SERIES 200

HIGH PERFORMANCE BUTTERFLY VALVE

INCO®
VALVE AND CONTROLS

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IncoValve® is a Subsidiary of AR Controls®

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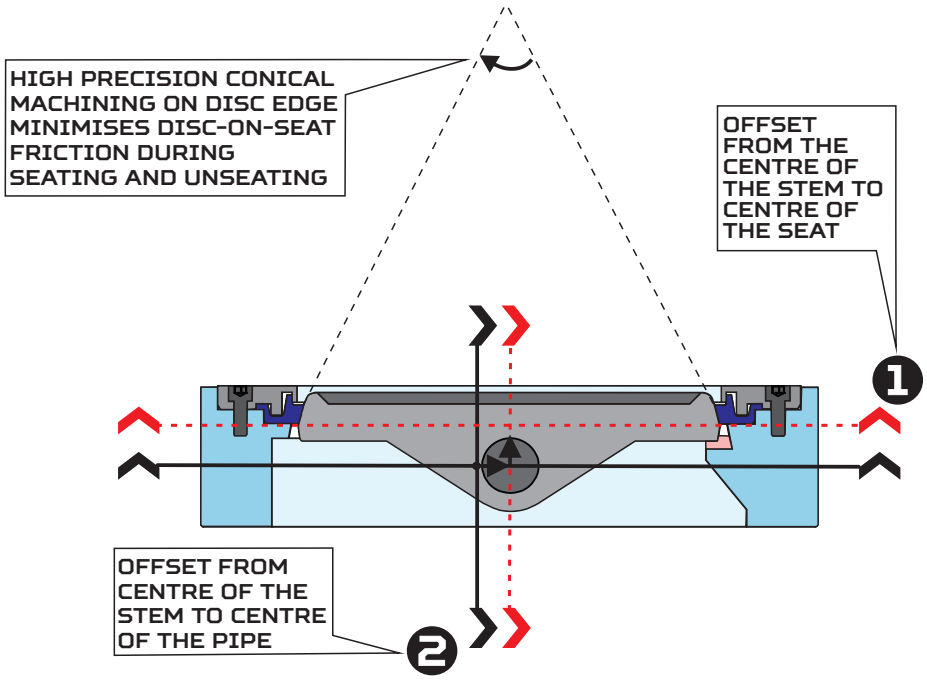
HIGH PERFORMANCE BUTTERFLY VALVE

SUMMARY

- **PRESSURE RATING** | PN10 - PN100
  MODEL 215: 20 BAR / #150; MODEL 230: 50 BAR / #300;
  MODEL 260: 100 BAR / #600
- **SIZE RANGE** | DN50 - DN3000 (2" - 120")
- **BODY MATERIALS** | CF8, CF8M, CARBON STEEL
  MONEL, HASTELLOY & SPECIAL ALLOYS
- **SEAT MATERIALS** | STANDARD: RPTFE
  OPTIONAL: PTFE, PEEK, PPL, METAL AND FIRESAFE
- **MOUNTING PAD & STEM** | ISO 5211
- **STANDARD LOCKABLE HAND LEVER** | DN50 - DN200
- **TEMPERATURE RANGE** | -50 TO 250°C
- **DESIGN** | API 609; ASME B16.34
- **VALVE INSPECTION & TESTING** | STANDARD: API 598
- **CERTIFICATIONS** | CE/PED; API 607 5th Ed; API 609
- **SHUTOFF RATING** | BI-DIRECTIONAL BUBBLE TIGHT

