

## Series 9120 Seated Angle Valves for ANSI 150 - 600 DIN/BS 4504 PN10-PN40

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Specification

## Series 9120 Seated Angle Valves for ANSI 150 - 600 DIN/BS 4504 PN10-PN40

### Series 9120 Features

#### General

The Series 9120 Angle-type control valve is an indispensable tool to control fluid of high differential pressure, slurry, high viscosity, or adhesive. They are provided with a number of features such as low resistance of passage, antiwear quality within the valve, and easy maintenance and inspection.

#### Performance :

- High Cv to body size ratio
- Streamlined flow passages to optimize capacity
- High Cv to valve weight ratio
- Excellent flow control rangeability

#### Design Flexibility :

- Modular construction design available with a range of different connections and styles
- All trim components removable from the top for easy of maintenance
- Wide range of supplementary noise control options
- Inherently characterized trim offered in equal percentage, linear, quick opening and modified-parabolic (options)
- Multi trim sizes available
- Full range of body and trim material options
- Fully rationalized and interchangeable features
- Full range of bonnet and packing designs to suit various temperatures and fluids



Figure 1.  
Series 9120 Valve incorporating Contoured Trim and complete with  
Series 6100 Actuator

**Angle Valve Specifications**

<b>Valve Type</b>	Diaphragm Operated Angle Control Valve										
<b>Valve Model</b>	Series 9210										
<b>Trim Type</b>	S-P, C-B, C-P, C-S, C-B-S, C-D, Optional Special Valve										
<b>Valve Size (in)</b>	1/2	3/4	1	1.1/2	2	2.1/2	3	4	5	6	
<b>(mm)</b>	15	20	25	40	50	65	80	100	125	150	
<b>Pressure Rating</b>	ANSI 150#~600# (JIS 10K~40K, PN 10~40)										
<b>End Connection</b>	RF, FF, SW, BW, Screw, RTJ										
<b>Body Materials</b>	A216WCB, A351CF8/CF8M, A351CF3/CF3M, H-C, H-B, and so on										
<b>Bonnet Type</b>	Plain(-17°c to 230°c), Extension(-45°c to -17°c over 230°c), Cryogenic(-196°c to -45°c)										
<b>Packing</b>	Graphite foil, Carbon fiber, Teflon fiber										
<b>Gasket</b>	Spiral Wound Metal gasket										
<b>Guiding</b>	Top/Cage										
<b>Seat Type</b>	Metal/Soft										
<b>Valve Plug Shapes</b>	Contoured/ Cage/ Pilot										
<b>Plug Characteristic</b>	Equal Percentage/Linear/Modified-Parabolic/Quick Opening										
<b>Trim Materials</b>	A351CF8/CF8M, A351CF3/CF3M, H-C, H-B, and so on										

**Design Integrity :**

- Heavy duty top guiding with no bottom guide to obstruct seat bore and potentially trap debris
- Large diameter stems
- Clamped bonnet and seat ring gaskets are fully retained for easy maintenance

**Quality Manufacturing :**

- Rigorously tested to ensure specified performance on site
- Quality assurance system in accordance with ISO 9001
- Optional full NACE MR-01-75 certification

**Scope of Design**

End Connection Sizes : 1/2" to 6" (15mm to 150mm)

**End Connection Styles :**

ANSI, DIN and BS flanged RF, FF, RTJ ( and other grooved designs).  
Welded profiles including butt weld, socket, etc, clamped and screwed designs. Other requirements available on request.

**Valve Body Ratings :**

ANSI 150 to ANSI 600, DIN/BS4504 PN10 to PN40 as standard. Other requirements available on request.

**Design Standards :**

ANSI B16.34 and ASME section VIII (for body/bonnet bolting)

**Trim Design Options :**

Full and reduces trim, SP, DP, and BP available as standard.  
Multi hole cages and attenuate. silencers are available for specific applications.

