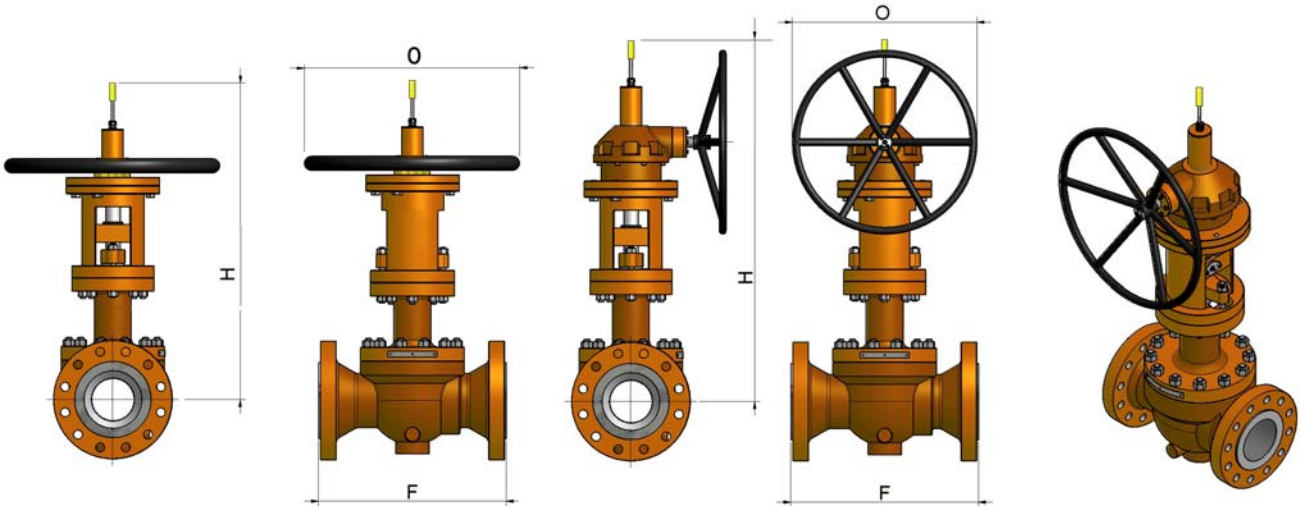
* Dimension according Nether Seal standard.

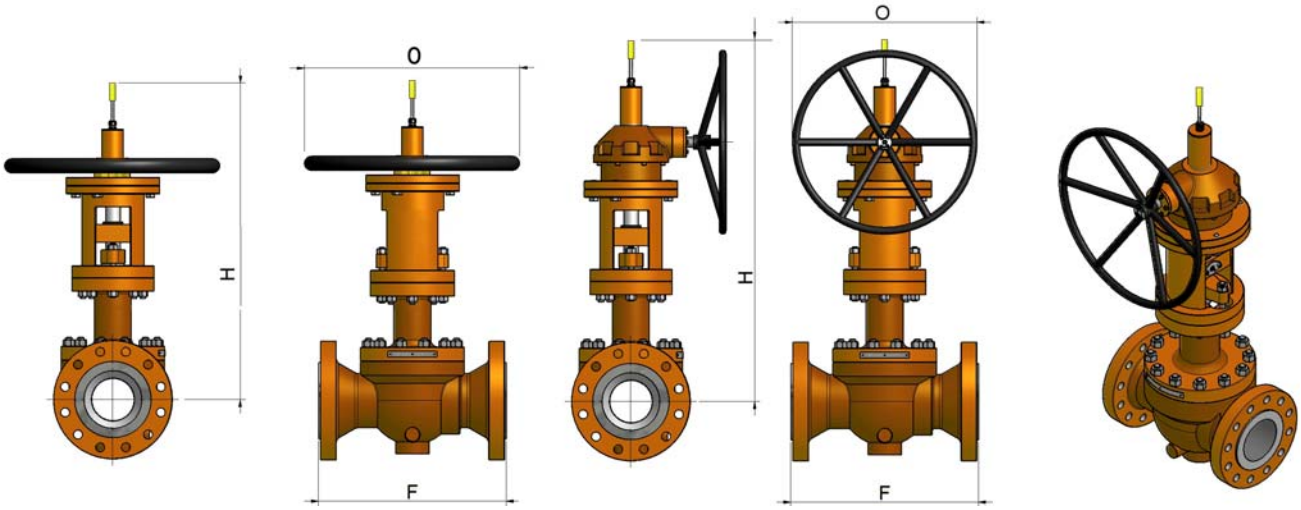
DIMENSIONAL DATA
ANSI Class 600 lbs
Reduced Port



