CMW BVA Valves Pty Ltd

PRODUCT APPRAISAL REPORT 2102

Challenger Wafer and Lugged Butterfly Valves

AS 4795.1:2011 Butterfly valves for waterworks purposes
Part 1: Wafer and lugged

Published: 3 August 2021

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Document History

The following information indicates the changes made to this document.

Date	Version
20 July 2021	Client Review
19 July 2021	Peer Review
3 August 2021	Publication

Peer Reviewers

Name/Title	Organisation	Date
Product Appraisal Technical Advisory Group	WSAA	3 August 2021
WSAA Expert Panel	WSAA	3 August 2021
Peter Pittard, WSAA Consultant	WSAA	20 July 2021
Carl Radford, Product Appraisal Manager	WSAA	3 August 2021

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Overview of WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 20 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

Based around our vision of 'customer driven, enriching life', WSAA facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. We are proud of the collegiate attitude of our members which has led to industry-wide approaches to national water issues.

WSAA can demonstrate success in the standardisation of industry performance monitoring and benchmarking, as well as many research outcomes of national significance. The WSAA Executive retains strong links with policy makers and legislative bodies and their influencers, to monitor emerging issues of importance to the urban water industry.

WSAA was formed in 1995 as a non-profit organisation to foster the exchange of information between industry, government and the community, and to promote sustainable water resource management.

The urban water industry is committed to anchoring its services to customers' values, and to enrich communities where water services have broad economic, environmental and social values. In line with this our main activities focus on four areas:

1. influencing national and state policies on the provision of urban water services and sustainable water resource management
2. promoting debate on environmentally sustainable development and management of water resources and the community health requirements of public water supplies
3. improving industry performance and establishing benchmarks and industry leading practices for water service processes; and
4. fostering the exchange of information on education, training, research, water and wastewater management and treatment and other matters of common interest.

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1 EXECUTIVE SUMMARY

CMW BVA Valves Pty Ltd, trading as Challenger Valves and Actuators (Challenger), is a privately-owned company established in 1984 and a major supplier of valves and actuators to industries including water, irrigation, power, mining and industrial. It also imports a range of pneumatic and electric actuation products.

The range of Challenger wafer and lugged butterfly valves included in this appraisal is manufactured by Tianjin Galaxy Valve Co Ltd, China. Galaxy is a vertically integrated specialist valve manufacturer with in-house R & D, foundry, machining, rubber moulding, coating, assembly and testing facilities.

This appraisal covers a range of PN16 resilient seated seal-on-body wafer and lugged butterfly valves in sizes from DN 50 to DN 600 manufactured in compliance with AS 4795.1:2011 *Butterfly valves for waterworks purposes Part 1: Wafer and lugged.*

The range of valves is detailed in Section 4.

Both CMW BVA Valves Pty Ltd and Tianjin Galaxy Valve Co Ltd holds an ISO 9001:2015 Quality Management System Licence.

The Challenger butterfly valves have ISO Type 5 OceanaMark product certification to AS 4795.1:2011 *Butterfly valves for waterworks purposes Part 1: Wafer and lugged.*

This Appraisal has determined that Challenger wafer and lugged butterfly valves as detailed in this report, meet the requirements of WSA PS 263 *Butterfly Valves for Pressure Applications – Drinking Water and Non-Drinking Water Supply* and are considered as ‘fit-for-purpose’.

1.1 Recommendations

It is recommended that WSAA members, subject to any specific requirements of the member, accept or authorise Challenger DN 50 to DN 600 PN16 wafer and lugged butterfly valves, as detailed in this report, for use in pressure water supply applications, provided they are installed in accordance with WSAA Codes and the manufacturers requirements, where specified.

2 THE APPLICANT

The applicant is CMW BVA Valves Pty Ltd, trading as Challenger Valves and Actuators.

2.1 The Supplier

CMW BVA Valves Pty Ltd, trading as Challenger Valves and Actuators, is a privately-owned company established in 1984 and a major supplier of valves and actuators to industries including water, irrigation, power, mining and industrial. It also imports a range of pneumatic and electric actuation products.

Challenger’s head office is situated in Shepparton, Victoria, where its purpose-built facility is located. The facility incorporates fabrication, assembly, testing, technical support and purchasing, warehouse and distribution capabilities. It also owns and operates stocking warehouse facilities in Queensland, NSW, Victoria and WA.

2.2 The Manufacturer

Tianjin Galaxy Valve Co Ltd is a vertically integrated specialist valve manufacturer with in-house R & D, foundry, machining, rubber moulding, coating, assembly and testing facilities. The company was founded in 2003 and employs more than 500 people.

Galaxy manufactures a comprehensive range of valves including butterfly valves, gate valves, check valves, balancing valves, control valves, ball valves, hydrants, strainers and many others

Galaxy valves are exported to more than 50 countries worldwide.

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3 THE PRODUCT

This appraisal covers a range of Challenger PN16 resilient seated seal-on-body wafer and lugged butterfly valves in sizes from DN 50 to DN 600 manufactured in compliance with AS 4795.1:2011 *Butterfly valves for waterworks purposes Part 1: Wafer and lugged.*

The lugged valves are compatible with Figure B5 of AS/NZS 4087:2011 *Metallic flanges for waterworks purposes.* Other flanges can also be accommodated including AS 2129 Table E and ANSI B16.1 Class 150.

Face to face dimensions comply with ISO 5752 Series 20, as specified in AS 4795.1.

Valves in sizes DN 50 to DN 300 are normally supplied with a manual lever; however, a manually operated gearbox, electric or pneumatic actuator may also be fitted where required. Valves in sizes DN 350 to DN 600 may be fitted with a manually operated gearbox, electric or pneumatic actuator. Mounting pads comply with ISO 5211.

Polymeric coatings conform to AS/NZS 4158 *Thermal bonded polymeric coating on valves and fittings for water industry purposes.*

The complete range of seal on body butterfly valves covered by this Appraisal is detailed in Section 4.

4 SCOPE OF THE APPRAISAL

The scope of this appraisal includes PN16 resilient seated seal-on-body wafer and lugged butterfly valves in sizes from DN 50 to DN 600.

TABLE 1

CHALLENGER BUTTERFLY VALVES

DN	Wafer	Lugged	Face to Face mm
50	√	√	43
65	√	√	46
80	√	√	46
100	√	√	52
125	√	√	56
150	√	√	56
200	√	√	60
250	√	√	68
300	√	√	78
350	√	√	78
400	√	√	102
450	√	√	114
500	√	√	127
600	√	√	154

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5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts <wafer and lugged butterfly valves manufactured in compliance with AS 4795.1:2011 *Butterfly valves for waterworks purposes Part 1: Wafer and lugged* and duly certified by means of an ISO Type 5 product certification scheme undertaken by a JAS-ANZ accredited Conformity Assessment Body (CAB) or by an international accreditation system recognised by JAS-ANZ.

The manufacturer is generally expected to have a production management and control system that has been duly accredited in accordance with AS/NZS ISO 9001 as a prerequisite to undergoing a product certification audit.

The ISO Type 5 Product Certification Scheme shall meet the criteria described in WSA TN-08.

5.2 Performance Requirements

Challenger butterfly valves have been appraised for compliance with AS 4795.1:2011 *Butterfly valves for waterworks purposes Part 1: Wafer and lugged*.

Appraisal criteria are also determined by the WSAA Product Appraisal Technical Advisory Group and regularly reviewed to ensure that the criteria reflect the requirements of WSAA members.

The following Product Specification is also relevant to this application:

WSA PS 263 *Butterfly Valves for Pressure Applications – Drinking Water and Non-Drinking Water Supply*

A copy of the Product Specification is available at the following link:

https://www.wsaa.asn.au/shop/product/35716

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

Challenger has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No. QEC10507 issued to CMW BVA Valves Pty Ltd by SAI Global.
- ISO 9001:2015 Certificate of Registration No. 10233928 issued to Tianjin Galaxy Valve Co Ltd by Lloyds Register.
- ISO 9001:2015 Certificate of Registration No. 10189720 issued to Tianjin Galaxy Metal Products Co Ltd by Lloyds Register.
- AS 4795.1:2011 OceanaMark ISO Type 5 product certification licence No. OMK32103 issued to Challenger Valves and Actuators by IAPMO R&T Oceana.

Copies of the Quality Assurance and Product Certification licences have been included in Appendix B and are also available from WSAA.

Copies of Quality Assurance certificates have also been supplied for the other component suppliers.

6.2 Compliance with Performance Requirements

6.2.1 Components material list

The Challenger butterfly valves material specifications are detailed below and are deemed to meet the minimum requirements specified in AS 4795.1. Material test certificates from ISO/IEC 17025 accredited laboratories have been submitted to demonstrate compliance with the material specifications.

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TABLE 2

CHALLENGER BUTTERFLY VALVES COMPONENT MATERIAL LIST

Component	Material	Standard	Grade
Body	Ductile iron	AS 1831	450-10
Disc	Stainless steel	ASTM A351	CF8M†
Shaft	Stainless steel	ASTM A276	431
Shaft bearings	PTFE lined St Steel	ASTM A276	316
Liner	Synthetic elastomer	AS 1646	EPDM
Seals	Synthetic elastomer	AS1646	EPDM
Fasteners	Stainless Steel	ASTM A276	316
Handle	Ductile iron‡	AS 1831	450-10
Notch plate	Stainless steel	ASTM A182	304

†CF8M is the cast equivalent of Grade 316. ‡ Accepted as equivalent material

6.2.2 Polymeric thermal bonded coatings

Challenger butterfly valves are coated with Akzo Nobel Resicaot R4, a thermosetting fusion bonded epoxy powder coating applied by the electrostatic spray method.

The FBE is StandardsMark ISO Type 5 product certified to AS/NZS 4158 *Thermal bonded polymeric coatings on valves and fittings* by SAI-Global. A copy of the product certification certificate and schedule is held on file by WSAA

The coating is applied in-house by Galaxy. A copy of their application procedures together with copies of typical batch release test reports have been submitted.

In addition, a report from Guangzhou DBI Testing Service Co Ltd (International Accreditation Service (IAS) Accreditation No. TL-909) has been submitted to demonstrate compliance with the process verification test requirements of AS/NZS 4158. IAS is recognised by ILAC-MRA.

