CRANE

Iron Valve Selection Guide and Figure Number Index

CRANE® Figure No.	Catalog Page No.	Pressure Class	Stem: RS or NRS	Body/Trim IBBM, Ductile	Bonnet/Cap: BB,TB, Clamp	End Connections	Disc
Iron Body Gate Valves							
460	7	125	NRS	IBBM	BB	THD	SW
461	8	125	NRS	IBBM	BB	FLG	SW
473	9	125	NRS	Al	BB	FLG	
464 ½	10	125	RS, OS&Y	IBBM	BB	THD	
465 ½	11	125	RS, OS&Y	IBBM	BB	FLG	
475 ½	12	125	RS, OS&Y	Al	BB	FLG	
488	13	125/150	RS	Ductile Iron	Clamp	THD	
488 ½	14	125/150	RS	Ductile Iron	Clamp	FLG	
490	15	125/150	RS	IBBM Ductile Iron	Clamp	THD	
3E	16	250	NRS	IBBM	BB	FLG	
7 ½ E	17	250	RS, OS&Y	IBBM	BB	FLG	
Iron Body Globe Valves							
351	18	125	RS, OS&Y	IBBM	BB	FLG	BRZ
21E	20	250	RS, OS&Y	IBBM	BB	FLG	BRZ
Iron Body Angle Valves							
353	19	125	RS, OS&Y	IBBM	BB	FLG	BRZ
Iron Body Stop Check Valves							
28E	21	250 (straight flow)	RS, OS&Y	IBBM	BB	FLG	BRZ
30E	22	250 (90° angle flow)	RS, OS&Y	IBBM	BB	FLG	BRZ
Iron Body Swing Check Valves							
372	27	125		IBBM	BC	THD	BRZ
373	28	125		IBBM	BC	FLG	BRZ
373 ½	30	125		Al	BC	FLG	Iron
383	29	125 w/outside lever & weight		IBBM	BC	FLG	BRZ
39E	31	250		IBBM	BC	FLG	BRZ
346 ½	32	300 Y-Pattern		Ductile Iron	SC	THD	Iron

NOTE: The following valves have been discontinued: 465, 467, 484½, 485½, 486½, 487½, 490½, 1670, 1671, 14477, 7E, 254XR, 373RS, 375, 14493. Please consult factory* for possible substitutions.

* See back cover for Customer Service information.

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Cross Reference for Commonly Used Valves & Materials

IRON VALVES

GATE	CRANE®	NIBCO	Milwaukee	Powell	Walworth	Stockham®
Class 125 NRS	461	F-619	F2882 A	1787	W719F	G-612
Class 125 OS&Y	465 ½	F-617-0	F2885 A	1793	W726F	G-623
Class 250 OS&Y	7 ½E	F-667-0	F2894 A	1797	W786F	F-667
GLOBE						
Class 125	351	F-718-B	F2981 A	241	W906F	G-512
SWING CHECK						
Class 125	373	F-918-B	F2974 A	559	W928F	G-931
STOP CHECK						
Class 250 Straight-Way Y-Pattern	28E	----	-----	-----	----	F-540
Class 250 Angle Y-Pattern	30E	F-869-B	-----	-----	----	F-541

BRONZE VALVES

GATE	CRANE®	NIBCO	Milwaukee	Stockham®
Class 125 RS-Threaded	428	T-111	148	B-100
Class 125 NRS-Threaded	438	T-113	105	B-103
Class 125 RS-Solder	1330	S-111	149	B-108
Class 125 NRS-Solder	1320	S-113	115	B-104
Class 150 Union Bonnet	431UB	T-134	1151	B-120
Class 300 SS Trim	634E	T-174-SS	1184	B-145
GLOBE				
Class 125	1	T-211-B	502	B-16
Class 300 SS Trim	382P	T-275	593A	B-74
CHECK				
Class 125 Threaded	37	T-413-BY	509	B-319Y
Class 125 Solder	1340	S-413-B	1509	B-309Y
Class 300 Swing Check	76E	T-473-B	507	B-375
Class 300 Lift Check	366E	----	----	B-367

Materials

CAST IRON - ASTM A126, CLASS B

Used primarily for valve pressure retaining parts. Recommended to 450 °F (232 °C).		
Chemical Requirements	Minimum	Maximum
Sulphur %	–	0.15
Phosphorus %	–	0.75
Tensile Requirements	Minimum	Maximum
Tensile Strength, psi	31,000	–
Transverse Test Load, lbs.	3,300	–
Deflection @ Center, in.	0.12	

