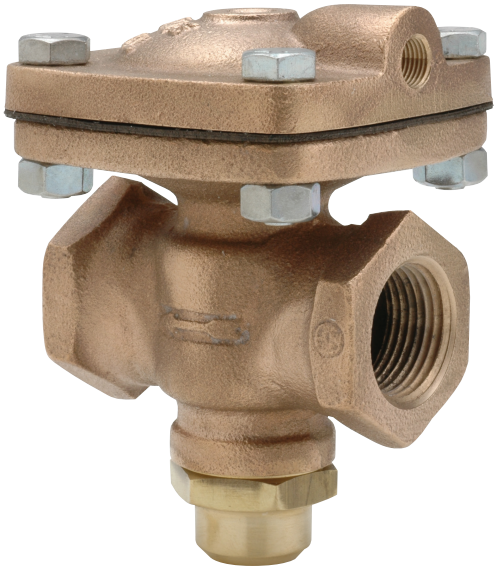
CASH VALVE™ TYPE D53 CONTROL VALVES

A pressure operated diaphragm type control valve designed to control the flow of a fluid or air by an independent pressure applied to the valve diaphragm.



FEATURES

- Available either normally open; closed by diaphragm pressure or normally closed; opened by diaphragm pressure.
- Diaphragm pressure connection can be indexed to over inlet, over outlet or over either side for maximum hook-up flexibility.
- Full port diameter means full capacity and low pressure drop through the valve.
- Larger sizes have a fully balanced inner valve for both inlet and outlet pressures up to 250 psig (17.2 barg), ensuring operating pressure requirements unchanged by variations in system pressure.
- Larger size valve component interchangeability enables easy changeover from normally open to normally closed or vice versa.

GENERAL APPLICATION

Suitable for service with water, air, oil or any non-corrosive fluid as a control valve for water cooled air compressors, an air compressor dump valve, an explosive atmosphere valve or as a substitute for expensive electric solenoids.

TECHNICAL DATA[1]

Materials:	Bronze
Sizes:	½, ¾, 1, 1¼, 1½ and 2 in. (15, 20, 25, 32, 40 and 50 mm)
Connections:	NPTF
Pressure range[2]:	0 to 250 psig (0 to 17.2 barg)

Maximum temperature: 180°F (82°C)

1. Refer to General Specifications Table in page 2 for more information.
2. The maximum diaphragm loading pressure must not exceed 300 psig (20.7 barg).

CONSTRUCTION/SPECIFICATIONS

The Type D53 Control Valve is fitted with a bronze body, renewable stainless steel plated valve seat of full port diameter, a renewable Nitrile (NBR) composition seat disc and diaphragm or fluorocarbon (FKM) option for body sizes ½ and ¾ (15 and 20 mm) only, and rust resistant steel bolts.

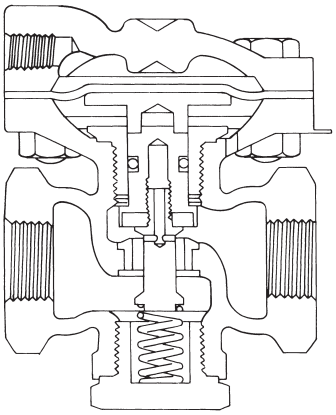
GENERAL SPECIFICATIONS

Body Material	Seat Position	Body Size, in. (mm)	Materials				Maximum Inlet Pressure, psig (barg)	Maximum Outlet Pressure, psig (barg)	Temperature, °F (°C)
			Spring	Trim	Seat (Disc)	Diaphragm			
Bronze	Normally open	½ to 2 (15 to 50)	SST (Standard, Heavy, None)	Brass	NBR or FKM[1]	NBR or FKM[1]	250 (17.2)	250 (17.2)	32 to 180 (0 to 32)
	Normally open (Min Flow Stop)	1 to 1¼ (15, 20)	SST (Standard, Heavy, None)	Brass	NBR or FKM	NBR	250 (17.2)	250 (17.2)	32 to 180 (0 to 32)
	Normally closed	½ to 2 (15 to 50)	SST (Standard, Heavy, None)	Brass	NBR or FKM[1]	NBR or FKM[1]	250 (17.2)	250 (17.2)	32 to 180 (0 to 32)
	Normally closed (Min Flow Stop)	1½ and 2 (40 and 50)	SST (Standard, Heavy, None)	SST	NBR	NBR	250 (17.2)	250 (17.2)	32 to 180 (0 to 32)

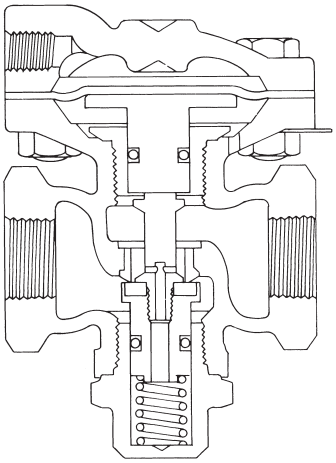
1. For sizes ½ and ¾ in. (15 and 20 mm) only.