Application procedures are also audited by IAPMO R&T Oceana in conjunction with OceanaMark product certification audits.

6.2.3 Type tests

Challenger has submitted copies of Type Test reports to demonstrate compliance with performance requirements of AS 4795.1:2011. Intelligence Quality Assurance Co Ltd (IAS Accreditation No. TL-573), based in Guangzhou, carried out the testing.

6.2.4 Contact with drinking water

Challenger has submitted a copy of a test report dated 4th July 2019 undertaken by Beijing Building Materials Testing Academy Co Ltd (CNAS Accreditation No. L1449) for a DN 50 wafer type butterfly valve to demonstrate compliance with AS/NZS 4020:2005.

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

Butterfly valves are commonly installed throughout water supply networks and installation and operation and maintenance is well understood by experienced installers and operators. A copy Challenger's Installation and Operation Manual may be sourced directly from Challenger or from WSAA.

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8 PRODUCT MARKING

Challenger butterfly valves have a stainless-steel nameplate attached to the body of the valve with the following markings in accordance with AS4795.1:2011:

Manufacturers Name: Challenger

Nominal Size: e.g., DN150

Year of manufacture: e.g., 2020

Pressure class: PN16

Standard number: AS4795.1

Serial number: e.g., 20071300392

In addition, the material of the body, seat, stem and disc is marked on the nameplate together with the OceanaMark Number OMK32103.

The DN and PN is also cast on to the valve body

FIGURE 1 EXAMPLE OF MARKING

9 PACKAGING AND TRANSPORTATION

Challenger butterfly valves are packaged in bubble bag plastic sleeves, palletised and shrink wrapped or crated, depending on order and valve size.

10 PRODUCT WARRANTY

The products are covered by the normal commercial and legal requirements of the *Competition and Consumer Act 2010 (Cth)*, which covers manufacture to the relevant standard, and details of CMW-BVA Valves Pty Ltd warranty is included in their terms and conditions of sale.

11 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD TESTING REPORT

Wafer and lugged butterfly valves have been utilised within the Australian Water Industry for many years and Challenger valves have been approved by most Australian water agencies. This Appraisal considers valves manufactured by a new supplier, however the valve designs are the same as that employed by Challenger for many years.

12 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW

No issues were raised

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13 FUTURE WORKS

No future works have been identified.

14 DISCLAIMER

This Product Appraisal Report (Report) is issued by the Water Services Association of Australia Limited on the understanding that:

This Report applies to the product(s) as submitted. Any changes to the product(s) either minor or major shall void this Report.

To maintain the recommendations of this Report any such changes shall be detailed and notified to the Product Appraisal Manager for consideration and review of the Report and appropriate action. Appraisals and their recommendations will be the subject of continuous review dependent upon the satisfactory performance of products.

WSAA reserves the right to undertake random audits of product manufacture and installation. Where products fail to maintain appraised performance requirements the appraisal and its recommendations may be modified and reissued. Appraisal reports will be reviewed and reissued at regular intervals not exceeding five (5) years.

The following information explains a number of very important limits on your ability to rely on the information in this Report. Please read it carefully and take it into account when considering the contents of this Report.

Any enquiries regarding this report should be directed to the Program Manager, Carl Radford, Phone: 03 8605 7601 email carl.radford@wsaa.asn.au.

14.1 Issue of Report

This Report has been published and/or prepared by the Water Services Association of Australia Limited and nominated Project Manager and peer group of technical specialists (the Publishers).

The Report has been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Report (the Recipients).

By accepting this Report, the Recipient acknowledges and represents to the Publisher(s) and each person involved in the preparation of the Report that the Recipient has understood and accepted the terms of this Disclaimer.

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This Report does not contain all information that a person might require for the purposes of assessing any product discussed or appraised within it (Product). The product appraisal criteria used in preparing this Report may not address all relevant aspects of the Product.

Recipients should seek independent evidence of any matter which is material to their decisions in connection with an assessment of the Product and consult their own advisers for any technical information required. Any decision to use the Product should take into account the reliability of that independent evidence obtained by the Recipient regarding the Product.

Recipients should also independently verify and assess the appropriateness of any recommendation in the Report, especially given that any recommendation will not take into account a Recipient’s particular needs or circumstances.

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14.4 No Warranty

The Publisher(s) do[es] not, in any way, warrant that steps have been taken to verify or audit the accuracy or completeness of the information in this Report, or the accuracy, completeness or reasonableness of any recommendation in this Report.

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APPENDIX A – PRODUCT LITERATURE

RESILIENT SEAT BUTTERFLY VALVE
WAFER DN50 - DN600
MODEL: BFW

CHALLENGER VALVES AND ACTUATORS

FEATURES AND BENEFITS

- Designed and tested in accordance with AS4795.1.
- AS4795.1 OceanaMark Certified product by Iapmo R&T Oceana Licence No. OMK32103.
- WaterMark Approved product by Iapmo R&T Oceana Licence No. WM-032103.
- Water Quality tested and approved to AS4020.
- Bi – directional bubble tight sealing.
- Vulcanised seat held securely in position making it suitable for vacuum applications.
- High strength one piece through shaft secured by precision taper pins provides a strong and reliable disc to stem connection that is field replaceable.
- Blow-Out proof stem ensures operator safety and eliminates OH&S issues.
- Heavy duty shaft bushing ensures disc alignment & absorbs side thrusts, reducing valve wear whilst prolonging valve life.
- Suitable for high repetition, actuated applications.
- Precision disc machining ensures mirror image of seat profile enhancing low torque operation & reduced liner wear.
- ISO interface flange allows interchange and standardisation of actuation equipment.
- Stem seal connection is ensured with moulded double "O" rings, as well as an additional upper stem seal to provide greater design integrity.
- Robust, extended neck allows easy installation of insulation and ensures bearing integrity.
- Flange seal connection is ensured with moulded double "O" rings seals eliminating the requirement for flange gaskets.
- Lockable lever handle to prevent tampering.

OPTIONS

- Actuators
  - Electric
  - Pneumatic
  - Hydraulic
- Extensions
- Lockable Gearbox
- Chain wheel Operation
- Limit Switches

APPLICATIONS

Challenger Valves and Actuators are the ***"Right Choice for Valves and Actuation"*** when quality matters.

Servicing industries such as:
Water & Waste Water, Mining, Desalination, Pumping, Industrial Processing, Irrigation, Materials Handling and Chemical Services.

TECHNICAL SPECIFICATION

Construction:	Wafer Concentric Seal On Body Butterfly Valve
Size:	50mm - 600mm
Pressure Rating:	PN16
Face to Face:	ISO5752 Series 20 / AS4795.1
Flange Drilling:	AS4087 PN16 (Table D) AS2129 Table E ANSI B16.5 #150
Coating:	AS4158 Fusion Bonded Epoxy AKZO Nobel R4-ES HJF01R
Temperature Range:	**AS4020 Compliance** EPDM 0°C to 40°C **General Application** EPDM 0-85°C (Optimum Range) -10°C to 120°C (Intermittent) Nitrile -10°C to 80°C
Pressure Testing:	AS4795.1
Mounting Pad:	ISO5211
Max Velocity:	5m/s (max) 7.5m/s (emergency)
Negative Pressure:	0.1MPa (Vacuum)

WaterMark

IAPMO R&T OCEANA OceanaMark

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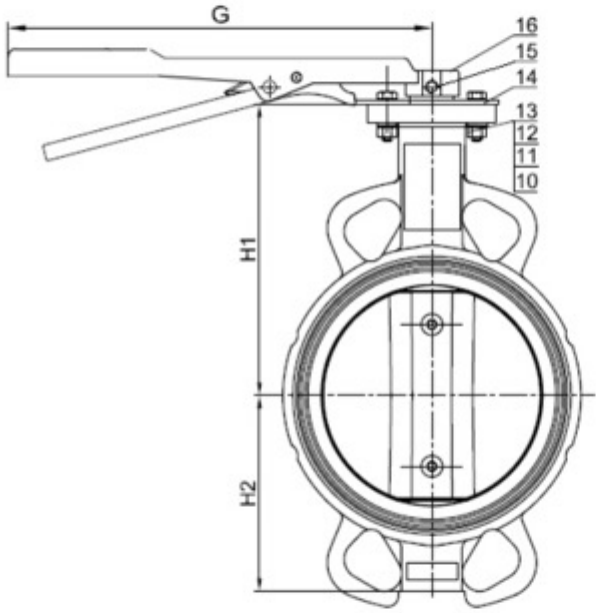
RESILIENT SEAT BUTTERFLY VALVE
WAFER DN50 - DN600
MODEL: BFW

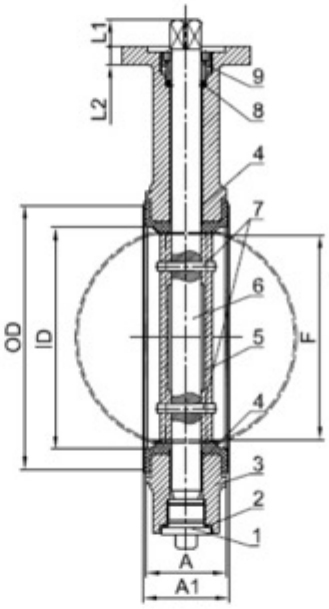
CHALLENGER VALVES AND ACTUATORS

TECHNICAL: DN50 - DN300

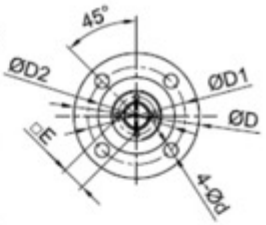
TECHNICAL: VALVE DETAILS

ITEM	COMPONENT	MATERIAL	GRADE	ITEM	COMPONENT	MATERIAL	GRADE
1	Plug	Stainless Steel	ASTM A276 - 304	9	Sealing Sleeve	Stainless Steel	ASTM A276 - 304
2	Sealing Gasket	PTFE		10	Hex Bolt	Stainless Steel	ASTM A276 - 316
3	Body and Vulcanized Seat	Ductile Iron Rubber	AS1831 - 450-10 AS1646 / AS681.1 - EPDM	11	Flat Washer	Stainless Steel	ASTM A276 - 316
4	Bushing	PTFE Steel Lined	PTFE / ASTM A276 - 316	12	Spring Washer	Stainless Steel	ASTM A276 - 316
5	Disc	Stainless Steel	ASTM A351 - CF8M	13	Hex Nut	Stainless Steel	ASTM A276 - 316
6	Stem	Stainless Steel	ASTM A276 - 431	14	Notch Plate	Stainless Steel	ASTM A276 - 304
7	Taper Pin	Stainless Steel	ASTM A276 - 316	15	Hex Bolt	Stainless Steel	ASTM A276 - 316
8	Y-Ring	Rubber	AS1646 / AS681.1 - EPDM	16	Lever	Malleable Iron	





