

Plug Valves

SPM® plug valves feature quality components for dependability, minimum weight, and maximum strength.

The plug valves act as quarter-turn isolation valves, allowing operators to isolate portions of their flow line or specific pumping units from the entire pumping system in order to address pumping, operational or maintenance requirements.

The valves require minimum space, are simple to operate, exhibit a fast response, and add relatively little

internal disturbance to the flow. Pressure drop across the valve is low. SPM® plug valves are designed to reduce required operating torque to improve ease of use.

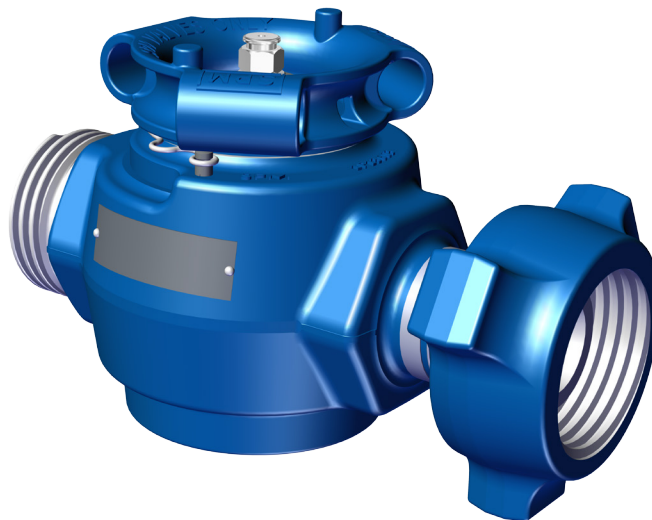
SPM® plug valves are available in sizes ranging from 1" x 2" to 4" in working pressures up to 15,000 psi. They feature precision machined and ground components, which aid in proper sealing at a wide range of operating pressures, and plating on critical areas for improved corrosion resistance.

SPM® plug valves are available with wheel (gear), hydraulic, or air actuators for most sizes of plug valves, which further enhances safety in the field. H2S plug valves are also available and conform to NACE MR1075-90 for exposure to H2S.

It is imperative that plug valves are routinely greased to promote proper performance and extend life. Operators should follow the greasing procedure outlined later in this document.

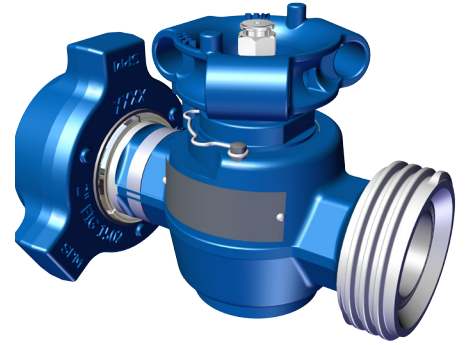
Warning

Turning valves under pressure should be avoided due to the inherent risks of SEVERE BODILY INJURY, DEATH, OR PROPERTY DAMAGE. It is recommended that remote control actuators be used for this purpose.



1" x 2" Plug Valve

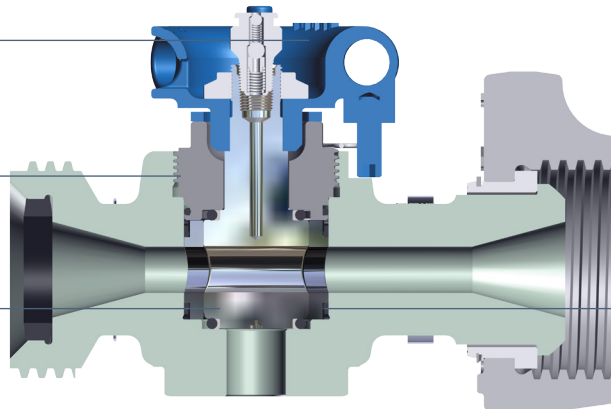
SPM® 1" x 2" plug valves provide reliable operation in a compact design. Suitable for pressures up to 15,000 psi, 1" x 2" plug valves are available in a manual, air, or hydraulic actuated configuration.



