



**WYECO** AUTO VALVES CO., LTD.

**Catalogue  
EN9000s**



# **WYECO 9000 Series Control Valves**

**Complete Line of Balanced, Perforated Plug,  
Multi-Stage Cage Guide, Globe Valves with  
Lo-dB and Anti-Cavitation Capabilities**

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## Introduction

偉允9000系列控制閥，於閥芯設計方面廣泛結合了市面上各式不同閥芯之特色，適用於需要抗噪音、抗孔蝕之環境。所有偉允生產的閥均經過工廠充份之測試驗證，且符合工業之標準。

WYECO's 9000 series control valves combine various features with wide ranges of trim designs; these are suited to meet the noise, cavitation process control requirements. All valves are fully factory tested and meet the industry standards.

偉允擁有熟練的維護團隊以及維護據點，分別位於台灣桃園，高雄及麥寮，以便維護偉允所生產製造之閥，及他廠所生產製造之閥。

WYECO has a skilled after service group and maintenance workshop located at Taoyuan, Kaohsiung, and Mailiao Taiwan, available for maintenance, and repair of WYECO valves and other manufactures products.

如需更進一步的資訊，請洽偉允客服中心 (Tel : 886 2 2502 5166)

If customers need further information please contact our service center. (Tel: 886 2 2502 5166)

## General Specification

控制閥尺寸：2，3，4，6，8，10 吋（9000 系列，高效閥籠導引）

Valve Size: 2, 3, 4, 6, 8, 10 inches (9000 series, high capacity cage guide.)

閥體等級：ANSI Class 150，300，600

Body Rating: ANSI Class 150, 300, 600

連接型式：RF，RTJ

End Connections: RF, RTJ.

鋼閥規範：ANSI B16.34

Steel Valves: ANSI B16.34

法蘭規範：ANSI B16.5

Flange: ANSI B16.5

法蘭面間規範：ANSI B16.10 / ISA-S75.03

Face to Face /End to End: ANSI B 16.10 / ISA-S75.03

洩漏測試規範：ANSI / FCI 70.2

Leakage Test: ANSI /FCI 70.2.

## Main Features

偉允 9000 系列控制閥構思源自更進階的設計概念，具有適應於不同液體、氣體環境之應用功能，特色包含理想之流道型式、由堅固及精確的導引閥籠讓流場均勻分佈，使得紊流、振動及噪音得以降至最低。藉由硬材質之金屬座及平衡式導向閥塞，於高溫狀態下仍可保持關閉時之緊密程度。結合硬質材料的閥芯特殊設計，於極端的使用環境下仍可有效地控制由孔蝕、腐蝕或振動所引起的磨耗或損壞。產品適用溫度範圍廣泛，可自低溫至 427°C。具有迫緊之預緊設計，使產品在長時間運轉下仍維持低洩漏率。標準的可替換閥芯模組化設計，方便安裝及維護。

WYECO's 9000 series control valves are built in advanced design concept and variety functions for liquid and gaseous application, including optimum flow profiles and evenly fluid field distribution with rugged and precision cage guide to reduce turbulence, vibration and noise. With hardened metal to metal seat and pilot balanced plug to keep tight Shut-off at high temperature. Combing special design of trims with hardened materials can effectively tight or lighten the wear and damage effect arose from cavitations, erosion, and noise phenomenon in severe service. Wide temperature service range from cryogenic to 427°C and low emission packing with live loading design for long-service, Standard Interchangeable Modular Trim design for easy installation and maintenance.

### **- Quick Change Trim Design**

- . 硬質的閥芯，適用於高壓差，高溫，腐蝕及孔蝕之使用環境。
- . Hardened trim for high pressure drop, high temperature, erosion and cavitation in severe service.
- . 高溫環緊密封斷（洩漏等級為 Class IV/V）。
- . Tight Shut-off (Leakage Class IV/V) at high temperature
- . 標準化及可替換式之模組化設計。
- . Standard and interchangeable modular design
- . 簡單安裝及維護。
- . Easy installation and maintenance

### **- Cage**

- . 提供多孔性、擴散器之多孔性閥籠，以及二階、三階、四階式閥籠可選用。
- . Provide multi-holes cage, multi-hole cage with diffuser, 2-stage cage.  
(Three and Four Stages available)
- . 流場特性曲線：線性/修正之 EQ 百分比。
- . Flow characteristic: Linear/ Modified EQ percentage
- . 抗孔蝕閥籠。
- . Anti-Cavitation Cage
- . 抗噪音閥籠：標準及特殊設計之多孔式閥籠。
- . Noise Reducing Cage: standard multi-hole and special design multi-holes.
- . 縮減型閥芯：提供縮減 40% 之流量。
- . Reduced Trim: provides 40% of full flow capacity.

### **- Plug**

- . 噪音控制及抗腐蝕閥芯，提供具噪音衰減及下游端最佳流場分佈之閥芯
- . Noise control and erosion resistant trim. Provide noise attenuation and excellent flow distribution at downstream of trim.
- . 二階式閥芯設計，特別適合須噪音衰減及孔蝕控制之場合。
- . Two stage design, well suited for noise attenuation and cavitation control.
- . 導引式閥籠、平衡式導向穿孔式閥塞。
- . Cage guide; Balanced, Pilot and perforate Plug.

### **- Tight Shut-off Design**

- . 具金屬對金屬閥座，及導向平衡式閥塞，關斷等級達 ANSI Class III, IV, V 水準。
- . With metal to metal seat and Pilot balanced plug, Shut off to ANSI Class III, IV, V
- . 具軟性閥座，關斷等級達 ANSI Class VI 水準。
- . With soft seat, Shut off to ANSI Class VI

### **- Low Emission Packing:**

- . 提供 PTFE/石墨材質之襯墊，以及 PTFE-Vee 之迫緊。
- . Provide PTFE/Graphite Braided and PTFE-Vee packing
- . 具迫緊預緊設計，適合長時間使用。
- . Live loading design for longer service

### **- NACE Standard MR0175 Compliance**

螺栓及閥芯材質是適合應用於酸性氣體及液體之環境。

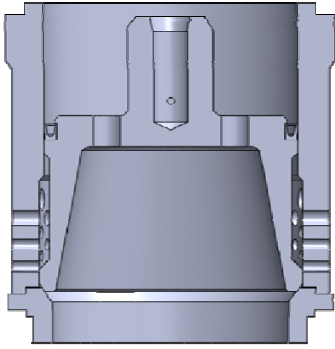
Bolting and trim materials are available for sour gas and liquid application.