Size	F		H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]		[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF	RTJ							
2 x 1½	292	295	395	300	38	Handwheel	60	130	R2R15C600H
3 x 2	356	359	455	300	51	Gear-box	85	260	R3R2C600G
4 x 3	432	435	570	300	76	Gear-box	120	650	R4R3C600G
6 x 4	559	562	680	450	102	Gear-box	180	960	R6R4C600G
8 x 6	660	663	980	650	152	Gear-box	300	2010	R8R6C600G
10 x 8	787	790	1185	850	203	Gear-box	520	4040	R10R8C600G
12 x 10	838	841	1370	850	254	Gear-box	935	7310	R12R10C600G
14 x 12	889	892	1560	850	305	Gear-box	1550	13230	R14R12C600G
16 x 12	991	994	1560	850	305	Gear-box	1720	10100	R16R12C600G
18 x 16	1092	1095	1940	850	387	Gear-box	2000	23100	R18R16C600G
20 x 16	1194	1200	1940	850	387	Gear-box	2280	16480	R20R16C600G
24 x 20	1397	1407	2295	850	489	Gear-box	5800	27000	R24R20C600G

NOTE:
- Dimensions are for information only. Certified dimensional drawings available on request.
* Dimension according Nether Seal standard.

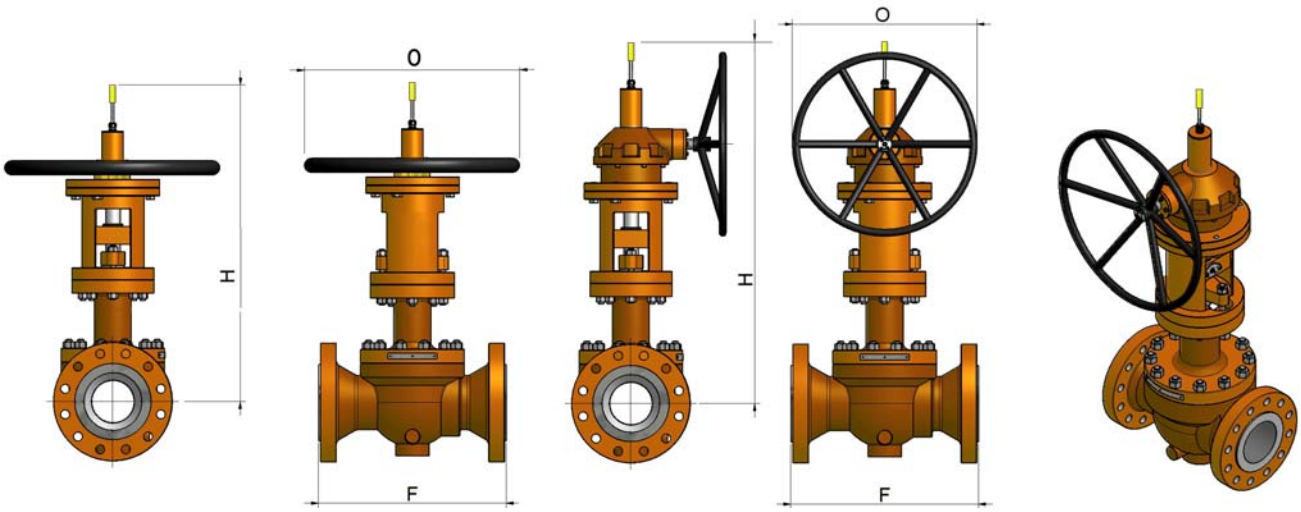
DIMENSIONAL DATA
ANSI Class 900 lbs
Reduced Port



Size	F		H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]		[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF	RTJ							
2 x 1½	368	371	425	450	38	Handwheel	90	120	R2R15C900H
3 x 2	381	385	495	450	51	Gear-box	140	190	R3R2C900G
4 x 3	457	460	620	450	76	Gear-box	150	515	R4R3C900G
6 x 4	610	613	750	450	102	Gear-box	230	950	R6R4C900G
8 x 6	737	740	1070	650	152	Gear-box	500	3000	R8R6C900G
10 x 8	838	841	1300	850	204	Gear-box	780	3955	R10R8C900G
12 x 10	965	968	1490	850	254	Gear-box	1105	6620	R12R10C900G
14 x 12	1029	1038	1725	850	305	Gear-box	1730	12075	R14R12C900G
16 x 12	1130	1140	1725	850	305	Gear-box	1880	8535	R16R12C900G
18 x 14	1219	1232	2010	850	375	Gear-box	3450	19900	R18R14C900G
20 x 16	1321	1334	2010	850	375	Gear-box	4500	11860	R20R16C900G

NOTE:
- Dimensions are for information only. Certified dimensional drawings available on request.
* Dimension according Nether Seal standard.