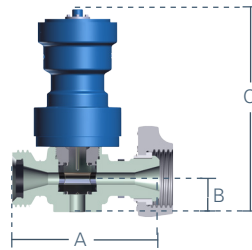
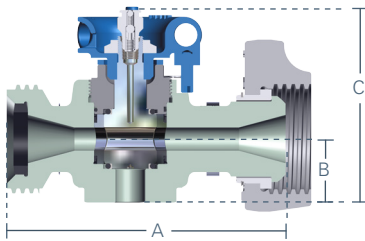
Plug bar cap has visible indication of open or closed position and detent spring to help the valve stay open or closed

Body cap seal arrangement reduces cap leakage

Nickel plated plug to reduce corrosive wear



Precision-ground seal segments create a positive seal between fluid stream and cylindrical plug



1" x 2" Plug Valve Specifications

Connec-tion Type	Actuation	Temp	Service Type	Part Number	Dim. A (in / mm)	Dim. B (in / mm)	Dim. C (in / mm)	Inner Dia. (in / mm)	Weight (lb / kg)	Parts Kit	Elastomer Kit	Seal Kit
Hammer Union	Manual	Low	Standard	1A14483	10.56 / 268.2	2.41 / 61.2	7.28 / 184.9	0.88 / 22.4	44 / 20	4L11769	4L20947	4L14203
Hammer Union	Manual	Low	Standard (Acid Service)	1A14483V	10.56 / 268.2	2.41 / 61.2	7.28 / 184.9	0.88 / 22.4	44 / 20	4L16800	4L20949	4L16783
Safety Iron®	Manual	Low	Standard	2A27975	10.07 / 255.8	2.41 / 61.2	7.28 / 184.9	0.88 / 22.4	32 / 14.5	4L11769	4L20947	4L14203
Hammer Union	Manual	Low	H2S	1A19777	10.56 / 268.2	2.41 / 61.2	7.28 / 184.9	0.88 / 22.4	44 / 20	4L20230	4L20949	4L16783
Hammer Union	Hyd.	Low	Standard	1A14483HB	10.56 / 268.2	2.41 / 61.2	14.47 / 367.5	0.88 / 22.4	86 / 39	4L11769	4L20947	4L14203
Hammer Union	Hyd.	Low	H2S	1A19777HB	10.56 / 268.2	2.41 / 61.2	14.47 / 367.5	0.88 / 22.4	86 / 39	4L20230	4L20949	4L16783
Hammer Union	Air	Low	Standard	1A14483A	10.56 / 268.2	2.41 / 61.2	16.8 / 426.7	0.88 / 22.4	64 / 29	4L11769	4L20947	4L14203
Hammer Union	No Actuator	Low	Standard	1A20391	10.56 / 268.2	2.41 / 61.2	6.29 / 159.8	0.88 / 22.4	41 / 18.6	4L11769	4L20947	4L14203

Note: Other parts or configurations may be available. Contact Weir for specific details.

