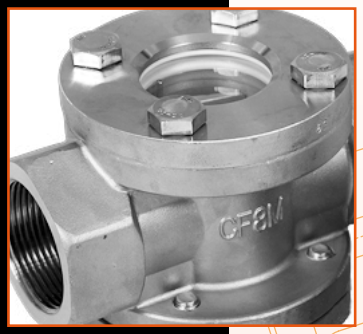
INSTALLATION, OPERATION & MAINTENANCE MANUAL

FLOWTURN®

SIGHT GLASS SLSG SERIES



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COMPLETE PRODUCT LINE

"Australian Pipeline Valve produces isolation, control and flow reversal protection products for severe and critical service media in utility, steam, pipelines, oil & gas and process industries. APV valves and pipeline products form the most competitive portfolio in the market."

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SUPER·CHECK®

SUPERSEAL®

TORQTURN®

TWIN-LOK®

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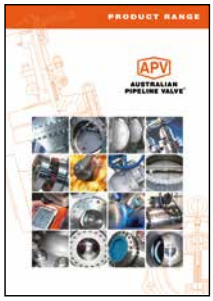
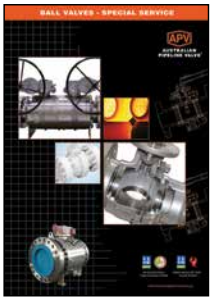
AUSTRALIAN PIPELINE VALVE BRAND RANGE - CATALOGUES



Product Brochure

Ball Valves Floating & Trunnion Mounted

Ball Valves Floating Small Bore

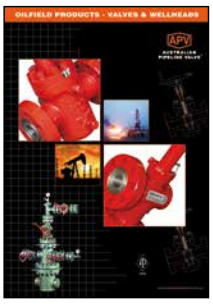


Ball Valves Special Service

Gate, Globe & Check Valves - Cast Steel

Gate, Globe & Check Valves - Forged Steel

Plug Valves Lubricated, Sleeved & Lined

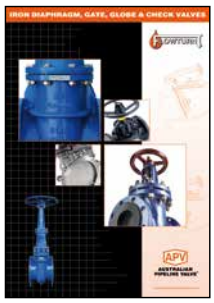


Oilfield Products Valves & Wellheads

APV FAMILY OF BRANDS RANGE - CATALOGUES

Diamond Gear Gearboxes

Flowturn Ball Valves Multiway & Deadman



Flowturn Gate, Globe & Check Valves

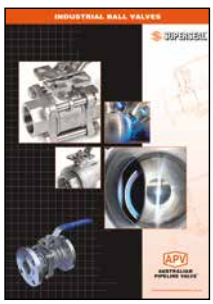
Flowturn Instrument Valves

Flowturn Strainers & Sight Glasses

Steamco Steam Valves

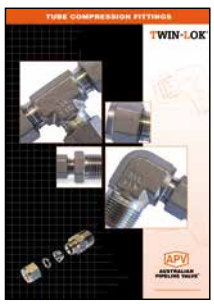
Supercheck Wafer Check Valves

Superseal Butterfly Valves

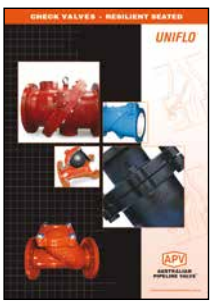


Superseal Industrial Ball Valves

Torqturn Actuators



TwinLok Tube Fittings



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INDEX

IOM Installation Operation Maintenance

INTRODUCTION

The majority of this information is common knowledge to experienced valve users. When properly installed in applications for which they were designed, Flowturn valves will give long reliable service. This instruction is only a guide for installation and operation on standard service and covers general maintenance and minor repairs. A professional APV approved valve engineering facility should be utilised for reconditioning or major repairs.

We do recommend however that this entire document be read prior to proceeding with any installation or repair. Australian Pipeline Valve and it's parent company take no responsibility for damage or injury to people, property or equipment. It is the sole responsibility of the user to ensure only specially trained valve repair experts perform repairs under the supervision of a qualified supervisor.

RESPONSIBILITY FOR SIGHT GLASS APPLICATION

The User is responsible for ordering the correct valves. The user is responsible for ensuring APV-Flowturn Valves are selected and installed in conformance with the current pressure rating and design temperature requirements. Prior to installation, the valves and nameplates should be checked for proper identification to ensure the valve is of the proper type, material and is of a suitable pressure class and temperature rating to satisfy the requirements of the service application.

Do not use sight glasses in applications where either the pressure or temperature is higher than the allowable working values. Also sight glasses should not be used in service media if not compatible with the sight glass material of construction, as this will cause chemical attacks, leakage, valve failure.

RECEIVING INSPECTION AND HANDLING

Valves should be inspected upon receipt to ensure:

- Conformance with all purchase order requirements.
- Correct type, pressure class, size, body and trim materials and end connections.
- Any damage caused during shipping and handling to end connections, hand wheel or stem.

