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## **4-Way Diverter Plug Valves**



**Plug Valve Specialists**  
Strong Company! Good Company!

[WWW.3ZVALVE.COM](http://WWW.3ZVALVE.COM)

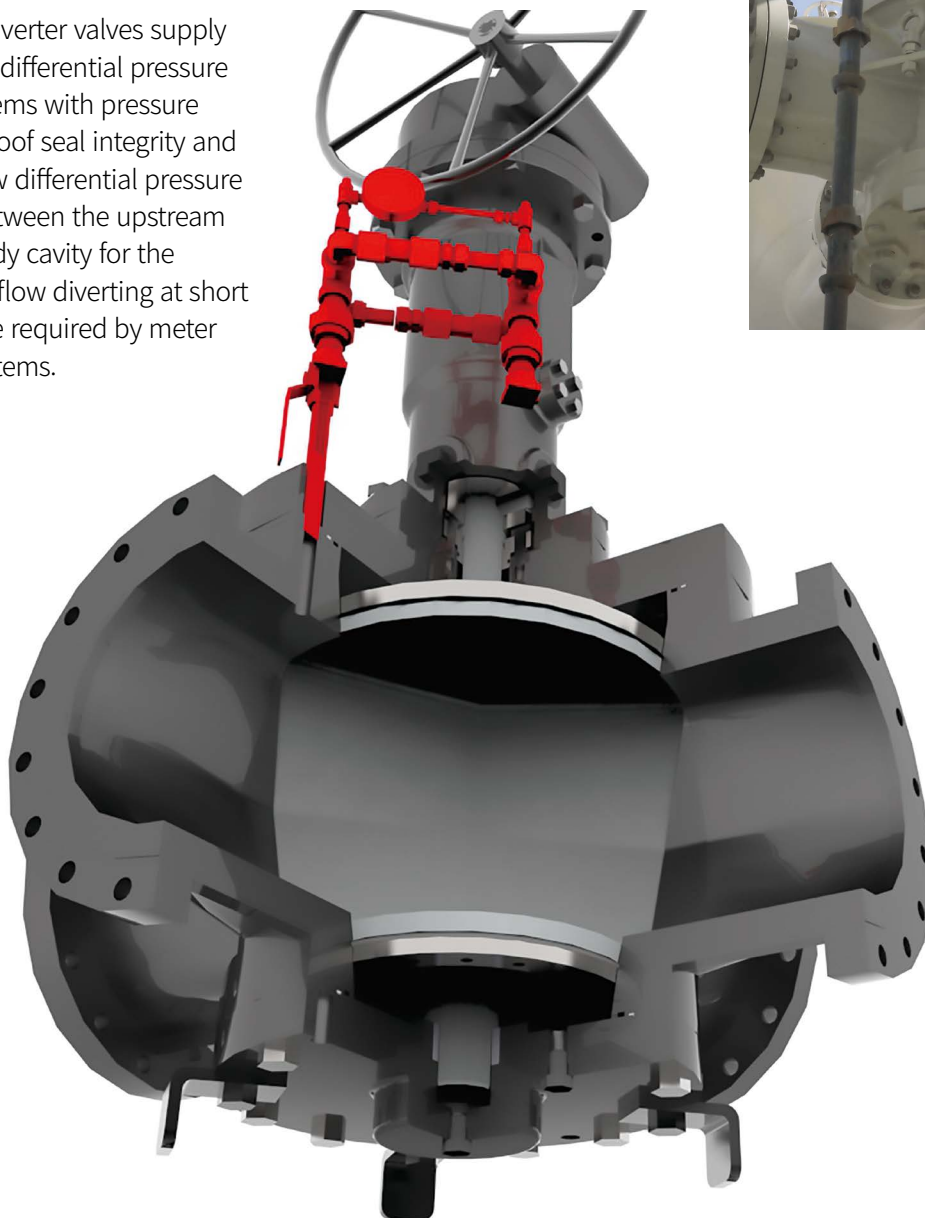
三千控制阀网  
[www.cv3000.com](http://www.cv3000.com)

# 4-Way Diverter Plug Valve

**3Z 4-way diverter plug valves** are designed for the rigid requirements of bi-directional meter proving which especially requires the valve to be cycled hundreds of times per day and has a short cycling time around 10 seconds during valve operation.