# Numbering System



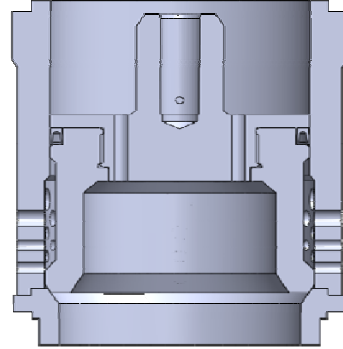
# Trim Types

## Balanced(F-O)/Single Cage(Lo-dB)



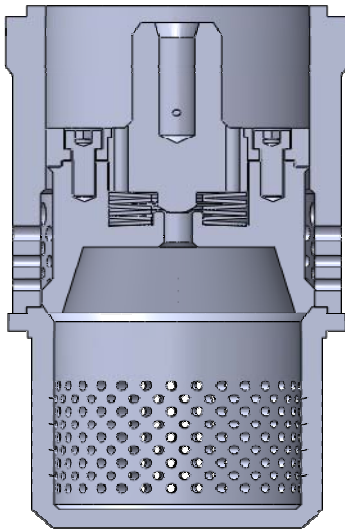
- a. 1 stage , multi-hole (一階多孔式)
- b. Suite for Gas (適用於氣體環境)
- c. Flow to Open (流體助開)
- d. Lo-dB (低噪音)
- e. Balance plug (平衡式閥塞)

## Balanced(F-C)/Single Cage(Anti-cavitation)



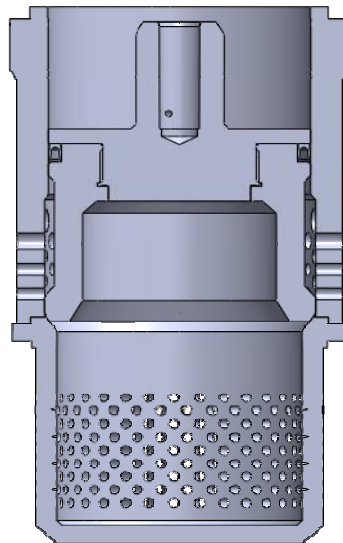
- a. 1 stage , multi-hole (一階多孔式)
- b. Suite for Fluid (適用於液體環境)
- c. Flow to Close (流體助關)
- d. Anti-Cavitation (抗孔蝕)
- e. Balance plug (平衡式閥塞)

## Pilot(F-C)/Single Cage +Diffuser(Lo-dB/Anti-Cavitation)



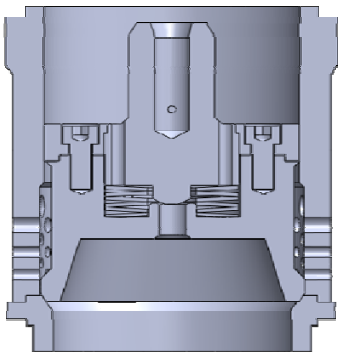
- a. 2 stage , Pilot (二階導向式)
- b. Suite for High Temperature , Middle & High Pressure Drop , and High Leakage Level.  
(適用高溫、中高壓差、及高洩漏等級之環境)
- c. Flow to Close (流體助關)
- d. Lo-dB / Anti-Cavitation  
(低噪音/抗孔蝕)
- e. Balance plug (平衡式閥塞)

## Balanced(F-C)/Single Cage +Diffuser(Lo-dB/Anti-Cavitation)



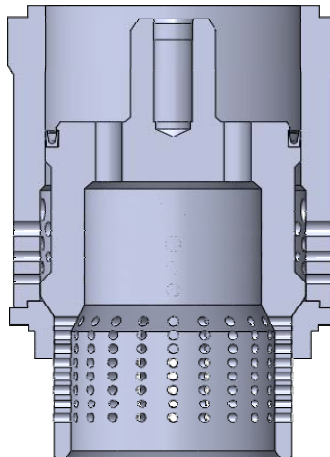
- a. 2 stage , multi-hole (二階多孔式)
- b. Suite for Middle & High Pressure Drop  
(適用於中高壓差環境)
- c. Flow to Close (流體助關)
- d. Lo-dB / Anti-Cavitation  
(低噪音/抗孔蝕)
- e. Balance plug (平衡式閥塞)

### Pilot(F-C)/Single Cage(Lo-dB/Anti-Cavitation)



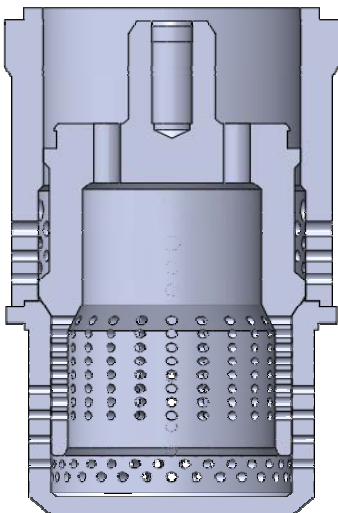
- a. 1 stage , Pilot (一階導向式)
- b. Suit for High Temperature & High Leakage Level  
(適用於高溫、高洩漏等級)
- c. Flow to Close (流體助關)
- d. Lo-dB / Anti-Cavitation  
(低噪音/抗孔蝕)
- e. Balance plug (平衡式閥塞)

### Balanced (F-O)/Single Cage + Perforated Plug(Lo-dB)



- a. 2 stage , Muti-Hole (二階多孔式)
- b. Suite for Middle & High Pressure Drop  
(適用中高壓差環境)
- c. Flow to Open (流體助開)
- d. Lo-dB (低噪音)
- e. Balance plug (平衡式閥塞)

### Balanced(F-O)/Single Cage + Perforated Plug+Diffuser



- a. 3 stage , Muti-Hole (三階多孔式)
- b. Suite for High Pressure Drop  
(適用高壓差環境)
- c. Flow to Open (流體助開)
- d. Lo-dB / Anti-Cavitation  
(低噪音/抗孔蝕)
- e. Balance plug (平衡式閥塞)

# C<sub>v</sub> versus Travel

Trim Type: 1-Stage Plug Type: Plug/Pilot

Cage Type: Single Cage

Direction: Flow to Open (FTO)

Apply to all products of ISO & IEC (Face to Face or end to end)

Flow Characteristic : LINEAR

Percent of Travel						10	20	30	40	50	60	70	80	90	100	
Valve Size		ASME Rating	Orifice Diameter		Travel		Rated Cv									
inch	mm		inch	mm	inch	mm										
2	50	Class 300 & 600	2.5	63.5	1.57	40	4.5	10.1	15.7	22.0	28.3	35.5	42.8	47.2	51.7	56.1
2	50		2.5	63.5	1.57	40	1.7	4.0	6.2	8.4	10.5	12.8	15.1	17.4	19.7	22.0
3	80		3.5	88.9	1.97	50	11.2	25.2	39.9	53.5	67.3	84.9	98.6	110	114	121
3	80		3.5	88.9	1.97	50	5.5	10.8	16.8	23.2	29.2	34.9	40.6	46.3	51.7	56.6
4	100		4.38	111.25	1.97	50	16.5	37.5	58.6	81.9	105	126	148	162	176	192
4	100		4.38	111.25	1.97	50	9.2	19.8	30.4	42.6	54.8	65.0	75.3	87.4	99.4	111
6	150		5.12	130.05	2.36	60	39.4	86.7	129	171	209	248	268	299	313	326
6	150		5.12	130.05	2.36	60	15.6	33.8	52.1	70.5	89.0	107	125	142	160	177
8	200		6.5	165.1	3.15	80	43	98	152	204	256	303	349	385	421	450
8	200		6.5	165.1	3.15	80	25.7	54.5	83.3	113	144	172	201	229	258	287
10	250		8	203.2	3.15	80	67.0	144	221	298	375	442	509	564	619	664
10	250		8	203.2	3.15	80	36.0	76.8	117	160	202	244	287	327	368	405

