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# CLA-VAL

**AUTOMATIC CONTROL VALVES**

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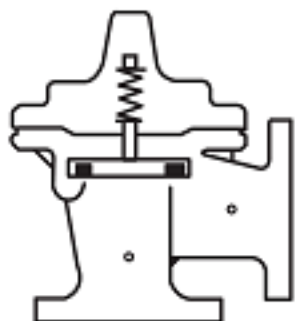
**100-20**

Place this manual with personnel responsible  
for maintenance of this valve

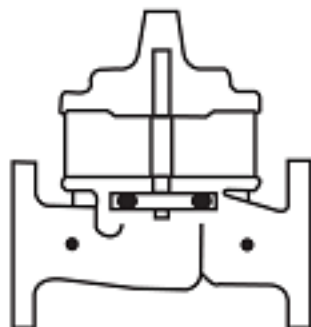
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## *Installation*



## *Operation*



## *Maintenance*





— MODEL — **100-20**  
(Reduced Internal Port)

# 600 Series Hytrol Valve

## SERVICE AND MAINTENANCE OF 600 SERIES VALVES

The 600 series main valves have only one part -the body- that is different from standard 100 Series Cla-Val main valve parts. The remaining parts of the 600 series main valve are standard Cla-Val main valve parts. All service and maintenance information for the standard 100 Series main valves in this manual also apply to the 600 series main valves.

The most important thing to remember when ordering main valve repair kits and replacement parts, except for the body, all other parts are going to be for a smaller size main valve. Cla-Val identifies main valve parts with the flange size of the standard 100 Series main valve. Refer to the "Main Valve Sizes Comparison" chart. For example, if you are servicing a 6" 100-20 Hytrol and needed a repair kit, you would order a repair kit for a 4" 100-01 Hytrol. This kit is also suitable for a 6" 100-20 Hytrol. Complete Technical Manuals include a repair kit data sheet N-RK that shows this relationship.

When you order repair parts, it is a good idea to include valve nameplate data (size, catalog number, and part number) and description of the parts desired. Do this to be sure parts will fit the valve you are working on and not be too big for it. Pilot controls and repair kits maintenance information remain the same for 100 or 600 Series valves.

## UNDERSTANDING THE 600 SERIES VALVES

In 1987, Cla-Val introduced the Model 100-20 Hytrol as the basic main valve for the 600 Series of automatic control valves. To identify all new valves using the 100-20 Hytrol, an existing catalog number is modified. Making a 600 Series catalog number is simply done by using a "6" in front of the two digit catalog numbers or replacing the "2" with a "6" in three digit catalog numbers. Current schematics reflect both catalog numbers together separated by a slash ( i.e. - 90-01/690-01, 58-02/658-02, 210-01/610-01, etc). Since these two valves 'share' the same catalog number and schematic, they provide the same function in a system. The only difference between the two valves is the relative capacity of the two main valve series.

The 100-01 Hytrol is the basic main valve for Cla-Val automatic control valves. This valve is the current version of the Clayton Hytrol valve design originated in 1936. The 100-01 Hytrol is designed as a full flow area valve. This means that the inlet, seat and outlet openings are the same size. Thus, the pressure drop is kept to a minimum for this globe style design.

The 100-20 Hytrol valve has all of the basic features and advantages of the original 100-01 Hytrol. Only one part has been changed - the body. It is designed with different size inlet, seat and outlet openings. The 100-20 Hytrol has inlet and outlet flanges one valve size larger than the seat opening size. This results in what is sometimes called a 'reduced port' main valve. For example, a 4" 100-20 valve has a 3" seat. Note: valve size is always determined by the flange size. The following chart compares the 100-01 and the 100-20 main valves.

