CASH VALVE B SERIES PRESSURE REGULATORS

Single seated, spring loaded, direct acting diaphragm-type pressure reducing and regulating valves for a broad range of services

FEATURES

- Reduce high inlet pressures to lower outlet pressures within close limits.
- Ruggedly built for long service life without maintenance.
- Simple design for easy maintenance and on-line repairs.
- Broad materials choice to suit a variety of applications.
- Self-supporting inbuilt strainer screen protects working parts and is cleaned easily.
- Easy pressure adjustment via standard square head adjusting screw and hex locknut. T-handle and aluminum handwheel options available.
- Optional construction for cryogenic service.
- Pre-packaged repair kits available for selected models to simplify maintenance.
- Every regulator supplied with pre-set delivery pressure.
- Each valve assembled and tested prior to shipment.

GENERAL APPLICATION

B series pressure reducing valves and regulators include models suitable for air, water, steam, oil and other liquids with versions also available for cryogenic liquids and gases. Type BBC is specifically designed for heavy oil and viscous fluid applications.

TECHNICAL DATA

Materials:	Cast iron, bronze, carbon steel, stainless steel
Sizes:	¼" to 2" (7 to 50 mm)
Connections:	Threaded NPTF
Max inlet pressures	
Air or water:	720 psig (49.6 barg)
Steam:	400 psig (27.6 barg)
Heavy oil or viscous fluids:	400 psig (27.6 psig)
Max. reduced pressures	
Air, water or steam:	150 psig (10.3 barg)
Heavy oil or viscous fluids:	200 psig (13.8 barg)
Temperature range:	-320° to 450°F (-195° to 232°C)

TYPE B: WATER AND AIR SERVICE (UP TO 180°F (82°C))

Model overview

Series B regulators are available in ¼" through 2" (7 to 50 mm) sizes with either iron or bronze bodies and feature a variety of optional internal trim (diaphragm, piston and cylinder) that enable them to be used in a wide range of applications.

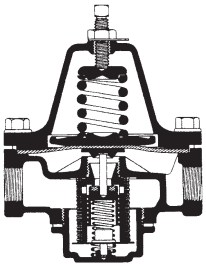
Each regulator is equipped with a pressure spring selected to provide the desired outlet or reduced delivery pressure setting. Depending on the adjusting spring installed, delivery pressures may be adjusted from a minimum of 2 psig (0.14 barg) to a maximum of 150 psig (10.3 barg). The range of adjustment or satisfactory working range of the individual springs that may be fitted to each valve size is listed in the spring range table on page 4.

The regulator is designed for systems with a maximum operating temperature of 180°F (82°C). In addition to the standard specifications indicated in the table, any combination of body material, piston cylinder and diaphragm is available to special order.

Application

Type B water and air regulators are suitable for a variety of applications including paint spray equipment, dishwashers, air tanks and equipment, food, chemical and industrial process gases and many other applications.

TYPE B
Pressure regulator/water and air

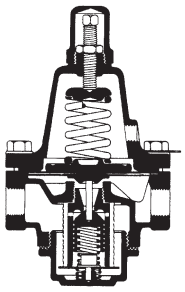


Service	Maximum initial pressure (psig)	Maximum reduced pressure (psig)	Body material		Piston and cylinder	Seat disk material	Diaphragm stock	Max. operating temp. °F
			Iron	Bronze	Bronze	NBR	NBR	
Water or air	200	150	X		X	X	X	180
	400	150		X	X	X	X	180

TYPE B: STEAM SERVICE (UP TO 400°F (204°C))

These valves are designed for steam operating temperatures up to 400°F (204°C) and are available in ¼" to 2" (7 to 50mm) sizes with either iron or bronze bodies. Iron body valves have a SST-filled PTFE seat and are for systems with initial pressures up to 150 psig (10.3 barg); bronze bodies are for initial pressures up to 250 psig (17.2 barg).

Valves will normally be equipped as indicated in the table but other combinations of body material, piston-cylinder and diaphragm are available to special order.