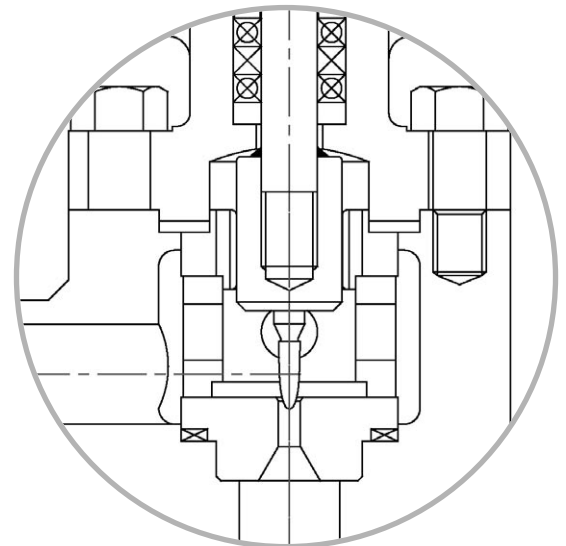


Figure 2. Single Contoured Plug (Small Size)

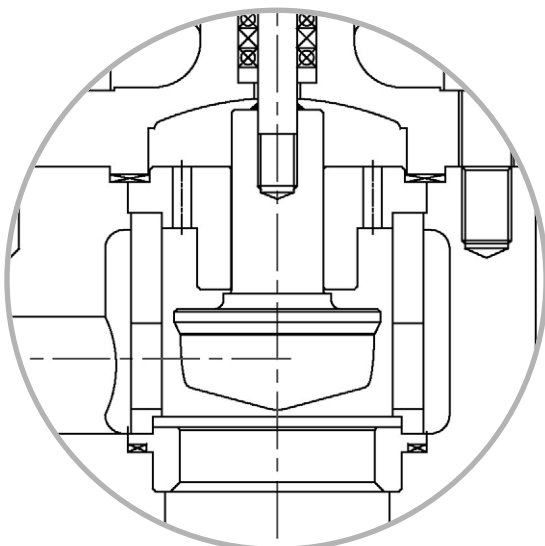


Figure 3. Single Contoured Plug Up to 6" (Unbalanced)

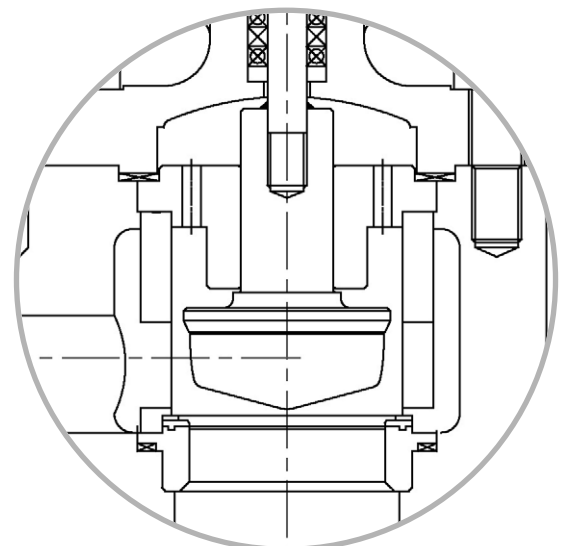


Figure 4. Single Contoured Plug (Unbalanced, Soft Seat)

**Inherent Characteristics :**

Equal percentage, Linear, Modified parabolic or Quick open.

**Material Combinations :**

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

**Plug Design Options :**

Unbalanced with metal/metal or resilient seating plus balanced with metal/metal seating and metallic or resilient piston rings.

**Bonnet Options**

Standard, Extension and Cryogenic bonnet design options available.

**Actuation :**

Various types of actuation are available including ;

Series 6100 spring opposed pneumatic diaphragm.

'C' Series spring opposed pneumatic piston.

'D' Series double acting pneumatic piston.

In addition electric, electro-hydraulic, hydraulic and manually operated versions are available.

**Sizing/Noise Prediction**

The procedures for performing valve sizing, velocity and sound pressure level calculations are detailed in both the Technical Selection Manual.

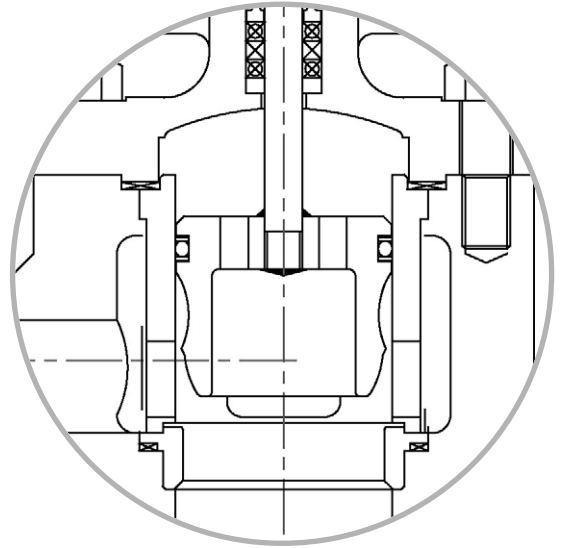


Figure 5. Single Contoured Plug (Balanced)