## Proof of Seal Integrity

3Z 4-way diverter valves supply special low differential pressure device systems with pressure gauge to proof seal integrity and to make low differential pressure (2~5psi) between the upstream and the body cavity for the purpose of flow diverting at short cycling time required by meter proving systems.



# How the 3Z 4-way Diverter Plug Valve Works

## STEP 1

Lowered and seated position : The plug and slip seal are lowered and seated at fully open or closed position.

## STEP 2

Lifted position : The plug and slip seal are lifted slightly to avoid galling or abrasion during this step.

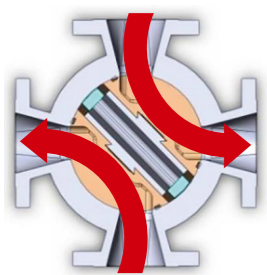
## STEP 3

90° Rotated position : The plug and slip seal are rotated 90° for the purpose of flow diverting with short cycling time, required in meter proving system. No rubbing. No friction.

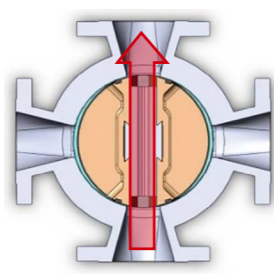
## STEP 4

Lowered & reseated position : The plug is lowered and reseated at fully open or closed position.

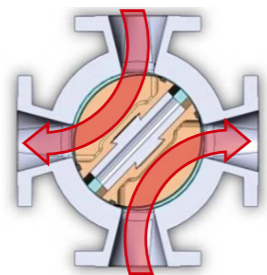
3Z developed a unique patented ball-locking mechanism. The 3Z mechanism provides low torque and smooth, frictionless operation. This mechanism is provided as a standard in 3Z 4-way Diverter Plug Valves.



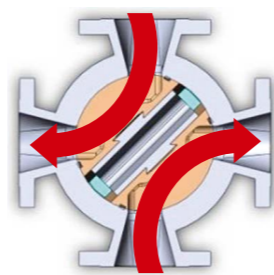
STEP 1



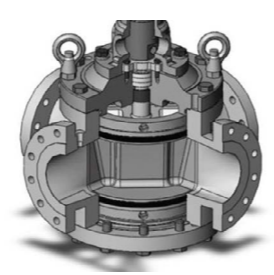
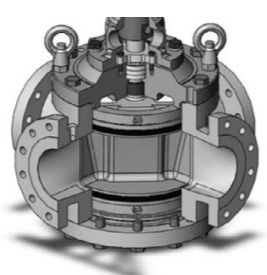
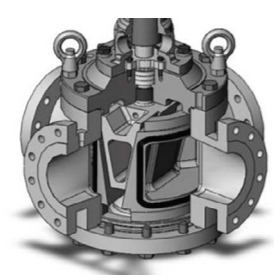
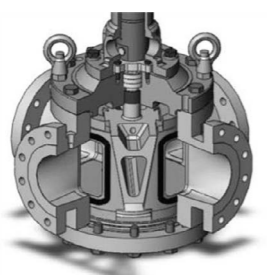
STEP 2 & 3



