

Approximate Weights by Materials and End Fittings, Manual Valves (product-series)



	SI 8/9		SP5/SI5				AN1			DP5/DI5				FT5/FI5				
	SS		SS		Carbon Steel		Bronze		SS	Carbon Steel	Bronze	SS		Carbon Steel				
	F/X	Q/X	L	Q/X	L	Q/X	L	L	L	L	Q/X	L	Q/X	L	Q/X	L		
1/4"		2		2		2												
3/8"		2		2		2												
1/2"	1.5	2	4	2	4	2	4			2	5	2	6	2	3	2	3	
3/4"	1.6	2	5	2	5	2	6			2	7	3	7	3	4	3	4	
1"	3	4	9	4	9	5	9	9	9	10	5	11	5	12	5	7	5	7
1-1/2"	8.9	10	17	10	17	11	18	18	18	20	12	23	13	24	13	16	13	16
2"	15	15	27	15	27	16	28	26	26	24	16	33	17	35	19	25	19	25
2-1/2"		37	54	37	54	39	57											
3"	30	46	66	46	66	48	70	53	53	92	51	80	53	85	54	64	54	64
4"	67	111	138	111	138	115	144	95	95	118	114	150	118	157	121	135	121	135
6"	164*		427		427		441	305	305	330		368			364			364

Useful Conversion Factors

DN to Inches

DN8 = 1/4"	DN40 = 1-1/2"
DN10 = 3/8"	DN50 = 2"
DN15 = 1/2"	DN65 = 2-1/2"
DN20 = 3/4"	DN80 = 3"
DN25 = 1"	DN100 = 4"
DN32 = 1-1/4"	DN150 = 6"

*Only Series 9 SS = stainless steel, F = Extended butt weld for tube ends, X = clamp ends, Q = Female NPT ends, L = 150# flanged ends

Mass

Kilograms	x 2.2 = lbs.
Pounds	x 4.54 = kg

	AF1				MP1						MP4					
	SS		Carbon Steel		SS		Carbon Steel		Bronze		Iron		SS		Carbon Steel	
	Q	L	Q	L	Q	L	Q	L	Q	L	Q	L	Q	L	Q	L
1/2"					8	16	8	16	9	17			7	11	7	11
3/4"					8	15	8	15	8	17			7	13	7	13
1"	5	7	5	7	12	20	12	20	12	22			12	19	12	19
1-1/4"					13	21	13	21	14				12	20	12	20
1-1/2"	12	15	12	15	30	43	30	43	33	47	30	43	31	43	31	43
2"	19	24	19	24	45	62	45	62	51	70	45	62	47	65	47	65
3"	63	71	63	71	69	96	69	96	76	107	69	96	133	167	133	167
4"	94	108	94	108	156	211	156	211		235	156	211	254	295	254	295
6"	234	289	234	289												

SS = stainless steel, Q = Female NPT ends, L = 150# flanged ends

Pressure

Feet of water	x .433 = PSI
Inches Hg.	x .491 = PSI
Meters of water	x 1.42 = PSI
kg/cm ²	x 14.22 = PSI
PSI	x 2.31 = ft. of water
bar g	x 14.7 = PSI

Temperature

Centigrade	(F - 32) x 5/9
Fahrenheit	(C x 5/9) + 32

Welding, Soldering, Brazing (for more information request LT-140A)

Valve pads may be welded directly to a tank or to a section of piping. Because excess temperature may damage the valve's elastomeric seats and seals, the valve body must be removed from the pad prior to welding. The valve body should be installed after the pad cools and has been cleaned.