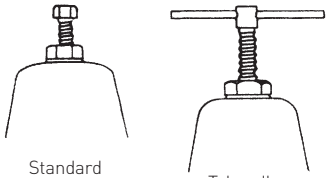


Type B steam with differential construction interior

Application

The Type B steam pressure reducing and regulating valve is ideally suited for installation in pressing irons, steam cookers, degreasers, sterilizers, vulcanizers and hundreds of other applications.

Type B steam regulators can also be furnished with a differential pressure control feature which may be desirable in steam/oil atomizing service.



Standard adjusting screw

T-handle

Options

Optional differential pressure control

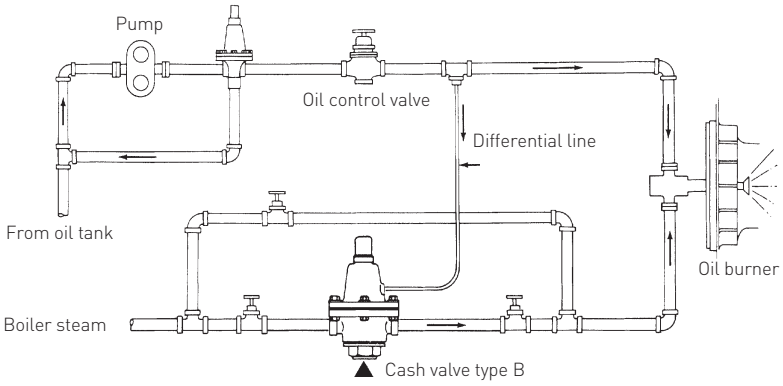
The Type B Steam regulator can be factory modified to serve as a constant differential pressure control valve by incorporating a ¼" (7 mm) side tap in the spring housing.

In a typical steam-oil atomizing installation, fluid loading pressure is introduced above the diaphragm of the regulator and steam is delivered through the valve at a regulated pressure higher than the loading pressure, with the difference in pressure being determined by the diaphragm spring setting. The outlet steam pressure is maintained automatically to provide a constant, fixed pressure differential between the steam pressure and the oil pressure. Variations in the loading pressure are reflected in a pound-for-pound change in the discharge pressure.

Valves equipped with the optional differential pressure control are fitted with a pressure-tight closing cap and gasket over the pressure adjusting screw and a gasket above the diaphragm to ensure a good seal between the spring housing and the valve body.

Service	Maximum initial pressure (psig)	Maximum reduced pressure (psig)	Body material		Piston and cylinder	Seat disk material	Diaphragm stock	Max. operating temperature °F
			Iron	Bronze	Bronze	PTFE	Phosphor bronze	
Saturated	150	125	X		X	X	X	400
steam	250	150		X	X	X	X	400

TYPICAL STEAM-OIL ATOMIZING INSTALLATION



MATERIALS OF CONSTRUCTION

Part description	Materials
Adjusting screw cap*	Brass
Cap gasket*	Fibre
Body	Iron or bronze
Spring chamber	Iron or bronze
Adjusting spring	Steel
Pressure plate	Cast iron or bronze
Diaphragm	NBR, bronze
Diaphragm gasket**	Aramid fibre
Pusher post button	Brass
Cylinder	Brass
Piston	Brass
Pusher post	Brass
Seat disk	NBR or SST-filled PTFE
Piston spring	302 Stainless steel
Strainer screen	Monel®
Bottom gasket	Aramid fibre or PTFE
Bottom plug	Brass

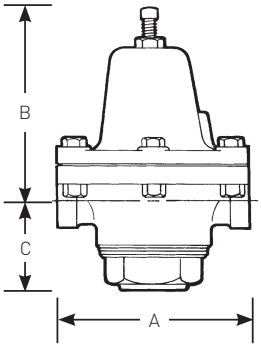
NOTES

* For pressure loaded valves only

** For use with metal diaphragms only

DIMENSIONS

Type B	Dimensions			Shipping weight (lbs.)	
valve size	A	B	C	Iron	Bronze
¼	3"	2⅞"	1¾"	2¾	3
⅜	3⅞"	4½"	1¾"	5	5½
½	4½"	4½"	2⅛"	7½	8
¾	5⅛"	4⅝"	2⅛"	9	10
1	5⅞"	5⅜"	2⅛"	12	16
1¼	6¾"	6⅛"	2⅝"	18	20
1½	6¾"	6⅛"	2⅝"	18	20
2	9¼"	8½"	3½"	32	37