Kit Contents

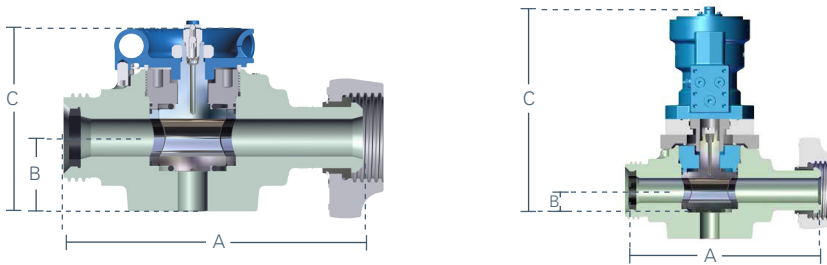
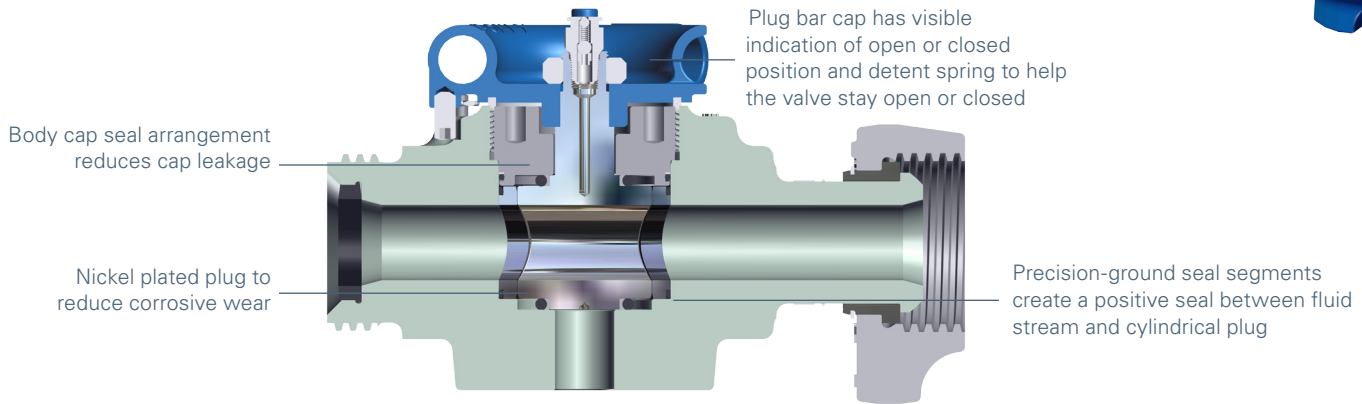
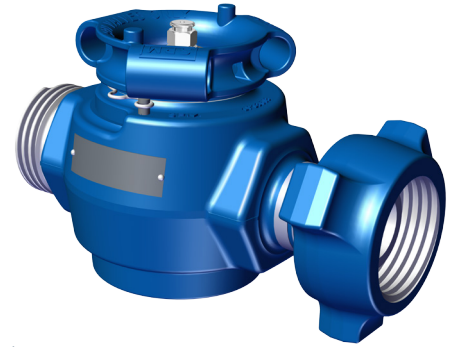
Parts Kit: plug, seals, side segments, seal segments, grease fitting, backup ring

Seal Kit: seals, backup rings, grease fitting, seal segment

Elastomer Kit: seals, backup ring

2" Plug Valve (Standard)

SPM® 2" plug valves are rated for pressures up to 15,000 psi. The SPM® 2" plug valves are available in a manual, air or hydraulic actuated configuration.



2" Plug Valve Specifications

Connection Type	Actuation	Temp	Service Type	Part Number	Dim. A (in / mm)	Dim. B (in / mm)	Dim. C (in / mm)	Inner Dia. (in / mm)	Weight (lb / kg)	Parts Kit	Elastomer Kit	Seal Kit
Hammer Union	Manual	Low	Standard	1A14487	13.88 / 352.6	3.44 / 87.4	8.88 / 225.6	1.75 / 44.5	99 / 44.9	4L11982	4L20948	4L13694
Hammer Union	Manual	Low	Std. (Acid Service)	1A20211	13.88 / 352.6	3.44 / 87.4	8.88 / 225.6	1.75 / 44.5	99 / 44.9	4L16826	4L20950	4L16824
Safety Iron®	Manual	Low	Standard	2A27973	12.25 / 317.5	2.63 / 66.8	8.19 / 208	1.75 / 44.5	79 / 35.8	4L11982	4L20948	4L13694
Hammer Union	Manual	Low	H2S	1A14492	13.88 / 352.6	3.44 / 87.4	8.88 / 225.6	1.75 / 44.5	99 / 44.9	4L20574	4L20950	4L20575
Hammer Union	Hydraulic	Low	Standard	1A14487HB	13.88 / 352.6	3.44 / 87.4	16.4 / 416.6	1.75 / 44.5	142 / 64.4	4L11982	4L20948	4L13694
Hammer Union	Air	Low	Standard	1A14487A	13.88 / 352.6	3.44 / 87.4	19.38 / 492.3	1.75 / 44.5	126 / 57.2	4L11982	4L20948	4L13694
Hammer Union	No Actuator	Low	Standard	1A24017	13.88 / 352.6	3.44 / 87.4	7.89 / 200.4	1.75 / 44.5	93 / 42.2	4L11982	4L20948	4L13694

Note: Other parts or configurations may be available. Contact Weir for specific details.

Note: Listed weights are approximate.

