Valve Body Strength (Lbs.) and Maximum Recommended Valve Settings (Feet)
Flomatic Submersible Check Valves
Series 80E, 100E, 80DI VFD, 80DIX, 80S6 VFD and Model VFD installed with Schedule 40 pipe

February 11, 2021 Rev: 10

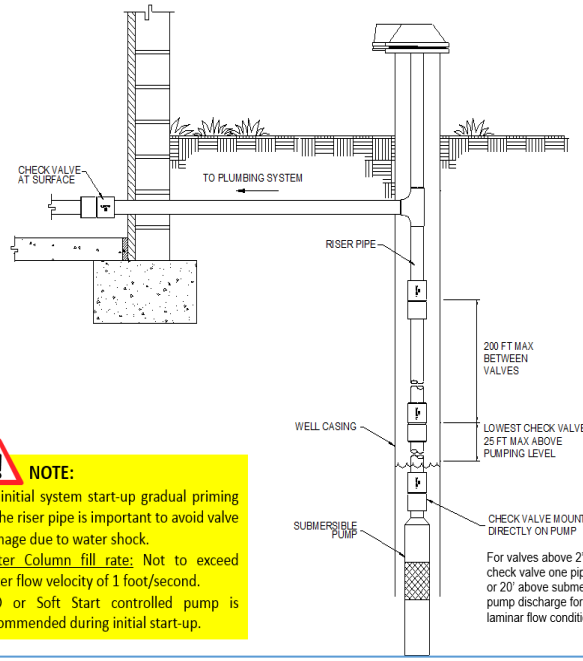
Model 80E & 100E ENIVIRO® and Model VFD Unleaded Bronze Check Valve

Body Material: ASTM C89833 (Federalloy® I-836-FL) Max Valve Operating Pressure: 400 PSI

Valve Size	1"	1 ¼"	1 ½"	2"	2 ½"	3"	4"
Part No:	**4031E/ 4201E**	**4032E/ 4202E**	**4033E**	**4034E**	**4035E**	**4036E**	**4037E**
Valve External Diameter	1.85 Inches	2.2 Inches	2.6 Inches	3 Inches	3.69 Inches	4.54 Inches	5.84 Inches
Maximum recommended Valve Body load *(With Safety Factor)*	**1,600 Lbs**	**2,200 Lbs**	**2,700 Lbs**	**3,200 Lbs**	**4,600 Lbs**	**7,900 Lbs**	**13,500 Lbs**
Max recommended* pump setting:	605 Ft	613 Ft	591 Ft	474 Ft	471 Ft	584 Ft	653 Ft
Weight of schedule 40 pipe per 100 Feet with water	205 lbs	292 lbs	360 lbs	510 lbs	786 lbs	1,078 lbs	1,630 lbs
Gallons of water/Ft of pipe	0.045	0.078	0.106	0.174	0.249	0.384	0.661

*Note: Does not include weight of electric wire. It does include an estimated weight of the pump.

- **Check Pump rotation (Counter clockwise looking down on pump discharge outlet for clockwise rotation use Model 80 VFD).**
- **On initial system start-up gradual priming of vertical water column (not to exceed 1 foot per second flow velocity) is important to avoid valve damage due to water shock.**



NOTE:
On initial system start-up gradual priming of the riser pipe is important to avoid valve damage due to water shock.
Water Column fill rate: Not to exceed water flow velocity of 1 foot/second.
VFD or Soft Start controlled pump is recommended during initial start-up.

Note:
One check valve shall be installed at every 200 feet of vertical riser pipe and no more than 25 feet max above lowest pumping level for proper operation and pump protection.
Follow Flomatic O & M manual and valve installation instruction to assure proper valve operation and pump protection.