Pad distortion could hinder valve operation. To minimize distortion of the pad from welding:

- Provide external cooling on the pad and the tank or piping. (Copper chills are preferred.)
- Control interpass temperature to a reasonable value
- Weld at minimal current to reduce heat. Reduction of heat reduces the amount of metal shrinkage per unit time, as well as the force that tends to distort the pad. Welding with reduced heat may require additional passes and time.
- Stagger welding into a number of steps around the 360° circumference. An example of such staggering would be to complete a pass in the following sequence:
 - 12 to 2 o'clock
 - 6 to 8 o'clock
 - 10 to 12 o'clock
 - 4 to 6 o'clock
 - 8 to 10 o'clock
 - 2 to 4 o'clock
- Do not weld to an unnecessary thickness. Weld only to the thickness needed to meet pressure vessel code or strength requirements. If practical, the weld preparation angle should not exceed 37.5°. Chamfering the weld preparation angle should be done on the tank exterior, not interior, if practical (see diagram below). Limiting heat buildup is extremely important on thick-walled tanks. If excessive heat distortion occurs, the pad may require re-machining to allow the valve to operate properly.
- If preheat is required, use minimum preheat temperatures.



TROUBLE SHOOTING GUIDE

Seat Leakage

1. ***Seats worn?*** Replace seats.
2. ***Seats worn unevenly?*** Replace seats, if required. Check piping supports and valve supports.
3. ***Seats crushed?*** Body bolts over tightened. Replace seats and gaskets. Tighten valve body bolts per maintenance instructions. Measure breakaway torque at the STEM, not at the body bolts.
4. ***Seats need adjustment?*** Using the Adjust-O-Seal™ design, tighten each body bolt 1/8 turn, in the order illustrated in the maintenance instructions, until the leak stops.
5. ***Ball scored?*** Replace ball; check seats for damage.

Body Seal Leakage

1. ***Seats crushed?*** Replace body seals. Check seats. Do not over tighten.
2. ***Seats cut?*** Replace body seals. Make sure seals are seated properly in the end or side fitting.

Stem Leakage

1. ***Stem packings worn?*** Tighten locking nut until spring washers are fully compressed. Then, back off 1/8 turn. If leakage continues, replace stem packings.
2. ***Actuator pushing down on stem?*** Provide vertical clearance between coupling and stem.
3. ***Actuator is side loading stem?*** Improve actuator/stem alignment.

Valve Turns Too Freely

1. ***Body bolts too loose?*** Tighten valve body bolts to recommended torque values measured at the STEM. See Maintenance Instructions or product brochures.
2. ***Lock washers missing?*** Check and replace lock washers on all body bolts.
3. ***Excessive piping vibration?*** Eliminate source of vibration. Use memory stops and/or castellated nuts on body bolts.

Valve Difficult To Turn

1. ***Seats too tight?*** Loosen body bolts 1/8 turn at a time. If body gaskets leak after loosening bolts, replace gaskets. Check torque of valve at STEM.

3. ***Locking hex nut too tight?*** Loosen nut, tighten locking nut until spring washers are fully compressed, then back off 1/8 turn.
4. ***Improper use of cavity fillers?*** If flow media is adhering to inside surfaces between ball and cavity filler, remove cavity filler.

Valve Will Not Turn

1. ***Seats crushed?*** Replace seats and seals.
2. ***Valve tightened metal to metal?*** Replace seats and seals.
3. ***Flow media hardened?*** Clean out valve. Heat trace valve to keep flow media soft.
4. ***Piping not supported?*** Support piping to relieve weight and stress from valve end fittings.

Loss Of Power To Actuator

1. ***Loss of pressure, or low supply pressure?*** Boost supply pressure. Repair supply line breaks.
2. ***O-ring leakage?*** Check actuator tightness. Replace damaged seats.
3. ***End cap(s) upside down?*** Verify that end caps are right-side up. Reinstall caps.

Excessive Back-Lash In Actuator

1. ***Worn piston/rack or pinion?*** Replace parts showing excessive wear.

Actuator Cycles Too Slowly

1. ***Low air pressure?*** Check power supply. Increase power supply.
2. ***Low spring force?*** Check that the actuator has the proper number of springs. Check that the actuator sizing is correct for the service. Install additional springs. Replace the actuator with a larger unit.
3. ***Solenoid valve too big?*** Install valve with a higher Cv.

Actuator Cycles Too Fast

1. ***High air pressure?*** Check power supply. Decrease power supply.
2. ***High air flow?*** Check air flow to the actuator. Install speed control or lower the air supply.
3. ***Solenoid valve too big?*** Install valve with a lower Cv.