B SERIES

The capacity of any regulator is governed by two factors:

1. Pressure differential or the difference between the inlet and outlet pressure.
2. A characteristic known as fall-off or droop, by which the outlet pressure drops slightly as flow starts through the valve and drops off even more as increased demand requires increased flow.

The rates of flow stated on the following charts are based on assumed conditions, which may be considered average for a given installation.

B SERIES WATER CAPACITY INFORMATION

Inlet pressure,	Outlet pressure,	Gallons inlet per minute by size							
psig	psig	¼"	⅜"	½"	¾"	1"	1¼"	1½"	2"
25	15	0.6	1.0	2.6	4.0	5.7	9.2	10.4	16.0
	10	0.6	1.2	2.9	4.5	6.4	10.4	11.7	18.0
50	40	0.8	1.4	3.5	5.5	7.9	12.7	14.3	22.0
	25	0.8	1.6	3.8	6.0	8.6	13.8	15.6	24.0
	10	0.8	1.6	3.8	6.0	8.6	13.8	15.6	24.0
75	65	1.0	2.0	4.8	7.5	10.7	17.3	19.5	30.0
	50	1.1	2.1	5.1	8.0	11.4	18.4	20.4	32.0
	25	1.3	2.3	5.8	9.0	12.9	20.7	23.4	36.0
	10	1.3	2.3	5.8	9.0	12.9	20.7	23.4	36.0
100	90	1.5	2.7	6.7	10.5	15.0	24.2	27.3	42.0
	75	1.6	3.0	7.4	11.5	16.4	26.5	29.9	46.0
	50	1.7	3.2	8.0	12.5	17.9	28.8	32.5	50.0
	25	1.8	3.4	8.3	13.0	18.6	29.9	33.8	52.0
125	100	1.5	2.9	7.0	11.0	15.7	25.3	28.6	44.0
	75	1.7	3.3	8.0	12.5	17.9	28.8	32.5	50.0
	50	2.0	3.6	9.0	14.0	20.0	32.2	36.4	56.0
	25	2.0	3.6	9.0	14.0	20.0	32.2	36.4	56.0
150	140	1.5	2.9	7.0	11.0	15.7	25.3	28.6	44.0
	100	1.9	3.5	8.6	13.5	19.3	27.0	35.1	54.0
	75	2.0	3.8	9.3	14.5	20.7	33.4	37.7	58.0
	50	2.2	4.0	9.9	15.5	22.2	35.7	40.3	62.0
	25	2.2	4.0	9.9	15.5	22.2	35.7	40.3	62.0
200	150	1.9	3.5	8.6	13.5	19.3	31.1	35.1	54.0
	100	2.2	4.0	9.9	15.5	22.2	35.7	40.3	62.0
	75	2.5	4.6	11.2	17.5	25.0	40.3	45.5	70.0
	50	2.7	4.9	12.2	19.0	27.2	43.7	49.4	76.0
	25	2.7	4.9	12.2	19.0	27.2	43.7	49.4	76.0
250	150	2.1	3.9	9.6	15.0	21.5	34.5	39.0	60.0
	100	2.5	4.6	11.2	17.5	25.0	40.3	45.5	70.0
	75	2.8	5.2	12.8	20.0	28.6	46.0	52.0	80.0
	50	2.9	5.5	13.4	21.0	30.0	48.3	54.6	84.0
	25	2.9	5.5	13.4	21.0	30.0	48.3	54.6	84.0
300/400	150	2.5	4.6	11.2	17.5	25.0	40.3	45.5	70.0
	100	3.5	6.5	16.0	25.0	35.8	57.5	65.0	100.0
	75	4.2	7.8	19.2	30.0	42.9	69.0	78.0	120.0
	50	4.2	7.8	19.2	30.0	42.9	69.0	78.0	120.0

NOTE

Capacities are based on a 20% droop.

