AB9020
Double Seated Globe Valve for Ratings ANSI 150 - 600
DIN/BS4404 PN 10 - 100

ABB Control Valves

T20
Technical Bulletin

AB9020 - Features

General

The Series AB 9020 valve developed by Kent Introl, will in its basic form satisfy the majority of general control valve applications where tight shut-off is not an essential requirement. The construction of this range of valves is of a simple form using the traditional top and bottom guided trim philosophy. For high pressure drop applications the range can be fitted with High Friction trim design.

Performance:

- High flow capacity.
- Excellent flow control rangeability.
- Cast globe type body proportioned to withstand high pipe stresses.
- Minimum differential plug areas to reduce actuator force requirements

Design Flexibility:

- Optional anti-cavitation/low noise trim option for high pressure drop applications.
- Inherently characterised trim offered in equal percentage or linear.
- All trim components removable from the top for ease of maintenance.
- Multiple trim sizes available.
- Full range of body and trim material options.
- Fully rationalised and interchangeable features.
- Full range of bonnet and packing designs to suit various application requirements.

Design Integrity:

- Heavy duty top and bottom guided construction.
- Large diameter stems.
- Generously proportioned seat rings screwed into body to ensure a leak proof joint.

Quality Manufacturing:

- Rigorously tested to ensure specified performance on site.
- Quality Assurance systems certified to BS EN ISO 9001.
- Optional full NACE MR-01-75 certification.

Scope of Design

End Connection Sizes:
1½" to 24" (40mm to 600mm) Nominal Bore.

End Connection Styles:
ANSI, DIN and BS Flanged RF, FF, RTJ (and other grooved designs). Welded profiles including butt weld, socket, etc.
Other requirements available on request.

Valve Body Ratings:
ANSI 150 to ANSI 600, DIN/BS 4504 PN 10 to PN 100 as standard. Other requirements available on request.

Bonnet Options:
Standard, Normalising and Bellows Seal (Refer to Figures 1 to 3).
Other requirements available on request.

Design Standards:
ANSI B16.34

Trim Design Options:
Contoured and High Friction. Special trims are available for specific applications.

Inherent Characteristics:
Equal percentage and linear.

Material Combinations:
A wide range of body/bonnet and trim materials are available.

Actuation:
Various types of actuation are available including.
'G' Series spring opposed pneumatic diaphragm.
'C' Series spring opposed pneumatic piston.
'D' Series double acting pneumatic piston.
In addition electric, electro-hydraulic and manually operated versions are available.

Instrumentation Options:
Pneumatic Positioner, Electro/Pneumatic (I/P) and Smart Positioner are all available.

Sizing/Noise:
The procedures for performing valve sizing, velocity and sound pressure level generated by the AB9020 range of control valves is detailed in the Technical Selection Manual.

Guide to Bonnet Selection

Selection of the bonnet design is undertaken on the basis of both the operating temperature range and fluid media being handled. Figures 1 to 3 illustrate the bonnet design option available for use with the AB9020.

Table 1 below provides a general guide to the temperature limitations of various bonnet designs and packaging materials available. Where fluid working temperatures below 0ºC (32ºF) and above 250ºC (482ºF) are specified, normalising bonnets are recommended to protect valve packing against extreme temperature.

The Bellows Seal Bonnet option ensures absolute sealing of the process fluid within their rated pressure and temperature ranges. An auxiliary packing box in the upper bonnet serves as an emergency seal in the unlikely event of bellows failure.

Fabricated extension bonnets in stainless steel are available as a special option when a longer extension is required on cryogenic service.

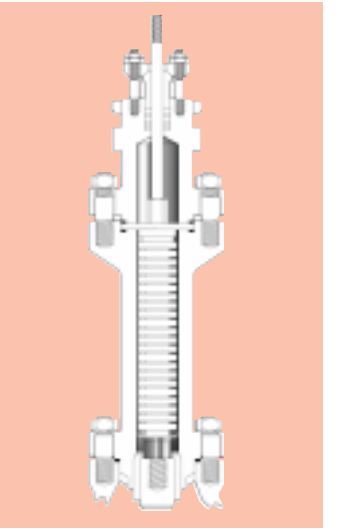

Figure 1. Bellows Seal Bonnet.

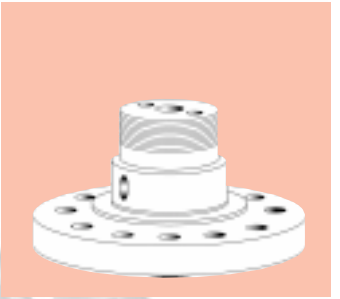

Figure 2. Standard Bonnet.

Figure 3. Normalising Bonnet.

Table 1. Temperature Related Features.