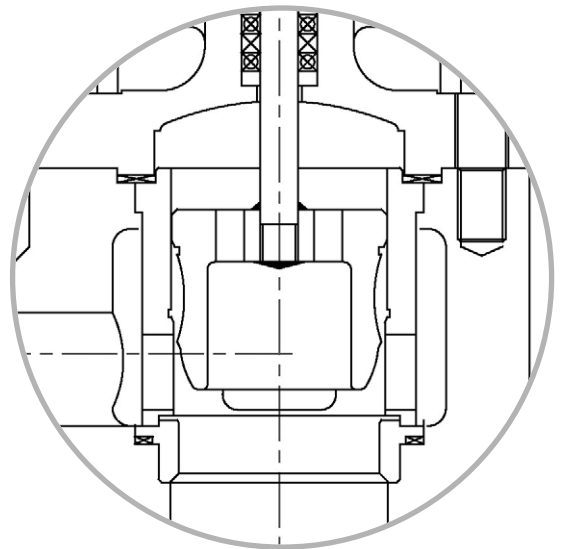


Figure 6. Double Contoured Plug (Over 2")

## Guide to Trim Options Available

### Modular Design

Series 9120 has been designed around a modular manufacturing concept. Using this philosophy, a centre body module selected to most suit the specified flow conditions and operating data, is combined with end connection size/rating, selected to support that module. This design feature allows not only the selection of full size ends, to offer oversize end connections to suit a particular requirement.

### Unbalance Trim

Single Contoured Unbalance Port(SP) are up to 6".

Ports are guided by heavy guide.

### Balance Trim

Pressure balance ports are used to reduced the thrust on the port.

Single Contoured Balance Port (BP) are over 2" are standard and under 2" are available for specific applications.

Double Contoured Balance port (DP) are over 2" for high pressure drop.

Soft seats are used in application requirement ANSI Class VI ' BUBBLE-TIGHT ' shutoff and FIRE SAFE design. It's design consist of an elastomer sandwiched between two metal piece,insert retainer and metal seat. The soft seat can be done by Installing the insert and soft seat between seat retainer and seat.Therefore it can be used for fire safe function.