# C<sub>v</sub> versus Travel

Trim Type: 1-Stage Plug Type: Plug/Pilot

Cage Type: Single Cage

Direction: Flow to Open (FTO)

Apply to all products of ISO & IEC (Face to Face or end to end)

Flow Characteristic : EQ%

Percent of Travel						10	20	30	40	50	60	70	80	90	100	
Valve Size		ASME Rating	Orifice Diameter		Travel		Rated Cv									
inch	mm		inch	mm	inch	mm										
2	50	Class 300 & 600	2.5	63.5	1.57	40	1.1	2.1	2.9	4.3	7.0	13.7	23.0	31.6	39.8	46.0
2	50		2.5	63.5	1.57	40	1.2	1.9	2.8	3.7	5.2	9.3	15.4	21.6	27.1	30.6
2	50		2.5	63.5	1.57	40	1.0	1.5	1.8	2.6	3.8	6.5	10.4	14.1	16.4	18.4
3	80		3.5	88.9	1.97	50	4.1	6.3	8.4	10.9	18.1	32.1	53.6	74.2	91.2	103
3	80		3.5	88.9	1.97	50	2.7	3.8	5.1	7.2	11.1	21.1	33.4	44.5	53.5	60.7
4	100		4.38	111.25	1.97	50	5.7	9.1	12.7	18.4	32.0	64.2	96.3	126	150	163
4	100		4.38	111.25	1.97	50	3.0	5.9	8.8	12.3	20.2	38.9	60.0	79.3	96.8	106
6	150		5.12	130.05	2.36	60	7.4	13.9	20.4	30.2	51.7	91.2	143	190	232	259
6	150		5.12	130.05	2.36	60	6.3	10.3	15.2	23.6	39.9	75.6	122	165	201	223
6	150		5.12	130.05	2.36	60	5.4	8.6	12.2	17.7	29.1	54.8	83.8	115	143	163
8	200		6.5	165.1	3.15	80	8.1	15.5	23.3	34.2	61.7	127	187	247	301	343
8	200		6.5	165.1	3.15	80	4.5	9.2	15.6	23.1	40.0	78.4	122	167	206	230
10	250	8	203.2	3.15	80	10.7	21.0	30.7	46.7	87.4	163	242	322	403	466	
10	250	8	203.2	3.15	80	7.8	14.1	20.5	30.7	51.9	98.5	148	205	255	281	



# C<sub>v</sub> versus Travel

Trim Type: 2-Stage Plug Type: Plug/Pilot Cage Type: Single Cage+Diffuser Direction: Flow to Close (FTC)  
 Apply to all products of ISO & IEC (Face to Face or end to end) Flow Characteristic : LINEAR

Valve Size		ASME Rating	Orifice Diameter		Travel		Percent of Travel									
inch	mm		inch	mm	inch	mm	10	20	30	40	50	60	70	80	90	100
2	50	Class 300 & 600	2.5	63.5	1.57	40	4.3	10.5	16.8	21.5	26.8	32.5	37.8	43.0	47.8	52.5
2	50		2.5	63.5	1.57	40	1.6	3.8	6.0	7.8	9.4	11.3	13.0	14.7	15.9	17.1
3	80		3.5	88.9	1.97	50	9.2	26.7	40.0	52.3	63.0	74.5	84.5	94.5	102.9	111.2
3	80		3.5	88.9	1.97	50	4.0	8.7	13.9	19.1	23.9	27.7	32.5	36.4	40.3	43.3
4	100		4.38	111.25	1.97	50	16.3	39.6	61.1	82.6	102.4	119.1	134.5	148.4	160.8	172.0
4	100		4.38	111.25	1.97	50	8.9	18.4	29.4	40.4	48.9	59.7	68.9	77.2	85.4	91.9
6	150		5.12	130.05	2.36	60	35.6	70.6	104	137	167	194	220	243	264	283
6	150		5.12	130.05	2.36	60	15.6	32.1	50.5	68.9	84.7	104.9	118.8	131.4	142.7	153.0
8	200		6.5	165.1	3.15	80	43.4	100.7	148.8	199.6	249.7	284.2	313.6	346.6	376.4	403.2
8	200		6.5	165.1	3.15	80	25.8	55.0	83.0	109.9	136.2	161.2	184.4	206.4	225.9	244.2
10	250		8	203.2	3.15	80	54.0	134.3	206.2	269.7	342.3	384.4	434.9	484.0	526.0	559.6
10	250		8	203.2	3.15	80	31.9	78.1	118.8	156.2	185.6	224.1	254.6	285.2	316.9	339.5

# C<sub>v</sub> versus Travel

Trim Type: 2-Stage Plug Type: Plug/Pilot Cage Type: Single Cage+Diffuser Direction: Flow to Close(FTC)  
 Apply to all products of ISO & IEC (Face to Face or end to end) Flow Characteristic : EQ%

Valve Size		ASME Rating	Orifice Diameter		Travel		Percent of Travel									
inch	mm		inch	mm	inch	mm	10	20	30	40	50	60	70	80	90	100
2	50	Class 300 & 600	2.5	63.5	1.57	40	1.0	1.9	2.7	4.1	6.6	16.3	24.4	30.6	35.2	38.7
2	50		2.5	63.5	1.57	40	0.4	0.7	1.2	2.0	3.5	7.5	11.0	13.6	15.6	16.8
3	80		3.5	88.9	1.97	50	2.5	5.5	7.7	12.2	16.0	39.3	57.3	71.0	81.2	87.4
3	80		3.5	88.9	1.97	50	1.6	2.6	3.5	5.7	9.2	19.8	28.8	35.6	40.7	43.9
4	100		4.38	111.25	1.97	50	2.9	5.2	9.0	14.2	24.3	55.5	82.6	103.3	118.8	129.1
4	100		4.38	111.25	1.97	50	1.2	3.0	5.2	8.1	14.7	30.9	46.4	58.2	67.8	73.7
6	150		5.12	130.05	2.36	60	4.2	7.2	12.5	21.5	37.7	73.3	108.8	136.1	160.1	178.9
6	150		5.12	130.05	2.36	60	2.9	4.8	8.1	13.1	22.7	48.1	70.2	87.0	99.6	107.4
8	200		6.5	165.1	3.15	80	8.1	14.8	20.7	35.4	61.1	118.1	177.2	224.4	265.7	295.3
8	200		6.5	165.1	3.15	80	4.3	7.7	11.9	21.3	37.2	73.3	109.1	136.4	156.8	170.4
10	250		8	203.2	3.15	80	9.4	19.2	28.8	46.1	80.0	172.2	251.0	311.1	355.9	383.8
10	250		8	203.2	3.15	80	6.7	13.3	19.4	29.8	48.1	99.2	144.6	179.2	205.1	221.1

# C<sub>v</sub> versus Travel

Trim Type: 2-Stage Plug Type: Perforated Plug

Cage Type: Single Cage

Direction: Flow to Open(FTO)

Apply to all products of ISO & IEC (Face to Face or end to end)

