

Features

- Fail safe return upon loss of power
- Programmable fail safe position (open, close, user-defined)
- Super capacitor recharges in seconds
- Full Port 316 stainless steel ball valve
- RTFE (reinforced Teflon) ball seats
- Triple PTFE/Viton live loaded stem seals, adjustable
- Highly visible multi-color LED indicator
- 100% duty cycle per IEC 60034-1
- Heavy duty brushless DC motor with over temp/over current/motor stall protection
- Three programmable relays with OPEN/CLOSE/FAULT and 14 additional output signals
- Valve position, capacitor charge status, and fault codes via LED display
- Remote operation (normal) or local operation via keypad
- Non-intrusive wiring installation includes two 1 meter long shielded multi-conductor cables
- Separate motor and control circuits
- Dry contact circuit control wiring
- Thermostatically controlled anti-condensation heater
- Manual override
- CSA listed per UL 429 and CSA 22.2
- Type IP 67 weatherproof enclosure
- Corrosion protection per ISO 12944 C3-02

Applications

On-off control of water, air, oil and other media compatible with the materials of construction. Suitable for vacuum service up to 29"Hg. Actuator designed for 100% duty cycle.

Operation

Safe return actuator fails to closed, open or user-set position upon loss of power. Operation is programmable in continuous mode (a signal pulse triggers continuous operation until full open or close) or inch mode (a signal pulse runs the motor for the duration of the pulse). Factory setting is continuous mode. Upon loss of power the actuator returns to the pre-determined safe position. Upon restoration of power, the actuator remains in the fail-safe position until receipt of an external control signal. The motor circuit is at line voltage and is separate from the control circuit. Open/close control signals are made via dry contacts making the circuit between the appropriate terminal points (see wiring diagram). External control voltage should not be applied to the control terminals. Normal operation is via remote signal, but the actuator can also be operated locally using the push button controls on the digital display.

Construction

Valve Body	316 stainless steel ASTM A351 CF8M
Ball/Stem	316 stainless steel
Ball Seats	RTFE (reinforced Teflon)
Stem Seals	PTFE/ Viton
Anti-static Device	Ball to Stem (1/4" - 4") + Stem to Body (1-1/2" - 4")
Gear Drive	Heat treated steel. Self locking, additional brake not required
Actuator Enclosure	Triple layer epoxy polyester powder coated aluminum alloy, Type 4X/ IP67
Visual Valve Position Indicator	High visible multi-color LED indicator
Fasteners	Stainless Steel
Auxiliary Limit Switches	3 Programmable Relays, 0.8A/ 110 VAC, 0.5A/ 250VAC, 1.0A/ 30VDC



Description

Electric actuated 2-piece stainless steel full port ball valves are investment cast with unrestricted flow and minimum pressure loss. Adjustable live loaded stem seal packing helps compensate for wear, pressure and/or temperature fluctuations, extending the cycle life of the valve. Rugged corrosion resistant electric actuator includes a manual override, valve position confirmation switches (on-off units), and over-torque protection.

Self-locking gear drive eliminates the need for an external brake. Thermostatically controlled anti-condensation heater is standard and will help protect against condensation build-up inside the actuator.

Approvals

Actuators

- CE- EN 60730-1:2016; EN IEX 60730-2-14:2019
- CSA Listed per UL429 and CSA C22.2 No. 139-13
- RoHS Directive (EU) 2015/863- 2011/65/EU



Valves

- Design: API 608
- Testing: API 598
- Threaded Connection: ASME B1.20.1 (NPT)/ ISO 228-1/ BS21
- Pressure/Temperature Rating: ASME B16.34
- Marking: MSS SP-25
- CE conformance: PED 2014/68/UE

Construction Features

Valve position and fault codes via LED display

Triple layer epoxy polyester powder coating on aluminum Type 4X/ IP67 weather-proof enclosure

Separate power/control and feedback cables for non-intrusive wiring

Triple PTFE/Viton live loaded stem seal design, adjustable

316SS Ball and Stem, RTFE ball seats

Highly visible multi-color LED indicator

Thermostatically controlled anti-condensation heater

Heavy duty brushless DC motor with over temp/over current/ motor stall protection

Super capacitor bank recharges in seconds

Direct mount ISO5211 flange, no brackets required

Full Port 316 stainless steel ball valve



Note: The safe return option returns the valve to a fail-safe position in the event of a loss of electrical power. It is not intended and should not be used for normal operation

