

MIL21000

TOP GUIDED SINGLE SEATED
CONTROL VALVES



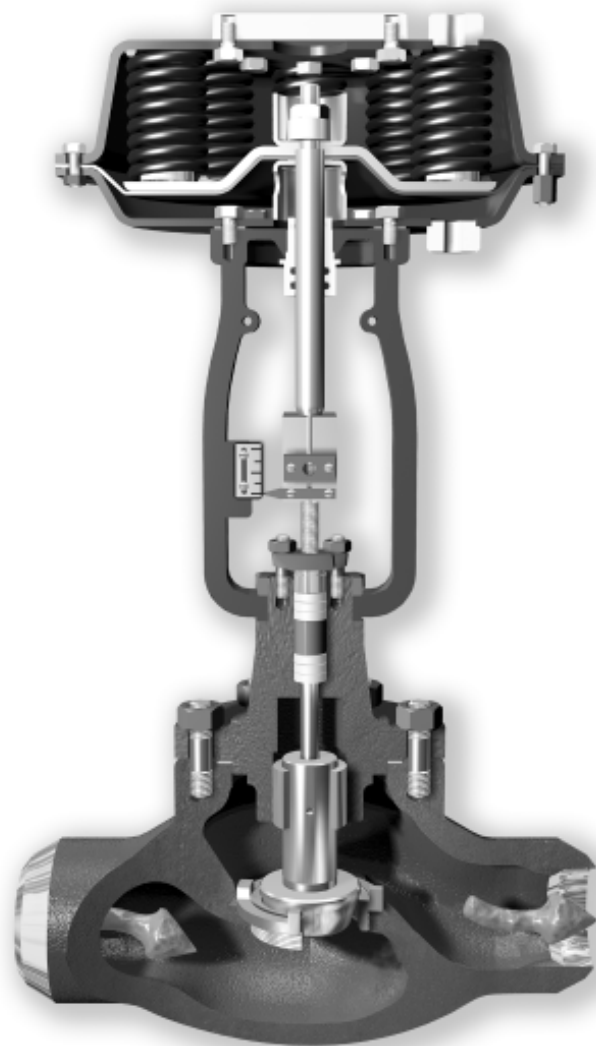
MIL Controls Limited

COMPLETE RANGE OF RUGGED, HEAVY TOP GUIDED, SINGLE SEATED CONTROL VALVES

Contoured valves	-	21100*
Single stage anti-cavitation and low noise valves	-	21700*
Double stage anti-cavitation valves	-	21800*
Double stage low noise valves	-	21900*
Bellows sealed valves*		

TABLE OF CONTENTS

Model numbering system	2
Available sizes and ratings	2
General data	3
Seat leakage class / Temp. range	3
Construction	4-10, 27, 28
Cv charts	6 - 9
37-38 series actuator selection	11 - 25
Dimensions & shipping weights	26 - 27
Other useful information	29



**For valves with angle body construction model number starts with 70 instead of 21*

FOREWORD

21000 series single ported, heavy top guided control valves are designed with built-in versatility making them the most widely used control valve, well-suited to handle a wide variety of process applications. Standard features include:

Top Guiding

Rugged, heavy top guiding provides maximum support to ensure plug stability. Valve plug shank is guided within the lower portion of the bonnet and such guiding minimises the effect of lateral thrust on the valve plug and eliminates trim vibration.

Anticavitation / Lo-dB Trim

Replacing conventional plug with the Lo-dB plug provides excellent noise attenuation and cavitation control.

Hardened / Exotic Trims

For severe service, in lieu of standard SS410 / SS 316 trims, hard faced trims, precipitation hardened stainless steel 17.4 PH, martensitic stainless steel CA6NM, 440 C etc. are used. For corrosive service, trims in Alloy 20, Monel, Hastelloy, Nickel, Urea Grade SS316LN, Ferralium-255, HVD1, APX etc. are used. Other special materials are available on request.

Reduced Capacity

Series of reduced area trim is available to provide wide flow range capabilities in all valve sizes. Reduced trim also permits larger outlet-to-orifice area relationship which result in lower exit velocities.

Tight Shut-off

Class IV leakage is standard. Optional constructions meet ANSI/FCI 70.2 Class V & Class VI leakage.

Quick-Change Trim

Optional clamped seat ring facilitates easy seat removal. The retaining cage and seat ring are held in place by the bonnet.

Extension Bonnet

Standard bonnet for 21000 series valves are designed for a temperature range of -27 deg C to 427 deg C. Optional constructions with extension bonnet are used upto 540 deg C and down to -100 deg C.

Bellows Sealed Valves

Precision engineered, formed, seamless Bellows and helicoflex gaskets ensures zero leakage for service where no stem leakage can be tolerated or where the line fluid cannot be contained by any packing. This may be the case when the process fluid is flammable, toxic, explosive, expensive or it rapidly destroys packing. They may also be used to prevent leakage in vacuum service.

Steam Jacketting

Steam Jacketting can be provided for services where the process fluid has tendency to solidify. Steam jacketting designs suitable for steam pressure upto 25 Kg/cm² are available.

Bottom Flange

Used for fluid streams carrying sediments, bottom flange can be removed and the valve body housing can be cleared of debris.

Purge Connection

½" NPT or ¾" NPT purging connection can be provided with optional flushing for the plug or body.

Angle Body

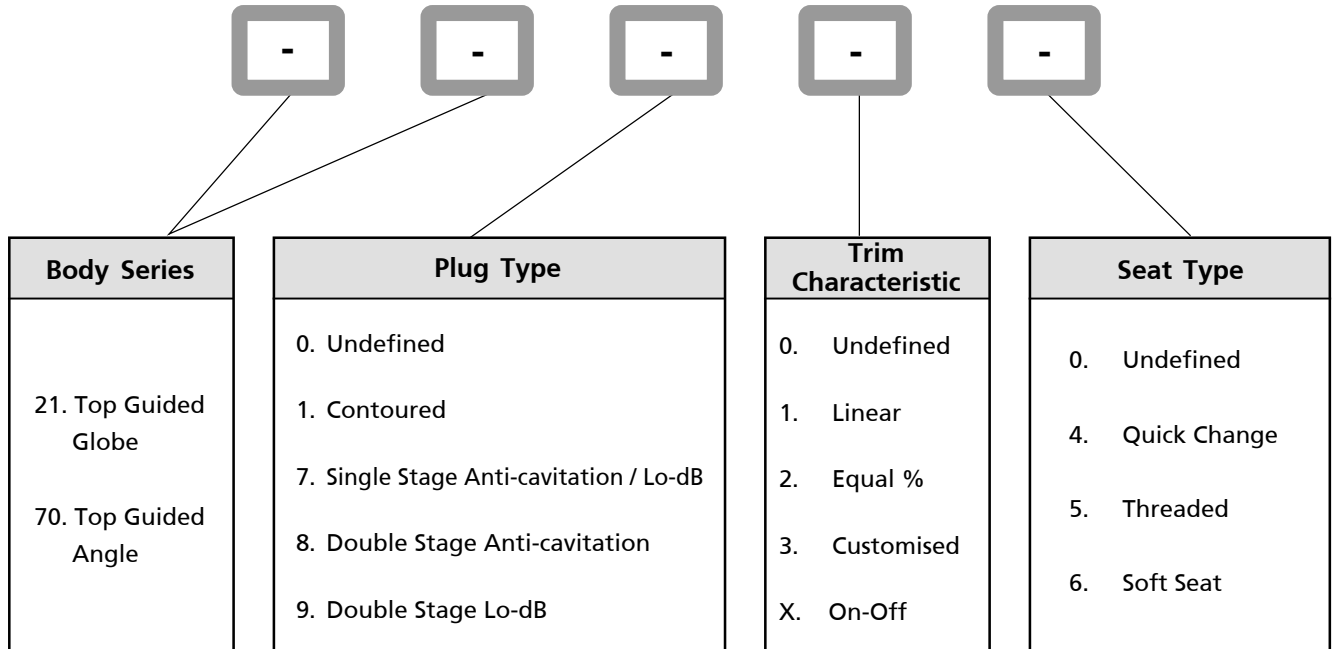
Optional angle body design with venturi seat is particularly suitable for handling slurries and corrosive liquids. Their angle design provides flow surfaces that slopes down permitting the valve to self drain. Smoothly contoured surfaces minimise turbulence and prevents entrapment of particles which can cause valve clogging. These valves are also ideally suited for special applications like flashing liquids, choked flow conditions and high pressure hydrocarbon service.

SPECIALLY ENGINEERED TRIM PACKAGES

Double Stage Anticavitation / Lo-dB trim

21800 & 21900 series double stage valves combine the principle of Anti-cavitation / Lo-dB Plug and Cage. Simultaneous throttling in the plug and cage all along the plug travel results in considerably lower sound pressure levels and excellent cavitation control.

NUMBERING SYSTEM



SIZES / RATINGS

RATING (2) (ANSI)	(1) VALVE SIZE (Inch)									
	0.5	0.75 & 1	1.5	2	2.5	3	4	6	8	10
150# - 600#	*	*	*	*	-	*	*	*	*	*
900# - 1500#	-	*	*	*	-	*	-	-	-	-
2500#	-	*	*	*	*	*	-	-	-	-

* : Available

STANDARD END CONNECTIONS (2)

VALVE SIZE	(2) ANSI CLASS		
	150# to 600#	900# to 1500#	2500#
0.5"	F S T	-	-
0.75" to 2"	F S T	F S B	F S B
2.5"	-	-	F B
3"	F B	F B	F B
4" to 10"	F B	-	-

F : Flanged (RF, RTJ, T&G, FF) S : Socket Weld B : Butt Weld T : Threaded

(1): For details refer Cv charts

(2): DIN, JIS, BS or other ratings and end connections can be usually supplied, consult MIL

GENERAL DATA

Body

Type: High Capacity Globe or Angle

Recommended Flow Directions:

All models except Anti-Cav Design: FTO ⁽³⁾

Anti-Cav Design: FTC ⁽⁴⁾

Bonnet

Type : Stud Bolted

Option : Extension Bonnet, Bellows sealed Bonnet

Gland Packing

Type: With Teflon (<180° C) or Graphite (>180° C) moulded split rings.

Option: Teflon 'V' Rings, Eco-Lock (Low Emission)

Trims

Plug Type: Contoured or Anti-cavitation / Lo-dB, with PTFE inserts for Class VI Leakage (Cv > 6)

Characteristic :

Standard : Linear or Equal% or Quick Opening

Anti-cav / Lo-dB : Linear

Special Application : Customised

Seat Ring

Threaded or Clamped, for Class VI leakage with PTFE inserts (Cv ≤ 6)

Actuator

Type: 37/38 Series Pneumatic Spring Diaphragm Actuators with optional Hand Wheels.