FEATURES

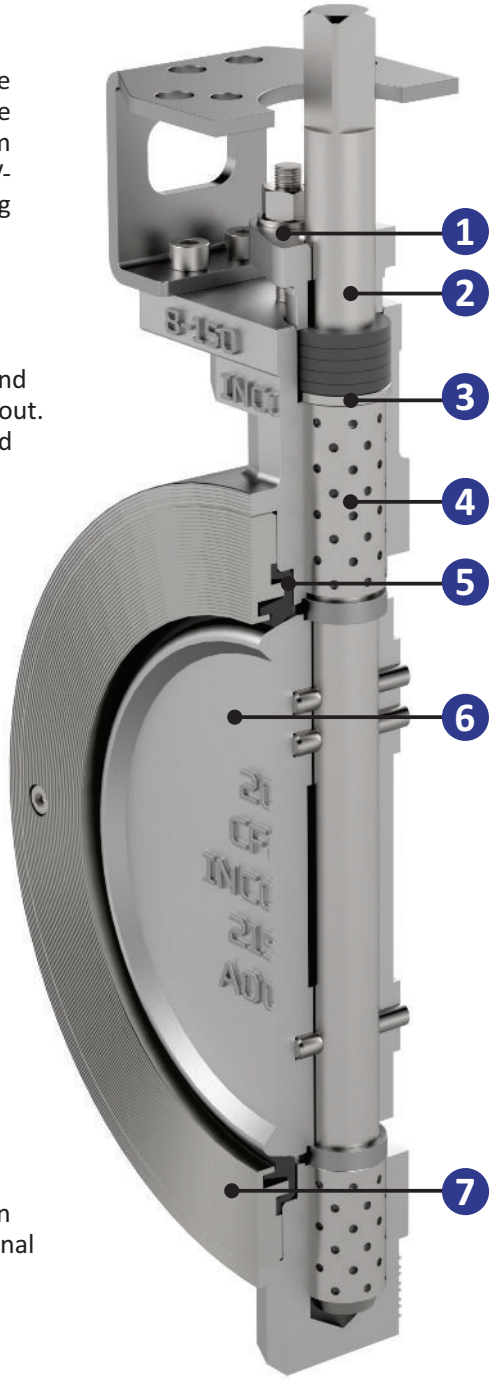
The INCOLOK® Series 200 double offset butterfly valve is a high performance valve that offers superior service life and is trouble-free to maintain. Its reliable sealing performance and wide range of working conditions is the result of the technologically advanced double offset seat design. The second offset in the design of the Series 200 promotes effortless operation by virtually eliminating disc-on-seat friction during seating and unseating. The disc lifts quickly out of the seat in the first few degrees of travel, and does not make contact with the seat again until it is nearly closed, reducing seat wear and the overall operating torque of the valve. The integrally cast disc travel stop perfectly locates the disc on to the seat, preventing over-travel and consequent seat damage. This design promotes the self alignment of the disc and seat, and therefore compensates for changes in pressure and temperature always ensuring bi-directional bubble tight shutoff.



INCOLOK® SERIES 200 DOUBLE OFFSET ILLUSTRATED

1 ADJUSTABLE STEM PACKING

The INCOLOK® Series 200 has a raised ISO 5211 mounting bracket allowing for the packing to be adjusted with the operator in place and preventing fugitive emissions into the operator in case of a leak. The Series 200 utilises a premium RPTFE V-type packing system as standard on resilient seated valves and Graphite V-type packing is supplied for fire-safe and metal seated applications. All packing systems have a pH range of 0-14.



2 BLOW-OUT PROOF STEM

In the event of a stem failure interference between the machined stem groove and gland retainer step will ensure that the stem is retained, and cannot be forced out. The stem connection is standard ISO 5211 for square stems and ISO R773 for keyed stems.

3 THRUST WASHER

The thrust washer ensures that packing forces are distributed equally, ensuring a premium seal. It also acts as an anti-extrusion ring and packing protector and increases the life of the packing by protecting the packing against frictional forces.

4 BEARINGS

PTFE lined Stainless Steel top and bottom bearings simultaneously offer superior corrosion resistance and lower coefficient of friction. The bearings support and secure the stem, preventing distortion from severe forces and temperatures acting on the disc and stem. The locating rings provide further disc / stem support. Unique perforation on the Stainless Steel substrate ensures long bearing life.

5 SEAT

The INCOLOK® Series 200 seat is designed to handle dynamic loads resulting from pressure and temperature changes. The standard seat material is RPTFE which provides excellent corrosion resistance and durability. The lip-seal design provides the resiliency required for a bubble tight seal whilst offering exceptional frictional properties. Optional API 607 fire safe & metal seats are available.

6 DISC

A full port and optimised hydrofoil disc shape maximises the C_v of the valve. The disc edge is mirror polished ensuring a zero leakage seal and a significantly increased cycle life of the valve, especially in modulating applications. Unlike centerline valves, the sealing face is not located on the disc leading edge where initial wear occurs, but rather on the trailing edge of the disc, thus increasing the serviceable life of the valve.