Flow Characteristic : LINEAR

Valve Size		ASME Rating	Orifice Diameter		Travel		Percent of Travel									
inch	mm		inch	mm	inch	mm	10	20	30	40	50	60	70	80	90	100
Class 300 & 600	2	50	2.5	63.5	1.57	40	1.3	5.4	8.8	11.7	14.2	18.4	22.1	25.8	29.9	34.0
	2	50	2.5	63.5	1.57	40	0.9	2.4	3.9	5.1	6.4	8.0	9.3	10.7	12.1	13.3
	3	80	3.5	88.9	1.97	50	5.0	13.6	20.4	27.9	34.8	42.2	50.5	58.8	67.1	75.4
	3	80	3.5	88.9	1.97	50	2.5	6.0	9.4	12.7	16.1	20.1	23.4	26.8	30.1	33.5
	4	100	4.38	111.25	1.97	50	8.4	19.2	29.4	41.7	52.2	64.2	74.9	85.6	96.3	106.9
	4	100	4.38	111.25	1.97	50	5.1	10.6	17.8	24.4	31.2	37.6	44.5	51.5	58.7	66.0
	6	150	5.12	130.05	2.36	60	15.0	34.9	54.2	73.5	91.7	110.3	128.7	147.0	165.4	183.8
	6	150	5.12	130.05	2.36	60	9.0	20.5	32.8	43.9	55.1	67.3	79.6	92.5	104.7	117.0
	8	200	6.5	165.1	3.15	80	25.5	53.2	87.5	121.9	153.7	187.6	218.9	250.1	281.4	312.7
	8	200	6.5	165.1	3.15	80	15.0	31.6	50.2	70.7	89.7	107.9	127.4	146.9	166.5	186.0
	10	250	8	203.2	3.15	80	32.4	79.5	123.7	172.2	217.2	265.0	309.1	353.3	397.4	441.6
	10	250	8	203.2	3.15	80	21.2	49.6	75.7	101.8	127.6	156.6	182.8	208.9	235.0	261.1

# C<sub>v</sub> versus Travel

Trim Type: 2-Stage Plug Type: Perforated Plug

Cage Type: Single Cage

Direction: Flow to Open(FTO)

Apply to all products of ISO & IEC (Face to Face or end to end)

Flow Characteristic : EQ%

Valve Size		ASME Rating	Orifice Diameter		Travel		Percent of Travel									
inch	mm		inch	mm	inch	mm	10	20	30	40	50	60	70	80	90	100
Class 300 & 600	2	50	2.5	63.5	1.57	40	0.5	1.3	2.2	3.3	5.2	10.9	17.4	22.4	27.4	31.1
	2	50	2.5	63.5	1.57	40	0.3	0.8	1.2	1.8	2.9	5.5	8.0	9.9	11.8	13.1
	3	80	3.5	88.9	1.97	50	1.0	3.0	4.7	8.1	13.6	28.2	40.6	51.0	60.0	67.1
	3	80	3.5	88.9	1.97	50	0.6	1.7	2.7	4.4	7.7	14.3	20.5	25.6	30.1	33.7
	4	100	4.38	111.25	1.97	50	1.5	4.0	6.7	10.7	19.7	36.7	53.4	67.5	79.7	89.2
	4	100	4.38	111.25	1.97	50	1.1	2.8	4.4	7.9	14.5	26.8	38.4	48.0	56.5	63.1
	6	150	5.12	130.05	2.36	60	2.1	5.7	9.7	16.2	31.1	59.8	90.5	117.2	142.3	161.7
	6	150	5.12	130.05	2.36	60	1.8	5.5	8.8	14.6	27.4	46.5	66.6	83.3	97.9	109.4
	8	200	6.5	165.1	3.15	80	3.6	11.0	17.1	29.2	56.7	99.5	145.3	184.1	217.8	243.7
	8	200	6.5	165.1	3.15	80	3.0	8.8	13.7	22.9	38.8	74.6	106.8	133.8	157.2	175.7
	10	250	8	203.2	3.15	80	4.8	14.3	22.3	38.3	66.2	128.1	188.5	240.0	284.8	318.7
	10	250	8	203.2	3.15	80	3.9	12.3	17.1	27.2	59.2	90.7	138.6	181.3	218.7	245.3

# C<sub>v</sub> versus Travel

Trim Type: 3-Stage Plug Type: Perforated Plug Cage Type: Single Cage+Diffuser Direction: Flow to Close(FTC)  
 Apply to all products of ISO & IEC (Face to Face or end to end) Flow Characteristic : LINEAR

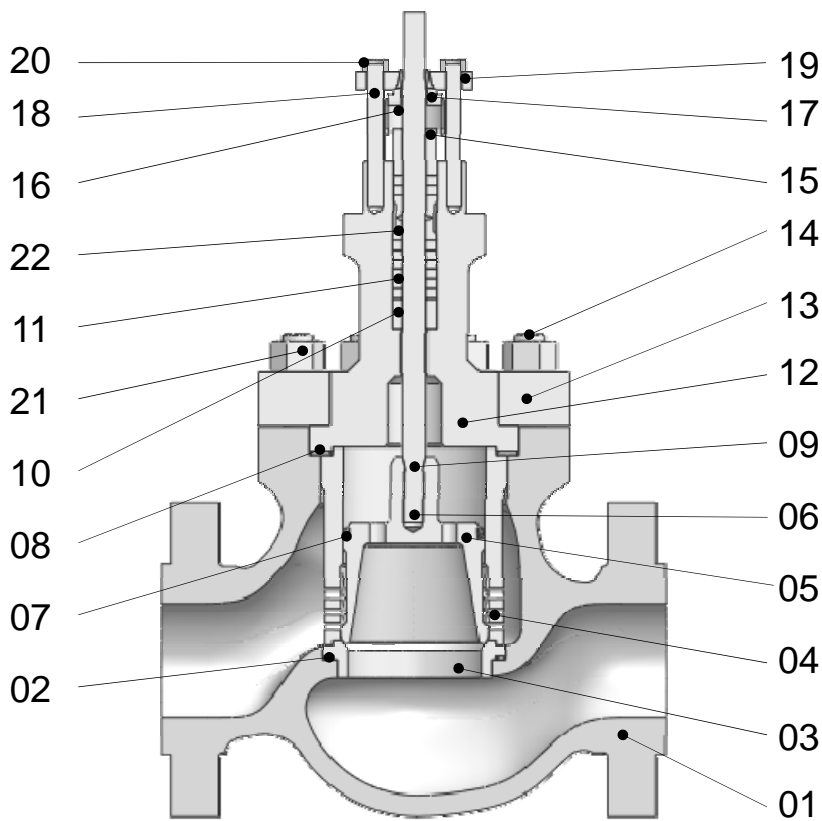
Percent of Travel								10	20	30	40	50	60	70	80	90	100
Valve Size		ASME	Orifice Diameter		Travel		Rated Cv										
inch	mm	Rating	inch	mm	inch	mm											
2	50	Class 300 & 600	2.5	63.5	1.57	40	Optional Manufacture Placement Contact WYECO Service Center. (Tel: 886 2 2502 5166)										
3	80		3.5	88.9	1.97	50											
4	100		4.38	111.25	1.97	50											
6	150		5.12	130.05	2.36	60											
8	200		6.5	165.1	3.15	80											
10	250		8	203.2	3.15	80											