ISO 5211 Mounting Pad



DIMENSIONS AND WEIGHTS

Size	A	A1	H1	H2	L1	L2	ØD	ØD1	ØD2	4-Ød	E	G	F	ID	OD	PCD		Compatible Flanges			Weight KG	
																Table D&E	ANSI# 150	Table D	Table E	ANSI#150	Lever	Gearbox
50	43	47	143	72	14	13	65	50 (F05)	35	4-7	11	266	24	56	71	114	121	4-M16	4-M16	4-UNC 5/8	4	6
65	46	50	156	78	14	13	65	50 (F05)	35	4-7	11	266	41	68	86	127	140	4-M16	4-M16	4-UNC 5/8	5	7
80	46	50	162	95	14	13	65	50 (F05)	35	4-7	11	266	61	82	102	146	152	4-M16	4-M16	4-UNC 5/8	5	7
100	52	56	177	108	18	13	90	70 (F07)	55	4-10	14	266	88	108	130	178	191	4-M16	8-M16	8-UNC 5/8	6	8
125	56	60	190	123	18	13	90	70 (F07)	55	4-10	14	266	108	127	155	210	216	8-M16	8-M16	8-UNC 3/4	8	10
150	56	60	205	117	18	13	90	70 (F07)	55	4-10	17	328	144	160	186	235	241	8-M16	8-M20	8-UNC 3/4	9	11
200	60	66	236	168	25	13	125	102 (F10)	70	4-12	17	386	192	207	239	292	299	8-M16	8-M20	8-UNC 3/4	14	17
250	68	74	267	207	25	13	125	102 (F10)	70	4-12	22	386	240	255	286	356	362	8-M20	12-M20	12-UNC 7/8	20	25
300	78	82	308	243	27	19	125	102 (F10)	70	4-12	22	386	290	307	341	406	432	12-M20	12-M24	12-UNC 7/8	32	37

COMPENSATION RINGS AND GASKETS MAY BE REQUIRED WHEN MOUNTING AGAINST SOME PIPES, PLEASE CHECK SEALING FACES.

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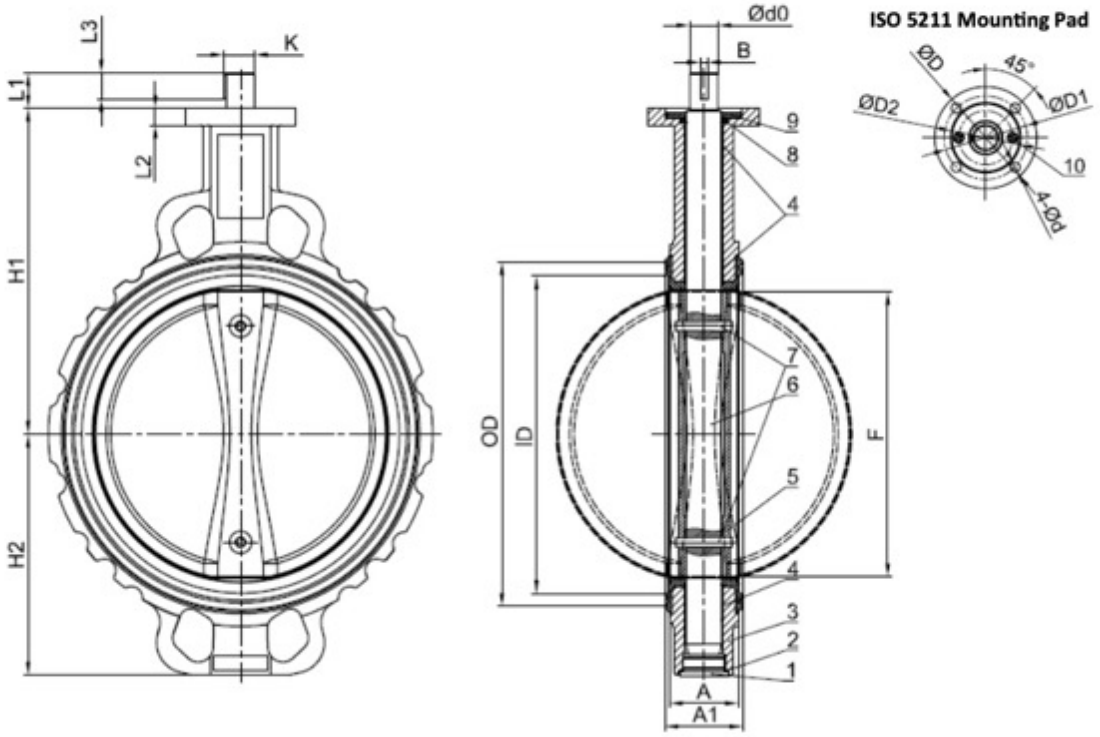
RESILIENT SEAT BUTTERFLY VALVE
WAFER DN50 - DN600
MODEL: BFW

CHALLENGER VALVES AND ACTUATORS

TECHNICAL: DN350

TECHNICAL: VALVE DETAILS

ITEM	COMPONENT	MATERIAL	GRADE	ITEM	COMPONENT	MATERIAL	GRADE
1	Plug	Stainless Steel	ASTM A276 - 304	6	Stem	Stainless Steel	ASTM A276 - 431
2	Sealing Gasket	PTFE		7	Taper Pin	Stainless Steel	ASTM A276 - 316
3	Body and Vulcanized Seat	Ductile Iron Rubber	AS1831 - 450-10 AS1646 / AS681.1 - EPDM	8	Y-Ring	Rubber	AS1646 / AS681.1 - EPDM
4	Bushing	PTFE Steel Lined	PTFE / ASTM A276 - 316	9	Gland	Stainless Steel	ASTM A276 - 304
5	Disc	Stainless Steel	ASTM A351 - CF8M	10	Cross Countersunk Head Screw	Stainless Steel	ASTM A276 - 316



DIMENSIONS AND WEIGHTS																							
Size	A	A1	H1	H2	L1	L2	L3	Ød0	F	K	ID	OD	B	ØD	ØD1	ØD2	4-Ød	PCD		Compatible Flanges			Weight KG	
																		Table D&E	ANSI# 150	Table D	Table E	ANSI#150	Bare Shaft	Gear Box
350	78	88	368	272	40	19	29.3	31.6	323	34.6	367	389	8	125	102 (F10)	86	4-12	470	476	12-M24	12-M24	12-UNC 1	42	56

COMPENSATION RINGS AND GASKETS MAY BE REQUIRED WHEN MOUNTING AGAINST SOME PIPES, PLEASE CHECK SEALING FACES.

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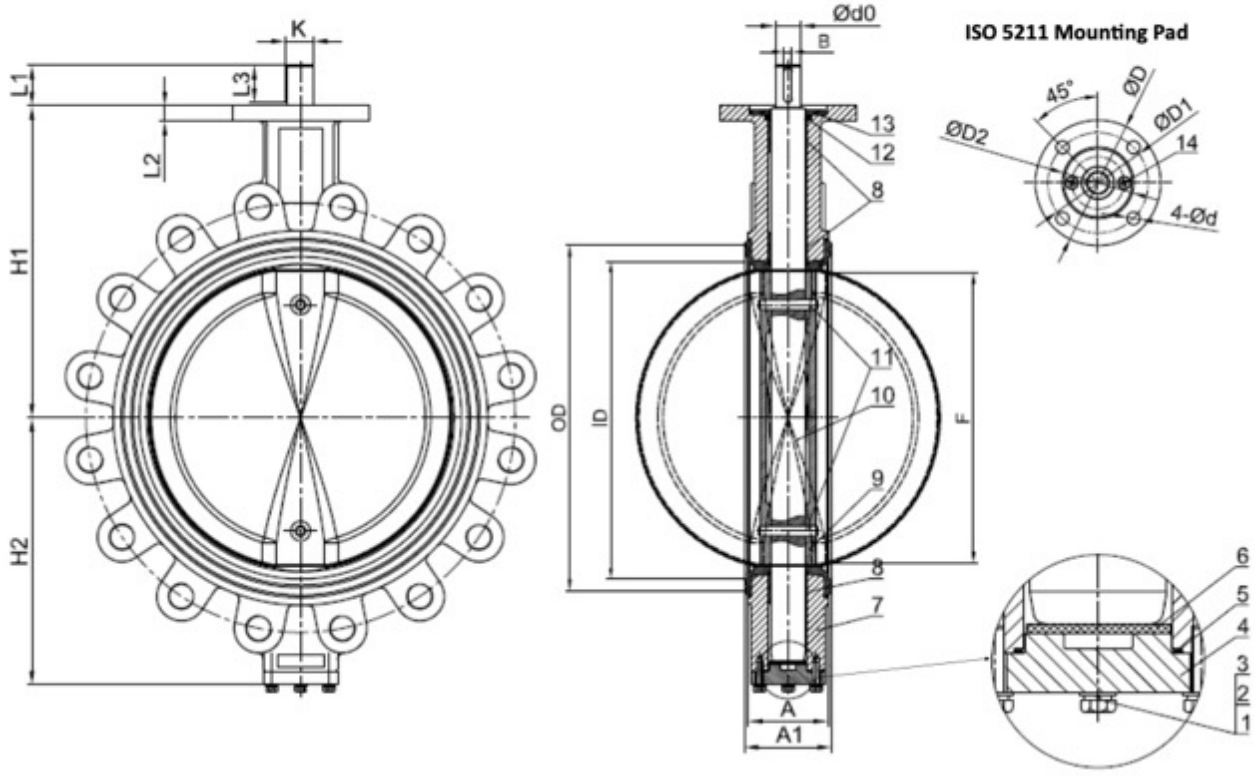
RESILIENT SEAT BUTTERFLY VALVE
LUGGED DN50 - DN600
MODEL: BFL