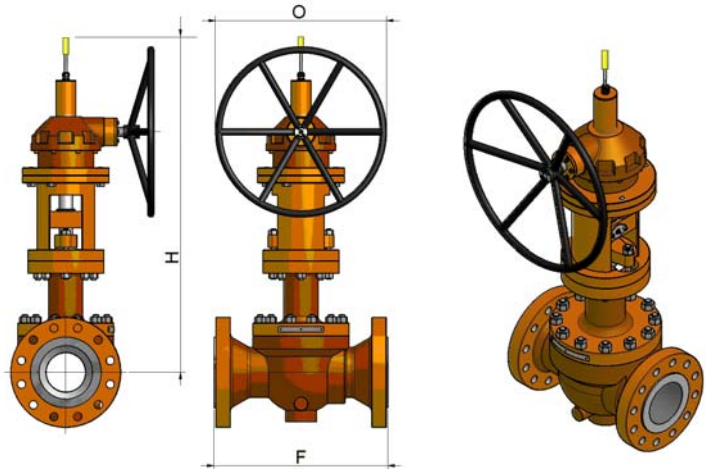
DIMENSIONAL DATA
ANSI Class 1500 lbs
Reduced Port



Size	F		H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]		[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF	RTJ							
2 x 1½	368	371	475	650	38	Handwheel	90	115	R2R15C1500H
3 x 2	470	473	555	450	51	Gear-box	160	200	R3R2C1500G
4 x 3	546	549	790	450	76	Gear-box	180	505	R4R3C1500G
6 x 4	705	711	935	450	102	Gear-box	330	945	R6R4C1500G
8 x 6	832	841	1170	850	146	Gear-box	990	2045	R8R6C1500G
10 x 8	991	1000	1420	850	194	Gear-box	1950	4000	R10R8C1500G
12 x 10	1130	1146	1655	850	242	Gear-box	2450	6290	R12R10C1500G
14 x 12	1257	1276	1885	850	289	Gear-box	3600	11475	R14R12C1500G
16 x 12	1384	1407	1885	850	289	Gear-box	4400	9200	R16R12C1500G

NOTE:
- Dimensions are for information only. Certified dimensional drawings available on request.
* Dimension according Nether Seal standard.

DIMENSIONAL DATA
ANSI Class 2500 lbs
Reduced Port



Size	F		H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]		[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF	RTJ							
2 x 1½	451	454	620	300	38	Gear-box	200	110	R2R15C2500G
3 x 2	578	584	670	300	45	Gear-box	215	175	R3R2C2500G
4 x 3	673	683	800	450	64	Gear-box	300	420	R4R3C2500G
6 x 4	914	927	965	450	89	Gear-box	510	600	R6R4C2500G
8 x 6	1022	1038	1250	850	134	Gear-box	1190	1590	R8R6C2500G
10 x 8	1270	1292	1530	850	181	Gear-box	2900	3575	R10R8C2500G
12 x 10	1422	1445	1785	850	225	Gear-box	4100	5980	R12R10C2500G

NOTE:
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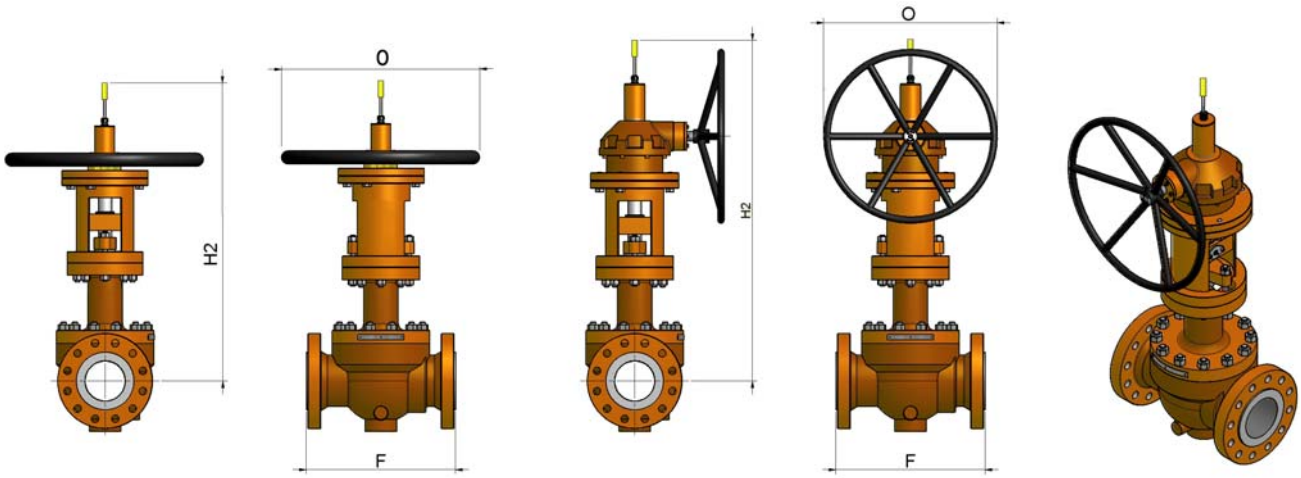
* Dimension according Nether Seal standard.