BRONZE

ASTM B584 C84400
ASTM B584 C86400
ASTM B61 C92200
ASTM B16 C36000
ASTM B62 C83600

DUCTILE IRON - ASTM A536, 65-45-12

Chemical Requirements	Minimum %	Maximum %
Carbon (C)	3.5	3.9
Manganese (Mn)	0.15	0.35
Silicone (Si)	2.25	2.75
Sulphur (S)	0.01	0.025
Phosphorus (P)		0.05
Tensile Requirements	Minimum	Maximum
Tensile Strength, psi	65,000 Minimum	
Yield Strength, psi	45,000 Minimum	
Elongation (in 2")	12%	

Overview

CRANE® iron body valves are proven performers in mechanical systems of commercial buildings throughout America. Chemical plants, steel mills, shipyards, refineries, pulp and paper mills, and utilities have also found that CRANE® iron body valves do the job better and longer for their many general services.

QUALITY MANAGEMENT

CRANE® is committed to a philosophy of total quality management. It begins with design, to comply with pertinent MSS and ASME Standards. Continuous improvements are applied in a process to improve materials and services to meet or exceed customer needs.

MATERIALS

The iron used as the basic valve material conforms to the chemical and physical requirements of the American Society of Testing and Materials A-126 Class B for Cast Iron Valves.

RATED WORKING PRESSURES

The pressure-temperature ratings of CRANE® iron body valves in this catalog section are as follows:

Temp. °F	PRESSURE (PSIG)			
	Class 125 Cast Iron		Class 250 Cast Iron	
	Sizes	Sizes	Sizes	Sizes
	2-12	14-24	2-12	14-2
-20 to 100	200	150	500	300
150	200	150	500	300
200	190	135	460	280
225	180	130	440	270
250	175	125	415	260
275	170	120	395	250
300	165	110	375	240
325	155	105	355	230
350	150	100	335	220
375	145		315	210
400	140		290	200
425	130		270	
450	125		250	
500				
600				
650				

The temperature shown for a corresponding pressure rating is the temperature of the pressure containing shell of the component. In general, this temperature is the same as that of the contained fluid. Composition disc valves are excluded from these ratings.

DESIGN
GATE VALVES-CLASSES 125 and 250

Stem—All stems are designed for ample strength and are machined to function easily. Backseats are provided on OS&Y valves.

Packing Gland Assembly—Glands and gland flanges have a ball and socket joint which assures alignment. It provides for proper packing compression without binding against the stem.

Gasket—Aramid fibers with SBR binder.

Packing—Braided flexible graphite with corrosion inhibitor or as specified with specific item.

Disc—Strong, solid wedge discs have disc guides for precision seating with minimum friction against body seats.

Yoke and Bonnet—One-piece yoke bonnets are utilized on 12" and smaller size OS&Y valves. Larger sizes have separate yokes and bonnets.

Stuffing Box—NRS valves have stuffing boxes assembled to bonnets to accommodate the packing gland assembly.

Seat Ring—Buttress-type seat rings are bottom-seated with accurately machined faces to match disc faces.

Handwheel or Operating Nut—Handwheels have large diameters for good leverage on operating nuts, a 2" square may be furnished on any NRS valve if specified.

Cv Coefficients*

(For estimating purposes only)

Size	Gate	Globe	Swing Check
2	327	50	131
2½	480	74	192
3	742	114	297
4	1314	202	526
5	2129	327	852
6	3175	487	1270
8	5691	873	2276
10	8970	1376	3588
12	13351	—	5340
14	16277	—	6511
16	21562	—	8625
18	28715	—	11486
20	35760	—	14304
24	52165	—	20866
30	82563	—	—
36	119910	—	—

*Fully open. C_V=GPM @ 1 PSI ΔP, 60°F Water

The above values for Swing Check Valves are correct only when the valve is fully open. This corresponds to a velocity of 6 ft./sec. for water flow.

Overview

Yoke Bushing—Yoke bushings on OS&Y valves have Acme threads for stem engagement; and handwheels fit snugly over bushings. Handwheels are securely locked to yoke bushings with locknuts. A bolted yoke cap secures the yoke bushing to the yoke.