STANDARD SPRING RANGES, psig (barg)

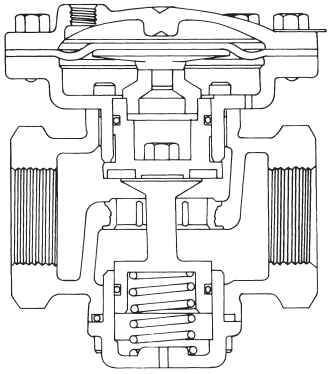
Spring material	Spring ranges
Stainless steel	0 to 250 (0 to 17.2)
Stainless steel (Heavy spring)	0 to 250 (0 to 17.2)
No spring	- - - -



¾ in. (10 mm)
Type D53 Normally open



¾ in. (10 mm)
Type D53 Normally closed



1½ and 2 in. (40 and 50 mm)
Type D53 Normally open

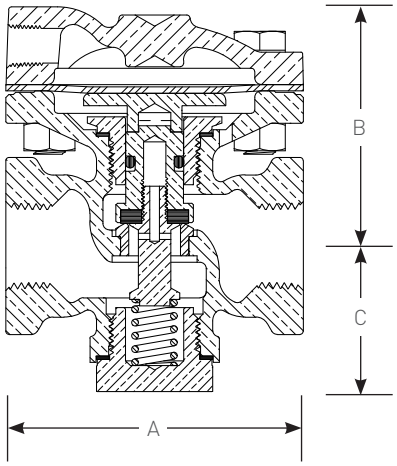
DIAPHRAGM PRESSURE REQUIREMENTS[1] (to fully open or fully close valve)

Inlet pressure, psig (barg)	Normally closed valve (pressure to fully open, psig (barg))	Normally open valve (pressure to fully close, psig (barg))
0	20 (1.4)	20 (1.4)
50 (3.4)	20 (1.4)	25 (1.7)
100 (6.9)	20 (1.4)	30 (2.1)
150 (10.3)	20 (1.4)	35 (2.4)
200 (13.8)	20 (1.4)	40 (2.8)
250 (17.2)	20 (1.4)	45 (3.1)

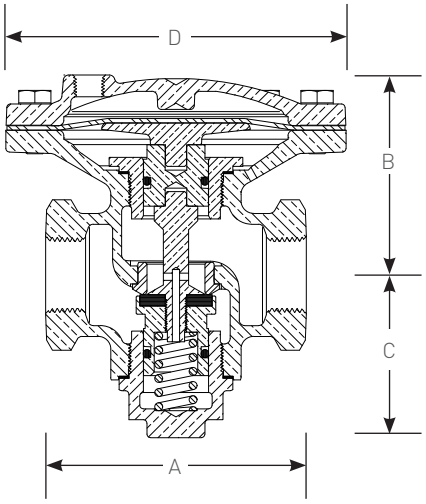
1. Open for ½ thru 1¼ in. (15 thru 32 mm) sizes.

NOTE

Diaphragm pressure requirements for 1½ and 2 in. (40 and 50 mm) sizes are 20 psig (1.4 barg) to fully open a normally closed valve and 20 psig (1.4 barg) to fully close a normally open valve.



½ and ¾ (10 and 15 mm)



1 to 2 in. (25 to 50 mm)

DIMENSIONS

		Dimensions, in. (mm)				Shipping weight,
Size, in. (mm)	**Top connection[1], in. (mm)**	**A**	**B**	**C**	**D**	**lbs (kg)**
½ (15)	⅛ (6)	2.88 (73.2)	2.31 (58.7)	1.41 (35.8)	- - - -	3 (1.36)
¾ (20)	⅛ (6)	2.88 (73.2)	2.31 (58.7)	1.41 (35.8)	- - - -	3 (1.36)
1 (25)	¼ (8)	4.50 (114)	3.45 (87.6)	2.81 (71.4)	5.88 (149)	7 (3.18)
1¼ (32)	¼ (8)	4.50 (114)	3.45 (87.6)	2.81 (71.4)	5.88 (149)	7 (3.18)
1½ (40)	¼ (8)	5.75 (146)	3.95 (100)	2.94 (74.7)	5.88 (149)	19 (8.62)
2 (50)	¼ (8)	5.75 (146)	3.95 (100)	2.94 (74.7)	5.88 (149)	19 (8.62)