DIMENSIONAL DATA
ANSI Class 150 lbs
Full Port



Size	F	H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]	[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF							
1	216*	265	300	25	Handwheel	40	60	R1FC150H
1½	242*	305	300	38	Handwheel	45	140	R15FC150H
2	178	345	300	51	Handwheel	80	450	R2FC150H
3	203	420	300	76	Gear-box	85	1170	R3FC150G
4	305*	495	300	102	Gear-box	110	2070	R4FC150G
6	404*	630	450	152	Gear-box	180	4860	R6FC150G
8	457	770	450	204	Gear-box	250	9000	R8FC150G
10	674*	900	650	254	Gear-box	650	16020	R10FC150G
12	762*	1120	450	305	Gear-box	940	23460	R12FC150G
14	826*	1200	650	337	Gear-box	1160	28800	R14FC150G
16	902*	1325	850	387	Gear-box	1810	39600	R16FC150G
18	1093*	1445	850	438	Gear-box	2700	52200	R18FC150G
20	1149*	1615	850	489	Gear-box	3500	67500	R20FC150G

NOTE:
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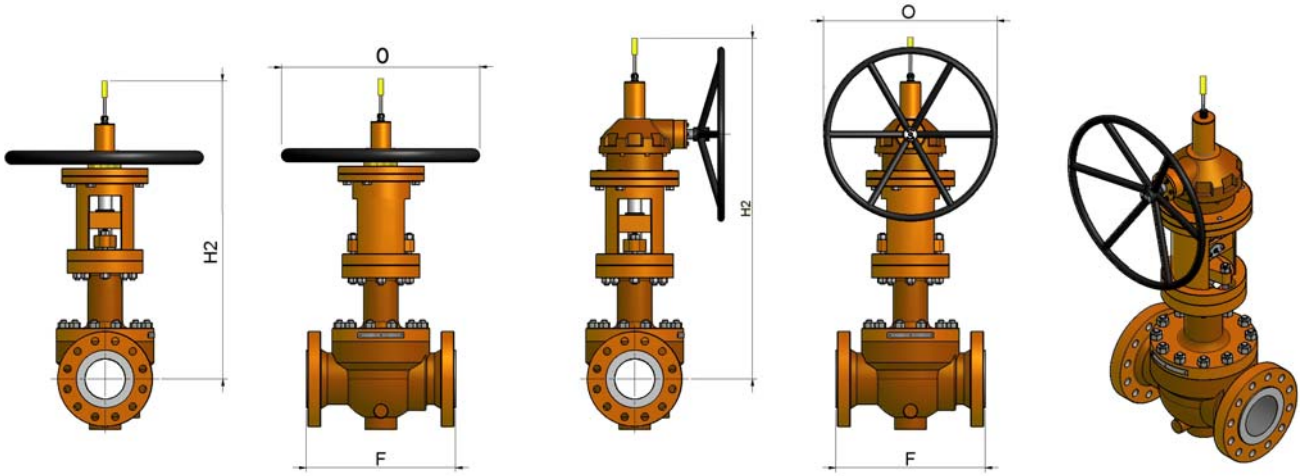
* Dimension according Nether Seal standard.

DIMENSIONAL DATA
ANSI Class 300 lbs
Full Port



Size	F	H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]	[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF							
1	216*	297	300	25	Handwheel	40	60	R1FC300H
1½	242*	350	300	38	Handwheel	45	140	R15FC300H
2	216	401	300	51	Handwheel	100	425	R2FC300H
3	282	496	300	76	Gear-box	105	990	R3FC300G
4	305	590	300	102	Gear-box	130	2100	R4FC300G
6	403	854	450	152	Gear-box	200	4860	R6FC300G
8	502	1028	450	204	Gear-box	300	9000	R8FC300G
10	673*	1190	650	254	Gear-box	580	15390	R10FC300G
12	762*	1351	850	305	Gear-box	1050	22500	R12FC300G
14	826*	1451	850	337	Gear-box	1300	27900	R14FC300G
16	902*	1604	850	387	Gear-box	2000	42000	R16FC300G
18	914*	1759	850	438	Gear-box	3300	50400	R18FC300G
20	991	1911	850	489	Gear-box	4550	64800	R20FC300G