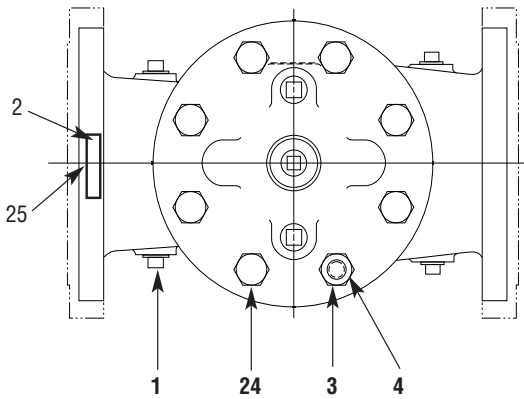
Basic Main Valve Size Comparison		
Globe Pattern Valves		
Flange Size (inch)	Seat Size	
	100-01 (100 Series)	100-20 (600 Series)
3	3	2
4	4	3
6	6	4
8	8	6
10	10	8
12	12	10
14	14	----
16	16	12
18	----	16
20	20	16
24	24	16
30	30	24
36	36	30
42	----	36
48	----	36
Angle Pattern Valves		
Flange Size (inch)	Seat Size	
	100-01 (100 Series)	100-20 (600 Series)
4	4	3
6	6	4
8	8	6

The 100-20 Hytrol is available only in ductile iron, 150 and 300 pressure class, and Bronze trim standard. Available extra cost main valve options include stainless steel trim, epoxy coating, Dura-Kleen stem, Delrin sleeved stem, and high temperature rubber parts. All four basic main valves have a 600 Series version available with all of the same benefits and size relationships. The following chart shows the relationship of Cla-Val main valve catalog numbers.

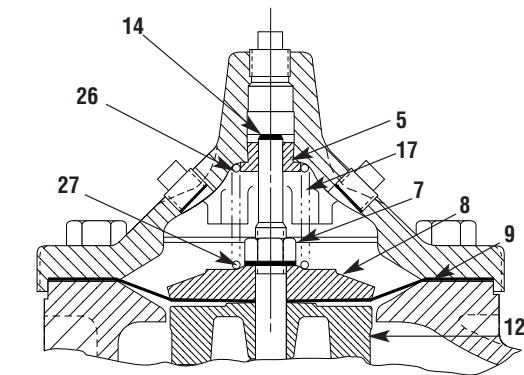
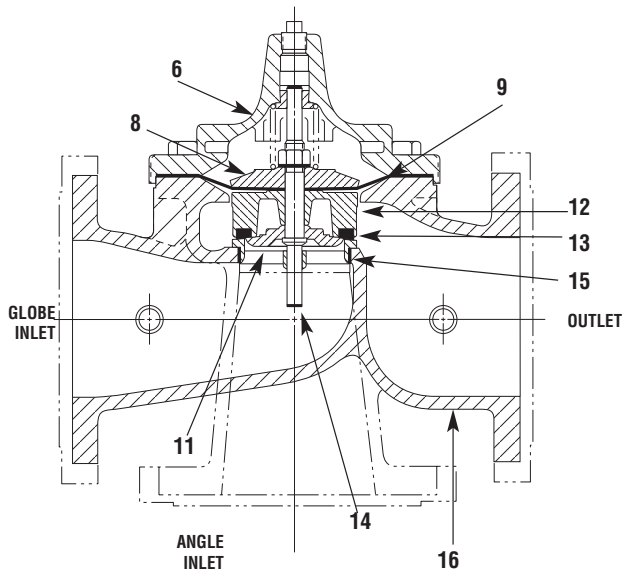
### Cla-Val Main Valves

Catalog Name	Catalog Number		
	Circa 1936	100-Series	600 Series
Hytrol	100 (Angle =2100)	100-01	100-20
Powertrol	100P & 100PA	100-02	100-21
Powercheck	100PC & 100PCA	100-03	100-22
Hycheck	181	100-04	100-23