Body—Body sections are evenly distributed for maximum strength. Dimensions and drilling of end flanges of cast iron valves conform to the ASME Standard B16.1 for Classes 125 and 250 Cast Iron Flanges. Face-to-face dimensions comply with ASME Standard B16.10.

DESIGN:
GLOBE AND ANGLE VALVES-OUTSIDE SCREW AND YOKE-CLASSES 125 and 250

CRANE® globe valves are highly efficient for services requiring frequent operations and throttling with pressure drop across the valve and about 20% of inlet pressure. Closer throttling, creating higher pressure drops, may cause cavitation or excessive velocities which could cause high noise levels, vibration and possible damage to the valve or adjacent piping.

Stem—Stems are machined with Acme threads which fully engage the yoke bushing threads at all times.

Packing Gland Assembly—Glands and gland flanges have a ball and socket joint which assures alignment and proper packing compression.

Packing—Braided flexible graphite with corrosion inhibitor or as specified with specific item.

Backseat Bushing—Bushings are threaded into bonnets, providing beveled seats for backseating on stem shoulders.

Disc—Bronze discs are furnished in Class 125 and 250 globe and angle valves, which are regrindable. Disc nuts thread into disc. The Class 250 nonreturn stop-check valve conforms to ASME boiler codes and utilizes a dashpot and piston design to cushion the disc action.

Yoke Bonnet—One-piece yoke bonnets are fastened to bodies with capscrews.

Seat Rings—Seat rings are bottom-seated and are readily renewable.

Handwheel—Handwheels have large diameters for ample leverage.

Yoke Bushing—Accurate Acme threads engage stem threads. Set screws fasten yoke bushings to yoke.

Body—Bodies are designed with uniform sections evenly distributed for maximum strength. Dimensions and drilling of end flanges on flanged valves conform to the ASME Standard B16.1 for Classes 125 and 250 Cast Iron Flanges. Face-to-face dimensions comply with the ASME Standard B16.10.

DESIGN:
SWING CHECK VALVES-CLASSES 125 and 250

Cap—Caps are bolted to bodies.

Hinge—Hinges are precisely drilled for assembly with discs.

Hinge Pin—Pins are located by side plugs, screwed into bodies.

Disc—Disc faces are accurately machined for tight seal with seat rings.

Seat Ring—Buttress design of renewable seat rings provides bottom seating and good strength.

Body—Dimensions and drilling of end flanges on flanged valves conform to ASME Standard B16.1 for Classes 125 and 250 Cast Iron Flanges. Face-to-face dimensions comply with ASME B16.10.

Figure 383 L&W:
Swing Check valves sized 2"-12" come standard with an adjustable lever arm which can be orientated in any position in 15° increments. These valves can be installed in horizontal lines or in vertical lines with upward flow. 14"-24" valves must be specified at the time of inquiry and order with the installation orientation for horizontal or vertical-upward flow.

ACCESSORIES—CRANE® iron body valves may be furnished with motor operators, gearings, bypasses, floorstands, extension stems, lever and weight attachment or other accessories.

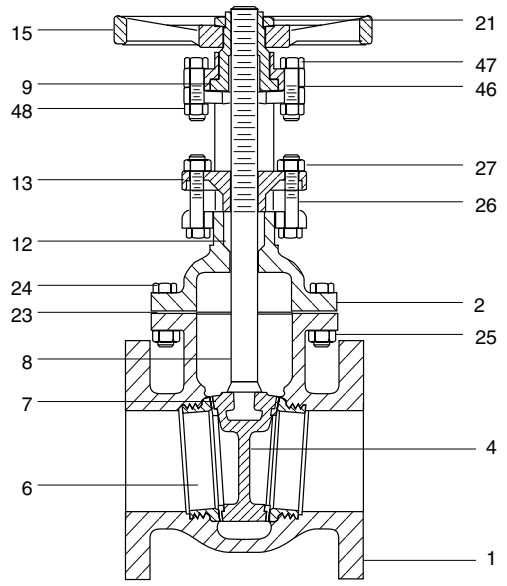
MARKING—Numerals indicate the size and pressure class. Cast arrows indicate direction of flow on check, globe, and angle valves.

TESTING AND INSPECTION—Before shipment, each valve is individually tested under pressure for soundness of castings and tight closure to MSS Standards.