NOTE:
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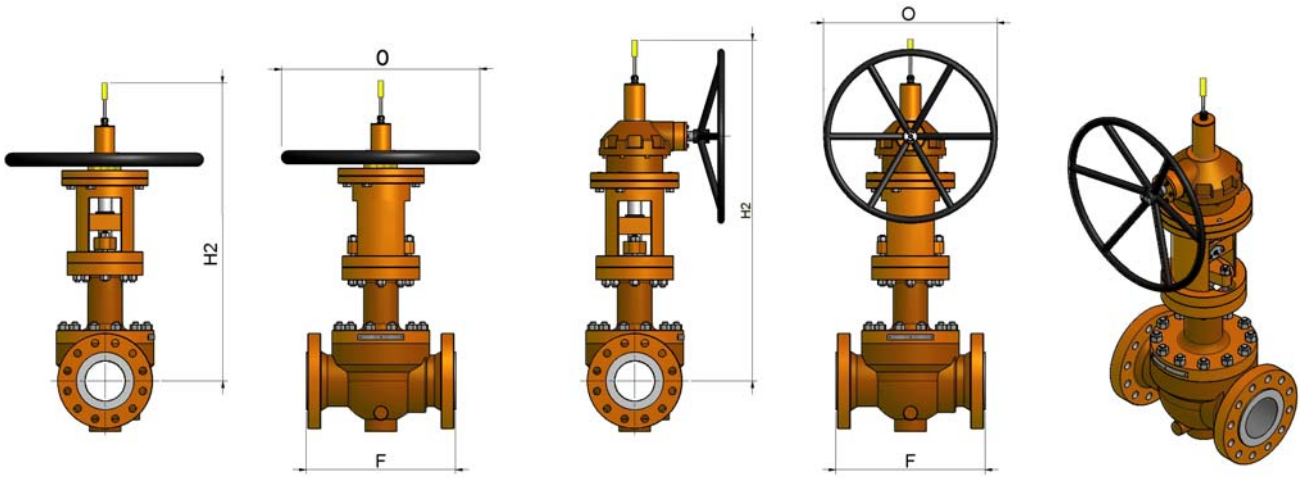
* Dimension according Nether Seal standard.

DIMENSIONAL DATA
ANSI Class 600 lbs
Full Port



Size	F		H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]		[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF	RTJ							
1	216	216	330	300	25	Handwheel	40	60	R1FC600H
1½	242	242	394	300	38	Handwheel	45	140	R15FC600H
2	292	295	456	300	51	Handwheel	100	310	R2FC600H
3	356	359	569	450	76	Gear-box	120	900	R3FC600G
4	432	435	682	450	102	Gear-box	200	1620	R4FC600G
6	559	562	979	650	152	Gear-box	360	4360	R6FC600G
8	660	663	1186	850	204	Gear-box	500	9500	R8FC600G
10	787	790	1379	850	254	Gear-box	840	12100	R10FC600G
12	838	841	1571	850	305	Gear-box	1410	18200	R12FC600G
14	889	893	1689	850	337	Gear-box	1850	31500	R14FC600G
16	991	994	1871	850	387	Gear-box	2600	42400	R16FC600G
18	1092	1095	2053	850	438	Gear-box	7150	45900	R18FC600G
20	1194	1201	2233	850	489	Gear-box	8000	59400	R20FC600G

NOTE:
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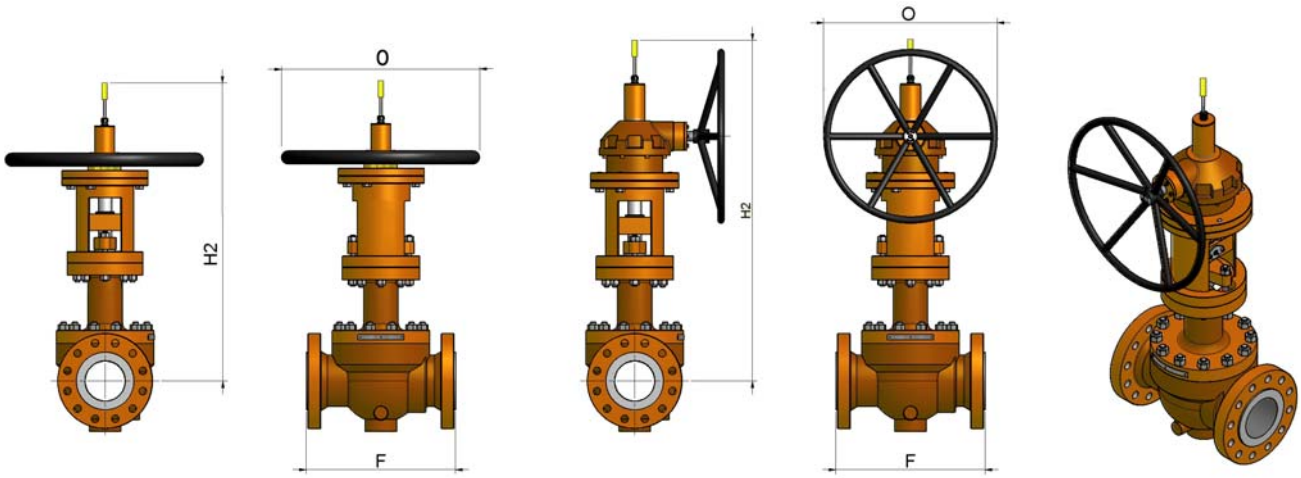
* Dimension according Nether Seal standard.