Options: Electrical, Piston Cylinder

LEAKAGE CLASS / TEMPERATURE RANGE

VALVE TYPE	ANSI CLASS	⁽⁵⁾ TEMPERATURE RANGE (°C)				MAXIMUM SEAT LEAKAGE CLASS (As per ANSI/FCI 70.2)	
		STANDARD BONNET		EXTENDED BONNET		Standard	Optional
		Min.	Max.	Min.	Max.		
21000 Standard	150# - 600#	-27	427	-100	540	IV	V, VI
	900# - 2500#	-27	427	-100	540	IV	V
21700/21800/21900 Anti-cav / Lo-dB	150# - 600#	-27	427	-100	540	IV	V
21006 Soft Seat	150# - 600#	-27	232	-100	232	VI	
21000 Bellows Sealed	150# - 600#	-	-	-100	232	IV	V, VI

Class IV : 0.01% of maximum rated capacity at 50 psig to atmosphere

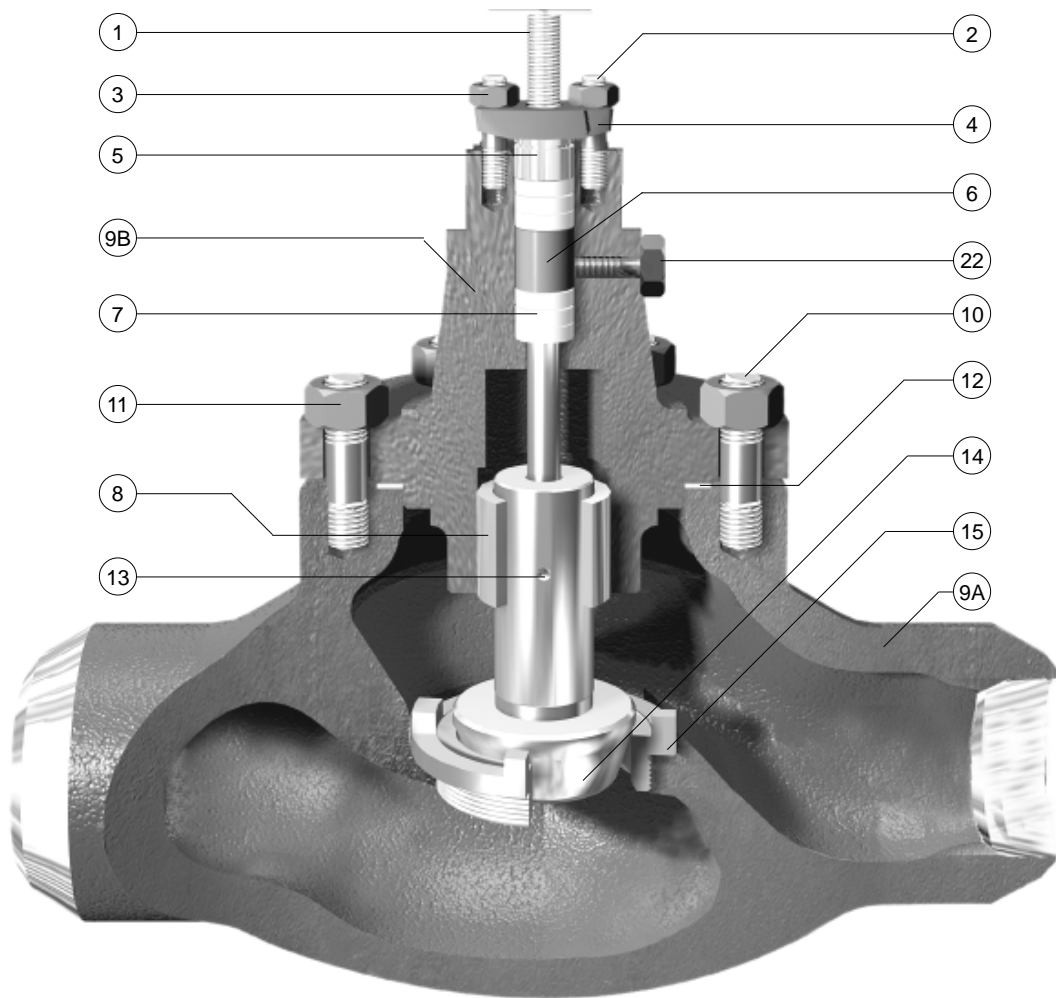
Class V : 5 x 10⁻⁴ ml per minute of water per inch of orifice diameter per psi differential

Class VI : Bubble tight as per ANSI/FCI 70.2

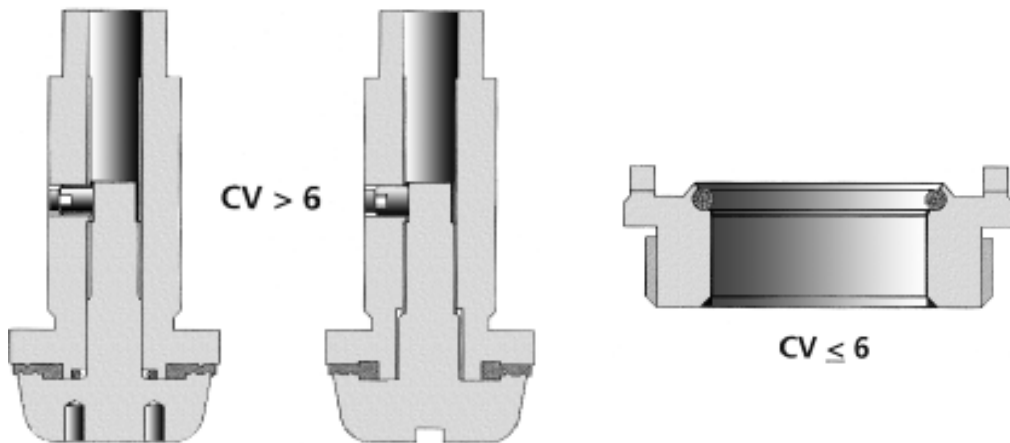
⁽³⁾: Flow to open

⁽⁴⁾: Flow to close

⁽⁵⁾: For requirements beyond the given temperature limits, consult MIL



MIL 21000 STANDARD CONSTRUCTION



MIL 21000 SOFT SEATED PLUG & SEAT CONSTRUCTION

MATERIAL OF CONSTRUCTION⁽⁶⁾

DRAWING REF. NO.	PART NAME	MAX. TEMP	STANDARD MATERIAL
1	Valve Plug Stem	<343 °C	ASTM A 479 Ty 316
		<343 °C	17.4 PH (ASTM A 564 Gr. 630, H 1075)
		>343 °C	Super Alloy (ASTM A 638 Gr. 660)
2	Packing Flange Stud		ASTM A 193 Gr. B8
3	Packing Flange Nut		ASTM A 194 Gr. 8
4	Packing Flange		ASTM A 105
5	Packing Follower		ASTM A 479 Ty 304
6	Packing Spacer/Lantern Ring		ASTM A 479 Ty 304
7	Gland Packing	<180 °C	PTFE
		>180 °C	GRAPHITE
8	Guide Bush	<427 °C	440 C (ASTM A 276 Ty 440 C, Heat Treated)
		>427 °C	SS 316 with Stellite No.6 Hardfacing ⁽⁷⁾
9A, 9B	Body, Bonnet	<427 °C	ASTM A 216 Gr. WCC
		<530 °C	ASTM A 217 Gr. WC6
			ASTM A 217 Gr. WC9 / C5
			ASTM A 351 Gr. CF8 / CF8M / CF3 / CF3M
10	Body Stud	<454 °C	ASTM A 193 Gr. B7
		>454 °C	ASTM A 193 Gr. B16
11	Body Nut	<454 °C	ASTM A 194 Gr. 2H
		>454 °C	ASTM A 194 Gr. 7
12	Body Gasket		SS 316L + Graphite (spiral wound)
13	Plug Pin		ASTM A 479 Ty 316
14	Valve Plug	<343 °C	SS 410
		<427 °C	SS 316
		<427 °C	SS 316 with Stellite No.6 hardfacing on seating area
			SS 316 with complete hardfacing or Solid Stellite ⁽⁸⁾
		<343 °C	17.4 PH (H 900)
			ASTM A 743 Gr. CA6NM, Nitrided
		<260 °C	440 C, Heat Treated ⁽⁸⁾
15	Seat Ring		Same as Plug material
16	Seat Ring / Cage Gasket ⁽⁹⁾		SS 316L + Graphite (spiral wound)
17	Retaining Cage ⁽⁹⁾		SS 304
			CA6NM, Nitrided
18	Anti-cav / Lo-dB Cage ⁽¹⁰⁾	<427 °C	ASTM A 351 Gr. CF8M
			ASTM A 743 Gr. CA6NM, Nitrided
19	Bellow S/A ⁽¹¹⁾	<232 °C	SS 316L, Inconel 600, Monel or Hastelloy C
20	Bottom Flange ⁽¹²⁾		Same as body material

⁽⁶⁾: For other material, consult MIL, MIL reserves right to provide superior material, owing to constant product upgradation.

⁽⁷⁾: Standard for Stainless steel bonnets.

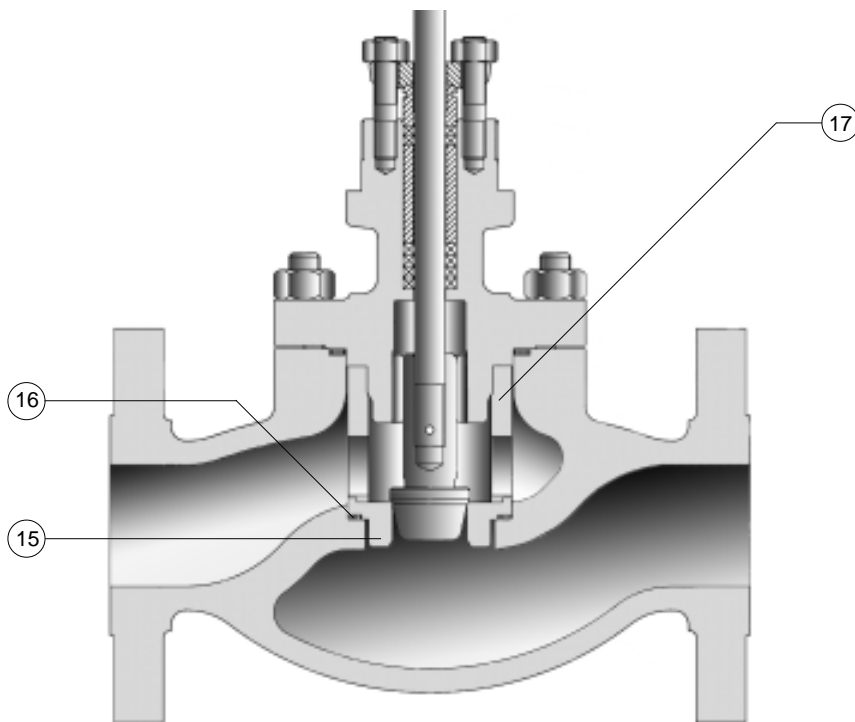
⁽⁸⁾: Due to manufacturing constraints, cannot be used for 21700 / 21800 / 21900 series valve plugs.

⁽⁹⁾: Applicable for 21004 series only, Cage gasket only for high pressure (≥ 900 #ANSI) valves.

⁽¹⁰⁾: Applicable for 21800 / 21900 series only, refer page 9.

⁽¹¹⁾: Applicable for Bellows sealed valves only, refer page 10.

⁽¹²⁾: Applicable only for valves with bottom flange, refer page 28.



**MIL 21104
LOW PRESSURE
CONSTRUCTION**

21100 SERIES (LINEAR / EQUAL% / ON-OFF)

Critical Flow Factor (C_f or F_L): 0.90

LOW PRESSURE	Valve Size (Inch)	Stroke (Inch)	ORIFICE DIAMETER (Inch) Vs RATED Cv												
			0.25 (min.)	0.375	0.5	0.812	1.25	1.625	2	2.625	3.5	5	6.25	8	
ANSI 150# THROUGH 600#	0.5	0.75	0.025, 0.04, 0.06, 0.1, 0.25, 0.3, 0.4 ⁽¹³⁾ , 0.6, 1, 1.7	2.5, 3.8	6	-	-	-	-	-	-	-	-	-	-
	0.75 & 1	0.75	0.025, 0.04, 0.06, 0.1, 0.25, 0.3, 0.4 ⁽¹³⁾ , 0.6, 1, 1.7	2.5, 3.8	6	9, 12	16 ⁽¹⁴⁾	-	-	-	-	-	-	-	-
	1.5	0.75	0.025, 0.04, 0.06, 0.1, 0.25, 0.3, 0.4 ⁽¹³⁾ , 0.6, 1, 1.7	2.5, 3.8	6	10, 13	20, 25	35	-	-	-	-	-	-	-
	2	0.75	0.025, 0.04, 0.06, 0.1, 0.25, 0.3, 0.4 ⁽¹³⁾ , 0.6, 1, 1.7	2.5, 3.8	6	11, 15	21, 26	46	-	-	-	-	-	-	-
	3	1.5	-	-	-	-	31	47	65	110	-	-	-	-	-
	4	1.5	-	-	-	-	-	49	66	113	195	-	-	-	-
	6	2	-	-	-	-	-	-	68	126	208	275 ⁽¹⁵⁾ , 400	-	-	-
	8	2	-	-	-	-	-	-	-	-	224	415	640	-	-
	10	3	-	-	-	-	-	-	-	-	-	-	650	1000	-