Pressure Rating

Pressure Rating: 1000 PSI (69 Bar) (1/4"-2")
800 PSI (55 Bar) (2-1/2"-4") CWP non-shock,
Vacuum 29inHg

Temperature Rating

Ball Valve Temperature Rating: -4 to 392° F (-20 to 200° C)
Actuator Temperature Rating: -13°F to 149°F (-25°C to 65°C)

*See P/T chart

LED Position Indicator

	Opening
	Open
	Closing
	Closed
	Fault
	Mid position (~20- 80°)
	Intermediate position (<20° or >80°)



*Indicator example

Specifications:(English units)

Stock Number	Pipe Size (NPT)	Orifice Size (inch)	Cv Flow Factor	Pressure Max.(PSI)*	Cycle Time/90° (seconds)	Voltage	Current (amps)
120 VAC ELECTRIC ACTUATED STAINLESS BALL VALVES							
591052	1/4	0.5	6.9	1000	11	110 VAC, 50/60Hz	0.32
591053	3/8	0.5	6.9	1000	11	110 VAC, 50/60Hz	0.32
591054	1/2	0.6	9.7	1000	11	110 VAC, 50/60Hz	0.32
591056	3/4	0.8	18.4	1000	11	110 VAC, 50/60Hz	0.32
591058	1	1.0	55.4	1000	11	110 VAC, 50/60Hz	0.32
591060	1-1/4	1.3	89.7	1000	11	110 VAC, 50/60Hz	0.32
591062	1-1/2	1.5	144.2	1000	12	110 VAC, 50/60Hz	0.65
591066	2	2.0	226.0	1000	18	110 VAC, 50/60Hz	0.65
591070	2-1/2	2.6	289.0	800	15	110 VAC, 50/60Hz	2.2
591074	3	3.1	454.0	800	15	110 VAC, 50/60Hz	2.2
591082	4	3.9	710.0	800	15	110 VAC, 50/60Hz	2.2
24 VDC ELECTRIC ACTUATED STAINLESS BALL VALVES							
591152	1/4	0.5	6.9	1000	11	DC24	0.7
591153	3/8	0.5	6.9	1000	11	DC24	0.7
591154	1/2	0.6	9.7	1000	11	DC24	0.7
591156	3/4	0.8	18.4	1000	11	DC24	0.7
591158	1	1.0	55.4	1000	11	DC24	0.7
591160	1-1/4	1.3	89.7	1000	11	DC24	0.7
591162	1-1/2	1.5	144.2	1000	12	DC24	1.4
591166	2	2.0	226.0	1000	18	DC24	1.4
591170	2-1/2	2.6	289.0	800	15	DC24	4.0
591174	3	3.1	454.0	800	15	DC24	4.0
591172	4	3.9	710.0	800	15	DC24	4.0

* Pressure @ 100° F (see P/T chart for maximum pressure at higher temperatures)

Specifications: (Metric units)

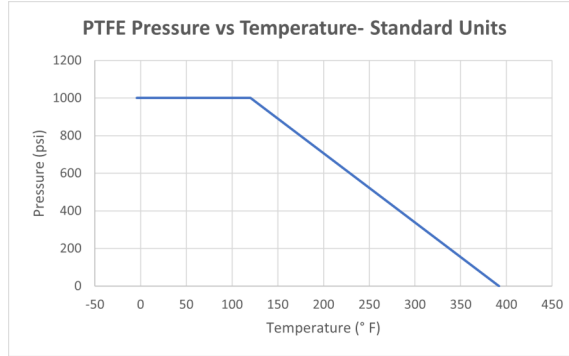
Stock Number	Pipe Size (NPT)	Orifice Size (mm)	Kv Flow Factor	Pressure Max.(Bar)*	Cycle Time/90° (seconds)	Voltage	Current (amps)
120 VAC ELECTRIC ACTUATED STAINLESS BALL VALVE							
591052	1/4	11.5	5.9	69	11	110 VAC, 50/60Hz	0.32
591053	3/8	12.5	5.9	69	11	110 VAC, 50/60Hz	0.32
591054	1/2	15.0	8.4	69	11	110 VAC, 50/60Hz	0.32
591056	3/4	20.0	15.9	69	11	110 VAC, 50/60Hz	0.32
591058	1	25.0	47.9	69	11	110 VAC, 50/60Hz	0.32
591060	1-1/4	32.0	77.6	69	11	110 VAC, 50/60Hz	0.32
591062	1-1/2	38.0	124.7	69	12	110 VAC, 50/60Hz	0.65
591066	2	50.0	195.5	69	18	110 VAC, 50/60Hz	0.65
591070	2-1/2	65.0	250.0	55	15	110 VAC, 50/60Hz	2.2
591074	3	80.0	392.7	55	15	110 VAC, 50/60Hz	2.2
591082	4	100.0	614.2	55	15	110 VAC, 50/60Hz	2.2
24 VDC ELECTRIC ACTUATED STAINLESS BALL VALVE							
591152	1/4	11.5	5.9	69	11	DC24	0.7
591153	3/8	12.5	5.9	69	11	DC24	0.7
591154	1/2	15.0	8.4	69	11	DC24	0.7
591156	3/4	20.0	15.9	69	11	DC24	0.7
591158	1	25.0	47.9	69	11	DC24	0.7
591160	1-1/4	32.0	77.6	69	11	DC24	0.7
591162	1-1/2	38.0	124.7	69	12	DC24	1.4
591166	2	50.0	195.5	69	18	DC24	1.4
591170	2-1/2	65.0	250.0	55	15	DC24	4.0
591174	3	80.0	392.7	55	15	DC24	4.0
591172	4	100.0	614.2	55	15	DC24	4.0