Kit Contents

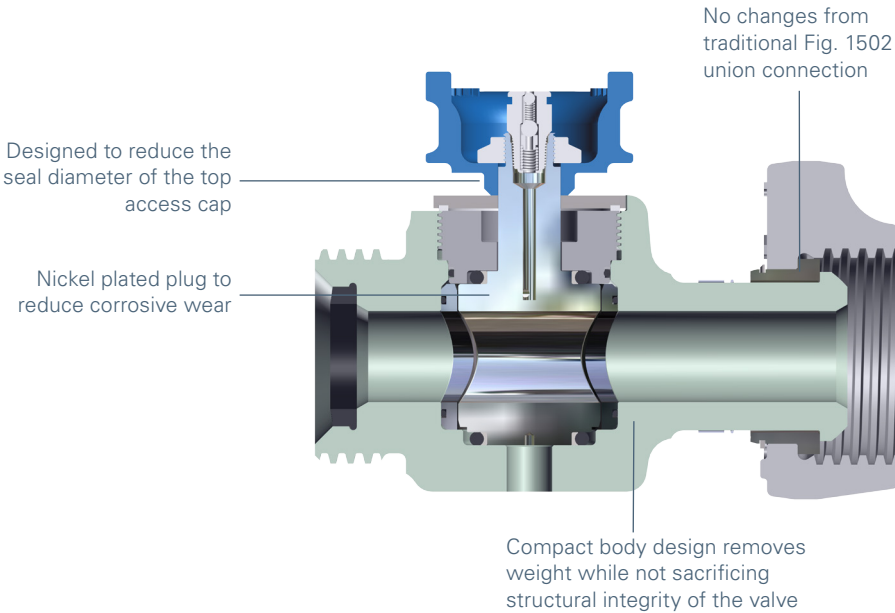
Parts Kit: plug, seals, side segments, seal segments, grease fitting, backup ring

Seal Kit: seals, backup rings, grease fitting, seal segment

Elastomer Kit: seals, backup ring

2" Light Weight Plug Valve

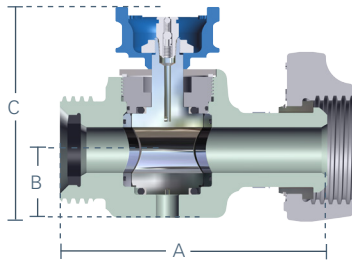
The SPM® 2" light weight (LW) plug valve is engineered with safety in mind. The valve is designed to meet HSE lifting requirements in the North Sea while maintaining Weir's high quality standards. The SPM® 2" LW plug valve is rated for non-shock, cold working pressures up to 15,000 psi.



Features and Benefits:

- Compact/Lightweight design – weighs 51 lbs. (23.1 kg)
- Meets HSE requirements for lifting by a single individual*
- Available with DNV Certification
- CE Compliant (97/23/EC)

* HSE compliant products offer a lifting weight of 55 lbs. or less to be lifted and carried by one person.



2" Light Weight Plug Valve Specifications

Connection Type	Actuation	Temp	Service Type	Part Number	Dim. A (in / mm)	Dim. B (in / mm)	Dim. C (in / mm)	Inner Dia. (in / mm)	Weight (lb / kg)	Parts Kit	Elastomer Kit	Seal Kit
Hammer Union	Manual	Low	Standard	2A29633	10.25 / 260.4	2.60 / 66	8.08 / 205.2	1.75 / 44.5	51 / 23.1	2A30161	2A30164	2A30162
Hammer Union	Manual	Low	H2S	2A36869	10.25 / 260.4	2.60 / 66	8.08 / 205.2	1.75 / 44.5	51 / 23.1	2A37146	2A37181	2A37180

Note: Other parts or configurations may be available. Contact Weir for specific details.

Note: Listed weights are approximate.