1. Top connection extends vertically upward on 1 to 2 in. (25 to 50 mm) body sizes.

HOW TO FIND WATER CAPACITY

1. Determine the pressure drop (psig) across the valve (inlet pressure minus outlet pressure). On the graph, locate this valve on the pressure drop ordinate.
2. Locate the given gpm capacity on the water flow ordinate.
3. Draw a horizontal line from the pressure drop point and a vertical line from the flow capacity point and mark their intersection. Select the diagonal valve sizing line to the right of this intersection point. Either of the two sizes is the correct valve for the given service conditions. Do not select a valve size to the left of an intersection point.

Example: Given inlet pressure 20 psig (1.4 barg), outlet pressure 10 psig (0.7 barg), flow 20 gpm.

(1) Pressure drop = 10 psig (0.7 barg). Locate this point on the pressure drop ordinate.
(2) Locate the 20 gpm point on the water flow ordinate.
(3) The 10 psig (0.7 barg) horizontal pressure drop line and the vertical 20 gpm water flow line intersect between the ½ to ¾ in. (15 to 20 mm) and 1 to 1¼ in. (25 to 32 mm) sizing lines.

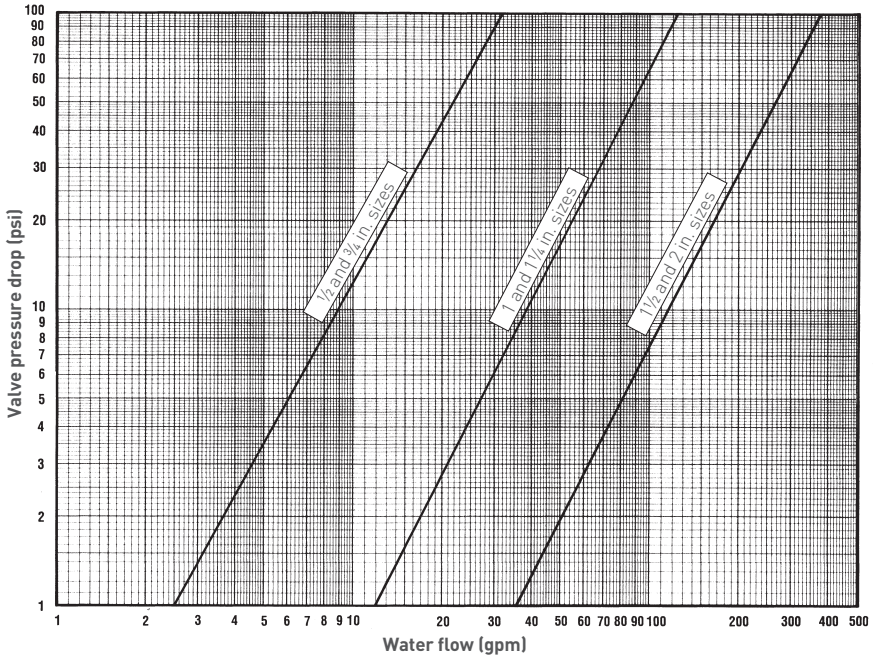
The closest valve size to the right of the intersection point is the 1 or 1¼ in. (25 or 32 mm) size. Select either of these two sizes.

(4) Maximum valve capacity = 38 gpm.

NOTES

1. Consult the factory for valve sizing with pressure drops greater than 100 psig (6.9 barg).
2. Maximum capacity of a selected valve size is found by drawing a horizontal line from the already determined intersection point to the valve sizing line. From this new point, draw a vertical line down to water flow ordinate. The maximum capacity of the valve is where this vertical line intersects the water flow ordinate.

WATER CAPACITY CHART



C_V=	½ and ¾ in.	1 and 1¼ in.	1½ and 2 in.
	2.5	12.0	35.0

HOW TO FIND AIR CAPACITY

1. Determine the pressure drop (psig) across the valve (inlet pressure minus outlet pressure). On the graph, locate this valve on the pressure drop ordinate.
2. Locate the given scfm capacity point on the air flow ordinate.
3. Draw a horizontal line from the pressure drop point and a vertical line from the flow capacity point and mark their intersection. Select the group of curves to the right of the intersection point. The inlet pressure curve must always be to the right of the intersection point. If not, the valve size must be obtained from the next group of inlet pressure curves – to the right of the intersection point.