CHALLENGER
VALVES AND ACTUATORS

TECHNICAL: DN400-DN600

TECHNICAL: VALVE DETAILS

ITEM	COMPONENT	MATERIAL	GRADE	ITEM	COMPONENT	MATERIAL	GRADE
1	Hex Bolt	Stainless Steel	ASTM A276 - 316	8	Bushing	PTFE Steel Lined	PTFE / ASTM A276 - 316
2	Spring Washer	Stainless Steel	ASTM A276 - 316	9	Disc	Stainless Steel	ASTM A351 - CF8M
3	Flat Washer	Stainless Steel	ASTM A276 - 316	10	Stem	Stainless Steel	ASTM A276 - 431
4	Bottom Cover	Ductile Iron	AS1831 - 450-10	11	Taper Pin	Stainless Steel	ASTM A276 - 316
5	O-Ring	Rubber	AS1646 / AS681.1 - EPDM	12	Y-Ring	Rubber	AS1646 / AS681 - EPDM
6	Adjusting Gasket	Nylon		13	Gland	Ductile Iron	AS1831 - 450-10
7	Body and Vulcanized Seat	Ductile Iron Rubber	AS1831 - 450-10 AS1646 / AS681.1 - EPDM	14	Counter Sunk Head Screw	Stainless Steel	ASTM A276 - 316



DIMENSIONS AND WEIGHTS

Size	A	A1	H1	H2	L1	L2	L3	Ød0	F	ID	OD	K	B	ØD	ØD1	ØD2	4-Ød	PCD		NØd			Weight KGs	
																		Table D&E	ANSI#150	Table D	Table E	ANSI#150	Bare Shaft	Gear Box
400*	102	112	400	342	52	20	48	33.15	374	421	443	36.15	10	175	140(F14)	100	4-18	521	540	12-M24	12-M24	16-UNC 1	92	106
450*	114	124	422	372	52	20	48	38	424	447	499	41	10	175	140(F14)	100	4-18	584	578	12-M24	16-M24	16-UNC 11/8	120	141
500*	127	137	480	402	64	22	59	41.15	742	531	553	44.15	10	175	140(F14)	110	4-18	641	635	16-M24	16-M24	20-UNC 11/8	165	186
600*	154	164	562	467	70	22	69	50.65	518	619	643	54.65	16	210	165(F16)	130	4-23	756	749	16-M27	16-M30	20-UNC 11/4	210	234

*ANSI#150 IS A SPECIAL PURCHASE.
TOP AND BOTTOM FLANGE HOLES FOR DN500 AND DN600 ANSI#150 VALVES WILL HAVE DRILLED AND TAPPED BLIND HOLES.
COMPENSATION RINGS AND GASKETS MAY BE REQUIRED WHEN MOUNTING AGAINST SOME PIPES, PLEASE CHECK SEALING FACES.

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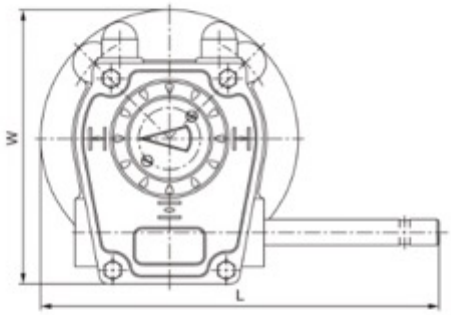
RESILIENT SEAT BUTTERFLY VALVE
WAFER DN50 - DN600
MODEL: BFW

CHALLENGER VALVES AND ACTUATORS

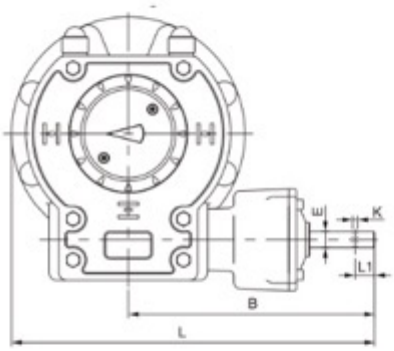
TECHNICAL: GEARBOX

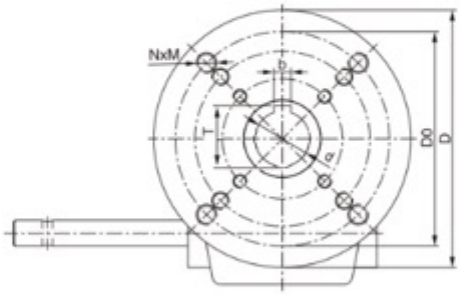
TECHNICAL: GEARBOX DETAILS

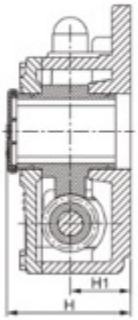
DN50-DN300



DN350-DN600







DIMENSIONS—GEARBOX																		
Size mm	L	B	H	H1	W	E	K	L1	D	D0	d	T	b	NxM	Ratio (:1)	Hand Wheel Diameter	Mechanical Advantage	Max Output Torque (Nm)	No. Turns
50	129	84	54	24	103	10	4	15	90	50 (F05)	11*	-	-	4xM6	41	140	11.07	160	10
65	129	84	54	24	103	10	4	15	90	50 (F05)	11*	-	-	4xM6	41	140	11.07	160	10
80	129	84	54	24	103	10	4	15	90	50 (F05)	11*	-	-	4xM6	41	140	11.07	160	10
100	129	84	54	24	103	10	4	15	90	70 (F07)	14*	-	-	4xM8	41	140	11.07	160	10
125	129	84	54	24	103	10	4	15	90	70 (F07)	14*	-	-	4xM8	41	140	11.07	160	10
150	129	84	54	24	103	10	4	15	90	70 (F07)	17*	-	-	4xM8	41	140	11.07	160	10
200	186.5	124	67	32	131.5	12	5	18	125	102 (F10)	17*	-	-	4xM10	42	140	11.34	300	10.5
250	219.5	157	73	36	147.5	15	5	20	125	102 (F10)	22*	-	-	4xM10	40	300	10.8	500	10
300	219.5	157	73	36	147.5	15	5	20	125	102 (F10)	22*	-	-	4xM10	40	300	10.8	500	10
350	350	262	97	47.5	200	20	6	24	175	102 (F10)	31.6	34.6	8	4xM10	140	200	32.2	1000	35
400	350	262	97	47.5	200	20	6	24	175	140 (F14)	33.15	36.15	10	4xM16	140	200	32.2	1000	35
450	388	283	105	51	241	20	6	24	210	140 (F14)	38	41	10	4xM16	156	300	40.56	2000	39
500	388	283	105	51	241	20	6	24	210	140 (F14)	41.15	44.15	10	4xM16	156	300	40.56	2000	39
600	393	286	109	55	259	20	6	24	210	165 (F16)	50.65	54.65	16	4xM20	227	400	59.02	3250	57

* DENOTES SQUARE SHAFT 45 DEGREES OFFSET
GEARBOX INPUT TORQUE = VALVE TORQUE DEVIDE MECHANICAL ADVANTAGE.

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RESILIENT SEAT BUTTERFLY VALVE
WAFER DN50 - DN600
MODEL: BFW

CHALLENGER VALVES AND ACTUATORS

TECHNICAL DATA

CV VALUES

Cv is defined as the volume of water in U.S.G.P.S that will flow through a given restriction or valve opening with a pressure drop of one (1) p.s.i at room temperature.
Recommended control angles are between 25°- 70° open.
Preferred angle for control valve sizing is 60° - 65° open.
Cv =1.167Kv

Cv VALUES														
Open° vs Size	50	65	80	100	125	150	200	250	300	350	400	450	500	600
10°	0.1	0.2	0.3	0.5	0.8	2	3	4	5	6	8	11	14	22
20°	5	8	12	17	29	45	89	151	234	338	464	615	791	1222
30°	12	20	22	36	61	95	188	320	495	715	983	1302	1674	2587
40°	24	37	39	78	133	205	408	694	1072	1549	2130	2822	3628	5605
50°	45	65	70	139	237	366	727	1237	1911	2761	3797	5028	6465	9989
60°	64	98	116	230	392	605	1202	2047	3162	4568	6282	8320	10698	16528
70°	90	144	183	364	620	958	1903	3240	5005	7230	9942	13168	16931	26157
80°	125	204	275	546	930	1437	2854	4859	7507	10844	14913	19752	25396	39236
90°	135	220	302	600	1022	1579	3136	5340	8250	11917	16388	21705	27908	43116

TORQUE DATA

Torque is the measure of the turning force on an object. For a butterfly valve the turning force is determined by the friction of the disc and the seat, bushing friction and fluid dynamic torque.

•TORQUE NOTES:
Results provided are differential pressure conditions with clean municipal water.
Torque figures provided do not include safety margin.
For conditions that vary from those noted, apply the following Application Factor Multipliers:
- Operated less than once per day x 1.2
- Dry Service with gas or air x 1.5
- Dry Service with abrasive powder x 1.7
- Lubricant oils x 0.5
- Temperature - lower than –4.5°C x 1.2
  - higher than 93°C x 1.2
- For NBR (Nitrile) Seat Figures will be 1.1 times

TORQUE VALUES (Nm)														
Size	50	65	80	100	125	150	200	250	300	350	400	450	500	600
16 BAR	8	11	15	25	35	62	129	245	340	475	730	1050	1270	2150

HOW TO ORDER

Series	Design	Seat	Disc & Stem	Connection	Rating	Size	Actuator	Accessories
BF	W	E	E	S	4	0100	H	

Example: DN100 BF Wafer Butterfly Valve, EPDM Seat, SS Trim, Wafer Style, PN16 with Lever Handle

Series
BF = AS4795.1 Certified Seal on Body Butterfly Valve

Design
W = Wafer Construction

Seat
E = EPDM
N = Nitrile (NBR)*
V = Viton*

Disc & Stem
E = CF8M Stainless Steel Disc & 431 Stainless Steel Stem

Connection
S = AS2129 Table E/D & ANSI #150 (Wafer Only)

Rating
1 = PN3* 2 = PN6*
3 = PN10* 4 = PN16

Size
0050 = 2" (50mm) 0150 = 6" (150mm) 0400 = 16" (400mm)
0065 = 2 1/2" (65mm) 0200 = 8" (200mm) 0450 = 18" (450mm)
0080 = 3" (80mm) 0250 = 10" (250mm) 0500 = 20" (500mm)
0100 = 4" (100mm) 0300 = 12" (300mm) 0600 = 24" (600mm)
0125 = 5 " (125mm) 0350 = 14" (350mm)

Actuator
BS = ISO Bare Shaft
H = Lever Handle DI (Not Available for DN350 - DN600)
W = Worm Gearbox (Standard—Clock Close Only)
WSA = SAMBO Gearbox (Anti Clockwise Close)
WSC = SAMBO Gearbox (Clockwise Close)
WD = Declutch able Gearbox
K = Gear Box with Key Cap
X = Other (Must Specify)

Accessories
Left Blank = No Accessories
CH = Chain Wheel (Chain Drop to be specified)
I = Input Stop Box
T = Torque Limiter
L = Lockout Device
D = Dial Position Indicator
B = Buried Service
X = Other (Must specify)

Note:
To include electric or pneumatic actuators, please specify the required part number by visiting the relevant data sheet.