→ **NOTE:** Flomatic Corp. reserves the right to change valve models, dimension and materials without

FLOMATIC® VALVES

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Model 80DI, 80DIX and Model VFD Ductile Iron Check Valves

Body Material: Ductile Iron ASTM A536-84 Valve Operating Pressure: 1" thru 1 ½" Max 400 PSI, 2" thru 8" Max 600 PSI, 10" & 12" Max 400 PSI

Valve Size	1"	1 ¼"	1 ½"	2"	2 ½"	3"	4"	5"	6"	8"	10"	12"
Part No:	**4031DI**	**4032DI**	**4033DI**	**7937**	**7936**	**7938**	**7939**	**4088**	**4089**	**4090**	**4091DIX**	**4092DIX**
Valve External Diameter	1.85 Inches	2.2 Inches	2.6 Inches	3 Inches	3.69 Inches	4.54 Inches	5.75 Inches	6.75 Inches	8.00 Inches	9.69 Inches	12.13 Inches	15.41 Inches
Maximum recommended Valve Body load	**4,500 Lbs**	**6,500 Lbs**	**7,800 Lbs**	**9,000 Lbs**	**13.300 Lbs**	**22,500 Lbs**	**36,000 Lbs**	**50,000 Lbs**	**60,000 Lbs**	**102,000 Lbs**	**158,000 Lbs**	**198,000 Lbs**
Max recommended* pump setting:	1,743 Ft	1,748 Ft	1,684 Ft	1,344 Ft	1,333 Ft	1,644 Ft	1,715 Ft	1,685 Ft	1,447 Ft	1,752 Ft	1,577 Ft	1,425 Ft
Weight of schedule 40 pipe per 100 Feet with water	205 lbs	292 lbs	360 lbs	510 lbs	786 lbs	1,078 lbs	1,630 lbs	2,328 lbs	3,148 lbs	5,022 lbs	7,464 lbs	10,200 lbs
Gallons of water/Ft of pipe	0.045	0.078	0.106	0.174	0.249	0.384	0.66	1.04	1.5	2.6	4.1	5.8

*NOTE: Does not include weight of electric wire or submersible pump.

Model 80S6 and Model VFD Stainless Steel Check Valves

Body Material: Stainless Steel ASTM A351 Grade CF8 Max Valve Operating Pressure: 450 PSI

Valve Size	1"	1 ¼"	1 ½"	2"	2 ½"**	3"	4"	5"	6"	8"	10"
Part No:	**4031S6**	**4032S6**	**4033S6**	**7937S6**	**7936S6**	**7938S6**	**7939S6**	**4088S6**	**4089S6**	**4090XXS**	**4091XSS**
Valve External Diameter	1.85 Inches	2.2 Inches	2.6 Inches	3 Inches	3.69 Inches	4.54 Inches	5.75 Inches	6.75 Inches	8 Inches	9.69 Inches	12.13 Inches
Maximum recommended Valve Body load	**3,400 Lbs**	**4,800 Lbs**	**5,700 Lbs**	**6,700 Lbs**	**10,000 Lbs**	**17,000 Lbs**	**27,000 Lbs**	**38,000 Lbs**	**45,000 Lbs**	**77,000 Lbs**	**118,000 Lbs**
Max recommended* pump setting:	1,300 Ft	1,306 Ft	1,258 Ft	1,000 Ft	1,000 Ft	1,100 Ft	1,200 Ft	1,300 Ft	1,000 Ft	1,300 Ft	1,200 Ft
Weight of schedule 40 pipe per 100 Feet with water	205 lbs	292 lbs	360 lbs	510 lbs	786 lbs	1,078 lbs	1,630 lbs	2,328 lbs	3,148 lbs	5,022 lbs	7,464 lbs
Gallons of water/Ft of pipe	0.045	0.078	0.106	0.174	0.249	0.384	0.661	1.04	1.5	2.6	4.1

*NOTE: Does not include weight of electric wire or submersible pump

Note: One check valve shall be installed at every 200 feet of vertical riser pipe for proper operation and pump protection. Follow Flomatic O&M and valve installation instruction to assure proper valve operation and pump protection.

Consult factory for the strength of other valve Models and valve body materials types.