Kit Contents

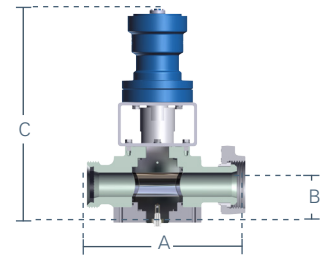
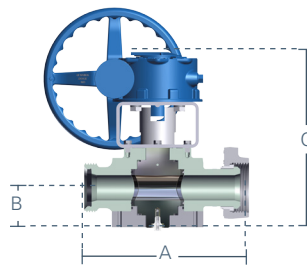
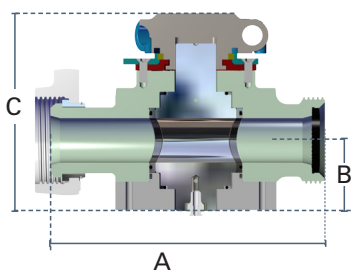
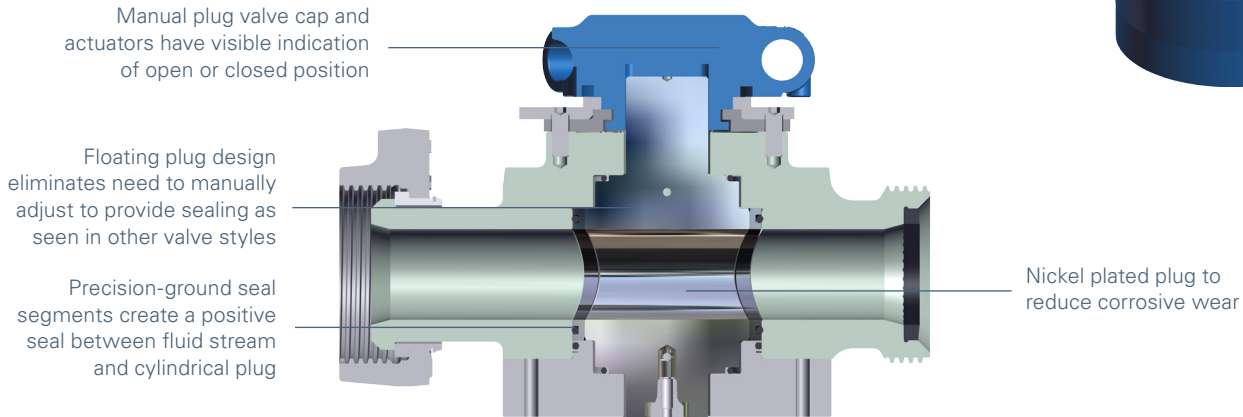
Parts Kit: plug, seals, side segments, seal segments, grease fitting, backup ring

Seal Kit: seals, backup rings, grease fitting, seal segment

Elastomer Kit: seals, backup ring

3" and 4" Plug Valve (Legacy Design)

SPM® 3" and 4" plug valves provide reliable isolation and are available in pressure ratings as high as 15,000 psi. The valves are available in multiple actuator options, including manual in the 3", as well as wheel (gear) and hydraulic in both sizes.