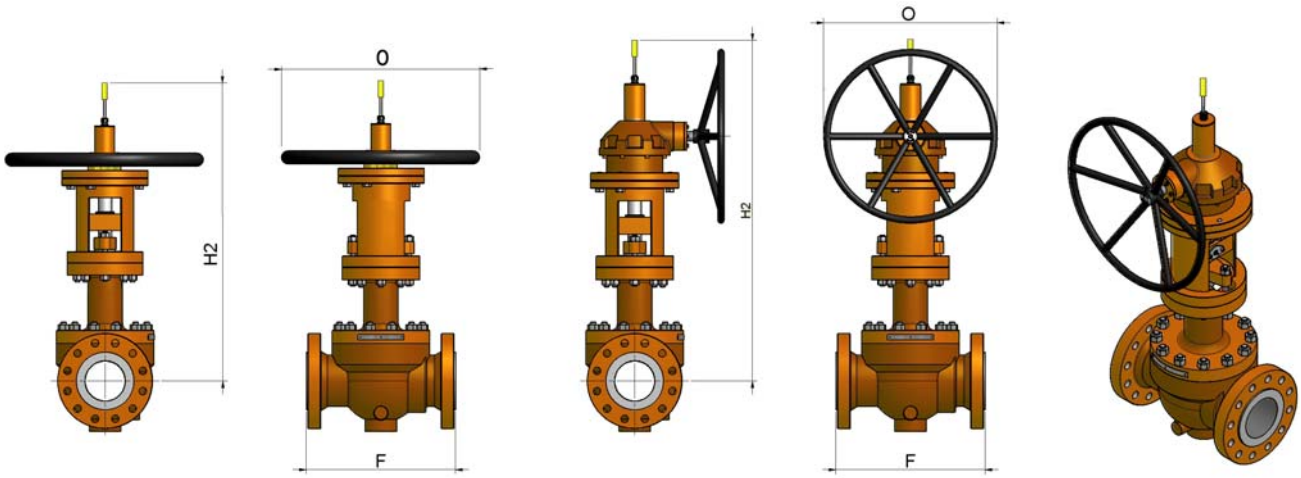
DIMENSIONAL DATA
ANSI Class 900 lbs
Full Port



Size	F		H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]		[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF	RTJ							
1	254	254	355	300	25	Handwheel	55	40	R1FC900H
1½	305	305	425	450	38	Handwheel	90	120	R15FC900H
2	368	371	495	300	51	Gear-box	120	285	R2FC900G
3	381	385	710	300	76	Gear-box	150	860	R3FC900G
4	457	460	840	300	102	Gear-box	200	1510	R4FC900G
6	610	613	1070	650	152	Gear-box	450	3400	R6FC900G
8	737	740	1300	850	204	Gear-box	700	9000	R8FC900G
10	838	841	1515	850	254	Gear-box	1050	10800	R10FC900G
12	965	968	1725	850	305	Gear-box	1990	16200	R12FC900G
14	1029	1038	1805	850	324	Gear-box	2300	37080	R14FC900G
16	1130	1140	2010	850	375	Gear-box	4200	41400	R16FC900G

NOTE:
- Dimensions are for information only. Certified dimensional drawings available on request.
* Dimension according Nether Seal standard.

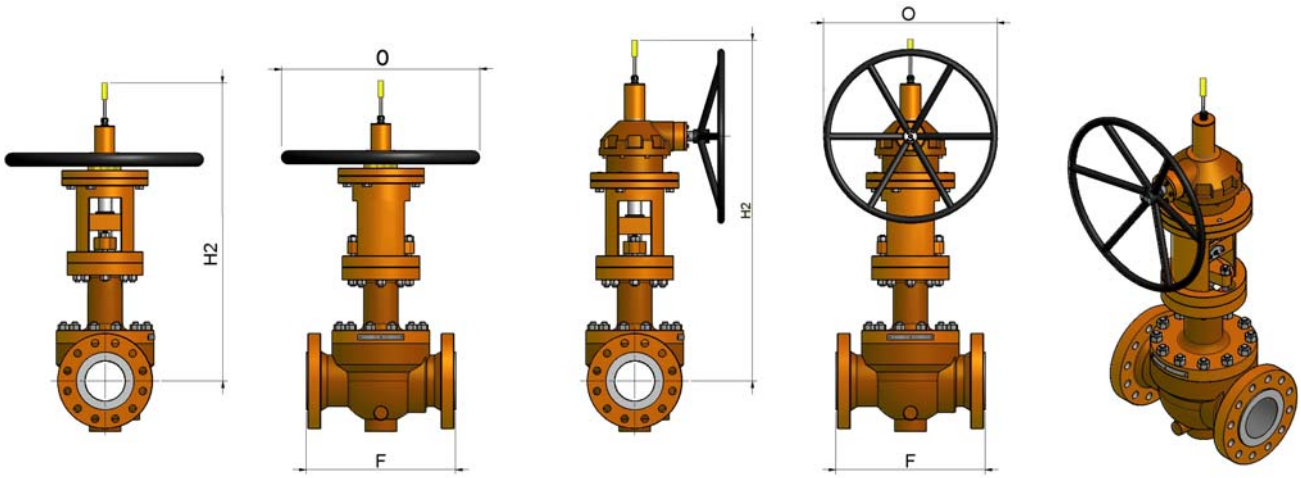
DIMENSIONAL DATA
ANSI Class 1500 lbs
Full Port