STEP 3



STEP 4



# Parts and Material

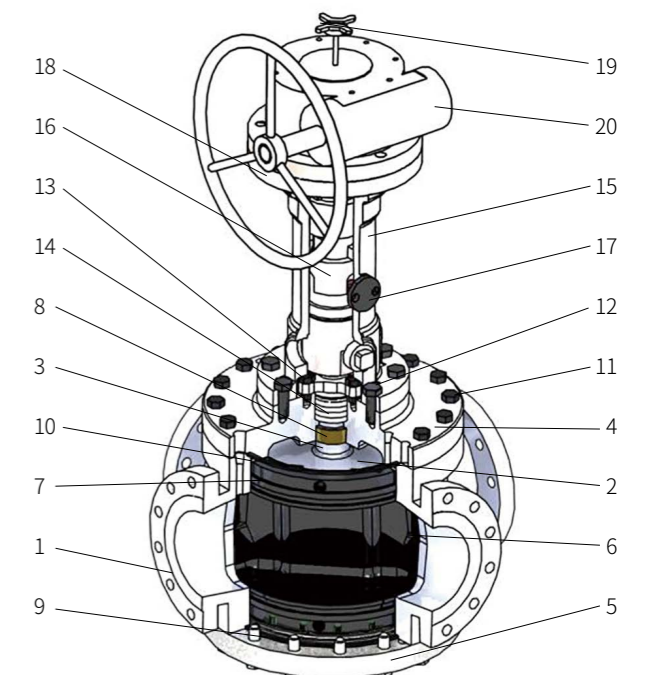


Size: 3" - 8"

No	Parts	Specification
1	Body	A216 WCB + Cr plated
2	Plug	A216 WCB + ENP
3	Stem	17-4PH
4	Top cover	A216 WCB
5	Bottom cover	A216 WCB
6	Slip	A536 80-55-06 + MPC
7	Slip Seal	Viton
8	Bushing	A436 Type 2
9	Gasket	(Graphite + 316) SWG
10	O-ring	Viton
11	Cover bolt	A193 B7
12	Housing bolt	STEEL
13	Gland	A216 WCB + Zn plated
14	Gland packing	Graphite
15	Housing	A216 WCB
16	Operator	A322 4140
17	Guide	A322 4140
18	Housing cover	AISI 1045
19	Indicator	AISI 1020
20	Gear operator	Ductile iron

## 4-way Diverter Plug Valve with Slip Seal

Sizes 3" - 8" 3Z 4-way diverter plug valves are designed with slip seals. It is possible to inspect and replace the sealing slips simply. The valve has top and bottom bolted cover that is disassembled to replace the sealing slips on the pipe line.



# Parts and Material

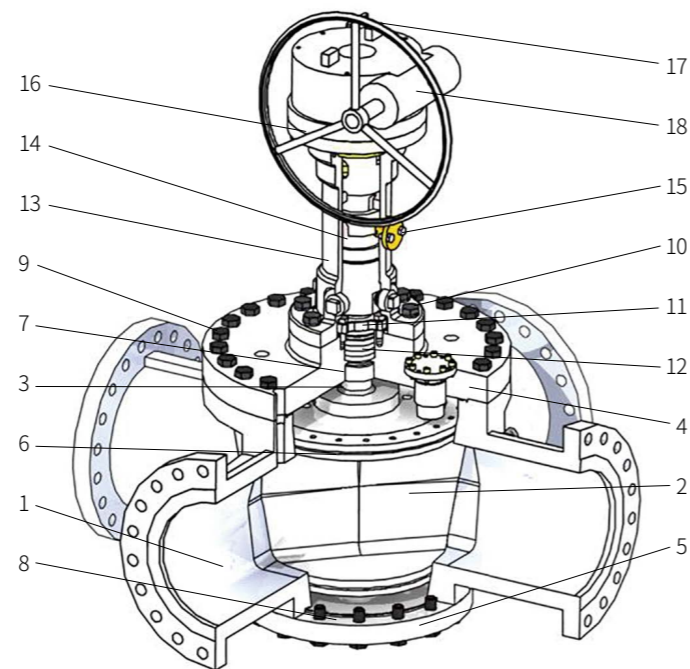


Size: 10" - 20"