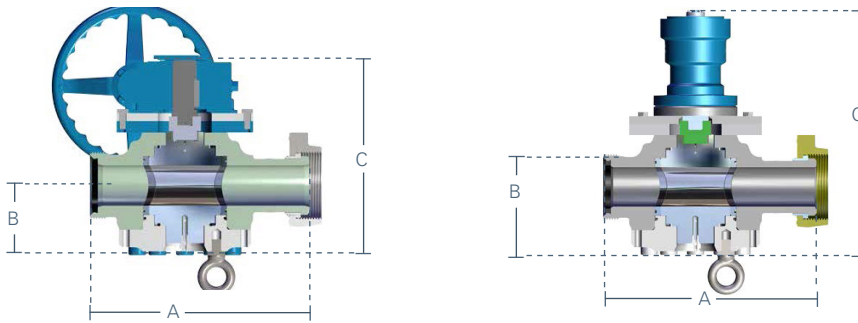


3" 1502 Plug Valve Specifications

Connection Type	Actuation	Temp	Service Type	Part Number	Dim. A (in / mm)	Dim. B (in / mm)	Dim. C (in / mm)	Inner Dia. (in / mm)	Weight (lb / kg)	Parts Kit	Elastomer Kit	Seal Kit
Hammer Union	Manual	Low	Standard	2A26611	17.00 / 431.8	4.32 / 109.7	11.83 / 300.5	2.75 / 69.8	229 / 103.9	2A39042	2A30678	2A39044
Safety Iron®	Manual	Low	Standard	2A27943	16.00 / 406.4	4.32 / 109.7	11.82 / 300.2	2.75 / 69.8	215 / 97.5	2A39042	2A30678	2A39044
Hammer Union	Gear	Low	Standard	1A14496	17.00 / 431.8	4.32 / 109.7	19.07 / 484.4	2.75 / 69.8	333 / 151	2A39042	2A30678	2A39044
Safety Iron®	Gear	Low	Standard	2A27942	16.00 / 406.4	4.32 / 109.7	19.07 / 484.4	2.75 / 69.8	320 / 145.2	2A39042	2A30678	2A39044
Hammer Union	Gear	Low	H2S	1A19585	17.00 / 431.8	4.32 / 109.7	19.07 / 484.4	2.75 / 69.8	333 / 151	2A39043	2A33788	2A39045
Hammer Union	Hydraulic	Low	Standard	1A14496H	17.00 / 431.8	4.32 / 109.7	24.32 / 617.7	2.75 / 69.8	312 / 141.5	2A39042	2A30678	2A39044
Hammer Union	Hydraulic	Low	H2S	1A19585H	17.00 / 431.8	4.32 / 109.7	24.32 / 617.7	2.75 / 69.8	312 / 141.5	2A39043	2A33788	2A39045
Hammer Union	Air	Low	Standard	1A14496A	17.00 / 431.8	4.32 / 109.7	22.14 / 562.4	2.75 / 69.8	257 / 116.6	2A39042	2A30678	2A39044
Hammer Union	No Actuator	Low	Standard	1A18962	17.00 / 431.8	4.32 / 109.7	10.32 / 262.1	2.75 / 69.8	200 / 90.7	2A39042	2A30678	2A39044
Hammer Union	No Actuator	Low	H2S	1A20933	17.00 / 431.8	4.32 / 109.7	10.32 / 262.1	2.75 / 69.8	200 / 90.7	2A39043	2A33788	2A39045

Note: Other parts or configurations may be available. Contact Weir for specific details.

Note: Listed weights are approximate.

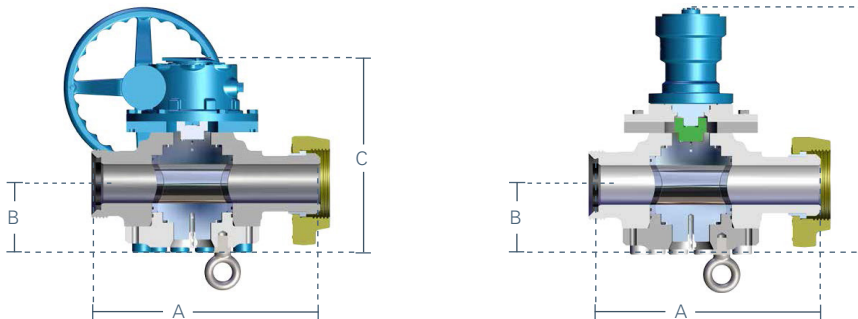


4" 1002 Plug Valve Specifications

Connection Type	Actuation	Temp	Service Type	Part Number	Dim. A (in / mm)	Dim. B (in / mm)	Dim. C (in / mm)	Inner Dia. (in / mm)	Weight (lb / kg)	Parts Kit	Elastomer Kit	Seal Kit
Hammer Union	Gear	Low	Standard	2A25182	20.50 / 520.7	5.76 / 146.3	22.71 / 576.8	3.75 / 95.3	495 / 224.5	2A26353	2A26361	2A26358
Safety Iron®	Gear	Low	Standard	2A27872	18.25 / 463.6	5.76 / 146.3	22.50 / 571.5	3.75 / 95.3	474 / 215	2A26353	2A26361	2A26358
Hammer Union	Hydraulic	Low	Standard	2A25182HB	20.50 / 520.7	5.76 / 146.3	27.24 / 691.9	3.75 / 95.3	471 / 213.6	2A26353	2A26361	2A26358
Hammer Union	No Actuator	Low	Standard	2A25154	20.50 / 520.7	5.76 / 146.3	15.31 / 388.9	3.75 / 95.3	341 / 154.7	2A26353	2A26361	2A26358

Note: Other parts or configurations may be available. Contact Weir for specific details.