# C<sub>v</sub> versus Travel

Trim Type: 3-Stage Plug Type: Perforated Plug Cage Type: Single Cage+Diffuser Direction: Flow to Close(FTC)  
 Apply to all products of ISO & IEC (Face to Face or end to end) Flow Characteristic : EQ%

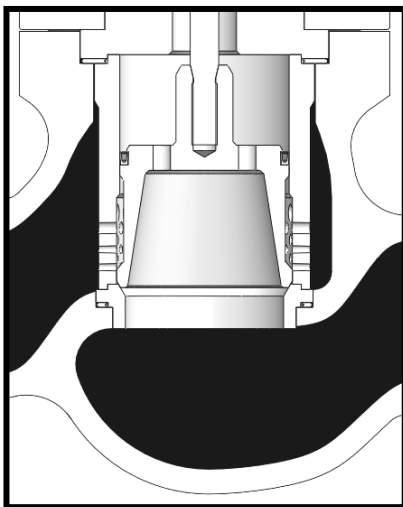
Percent of Travel								10	20	30	40	50	60	70	80	90	100
Valve Size		ASME	Orifice Diameter		Travel		Rated Cv										
inch	mm	Rating	inch	mm	inch	mm											
2	50	Class 300 & 600	2.5	63.5	1.57	40	Optional Manufacture Placement Contact WYECO Service Center. (Tel: 886 2 2502 5166)										
3	80		3.5	88.9	1.97	50											
4	100		4.38	111.25	1.97	50											
6	150		5.12	130.05	2.36	60											
8	200		6.5	165.1	3.15	80											
10	250		8	203.2	3.15	80											

# Standard Construction of Body assembly: Parts Reference (1)

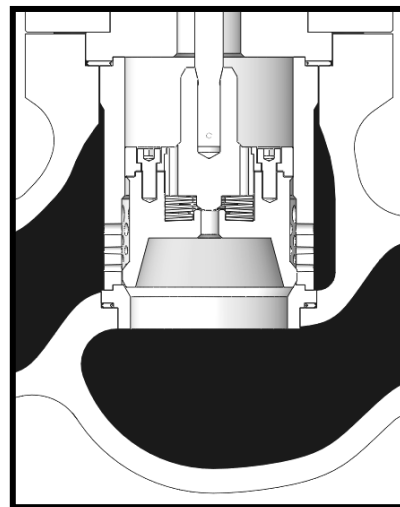


Item	Description
01	Body
**02	Seat Ring Gasket
*03	Seat Ring
*04	Cage
*05	Plug
*06	Plug Pin
**07	Plug Seal
**08	Body Gasket
*09	Plug Stem
10	Guide Bushing
**11	Gland Packing
12	Bonnet
13	Bonnet Flange
14	Body Stud
*15	Packing Follower
16	Disc Spring
17	Spring Retainer
18	Packing Flange Stud
19	Packing Flange
20	Packing Flange Nut
21	Body Stud Nut
*22	Lantern Ring

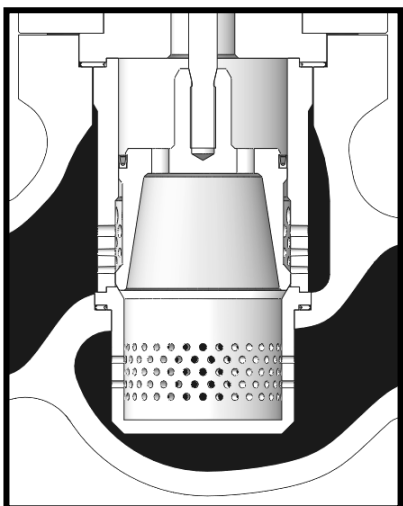
Note: \*\*Mandatory spare parts.  
\*Recommend spare parts.



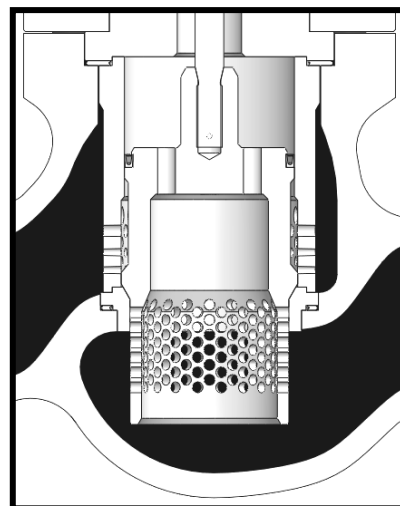
Multi-hole cage with Plug



Multi-hole cage with Pilot



Multi-hole cage with diffuser



Multi-hole cage with Perforate Plug

## Materials of Construction and Specification

Table I: Standard Materials for WCB/WCC/WC6/WC9/C5/C12 Body

Service Temperature		-29°C	200°C	343°C	427°C
Item	Part Name	Material Specifications			
1	Body	(1) WC6/WC9/C5/C12 Casting Cr-Mo Alloy Steel, ASTM A217 (2) WCC/WCB Casting Carbon Steel, ASTM A216			
2	Seat Ring Gasket	Spiral Wound · 316 SST with Flexible Graphite			
3	Seat Ring	410 SST, ASTM A479, Heat-treated (HRC 40±2)			See note 3
4	Cage	410 SST, ASTM A479 (HRC40±2) or CA6NM(HRC34±2), ASTM A487; Heat-treated & Hard Chrome plated			
5	Plug	17-4PH, ASTM A564 Gr.630, H900 (HRC 42±2)			See note 3
6	Plug Pin	316 SST, ASTM A479, Strain hardened			
7	Plug Seal	Energized Spring Seal PTFE Reinforced with special filler	Graphite (Shut off to ANSI Class II, III Seat Leakage; With pilot plug, ANSI Class IV, V Seat Leakage)		
8	Body Gasket	Spiral Wound 316 SST with Flexible Graphite			
9	Plug Stem	410 SST, ASTM A479, Heat-treated (HRC 34±2) & Hard Chrome plated			
10	Guide Bushing	ASTM A564 Gr630, H900 (HRC 42±2)			
11	Gland Packing	PTFE Braided (Low emission available)			
		Flexible Graphite (Low emission available)			
12	Bonnet	(1) F11/F22/F5/F12 Class 2, Cr-Mo Alloy, ASTM A182 or WC6/WC9/C5/C12 Casting Cr-Mo Alloy Steel, ASTM A217			
13	Bonnet Flange	(2) Carbon Steel, ASTM A105 or WCC/WCB Casting Carbon Steel, ASTM A216			
14	Body Stud	ASTM A193, B7			
15	Packing Follower	17-4PH, ASTM A564 Gr.630, H900 (HRC 42±2)			
16	Disc Spring	AISI 1065~1070, ASTM A682, Chrome plated			
17	Spring Retainer	17-4PH, ASTM A564 Gr.630, H900 (HRC 42±2)			
18	Packing Flange Stud	304SST, ASTM A193, Gr. B8 Class 2 (Strain hardened)			
19	Packing Flange	304S.S. or Carbon Steel, Zinc Plated, ASTM A105			
20	Packing Flange Nut	ASTM A194, Gr. 8			
21	Body Stud Nut	ASTM A194, Gr. 2H			
22	Lantern Ring	316 SST, ASTM A276			
23	Spacer	316 SST, ASTM A276			
24	Pilot Plug	Not available	410 SST, ASTM A479, Heat-treated (HRC34±2) & seat and g hard faced with satellite 6 ( Shutoff to ANSI Class IV, V)		
25	Pilot Plug Spring	Not available	17-4PH, ASTM A564 Gr.630, H900 (HRC 42±2)		
		Not available	Inconel X-750, ASTM B637 Gr. 688		
26	Retaining Ring	Not available	ASTM A564 Gr. 630, H900 (HRC 42±2)		
		Not available	Inconel X-750, ASTM B637 Gr. 688		
27	Diffuser	316 SST, ASTM A182A or CF8M, ASTM A351; Seat hard faced with satellite 6 (Hardened Diffuser is available)			
28	Optional Trim	Trim combination and selection, Refer to table III			
Service Temperature		-20°F	390°F	650°F	800°F