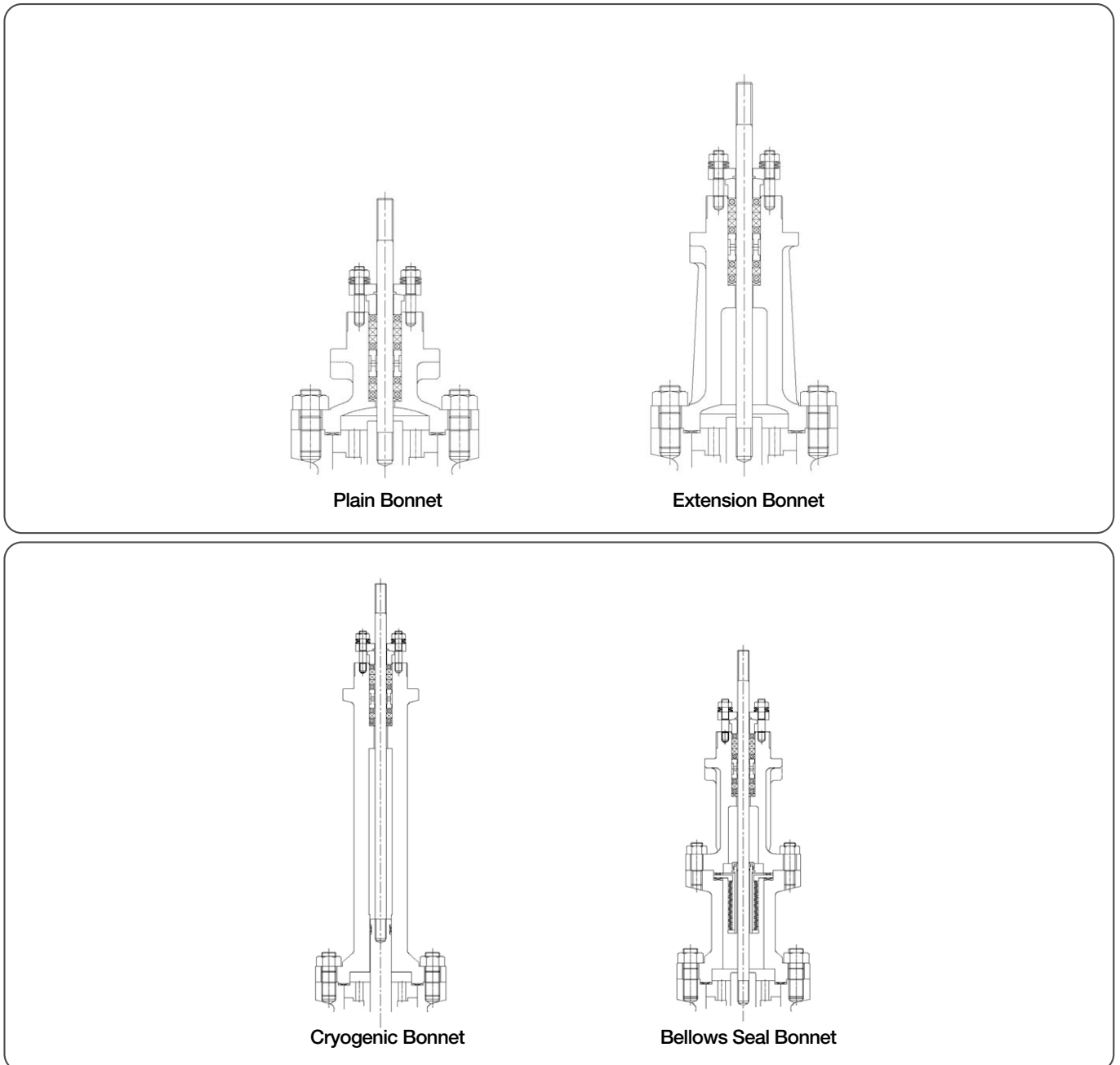


Figure 7. Bonnet Design Option

## Series 9120 Design Cv Values

Table 1. Small Flow

Valve Size		Lift	Trim Size Number	Linear
in	mm			
1/2" 3/4" 1"	15 20 25	15	No.5	0.007
			No.4	0.014
			No.3	0.025
			No.2	0.037
			No.1	0.056

Note : Special small flow (optional) is available.

Table 2. Single Contoured up to 1" Valve Size

Connection Size		Trim Size	Lift	Eq% Linear	Quick Opening
in	mm				
1/2"	15	3	15	0.09	0.09
		4		0.15	0.15
		6(1/8)		0.4	0.4
		7(3/16)		0.8	0.8
		8(1/4)		1.5	1.5
		10(3/8)		3.0	3.0
		15(1/2)		5.2	5.2
3/4"	20	3	15	0.09	0.09
		4		0.15	0.15
		6(1/8)		0.4	0.4
		7(3/16)		0.8	0.8
		8(1/4)		1.5	1.5
		10(3/8)		3.0	3.0
		15(1/2)		5.2	5.2
		20(3/4)		9.0	9.0
1"	25	3	15	0.09	0.09
		4		0.15	0.15
		6(1/8)		0.4	0.4
		7(3/16)		0.8	0.8
		8(1/4)		1.5	1.5
		10(3/8)		3.0	3.0
		15(1/2)		5.2	5.2
		20(3/4)		9.0	9.0
		25(1)		14	14

Note : The above design Cv values apply to valves with body rating ANSI 150 to ANSI 600

**Table 3. Contoured Cv Valve 1" - 4" Valve Size(Unbalanced)**

Connection Size	Full Ported			
	Trim Size	Lift	Eq% Linear	Quick Opening
1"	1"	15	14	14
1 1/2"	1 1/2"	20	32	36
2"	2"	25	52	58
2 1/2"	2 1/2"	25	78	88
3"	3"	38	116	130
4"	4"	38	195	220

**Table 4. Cage Guided Cv Valve 1" - 6" Valve Size(Balanced)**

Connection Size	Full Ported			
	Trim Size	Lift	Eq% Linear	Quick Opening
1 1/2"	1 1/2"	20	34	38
2"	2"	25	56.2	67.2
2 1/2"	2 1/2"	25	83	93.5
3"	3"	38	125	135
4"	4"	38	210	235
5"	5"	50	276	368
6"	6"	50	424	547

### Velocity Limitations

In selecting a valve for either a liquid or gas / vapor application one of the major considerations is the effect of fluid velocity. High velocity could lead to operational problems including erosion, excessive vibration and instability. The following tables indicate the maximum recommended velocity values for liquid and gas / vapor services. Table 5. Recommended Maximum Velocities for Liquid Service .