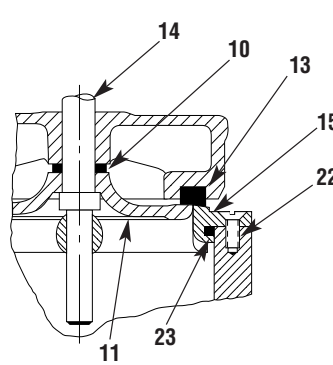
100-20



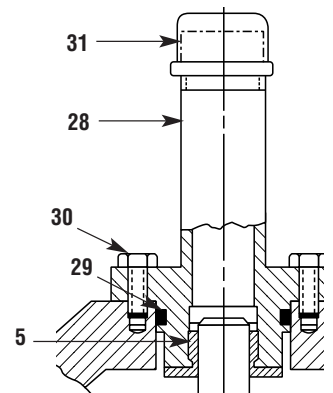
TOP VIEW



3" - 6" COVER DETAIL



10" - 24" SEAT DETAIL



20" - 24" COVER DETAIL

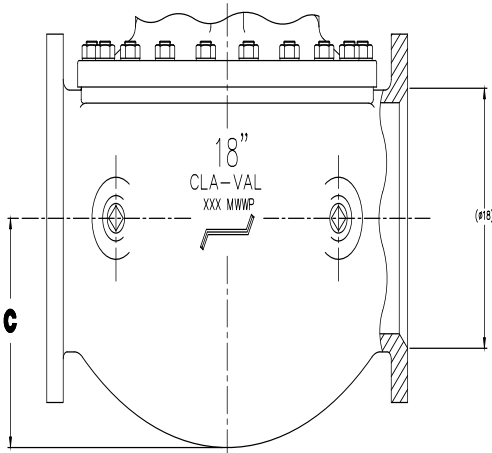
PARTS LIST

NO. DESCRIPTION

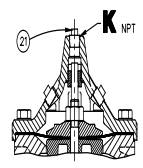
- 1 Pipe Plug
- 2 Drive Screws (for nameplate)
- 3 Hex Nut (8" and larger)
- 4 Stud (8" and larger)
- 5 Cover Bearing
- 6 Cover
- 7 Stem Nut
- 8 Diaphragm Washer
- 9 Diaphragm
- 10 Spacer Washers
- 11 Disc Guide
- 12 Disc Retainer
- 13 Disc
- 14 Stem
- 15 Seat
- 16 Body
- 17 Spring
- 22 Flat Head Screws (10" and larger)
- 23 Seat O-Ring
- 24 Hex Bolt (3" Thru 6")
- 25 Nameplate (Mounted on inlet flange)
- 26 Upper Spring Washer (Epoxy coated valves only)
- 27 Lower Spring Washer (Epoxy coated valves only)
- 28 Cover Bearing Housing (20" & 24" & 30")
- 29 Cover Bearing Housing O-Ring (20" & 24" & 30")
- 30 Hex Bolt (20" & 24")
- 31 Pipe Cap (20" & 24" & 30")

WHEN ORDERING PARTS, BE SURE TO GIVE COMPLETE NAMEPLATE DATA, ITEM NUMBER AND DESCRIPTION.

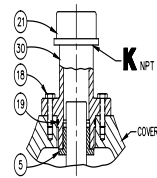
This drawing is the property of CLA-VAL, CO. and shall not be loaned, copied, or reproduced in any manner without the written consent of CLA-VAL, CO. This drawing is intended for use only for the design of parts and shall not be used for the design of any other parts. The user shall be responsible for the design of any parts and shall be responsible for the design of any parts. The user shall be responsible for the design of any parts. The user shall be responsible for the design of any parts.



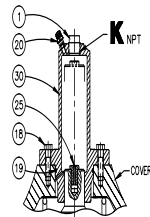
18" SIZE GLOBE BODY CONFIGURATION



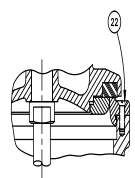
OPTIONAL NO COVER CONFIGURATION  
3", 4", & 6" SIZES ONLY