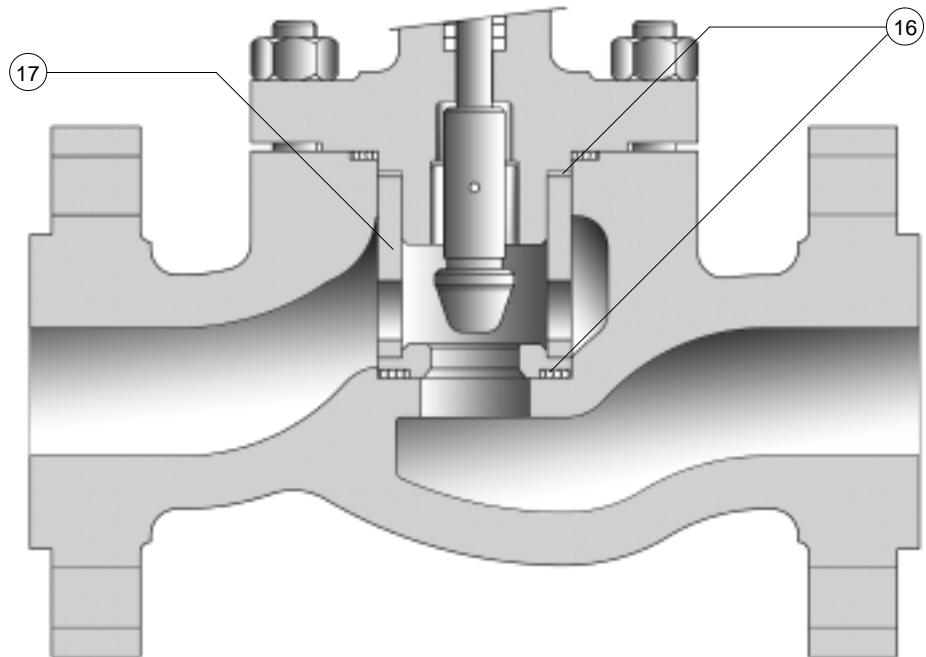
⁽¹³⁾: Cv values of 0.3 and less with linear characteristic only.

⁽¹⁴⁾: Cv value of 16 for 1" valve only.

⁽¹⁵⁾: With 4" orifice diameter.

Other Cv's on request

**MIL 21104
HIGH PRESSURE
CONSTRUCTION**



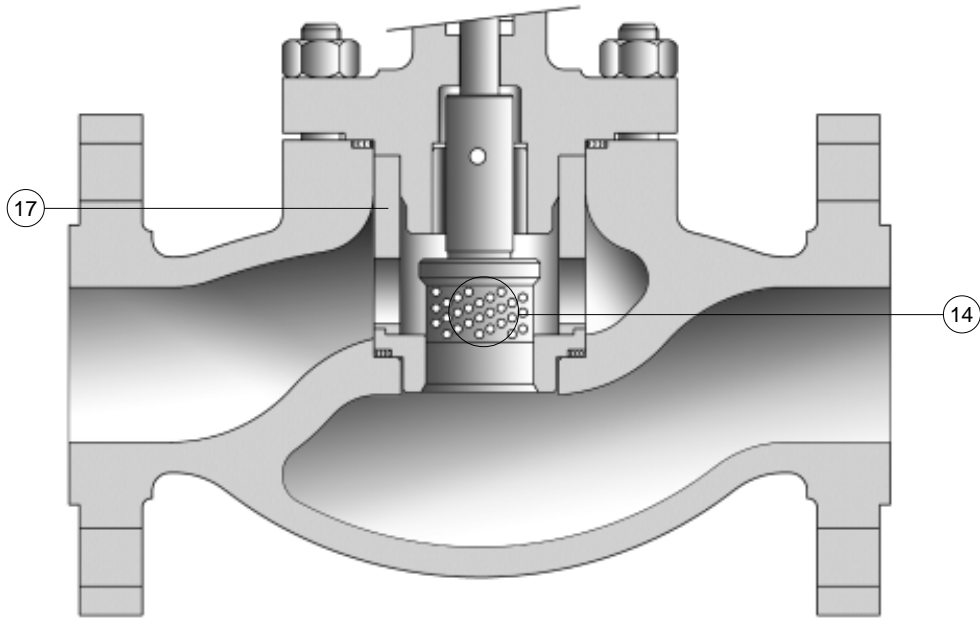
21100 SERIES (LINEAR / EQUAL% / ON-OFF)

Critical Flow Factor (C_r or F_L): 0.90

HIGH PRESSURE	Valve Size (Inch)	Stroke (Inch)	ORIFICE DIAMETER (Inch) Vs RATED Cv								
			0.25 (min.)	0.375	0.5	0.812	1.25	1.625	2	2.625	3
ANSI 900# THROUGH 1500#	0.75 & 1	0.75	0.025, 0.04, 0.06, 0.1, 0.25, 0.3, 0.4 ⁽¹³⁾ , 0.6, 1, 1.7	2.5, 3.8	6	11	-	-	-	-	-
	1.5	0.75	0.025, 0.04, 0.06, 0.1, 0.25, 0.3, 0.4 ⁽¹³⁾ , 0.6, 1, 1.7	2.5, 3.8	6	11	15	-	-	-	-
	2	0.75	0.025, 0.04, 0.06, 0.1, 0.25, 0.3, 0.4 ⁽¹³⁾ , 0.6, 1, 1.7	2.5, 3.8	6	11	15	26 ⁽¹⁶⁾	46 ⁽¹⁶⁾	-	-
	3	1.5	-	-	-	-	15	26	-	65	110
ANSI 2500#	0.75 & 1	0.75	1.7	2.5, 3.8	6	11	-	-	-	-	-
	1.5	0.75	1.7	2.5, 3.8	6	11	15	-	-	-	-
	2,2.5	0.75	1.7	2.5, 3.8	6	11	15	-	26 ⁽¹⁶⁾	-	-
	3	1.5	-	-	-	-	-	-	-	46	80

⁽¹⁶⁾: Cv values of 26, 46 for high pressure valves with 1.5" stroke.

Other Cv's on request



**MIL 21700
CONSTRUCTION**

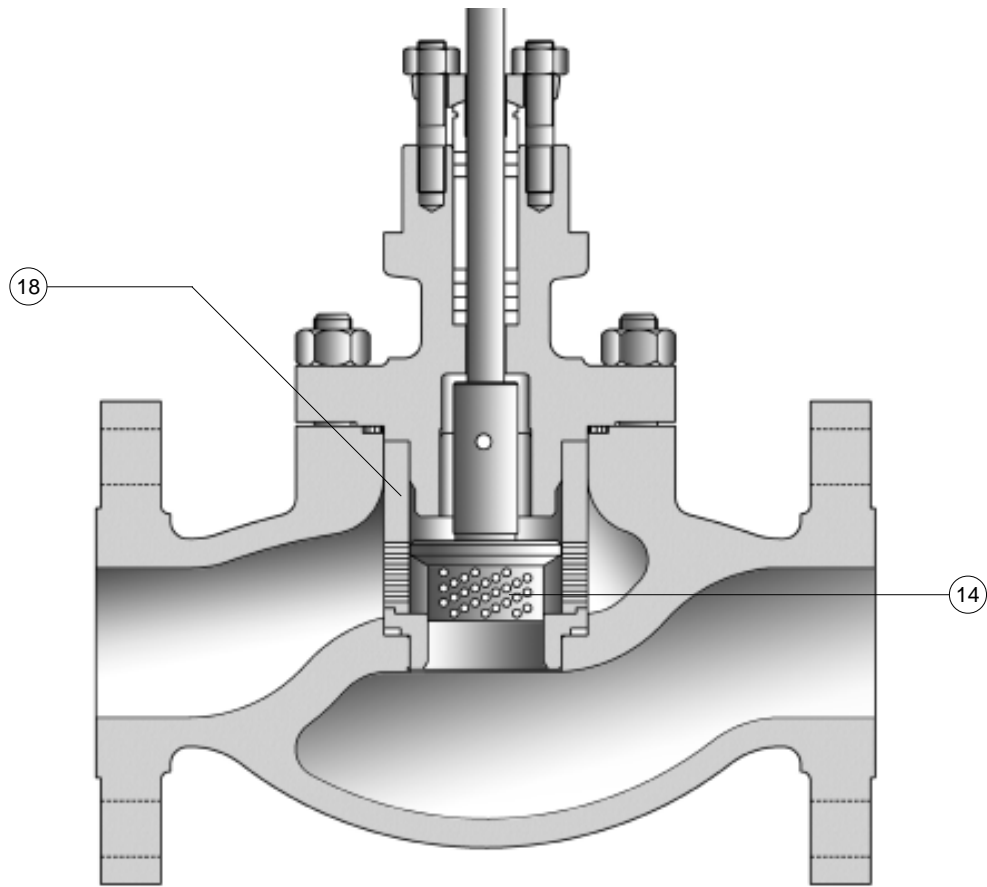
21700 SERIES (ANTI-CAVITATION / Lo-dB) - SINGLE STAGE

Critical Flow Factor (C_c or F_c): 0.95

	Valve Size (Inch)	Stroke (Inch)	ORIFICE DIAMETER (Inch) Vs RATED Cv						
			1.25	1.625	2	2.625	3.5	5	6.25
ANSI 150# THROUGH 600#	0.75 & 1	0.75	2.5, 4, 6, 8	-	-	-	-	-	-
	1.5 & 2	0.75	2.5, 4, 6, 8, 15	20, 25	-	-	-	-	-
	3	1.5	-	-	30	40, 60, 75	-	-	-
	4	1.5	-	-	30	45, 65, 75	100	-	-
	6	2	-	-	-	-	100	200	-
	8	2	-	-	-	-	-	-	300, 415

Other Cv's on request

**MIL 21800, 21900
DOUBLE STAGE
CONSTRUCTION**



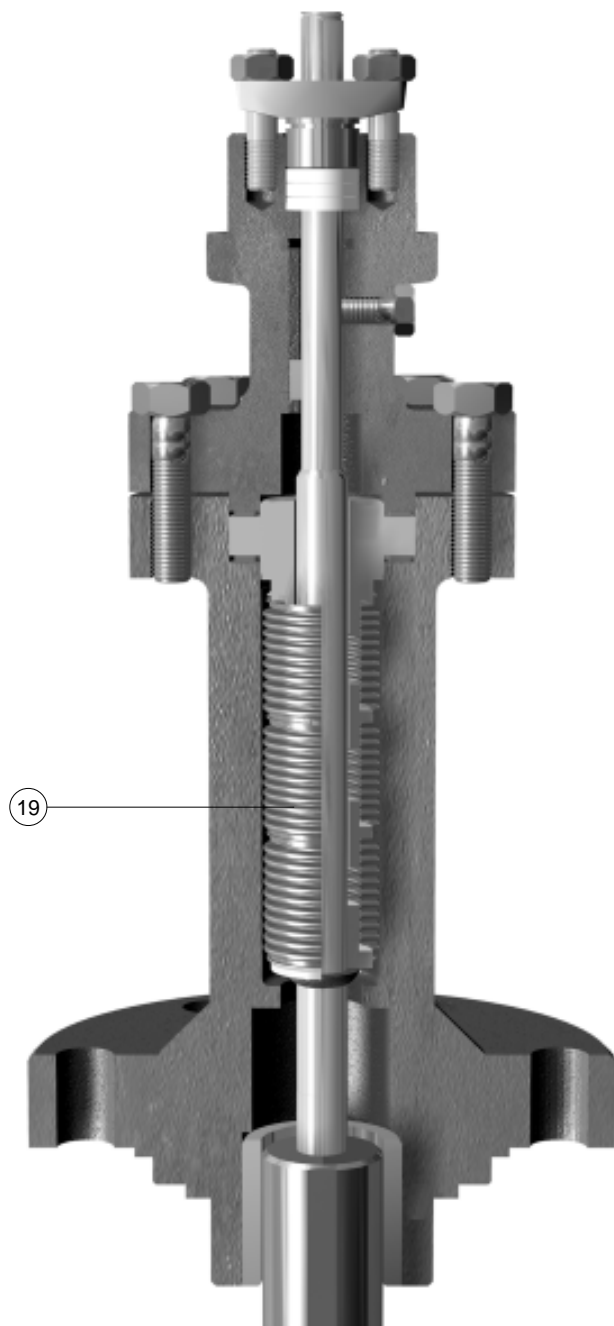
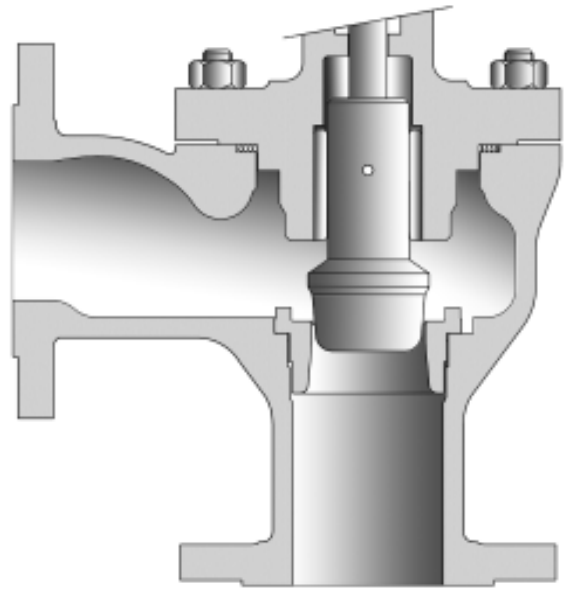
21800, 21900 SERIES (ANTI-CAVITATION / Lo-dB) - DOUBLE STAGE