**Table 5. Recommended Maximum Velocities for Liquid Service.**

Valve Size				Maximum Velocity			
		Carbon Steel		Alloy Steel		Bronze, Cu/Ni Alloy	
in	mm	ft/s	m/s	ft/s	m/s	ft/s	m/s
0.5-2	15-50	41	12.5	46	14	25	7.6
3-6	80-150	34	10.4	34	10.4	20	6.2
8-2	200-300	29	8.9	29	8.9	17	5.2

**Table 6. Recommended Maximum Velocities for Gas/ Vapor Services**

Valve Size		Maximum Inlet Velocity		Maximum Inlet Velocity		Max. Outlet Mach Number for Required Noise Level		
in	mm	ft/s	m/s	ft/s	m/s	>95 dBA	<95 dBA	<85 dBA
0.5 - 2	15 - 50	340	104	830	253	0.65	0.5	0.3
3 - 6	80 - 150	294	90					
8 - 12	200 - 300	265	81					

## Inherent Rangeability

The inherent rangeability of a control valve is the ratio between maximum and minimum flow with in the working characteristic at constant pressure drop.

Table 7. Rangeability Values

Trim type	Rangeability		
Trim No. 1~5	10:1		*Over
Contoured Plug	30:1		*Over
Cage Guide	50:1		*Over

\* Special option

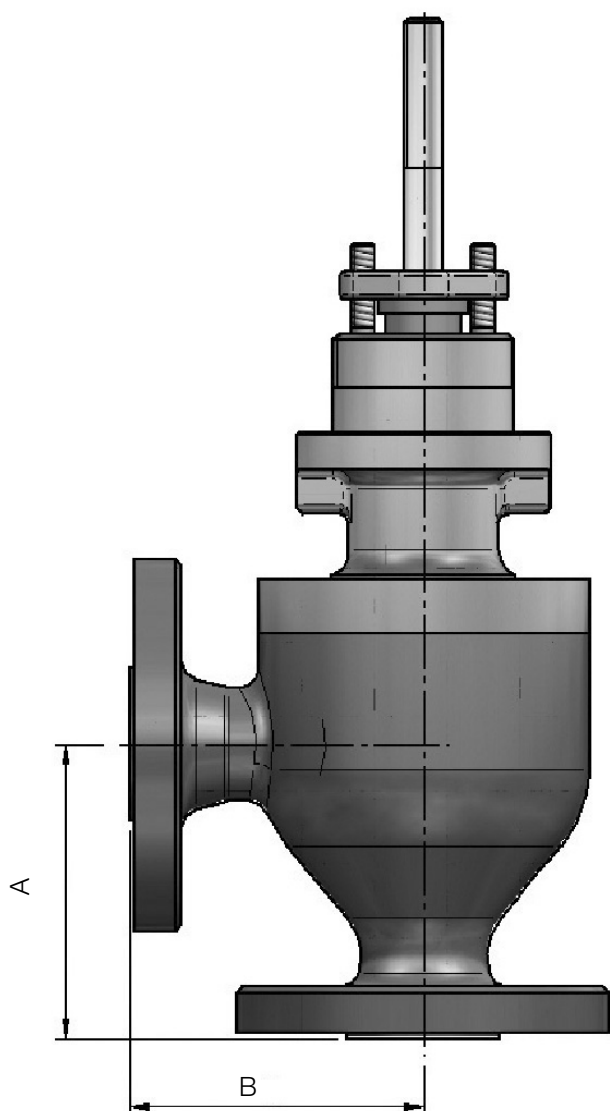


Figure 8. Series 9120 Dimensions

Table 8. Series 9120 Outline Dimensions up to ANSI 600 Rating

(Unit : mm)