7 RETAINER RING

The retaining ring allows for easy seat replacement and also acts as a built in deflector cone to divert flow away from the seat. The body is recessed to enclose and support the retaining ring. The unique valve seat acts as a seal between the body and seat retainer, eliminating the requirement for additional seat retainer gaskets as found in conventional high performance butterfly valves.

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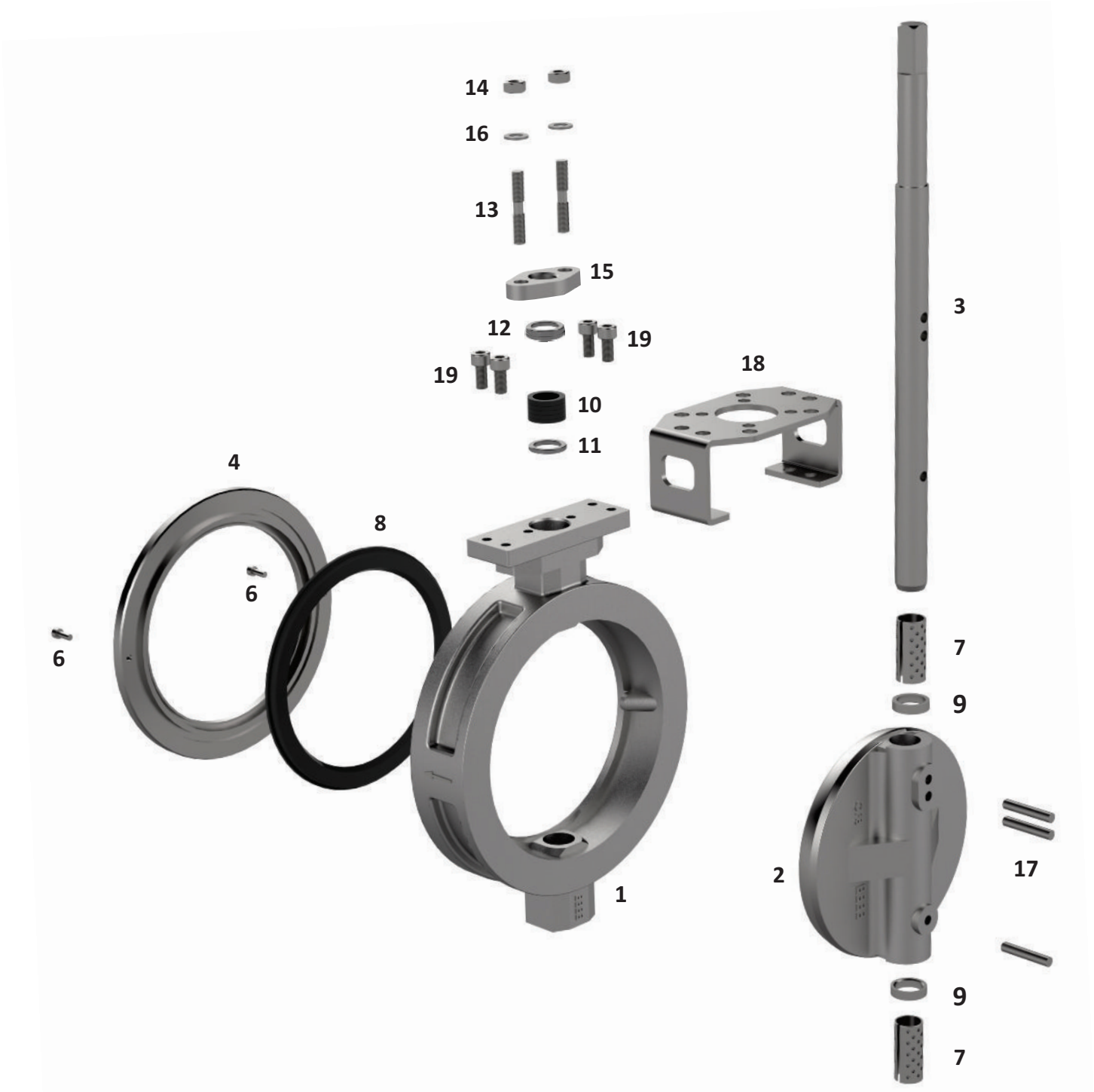
MATERIALS OF CONSTRUCTION