For valve extension spindles, please specify the required part number as per the code builder on the relevant data sheet.

Visit the Challenger website to access further data sheets.

* Denotes valve not certified to AS4795.1 with these options.

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RESILIENT SEAT BUTTERFLY VALVE
LUGGED DN50 - DN600
MODEL: BFL

CHALLENGER
VALVES AND ACTUATORS

FEATURES AND BENEFITS

- Designed and tested in accordance with AS4795.1
- AS4795.1 OceanaMark Certified product by Iapmo R&T Oceana Licence No: OMK32103.
- WaterMark Approved product by Iapmo R&T Oceana Licence No: WM-032103.
- Water Quality tested and approved to AS4020.
- End of line service/isolation, full 16 bar rating with downstream flange removed.
- Bi – directional bubble tight sealing.
- Vulcanised seat held securely in position making it suitable for vacuum applications.
- High strength one piece through shaft secured by precision taper pins provides a strong and reliable disc to stem connection that is field replaceable.
- Blow-Out proof stem ensures operator safety and eliminates OH&S issues.
- Heavy duty shaft bushing ensures disc alignment & absorbs side thrusts, reducing valve wear whilst prolonging valve life.
- Suitable for high repetition, actuated applications.
- Precision disc machining ensures mirror image of seat profile enhancing low torque operation & reduced liner wear.
- ISO interface flange allows interchange and standardisation of actuation equipment.
- Stem seal connection is ensured with moulded double "O" rings, as well as an additional upper stem seal to provide greater design integrity.
- Robust, extended neck allows easy installation of insulation and ensures bearing integrity.
- Flange seal connection is ensured with moulded double "O" rings seals eliminating the requirement for flange gaskets.
- Lockable lever handle to prevent tampering.

OPTIONS

- Actuators
  - Electric
  - Pneumatic
  - Hydraulic
- Extensions
- Lockable Gearbox
- Chain wheel Operation
- Limit Switches

APPLICATIONS

Challenger Valves and Actuators are the ***"Right Choice for Valves and Actuation"*** when quality matters.

Servicing industries such as:
Water & Waste Water, Mining, Desalination, Pumping, Industrial Processing, Irrigation, Materials Handling and Chemical Services.

TECHNICAL SPECIFICATION

Construction:	Lugged Concentric Seal On Body Butterfly Valve
Size:	50mm - 600mm
Pressure Rating:	PN16
Face to Face:	ISO5752 Series 20/AS4795.1
Flange Drilling:	AS4087 PN16 (Table D) AS2129 Table E ANSI B16.5 #150
Coatings:	Fusion Bonded Epoxy AS4158 AKZO Nobel R4-ES HJF01R
Temperature Range:	**AS4020 Compliance** EPDM 0°C to 40°C **General Application** EPDM 0-85°C (Optimum Range) -10°C to 120°C (Intermittent) Nitrile -10°C to 80°C
Pressure Testing:	AS4795.1
Mounting Pad:	ISO5211
Max Velocity:	5m/s (max) 7.5m/s (emergency)
Negative Pressure:	0.1MPa (vacuum)

WaterMark
IAPMO R&T OCEANA OceanaMark

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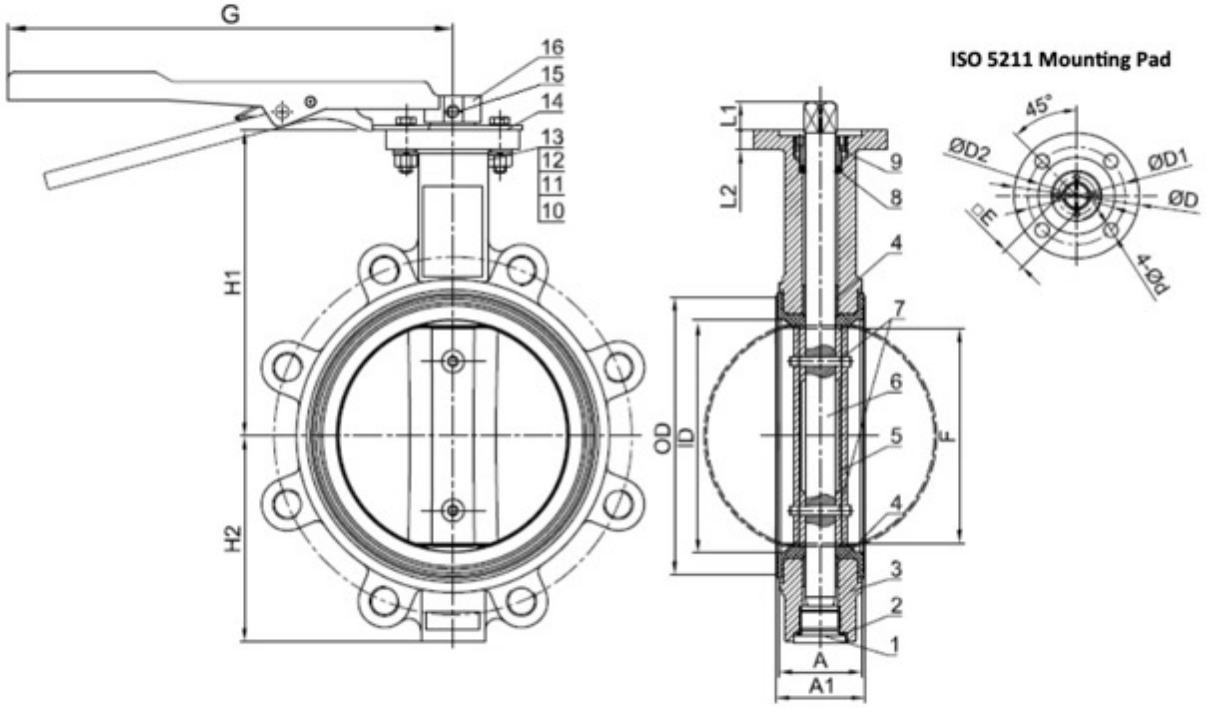
RESILIENT SEAT BUTTERFLY VALVE
LUGGED DN50 - DN600
MODEL: BFL

CHALLENGER VALVES AND ACTUATORS

TECHNICAL: DN50 - DN300

TECHNICAL : VALVE DETAILS

ITEM	COMPONENT	MATERIAL	GRADE	ITEM	COMPONENT	MATERIAL	GRADE
1	Plug	Stainless Steel	ASTM A276 - 304	9	Sealing Sleeve	Stainless Steel	ASTM A276 - 304
2	Sealing Gasket	PTFE		10	Hex Bolt	Stainless Steel	ASTM A276 - 316
3	Body and Vulcanized Seat	Ductile Iron Rubber	AS1831 - 450-10 AS1646 / AS681.1 - EPDM	11	Flat Washer	Stainless Steel	ASTM A276 - 316
4	Bushing	PTFE Steel Lined	PTFE / ASTM A276 - 316	12	Spring Washer	Stainless Steel	ASTM A276 - 316
5	Disc	Stainless Steel	ASTM A351 - CF8M	13	Hex Nut	Stainless Steel	ASTM A276 - 316
6	Stem	Stainless Steel	ASTM A276 - 431	14	Notch Plate	Stainless Steel	ASTM A276 - 304
7	Taper Pin	Stainless Steel	ASTM A276 - 316	15	Hex Bolt	Stainless Steel	ASTM A276 - 316
8	Y-Ring	Rubber	AS1646 / AS681.1 - EPDM	16	Lever	Malleable Iron	



DIMENSIONS AND WEIGHTS

Size	A	A1	H1	H2	L1	L2	ØD	ØD1	ØD2	4-Ød	E	F	G	ID	OD	PCD		Compatible Flanges			Weight KG	
																Table D&E	ANSI#150	Table D	Table E	ANSI#150	Lever	Gear Box
50	43	47	143	72	14	13	65	50 (F05)	35	4-7	11	24	266	56	71	114	121	4-M16	4-M16	4-UNC 5/8	5	7
65	46	50	156	78	14	13	65	50 (F05)	35	4-7	11	41	266	68	86	127	140	4-M16	4-M16	4-UNC 5/8	5	7
80	46	50	162	95	14	13	65	50 (F05)	35	4-7	11	61	266	82	102	146	152	4-M16	4-M16	4-UNC 5/8	6	8
100	52	56	177	108	18	13	90	70 (F07)	55	4-10	14	88	266	108	130	178	191	4-M16	8-M16	8-UNC 5/8	9	11
125	56	60	190	123	18	13	90	70 (F07)	55	4-10	14	108	266	127	155	210	216	8-M16	8-M16	8-UNC 3/4	11	13
150	56	60	205	117	18	13	90	70 (F07)	55	4-10	17	144	328	160	186	235	241	8-M16	8-M20	8-UNC 3/4	12	14
200	60	66	236	168	25	13	125	102 (F10)	70	4-12	17	192	386	207	239	292	299	8-M16	8-M20	8-UNC 3/4	18	21
250	68	74	267	207	25	13	125	102 (F10)	70	4-12	22	240	386	255	286	356	362	8-M20	12-M20	12-UNC 7/8	32	37
300	78	84	308	243	27	19	125	102 (F10)	70	4-12	22	290	386	307	341	406	432	12-M20	12-M24	12-UNC 7/8	45	50

COMPENSATION RINGS AND GASKETS MAY BE REQUIRED WHEN MOUNTING AGAINST SOME PIPES, PLEASE CHECK SEALING FACES.