FLOMATIC® VALVES

Pipe Data for Schedule 40 Steel Pipes

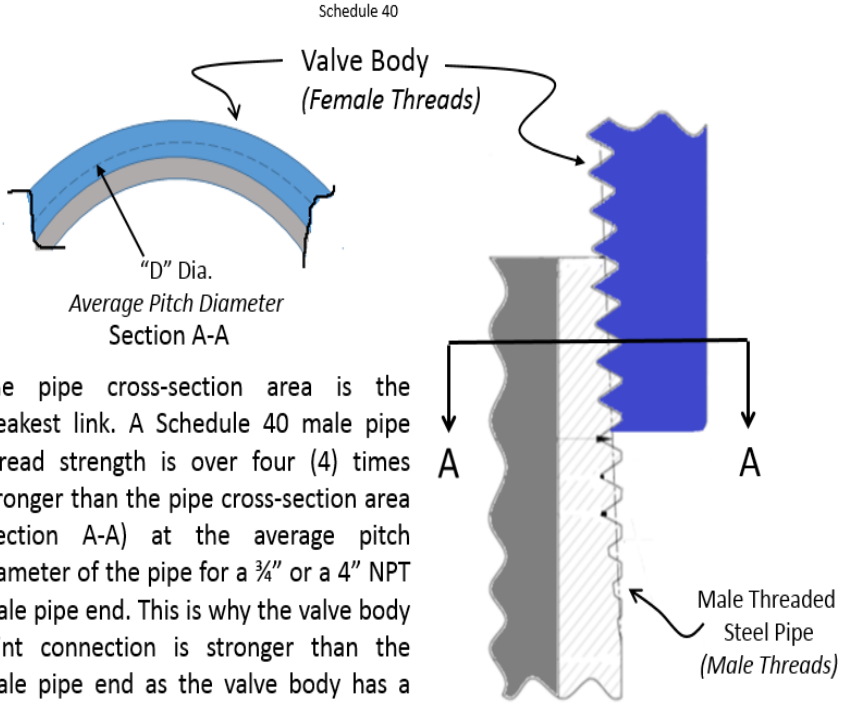
Pipe Strength based on a Material Yield strength of:

Steel Pipes Dimensions - ANSI Schedule 40

Pipe Size	Diameter (in)		Gallons	Pipe Weight	Pipe & Water Weight	Calculated Max Pipe Load	Max Pipe Joint Strength
(in)	External	Internal	Gal/Ft	lb/ft	Lb/Ft	Force in Lbs. (Safety Factor of 4)	Force in Lbs. (Safety Factor of 4)
¾	1.05	0.82	0.03	1.1	1.4	2,956	**834**
1	1.32	1.05	0.04	1.7	2.1	4,398	**1,167**
1 ¼	1.66	1.38	0.08	2.3	2.9	5,850	**1,750**
1 ½	1.9	1.61	0.11	2.7	3.6	6,995	**2,228**
2	2.38	2.07	0.17	3.7	5.1	9,480	**2,812**
2 ½	2.88	2.47	0.25	5.8	7.9	15,074	**4,177**
3	3.5	3.07	0.38	7.6	10.8	19,415	**6,230**
3 ½	4	3.55	0.51	9.1	13.4	23,348	**8,085**
4	4.5	4.03	0.66	10.8	16.3	27,552	**10,162**
5	5.56	5.05	1.04	14.6	23.3	37,186	**13,067**
6	6.63	6.07	1.50	19.0	31.5	48,875	**18,550**
8	8.63	7.98	2.66	28.6	50.7	74,196	**27,700**
10	10.75	10.02	4.10	40.5	74.6	104,198	**38,900**
12	12.75	11.94	5.81	53.6	102.0	137,437	**51,310**

NPT Pipe Joint Strength

Schedule 40



The pipe cross-section area is the weakest link. A Schedule 40 male pipe thread strength is over four (4) times stronger than the pipe cross-section area (section A-A) at the average pitch diameter of the pipe for a ¾" or a 4" NPT male pipe end. This is why the valve body joint connection is stronger than the male pipe end as the valve body has a larger cross-section area (see section A-A). Select a Schedule 80 or 8 long round thread for more pipe joint strength.

NOTE: The above Pipe data are based on Schedule 40 pipe material with 35,000 psi minimum yield, minimum allowable wall, maximum allowable OD, and a safety factor of 4. The information and data presented above are standard values and are not a guarantee of maximum or minimum values. No liability is assumed for the correctness of this, or any other, data in this publication, either direct or indirect. Applications specifically suggested are made only for the purpose of illustration, to enable the reader to make his own evaluation, and are not intended as warranties, either expressed or implied, of fitness for these or other uses.