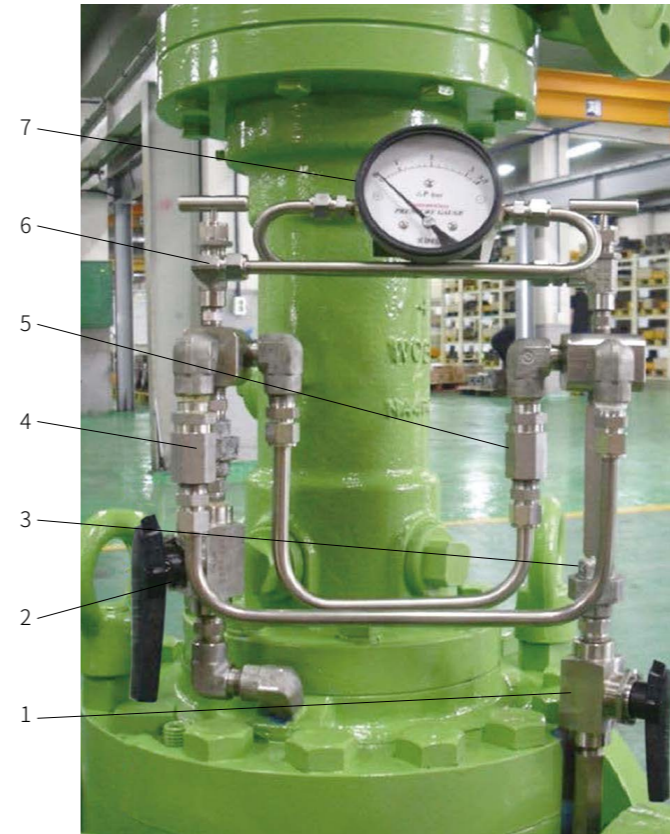
No	Parts	Specification
1	Body	A216 WCB + Cr plated
2	Plug	A216 WCB + ENP
3	Stem	17-4PH
4	Top cover	A216 WCB
5	Bottom cover	A216 WCB
6	Plug Seal	Viton
7	Bushing	A436 Type 2
8	Gasket	(Graphite + 316) SWG
9	Cover bolt	A193 B7
10	Housing bolt	STEEL
11	Gland	A216 WCB + Zn plated
12	Gland packing	Graphite
13	Housing	A216 WCB
14	Operator	A322 4140
15	Guide	A322 4140
16	Housing cover	AISI 1045
17	Indicator	AISI 1020
18	Gear operator	Ductile iron

## 4-way Diverter Plug Valve

Sizes 10" – 20" 3Z 4-way diverter plug valves are designed with plug seals. The plug seal has an especially simple design to replace simply. The valve has top and bottom bolted cover that is disassembled to replace the plug seal on the pipe line.