FINISH—External cast iron parts are coated with a durable black finish.

WEIGHTS AND DIMENSIONS—Dimensions and weights shown in this catalog section are furnished for estimating purposes only and are subject to change without notice. It is our intent to maintain basic dimensional requirements of accepted standards.

465 ½ Gate Valve



Dimensions and Weights

Inches (millimeters) - Pounds (kilograms)

Valve Size	Dimensions			WT
	B	C	M	
2	14.75	8.00	7.00	33
	(375)	(203)	(178)	(15)
2 ½	16.06	8.00	7.50	47
	(408)	(203)	(191)	(21)
3	17.38	8.00	8.00	58
	(441)	(203)	(203)	(26)
4	21.44	10.00	9.00	97
	(545)	(254)	(229)	(44)
5	25.81	10.00	10.00	135
	(656)	(254)	(254)	(61)
6	30.31	12.00	10.50	162
	(770)	(305)	(267)	(73)
8	37.75	14.00	11.50	280
	(959)	(356)	(292)	(126)
10	49.41	18.00	13.00	502
	(1255)	(457)	(330)	(228)
12	56.81	18.00	14.00	670
	(1442)	(457)	(356)	(304)
14	64.88	20.00	15.00	1093
	(1648)	(508)	(381)	(496)
16	75.25	22.00	16.00	1425
	(1911)	(559)	(406)	(647)
18	82.00	22.00	17.00	1738
	(2083)	(559)	(432)	(789)
20	90.62	24.00	18.00	2085
	(2302)	(610)	(457)	(946)
24	105.38	30.00	20.00	3183
	(2677)	(762)	(508)	(1445)

Materials of Construction

No.	Description	Material	ASTM
1	Body	Cast Iron	A126 Class B
2	Bonnet	Cast Iron	A126 Class B
4	Disc	Bronze (2")	B61 C92200
		Bronze (2½"& 3")	B584 C84400
		Cast Iron (4" - 24")	A126 Class B
6	Body Seat Ring	Bronze	B584 C84400
7	Disc Seat Ring	Bronze	B584 C84400
8	Stem	Manganese Bronze (2" - 12")	B584 C86400
		Brass (14" - 36")	
9	Yoke Sleeve	Manganese Bronze (2" - 12")	B584 C86400
		Ductile Iron (14" - 24")	A536 Gr. 65-45-12
10	Gland*	Bronze (10" & 12")	B584 C84400
	Gland Flange*	Ductile Iron (10" & 12")	A536 Gr. 65-45-12
12	Packing	Braided Flexible Graphite with Corrosion Inhibitor	
15	Handwheel	Ductile Iron	A536 Gr. 65-45-12
21	Handwheel Nut	Sintered Nickel Steel (2" - 8")	B484 Gr. 2 CL B Type II
		Ductile Iron (10" - 24")	A536 Gr. 65-45-12
23	Bonnet Gasket	Aramid Fibers with SBR Binder	
24	Bonnet Bolt	Carbon Steel	A307 Gr. B
25	Bonnet Bolt Nut	Carbon Steel	A563 Gr. A
26	Gland Bolt	Carbon Steel (2" - 12")	A307 Gr. B
26	Gland Eyebolt*	Carbon Steel (14" - 24")	
27	Gland Bolt Nut	Carbon Steel	A563 Gr. A
46	Yoke Cap	Ductile Iron (2" - 8")	A536 Gr. 65-45-12
		Cast Iron (10" - 12")	A126 Class B
47	Yoke Cap Bolt	Carbon Steel (2" - 12")	A307 Gr. B
48	Yoke Cap Bolt Nut	Carbon Steel (2" - 12")	A563 Gr. A
49	Stem Collar Seat*	Brass (14" - 24")	
50	Disc Pin*	Brass (14" - 24")	
51	Yoke Bolt*	Carbon Steel (14" - 24")	
52	Yoke Bolt Nut*	Carbon Steel (14" - 24")	
53	Yoke to Bonnet Bolt*	Carbon Steel (14" - 24")	
54	Backseat Bushing*	Brass (14" - 24")	
55	Eyebolt Pin*	Carbon Steel (14" - 24")	
56	Yoke*	Cast Iron (14" - 24")	

* Not shown

See page 5 for Pressure Temperature Ratings

Industry Standards
MSS SP-70, Type 1