Component	Temperature Range ºC (ºF)		
	- 100 to 0 (-148 to 32)	0 to 250 (32 to 482)	250 to 550 (482 to 1020)
Bonnet Packings	Normalising Tef/Chef	Standard Tef/Chef	Normalising Flexigraph

Guide to Trim Options Available

Contoured Trim.
The contoured trim design presents a symmetrical smooth profile being suitable for modulating or on/off applications, satisfying a large percentage of process control requirements.

Trim Design Options:
Contoured trim - full and reduced capacities.

Characteristics Available:
Equal Percentage & Linear.

Plug Design:
Metal/Metal seating faces.

Direction of Flow:
See Figure 4.

Degree of Shut Off
ANSI/FCI 70.2 Class III (0.1% or rated capacity).

Figure 4. Contoured Trim.

High Friction Trim.
The High Friction HF trim design has been developed for high pressure drop applications to prevent the onset of cavitation, and reduce the noise level generated as a result of both liquid and gas/vapour flow.

Trim Design Options:
High Friction Trim- full and reduced capacities.

Characteristics Available:
Equal Percentage & Linear.

Plug Design:
Metal to Metal Seating Faces.

Direction of Flow:
See Figure 5.

Degree of Shut Off
ANSI/FCI 70.2 Class III (0.1% or rated capacity).

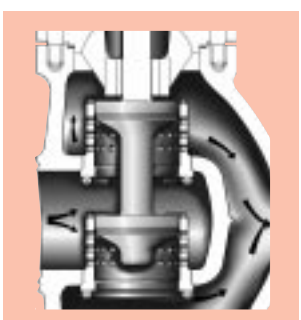

Figure 5. High Friction Trim.

Table 2. Design Cv Values.

Valve Size		Trim Size	Contoured Trim		High Friction - HF Trim	
in	mm	in	Equal %	Linear	Equal %	Linear
1½	40	1½	38	38	38	38
		1¼	25	25	25	25
		1	18	18	-	-
2	50	2	67	67	67	67
		1½	38	38	38	38
		1¼	25	25	25	25
3	80	3	144	144	144	144
		2½	105	105	105	105
		2	67	67	67	67
4	100	4	258	258	258	258
		3	144	144	144	144
		2½	105	105	105	105
6	150	6	535	575	535	575
		5	385	405	385	405
		4	258	258	258	258
8	200	8	865	1012	865	1012
		6	535	575	535	575
		5	385	405	385	405
10	250	10	1375	1456	1375	1456
		8	865	1012	865	1012
		6	535	575	535	575
12	300	12	1725	1850	1725	1850
		10	1375	1456	1375	1456
		8	865	1012	865	1012
14	350	14	2525	2689	2150	2330
		12	1725	1850	1725	1850
			1375	1456	1375	1456
16	400	16	3290	3504	2800	2987
		14	2525	2689	2150	2330
18	450	18	4200	4473	3560	3809
		16	3290	3504	2800	2987
20	500	20	5170	5506	4380	4687
		18	4200	4473	3560	3809
24	600	24	7420	7902	6310	6770
		22	6250	6656	5320	5719

Table 3. Recommended Maximum Velocities for Liquid Service.

Valve Rating	Trim Style	Valve Size		Maximum Velocity					
				Carbon Steel		Alloy Steel		Bronze, Cu/Ni Alloys	
		in	mm	ft/s	m/s	ft/s	m/s	ft/s	m/s
Upto and including ANSI 600 (PN 100)	Contoured	1½ - 2	40 - 50	41	12.5	46	14	25	7.6
		3 - 6	80 - 150	34	10.4	34	10.4	20	6.2
		8 -14	200 - 350	29	8.9	29	8.9	17	5.2
		16 -18	400 - 450	22	6.7	22	6.7	13	4
		20	500	18	5.5	18	5.5	11	3.4
		24	600	12	3.7	12	3.7	7	2.1
	HF	1½ - 12	40 -300	43	15.8	52	15.8	26	7.9
		14 - 20	350 - 500	35	13.1	43	13.1	21	6.4
		24	600	25	10.7	35	10.7	15	4.6

Table 4. Recommended Maximum Velocities for Gas/Vapour Flow.

Valve Rating	Trim Style	Valve Size		Maximum inlet velocity		Maximum outlet velocity		Max. outlet Mach no. for predicted noise level		
		in	mm	ft/s	m/s	ft/s	m/s	>95dBA	>95dBA	>85dBA
Upto and including ANSI 600 (PN 100)	Contoured	1½ - 2	40 - 50	340	104	830	253	0.65	0.5	0.3
		3 - 6	80 - 150	295	90					
		8 -14	200 - 350	285	81					
		16 -18	400 - 450	190	58					
		20	500	150	46					
		24	600	115	35					
	HF	1½ - 12	40 -300	475	144					
		14 - 20	350 - 500							
		24	600							

Dimensions Series AB9020

Note:

1. Face to face dimensions comply with ISA S75.03 1984.
2. Face to face dimensions exclude RTJ Flanges.
3. ABB Control Valves reserve the right to confirm dimensions on certified drawings.
4. CF indicates consult factory.