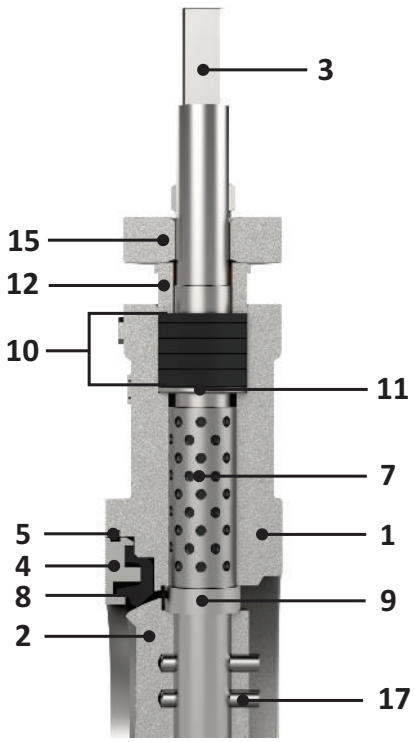


INCOLOK® SERIES 200 EXPLODED VIEW FOR SIZES DN200 AND LARGER.

BILL OF MATERIALS

NO.	PART NAME	MATERIAL	MATERIAL CODE
1	* BODY	STAINLESS STEEL / CARBON STEEL	ASTM A351 CF8M / ASTM A216 WCB
2	* DISC	STAINLESS STEEL	ASTM A351 CF8M
3	* STEM	STAINLESS STEEL	ASTM A564 630 / 17-4 PH SS
4	* SEAT RETAINER	STAINLESS STEEL / CARBON STEEL	ASTM A182 F316 / ASTM A105
5	** C-RING	STAINLESS STEEL	GRADE 316
6	*** RETAINER BOLTS	ALLOY STEEL / STAINLESS STEEL	ASTM 193 B7 / B8
7	BEARING	STAINLESS STEEL + PTFE	
8	* SEAT	R-PTFE	
9	LOCATING RING	STAINLESS STEEL	GRADE 316
10	STEM PACKING	RPTFE / GRAPHITE	
11	THRUST WASHER	STAINLESS STEEL	GRADE 316
12	GLAND BUSH	STAINLESS STEEL / CARBON STEEL	ASTM A351 CF8M / ASTM A216 WCB
13	STUD	STAINLESS STEEL / CARBON STEEL	ASTM 193 B7 / B8
14	NUT	CARBON STEEL / STAINLESS STEEL	ASTM 194 2H / 8
15	GLAND RETAINER	STAINLESS STEEL / CARBON STEEL	ASTM A351 CF8M / ASTM A216 WCB
16	SPRING WASHER	STAINLESS STEEL	GRADE 316 / 304
17	PIN	STAINLESS STEEL	ASTM A564 630 / 17-4 PH SS
18	* MOUNTING BRACKET	STAINLESS STEEL / CARBON STEEL	ASTM A240 316 / ELECTROPLATED MILD STEEL
19	BRACKET BOLTS	ALLOY STEEL / STAINLESS STEEL	ASTM 193 B7 / B8

* ALTERNATIVE MATERIALS AVAILABLE ON REQUEST, CONSULT FACTORY
** APPLICABLE ONLY FOR SIZES DN50- DN125
*** APPLICABLE ONLY FOR SIZES DN 150 AND LARGER