* Pressure @ 38° C (see P/T chart for maximum pressure at higher temperatures)

Pressure/Temperature Chart:

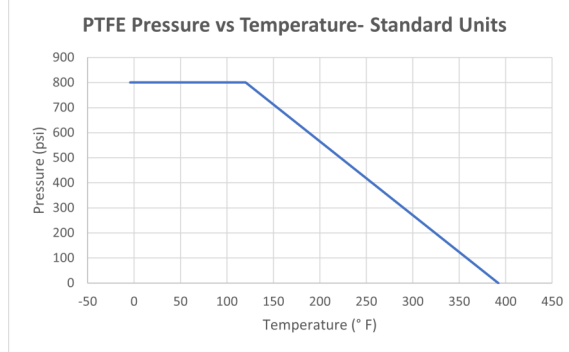
Pressure/Temp. Chart - 1000 PSI (69 Bar)

P/T Chart (PSI/°F)				
PSI	1000	1000	100	0
°F	-4	50	330	392



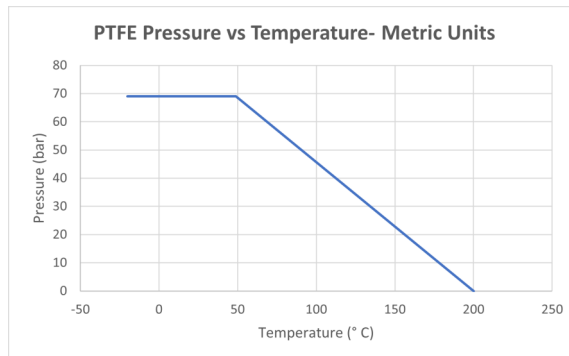
Pressure/Temp. Chart - 800 PSI (55 Bar)

P/T Chart (PSI/°F)				
PSI	800	800	100	0
°F	-4	50	330	392



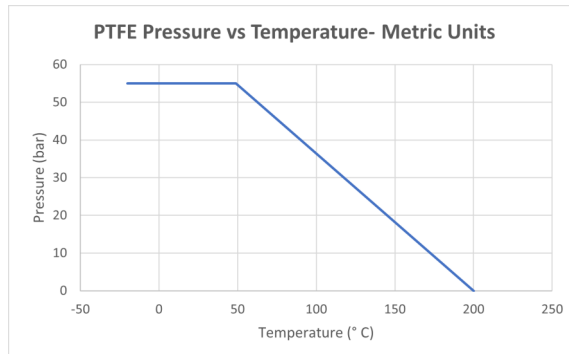
Pressure/Temp. Chart - 69 Bar (1000 PSI)

P/T Chart (BAR/°C)				
Bar	69	69	7	0
°C	-20	10	166	200



Pressure/Temp. Chart - 55 Bar (800 PSI)

P/T Chart (BAR/°C)				
Bar	55	55	7	0
°C	-20	10	166	200



Electrical Wiring

Power should be maintained to activate the internal heater. The internal heater will help prevent condensation build-up inside the actuator. The feedback cable may be replaced with a plug (P/N 591890) if it is not used.