The User is advised that specifying an incorrect valve for the application may result in injuries or property damage. Selecting the correct valve type, rating, material and connections, in conformance with the required performance requirements is important for proper application and is the sole responsibility of the user.

SAFETY INFORMATION

The following general safety information should be taken in account in addition to the specific warnings and cautions specified in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered in this I.O.M.

Caution

To avoid injury, never attempt disassembly while there are pressures either upstream or downstream. Caution is necessary to avoid possible injury.

Caution

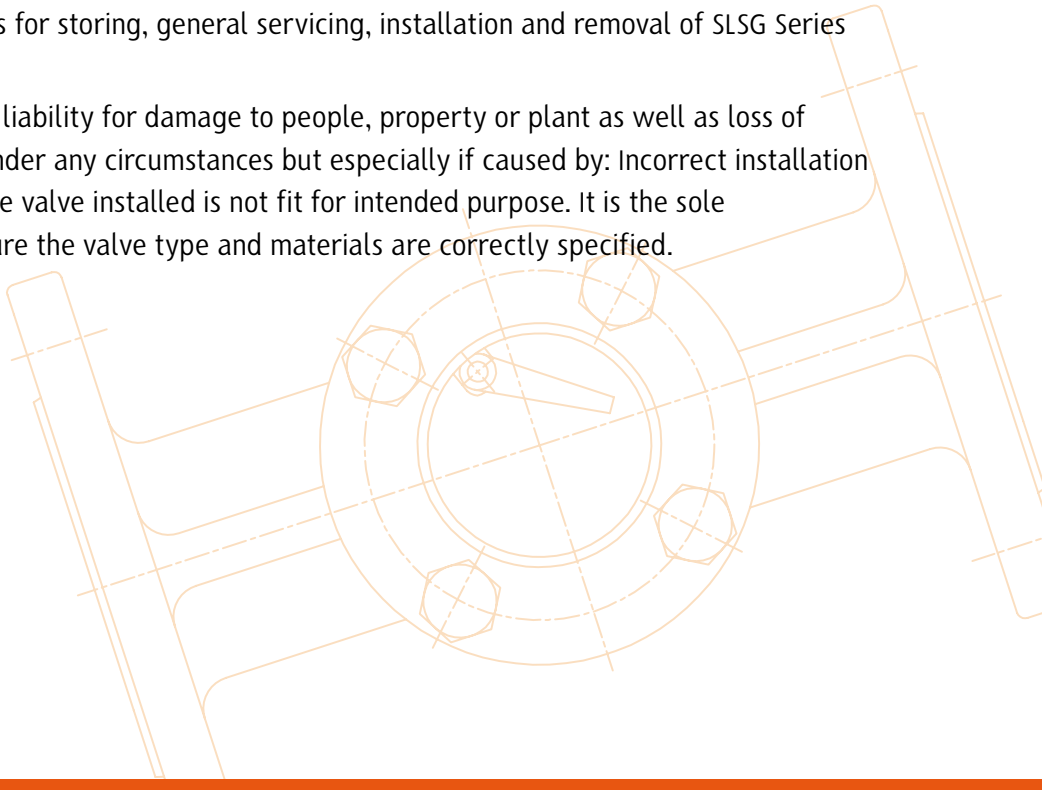
To prevent bending, damage, inefficient operation, or early maintenance problems, support piping on each side of the sight glass.

Caution

- *A sight glass is a pressurised mechanism containing energised fluids under pressure and consequently should be handled with appropriate care.*
- *Valve surface temperature may be dangerously too hot or too cold for skin contact.*
- *Upon disassembly, attention should be paid to the possibility of releasing dangerous and or ignitable accumulated fluids.*
- *Ensure adequate ventilation is available for service.*

This manual provides instructions for storing, general servicing, installation and removal of SLSG Series Sight Glasses.

APV and it's resellers refuse any liability for damage to people, property or plant as well as loss of production and loss of income under any circumstances but especially if caused by: Incorrect installation or utilisation of the valve or if the valve installed is not fit for intended purpose. It is the sole responsibility of the user to ensure the valve type and materials are correctly specified.



DURING OPERATION TAKE INTO ACCOUNT THE FOLLOWING WARNINGS:

a- Graphite body gaskets are very brittle, any impacting, twisting or bending should be avoided. PTFE gaskets must not have any scrathes to surface.

b- The sight glass's internal parts such as flow indicator, pin & gasket shall be handled with care.

c- All tools and equipment for handling the internal parts shall be soft coated.

d- Valves can be fitted with gaskets or seals in PTFE, Buna, EPDM, NBR, Viton, etc., hence chemicals or high temperatures will damage sealing components.

For all operations make reference to position number on part list of the applicable drawing listed.