INCOLOK® SERIES 200 STANDARD PACKING AND SEAT ARRANGEMENT FOR SIZES DN50 - DN150

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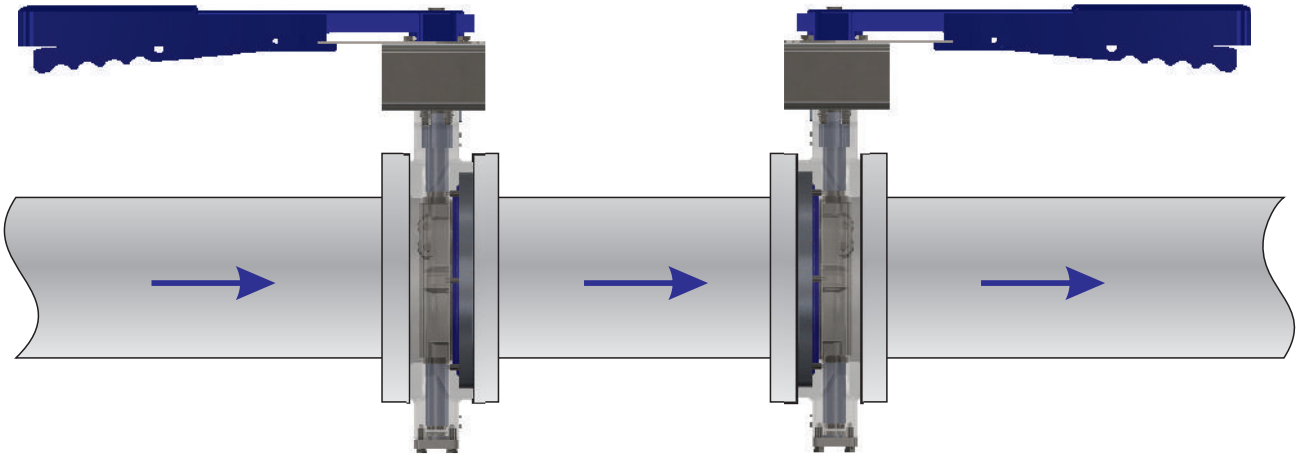
TORQUE FIGURES [Nm]: MODEL 215, RESILIENT SEATED

Valve Size		≤ 7 Bar		> 7 - 14 Bar		> 14 - 20 Bar	
inch	mm	Seat Upstream	Seat Downstream	Seat Upstream	Seat Downstream	Seat Upstream	Seat Downstream
2"	50	41	42	42	44	46	48
2.5"	65	46	47	48	49	52	53
3"	80	53	53	58	58	61	61
4"	100	73	74	83	84	90	91
5"	125	102	113	119	131	134	149
6"	150	151	172	176	200	197	223
8"	200	256	299	301	353	338	396
10"	250	347	436	427	538	496	623
12"	300	452	498	608	670	742	816
14"	350	766	991	1067	1380	1325	1714
16"	400	979	1363	1367	1901	1696	2359
18"	450	1273	1721	1784	2413	2220	3001
20"	500	1712	2230	2412	3139	3005	3911
22"	550	2397	3121	3377	4395	4207	5475
24"	600	2610	3367	3719	4799	4654	6005
30"	750	4590	5935	6218	8042	7602	9832
32"	800	5545	7385	7589	10108	9324	11798
36"	900	7466	10118	10279	13930	12668	17168

* CONSULT FACTORY FOR MODEL 215 FIRESAFE & METAL SEATED TORQUE FIGURES
** TORQUE FIGURES INCLUDE 20% SAFETY FACTOR



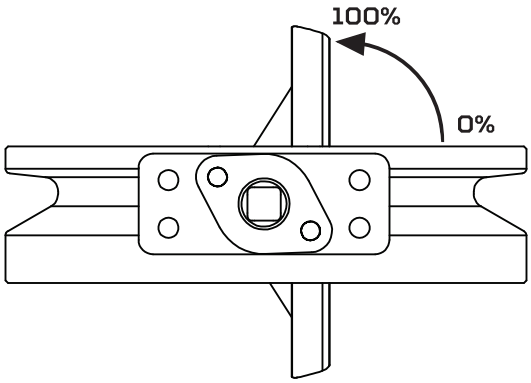
SEAT DOWNSTREAM SEAT UPSTREAM

FLOW COEFFICIENT [K_V]: MODEL 215 & 230

- K_V is the flow coefficient in metric units, and is defined as the flowrate [m^3/h] of water at a temperature of 16° Celsius at a pressure drop of 1 bar.
- Conversion factors between metric and imperial: $C_V = K_V \times 1.156$

DISC TRAVEL [%]

inch	mm	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2.5"	65	3	5	9	13	18	25	34	50	61	67
3"	80	6	11	19	27	37	53	11	106	128	143
4"	100	14	28	45	66	90	128	28	256	311	346
5"	125	22	45	73	107	146	208	45	416	506	562
6"	150	36	73	118	173	236	336	73	672	817	908
8"	200	76	152	247	362	495	704	152	1408	1713	1903
10"	250	114	228	371	542	742	1056	228	2112	2569	2855
12"	300	176	353	574	838	1147	1632	353	3265	3971	4412
14"	350	201	401	652	953	1304	1856	401	3713	4516	5017
16"	400	277	554	900	1315	1799	2561	554	5121	6228	6920
18"	450	363	727	1181	1726	2362	3361	727	6721	8175	9083
20"	500	484	969	1574	2301	3149	4481	969	8962	10900	12111
22"	550	554	1109	1802	2633	3603	5128	1109	10255	12472	13858
24"	600	747	1495	2429	3550	4858	6913	1495	13827	16817	18685
30"	750	1176	2353	3824	5588	7647	10882	2353	21765	26471	29412
32"	800	1386	2772	4504	6583	9008	12819	2772	25638	31181	34645
36"	900	1920	3841	6241	9122	12483	17764	3841	35528	43209	48010