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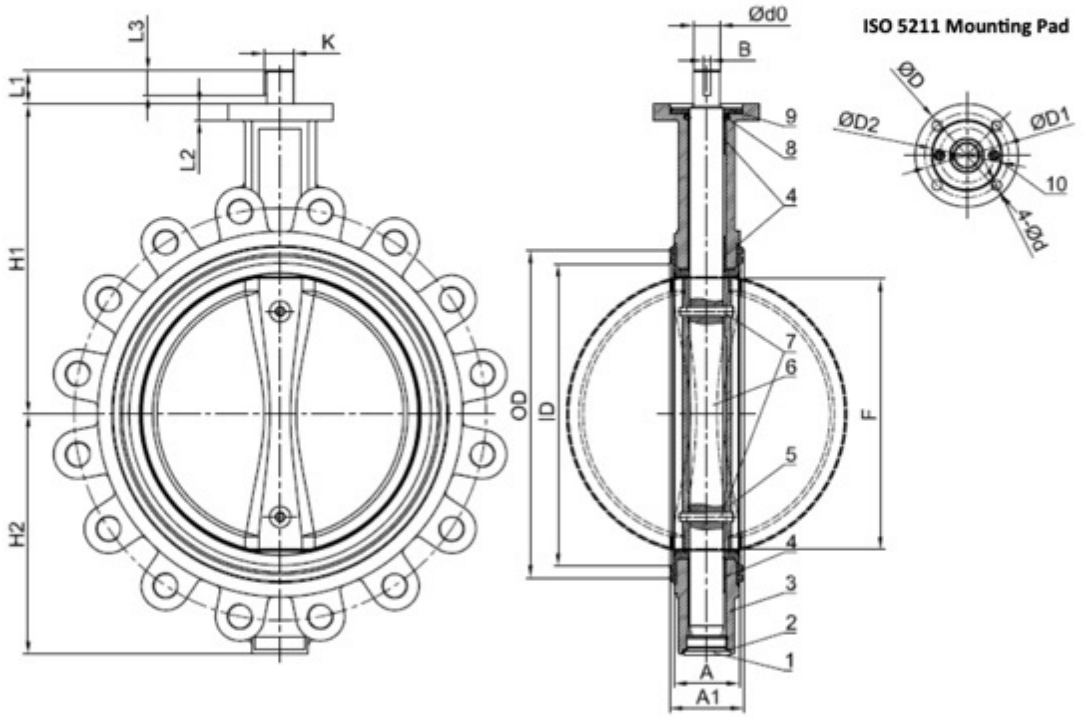
RESILIENT SEAT BUTTERFLY VALVE
LUGGED DN50 - DN600
MODEL: BFL

CHALLENGER VALVES AND ACTUATORS

TECHNICAL: DN350

TECHNICAL: VALVE DETAILS

ITEM	COMPONENT	MATERIAL	GRADE	ITEM	COMPONENT	MATERIAL	GRADE
1	Plug	Stainless Steel	ASTM A276 - 304	6	Stem	Stainless Steel	ASTM A276 - 431
2	Sealing Gasket	PTFE		7	Taper Pin	Stainless Steel	ASTM A276 - 316
3	Body and Vulcanized Seat	Ductile Iron Rubber	AS1831 - 450-10 AS1646 / AS681.1 - EPDM	8	Y-Ring	Rubber	AS1646 / AS681.1 - EPDM
4	Bushing	PTFE Steel Lined	PTFE / ASTM A276 - 316	9	Gland	Stainless Steel	ASTM A276 - 304
5	Disc	Stainless Steel	ASTM A351 - CF8M	10	Cross Countersunk Head Screw	Stainless Steel	ASTM A276 - 316



DIMENSIONS AND WEIGHTS

Size	A	A1	H1	H2	L1	L2	L3	Ød0	F	ID	OD	K	B	ØD	ØD1	ØD2	4-Ød	PCD		NØd			Weight KG	
																		Table D&E	ANSI#150	Table D	Table E	ANSI#150	Bare Shaft	Gear Box
*350	78	88	368	272	34	19	29.3	31.6	323	367	389	34.6	8	125	102 (F10)	86	4-12	470	476	12-M24	12-M24	12-UNC 1	70	84

*ANSI#150 IS A SPECIAL PURCHASE
COMPENSATION RINGS AND GASKETS MAY BE REQUIRED WHEN MOUNTING AGAINST SOME PIPES, PLEASE CHECK SEALING FACES.

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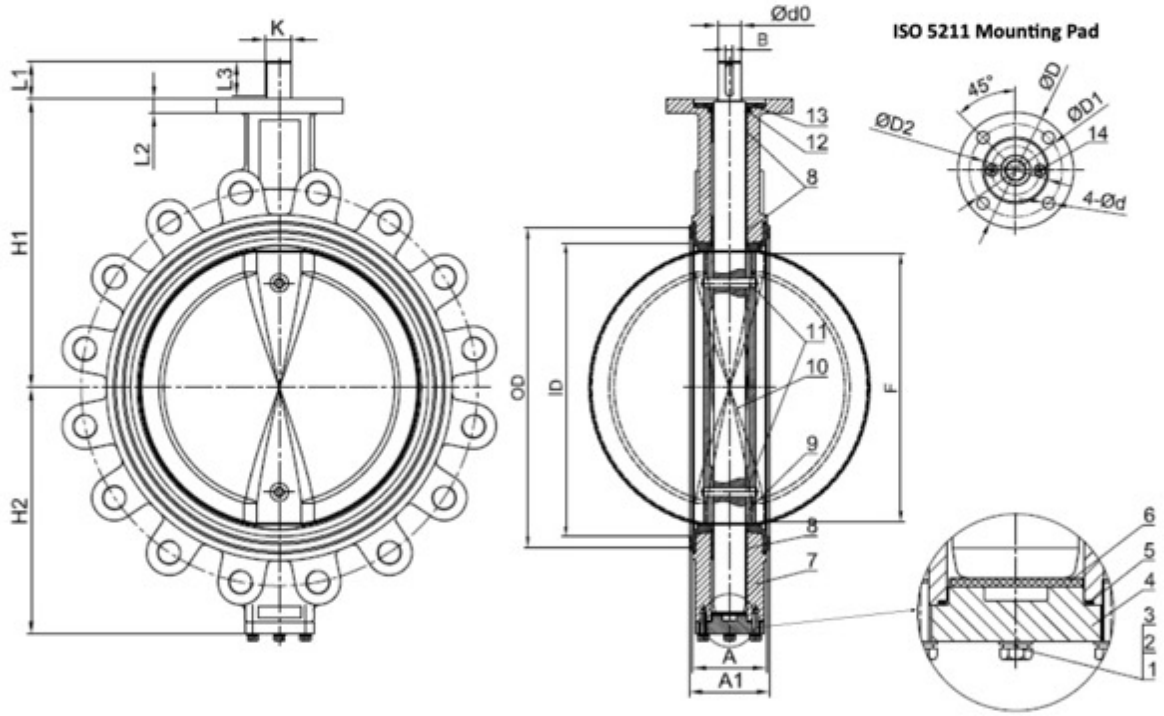
RESILIENT SEAT BUTTERFLY VALVE
LUGGED DN50 - DN600
MODEL: BFL

CHALLENGER VALVES AND ACTUATORS

TECHNICAL: DN400-DN600

TECHNICAL: VALVE DETAILS

ITEM	COMPONENT	MATERIAL	GRADE	ITEM	COMPONENT	MATERIAL	GRADE
1	Hex Bolt	Stainless Steel	ASTM A276 - 316	8	Bushing	PTFE Steel Lined	PTFE / ASTM A276 - 316
2	Spring Washer	Stainless Steel	ASTM A276 - 316	9	Disc	Stainless Steel	ASTM A351 - CF8M
3	Flat Washer	Stainless Steel	ASTM A276 - 316	10	Stem	Stainless Steel	ASTM A276 - 431
4	Bottom Cover	Ductile Iron	AS1831 - 450-10	11	Taper Pin	Stainless Steel	ASTM A276 - 316
5	O-Ring	Rubber	AS1646 / AS681.1 - EPDM	12	Y-Ring	Rubber	AS1646 / AS681 - EPDM
6	Adjusting Gasket	Nylon		13	Gland	Ductile Iron	AS1831 - 450-10
7	Body and Vulcanized Seat	Ductile Iron Rubber	AS1831 - 450-10 AS1646 / AS681.1 - EPDM	14	Counter Sunk Head Screw	Stainless Steel	ASTM A276 - 316



DIMENSIONS AND WEIGHTS

Size	A	A1	H1	H2	L1	L2	L3	Ød0	F	ID	OD	K	B	ØD	ØD1	ØD2	4-Ød	PCD Table D&E	PCD ANSI#150	NØd Table D	NØd Table E	NØd ANSI#150	Weight KGs Bare Shaft	Weight KGs Gear Box
400*	102	112	400	342	52	20	48	33.15	374	421	443	36.15	10	175	140(F14)	100	4-18	521	540	12-M24	12-M24	16-UNC 1	92	106
450*	114	124	422	372	52	20	48	38	424	447	499	41	10	175	140(F14)	100	4-18	584	578	12-M24	16-M24	16-UNC 11/8	120	141
500*	127	137	480	402	64	22	59	41.15	742	531	553	44.15	10	175	140(F14)	110	4-18	641	635	16-M24	16-M24	20-UNC 11/8	165	186
600*	154	164	562	467	70	22	69	50.65	518	619	643	54.65	16	210	165(F16)	130	4-23	756	749	16-M27	16-M30	20-UNC 11/4	210	234

*ANSI#150 IS A SPECIAL PURCHASE.
TOP AND BOTTOM FLANGE HOLES FOR DN500 AND DN600 ANSI#150 VALVES WILL HAVE DRILLED AND TAPPED BLIND HOLES.
COMPENSATION RINGS AND GASKETS MAY BE REQUIRED WHEN MOUNTING AGAINST SOME PIPES, PLEASE CHECK SEALING FACES.