Bonnet seal could result in personal injury. Bonnet is tightened prior to shipping but may require replacement seal or tightening to meet specific service conditions.

Personal injury may result from sudden release of any process pressure. APV recommends the use of protective clothing, gloves and eye wear when performing any installation or maintenance.

Isolate the sight glass from the system and relieve pressure prior to performing maintenance.

Disconnect any operating line providing air pressure, control signals or electrical power to actuators.

If a gasket seal is disturbed while removing or adjusting gasketed parts, APV recommends installing a new gasket while reassembling. A proper seal is required to ensure optimum operation.

1.0 INSTALLATION

Piping should be properly aligned and supported to reduce mechanical loading on the end connections.

1.1 INSTALLATION POSITIONS

Sight valves fitted with flow indicators are uni-directional, the direction of flow will be indicated on the valve body. Sight glasses with indicators should be used for horizontal lines with the bonnet facing up, and vertical lines where the direction of flow as indicated on the valve body is upwards.

1.2 PREPARATION FOR INSTALLATION

- Remove protective end caps or plugs and inspect valve ends for damage to flange faces.
- Thoroughly clean adjacent piping system to remove any foreign material that could cause damage to seating surfaces during valve operation.
- Verify that the space available for installation is adequate to allow the valve to be installed and to be operated.

1.3 POST-INSTALLATION PROCEDURES

After installation, the line should be cleaned by flushing to remove any foreign material. When caustics are to be used to flush the line, additional flushing with clean water is required. The valve should be tested after installation to ensure proper operating function.

With the line pressurised, check the valve end connections, body to bonnet/cover joints and plugs for leaks.

2.0 HANDLING

1. Take care in handling sight glasses especially the sealing faces.
2. Make sure that piping and equipment is clean of dust, rust and pipeline scale. Clean all adjoining pipe and fittings. Remove end protector covers from the valves immediately prior to installation. Blow compressed air inside the valves to remove residual dust, dirt, etc., from inside the sight glasses as this could hamper the valves functioning and could also damage the seats.
3. Make bonnet joints tight but do not overstress them. Always tighten in a diagonal pattern, gradually increasing torque settings. Refer to Appendix A, Diagram 1.
4. Install sight glasses in the connecting piping so that the arrow mark on the valve body coincides with the flow direction in the pipe.
5. After installation it is advisable to once again flush the piping. Check carefully for visible leaks if any and tighten bonnet nuts accordingly.

6. If the leakage still persists change the bonnet gasket.

Proper safety equipment and apparel should be worn when preparing to service the sight glass.

3.0 OPERATION

The sight glass operation is automatic and requires no assistance. When the flow exerts sufficient pressure against the disc to overcome the flow indicator's weight, the disc allows the flow to continue through the piping system.

Flow indicators do not act as check valves.

4.0 MAINTENANCE DURING OPERATION

The sight glass may experience leakage after a certain period of operation; maintenance should be performed as follows:

4.1 LEAKING BETWEEN SIGHT GLASS BODY AND SIGHT GLASS CAP

After a period of operation, the tightening force between the sight glass body and sight glass cap could become weaker, resulting in less pressure against the gasket and therefore a leak.

Adequately tighten the bolts connecting the cap to the body with a proper wrench, so as to enhance the sealing effect of the gasket between the cap and the body by increasing the pressure and therefore stopping the leak. Refer to Appendix A for bolting torques. For screwed bonnet deisng, utilise tightening lugs on bonnet. If there is still a leak replace the bonnet gaskets.

Caution

Personal injury may result from sudden release of any process pressure. APV recommends the use of protective clothing, gloves and eye wear when performing any installation or maintenance.
Isolate the sight glass from the system and relieve pressure prior to performing maintenance.
Disconnect any operating line providing air pressure, control signals or electrical power actuators.

5.0 DISASSEMBLING SIGHT GLASSES

1. Check that the line is in a complete shut down phase.
2. Pre-order all necessary jointing gaskets and parts.
3. Check to ensure the flow indicator is functioning correctly.
4. If the bolts and nuts are too tight, apply deep penetrating oil and then unscrew.

6.0 REPAIR

After a certain period of operation, the the product still leaks after the above mentioned maintenance, repair should be performed as follows:

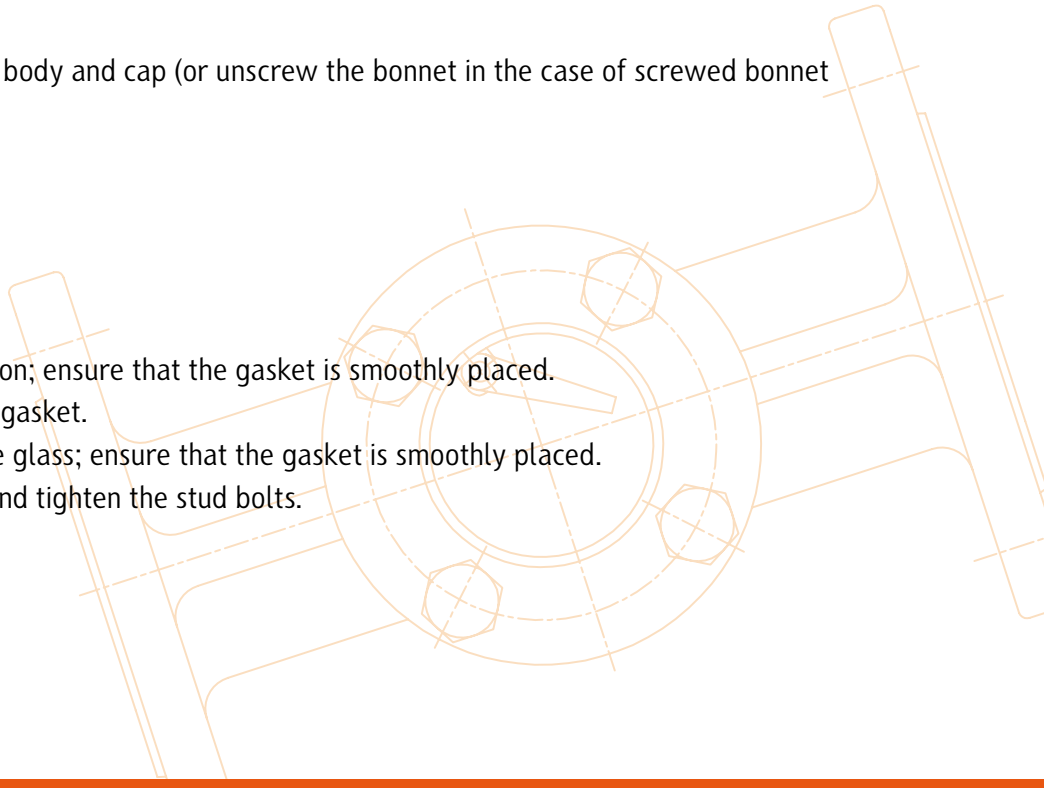
6.1 REPAIRING THE LEAK AT THE BODY-CAP JOINT & REPLACING BODY GASKET

Dis-assembly

a. Remove stud bolts joining the body and cap (or unscrew the bonnet in the case of screwed bonnet version).
b. Remove the gasket
c. Remove the sight glass
d. Remove the gasket

Assembly

a. Place the new gasket in position; ensure that the gasket is smoothly placed.
b. Place the sight glass onto the gasket.
c. Place the new gasket onto the glass; ensure that the gasket is smoothly placed.
d. Place the cap onto the body and tighten the stud bolts.



7.0 REASSEMBLY

1. Re-assemble in reverse order of disassembly.
2. Refer Appendix A for bonnet bolt re-tightening procedure and torques.

8.0 PREVENTATIVE MAINTENANCE

Sight glasses require virtually no maintenance but ensure during normal functioning the flow indicator is not hammering or slamming.

9.0 LEAKAGE ACROSS GASKET

Should any bonnet gasket leaks occur, tighten the bolts/nuts & studs (refer Diagram 1, Appendix A). If leakage still persists, the bonnet gasket should be changed, refer to 10.1 below.

10.0 MAJOR MAINTENANCE

Only an expert valve re-conditioner should attempt the following major maintenance/repairs.

Sight glasses require very little maintenance. Generally, the only viable repairs are replacement of bonnet gasket. However, see below for further extraordinary repairs.

Always replace the bonnet gasket whenever a sight glass is disassembled. Gasket seating surfaces should be scraped clean (avoid radial marks). Bonnet bolts should be tightened in a diagonal pattern at several different increasing torque settings in accordance with the recommended torque value (see Diagram 1, Appendix A).

10.1 GASKET REPLACEMENT

1. Disassemble all cover bolts and nuts (or unscrew if a screwed bonnet).
2. The bonnet should be easy to remove without the aid of a mechanical lifting device. Gently break the seal with a lever, gradually lifting the bonnet flange at intervals 360° around the bonnet.
3. Clean gasket surface areas, replace gasket and refit bonnet as detailed in 10.0 above.

10.2 SIGHT GLASS INTERNALS DISASSEMBLY INSPECTION AND REPAIR

1. Check that the (where applicable) hinge pin, nut and sight flow indicator are in good condition and firmly connected. Replace damaged parts as necessary.
2. Lift and remove the sight flow indicator assembly. Movement should be free and not hindered by any

malfunction of the hinge pin. Where sight flow indicator travel is not sufficiently smooth, remove hinge pin. Fit a new hinge pin and indicator.