PRIOR TO WIRING, CONFIRM THE ACTUATOR VOLTAGE IS CORRECT. APPLYING THE WRONG VOLTAGE WILL DAMAGE THE ACTUATOR AND VOID THE WARRANTY



NOTE: THE CONTROL CIRCUIT WIRING IS DRY CONTACT ONLY. DO NOT APPLY VOLTAGE TO THE CONTROL CIRCUIT TERMINALS. DOING SO WILL DAMAGE THE UNIT AND VOID THE WARRANTY.

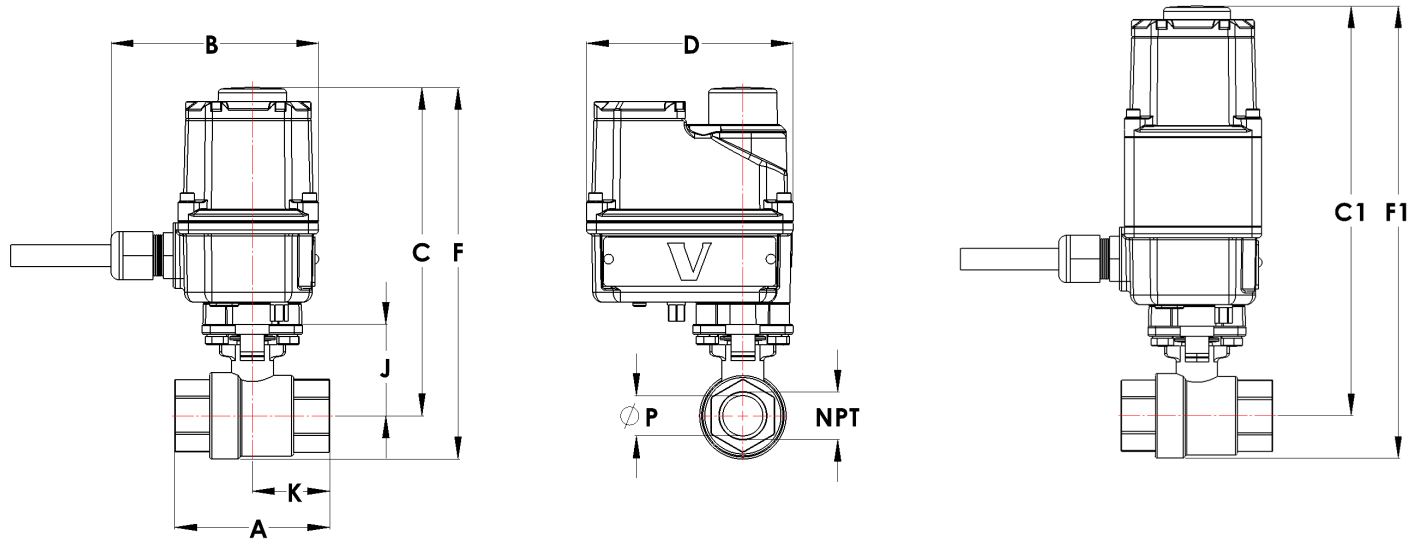
ON-OFF Valves AC Voltages

		USE DRY CONTACT ONLY DO NOT APPLY VOLTAGE ON/OFF SIGNAL			FEEDBACK SIGNAL OUTPUT				
					FAULT	CLOSE	OPEN	COM1	
1	2	3	4	5	6	7	8	9	PE
L/+ Black	N/+ White	COM Blue	Open Orange	Close Brown	NO3 Purple	NO2 Grey	NO1 Light Green	COM1 White	PE Yellow/Green