Pressure Rating Body Size(mm)	A, B		
	JIS10K, 20K ANSI 150RF 300RF	JIS 30K, 40K ANSI 300 RJ 400, 600RF	ANSI 400RJ 600RJ
20	97	103	103
25	98	105	105
40	117	125	125
50	133	143	145
65	146	156	158
80	159	168	170
100	184	197	200
125	212	228	230
150	237	254	256

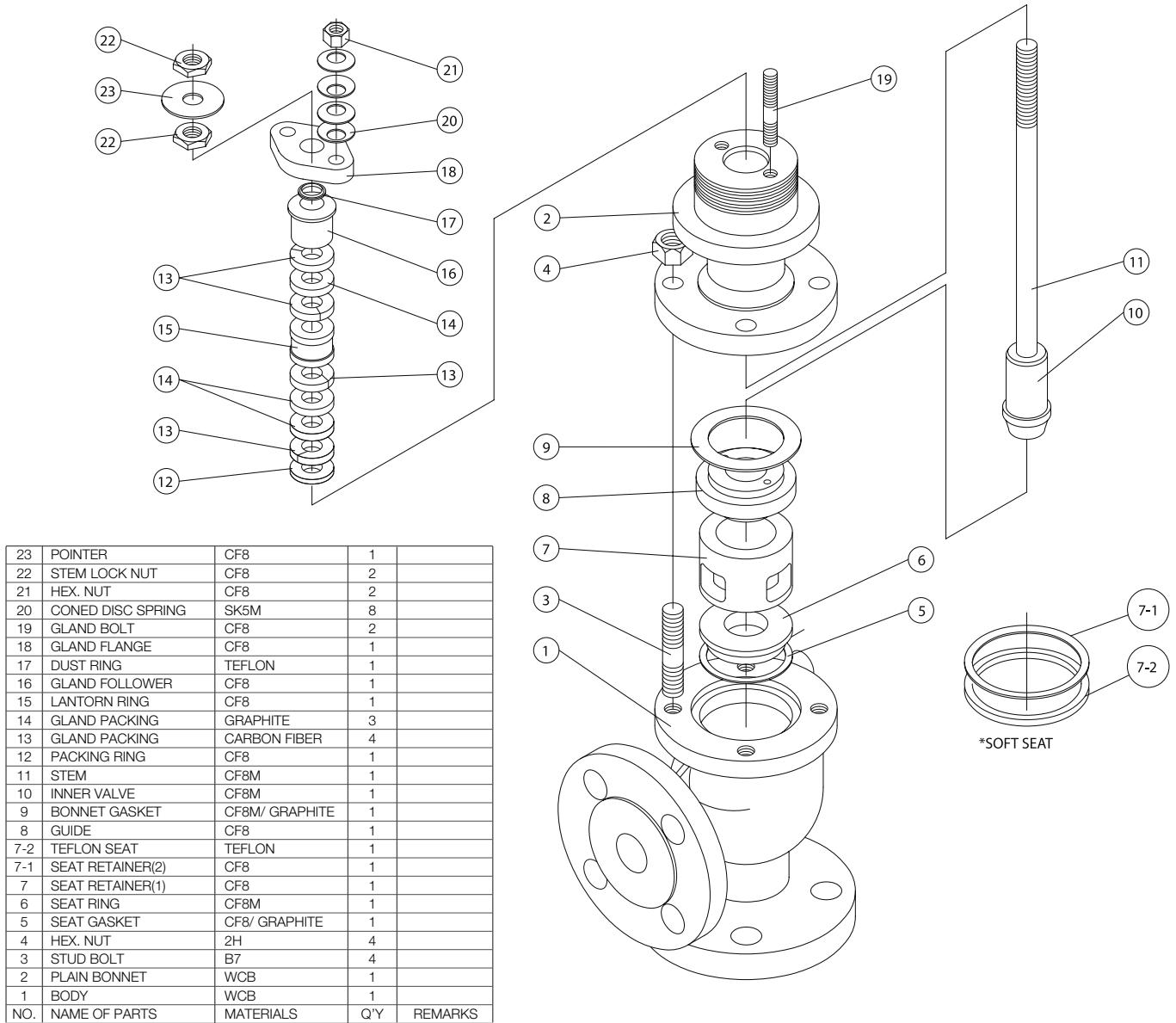


Figure 9. Body Disassembly and Assembly Diagram

### Warranty / Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is **in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.**

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