# Proof of Seal Integrity

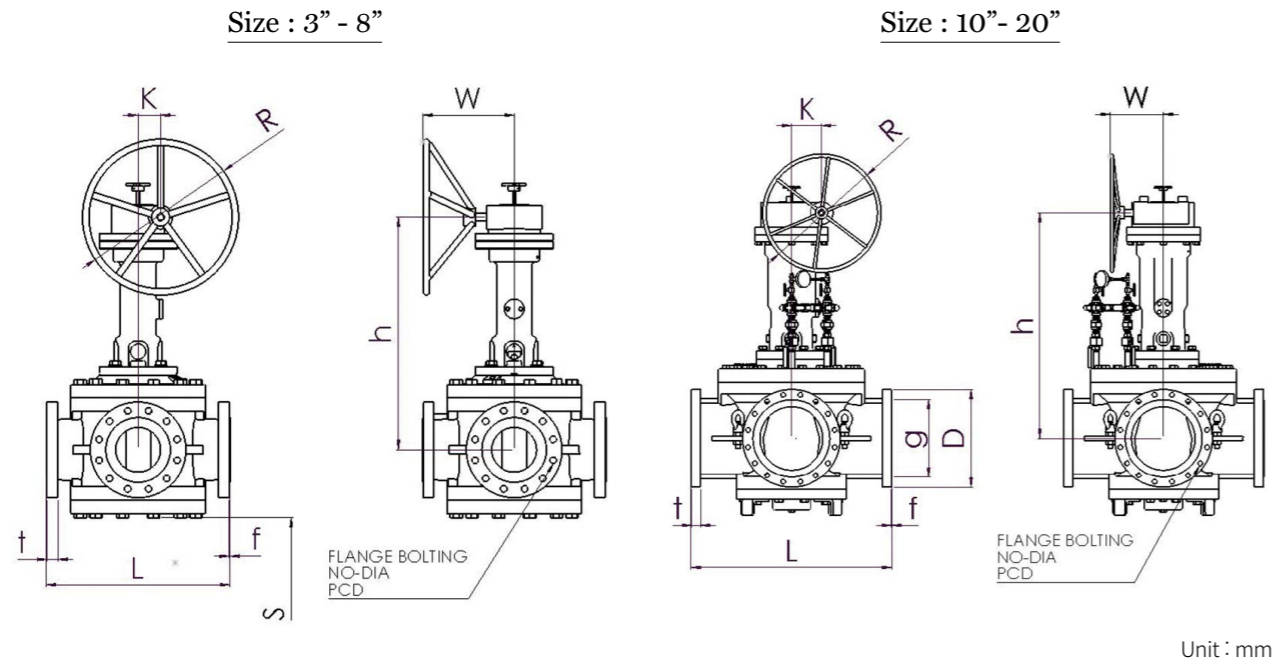


No	Parts
1	Inlet Ball Valve
2	Outlet Ball Valve
3	Pipe Union
4	Outlet Relief Valve
5	Inlet Relief Valve
6	Needle Valve
7	Differential Pressure Gauge

1. Inlet ball valve, installed through flow path of 4way diverter valve shall be opened.
2. Outlet ball valve, installed through body cavity of 4way diverter valve shall be opened.
3. Inlet and Outlet relief valve shall be installed in opposite position.
4. Needle valve shall be closed usually.
5. Differential Pressure Gauge shall be checked after valve operation.
6. Leakage acceptance criteria : The indicator of differential pressure gauge shall be held on for 30 second within in limits from 0.5 bar to 2 bar.
7. The following point shall be checked if the indicator of differential pressure gauge is dropped or does not be held for test duration.
  - A. Check full open & close limit setting of valve.
  - B. Check leakage at isolation valve or differential check valve
  - C. Check external leakage from the body cavity.
  - D. Finally check the damage on Plug Seal or Slip Seal.

# 4-way Diverter Plug Valve - Dimensions

# Technical Data



Unit : mm

Class	Size	* L	D	PCD	NO	DIA	g	t	f	h	R	K	W	+ S
150	12	930	485	431.8	12	25	381	*49.3	2	1,200	710	180	400	-
	16	1,219	595	539.8	16	29	469.9	*55.6	2	1,370	710	180	400	-
	20	1,473	700	635.0	20	32	584.2	*62.0	2	1,470	800	230	488	-
300	3	432	210	168.3	8	22	127	27.0	2	720	400	83	260	220
	4	508	255	200.0	8	22	157.2	30.2	2	750	400	83	260	250
	6	614	320	269.9	12	22	215.9	35.0	2	800	500	97	294	305
	8	711	380	330.2	12	25	269.9	39.7	2	1,020	630	153	370	355
	10	930	445	387.4	16	29	323.8	46.1	2	1,200	710	180	400	-
	12	930	520	450.8	16	32	381.0	49.3	2	1,200	710	180	400	-
600	16	1,219	650	571.5	20	35	469.9	55.6	2	1,370	710	180	400	-
	20	1,473	775	685.8	24	35	584.2	62.0	2	1,470	800	230	488	-
	4	530	275	215.9	8	25	157.2	38.1	7	800	500	97	294	260
	6	645	355	292.1	12	29	215.9	47.7	7	870	560	112	324	330
	8	820	420	349.2	12	32	269.9	55.6	7	1,020	630	153	370	400
900	10	1,020	510	431.8	16	35	323.8	63.5	7	1,200	710	180	400	-
	12	1,020	560	489.0	20	35	381.0	66.7	7	1,250	710	180	400	-
	16	1,319	685	603.2	20	41	469.9	76.2	7	1,370	710	180	400	-
	4	546	290	235.0	8	32	157.2	44.5	7	840	500	97	294	260
900	6	711	380	317.5	12	32	215.9	55.6	7	870	560	112	324	420
	8	813	470	393.7	12	38	269.9	63.5	7	1,150	630	153	370	530
	10	1,020	545	469.9	16	38	323.8	69.9	7	1,260	710	180	400	-