ON-OFF Valves DC Voltages

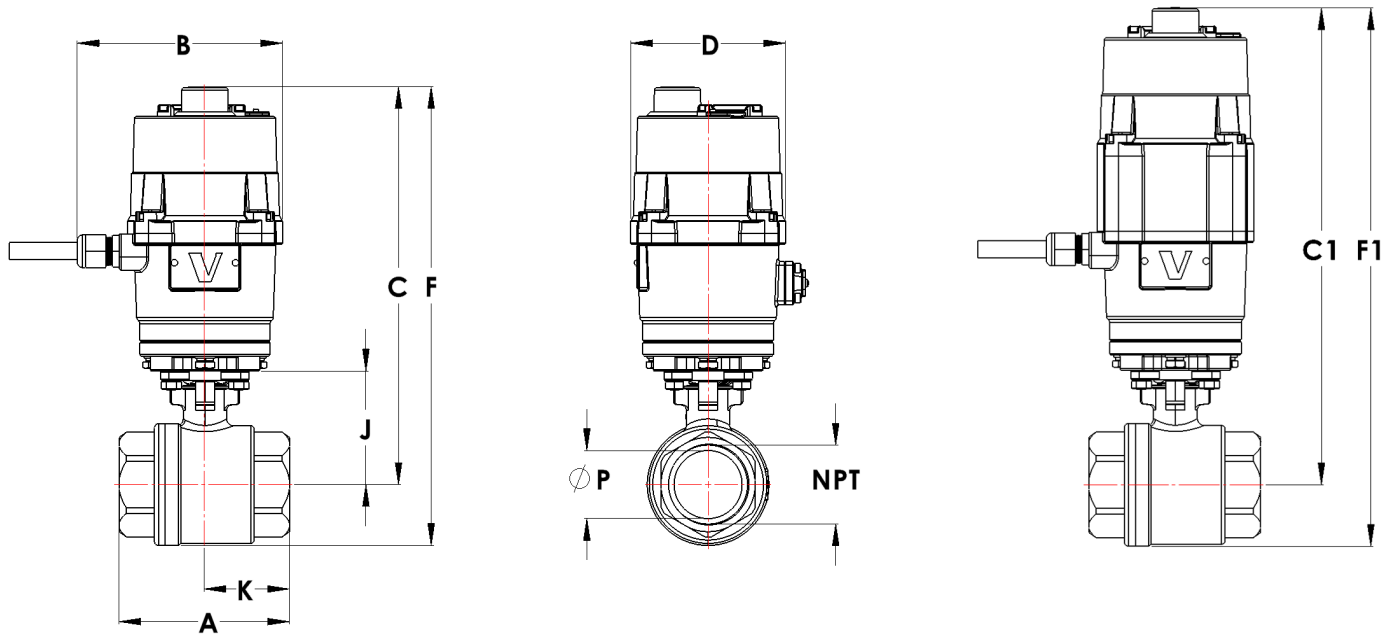
		USE DRY CONTACT ONLY DO NOT APPLY VOLTAGE ON/OFF SIGNAL			FEEDBACK SIGNAL OUTPUT				
					FAULT	CLOSE	OPEN	COM1	
1	2	3	4	5	6	7	8	9	PE
L/+ Red	N/- Black	COM Blue	Open Orange	Close Brown	NO3 Purple	NO2 Grey	NO1 Light Green	COM1 White	PE Yellow/Green

Dimensions: 1/4" - 1-1/4"