11.0 PRESSURE TEMPERATURE RATING

Flange & Body Rating	Refer to Pressure/temperature rating of supplied standard flanging and pressure rating of glass (see as-built drawing, see Appendix A)
Working temperature*	-20°C ~ 200°C (-4°F ~ 392°F)

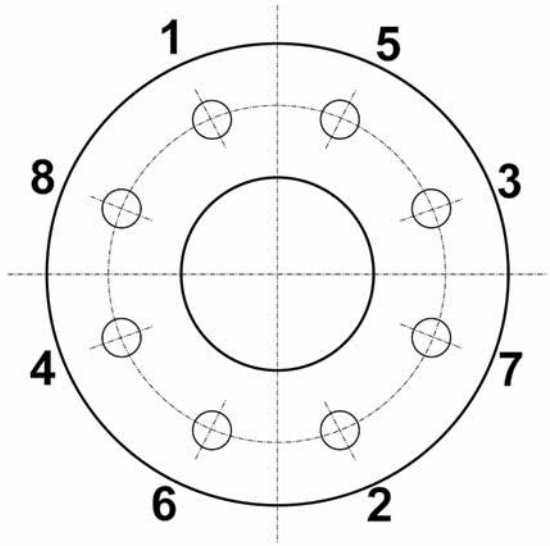
*PTFE bonnet gasket 200°C maximum

Caution

The glass will down-rate the pressure rating.

APPENDIX A

DIAGRAM 1



Bolting torque sequence: 1 – 2 – 3 – 4 – 5 – 6 – 7 - 8

Example only, number of bolts will vary, apply the same criss cross process, gradually tightening more after each revolution.

BOLTING TORQUES

NPS	DN	Bolt	
		N-m	in/lb
1/2”	15	35	310
3/4”	20	35	310
1”	25	35	310
1 1/4”	32	45	398
1 1/2”	40	45	398
2”	50	50	443
2 1/2”	65	50	443
3”	80	50	443
4”	100	55	487
5”	125	65	575
6”	150	65	575
8”	200	80	708

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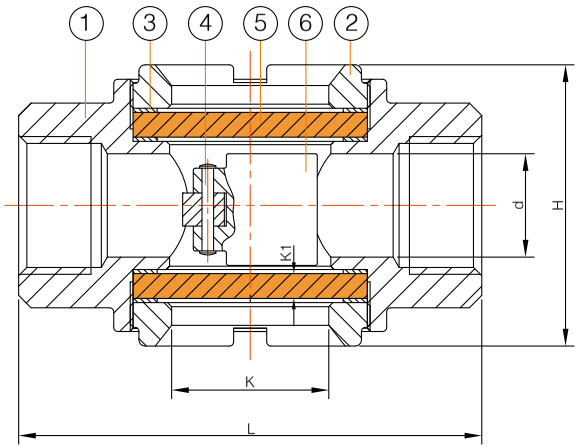
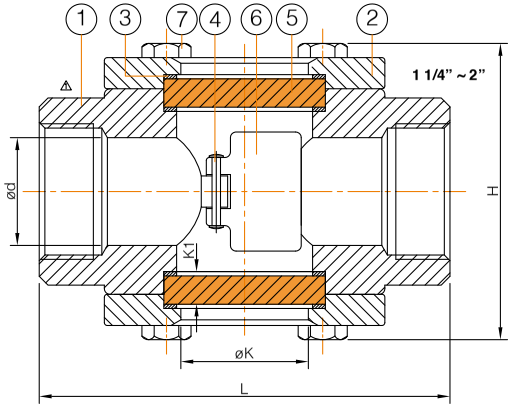
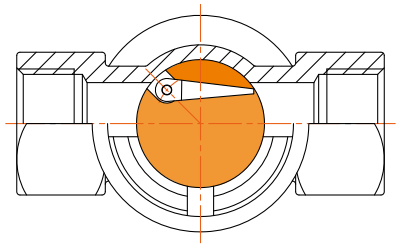
15NB ~ 25NB



32NB ~ 50NB



Top View



DIMENSIONS (MM) & WEIGHT (KG)

Inch	DN	d	L	H	K	K1	Weight
1/2"	15	15	112	68	38	10	2.5
3/4"	20	20	112	68	38	10	2.6
1"	25	25	112	68	38	10	3.6
1 1/4"	32	32	145	110	45	10	5
1 1/2"	40	40	145	110	45	10	7
2"	50	50	168	131	55	10	10

Dimensions in millimeters

BILL OF MATERIALS

NO.	PART NAME	MATERIAL	NOTES
1	BODY	ASTM A351 CF8M	-
2	CAP	ASTM A351 CF8M	-
3	GASKETS (4)	PTFE	-
4	STEM	SUS316	-
5	GLASS	BOROSILICATE GLASS	-
6	INDICATOR	ASTM A351 CF8M	-
7	BOLT	A2-70 (304 SS)	32~50 NB