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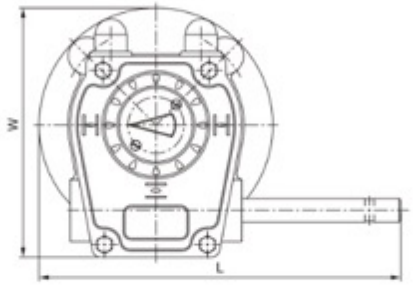
RESILIENT SEAT BUTTERFLY VALVE
LUGGED DN50 - DN600
MODEL: BFL

CHALLENGER VALVES AND ACTUATORS

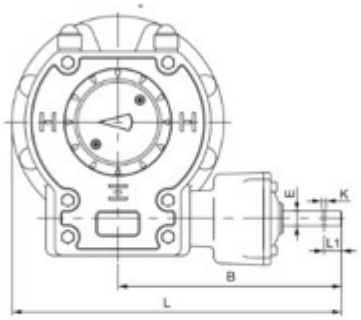
TECHNICAL: GEARBOX

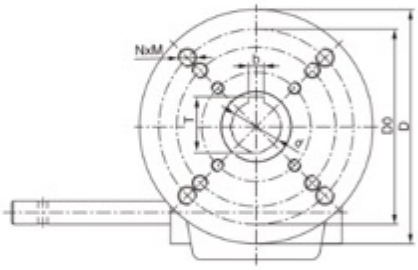
TECHNICAL: GEARBOX DETAILS

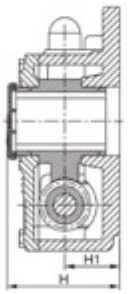
DN50-DN300



DN350-DN600







DIMENSIONS—GEARBOX

Size mm	L	B	H	H1	W	E	K	L1	D	D0	d	T	b	NxM	Ratio (:1)	Hand Wheel Diameter	Mechanical Advantage	Max Output Torque (Nm)	No. Turns
50	129	84	54	24	103	10	4	15	90	50 (F05)	11*	-	-	4xM6	41	140	11.07	160	10
65	129	84	54	24	103	10	4	15	90	50 (F05)	11*	-	-	4xM6	41	140	11.07	160	10
80	129	84	54	24	103	10	4	15	90	50 (F05)	11*	-	-	4xM6	41	140	11.07	160	10
100	129	84	54	24	103	10	4	15	90	70 (F07)	14*	-	-	4xM8	41	140	11.07	160	10
125	129	84	54	24	103	10	4	15	90	70 (F07)	14*	-	-	4xM8	41	140	11.07	160	10
150	129	84	54	24	103	10	4	15	90	70 (F07)	17*	-	-	4xM8	41	140	11.07	160	10
200	186.5	124	67	32	131.5	12	5	18	125	102 (F10)	17*	-	-	4xM10	42	140	11.34	300	10.5
250	219.5	157	73	36	147.5	15	5	20	125	102 (F10)	22*	-	-	4xM10	40	300	10.8	500	10
300	219.5	157	73	36	147.5	15	5	20	125	102 (F10)	22*	-	-	4xM10	40	300	10.8	500	10
350	350	262	97	47.5	200	20	6	24	175	102 (F10)	31.6	34.6	8	4xM10	140	200	32.2	1000	35
400	350	262	97	47.5	200	20	6	24	175	140 (F14)	33.15	36.15	10	4xM16	140	200	32.2	1000	35
450	388	283	105	51	241	20	6	24	210	140 (F14)	38	41	10	4xM16	156	300	40.56	2000	39
500	388	283	105	51	241	20	6	24	210	140 (F14)	41.15	44.15	10	4xM16	156	300	40.56	2000	39
600	393	286	109	55	259	20	6	24	210	165 (F16)	50.65	54.65	16	4xM20	227	400	59.02	3250	57

* DENOTES SQUARE SHAFT 45 DEGREES OFFSET
GEARBOX INPUT TORQUE = VALVE TORQUE DEVIDE MECHANICAL ADVANTAGE.

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RESILIENT SEAT BUTTERFLY VALVE
LUGGED DN50 - DN600
MODEL: BFL

CHALLENGER VALVES AND ACTUATORS

TECHNICAL DATA

CV VALUES

Cv is defined as the volume of water in U.S.G.P.S that will flow through a given restriction or valve opening with a pressure drop of one (1) p.s.i at room temperature.
Recommended control angles are between 25°- 70° open.
Preferred angle for control valve sizing is 60° - 65° open.
Cv = 1.167Kv

Cv VALUES														
Open° vs Size	50	65	80	100	125	150	200	250	300	350	400	450	500	600
10°	0.1	0.2	0.3	0.5	0.8	2	3	4	5	6	8	11	14	22
20°	5	8	12	17	29	45	89	151	234	338	464	615	791	1222
30°	12	20	22	36	61	95	188	320	495	715	983	1302	1674	2587
40°	24	37	39	78	133	205	408	694	1072	1549	2130	2822	3628	5605
50°	45	65	70	139	237	366	727	1237	1911	2761	3797	5028	6465	9989
60°	64	98	116	230	392	605	1202	2047	3162	4568	6282	8320	10698	16528
70°	90	144	183	364	620	958	1903	3240	5005	7230	9942	13168	16931	26157
80°	125	204	275	546	930	1437	2854	4859	7507	10844	14913	19752	25396	39236
90°	135	220	302	600	1022	1579	3136	5340	8250	11917	16388	21705	27908	43116

TORQUE DATA

Torque is the measure of the turning force on an object. For a butterfly valve the turning force is determined by the friction of the disc and the seat, bushing friction and fluid dynamic torque.

***TORQUE NOTES:**
Results provided are differential pressure conditions with clean municipal water.
Torque figures provided do not include safety margin.
For conditions that vary from those noted, apply the following Application Factor Multipliers:
- Operated less than once per day x 1.2
- Dry Service with gas or air x 1.5
- Dry Service with abrasive powder x 1.7
- Lubricant oils x 0.5
- Temperature - lower than –4.5°C x 1.2
  - higher than 93°C x 1.2
- For NBR (Nitrile) Seat Figures will be 1.1 times

TORQUE VALUES (Nm)														
Size	50	65	80	100	125	150	200	250	300	350	400	450	500	600
16 BAR	8	11	15	25	35	62	129	245	340	475	730	1050	1270	2150

HOW TO ORDER							
Series	Design	Seat	Disc & Stem	Connection	Rating	Size	Actuator	Accessories
BF	L	E	E	E	4	0100	H	

Example: DN100 BF Lugged Butterfly Valve, EPDM Seat, SS Trim, Lugged AS2129 Table E, PN16 with Lever Handle

Series
BF = AS4795.1 Certified Seal on Body Butterfly Valve

Design
L = Lugged Construction

Seat
E = EPDM
N = Nitrile (NBR)*
V = Viton*

Disc & Stem
E = CF8M Stainless Steel Disc & 431 Stainless Steel Stem

Connection
D = AS2129 Table D
E = AS2129 Table E
A = ANSI #150

Rating
1 = PN3* 2 = PN6*
3 = PN10* 4 = PN16

Size
0050 = 2" (50mm) 0150 = 6" (150mm) 0400 = 16" (400mm)
0065 = 2 1/2" (65mm) 0200 = 8" (200mm) 0450 = 18" (450mm)
0080 = 3" (80mm) 0250 = 10" (250mm) 0500 = 20" (500mm)
0100 = 4" (100mm) 0300 = 12" (300mm) 0600 = 24" (600mm)
0125 = 5 " (125mm) 0350 = 14" (350mm)

Actuator
BS = ISO Bare Shaft
H = Lever Handle DI (Not available for DN350-DN600)
W = Worm Gearbox (Standard—Clock Close Only)
WSA = SAMBO Gearbox (Anti Clockwise Close)
WSC = SAMBO Gearbox (Clockwise Close)
WD = Declutch able Gearbox
K = Gearbox with Key Cap
X = Other (Must Specify)

Accessories
Left Blank = No Accessories
CH = Chain Wheel (Chain Drop to be specified)
I = Input Stop Box
T = Torque Limiter
L = Lockout Device
D = Dial Position Indicator
B = Buried Service
X = Other (Must specify)

Note:
To include electric or pneumatic actuators, please specify the required part number as per the relevant data sheet.

For valve extension spindles, please specify the required part number as per the code builder on the relevant data sheet.

Visit the Challenger website to access further data sheets.

*** Denotes valve not certified to AS4795.1 with these options**

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APPENDIX B - QUALITY CERTIFICATIONS

Copies of the following Quality Certification Certificates are also available from WSAA.

TABLE B1
CMW-BVA VALVES PTY LTD– MANAGEMENT SYSTEMS

3 Glenn St Shepparton Vic	
Quality Systems Standard	ISO 9001:2015
Certification Licence No.	QEC 10507
Certifying Agency	SAI-Global
First Date of Certification	24 April 1997
Current Date of Certification	31 March 2021
Expiry Date of Certification	17 April 2024

TABLE B2
TIANJIN GALAXY VALVE CO LTD – MANAGEMENT SYSTEMS

No 4 Construction Six Branch Road Balitai Industry Area Jinnan District Tianjin China	
Quality Systems Standard	ISO 9001:2015
Certification Licence No.	10233928
Certifying Agency	Lloyds Register
First Date of Certification	29 December 2004
Current Date of Certification	29 December 2019
Expiry Date of Certification	28 December 2022

TABLE B3
TIANJIN GALAXY METAL PRODUCTS CO LTD – MANAGEMENT SYSTEMS

No 49 Guanghui Road Beizhakou Town Jinnan District Tianjin China	
Quality Systems Standard	ISO 9001:2015
Certification Licence No.	10189720
Certifying Agency	Lloyds Register
First Date of Certification	8 May 2019
Current Date of Certification	8 May 2019
Expiry Date of Certification	7 May 2022

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TABLE B4
CHALLENGER VALVES AND ACTUATORS – PRODUCT CERTIFICATION

3 Glenn St Shepparton Vic	
Product Standard/Spec.	AS 4795.1:2001
Certificate No.	OMK32103
Issuing Certification Body	IAPMO R&T Oceana
First Date of Certification	8 May 2020
Current Date of Certification	8 May 2020
Expiry Date of Certification	7 May 2025

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CERTIFICATE OF REGISTRATION

This is to certify that:

CMW-BVA Valves Pty. Ltd.