Critical Flow Factor (C_f or F_L): 0.975

	Valve Size (Inch)	Stroke (Inch)	ORIFICE DIAMETER (Inch) Vs RATED Cv			
			1.25	1.625	2.625	3.5
ANSI 150# THROUGH 600#	21800 Series Double Stage Anti-cavitation					
	0.75 & 1	0.75	1.7, 2.3, 4.5	-	-	-
	1.5	0.75	1.7, 2.3, 4.5, 8.5	-	-	-
	2	0.75	1.7, 2.3, 4.5, 8.5	14	-	-
	3	1.5	-	-	27,42	-
	21900 Series Double Stage Lo-dB					
	0.75 & 1	0.75	3.5, 7	-	-	-
	1.5	0.75	7, 13	-	-	-
	2	0.75	13	21	-	-
	3	1.5	-	-	40, 63	-
	4	1.5	-	-	53	83
	6	2	-	-	-	125

Other Cv's on request

MIL 7000
LOW PRESSURE
ANGLE BODY CONSTRUCTION



MIL 21000
BELLOWS SEAL CONSTRUCTION

38 SERIES ACTUATOR FOR MIL 21100, ANSI 150# - 600#, FTO

Valve size (Inch)	Rated Cv	Act. Size	Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)			Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)			Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)		
				IV	V	VI		IV	V	VI		IV	V	VI
0.5	≤ 1.7	11	3-15	100	30	40	6-30	100	100	40	11-30	100	100	40
	2.5, 3.8	11	3-15	74	-	40	6-30	100	100	40	11-30	100	100	40
	6	11	3-15	38	-	24	6-30	100	51	40	11-30	100	100	40
0.75 & 1	≤ 1.7	11	3-15	100	30	40	6-30	100	100	40	11-30	100	100	40
	2.5, 3.8	11	3-15	74	-	40	6-30	100	100	40	11-30	100	100	40
	6	11	3-15	38	-	24	6-30	100	51	40	11-30	100	100	40
	9, 12	11	3-15	11	-	3	6-30	45	-	36	11-30	100	54	40
		13	3-15	25	-	16	6-30	72	25	40	19-31	100	100	40
	16	11	3-15	3	-	-	6-30	17	-	11	11-30	40	10	35
13		3-15	8	-	3	6-30	28	-	23	19-31	100	84	40	
1.5	≤ 1.7	11	3-15	100	30	40	6-30	100	100	40	11-30	100	100	40
	2.5, 3.8	11	3-15	74	-	40	6-30	100	100	40	11-30	100	100	40
	6	11	3-15	38	-	24	6-30	100	51	40	11-30	100	100	40
	10, 13	11	3-15	11	-	3	6-30	45	-	36	11-30	100	54	40
		13	3-15	25	-	16	6-30	72	25	40	19-31	100	100	40
	20, 25	11	3-15	3	-	-	6-30	17	-	11	11-30	40	10	35
		13	3-15	8	-	3	6-30	28	-	23	19-31	100	84	40
	35	11	3-15	-	-	-	6-30	9	-	5	11-30	23	-	19
13		3-15	4	-	-	12-30	39	16	35	19-31	66	43	40	
2	≤ 1.7	11	3-15	100	30	40	6-30	100	100	40	11-30	100	100	40
	2.5, 3.8	11	3-15	74	-	40	6-30	100	100	40	11-30	100	100	40
	6	11	3-15	38	-	24	6-30	100	51	40	11-30	100	100	40
	11, 15	11	3-15	11	-	3	6-30	45	-	36	11-30	100	54	40
		13	3-15	25	-	16	6-30	72	25	40	19-31	100	100	40
	21, 26	11	3-15	3	-	-	6-30	17	-	11	11-30	40	10	35
		13	3-15	8	-	3	6-30	28	-	23	19-31	100	84	40
	46	11	3-15	-	-	-	6-30	9	-	5	11-30	23	-	19
13		3-15	4	-	-	12-30	39	16	35	19-31	66	43	40	
3	31	13	3-15	8	-	3	6-30	28	-	23	12-31	68	38	40
		15	3-15	19	-	13	6-30	49	19	40	14-31	100	100	40
	47	13	3-15	4	-	-	6-30	16	-	11	12-31	39	16	35
		15	3-15	10	-	6	6-30	28	5	24	14-31	76	53	40
	65	13	3-15	-	-	-	6-30	10	-	6	12-31	25	6	22

To get the required supply pressure, add 5 Psig to the final spring tension

MIL 21000 - Actuator Selection

38 SERIES ACTUATOR FOR MIL 21100, ANSI 150# - 600#, FTOContinued

Valve size (Inch)	Rated Cv	Act. Size	Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)			Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)			Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)			
				IV	V	VI		IV	V	VI		IV	V	VI	
3	65	15	3-15	6	-	3	6-30	18	-	14	14-31	49	31	40	
	110	13	3-15	-	-	-	6-30	5	-	-	12-31	14	-	11	
		15	3-15	3	-	-	6-30	10	-	7	14-31	28	14	25	
		18	6-30	17	3	15	12-30	38	24	36	20-30	67	52	40	
4	49	13	3-15	4	-	-	6-30	16	-	11	12-31	39	16	35	
		15	3-15	10	-	6	6-30	28	5	24	14-31	76	53	40	
	66	13	3-15	-	-	-	6-30	10	-	6	12-31	25	6	22	
		15	3-15	6	-	3	6-30	18	-	14	14-31	49	31	40	
	113	13	3-15	-	-	-	6-30	5	-	-	12-31	14	-	11	
		15	3-15	3	-	-	6-30	10	-	7	14-31	28	14	25	
		18	6-30	17	3	15	12-30	38	24	36	20-30	67	52	40	
	195	13	3-15	-	-	-	6-30	-	-	-	12-31	7	-	5	
		15	6-30	5	-	3	12-30	13	-	11	14-31	15	4	13	
		18	6-30	9	-	7	12-30	21	10	19	20-30	37	26	35	
	6	68	15	3-15	4	-	-	6-30	16	-	12	10-31	31	13	28
			18	6-30	29	10	25	18-30	100	83	40	20-45	100	95	40
126		15	3-15	-	-	-	6-30	8	-	6	10-31	18	3	15	
		18	6-30	16	-	13	18-30	58	44	40	20-45	65	51	40	
208		15	3-15	-	-	-	6-30	4	-	-	10-31	9	-	7	
		18	6-30	8	-	6	18-30	32	22	30	20-45	36	26	34	
275, 400		15	3-15	-	-	-	6-30	-	-	-	10-31	4	-	3	
		18	6-30	4	-	-	18-30	15	8	14	20-45	17	10	16	
		24	12-30	14	6	12	18-30	22	14	20	24-40	30	22	28	
8		224	15	3-15	-	-	-	6-30	4	-	-	10-31	9	-	7
	18		6-30	8	-	6	18-30	32	22	30	20-45	36	26	34	
	415	18	6-30	4	-	-	18-30	15	8	14	20-45	17	10	16	
		24	12-30	14	6	12	18-30	22	14	20	24-40	30	22	28	
	640	18	12-30	6	-	5	18-30	10	4	9	20-45	11	5	10	
		24	12-30	9	3	7	18-30	14	8	12	24-40	19	13	18	
10	650	18	6-27	-	-	-	12-30	6	-	4	15-50	7	-	6	
		24	12-30	8	-	7	18-42	13	7	12	24-48	18	12	17	
	1000	18	6-27	-	-	-	12-30	3	-	-	15-50	4	-	3	
		24	12-30	5	-	4	18-42	8	3	7	24-48	11	6	10	

To get the required supply pressure, add 5 Psig to the final spring tension

37 SERIES ACTUATOR FOR MIL 21100, ANSI 150# - 600#, FTO

Valve size (Inch)	Rated Cv	Act. Size	Supply Pressure (Psig) Vs Allowable Shut-off Pressure (Kg/cm ²)																	
			20			30			40			45			55			65		
			IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI
0.5	≤ 1.7	11	100	100	40															
	2.5, 3.8	11	100	17	40	100	100	40												
	6	11	62	-	40	100	100	40												
0.75&1	≤ 1.7	11	100	100	40															
	2.5,3.8	11	100	17	40	100	100	40												
	6	11	62	-	40	100	100	40												
	9,12	11	20	-	12	72	26	40	100	100	40									
		13	39	-	30	100	67	40	100	100	40									
	16	11	7	-	-	29	-	23	69	38	40									
13		14	-	9	46	16	40	100	73	40	100	100	40							
1.5	≤ 1.7	11	100	100	40															
	2.5,3.8	11	100	17	40	100	100	40												
	6	11	62	-	40	100	100	40												
	10, 13	11	20	-	12	72	26	40	100	100	40									
		13	39	-	30	100	67	40	100	100	40									
	20,25	11	7	-	-	29	-	23	69	38	40									
		13	14	-	9	46	16	40	100	73	40	100	100	40						
	35	11	3	-	-	16	-	12	40	16	35									
13		8	-	3	26	3	22	60	37	40	77	54	40							
2	≤ 1.7	11	100	100	40															
	2.5,3.8	11	100	17	40	100	100	40												
	6	11	62	-	40	100	100	40												
	11,15	11	20	-	12	72	26	40	100	100	40									
		13	39	-	30	100	67	40	100	100	40									
	21, 26	11	7	-	-	29	-	23	69	38	40									
		13	14	-	9	46	16	40	100	73	40	100	100	40						
	46	11	3	-	-	16	-	12	40	16	35									
13		8	-	3	26	3	22	60	37	40	77	54	40							
3	31	13	13	-	7	43	13	37	97	67	40	100	94	40						
		15	24	-	18	67	36	40	100	100	40									
	47	13	7	-	-	24	-	20	56	33	40	72	49	40						
		15	13	-	9	38	15	34	85	61	40	100	84	40						
	65	13	4	-	-	15	-	12	37	18	33	47	28	40						