Note: 1. The maximum operation pressure and temperature for class rating of WCC/WCB/WC6/WC9/C5/C12 body material should comply with ASME B16.34 Standard.

2. Soft Seat Trim, Refer to Table III, Trim Designation 8 (See page 19).

3. When operation temperature is higher than 343°C, using Trim Designation 2 (See page 18).

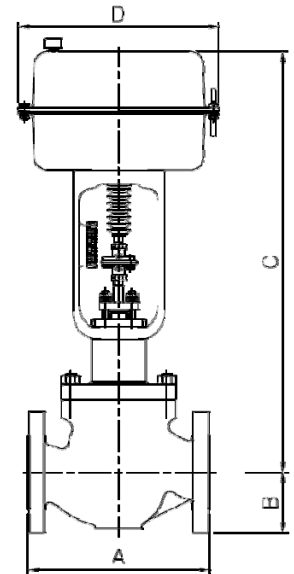
Table II: Standard Materials for CF8M Body

Service Temperature		-40°C	200°C	343°C	427°C
Item	Part Name	Material Specifications			
1	Body	CF8M, ASTM A351			
3	Seat Ring	316 SST, ASTM A479 or CF8M ASTM A351; Seat hard faced with Stellite 6			
4	Cage	316 SST, ASTM A479 or CF8M ASTM A351; Hard Chrome plated			
5	Plug	316 SST, ASTM A479, Seat and Guide hard faced with Stellite 6			
9	Plug Stem	17-4PH, ASTM A564 Gr.630 H1075 (HRC32±2), Hard Chrome plated			
12	Bonnet	316 SST, ASTM A479 or CF8M Casting Stainless Alloy, ASTM A351			
13	Bonnet Flange	316 SST, ASTM A479 or CF8M Casting Stainless Alloy, ASTM A351			
14	Body Stud	ASTM A193, Gr. B8M Class 2 (Strain hardened)			
21	Body Stud Nut	ASTM A194, Gr. 8M			
26	Optional Trims	Trim combination and selection, Refer to table III			
Service Temperature		-20°F	390°F	650°F	800°F

- Note:
1. Material specifications for other parts are the same as listed on Table I (Standard Materials for WCC/WCB/WC6/WC9/C5/C12Body).
  2. Soft Seat Trim, Refer to Table III, Trim Designation 9 (See page 19).
  3. The maximum operation pressure and temperature for class rating of CF8M body material should comply with ASME B16.34 Standard.

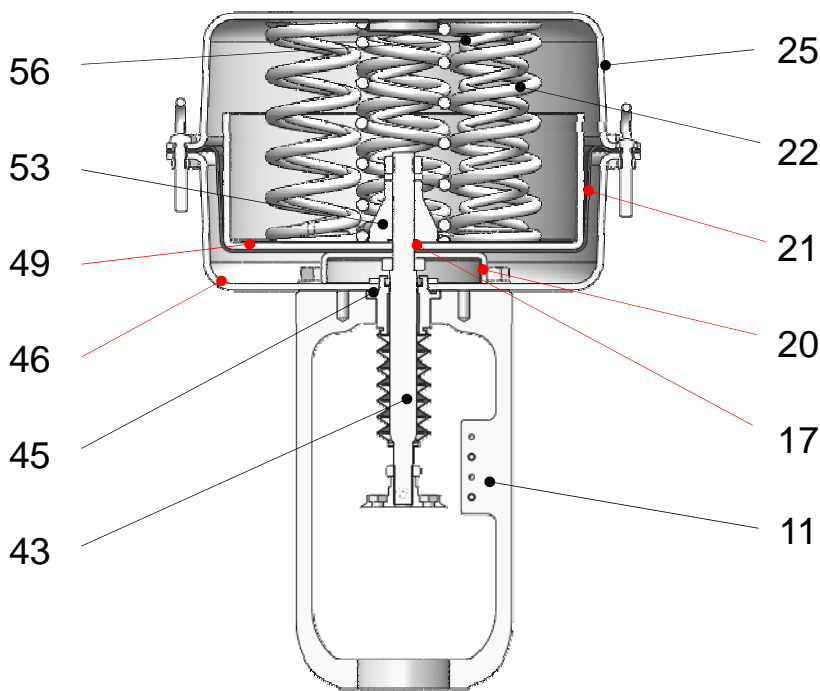
**Dimension (ISA-S75.03)**

Valve Size			Actuator		CL 300						CL 300 & 600	
					RF			RTJ				C
					A	B	weight	A''	B''	weight		
DN	NPS	mm	mm	mm	kg	mm	mm	kg	mm			
50	2	300	267	83	64	282	83	65	226			
80	3	350	318	105	101	333	105	103	298			
100	4	350	368	127	126	384	127	133	303			
150	6	460	473	159	198	489	159	206	381			
200	8	465	568	191	350	584	191	360	466			
250	10	560	708	222	486	724	222	498	492			



Valve Size			Actuator		CL 600						CL 300 & 600	
					RF			RTJ				C
					A	B	weight	A''	B''	weight		
DN	NPS	mm	mm	mm	kg	mm	mm	kg	mm			
50	2	300	286	83	68	289	83	69	226			
80	3	350	337	105	106	340	105	108	298			
100	4	350	394	137	142	397	137	149	303			
150	6	460	508	178	247	511	178	255	381			
200	8	465	610	210	450	613	210	460	466			
250	10	560	752	254	650	755	254	662	492			

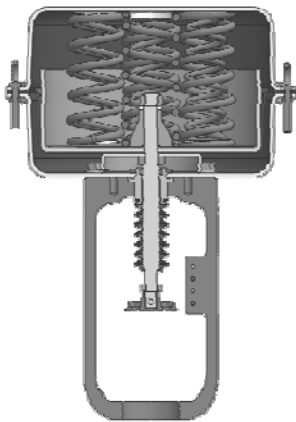
## Standard Construction of Actuator: Parts Reference (2)