Size	F		H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]		[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF	RTJ							
1	254	254	389	300	25	Handwheel	55	40	R1FC1500H
1½	305	305	472	300	38	Handwheel	90	120	R15FC1500H
2	368	371	642	300	51	Gear-box	120	280	R2FC1500G
3	470	473	788	300	76	Gear-box	170	700	R3FC1500G
4	546	549	934	450	102	Gear-box	245	1440	R4FC1500G
6	705	711	1169	850	146	Gear-box	800	3200	R6FC1500G
8	832	841	1416	850	194	Gear-box	1300	7800	R8FC1500G
10	991	1000	1654	850	242	Gear-box	2240	11700	R10FC1500G
12	1130	1146	1882	850	289	Gear-box	3600	17100	R12FC1500G

NOTE:
- Dimensions are for information only. Certified dimensional drawings available on request.
* Dimension according Nether Seal standard.

DIMENSIONAL DATA
ANSI Class 2500 lbs
Full Port



Size	F		H1/H2	O	Min. Port	Operated	Weight	Cv Value	Valve type no.
[inch]	[mm]		[mm]	[mm]	[mm]	[-]	[Kg]	GPM	[-]
	RF	RTJ							
1	451	454	430	450	25	Handwheel	90	35	R1FC2500H
1½	451	454	527	450	38	Handwheel	95	110	R15FC2500H
2	451	454	660	300	44	Gear-box	140	160	R2FC2500G
3	578	584	791	450	63	Gear-box	210	510	R3FC2500G
4	673	683	963	450	89	Gear-box	405	790	R4FC2500G
6	914	927	1240	850	133	Gear-box	980	2300	R6FC2500G
8	1022	1038	1527	850	181	Gear-box	2000	6370	R8FC2500G
10	1270	1292	1781	850	225	Gear-box	3500	9900	R10FC2500G

NOTE:
- Dimensions are for information only. Certified dimensional drawings available on request.
* Dimension according Nether Seal standard.

OPENING AND CLOSING SEQUENCE RSBV

The features of the Nether Seal Non Contact Rising Stem Valves are friction free operation, with the sealing mechanism based on an axial movement only. The sealing is not liable to friction or tearing. This friction free quarter turn mechanical energized sealing is achieved by the special designed helix shaped trunnion stem and means no abrasion on the seal and, compared with other type of valves, an exceptional long lifetime..

1. RSBV is in open position

Valve is in full open position and the ball is not in contact with the seat. The stem is at its upper position and the ball is positioned for optimal flow.

2. RSBV start to close

As the stem lowers, the special designed helix shaped trunnion causes the ball to start its rotation towards the closed position.

OPENING AND CLOSING SEQUENCE RSBV

As the stem continues its lineair downwards movement, the ball will complete its 90 degrees friction free rotation.