37 Series Actuators are with 3 -15 Psig spring ranges.

37 SERIES ACTUATOR FOR MIL 21100, ANSI 150# - 600#, FTOContinued

Valve size (Inch)	Rated Cv	Act. Size	Allowable Shut-off Pressure (Kg/cm ²)																		
			20			30			40			45			55			65			
			IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	
3	65	15	8	-	4	25	6	21	55	36	40	70	52	40							
	110	13	-	-	-	8	-	6	21	6	18	27	12	24							
		15	4	-	-	14	-	11	31	17	29	40	26	38							
		18	9	-	6	25	11	22	54	40	40	69	54	40	98	84	40	100	100	40	
4	49	13	7	-	-	24	-	20	56	33	40	72	49	40							
		15	13	-	9	38	15	34	85	61	40	100	84	40							
	66	13	4	-	-	15	-	12	37	18	33	47	28	40							
		15	8	-	4	25	6	21	55	36	40	70	52	40							
	113	13	-	-	-	8	-	6	21	6	18	27	12	24							
		15	4	-	-	14	-	11	31	17	29	40	26	38							
		18	9	-	6	25	11	22	54	40	40	69	54	40	98	84	40	100	100	40	
	195	13	-	-	-	4	-	-	11	-	9	15	4	13							
		15	-	-	-	7	-	5	17	6	15	22	11	20							
		18	5	-	3	14	3	12	30	19	28	38	27	36	55	44	40	71	60	40	
	6	68	15	6	-	-	22	3	18	52	33	40	67	48	40						
			18	14	-	11	42	23	38	92	73	40	100	98	40	100	100	40			
126		15	3	-	-	12	-	9	30	15	27	38	24	36							
		18	8	-	5	24	9	21	53	38	40	67	53	40	96	82	40	100	100	40	
208		15	-	-	-	6	-	4	16	5	14	21	10	19							
		18	4	-	-	13	-	11	29	18	27	37	27	35	54	43	40	70	59	40	
275		15	-	-	-	3	-	-	7	-	6	10	-	8							
		18	-	-	-	6	-	4	14	6	12	18	10	16	26	18	24	34	26	32	
400		24	3	-	-	9	-	8	20	13	19	26	18	25	37	30	36				
8	224	15	-	-	-	6	-	4	16	5	14	21	10	19							
		18	4	-	-	13	-	11	29	18	27	37	27	35	54	43	40	70	59	40	
	415	18	-	-	-	6	-	4	14	6	12	18	10	16	26	18	24	34	26	32	
		24	3	-	-	9	-	8	20	13	19	26	18	25	37	30	36				
	640	18	-	-	-	4	-	-	9	3	8	11	5	10	16	10	15	21	15	20	
		24	-	-	-	6	-	4	13	7	12	16	10	15	24	18	22				
10	650	18	-	-	-	3	-	-	8	-	7	11	4	9	15	9	14	20	14	19	
		24	-	-	-	4	-	3	11	5	10	14	8	13	21	15	19				
	1000	18	-	-	-	-	-	-	5	-	4	6	-	5	9	5	8	12	8	11	
		24	-	-	-	3	-	-	6	-	6	8	4	8	12	8	11				

37 Series Actuators are with 3 -15 Psig spring ranges.



38 SERIES ACTUATOR FOR MIL 21000 BELLOWS SEALED, ANSI 150# - 600#, FTO

Valve size (Inch)	Rated Cv	Act. Size	Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)			Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)			Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)		
				IV	V	VI		IV	V	VI		IV	V	VI
0.5	≤1.7	11	3-15	-	-	-	6-30	40	40	40	11-30	40	40	40
	2.5, 3.8	11	3-15	-	-	-	6-30	40	31	40	11-30	40	40	40
	6	11	3-15	-	-	-	6-30	40	-	40	11-30	40	40	40
0.75&1	≤1.7	11	3-15	-	-	-	6-30	40	40	40	11-30	40	40	40
	2.5,3.8	11	3-15	-	-	-	6-30	40	31	40	11-30	40	40	40
	6	11	3-15	-	-	-	6-30	40	-	40	11-30	40	40	40
	9,12	11	3-15	-	-	-	6-30	23	-	15	11-30	40	33	40
		13	3-15	4	-	-	6-30	40	4	40	19-31	40	40	40
	16	11	3-15	-	-	-	6-30	8	-	-	11-30	31	-	26
13		3-15	-	-	-	6-30	19	-	14	19-31	40	40	40	
1.5	≤1.7	11	3-15	-	-	-	6-30	40	40	40	11-30	40	40	40
	2.5,3.8	11	3-15	-	-	-	6-30	40	31	40	11-30	40	40	40
	6	11	3-15	-	-	-	6-30	40	-	40	11-30	40	40	40
	10, 13	11	3-15	-	-	-	6-30	23	-	15	11-30	40	33	40
		13	3-15	4	-	-	6-30	40	4	40	19-31	40	40	40
	20,25	11	3-15	-	-	-	6-30	8	-	-	11-30	31	-	26
		13	3-15	-	-	-	6-30	19	-	14	19-31	40	40	40
	35	11	3-15	-	-	-	6-30	4	-	-	11-30	18	-	13
13		3-15	-	-	-	12-30	34	11	30	19-31	40	38	40	
2	≤1.7	11	3-15	-	-	-	6-30	40	40	40	11-30	40	40	40
	2.5,3.8	11	3-15	-	-	-	6-30	40	31	40	11-30	40	40	40
	6	11	3-15	-	-	-	6-30	40	-	40	11-30	40	40	40
	11,15	11	3-15	-	-	-	6-30	23	-	15	11-30	40	33	40
		13	3-15	4	-	-	6-30	40	4	40	19-31	40	40	40
	21, 26	11	3-15	-	-	-	6-30	8	-	-	11-30	31	-	26
		13	3-15	-	-	-	6-30	19	-	14	19-31	40	40	40
	46	11	3-15	-	-	-	6-30	4	-	-	11-30	18	-	13
13		3-15	-	-	-	12-30	34	11	30	19-31	40	38	40	
3	31	13	3-15	-	-	-	6-30	10	-	5	12-31	40	20	40
		15	3-15	-	-	-	6-30	31	-	26	14-31	40	40	40
	47	13	3-15	-	-	-	6-30	5	-	-	12-31	29	5	24
		15	3-15	-	-	-	6-30	18	-	13	14-31	40	40	40
	65	13	3-15	-	-	-	6-30	3	-	-	12-31	18	-	15

To get the required supply pressure, add 5 Psig to the final spring tension

MIL 21000 - Actuator Selection

38 SERIES ACTUATOR FOR MIL 21000 BELLOWS SEALED, ANSI 150# - 600#, FTOContinued

Valve size (Inch)	Rated Cv	Act. Size	Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)			Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)			Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)		
				IV	V	VI		IV	V	VI		IV	V	VI
3	40	15	3-15	-	-	-	6-30	11	-	7	14-31	40	24	39
	110	13	3-15	-	-	-	6-30	-	-	-	12-31	10	-	7
		15	3-15	-	-	-	6-30	6	-	3	14-31	24	10	21
		18	6-30	13	-	10	12-30	34	20	32	20-30	40	40	40
4	49	13	3-15	-	-	-	6-30	5	-	-	12-31	29	5	24
		15	3-15	-	-	-	6-30	18	-	13	14-31	40	40	40
	66	13	3-15	-	-	-	6-30	3	-	-	12-31	18	-	15
		15	3-15	-	-	-	6-30	11	-	7	14-31	40	24	39
	113	13	3-15	-	-	-	6-30	-	-	-	12-31	10	-	7
		15	3-15	-	-	-	6-30	6	-	3	14-31	24	10	21
		18	6-30	13	-	10	12-30	34	20	32	20-30	40	40	40
	195	13	3-15	-	-	-	6-30	-	-	-	12-31	5	-	3
		15	6-30	3	-	-	12-30	10	-	8	14-31	13	-	11
		18	6-30	7	-	5	12-30	19	8	17	20-30	35	24	33
6	68	15	3-15	-	-	-	6-30	6	-	3	10-31	22	3	19
		18	6-30	19	-	16	18-30	40	40	40	20-45	40	40	40
	126	15	3-15	-	-	-	6-30	3	-	-	10-31	12	-	10
	208	18	6-30	11	-	8	18-30	40	39	40	20-45	40	40	40
		15	3-15	-	-	-	6-30	-	-	-	10-31	6	-	4
		18	6-30	5	-	3	18-30	29	18	27	20-45	33	22	31
	275, 400	15	3-15	-	-	-	6-30	-	-	-	10-31	3	-	-
		18	6-30	-	-	-	18-30	14	6	13	20-45	16	8	14
24		12-30	12	5	11	18-30	20	13	19	24-40	28	20	27	
8	224	15	3-15	-	-	-	6-30	-	-	-	10-31	6	-	4
		18	6-30	5	-	3	18-30	29	18	27	20-45	33	22	31
	415	18	6-30	-	-	-	18-30	14	6	13	20-45	16	8	14
		24	12-30	12	5	11	18-30	20	13	19	24-40	28	20	27
	640	18	12-30	5	-	4	18-30	9	3	8	20-45	10	4	9
24		12-30	8	-	6	18-30	13	7	12	24-40	18	12	17	
10	400	18	6-27	-	-	-	12-30	4	-	3	15-50	6	-	5
		24	12-30	7	-	6	18-42	12	6	11	24-40	17	11	16
	400	18	6-27	-	-5	-	12-30	-	-	-	15-50	3	-	3
		24	12-30	4	-	3	18-42	7	-	6	24-40	10	5	9

To get the required supply pressure, add 5 Psig to the final spring tension

37 SERIES ACTUATOR FOR MIL 21000 BELLOWS SEALED, ANSI 150# - 600#, FTO

Valve size (Inch)	Rated Cv	Act. Size	Supply Pressure (Psig) Vs Allowable Shut-off Pressure (Kg/cm ²)																	
			20			30			40			45			55			65		
			IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI
0.5	≤1.7	11	40	-	26	40	40	40												
	2.5, 3.8	11	18	-	-	40	40	40												
	6	11	7	-	-	40	40	40												
0.75&1	≤1.7	11	40	-	26	40	40	40												
	2.5,3.8	11	18	-	-	40	40	40												
	6	11	7	-	-	40	40	40												
		13	18	-	9	40	40	40												
	16	11	-	-	-	20	-	14	40	29	40	40	40	40						
		13	5	-	-	37	7	31	40	40	40									
1.5	≤1.7	11	40	-	26	40	40	40												
	2.5,3.8	11	18	-	-	40	40	40												
	6	11	7	-	-	40	40	40												
		13	18	-	9	40	40	40												
	10, 13	11	-	-	-	40	5	40	40	40	40									
		13	18	-	9	40	40	40												
	20,25	11	-	-	-	20	-	14	40	29	40	40	40	40						
		13	5	-	-	37	7	31	40	40	40									
35	11	-	-	-	11	-	6	34	11	30	40	23	40							
	13	-	-	-	21	-	17	40	32	40	40	40	40							
2	≤1.7	11	40	-	26	40	40	40												
	2.5,3.8	11	18	-	-	40	40	40												
	6	11	7	-	-	40	40	40												
		13	18	-	9	40	40	40												
	11,15	11	-	-	-	40	5	40	40	40	40									
		13	18	-	9	40	40	40												
	21, 26	11	-	-	-	20	-	14	40	29	40	40	40	40						
		13	5	-	-	37	7	31	40	40	40									
46	11	-	-	-	11	-	6	34	11	30	40	23	40							
	13	-	-	-	21	-	17	40	32	40	40	40	40							
3	31	13	-	-	-	25	-	19	40	40	40									
		15	6	-	-	40	19	40	40	40	40									
	47	13	-	-	-	14	-	9	40	23	40	40	39	40						
		15	-	-	-	28	5	24	40	40	40									
	65	13	-	-	-	8	-	5	30	11	26	40	21	37						