B SERIES AIR CAPACITY INFORMATION

Inlet pressure, psig	Outlet pressure, psig	Air capacity inlet in SCFM by size							
		¼"	⅜"	½"	¾"	1"	1¼"	1½"	2"
25	15	4.7	7.0	16.5	23.5	37.6	56.4	65.8	105.8
	10	5.0	7.5	17.5	25.0	40.0	60.0	70.0	112.5
50	40	7.0	10.5	24.5	35.0	56.0	84.0	98.0	157.5
	25	8.2	12.3	28.7	41.0	65.6	98.4	114.8	184.5
	10	8.2	12.3	28.7	41.0	65.6	98.4	114.8	184.5
75	65	7.5	11.3	26.3	37.5	60.0	90.0	105.0	168.8
	50	8.5	12.8	29.8	42.5	68.0	102.0	115.0	191.3
	25	11.0	16.5	38.5	55.0	88.0	132.0	154.0	247.5
	10	11.0	16.5	38.5	55.0	88.0	132.0	154.0	247.5
100	90	9.0	13.5	31.5	45.0	72.0	108.0	126.0	203.0
	75	12.0	18.0	42.0	60.0	96.0	144.0	168.0	270.0
	50	15.0	22.5	52.5	75.0	120.0	180.0	210.0	337.5
	25	15.0	22.5	52.5	75.0	120.0	180.0	210.0	337.5
125	100	13.0	19.5	45.5	65.0	104.0	156.0	182.0	293.0
	75	15.0	22.5	52.5	75.0	120.0	180.0	236.0	338.0
	50	18.0	27.0	63.0	90.0	144.0	216.0	252.0	405.0
	25	18.0	27.0	63.0	90.0	144.0	216.0	252.0	405.0
150	140	15.0	22.5	52.5	75.0	120.0	180.0	210.0	338.0
	100	18.0	27.0	63.0	90.0	144.0	216.0	252.0	405.0
	75	23.0	34.5	80.5	115.0	184.0	276.0	322.0	518.0
	50	25.0	37.5	87.5	125.0	200.0	300.0	350.0	563.0
	25	25.0	37.5	87.5	125.0	200.0	300.0	350.0	563.0
200	150	19.0	28.5	66.5	95.0	152.0	228.0	266.0	428.0
	100	23.0	34.5	80.5	115.0	184.0	276.0	322.0	518.0
	75	27.0	40.5	94.5	135.0	216.0	324.0	378.0	608.0
	50	29.0	43.5	101.5	145.0	232.0	348.0	406.0	653.0
	25	29.0	43.5	101.5	145.0	232.0	348.0	406.0	653.0
250	150	25.0	37.5	87.5	125.0	200.0	300.0	350.0	563.0
	100	33.0	49.5	115.5	165.0	264.0	396.0	462.0	743.0
	75	37.0	55.5	129.5	185.0	296.0	444.0	518.0	833.0
	50	37.0	55.5	129.5	185.0	296.0	444.0	518.0	833.0
	25	37.0	55.5	129.5	185.0	296.0	444.0	518.0	833.0
300/400	150	34.0	51.0	115.0	170.0	272.0	408.0	476.0	765.0
	100	37.0	55.5	129.5	185.0	296.0	444.0	518.0	833.0
	75	43.0	64.5	150.5	215.0	344.0	516.0	602.0	968.0
	50	43.0	64.5	150.5	215.0	344.0	516.0	602.0	968.0

NOTE

Capacities are based on a 20% droop.