DISC POSITION

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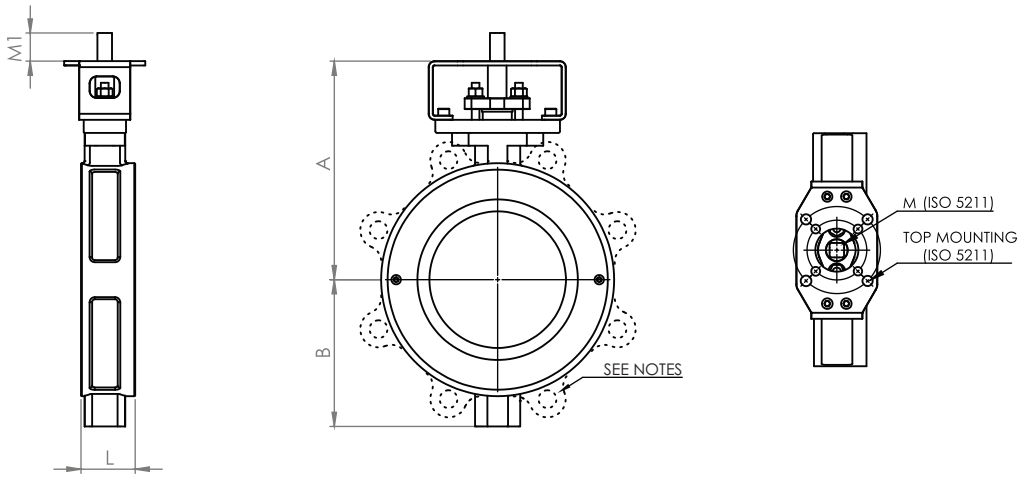
DIMENSIONS: MODEL 215, 20 BAR / ASME B16.34 CLASS 150



SERIES 200 DN50 - DN600 (2" - 24")

Valve Size		DIMENSION (mm)					
inch	DN	M (Square)	M1	TOP MOUNTING	L	A	B
2"	50	9 x 9	30	F07	44	136	70
2.5"	65	11 x 11	30	F07	48	166	82
3"	80	11 x 11	30	F07	48	175	93
4"	100	11 x 11	30	F07	54	188	110
5"	125	11 x 11	30	F07	57	190	120
6"	150	14 x 14	33	F07; F10	57	220	135
8"	200	17 x 17	33	F07; F10	64	255	172
10"	250	22 x 22	31	F10; F12; F14	71	299	202
12"	300	22 x 22	31	F10; F12; F14	81	328	241
14"	350	27 x 27	38	F14; F16	92	415	295
16"	400	27 x 27	38	F14; F16	102	435	329
18"	450	36 x 36	48	F16	114	456	340
20"	500	36 x 36	48	F16; F25	127	477	387
22"	550	36 x 36	48	F16; F25	127	507	417
24"	600	46 x 46	58	F16; F25	154	640	467

SERIES 200 DN650 - DN900 (26" - 36")

Valve Size		DIMENSION (mm)					
inch	DN	M (Stem Dia * Key width)	M1	TOP MOUNTING	L	A	B
26"	650	64 x 18	138	F25	165	640	483
28"	700	75 x 20	138	F25	165	720	552
30"	750	75 x 20	138	F25; F30	167	720	557
32"	800	75 x 20	138	F25; F30	191	720	557
36"	900	90 x 25	148	F25; F30	191	810	640

NOTES:

1. MODEL 215 WAFER VALVES ARE MULTI-DRILLED TO SANS 1123 T1000 / 1600 AND ASME B16.5 CLASS 150 FOR SIZES DN50-DN400.
2. MODEL 215 WAFER VALVES LARGER THAN DN400 ARE AVAILABLE BLIND TAPPED AND DRILLED TO EITHER SANS 1123 T1000, SANS 1123 T1600 OR TO ASME B16.5 CLASS 150, BS 4504 T10, BS 4504 T16.
3. MODEL 215 LUGGED VALVES CAN BE SUPPLIED WITH THE FOLLOWING END CONNECTIONS: SANS 1123 T1000 / T1600; ASME B16.5 CLASS 150, BS 4504 T10, BS 4504 T16.
4. FOR DOUBLE FLANGED SERIES 200 VALVES CONSULT FACTORY.