37 Series Actuators are with 3 -15 Psig spring ranges.

37 SERIES ACTUATOR FOR MIL 21000 BELLOWS SEALED, ANSI 150# - 600#, FTOContinued

Valve size (Inch)	Rated Cv	Act. Size	Supply Pressure (Psig) Vs Allowable Shut-off Pressure (Kg/cm ²)																		
			20			30			40			45			55			65			
			IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	IV	V	VI	
3	65	15	-	-	-	18	-	14	40	29	40	40	40	40							
	110	13	-	-	-	4	-	-	17	-	14	23	8	20							
		15	-	-	-	10	-	7	27	13	25	36	22	33							
		18	5	-	-	21	7	18	40	36	40	40	40	40							
4	49	13	-	-	-	14	-	9	40	23	40	40	39	40							
		15	-	-	-	28	5	24	40	40	40										
	66	13	-	-	-	8	-	5	30	11	26	40	21	37							
		15	-	-	-	18	-	14	40	29	40	40	40	40							
	113	13	-	-	-	4	-	-	17	-	14	23	8	20							
		15	-	-	-	10	-	7	27	13	25	36	22	33							
		18	5	-	-	21	7	18	40	36	40	40	40	40							
	195	13	-	-	-	-	-	-	9	-	7	12	-	10							
		15	-	-	-	5	-	3	15	4	13	20	9	18							
		18	-	-	-	11	-	9	28	17	26	36	25	34	40	40	40				
	6	68	15	-	-	-	13	-	9	40	24	39	40	39	40						
			18	5	-	-	33	14	29	40	40	40									
126		15	-	-	-	7	-	4	24	10	21	33	18	30							
		18	-	-	-	18	4	16	40	33	40	40	40	40							
208		15	-	-	-	3	-	-	13	-	11	18	7	16							
		18	-	-	-	10	-	8	26	15	24	34	23	32	51	40	40	67	56	40	
275,400		15	-	-	-	-	-	-	6	-	5	8	-	7							
		18	-	-	-	4	-	3	12	5	11	16	9	15	24	17	23	32	25	31	
		24	-	-	-	8	-	6	19	11	17	25	17	23	36	28	34				
8	224	15	-	-	-	3	-	-	13	-	11	18	7	16							
		18	-	-	-	10	-	8	26	15	24	34	23	32	40	40	40				
	415	18	-	-	-	4	-	3	12	5	11	16	9	15	24	17	23	32	25	31	
		24	-	-	-	8	-	6	19	11	17	25	17	23	36	28	34	40	39	40	
	640	18	-	-	-	3	-	-	8	-	7	10	4	9	15	9	14	20	14	19	
		24	-	-	-	5	-	4	12	6	11	15	9	14	23	17	22	30	24	29	
10	650	18	-	-	-	-	-	-	7	-	5	9	3	8	14	8	13	19	13	18	
		24	-	-	-	3	-	-	9	3	8	13	7	12	19	13	18	26	19	24	
	1000	18	-	-	-	-	-	-	4	-	3	5	-	4	8	4	8	11	7	11	
		24	-	-	-	-	-	-	6	-	5	8	3	7	11	7	11	15	11	15	

37 Series Actuators are with 3 -15 Psig spring ranges.

38 SERIES ACTUATOR FOR MIL 21100, ANSI 900# - 1500#, FTO

Valve size (Inch)	Rated Cv	Act. Size	Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)		Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)		Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)	
				IV	V		IV	V		IV	V
0.75&1	≤1.7	11	3-15	181	-	6-30	250	250	11-30	250	250
	2.5,3.8	11	3-15	74	-	6-30	231	130	11-30	250	250
	6	11	3-15	-	-	6-30	126	51	11-30	250	198
	11	11	3-15	-	-	6-30	-	-	11-30	100	54
		13	6-30	72	-	12-30	165	119	19-31	250	229
1.5	≤1.7	11	3-15	181	-	6-30	250	250	11-30	250	250
	2.5,3.8	11	3-15	74	-	6-30	231	130	11-30	250	250
	6	11	3-15	-	-	6-30	126	51	11-30	250	198
	11	11	3-15	-	-	6-30	-	-	11-30	100	54
		13	6-30	72	-	12-30	165	119	19-31	250	229
	15	13	6-30	-	-	12-30	68	-	19-31	114	84
		15	12-30	110	79	18-30	170	140	24-32	231	201
2	≤1.7	11	3-15	181	-	6-30	250	250	11-30	250	250
	2.5,3.8	11	3-15	74	-	6-30	231	130	11-30	250	250
	6	11	3-15	-	-	6-30	126	51	11-30	250	198
	11	11	3-15	-	-	6-30	-	-	11-30	100	54
		13	6-30	72	-	12-30	165	119	19-31	250	229
	15	13	6-30	-	-	12-30	68	-	19-31	114	84
		15	12-30	110	79	18-30	170	140	24-32	231	201
	26	15	6-30	-	-	12-30	64	-	14-31	76	53
		18	12-30	103	80	18-30	158	135	20-30	177	154
	46	15	6-30	-	-	12-30	-	-	14-31	-	-
		18	12-30	67	-	18-30	104	85	20-30	116	97
3	15	15	6-30	-	-	12-30	110	79	14-31	130	100
		18	12-30	176	145	18-30	250	239	20-30	250	250
	26	15	6-30	-	-	12-30	64	-	14-31	76	53
		18	12-30	103	80	18-30	158	135	20-30	177	154
	65	18	12-30	-	-	18-30	60	-	20-30	67	52
		24	12-30	53	-	18-30	82	68	24-36	111	96
	110	18	12-30	-	-	18-30	-	-	20-30	51	-
		24	12-30	-	-	18-30	63	50	24-36	85	72

To get the required supply pressure, add 5 Psig to the final spring tension

37 SERIES ACTUATOR FOR MIL 21100, ANSI 900# - 1500#, FTO

Valve size (Inch)	Rated Cv	Act. Size	Supply Pressure (Psig) Vs Allowable Shut-off Pressure (Kg/cm ²)											
			20		30		40		45		55		65	
			IV	V	IV	V	IV	V	IV	V	IV	V	IV	V
0.75&1	≤1.7	11	250	127	250	250								
	2.5,3.8	11	117	-	250	250								
	6	11	62	-	200	124	250	250						
	11	11	-	-	72	-	167	121	214	168				
		13	-	-	114	67	249	203	250	250				
1.5	≤1.7	11	250	127	250	250								
	2.5,3.8	11	117	-	250	250								
	6	11	62	-	200	124	250	250						
	11	11	-	-	72	-	167	121	214	168				
		13	-	-	114	67	249	203	250	250				
	15	13	-	-	-	-	103	73	132	102				
		15	-	-	40	-	153	122	194	163				
2	≤1.7	11	250	127	250	250								
	2.5,3.8	11	117	-	250	250								
	6	11	62	-	200	124	250	250						
	11	11	-	-	72	-	167	121	214	168				
		13	-	-	114	67	249	203	250	250				
	15	13	-	-	-	-	103	73	132	102				
		15	-	-	40	-	153	122	194	163				
	26	15	-	-	-	-	85	61	108	84				
		18	-	-	68	-	144	121	182	159	250	235	250	250
		46	15	-	-	-	-	55	-	70	52			
18			-	-	-	-	95	76	120	101	170	151	220	201
3	15	15	-	-	67	-	145	114	184	153	-	-	-	-
		18	-	-	117	87	245	215	250	250	-	-	-	-
	26	15	-	-	-	-	85	61	108	84	-	-	-	-
		18	-	-	68	-	144	121	182	159	250	235	250	250
	65	18	-	-	-	-	54	-	69	54	98	84	127	113
		24	-	-	-	-	80	66	101	87	143	129	-	-
	110	18	-	-	-	-	-	-	52	-	75	62	97	84
		24	-	-	-	-	61	-	77	65	110	97	-	-

37 Series Actuators are with 3 -15 Psig spring ranges.

38 SERIES ACTUATOR FOR MIL 21100, ANSI 2500#, FTO

Valve size (Inch)	Rated Cv	Act. Size	Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)		Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)		Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)	
				IV	V		IV	V		IV	V
0.75 & 1	1.7	11	3-15	181	-	6-30	350	350	11-30	350	350
	2.5,3.8	11	3-15	74	-	6-30	231	130	11-30	350	350
	6	11	3-15	-	-	6-30	126	51	11-30	273	198
	11	11	3-15	-	-	6-30	-	-	11-30	100	54
		13	6-30	72	-	12-30	165	119	19-31	275	229
1.5	1.7	11	3-15	181	-	6-30	350	350	11-30	350	350
	2.5,3.8	11	3-15	74	-	6-30	231	130	11-30	350	350
	6	11	3-15	-	-	6-30	126	51	11-30	273	198
	11	11	3-15	-	-	6-30	-	-	11-30	100	54
		13	6-30	72	-	12-30	165	119	19-31	275	229
	15	13	6-30	-	-	12-30	68	-	19-31	114	84
		15	12-30	110	79	18-30	170	140	24-32	231	201
2 & 2.5	1.7	11	3-15	181	-	6-30	350	350	11-30	350	350
	2.5,3.8	11	3-15	74	-	6-30	231	130	11-30	350	350
	6	11	3-15	-	-	6-30	126	51	11-30	273	198
	11	11	3-15	-	-	6-30	-	-	11-30	100	54
		13	6-30	72	-	12-30	165	119	19-31	275	229
	15	13	6-30	-	-	12-30	68	-	19-31	114	84
		15	12-30	110	79	18-30	170	140	24-32	231	201
	26	15	6-30	-	-	12-30	-	-	14-31	-	-
		18	12-30	67	-	18-30	104	85	20-30	116	97
3	46	18	12-30	-	-	18-30	60	-	20-30	67	52
		24	12-30	53	-	18-30	82	68	24-36	111	96
	80	18	12-30	-	-	18-30	-	-	20-30	51	-
		24	12-30	-	-	18-30	63	50	24-36	85	72

To get the required supply pressure, add 5 Psig to the final spring tension

37 SERIES ACTUATOR FOR MIL 21100, ANSI 2500#, FTO

Valve size (Inch)	Rated Cv	Act. Size	Supply Pressure (Psig) Vs Allowable Shut-off Pressure (Kg/cm ²)											
			20		30		40		45		55		65	
			IV	V	IV	V	IV	V	IV	V	IV	V	IV	V
0.75 & 1	1.7	11	278	127	350	350								
	2.5,3.8	11	117	-	350	261	350	350						
	6	11	62	-	200	124	350	350						
	11	11	-	-	72	-	167	121						
		13	-	-	114	67	249	203	317	271				
1.5	1.7	11	278	127	350	350								
	2.5,3.8	11	117	-	350	261	350	350						
	6	11	62	-	200	124	350	350						
	11	11	-	-	72	-	167	121						
		13	-	-	114	67	249	203	317	271				
	15	13	-	-	-	-	103	73	132	102				
		15	-	-	71	-	153	122	194	163				
2 & 2.5	1.7	11	278	127	350	350								
	2.5,3.8	11	117	-	350	261	350	350						
	6	11	62	-	200	124	350	350						
	11	11	-	-	72	-	167	121						
		13	-	-	114	67	249	203	317	271				
	15	13	-	-	-	-	103	73	132	102				
		15	-	-	71	-	153	122	194	163				
	26	15	-	-	-	-	55	-	70	52				
		18	-	-	-	-	95	76	120	101	170	151	220	201
3	46	18	-	-	-	-	54	-	69	54	98	84	127	113
		24	-	-	-	-	80	66	101	87	143	129		
	80	18	-	-	-	-	-	-	52	-	75	62	97	84
		24	-	-	-	-	61	-	77	65	110	97		

37 Series Actuators are with 3 -15 Psig spring ranges.

38 SERIES ACTUATOR FOR MIL 21700, 21900 ANSI 150# - 600#, FTO

Valve size (Inch)	Rated Cv 21700	Rated Cv 21900	Act. Size	Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)		Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)		Spring Range (psig)	Allowable Shut-off Pressure (Kg/cm ²)	
					IV	V		IV	V		IV	V
0.75 & 1	≤ 8	≤ 7	11	3-15	3	-	6-30	17	-	11-30	40	10
			13	3-15	8	-	6-30	28	-	19-31	100	84
1.5	≤ 15	≤ 13	11	3-15	3	-	6-30	17	-	11-30	40	10
			13	3-15	8	-	6-30	28	-	19-31	100	84
	20, 25	-	11	3-15	-	-	6-30	9	-	11-30	23	-
			13	3-15	4	-	12-30	39	16	19-31	66	43
2	≤ 15	≤ 13	11	3-15	3	-	6-30	17	-	11-30	40	10
			13	3-15	8	-	6-30	28	-	19-31	100	84
	20, 25	21	11	3-15	-	-	6-30	9	-	11-30	23	-
			13	3-15	4	-	12-30	39	16	19-31	66	43
3	30	-	13	3-15	-	-	6-30	10	-	12-31	25	6
			15	3-15	6	-	6-30	18	-	14-31	49	31
	40, 60, 75	40, 63	13	3-15	-	-	6-30	5	-	12-31	14	-
			15	3-15	3	-	6-30	10	-	14-31	28	14
			18	6-30	17	3	12-30	38	24	20-30	67	52
4	30	-	13	3-15	-	-	6-30	10	-	12-30	25	6
			15	3-15	6	-	6-30	18	-	14-31	49	31
	45, 65, 75	53	13	3-15	-	-	6-30	5	-	12-31	14	-
			15	3-15	3	-	6-30	10	-	14-31	28	14
			18	6-30	17	3	12-30	38	24	20-30	67	52
	100	83	13	3-15	-	-	6-30	-	-	12-31	7	-
			15	6-30	5	-	12-30	13	-	14-31	15	4
			18	6-30	9	-	12-30	21	10	20-30	37	26
6	100	125	15	3-15	-	-	6-30	4	-	10-31	9	-
			18	6-30	8	-	18-30	32	22	20-45	36	26
			24	12-30	29	18	18-30	45	34	24-40	61	50
	200	-	15	3-15	-	-	6-30	-	-	10-31	4	-
			18	6-30	4	-	18-30	15	8	20-45	17	10
			24	12-30	14	6	18-30	22	14	24-40	30	22
8	300, 415	-	18	12-30	6	-	18-30	10	4	20-45	11	5
			24	12-30	9	3	18-30	14	8	24-40	19	13