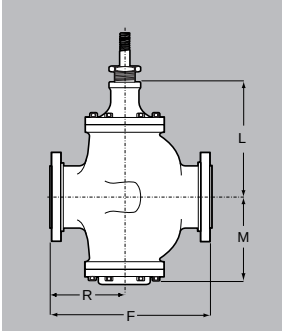

Figure 6. Series AB9020 Dimensions for Ratings ANSI 150-600, PN 10-100.

Table 5. Series AB9020 Outline Dimensions.

Body size ins (mm)	Face to Face Dimensions (RF Flanges) ins (mm)						Centerline to Bonnet mount ins (mm)			Centerline to Base ins (mm)	Travel ins (mm)	Nett Weight lb(kg)		
	ANSI 150 PN 10-16		ANSI 300 PN 25-40		ANSI 600 PN 64-100		Standard	Normalising	Bellows			ANSI 150 PN 10-16	ANSI 300 PN 25-40	ANSI 600 PN 64-100
	F	R	F	R	F	R	L	L	L	M				
1½	1½	4⅛	9¼	4⅜	9⅞	4¾	7 7/16	12 1/16	15⅛	5½	1⅛	76	83	108
(40)	(40)	(105)	(235)	(111)	(251)	(121)	(189)	(189)	(348)	(140)	(28)	(34)	(38)	(49)
2	2	4⅛	10½	4⅞	11¼	5¼	7⅞	13	15⅞	5⅞	1⅛	102	108	122
(50)	(50)	(117)	(267)	(124)	(286)	(133)	(200)	(330)	(349)	(149)	(28)	(46)	(49)	(55)
3	3	5¼	12½	5⅝	13¼	6	9½	14⅜	19 13/16	7⅝	1½	178	192	228
(80)	(80)	(133)	(318)	(143)	(337)	(152)	(152)	(365)	(503)	(194)	(38)	(81)	(87)	(103)
4	4	6⅛	14½	6⅜	15½	6⅞	10⅝	16½	20 13/16	10	1½	285	305	349
(100)	(100)	(156)	(368)	(162)	(394)	(175)	(270)	(419)	(529)	(254)	(38)	(129)	(138)	(158)
6	6	7 15/16	18⅝	8⅜	20	9	13½	18	29½	11⅜	2¼	413	441	595
(150)	(150)	(202)	(473)	(213)	(508)	(229)	(343)	(457)	(749)	(289)	(57)	(187)	(200)	(270)
8	8	9¼	22⅜	9¾	24	10⅝	14⅞	20½	30 7/16	13 7/16	2¼	733	789	1164
(200)	(200)	(235)	(568)	(248)	(610)	(270)	(378)	(521)	(773)	(341)	(57)	(332)	(358)	(528)
10	10	10½	27⅞	11 3/16	29⅝	12 1/16	20¼	29¾	41¼	17⅜	3½	1273	1394	1989
(250)	(250)	(267)	(708)	(284)	(752)	(306)	(514)	(756)	(1048)	(441)	(89)	(577)	(632)	(902)
12	12	11⅛	30½	11¼	32¼	12¾	20⅜	31 9/16	41 13/16	18½	3½	1926	2050	2765
(300)	(300)	(283)	(775)	(302)	(819)	(324)	(518)	(802)	(1062)	(470)	(89)	(873)	(930)	(1254)
1	1	14⅝	36½	15⅜	38¼	16¼	22½	34¾	45⅛	18⅝	3½	2701	2822	3638
(350)	(350)	(371)	(927)	(391)	(972)	(413)	(572)	(883)	(1146)	(473)	(89)	(1225)	(1280)	(1650)
16	16	18	41⅝	18 13/16	43⅝	19⅛	31	39¼	49⅝	27½	3½	3528	3528	4542
(400)	(400)	(457)	(1057)	(478)	(1108)	(486)	(787)	(997)	(1260)	(698)	(89)	(1600)	(1675)	(2060)
18	18	18 13/16	47	19	49¼	20⅝	30¼	43⅛	55	29½	4	4287	4575	5402
(450)	(450)	(462)	(1194)	(483)	(1251)	(524)	(768)	(1095)	(1397)	(749)	(102)	(1944)	(2075)	(2450)
20	20	23 1/16	55⅝	23⅞	58	25 1/16	35½	49½	59½	34¾	5	5093	5402	CF
(500)	(500)	(586)	(1413)	(606)	(1473)	(637)	(902)	(1257)	(1511)	(883)	(127)3	(2310)	(2450)	CF
24	24	24⅜	60	25½	63	27	48	56	65	46¼	4¾	CF	CF	CF
(600)	(600)	(619)	(1524)	(648)	(1600)	(686)	(1219)	(1435)	(1654)	(1175)	(883)	CF	CF	CF

The Company's policy is one of continuous product improvement and the right is reserved to modify the specifications contained herein without notice.

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