OPERATORS

GEAR OPERATORS

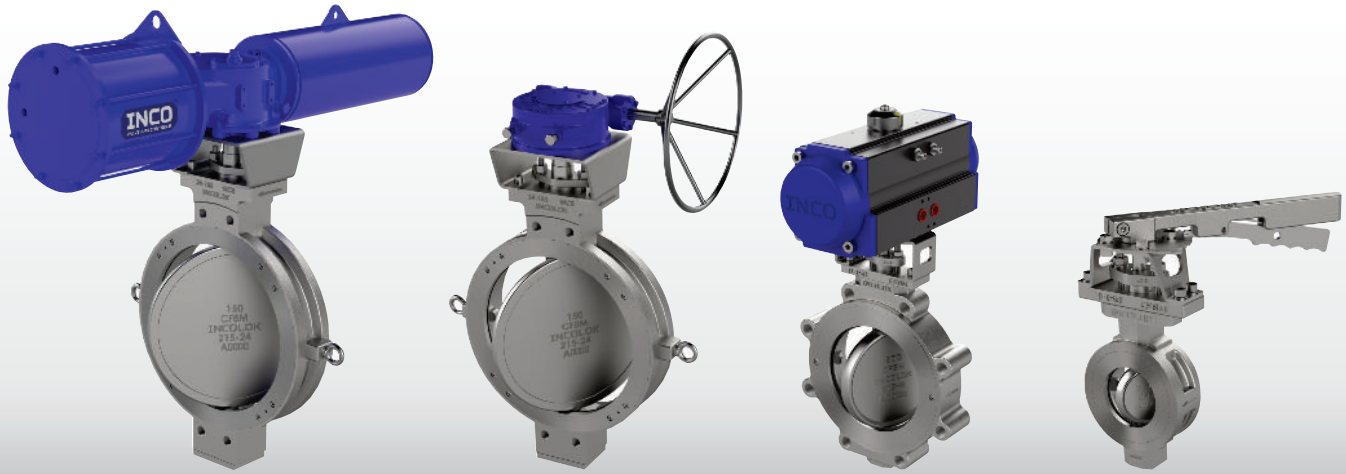
We offer the INCOLOK® Series 200 with standard epoxy coated ductile iron gearbox. The gearbox is available with an acid resistant or offshore coating on request as well as in full ASTM A351 Gr. CF8M Stainless Steel on request.

HAND LEVERS

The INCOLOK® Series 200 has a standard lockable epoxy coated ductile iron hand lever. For added corrosion resistance, ASTM A351 Gr CF8M levers are also available on request.

PNEUMATIC ACTUATORS

The INCOLOK® Series 200 can be fitted with an INCOAIR® scotch yoke or rack & pinion actuator. INCOAIR® Scotch yoke actuators can deliver up to 257,000 Nm torque and the standard material offered is epoxy coated ductile iron. INCOAIR® rack & pinion actuators are both hard anodized and epoxy coated as standard and can deliver up to 13,000 Nm torque. For additional corrosion resistance INCOAIR® actuators can be supplied either in ASTM 351 Gr. CF8M or with a PTFE protective coating.



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PRODUCT WARRANTY

AR Controls will at its discretion repair or replace without charge or refund the purchase price for products supplied, which prove to be defective in matter or workmanship provided that, in each case the product has been properly installed and is used in the service for which it was recommended, and that the written claim, specifying the alleged defect is presented to AR Controls within 18 months from the date of shipment or within 12 months from date of installation, whichever date occurs first. AR Controls shall in no event be liable for the following cost, which includes but is not limited to costs associated with; consequential damages, labour, equipment or engineering costs related to the repair or replacement of defective equipment.

The warranty stated in this paragraph is in lieu of all other warranties, either express or implied. With respect to warranties, this paragraph states the buyer's exclusive remedy and AR Controls' exclusive liability.

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