+ Minimum Clearance for installation, repair and replacement

\* Manufacturing Standard

- If additional classes and sizes are required, please consult the factory when ordering.

## Approx. CV Factor (GPM)

Class 150 - 900

2-way Standard Type, Full Bore Type, 4-way - Diverter Type

Class	150	300	600	900	150	300	600	150	300	600	900
Size / Fig	124	324	624	924	124 FB	324 FB	624 FB	144	344	644	944
2	200	200	280	-	525	525	-	-	-	-	-
3	260	220	300	-	1,100	1,100	-	-	300	-	-
4	620	600	500	500	2,100	2,100	2,000	-	600	600	600
6	1,400	1,200	1,300	1,300	5,000	5,000	4,900	-	1,200	1,200	1,200
8	2,500	2,000	2,100	2,500	9,700	9,700	9,600	-	2,200	2,200	2,200
10	3,700	3,100	3,300	3,300	14,600	14,600	14,000	-	4,200	4,200	4,200
12	4,200	3,700	4,800	5,000	21,500	21,500	21,000	5,100	5,100	5,100	-
14	5,600	5,000	-	-	28,000	28,000	-	-	-	-	-
16	7,000	8,500	7,400	-	35,000	35,000	34,000	8,800	8,800	8,800	-
18	10,000	10,000	13,000	-	47,000	47,000	-	-	-	-	-
20	15,900	12,000	20,000	-	59,000	59,000	58,000	14,000	14,000	-	-
22	19,000	-	-	-	-	-	-	-	-	-	-
24	23,000	18,000	-	-	85,000	85,000	-	-	-	-	-
28	-	29,000	-	-	-	-	-	-	-	-	-
30	37,000	33,000	-	-	-	-	-	-	-	-	-
36	53,000	-	-	-	-	-	-	-	-	-	-
40	65,600	-	-	-	-	-	-	-	-	-	-