To get the required supply pressure, add 5 Psig to the final spring tension

37 SERIES ACTUATOR FOR MIL 21700, 21900 ANSI 150# - 600#, FTO

Valve size (Inch)	Rated Cv 21700	Rated Cv 21900	Act. Size	Supply Pressure (Psig) Vs Allowable Shut-off Pressure (Kg/cm ²)											
				20		30		40		45		55		65	
				IV	V	IV	V	IV	V	IV	V	IV	V	IV	V
0.75 & 1	≤ 8	≤ 7	11	7	-	29	-	69	38						
			13	14	-	46	16	100	73	100	100				
1.5	≤ 15	≤ 13	11	7	-	29	-	69	38						
			13	14	-	46	16	100	73	100	100				
	20, 25	-	11	3	-	16	-	40	16						
			13	8	-	26	3	60	37	77	54				
2	≤ 15	≤ 13	11	7	-	29	-	69	38						
			13	14	-	46	16	100	73	100	100				
	20, 25	21	11	3	-	16	-	40	16						
			13	8	-	26	3	60	37	77	54				
3	30	-	13	4	-	15	-	37	18	47	28				
			15	8	-	25	6	55	36	70	52				
	40, 60, 75	40, 63	13	-	-	8	-	21	6	27	12				
			15	4	-	14	-	31	17	40	26				
			18	9	-	25	11	54	40	69	54	98	84	100	100
4	30	-	13	4	-	15	-	37	18	47	28				
			15	8	-	25	6	55	36	70	52				
	45, 65, 75	53	13	-	-	8	-	21	6	27	12				
			15	4	-	14	-	31	17	40	26				
			18	9	-	25	11	54	40	69	54	98	84	100	100
	100	83	13	-	-	4	-	11	-	15	4				
			15	-	-	7	-	17	6	22	11				
18			5	-	14	3	30	19	38	27	55	44	71	60	
6	100	125	15	-	-	6	-	16	5	21	10				
			18	4	-	13	-	29	18	37	27	54	43	70	59
			24	7	-	19	9	42	32	54	43	77	66		
	200	-	15	-	-	3	-	7	-	10	-				
			18	-	-	6	-	14	6	18	10	26	18	34	26
			24	3	-	9	-	20	13	26	18	37	30		
8	300,	-	18	-	-	4	-	9	3	11	5	16	10	21	15
	415		24	-	-	6	-	13	7	16	10	24	18		

37 Series Actuators are with 3 - 15 Psig spring ranges.

37 / 38 SERIES ACTUATOR FOR MIL 21700, 21800 ANSI 150# - 600#, FTC

Valve size (Inch)	Rated Cv 21700	Rated Cv 21800	Act. Size	CLASS IV (ANSI/FCI 70.2)				CLASS IV (ANSI/FCI 70.2) ⁽¹⁷⁾		
				▲P (Kg/cm ²) - 37 & 38				37		38
				3-15Psig,	20 Psig	6-30Psig,	35 Psig	▲P (Kg/cm ²)	Supply (Psig)	▲P (Kg/cm ²)
0.75 & 1	≤ 8	≤ 4.5	11	15	30	30	40	30		
			13	22	44	44	35	44		
1.5	≤ 15	≤ 8.5	11	15	30	30	40	30		
			13	22	44	44	35	44		
	20,	-	11	8	17	17	45	-		
	25		13	12	24	24	40	24		
2	≤ 15	≤ 8.5	11	15	30	30	40	30		
			13	22	44	44	35	44		
	20,	14	11	8	17	17	45	-		
	25		13	12	24	24	40	24		
3	30	-	13	7	15	15	40	15		
			15	11	22	22	35	22		
	40, 60, 75	27, 42	13	4	8.5	8.5	45	-		
			15	6	12	12	40	12		
			18	10	20	20	35	20		
4	30	-	13	7	15	15	40	15		
			15	11	22	22	35	22		
	45, 65, 75	-	13	4	8.5	8.5	45	-		
			15	6	12	12	40	12		
			18	10	20	20	35	20		
	100	-	13	3	5.5	5.5	45	-		
			15	4	8	8	40	8		
			18	6	13	13	35	13		
6	100	-	15	3	7	7	45	7		
			18	5	14.5 ⁽¹⁸⁾	14.5 ⁽¹⁸⁾	55	14.5 ⁽¹⁸⁾		
			24	7	15.5	15.5	35	15.5		
	200	-	15	-	3	-	-	-		
			18	2	7 ⁽¹⁸⁾	7 ⁽¹⁸⁾	55	7 ⁽¹⁸⁾		
			24	3	7.5	7.5	35	7.5		
8	300, 415	-	18	-	4.5 ⁽¹⁸⁾	4.5 ⁽¹⁸⁾	55	4.5 ⁽¹⁸⁾		
			24	-	5	5	40	5		

⁽¹⁷⁾ Actuators are with 6-30 Psig spring range.

⁽¹⁸⁾ 18" Actuators with 16-47 Psig spring & 55 Psig Supply Pressure.

APPROXIMATE DIMENSIONS (mm) FOR MIL 21000, ANSI CLASS 150# THROUGH 600#⁽¹⁹⁾

Valve size (Inch)	A							B		H			
	Raised Face			Ring Type Joint			Weld End	<300#	600#	Standard Bonnet		Extended Bonnet	Bellows Sealed
	150#	300#	600#	150#	300#	600#	≤600#			≤300#	600#	≤300#	≤300#
0.5	190	190	203	195	202	206	200	37.5	37.5	142	142	-	-
0.75	184	194	206	195	206	206	209.5	51	51	142	142	352	266
1	184	197	209	197	209	209	209.5	51	51	142	142	352	266
1.5	223	235	251	235	248	251	251	64	64	142	142	352	266
2	254	267	286	267	283	289	286	76	76	142	142	352	266
3	299	318	337	311	333	340	404	94	114	205	298	388	429
4	353	368	394	365	384	397	444	117	140	206	266	402	432
6	451	473	508	463	489	511	540	159	187	288	303	519	550
8	543	569	610	556	584	613	626	184	216	436	436	576	655
10	673	708	752	-	-	-	-	225	232	489	-	-	747

APPROXIMATE DIMENSIONS (mm) FOR MIL 21000, ANSI CLASS 900# THROUGH 1500#⁽¹⁹⁾

Valve size (Inch)	A						B		H	
	Raised Face		Ring Type Joint		Weld End		<1500#	2500#	Standard Bonnet	
	≤1500#	2500#	≤1500#	2500#	1500#	2500#			<1500#	2500#
0.75	292	318	292	318	292	292	65	65	175	175
1	292	317.5	292	317.5	292	292	65	65	175	175
1.5	333.5	362	333.5	362	292	292	65	65	175	175
2	311	394	315	397	311	394	96	111	234	259
2.5	-	-	-	-	-	394	-	111	-	259

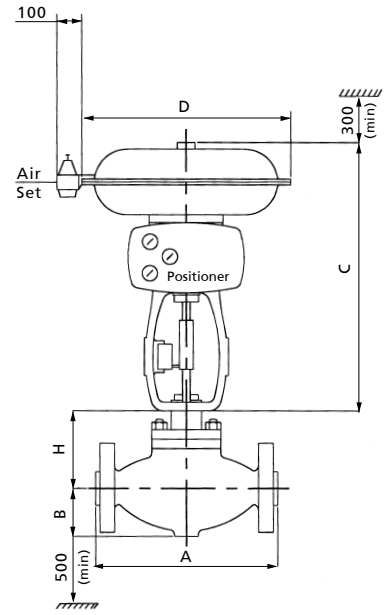
APPROXIMATE SHIPPING WEIGHTS FOR MIL 21000 BODY SUBASSEMBLY⁽¹⁹⁾

Valve size (Inch)	WEIGHT IN KILOGRAMS							
	Flanged				Weld End			
	300#	600#	1500#	2500#	300#	600#	1500#	2500#
0.5	13	15	-	-	20	20	-	-
0.75	16	19	29	29	21	21	26	26
1	16	19	29	29	21	21	29	29
1.5	22	25	35	35	25	25	35	35
2	26	29	46	78	29	29	46	78
3	57	62	-	-	33	45	80	-
4	88	98	-	-	55	61	90	-
6	160	203	-	-	109	123	145	-
8	318	410	-	-	287	-	-	-
10	600	-	-	-	-	-	-	-

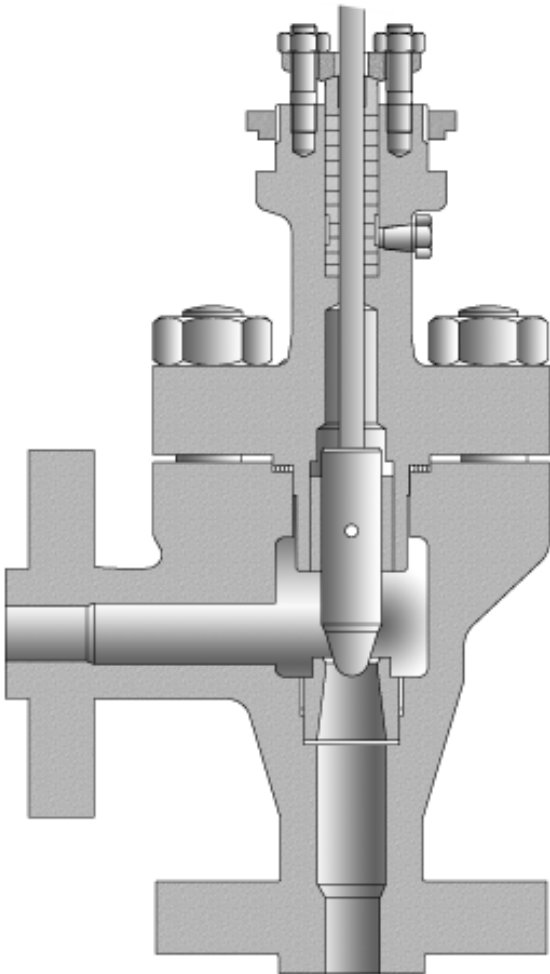
⁽¹⁹⁾ Dimensions & Weights are for reference only.