B SERIES STEAM CAPACITY INFORMATION (WITH PTFE SEAT)

Inlet pressure	Outlet pressure	Steam lbs per hour by size							
psig	psig	¼"	⅜"	½"	¾"	1"	1¼"	1½"	2"
25	15	25	38	88	126	202	302	353	567
	10	25	38	88	126	202	302	353	567
50	40	36	55	129	183	294	440	514	826
	25	42	63	137	210	336	504	588	945
	10	42	63	137	210	336	504	588	945
75	65	39	59	139	197	316	473	553	889
	50	53	78	185	263	421	631	736	1184
	25	68	102	239	342	546	820	956	1537
	10	69	102	239	342	546	820	956	1537
100	90	49	91	154	231	371	560	654	1050
	75	84	126	294	420	672	1008	1176	1890
	50	85	129	300	427	683	1025	1196	1922
	25	85	129	300	427	683	1025	1196	1922
125	100	88	133	266	441	706	1008	1165	1985
	75	111	165	385	550	881	1320	1540	2477
	50	115	172	400	573	916	1375	1603	2577
	25	115	172	400	573	916	1375	1603	2577
150	140	63	95	126	210	350	525	616	994
	125	112	168	392	560	896	1344	1568	2520
	100	116	174	405	578	924	1387	1618	2603
	75	137	204	479	683	1093	1639	1912	3074
	50	137	204	479	683	1093	1639	1912	3074
200	150	130	195	454	648	1037	1555	1814	2916
	125	153	230	535	763	1221	1831	2136	3434
	100	179	267	626	893	1429	2143	2500	4019
	75	179	267	626	893	1429	2143	2500	4019
225	150	190	287	671	956	1532	2297	2681	4308
	125	214	322	750	1072	1715	2572	3002	4823
	100	230	344	804	1147	1835	2752	3212	5162
	75	230	344	804	1147	1835	2752	3212	5162
250	150	196	294	686	980	1568	2352	2744	4410
	125	253	379	888	1267	2027	3039	3546	5699
	100	253	379	888	1267	2027	3039	3546	5699

NOTE

Capacities are based on a 20% droop.

TYPE B SELECTION GUIDE

Example:	B	F	A	W	S	S	B	B	S	01	A	D	1

Model
B B valve

Material of construction
Z Bronze
F Iron

Valve size
A ¼" **E** 1"
B ⅜" **F** 1¼"
C ½" **G** 1½"
D ¾" **H** 2"

Service
W Water/air
S Steam

Body style/connection style
S Side inlet/side outlet - straight thru w/ NPTF connections

Spring chamber style
S Standard
D w/ Pressure screw cap and differential connection

Diaphragm material
B Buna-N (water/air)
Z Bronze (steam)
M Monel (steam)

Seat material
B Buna-N (water/air)
T Teflon (steam)

Pressure screw style
S Standard
H Hex head
T T-handle

Variation
01 Standard

Design revision
A Indicates 2nd design revision

Spring material
D Steel

Spring Range
Refer to table below

STANDARD SPRING RANGES (psig)

Spring Material	Size	1	2	3	4	5	6
Steel	¼"	2 - 25	2 - 60	30 - 100	50 - 150	- - - -	- - - -
	⅜"	2 - 30	2 - 70	40 - 110	90 - 150	- - - -	- - - -
	½"	2 - 30	10 - 50	30 - 125	50 - 150	- - - -	- - - -
	¾"	2 - 20	10 - 35	30 - 75	50 - 110	105 - 150	- - - -
	1"	2 - 20	10 - 45	20 - 60	55 - 100	90 - 150	- - - -
	1¼"	2 - 15	10 - 30	20 - 50	45 - 100	90 - 150	- - - -
	1½"	2 - 15	10 - 30	20 - 50	45 - 100	90 - 150	100 - 250
	2"	2 - 20	10 - 60	20 - 100	90 - 150	- - - -	- - - -

HOW TO ORDER

To order, specify Cash Valve type by specific series designation (i.e. B Series).
Also state the following:

1. Valve size.
2. Service (water, air, oil, etc.).
3. Inlet pressure.
4. Outlet or delivery pressure range and setting.
5. Maximum required flow rate.
6. System operating temperature.
7. Optional features, if any, as described for a specific valve.

NOTES

1. NPTF, also referred to as "Dryseal" thread, is designed to provide a more leak-free seal without the use of PTFE tape or other sealant compound. NPTF threads are interchangeable with NPT threads and are standard on all Cash Valve products.
2. Series B valves are also available with special modifications. Cash Valve will be pleased to assist you in selecting the regulator features that are needed to meet the service requirements of your particular system. Consult the factory for details.