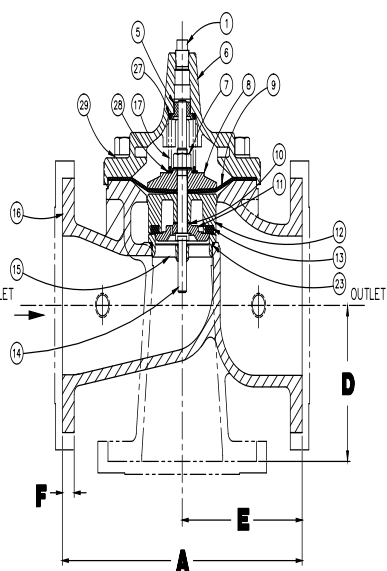
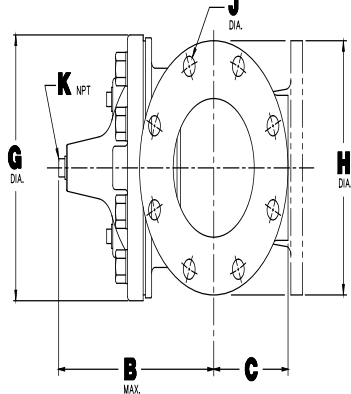
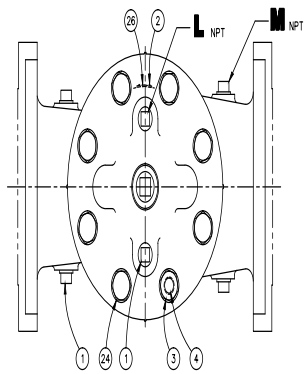
COVER BEARING/HOUSING DETAIL  
18", 20" & 24" SIZES ONLY



HOUSING DETAIL  
30" SIZE ONLY



SEAT CONFIGURATION  
8", 10", 12", 16", 18", 20", 24" & 30" SIZES ONLY



6" SIZE SHOWN

VALVE SIZE*	PRESSURE CLASS	DIMENSION TABLE											BOLT DIA.	NO. OF BOLT HOLES	K	L	M			
		A	B	C	D	E	F	G	H	J	J	J								
3"	150 LB.	10.25		3.75				7.5/8"					6.62	7.50	7.50	6.000	4			
	300 LB.	11.00	7.00	4.12			1.12/1.19						6.62	8.25	8.25	6.625	4	1/2"	3/8"	3/8"
4"	150 LB.	13.88		4.50	5.50	6.94	94/100					8.12	10.00	10.00	7.500	8				
	300 LB.	14.50	8.62	5.00	5.81	7.25	1.25/1.31						8.12	10.00	10.00	7.875	8	1/2"	1/2"	1/2"
6"	150 LB.	17.75		6.50	6.75	8.88	1.00/1.06					11.50	12.50	12.50	10.625	12				
	300 LB.	18.62	11.62	6.25	7.25	9.38	1.44/1.50					11.50	12.50	12.50	10.625	12	3/4"	3/4"	3/4"	
8"	150 LB.	21.38		7.50	7.75	11.19	1.62/1.69					15.75	15.00	15.00	13.000	12				
	300 LB.	22.38	15.00	7.50	7.75	11.19	1.62/1.69					15.75	15.00	15.00	13.000	12				
10"	150 LB.	26.00		8.00	8.06	12.75	1.75/1.75					20.00	17.50	17.50	15.250	16				
	300 LB.	27.38	17.88	8.75			1.89/1.94					20.00	17.50	17.50	15.250	16				
12"	150 LB.	30.00		9.50	8.68	14.94	1.25/1.31					23.62	19.00	19.00	17.000	12				
	300 LB.	31.50	21.00	10.25			2.00/2.06					23.62	20.50	20.50	17.750	16	1"			
16"	150 LB.	35.00		11.75			1.44/1.50					28.00	23.50	23.50	21.250	24				
	300 LB.	36.62	25.75	12.75			2.25/2.31					28.00	25.00	25.00	22.000	24	1 1/4"			
18"	150 LB.	42.12	25.00	15.87	15.81	20.83	1.56/1.62					33.16	28.00	28.00	22.750	16				
	300 LB.	43.64		15.87			2.38/2.44					33.16	28.00	28.00	22.750	16	1"	1"		
20"	150 LB.	48.00		14.56	15.94	21.06	1.69/1.75					35.44	27.50	27.50	25.000	20				
	300 LB.	49.62	31.50	16.08			2.50/2.56					35.44	30.50	30.50	27.000	24	2"			
24"	150 LB.	48.00		17.00			1.69/1.74					38.00	33.00	33.00	29.500	20				
	300 LB.	49.75		19.00			2.75/2.81					38.00	36.00	36.00	32.000	24				
30"	150 LB.	63.25		19.88			2.75/2.81					43.00	38.75	38.75	36.000	28				
	300 LB.	63.75	43.90	22.00			3.00/3.06					43.00	43.00	43.00	39.250	28	1"			