APPROXIMATE DIMENSIONS (mm) & SHIPPING WEIGHTS (Kg) FOR 37 / 38 ACTUATORS

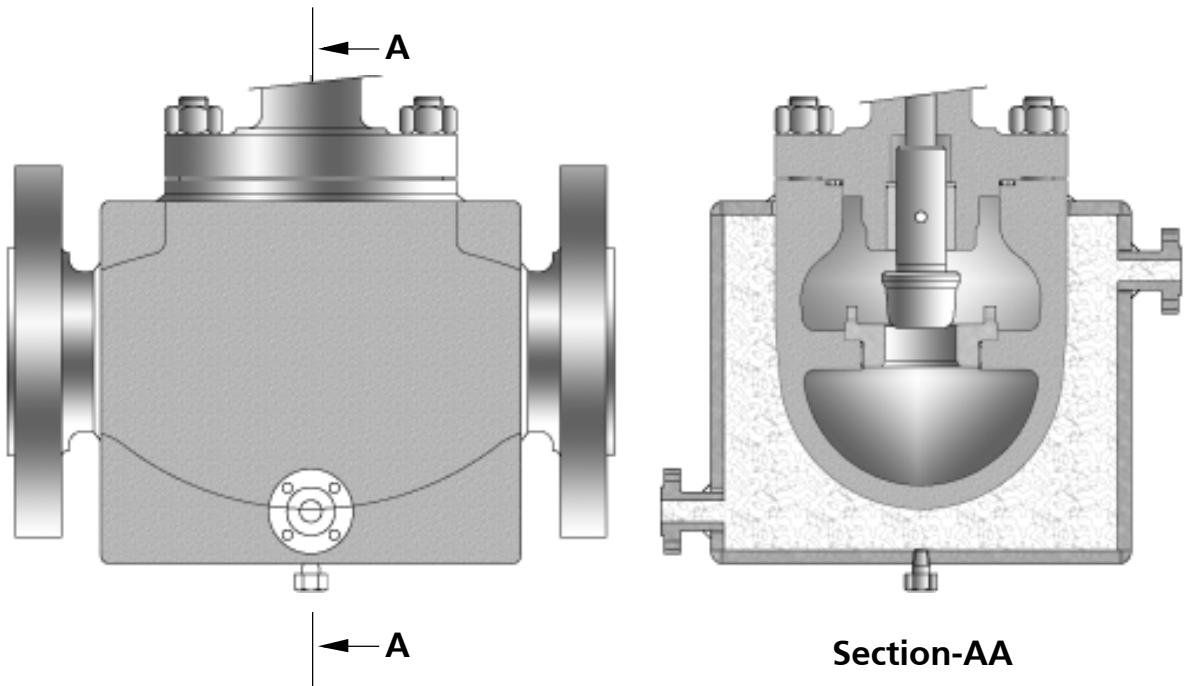
Actuator Size	37 (Air to Close)			38 (Air to Open)		
	C	D	W ₂	C	D	W ₂
11	417	331	21	613	331	25
13	511	381	32	752	381	40
15	646	445	55	897	445	64
18	681	527	82	935	527	114
18(SPL.)	844	527	90	1070	527	168
24	881	699	109	1156	699	109



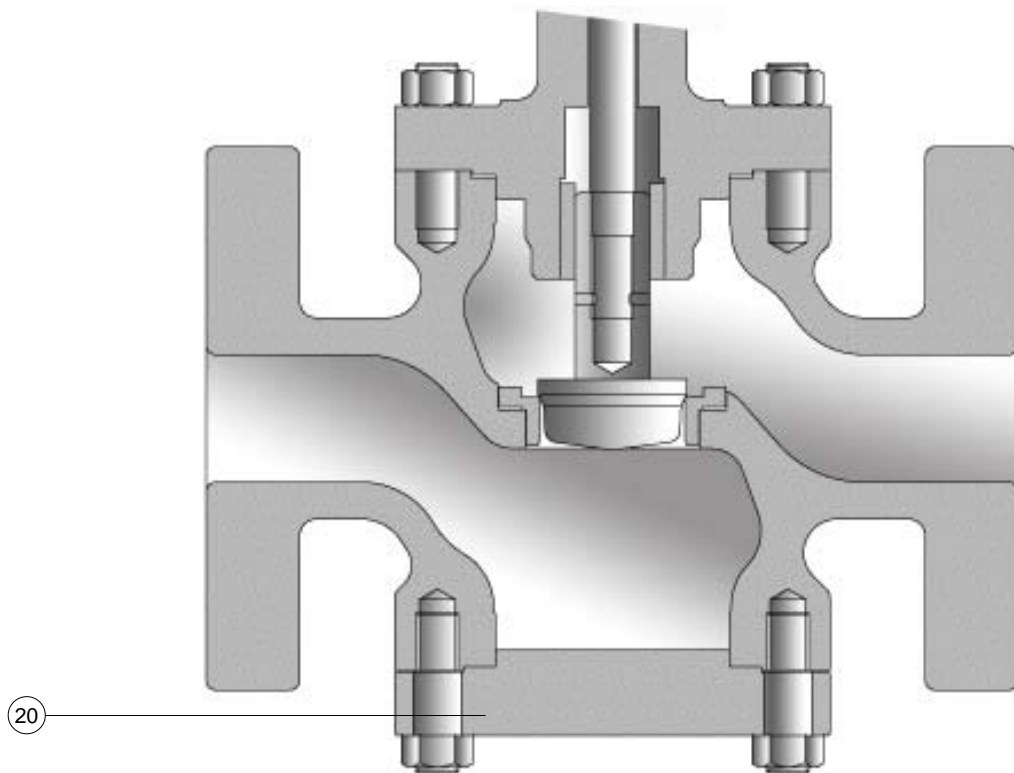
DIMENSIONAL REFERENCE



MIL 70000
HIGH PRESSURE ANGLE BODY
CONSTRUCTION



MIL 21000
STEAM JACKETED CONSTRUCTION



MIL 21000
CONSTRUCTION WITH BOTTOM FLANGE

SPECIFICATION DATA:-

Checklist below contains the necessary data to specify the basic 21000 series control valve. The page reference will guide you to the appropriate sections when a selection is to be made. For accessories a& special options, consult your MIL representative.

BODY	Type	Globe <input type="checkbox"/> Angle <input type="checkbox"/> Globe with steam jacketing <input type="checkbox"/> Globe with bottom flange <input type="checkbox"/> Globe with purge connection <input type="checkbox"/>	
	Size	Refer Page 6 to 9	
	Rating	Refer Page 6 to 9	
	Connection	Refer Page 2	
	Material	Refer Page 5	
BONNET	Type	Standard <input type="checkbox"/> With double packing <input type="checkbox"/> With Bellows seal <input type="checkbox"/> With plain extension <input type="checkbox"/> With finned extension <input type="checkbox"/>	
	Packing	Refer Page 5	
TRIM	Capacity		Full <input type="checkbox"/> Reduced <input type="checkbox"/>
	Cv		Refer Page 6 to 9
	PLUG	Type	Contoured <input type="checkbox"/> Disc <input type="checkbox"/> Lo-dB or Anti-cavitation <input type="checkbox"/> Double Stage Lo-dB <input type="checkbox"/> Double Stage Anti-cavitation <input type="checkbox"/>
		Characteristic	Linear <input type="checkbox"/> Equal % <input type="checkbox"/> On-Off <input type="checkbox"/> Customised <input type="checkbox"/>
		Material	Refer Page 5
	SEAT	Type	Threaded <input type="checkbox"/> Clamped <input type="checkbox"/>
		Material	Refer Page 5
	GUIDE	Type	Top Guided
Material		Refer Page 5	
FLOW DIRECTION		Refer Page 3	
LEAKAGE CLASS (ANSI/FCI 70.2)		Class IV <input type="checkbox"/> Class V <input type="checkbox"/> Class VI <input type="checkbox"/>	
ACTUATOR	Type	Pneumatic Spring Diaphragm <input type="checkbox"/> Electrical <input type="checkbox"/> Pneumatic Piston Cylinder <input type="checkbox"/> Manual <input type="checkbox"/>	
	Action	Air to open <input type="checkbox"/> Air to close <input type="checkbox"/>	
	Air failure	Close <input type="checkbox"/> Open <input type="checkbox"/> Stayput <input type="checkbox"/>	
	Act. Size	Refer Page 11 to 25	
	Act. Spring	Refer Page 11 to 25	
	Hand Wheel	Yes <input type="checkbox"/> No <input type="checkbox"/>	
MODEL NUMBER		Refer Page 2	
ACCESSORIES & SPECIAL REQUIREMENTS			

APPLICATION DATA:-

Checklist below provides a convenient means for listing all the process data required to properly size your 21000 series control valve.

FLUID PHASE	Liquid <input type="checkbox"/>	Gas <input type="checkbox"/>	Two-Phase <input type="checkbox"/>
	Steam <input type="checkbox"/>		
Required Parameters	Liquid	Gas	Steam
Flow Rate (Start-up/Min/Nor/Max)	✓	✓	✓
Inlet Press. (Start-up/Min/Nor/Max)	✓	✓	✓
Outlet Press. (Start-up/Min/Nor/Max)	✓	✓	✓
Shut-off Pressure	✓	✓	✓
Temperature	✓	✓	✓
*Specific Gravity or Density or Mol. Wt.	✓	✓	
*Vapour Pressure	✓		
*Critical Pressure	✓		
*Viscosity	✓		
*Compressibility Factor		✓	
*Specific Heat Ratio		✓	
Inlet & Outlet Pipe Size / Schedule	✓	✓	✓

**Our sizing software has a databank for standard fluids.*



MIL Controls Limited
A KSB Company



REGD. OFFICE & WORKS

Meladoor, Mala
PIN 680 741, Thrissur Dist., Kerala, India
T: 91 (0)480 2890272, 2890772, 2891773
F: 91 (0)480 2890952
E: milf@vsnl.com, W: www.milcontrols.com

MARKETING HEAD OFFICE

N.H. 47, Thaikattukara P.O., Aluva
PIN 683 106, Ernakulam Dist., Kerala, India
T: 91 (0)484-2624955, 2624876, 2628041
F: 91 (0)484-2623331
E: ksbmil@sancharnet.in, mail@milcontrols.com

BRANCH OFFICES

NEW DELHI

MIL Controls Limited
KSB House, A-96, Sector 04,
Gautam Budh Nagar,
Noida 201 301, India
Tel: 91 (0)120 2541091 to 93, 2541501 to 03
Fax: 91 (0)120 2550567, 2525626
Email: milnoida@ksb.co.in

MUMBAI

MIL Controls Limited
126, Maker Chamber III, Nariman Point,
Mumbai - 400 021, India.
Tel: 91 (0)22 56588787,
56588757 to 59, 56588761
Fax: 91 (0)22 56588788
Email: milmumbai@vsnl.com,
mum-mil@ksb.co.in

KOLKATA

MIL Controls Limited
2nd Floor, 30 Circus Avenue,
Kolkata 700 017, India
Tel: 91 (0)33 22470473, 22400117, 22400418
Fax: 91 (0) 33 22470588
Email: milcal@vsnl.net, cal-mil@ksb.co.in

CHENNAI

MIL Controls Limited
Guindy House, 2nd Floor,
95, Annal Salai,
Chennai 600 032, India
Tel: 91 (0)44 22352571 to 72, 22300629
Fax: 91 (0)44 22352749
Email: che-mil@ksb.co.in

VADODARA

MIL Controls Limited
4-B, Ramakrishna Chambers,
Productivity Road,
Vadodara 390 005, India
Tel: 91 (0)265 2330532, 2333226
Fax: 91 (0)265 2314693
Email: ksbad1@sancharnet.in

PUNE

MIL Controls Limited
KSB Pumps Limited
D-II Block, MIDC
Chinchwad
Pune - 411 019
Tel: 91 (0)20 2740 9100
Fax: 91 (0)20 2747 0890

OVERSEAS SALES OFFICES

CHINA

KSB-AMRI BEIJING
Unit 1102, The Gateway,
No. 10 Yabao Road, Chao yang District,
Beijing 100020, China
Tel: (86-10) 6591 5768
Fax: (86-10) 6591 5769
Email: amribj@public.fhnet.cn.net

FINLAND

KSB Finland Oy
Savirunninkatu 4, FI-04260
Kerava, Finland
Tel: 358 10 288 5427
Fax: 358 10 288 5655
Email: reima.kairento@ksb.com

HONG KONG

KSB Limited
17/F, Chuang's City Tower,
39 Morrison Hill Road,
Causeway Bay, Hong Kong
Tel: 852 2147 1220
Fax: 852 2147 1230
Email: ksb_hk@pacific.net.hk

MALAYSIA

KSB AMRI Sdn Bhd
65-2 Jalan 51/205, Highway Centre,
4605 Petaling Jaya,
Selangor Darul Ehsan, Malaysia
Tel: 60-03 7781 3026
Fax: 60-03 7781 3020
Email: ksbamri@go.jaring.my

MIDDLE EAST

KSB Middle East FZE,
PO Box 18315
Jebel Ali, Dubai, UAE,
Tel: 9714-8830455
Fax: 9714-8830456
email: varghese.ionappan@ksbme.ae

SINGAPORE

KSB Singapore (Asia Pacific) Pte Ltd
4 Woodlands Walk,
Singapore 738248
Tel: 65 6757 7200
Fax: 65 6482 3005
Email: sales@ksb.com.sg

TAIWAN

KSB Taiwan Co Ltd
Virtuoso Enterprise Building, 12F-1, No.380,
Fushing South Road, Sec. 1, Taipei 106,
Taiwan, ROC
Tel: 886-2 2755 5858
Fax: 886-2 2703 3366
Email: ksbtw@gmail.com, gcn.net.tw