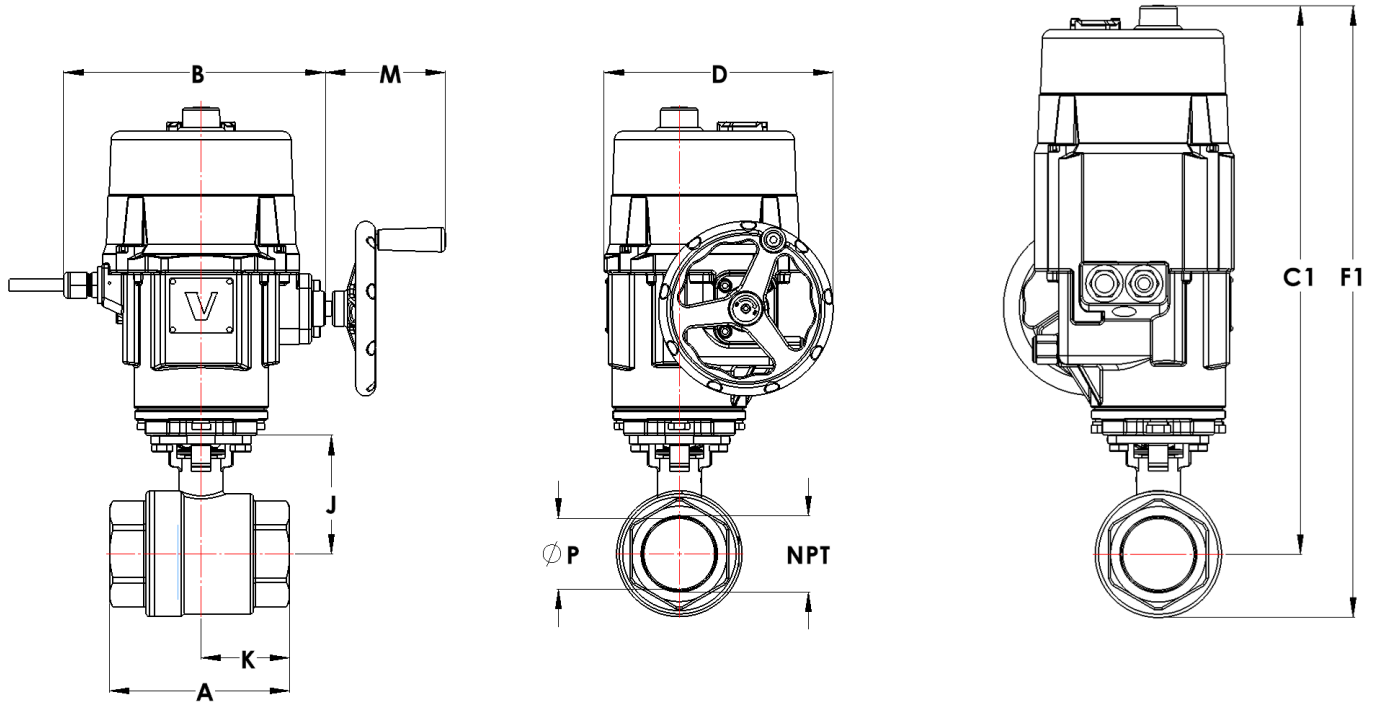
Pipe Size (NPT)		A	B	C1	D	F1	J	K	P	Weight
1/4	inch	2.6	3.3	6.1	4.1	6.7	1.5	1.2	0.5	4.5 lb
	mm	65.3	83.8	154.9	103.0	170.2	37.0	31.0	11.5	2.0 kg
3/8	inch	2.6	3.3	6.1	4.1	6.7	1.5	1.2	0.5	4.5 lb
	mm	65.3	83.8	154.9	103.0	170.2	37.0	31.0	12.5	2.0 kg
1/2	inch	2.6	3.3	6.1	4.1	6.7	1.5	1.2	0.6	4.4 lb
	mm	65.3	83.8	154.9	103.0	170.2	37.0	31.0	15.0	2.0 kg
3/4	inch	3.0	3.3	6.4	4.1	7.2	1.8	1.5	0.8	4.9 lb
	mm	77.3	83.8	162.6	103.0	182.9	45.0	38.7	20.0	2.2 kg
1	inch	3.5	3.3	6.7	4.1	7.7	2.1	1.7	1.0	5.5 lb
	mm	88.7	83.8	170.2	103.0	195.6	53.5	43.8	25.0	2.5 kg
1-1/4	inch	4.0	3.3	6.9	4.1	8.2	2.3	2.0	1.3	6.5 lb
	mm	102.4	83.8	175.3	103.0	208.3	59.0	50.7	32.0	2.9 kg

Dimensions: 1-1/2" - 2"



Pipe Size (NPT)		A	B	C1	D	F1	J	K	P	Weight
1-1/2	inch	4.3	5.7	9.0	4.5	10.5	2.9	2.2	1.5	10.9 lb
	mm	109.0	144.7	228.6	114.0	266.7	74.8	55.0	38.0	4.9 kg
2	inch	4.9	5.7	11.5	4.5	13.3	3.3	2.4	2.0	16.9 lb
	mm	125.3	144.7	292.1	114.0	337.8	83.5	62.2	50.0	7.7 kg

Dimensions: 2-1/2" - 4"



Pipe Size (NPT)		A	B	C1	D	F1	J	K	M	P	Weight
2 1/2	inch	6.5	8.3	16.1	8.3	18.1	4.3	3.2	5.3	2.6	52.2 lb
	mm	165.0	210.8	408.9	210.8	459.7	108.8	82.5	135.0	65.0	23.7 kg
3	inch	7.5	8.3	16.5	8.3	19.1	4.7	3.7	5.3	3.1	57.7 lb
	mm	189.5	210.8	419.1	210.8	485.1	118.3	94.8	135.0	80.0	26.2 kg
4	inch	9.4	8.3	17.9	8.3	21.1	6.1	4.7	5.3	3.9	72.5 lb
	mm	238.0	210.8	454.7	210.8	535.9	153.8	119.0	135.0	100.0	32.9 kg