15NB ~ 25NB

32NB ~ 50NB

RATING	1378 kPa / 200 PSI CWP	TEST PRESSURE	
DESIGN & MFG.	ASME B16.34	SHELL HYDRO	SEAT HYDRO
PRESS-TEMP RATING	SEE TABLE	2.07 Mpa | 300 Psi	Mpa | Psi
FACE TO FACE DIM.	MFG STANDARD	SEAT AIR	BACKSEAT
TEST & INSPECTION	API 598/ISO 5208	Mpa | Psi	Mpa | Psi
PORT SIZE	FULL	TEMPERATURE	
TRIM	316	MAX 200 °C	MAX 392 °F
END CONNECTION	BSPT OR NPT	MEDIUM	Water, Oil, Gas
END DIMENSION	BS21/ ISO7-1-RC (AS1722.1) BSPT OR ASME B1.20.1 NPT		
MARKING & PAINT	MSS SP-25 PICKLED & PASSIVATED		
OTHER REQ.			
NOTES	INVESTMENT CAST BODY		
OTHER	DOUBLE SIDED		

Screwed End Sight Glass, Model SLSGSS-S, NPS 1/2" ~ 1" (DN15~DN25) 1378 kPa (200 PSI) WOG	ORDER Nº/ DWG Nº	43	APPROVED	B.T.
	REV.	00	CHECKED	S.Q.
Australian Pipeline Valve			DRAWN	C.C.

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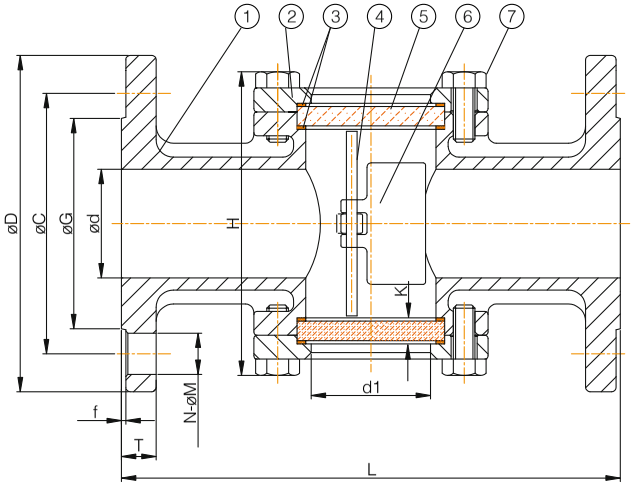
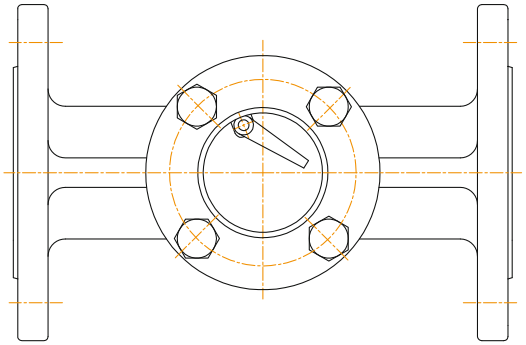
BILL OF MATERIALS

NO.	PART NAME	MATERIAL	NOTES
1	BODY	ASTM A216 WCB	-
2	CAP	ASTM A216 WCB	-
3	GASKETS (4)	PTFE	-
4	HINGE PIN	SUS316	-
5	GLASS WINDOW	BOROSILICATE GLASS	-
6	INDICATOR	ASTM A351 CF8M	-
7	BOLT	SUS304	8.8 ZINC PLATED





RATING	CL 150 BODY/FLANGES	TEST PRESSURE	
DESIGN & MFG.	ASME B16.34 (WALL)	SHELL HYDRO	GLASS HYDRO
PRESS-TEMP RATING	ASME B16.34	2.16 Mpa / 313 Psi	Mpa / Psi
FACE TO FACE DIM.	DIN 3202-F1	SEAT AIR	BACKSEAT
END DIMENSION	ASME B16.5	Mpa / Psi	Mpa / Psi
END CONNECTION	RF 3.2~6.3Ra (125~250AARH)	TEMPERATURE	
TEST & INSPECTION	API 598/ISO 5208	MAX 200 °C	MAX 392 °F
MARKING & PAINT	MSS-SP25, PAINT PPWF07.002	MEDIUM	Water, Oil, Gas
OTHER REQ.	1960 KPA CWP (285 PSI) BODY & GLASS P/T ASME B16.34		
PORT SIZE	FULL		
TRIM	316		
NOTES	INVESTMENT CAST BODY		
OTHER	DOUBLE SIDED FLOW INDICATOR		

*BOROSILICATE GLASS RATED TO 1960 KPA CWP

DIMENSIONS (MM) & WEIGHT (KG)