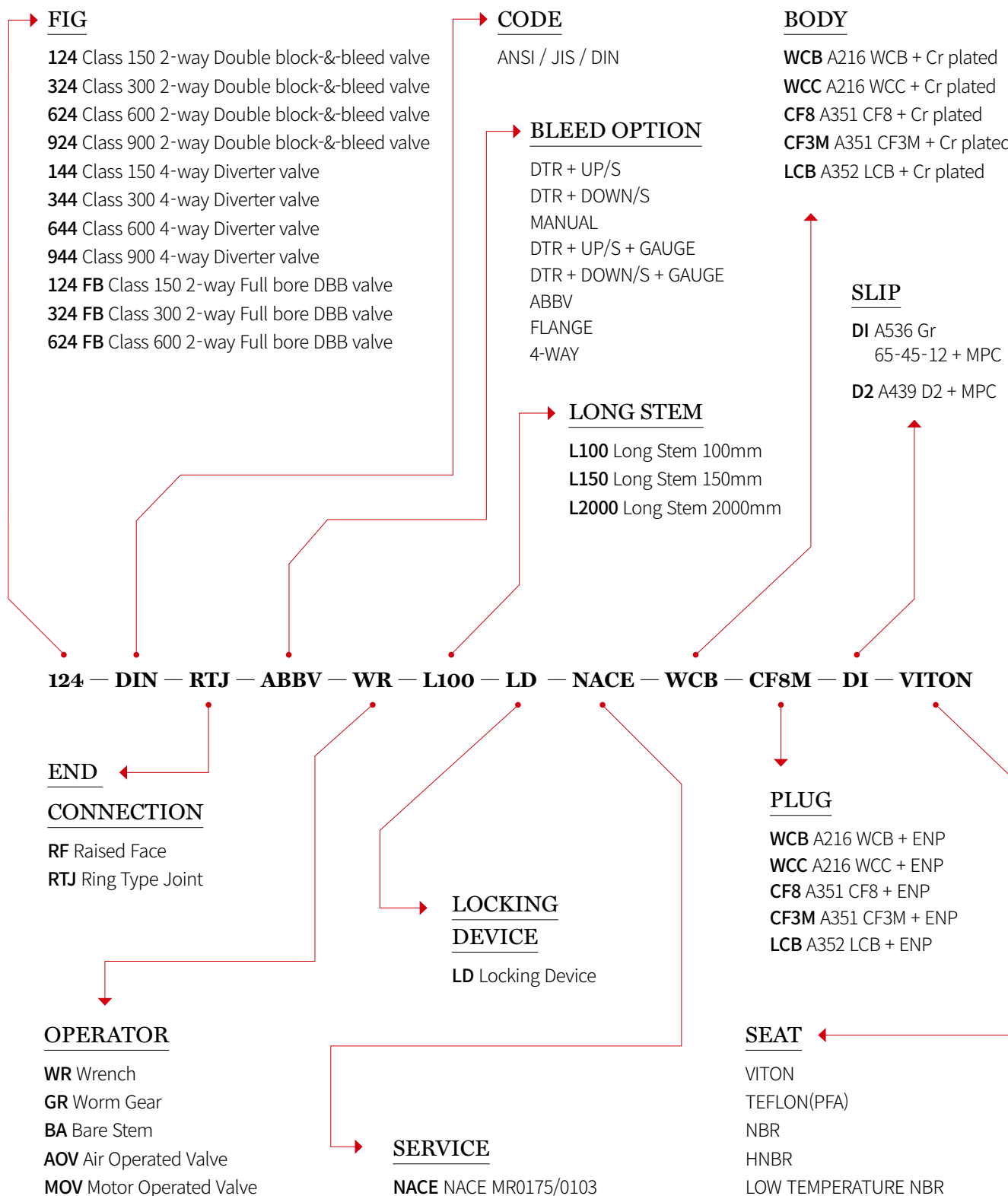
## Approx. Weight (kg)

Class 150 - 900

2-way - Standard Type, Full Bore Type, 4-way - Diverter Type

Class	150	300	600	900	150	300	600	150	300	600	900
Size / Fig	124	324	624	924	124 FB	324 FB	624 FB	144	344	644	944
2	30	34	39	-	70	75	-	-	-	-	-
3	42	42	60	-	80	85	-	-	240	290	-
4	50	60	100	150	130	160	270	-	470	450	600
6	100	140	320	430	240	310	480	-	510	680	760
8	180	240	520	820	450	560	820	-	1,000	1,300	1,500
10	250	320	820	1,200	650	820	1,200	-	1,600	1,700	1,900
12	400	510	1,200	2,300	820	1,400	2,000	1,600	1,600	1,900	-
14	490	880	-	-	1,400	1,700	-	-	-	-	-
16	650	1,200	2,100	-	1,900	2,500	3,400	2,600	2,600	3,600	-
18	790	1,700	-	-	3,200	3,200	-	-	-	-	-
20	1,600	2,100	3,700	-	3,600	4,500	7,500	4,000	4,000	-	-
22	1,750	-	-	-	-	-	-	-	-	-	-
24	2,050	3,300	7,200	-	5,100	7,100	-	-	-	-	-
28	-	5,400	-	-	-	-	-	-	-	-	-
30	4,170	8,000	-	-	-	-	-	-	-	-	-
36	6,520	-	-	-	-	-	-	-	-	-	-
40	10,500	-	-	-	-	-	-	-	-	-	-

# How to Order



- If additional information is required, please consult the factory when ordering.