Pipe Data for Schedule 40 and 80 Pipe (ANSI B36.10-1975)

Schedule 40	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
EXTERNAL DIA.	1.315	1.66	1.9	2.375	2.875	3.5	4.5	5.563	6.625	8.625	10.75	12.75
INSIDE DIA.	1.049	1.38	1.61	2.067	2.469	3.068	4.026	5.047	6.065	8.125	10.025	12.25
WALL THICKNESS	0.133	0.14	0.145	0.154	0.203	0.216	0.237	0.258	0.28	0.25	0.3625	0.25
WALL AREA SQ IN	0.49	0.67	0.80	1.07	1.70	2.23	3.17	4.30	5.58	6.58	11.83	9.82
INTERNAL PIPE AREA SQ IN	0.86	1.50	2.04	3.36	4.79	7.39	12.73	20.01	28.89	51.85	78.93	117.86
WEIGHT/FEET OF PIPE	1.68	2.27	2.72	3.65	5.79	7.58	10.79	14.62	18.97	28.55	40.48	53.52
MAX WORKING PRESSURE (PSI)	**2,100**	**1,800**	**1,700**	**1,500**	**1,900**	**1,600**	**1,400**	**1,300**	**1,210**	**1,460**	**1,030**	**1,000**
Yield at MAX working pressure:	3,675	4,027	4,329	4,684	5,338	5,308	5,615	6,048	6,263	11,508	6,873	12,005
WATER HAMMER FACTOR*	***22.3***	***12.9***	***9.46***	***5.74***	***4.02***	***2.6***	***1.51***	***0.96***	***0.666***	***0.385***	***0.244***	***0.172***
GALLONS/FT OF PIPE	0.045	0.078	0.106	0.174	0.249	0.384	0.661	1.039	1.501	2.693	4.100	6.123
WEIGHT OF 100 FEET OF PIPE WITH WATER:(LBS)	205	292	360	510	786	1,078	1,630	2,329	3,148	5,101	7,467	10,457

Schedule 80	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
EXTERNAL DIA.	1.315	1.66	1.9	2.375	2.875	3.5	4.5	5.563	6.625	8.625	10.75	12.75
INSIDE DIA.	0.957	1.278	1.5	1.939	2.323	2.9	3.826	4.813	5.761	7.625	9.562	11.374
WALL THICKNESS	0.179	0.191	0.2	0.218	0.276	0.3	0.337	0.375	0.432	0.5	0.594	0.688
WALL AREA SQ IN	0.64	0.88	1.07	1.48	2.25	3.02	4.41	6.11	8.40	12.76	18.95	26.07
INTERNAL PIPE AREA SQ IN	0.72	1.28	1.77	2.95	4.24	6.61	11.50	18.19	26.07	45.66	71.81	101.61
WEIGHT/FEET OF PIPE	2.17	2.99	3.63	5.02	7.66	10.25	14.98	20.78	28.57	35.64	64.43	88.63
MAX WORKING PRESSURE (PSI)	**3,500**	**3,000**	**2,800**	**2,500**	**2,800**	**2,600**	**2,300**	**2,090**	**2,070**	**2,280**	**1,800**	**1,800**
Yield at MAX working pressure:	3,941	4,366	4,632	4,997	5,266	5,694	6,000	6,221	6,420	8,158	6,820	7,015
WATER HAMMER FACTOR*	***26.8***	***15***	***10.9***	***6.52***	***4.54***	***2.92***	***1.67***	***1.06***	***0.738***	***0.422***	***0.268***	***0.181***
GALLONS/FT OF PIPE	0.037	0.067	0.092	0.153	0.220	0.343	0.597	0.945	1.354	2.372	3.730	5.278
WEIGHT OF 100 FEET OF PIPE WITH WATER:(LBS)	248	355	440	630	950	1,311	1,996	2,866	3,986	5,542	9,553	13,264

***Note:** Water Hammer Factor should be used to reduce allowable working pressure by the amount of flow in gal. Per min. times water hammer factor.