Inch	DN	d	d1	K	L	H	D	C	G	f	T	N-M	Weight
1/2"	15	15	35	10	130	115	89	60.5	35	1.6	11.1	4-16	3.0
3/4"	20	20	35	10	150	115	98	70.0	43	1.6	11.1	4-16	4.0
1"	25	25	35	10	160	115	108	79.5	51	1.6	11.1	4-16	5.6
1 1/4"	32	32	55	10	180	143	117	89.5	64	1.6	12.7	4-16	6.8
1 1/2"	40	40	55	10	200	143	127	98.5	73	1.6	14.3	4-16	9.0
2"	50	50	55	10	230	143	152	120.5	92	1.6	15.9	4-19	11.0
2 1/2"	65	65	85	12	290	185	178	139.5	105	1.6	17.5	4-19	14.0
3"	80	80	85	12	310	196	190	152.5	127	1.6	19.1	4-19	19.0
4"	100	100	110	15	350	228	229	190.5	157	1.6	23.9	8-19	25.0

Dimensions in millimeters

Sight Glass, Model SLSG150CS-L2, NPS 1/2"~4" (DN15~DN100) Class 150, Flanged End	ORDER Nº/ DWG Nº	660	APPROVED	B.T.
	REV.	00	CHECKED	S.Q.
Australian Pipeline Valve			DRAWN	C.C.

APV DWG FRM 660

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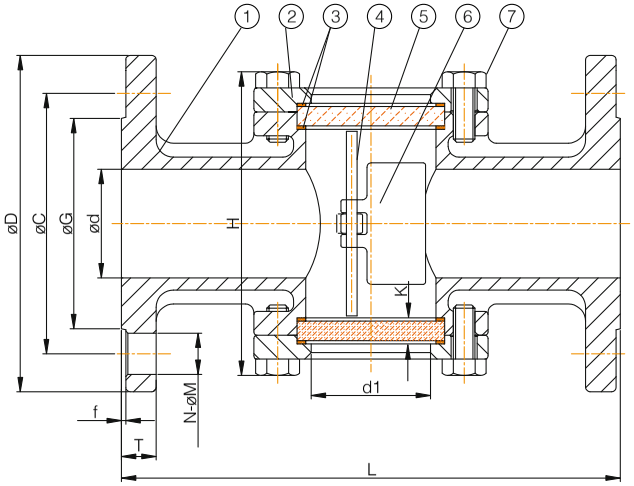
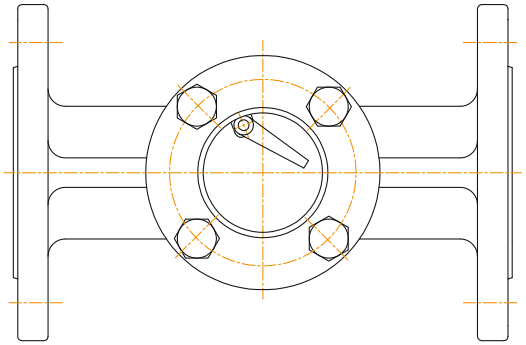
BILL OF MATERIALS

NO.	PART NAME	MATERIAL	NOTES
1	BODY	ASTM A216 WCB	-
2	CAP	ASTM A216 WCB	-
3	GASKETS (4)	PTFE	(1)
4	HINGE PIN	SUS316	-
5	GLASS WINDOW	BOROSILICATE GLASS	-
6	INDICATOR	ASTM A351 CF8M	-
7	BOLT	SUS304	8.8 ZINC PLATED

(1) 200°C MAXIMUM





RATING	CL 150 BODY/FLANGES	TEST PRESSURE	
DESIGN & MFG.	ASME B16.34 (WALL)	SHELL HYDRO	GLASS HYDRO
PRESS-TEMP RATING	ASME B16.34	2.16 Mpa | 313 Psi	* Mpa | * Psi
FACE TO FACE DIM.	DIN 3202-F1	SEAT AIR	BACKSEAT
END DIMENSION	ASME B16.5	Mpa | Psi	Mpa | Psi
END CONNECTION	RF 3.2~6.3Ra (125~250AARH)	TEMPERATURE	
TEST & INSPECTION	API 598/ISO 5208	MAX 200 °C	MAX 392 °F
MARKING & PAINT	MSS-SP25, PAINT PPWF07.002	MEDIUM	Water, Oil, Gas
OTHER REQ.	*1600 KPA MAXIMUM CWP BOROSILICATE GLASS		
PORT SIZE	FULL		
TRIM	316		
NOTES	INVESTMENT CAST BODY		
OTHER	DOUBLE SIDED FLOW INDICATOR		

*1600 KPA MAXIMUM COLD WORKING PRESSURE BOROSILICATE GLASS, BODY IS FULL ANSI 150 RATED B16.34

DIMENSIONS (MM) & WEIGHT (KG)

Inch	DN	d	d1	K	L	H	D	C	G	f	T	N-M	Weight
5"	125	125	135	15	400	268	254	216.0	186	1.6	23.9	8-22	30.0
6"	150	150	160	18	480	310	279	241.5	216	1.6	25.4	8-22	48.0

Dimensions in millimeters

Sight Glass, Model SLSG150CS-L2, NPS 5"~6" (DN125~DN150) Class 150, Flanged End	ORDER Nº/ DWG Nº	661	APPROVED	B.T.
	REV.	00	CHECKED	S.Q.
Australian Pipeline Valve			DRAWN	C.C.