ANGLE BODY CONFIGURATION AVAILABLE IN 4", 6", 8", 10", 12", 16" AND 20" SIZES (10", 12", 16" & 20" 150 LB CLASS ONLY).  
\*\* 20" ANGLE BODY CONFIGURATION "B" MAX = 25.00

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
-	RELEASED FOR PRODUCTION (NED 13607/13688)	4-16-87	MGR
A	ADDED ANGLE BODY STYLE CONFIGURATION (NED 34138)	12-14-87	MGR
B	ADDED 20" & 24" VALVE COVER BEARING DETAIL & ITEMS 29-32 TO PARTS LIST (ECO 10227)	3-9-89	NAL
C	TAPPING DIM'S WHERE IN ERROR (ECO 10848)	1-8-90	NAL
D	REVISED AND REBRAIN ON CAD; ADDED 16" & 30" VALVES (ECO 20710)	12-15-90	PC
E	ADDED 12" ANGLE 150 SIZE VALVE (NED 63757)	10-09-09	EX
F	ADDED WASHERS & REVISED STUD LENGTH (ECO 23155)	7-19-12	MS
G	ADDED 10" ANGLE 150 SIZE VALVE (ECO 23688)	10-10-13	MS
H	SIZES FOR ITEM NO.'S 3 & 4 (SOLD & NUT) WAS 8" THRU 30" ONLY; SIZES FOR ITEM NO. 24 (BOLT) WAS 3" THRU 6" ONLY; WAS ON 10" SIZE (ECO 28536)	11-12-18	VL

\* RECOMMENDED SPARE PARTS

ITEM NO.	DESCRIPTION	QUANTITY
30	HOUSING COVER BEARING (20", 24" AND 30" ONLY)	1
29	WASHER, FLAT	A/R
28	WASHER, SPRING, LOWER (100-200C)	1
27	WASHER, SPRING, UPPER (100-200C)	1
26	NAMEPLATE	1
25	BUSHING, ADAPTER (30" ONLY)	1
24	BOLT, HEX HD. (3" THRU 8" ONLY)	A/R
23*	O-RING, SEAT	1
22	SCREW, FLAT HD. (10" THRU 24" ONLY)	A/R
21	CAP. PIPE (18", 20" AND 24" ONLY)	1
20	PURGE VALVE (30" ONLY)	1
19*	O-RING, (20", 24" AND 30" ONLY)	1
18	BOLT, HEX HD. (20", 24" AND 30" ONLY)	8
17	SPRING	1
16	BOOT	1
15	SEAT	1
14	STEM	1
13*	DISC	1
12	RETAINER, DISC	1
11	GUIDE, DISC	1
10	WASHER, SPACER	A/R
9*	DIAPHRAGM	1
8	WASHER, DIAPHRAGM	1
7	NUD, STEM	1
6	COVER	1
5	BEARING, COVER	1
4	STUD (10" THRU 30" ONLY)	A/R
3	NUT, HEX (10" THRU 30" ONLY)	A/R
2	DRIVE, SCREW	2
1	PLUG, PIPE (EXCEPT 18", 20" AND 24")	A/R

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES  
TOLERANCES ARE:  
FRACTIONAL DECIMAL ANGULAR  
± 1/32 ±.005 ±.5°  
±.010 ±.015 ±.5°

APPROVALS: DATE: 3" THRU 30"  
DRAWN: MGR 3-26-87  
CHECKED: BF 4-22-87  
APPROVED: CH 5-27-87

CONTRACT NO. 100-20 HYTROL (GLOBE & ANGLE)  
PARTS LIST  
150/300 LB. ANSI FLANGES

DATE: 8/6/84  
BY: 16949  
SHEET 1 OF 1