Trading as
Challenger Valves and Actuators Pty. Ltd.

3 Glenn Street Shepparton VIC 3630 AUSTRALIA

operates a

QUALITY MANAGEMENT SYSTEM

which complies with the requirements of

ISO 9001:2015

for the following scope

The sale, assembly and distribution of process control valves and fittings.

Certificate No: QEC10507

Issued: 31 March 2021
Originally Certified: 24 April 1997
Expires: 17 April 2024
Current Certification: 31 March 2021

Frank Camasta
Global Head of Technical Services
SAI Global Assurance

Certified System
ISO 9001

JAS-ANZ
WWW.JAS-ANZ.ORG/REGISTER

Registered by:
SAI Global Certification Services Pty Ltd (ACN 108 716 669) 680 George Street Sydney NSW 2000 Australia with SAI Global Pty Limited 680 George Street Sydney NSW 2000 Australia ("SAI Global") and subject to the SAI Global Terms and Conditions for Certification. While all due care and skill was exercised in carrying out this assessment, SAI Global accepts responsibility only for proven negligence. This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. To verify that this certificate is current please refer to SAI Global On-Line Certification register at http://register.saiglobal.com/

SAI GLOBAL

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Lloyd's Register

Current issue date: 29 December 2019
Expiry date: 28 December 2022
Certificate identity number: 10233928

Original approval(s):
ISO 9001 - 29 December 2004

Certificate of Approval

This is to certify that the Management System of:

Tianjin Galaxy Valve Co., Ltd.

No. 4, Construction Six Branch Road, Balitai Industry Area, Jinnan District, Tianjin City 300350, China

Unified Social Credit Code: 911201127548218844

has been approved by Lloyd's Register to the following standards:

ISO 9001:2015
GB/T 19001-2016

Approval number(s): ISO 9001 – 0070720

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:

Design and manufacture of valves, strainers and NEUMAX actuators. Manufacture of valve castings.

Rhett Wang

Area Operations Manager, Greater China

Issued by: Lloyd's Register Quality Assurance (Shanghai) Co., Ltd.

for and on behalf of: Lloyd's Register Quality Assurance Limited

UKAS MANAGEMENT SYSTEMS 001

The certificate can be checked for validity on CNCA website (www.cnca.gov.cn) 30 working days after the date of issuance. This approval is subject to surveillance assessment carried out in accordance with the LRQA assessment and certification procedures.
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Issued by: Lloyd's Register Quality Assurance (Shanghai) Co., Ltd., Room 2018, Ocean Tower, No. 550 Yan An Dong Road, Shanghai, 200001 for and on behalf of: Lloyd's Register Quality Assurance Limited, 1 Trinity Park, Bickenhill Lane, Birmingham B37 7ES, United Kingdom

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Lloyd's Register

Certificate of Approval

This is to certify that the Management System of:

Tianjin Galaxy Metal Products Co.,Ltd

No.49 , Guanghui Road, Beizhakou Town, Jinnan District, Tianjin City, China

Unified Social Credit Code: 91120112671469 90XK

has been approved by LRQA to the following standards:

ISO 9001:2015

GB/T 19001-2016

Rhett Wang - Area Operations Manager, Greater China

Issued by: Lloyd's Register Quality Assurance (Shanghai) Co., Ltd.

for and on behalf of: Lloyd's Register Quality Assurance Limited

Current issue date: 8 May 2019
Expiry date: 7 May 2022
Certificate identity number: 10189720

Original approval(s):
ISO 9001 – 8 May 2019

Approval number(s): ISO 9001 – 00020135

The scope of this approval is applicable to:
Manufacture of iron steel valve castings.

UKAS MANAGEMENT SYSTEMS
001

The certificate can be checked for validity on CNCA website (www.cnca.gov.cn) 30 working days after the date of issuance. This approval is subject to surveillance assessment carried out in accordance with the LRQA assessment and certification procedures.
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IAPMO R&T OCEANA

7-11 Fullard Road, Narre Warren, Victoria 3805, Australia

OceanaMark

www.jas-anz.org/register

IAPMO R&T Oceana is a product certification body which inspects and arranges for the independent laboratory testing of samples taken from the manufacturer's stock or from the market or a combination of both, to verify compliance of the requirements of applicable Standards and Specifications. This activity is coupled with periodic surveillance of the certified product taken from the market place or the manufacturer's factory. This certification is subject to the conditions set forth in the characteristics below and is not to be construed as any recommendation, assurance or guarantee by IAPMO R&T Oceana of the product acceptance by Authorities Having Jurisdiction. The IAPMO R&T Oceana "OceanaMark" Product Certification Scheme is a JAS-ANZ accredited ISO Guide 67 Type 5 Product Certification Scheme.

OCEANAMARK LICENCE

IAPMO R&T Oceana hereby grants to:

Challenger Valves and Actuators Pty, Ltd.

A.B.N.: 81 006 321 704

3 Glenn Street, Shepparton, 3630 Australia

the right to use the OceanaMark in accordance with IAPMO R&T Oceana Pty Ltd 'Mark Rules' on the product as described in the attached OceanaMark Schedule. The Certificate is granted subject to IAPMO R&T Oceana Pty Ltd 'Governance Rules'. the right to use the WaterMark in accordance with the Procedures for Certification of Plumbing and Drainage Products - WaterMark Technical Specification and the Plumbing Code of Australia only in respect of the certified product as described in the attached WaterMark Schedule. The Licence is granted subject to the rules governing the Watermark Certification Scheme and the Terms and Conditions for WaterMark Certification

Evaluated to:

AS 4795.1-2011

Butterfly valves for waterworks purposes - Wafer and lugged

Manufacturer:

Refer to Licence Holder

Licence No.:	OMK32103	**First Certified:**	8 May 2020
Certification Date:	8 May 2020	**Expiry Date:**	7 May 2025

Chief Executive Officer of The IAPMO Group

This OceanaMark certification is for the period indicated herein and is void after the date shown above. Any change in material, manufacturing process, marking or design without having first obtained the approval of IAPMO R&T Oceana, or any evidence of non-compliance with applicable Standards, Specifications or of inferior workmanship, may be deemed sufficient cause for revocation of this certification. Reproduction of or reference to this certificate for advertising purposes may be made only by specific written permission of IAPMO R&T Oceana. Any alteration of this certificate could be grounds for revocation of this certification.

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OCEANAMARK SCHEDULE

Certificate Holder: Challenger Valves and Actuators Pty, Ltd.
Address: 3 Glenn Street, Shepparton, 3630 Australia
A.B.N.: 81 006 321 704
Manufacturer: Refer to Licence Holder

Licence No: OMK32103
Certification Date: 8 May 2020
Expiry Date: 7 May 2025
First Certified: 8 May 2020
Standards: AS 4795.1-2011
Title: Butterfly valves for waterworks purposes - Wafer and lugged

Brand Name	Model Name	Model ID	Product Type	Product Description	Nominal Size	End Connection	Nominal Pressure	Material	Operating Mechanism
Challenger	2302V	BFWEES40050	Butterfly valve	Wafer butterfly valve	DN50	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2302V	BFWEES40065	Butterfly valve	Wafer butterfly valve	DN65	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2302V	BFWEES40080	Butterfly valve	Wafer butterfly valve	DN80	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2302V	BFWEES40100	Butterfly valve	Wafer butterfly valve	DN100	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2302V	BFWEES40125	Butterfly valve	Wafer butterfly valve	DN125	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2302V	BFWEES40150	Butterfly valve	Wafer butterfly valve	DN150	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2302V	BFWEES40200	Butterfly valve	Wafer butterfly valve	DN200	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2302V	BFWEES40250	Butterfly valve	Wafer butterfly valve	DN250	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2302V	BFWEES40300	Butterfly valve	Wafer butterfly valve	DN300	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2302V	BFWEES40350	Butterfly valve	Wafer butterfly valve	DN350	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator
Challenger	2302V	BFWEES40400	Butterfly valve	Wafer butterfly valve	DN400	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator
Challenger	2302V	BFWEES40450	Butterfly valve	Wafer butterfly valve	DN450	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator
Challenger	2302V	BFWEES40500	Butterfly valve	Wafer butterfly valve	DN500	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator
Challenger	2302V	BFWEES40600	Butterfly valve	Wafer butterfly valve	DN600	Wafer	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator
Challenger	2502V	BFLEE-40050	Butterfly valve	Lugged butterfly valve	DN50	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2502V	BFLEE-40065	Butterfly valve	Lugged butterfly valve	DN65	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2502V	BFLEE-40080	Butterfly valve	Lugged butterfly valve	DN80	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2502V	BFLEE-40100	Butterfly valve	Lugged butterfly valve	DN100	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2502V	BFLEE-40125	Butterfly valve	Lugged butterfly valve	DN125	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2502V	BFLEE-40150	Butterfly valve	Lugged butterfly valve	DN150	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator

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Brand Name	Model Name	Model ID	Product Type	Product Description	Nominal Size	End Connection	Nominal Pressure	Material	Operating Mechanism
Challenger	2502V	BFLEE-40200	Butterfly valve	Lugged butterfly valve	DN200	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2502V	BFLEE-40250	Butterfly valve	Lugged butterfly valve	DN250	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2502V	BFLEE-40300	Butterfly valve	Lugged butterfly valve	DN300	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Handle / Gearbox / Actuator
Challenger	2502V	BFLEE-40350	Butterfly valve	Lugged butterfly valve	DN350	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator
Challenger	2502V	BFLEE-40400	Butterfly valve	Lugged butterfly valve	DN400	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator
Challenger	2502V	BFLEE-40450	Butterfly valve	Lugged butterfly valve	DN450	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator
Challenger	2502V	BFLEE-40500	Butterfly valve	Lugged butterfly valve	DN500	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator
Challenger	2502V	BFLEE-40600	Butterfly valve	Lugged butterfly valve	DN600	Lugged	PN16	Ductile cast iron body with stainless steel disc and EPDM seal	Bare Shaft / Gearbox / Actuator

END RECORD **END RECORD**

Chief Executive Officer of The IAPMO Group

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APPENDIX C - SUPPLIER CONTACTS

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