TYPE B-95

Model overview

The Type B-95 is a fully automatic pressure reducing valve which is ideal for use in the pressure build-up circuit for either liquid or gas service and is also available in a cryogenic version.

Type B-95 valves are designed for operating temperatures from -320°F to +450°F (-195° to 232°C), depending on construction, and are available in ½", ¾" and 1" (15, 18 and 25 mm) sizes with either carbon steel or stainless steel bodies with NPTF threaded connections. They offer the option of either NBR or stainless steel diaphragms, with a PTFE seat or NBR seat disk.

They are suitable for inlet pressures up to 720 psig at +180°F (49.6 barg at 82°C) or up to 400 psig at -320°F to +450°F (240 barg at -195° to 232°C). In addition to the standard specification, they offer an optional closing cap, T-handle and are also available with a drilled and tapped spring chamber for differential service.

Application

Type B-95 valves are suitable for use on air, water, steam, oil and other liquids and also for cryogenic liquids and gases.

TYPE B95 SELECTION GUIDE

Example:	B95	D	C	W	S	S	B	B	S	01	-	D	1
Model													
B95 B95 valve													
Material of construction													
D Carbon steel body and chamber													
G 316 SST body and chamber													
Valve size													
C ½"													
D ¾"													
E 1"													
Service													
W Water/air													
S Steam													
Body style/connection style													
S Side inlet/side outlet - straight thru w/ NPT connections													
F Side inlet/side outlet - straight thru w/ BSPP connections													
Spring chamber style													
S Standard													
K w/ Pressure screw cap and differential connection													
Diaphragm material													
B Buna-N (water/air)													
G 316 SST (steam)													
Seat material													
B Buna-N (water/air)													
T Teflon (steam)													
Pressure screw style													
S Standard													
Variation													
01 Standard													
Design revision													
(-) Indicates original design													
Spring material													
D Steel													
E SST													
Spring range													
Refer to table below													

STANDARD SPRING RANGES (psig)

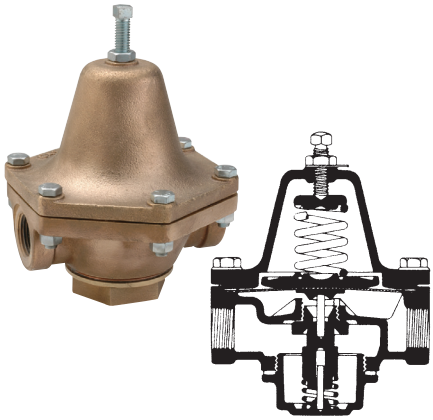
Spring Material	Size	1	2	3	4	5	6	7
Steel	½"	2 - 30	10 - 50	30 - 125	50 - 150	- - - -	- - - -	- - - -
	¾"	2 - 20	10 - 35	30 - 75	50 - 110	105 - 150	- - - -	- - - -
	1"	2 - 20	10 - 45	20 - 60	55 - 100	90 - 150	- - - -	- - - -
SST	½"	10 - 30	20 - 75	25 - 125	100 - 200	150 - 250	250 - 400	200 - 600
	¾"	10 - 30	20 - 70	30 - 100	50 - 150	100 - 225	150 - 250	- - - -
	1"	10 - 35	20 - 60	50 - 100	50 - 150	100 - 250	200 - 400	- - - -

NOTE

1. Steel springs are furnished as standard. Stainless springs furnished for higher ranges and for all cryogenic valves.
2. Stainless steel valves available with 200-400 psi range. Consult factory.
3. For steam service, we recommend a max. differential pressure of 150 psi to prevent seat erosion.

If downstream pressure control is critical to the safety of the installation, then the downstream side should be protected by a safety relief valve set to relieve at the maximum safe limit, but at least 10 psi higher than the pressure regulator's delivery setting.