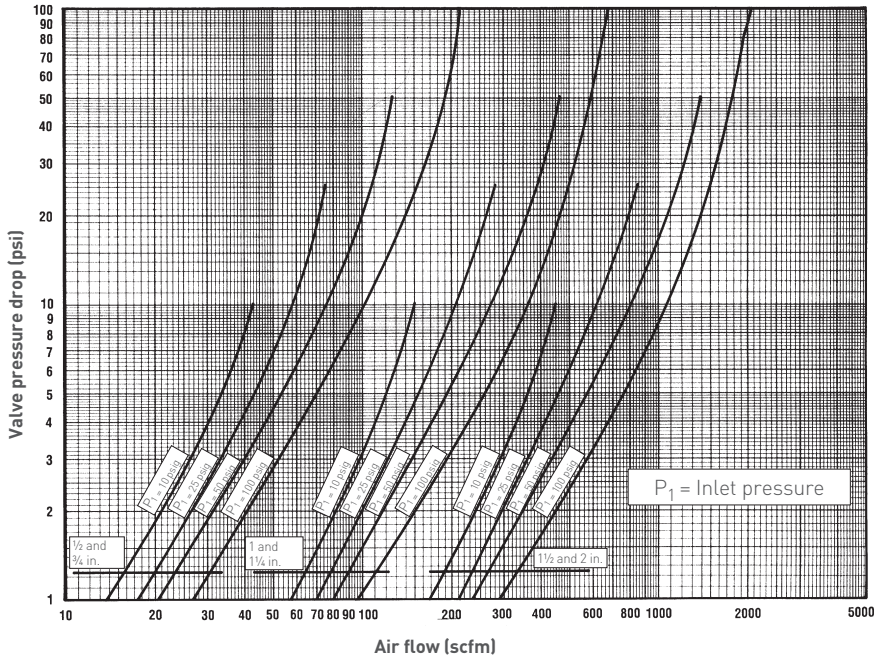
Example: Given inlet pressure 20 psig (1.4 barg), outlet pressure 10 psig (0.7 barg), flow 200 scfm.

(1) Pressure drop is 10 psig (0.7 barg). Locate this point on the pressure drop ordinate.
(2) Locate the flow of 200 scfm on the air flow ordinate.
(3) Mark the point where the 10 psig (0.7 barg) and 200 scfm lines intersect. Notice the intersection point is to the right of the inlet pressure curve of 20 psig (1.4 barg). Therefore, a 1 or 1¼ in. (25 or 32 mm) valve should not be selected. Rather, a 1½ or 2 in. (40 or 50 mm) valve should be chosen from the next group of inlet pressure curves - to the right of the intersection point.
(4) Maximum valve capacity = 540 scfm.

NOTES

1. Consult the factory for valve sizing with pressure drops greater than 100 psig (6.9 barg).
2. Inlet pressure curves for pressures other than 10, 25, 50 or 100 psig (0.7, 1.7, 3.4 or 6.9 barg) should be spaced proportionately and drawn parallel to the given higher and lower inlet pressure curves.
3. Maximum valve capacity is found by drawing a horizontal line from the intersection point to the valve size inlet pressure curve. From this new point draw a vertical line down to the air flow ordinate. The maximum capacity of the valve is where this vertical line intersects the air flow ordinate.

AIR CAPACITY CHART



SELECTION GUIDE

Example:	D53	C	W	S	0	B	B	01	–	E	1

Model

D53 Type D53 bronze control valve

Valve size

C	½ in. (15 mm)	**F**	1¼ in. (32 mm)
D	¾ in. (20 mm)	**G**	1½ in. (40 mm)
E	1 in. (25 mm)	**H**	2 in. (50 mm)

Service

W Water/air

O Oxygen gas

Connection style

S Side inlet/side outlet - straight thru with NPT connections

Seat position

O Normally open

C Normally closed

Diaphragm material

B NBR

V FKM (for sizes ½ and ¾ in. only)

Seat material

B NBR

V FKM (for sizes ½ and ¾ in. only)

Variation

01 Diaphragm chamber connection in line with inlet

02 Diaphragm chamber connection right of inlet

03 Diaphragm chamber connection left of inlet

04 Minimum flow stop

Design revision

(-) Original design

Spring material

E Stainless steel

H Heavy spring (stainless steel)

N No spring

Spring range

Refer to table in page 2