APV DWG FRM 661

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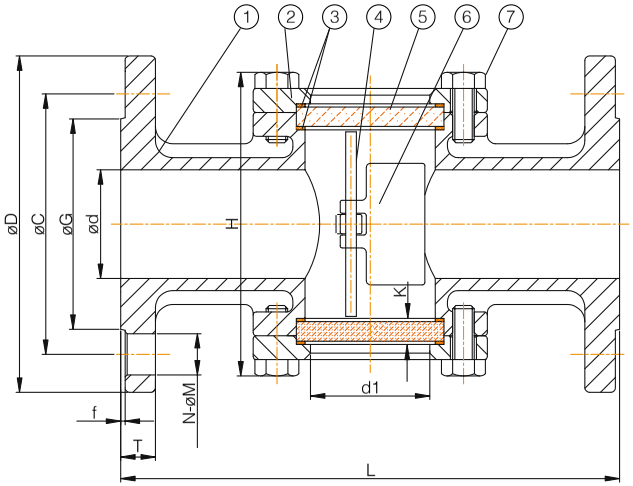
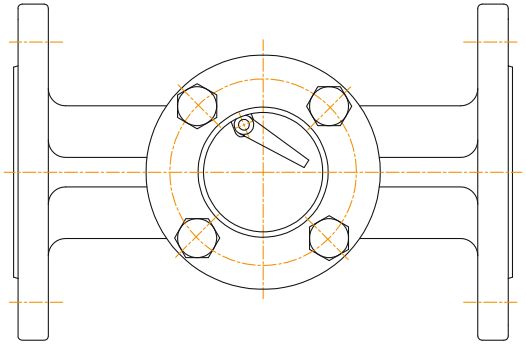
FLOWTURN®

BILL OF MATERIALS

NO.	PART NAME	MATERIAL	NOTES
1	BODY	ASTM A216 WCB	-
2	CAP	ASTM A216 WCB	-
3	GASKETS	PTFE	-
4	HINGE PIN	SUS316	-
5	GLASS WINDOW	BOROSILICATE GLASS	-
6	INDICATOR	ASTM A351 CF8M	-
7	BOLT	SUS304	8.8 ZINC PLATED





RATING	CL 150* BODY/FLANGES	TEST PRESSURE	
DESIGN & MFG.	ASME B16.34 (WALL)	SHELL HYDRO	GLASS HYDRO
PRESS-TEMP RATING	ASME B16.34	2.16 Mpa / 313 Psi	* Mpa / * Psi
FACE TO FACE DIM.	DIN 3202-F1	SEAT AIR	BACKSEAT
END DIMENSION	ASME B16.5	Mpa / Psi	Mpa / Psi
END CONNECTION	RF 3.2~6.3Ra (125~250AARH)	TEMPERATURE	
TEST & INSPECTION	API 598/ISO 5208	MAX 200 °C	MAX 392 °F
MARKING & PAINT	MSS-SP25, PAINT PPWF07.002	MEDIUM	Water, Oil, Gas
OTHER REQ.	*1378 KPA MAX CWP BOROSILICATE GLASS		
PORT SIZE	FULL		
TRIM	316		
NOTES	INVESTMENT CAST BODY		
OTHER	DOUBLE SIDED FLOW INDICATOR		

*1378 KPA MAXIMUM COLD WORKING PRESSURE BOROSILICATE GLASS, BODY IS FULL ANSI 150 RATED B16.34

DIMENSIONS (MM) & WEIGHT (KG)

Inch	DN	d	d1	K	L	H	D	C	G	f	T	N-M	Weight
8"	200	200	200	19	600	400	343	298.5	270	1.6	28.6	8-22	75.0

Dimensions in millimeters

Sight Glass, Model SLSG150CS-L2, NPS 8" (DN200) Class 150, Flanged End	ORDER Nº/ DWG Nº	662	APPROVED	B.T.
	REV.	00	CHECKED	S.Q.
Australian Pipeline Valve			DRAWN	C.C.

APV DWG FRM 662

AUSTRALIAN PIPELINE VALVE®

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AUSTRALIAN PIPELINE VALVE® HEAD OFFICE
70-78 Stanbel Road Salisbury Plain South Australia 5109 Telephone +61 (0)8 8285 0033 Fax +61 (0)8 8285 0044
email: admin@australianpipelinevalve.com.au

www.australianpipelinevalve.com.au

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