TYPE BBC: HEAVY OIL OR VISCOUS FLUIDS



Model overview

Type BBC is available in ⅜" through 1½" (10.5 to 38 mm) sizes with either a cast iron or bronze body. These valves are suited to systems with a maximum operating temperature of 180°F (82°C) when fitted with an NBR diaphragm and a maximum operating temperature of 400°F (204°C) with a Monel® metal diaphragm. A stainless steel piston and seat are standard.

Depending on the setting of the adjusting spring installed, delivery pressures may be adjusted from a minimum of 2 psig to a maximum of 200 psig (0.14 to 13.8 barg).

Valves will normally be equipped as indicated in the table but other combinations of body material, piston-cylinder and diaphragm are available to special order.

The Type BBC incorporates a radical departure from the conventional regulator valve design, featuring a 'universal joint' type seating arrangement which ensures free valve operation. This design ensures that there are no small ports or close tolerances which would prevent dependable performance. The working parts are accessible easily without removing the valve from the line. The standard regulator is fitted with a square head adjusting screw and lock nut arrangement. A T-handle or handwheel may also be fitted for a small additional charge.

Application

The Type BBC is designed for heavy oil service (Bunker C and other grades) as well as for dirty liquids or fluids with a high viscosity.

NOTE

If downstream pressure control is critical to the safety of the installation, the downstream side should be protected by a safety relief valve set to relieve at the maximum safe limit, but at least 10 psig (0.69 barg) higher than the pressure regulator's delivery setting.

Specifications

Dimensions and weights: The dimensions and weights stated for the ⅜" through 1½" (10.5 to 38 mm) Series B regulators as shown in the table on page 4 also apply to the Type BBC.

Capacity information: For specific capacity information, consult the factory giving the pressure conditions that apply to your system.

MATERIALS OF CONSTRUCTION

Part description	Materials
Adjusting spring	Steel
Spring housing	Cast iron or bronze
Pressure plate	Cast iron
Diaphragm	NBR or Monel®
Diaphragm gasket (for metal diaphragms only)	Aramid fibre
Body	Cast iron or bronze
Pusher post seat	Brass
Body seat	303 Stainless steel
Bottom plug gasket	Aramid fibre
Piston	303 Stainless steel
Pusher post	Monel®
Piston spring	Monel®

			Body material		Piston and seat	Diaphragm stock	
Service	Maximum initial pressure (psig)	Maximum reduced pressure (psig)	Iron	Bronze	SS	NBR	Monel®
Oil up to 180°F	200	150	X		X	X	
	400	200		X	X	X	
Oil 180°F to 400°F	150	125	X			X	X
	250	200		X		X	X

TYPE BBC SELECTION GUIDE

Example:	BBC	F	B	W	S	S	B	E	S	01	-	D	1

Model
BBC BBC valve

Material of construction
Z Bronze
F Iron

Valve size
B ⅜" **E** 1"
C ½" **F** 1¼"
D ¾" **G** 1½"

Service
O Oil

Body style/connection style
S Side inlet/side outlet - straight thru w/ NPT connections
B Side inlet/side outlet - straight thru w/ BSPT connections

Spring chamber style
S Standard

Diaphragm material
B Buna-N (oil up to 180°F)
M Monel (oil 180°F to 400°F)

Seat material
E 303 Stainless steel

Pressure screw style
S Standard
T T-handle

Variation
01 Standard
UL UL approved (⅜" and ½" iron only)

Design revision
(-) Indicates original design

Spring material
D Steel

Set pressure
Refer to table below

STANDARD SPRING RANGES (psig)

Spring Material	Size	1	2	3	4	5	6
	⅜"	2 - 15	10 - 50	40 - 80	75 - 150	125 - 200	- - - -
	½"	2 - 35	20 - 50	40 - 120	100 - 200	- - - -	- - - -
Steel	¾"	2 - 15	10 - 30	20 - 75	60 - 125	100 - 200	- - - -
	1"	2 - 15	10 - 40	30 - 60	50 - 100	90 - 150	125 - 200
	1¼", 1½"	2 - 20	10 - 30	20 - 100	90 - 150	100 - 175	100 - 200