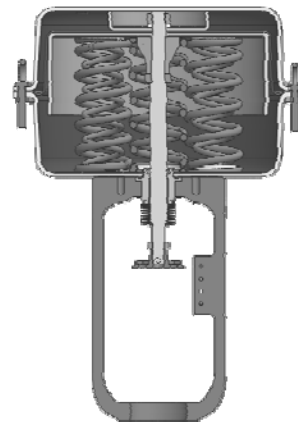
Item	Description
11	Yoke
**17	Shaft Seal
20	Diaphragm Seat
21	Diaphragm
22	Outer Spring
25	Upper Diaphragm Case
*43	Actuator Stem
**45	O-Ring
46	Lower Diaphragm Case
49	Diaphragm Supporter
53	Retainer
56	Inner Spring

Note: \*\*Mandatory spare parts.  
\*Recommend spare

## Multi-Spring Type of Diaphragm Actuators



Air to Open



Air to Close

Travel Length (mm)	Actuator Type						
	150	200	250	300	350	465	560
20	O	O					
30	O	O	O				
40		O	O	O	O	O	
50			O	O	O	O	O
60			O	O	O	O	O
80						O	O

## Actuator Size Selection

### Maximum Allowable Differential Pressure in kg/cm<sup>2</sup>

#### Metal Seated Valve with Double PTFE Packing

Air to Open

ASME B16.34 Class 600

Leakage: ANSI/FCI 70.2, Class V

Valve Size (in)	Max. Travel (mm)	Flow Coefficients (Cv)	Orifice diameter (mm)	Actuator Size (mm)	No. of Springs (Inner + Outer)	Thrust Force (kgf)	Max. ΔP* (kg/cm <sup>2</sup> )
2"	40	50	63.5	300	8 + 1	668	100
3"	50	105	88.9	350	0 + 7	1176	100
4"	50	158	110	350	0 + 7	1176	100
6"	60	270	130	460	10 + 10	1740	100
8"	80	405	165	465	0 + 7	1821	100
10"	80	570	203	465	0 + 7	1821	100

\*Max ΔP = 100 kg/cm<sup>2</sup> for leakage class IV

Air to Close

ASME B16.34 Class 600

Leakage: ANSI/FCI 70.2, Class IV & V

Valve Size (in)	Max. Travel (mm)	Flow Coefficients (Cv)	Orifice diameter (mm)	Actuator Size (mm)	No. of Springs (Inner+ outer)	Air Pressure (kg/cm <sup>2</sup> )	Thrust Force (kgf)	Max. ΔP (kg/cm <sup>2</sup> )
2"	40	50	63.5	300	4 + 0	4	741	100
3"	50	105	88.9	350	0 + 3	4	1410	100
4"	50	158	110	350	0 + 3	4	1410	100
6"	60	270	130	460	0 + 3	4	3543	100
8"	80	405	165	465	0 + 3	4	2272	100
10"	80	570	203	465	0 + 3	4	2272	100



### Metal Seated Valve with Graphite Packing

Air to Open

ASME B16.34 Class 600

Leakage: ANSI/FCI 70.2, Class V

Valve Size (in)	Max. Travel (mm)	Flow Coefficients (Cv)	Orifice diameter (mm)	Actuator Size (mm)	No. of Springs (Inner+ outer)	Thrust Force (kgf)	Max. $\Delta P^*$ (kg/cm <sup>2</sup> )
2"	40	50	63.5	300	8 + 0	560	100
3"	50	105	88.9	350	0 + 7	756	100
4"	50	158	110	350	0 + 7	756	100
6"	60	270	130	460	10 + 10	1740	100
8"	80	405	165	465	0 + 7	1821	100
10"	80	570	203	465	0 + 7	1821	100

\*Max  $\Delta P = 100 \text{ kg/cm}^2$  for leakage class IV

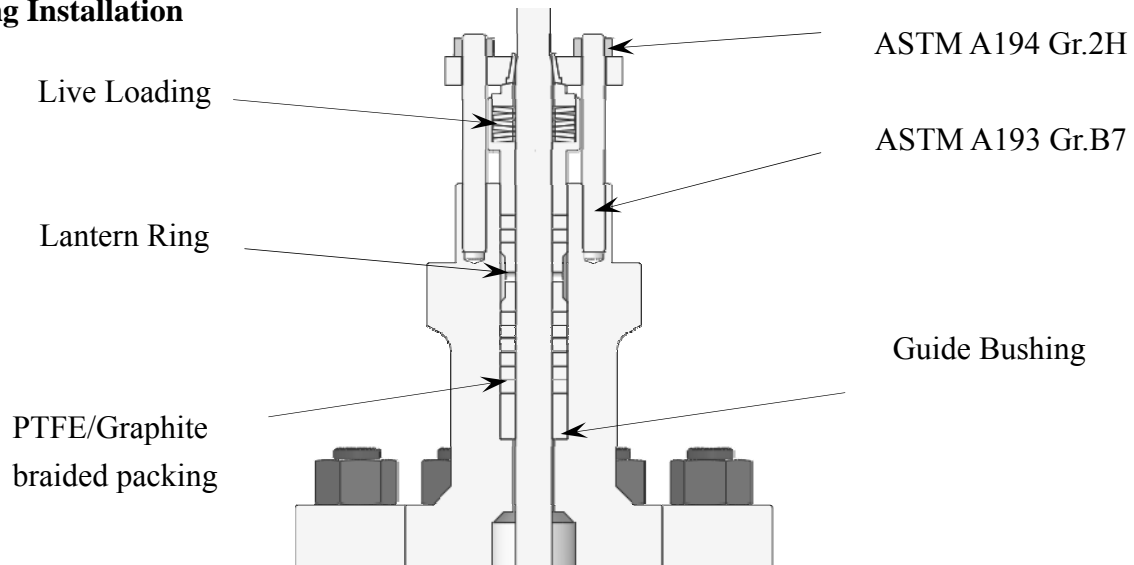
Air to Close

ASME B16.34 Class 600

Leakage: ANSI/FCI 70.2, Class IV & V

Valve Size (in)	Max. Travel (mm)	Flow Coefficients (Cv)	Orifice diameter (mm)	Actuator Size (mm)	No. of Springs (Inner +outer)	Air Pressure (kg/cm <sup>2</sup> )	Thrust Force (kgf)	Max. $\Delta P$ (kg/cm <sup>2</sup> )
2"	40	50	63.5	300	4 + 0	4	630	100
3"	50	105	88.9	350	0 + 3	4	1271	100
4"	50	158	110	350	0 + 3	4	1271	100
6"	60	270	130	460	0 + 3	4	3405	100
8"	80	405	165	465	0 + 3	4	1954	100
10"	80	570	203	465	0 + 3	4	1954	100

## Packing Installation



<p>CL150~300 PTFE(-200°C~200°C) Graphite (-200 °C ~ 455°C) (General Application /Low Emission)</p>	<p>CL600 PTFE(-200°C~200°C) Graphite (-200°C ~ 455°C) (General Application /Low Emission)</p>	<p>CL300~600 EVS P9000(-200°C~455°C) (Low Emission)</p>