3. RSBV is closing

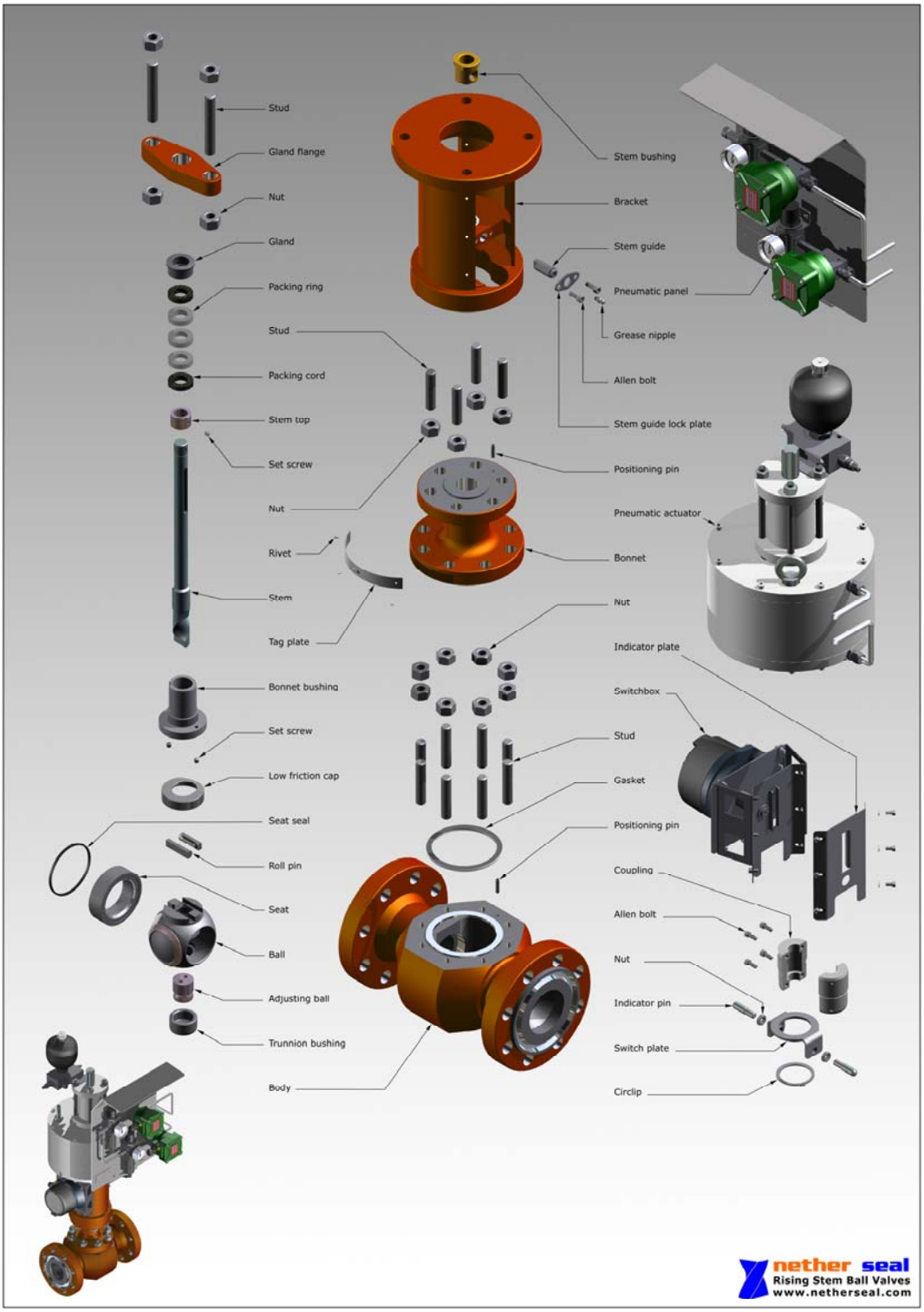
The ball has rotated the full 90 degrees without touching the seat.

As the stem continues to lower, a flat angled surface (helix top part) forces the ball to wedge mechanically against the metal seat to ensure proper seat tightness.

The valve is now closed.

For opening, reverse operations apply as described before

EXPLODED VIEW RSBV



STANDARD MATERIALS RSBV

Description	Material
Body	ASTM A216 WCC or ASTM A105N
Bonnet	ASTM A216 WCC or ASTM A105N
Ball	ASTM A216 WCC + STELLITE6 or ASTM A105N + STELLITE6
Bracket	ASTM A106 Gr.B / St.52.3
Stem	ASTM A564 630 (17/4PH)(H1150DA)
Seat	ASTM A105N + STELLITE6
Adjusting ball	ASTM A564 630 (17/4PH)(H900)
Roll pin	ASTM B637 (Inconel 718)
Bonnet bushing	GGG50
Trunnion bushing	ASTM A564 630 (17/4PH)(H1150DA)
Gland flange	St.52.3 (S355JO)
Gland	ASTM A182 F6a
Stem guide	ASTM 895 Gr.416
Stem guide lock plate	ASTM A240 Gr.316
Allen bolt D912	DIN267 p.11 A2/70
Stud	ASTM A193 B7
Nut	ASTM A194 2H
Gasket	SPW F316L Graphite
Stem top	ASTM A564 630 (17/4PH)(H900)
Set screw D916	DIN267 p.11 A2/70
Positioning pin D1481	DIN267 p.11 A2/70
Indicator pin	AISI 316
Rivet	DIN 267 p.11 A1
Packing cord	Graphite Braided
Packing ring	Graphite
Tag plate	ASTM A240 Gr.316
Low friction cap	ASTM A350 LF2
Seat seal	Graphite
Stem bushing	CuAL10Ni
Pneumatic panel	Stainless steel
Grease nipple D71412	DIN 267 p.11 A1
Pneumatic actuator	Carbon steel
Indicator plate	ASTM A240 Gr.304
Switchbox	ASTM A240 Gr.316 / ASTM A351 CF8M
Coupling	ASTM A564 630 (17/4PH)(H1150DA)
Switch plate	ASTM A240 Gr.304
Circlip	DIN 267 p.11 A1