## Combinations of Trim Materials

Trim Designation	Plug	Cage	Seat	Stem	Body
1 Standard	17-4PH, H900, ASTM A564 Gr.630, HRC42±2	410 SST, ASTM A479 (HRC40±2) or CA6NM HRC34±2, ASTM A487 (Heat-treated & Hard Chrome plated)	410 SST, ASTM A479, Class4 HRC40±2	410 SST, ASTM A479 HRC34±2, (Heat-treated & Hard Chrome plated)	<u>WCC/WCB/WC6/WC9 /C5/C12</u> (-29°C~343°C) Boiler feed Water, Steam, Hot oil, Power, Erosive And Non-sour Hydrocarbons fluids
2	17-4PH, H1150 ASTM A564 Gr.630, HRC30±2 (Seat and Guide hard faced with Stellite 6)	410 SST, ASTM A479 (HRC40±2) or CA6NM HRC34±2, ASTM A487 (Heat-treated & Hard Chrome plated)	410 SST, ASTM A479, HRC34±2 (Heat-treated and Seat hard faced with Stellite 6)	410 SST, ASTM A479 HRC34±2, (Heat-treated & Hard Chrome plated)	<u>WCC/WCB/WC6/WC9 /C5/C12</u> (-29°C~427°C) Boiler feed Water, Steam Hot oil, Power, Erosive And Non-sour Hydrocarbons fluids

to be continued

Trim Designation	Plug	Cage	Seat	Stem	Body
3	<u>17-4PH, H900</u> ASTM A564 Gr.630 (HRC42±2)	<u>17-4PH, H900</u> ASTM A564 Gr.630 Or CB7Cu-1(17-4),H900 ASTM A747 (HRC42±2) (Hard Chrome plated)	<u>17-4PH, H900</u> ASTM A564 Gr.630 (HRC42±2)	<u>17-4PH, H 1075</u> ASTM A564 Gr.630 (HRC32±2) (Hard Chrome plated)	<u>CF8M</u> : (-40°C~343°C) <u>WCC/WCB/WC6/WC9</u> <u>/C5/C12</u> : (-29°C~343°C) Power, process, high pressure application; application Erosive and Moderate Corrosive Service
4 (NACE MR0175)	<u>17-4PH, H1150M</u> ASTM A564 Gr.630 (HRC30±2) (Seat and Guide with Stellite 6)	<u>17-4PH, H1150M</u> ASTM A564 Gr.630 (HRC30±2) (Hard Chrome plated)	<u>17-4PH, H1150M</u> ASTM A564 Gr.630 (HRC30±2) (Seat hard faced With Stellite 6)	<u>17-4PH, H1150M</u> ASTM A564 Gr.630 (HRC30±2) (Hard Chrome plated)	<u>CF8M</u> : (-40°C~343°C) <u>WCC/WCB/WC6/WC9</u> <u>/C5/C12</u> : (-29°C~343°C) Sour Gas ,Petroleum And Moderate Corrosive Service General Service: -40°C~427°C
5 Standard	<u>316 SST,</u> ASTM A479 (Seat and Guide hard faced with Stellite 6)	<u>316 SST,</u> ASTM A479 F316 (Hard Chrome plated) Or ASTM A351, CF8M (Hard Chrome plated)	<u>316 SST,</u> ASTM A479 (Seat hard faced with Stellite 6)	<u>17-4PH, H1075</u> ASTM A564 Gr.630 (HRC32±2) (Hard Chrome plated)	<u>CF8M</u> : (-198°C~343°C) Chemical Refining Petroleum, power, process, Food , medical, distilled water Industry and Corrosive Service (Not for boiler feed Water use) General Service:-198°C to427°C
6 (NACE MR0175)	<u>316 SST,</u> ASTM A479 (Seat and Guide hard faced with Stellite 6)	<u>316 SST,</u> ASTM A479 F316 (Hard Chrome plated) Or ASTM A351, CF8M (Hard Chrome plated)	<u>316 SST,</u> ASTM A479 (Seat hard faced with Stellite 6)	<u>Nitronic 50</u> <u>(XM-19),</u> ASTM A479 Strain Hardened (HRC 30~35) (Hard Chrome plated)	<u>CF8M</u> : (-198°C~343°C) Sour gas, Chemical Refining Petroleum, power, process, Food, medical, distilled water Industry and Corrosive Service (Not for boiler feed Water use) General Service: -198°C t427°C
7	<u>440C SST,</u> ASTM A479 (HRC 58±2) (Heat-treated)	<u>440C SST,</u> ASTM A479 (HRC 58±2) (Heat-treated)	<u>440C SST,</u> ASTM A479(HRC 58±2) (Heat-treated)	<u>410 SST,</u> ASTM A479(HRC 34±2) (Heat-treated & Hard Chrome plated)	<u>WCC/WCB/WC6/WC9</u> <u>/C5/C12</u> :(-29°C~343°C) Boiler feed Water, Steam Hot Oil, power ;High Pressure application, Non-Corrosive and Severe Erosive Service
8 (Soft Seat)	<u>17-4PH, H900</u> ASTM A564 Gr.630 (HRC 42±2)	<u>410 SST,</u> ASTM A479 (HRC40+-2) or CA6NM. ASTM A487 (HRC34±2)(Heat-treated and Hard Chrome plated)	<u>410 SST,</u> ASTM A479(HRC40±2) (Heat-treated <u>with PTFE Seal</u> )	<u>410 SST,</u> ASTM A479(HRC34±2) (Heat-treated & Hard Chrome plated)	<u>WCC/WCB/WC6/WC9</u> <u>/C5/C12</u> :(-29°C~200°C) Boiler feed Water, Steam Hot oil, Process, Erosive and Non Corrosive Fluids
9 (Soft Seat)	<u>316 SST,</u> ASTM A479 , (Seat hard faced with Stellite 6)	<u>316 SST,</u> ASTM A479 F316 or CF8M ASTM A351 (Hard Chrome plated)	<u>316 SST,</u> ASTM A479 or CF8M ASTM A351 ( <u>With PTFE Seal</u> )	<u>17-4PH,</u> ASTM A564 Gr.630 H1075 (HRC32±2) (Hard Chrome plated)	<u>CF8M</u> : (-29°C~200°C) Chemical, Food, Medical and Corrosive Fluids. (Not for boiler feed Water)

Note: For other body and trim materials not listed on Table III, Consulting with Wyeco Auto Valve Co. to meet customer specification requirement. (Including WC6/WC9/C5/C12/CF3M/CF8C/CF3/Alloy20/Hastelloy B&C and Monel alloys...  
...etc. are availab

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台北總公司 Taipei Office

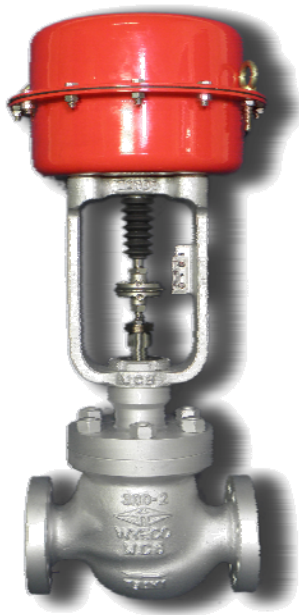
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Please contact us for more details

2012/03/13 V.02

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