Note: Listed weights are approximate.



4" 1502 Plug Valve Specifications

Connection Type	Actuation	Temp	Service Type	Part Number	Dim. A (in / mm)	Dim. B (in / mm)	Dim. C (in / mm)	Inner Dia. (in / mm)	Weight (lb / kg)	Parts Kit	Elastomer Kit	Seal Kit
Hammer Union	Gear	Low	Standard	2A25168	22.13 / 562.1	5.76 / 146.3	20.70 / 525.8	3.75 / 95.3	564 / 255.8	2A26354	2A26362	2A26359
Safety Iron®	Gear	Low	Standard	2A28135	19.25 / 489	5.76 / 146.3	22.50 / 571.5	3.75 / 95.3	538 / 244	2A26354	2A26362	2A26359
Hammer Union	Hydraulic	Low	Standard	2A25168HB	22.13 / 562.1	5.76 / 146.3	27.24 / 691.9	3.75 / 95.3	540 / 244.9	2A26354	2A26362	2A26359
Hammer Union	No Actuator	Low	Standard	2A25167	22.13 / 562.1	5.76 / 146.3	15.30 / 388.6	3.75 / 95.3	410 / 186	2A26354	2A26362	2A26359

Note: Other parts or configurations may be available. Contact Weir for specific details.

Note: Listed weights are approximate.

Kit Contents

Parts Kit: plug, seals, side segments, seal segments, grease fitting, backup ring

Seal Kit: seals, backup rings, grease fitting, seal segment

Elastomer Kit: seals, backup ring

EXL Plug Valve

The SPM® EXL plug valve is designed to provide longer life and reliable sealing performance in harsh pumping operations. The design of the valve includes a robust forged body with internal geometry designed to provide long life. Unique sealing features, also provide superior sealing performance across low and high pressure applications.

Grease distribution is critical to the life of a plug valve. It improves sealing performance, reduces friction resulting in lower torque required to actuate, and fills voids around internal components where entrapped corrosive fluids could stagnate between pumping operations. The SPM® EXL plug valve facilitates exceptional grease distribution through the utilization of dual side-entry grease inserts paired with a channelled plug that allows for improved, uniform fill.

First available in 3-inch 1502/15K configurations, the SPM® EXL plug valve is available with hammer union or SPM® Safety Iron® end connections, and can be equipped with a manual, gear/wheel or hydraulic actuator.

PATENTS PENDING

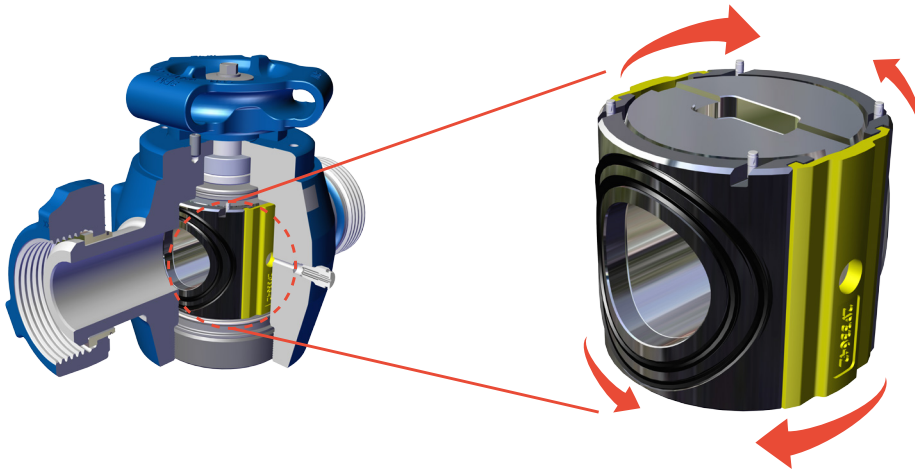
Sealing Enhancements

- The SPM® EXL plug valve features a floating plug designed to provide reliable alignment and adjustment-free operation
- The two-piece plug features a decoupled plug and stem, allowing superior floating capability which is important in seal alignment
- A thrust bearing is utilized to facilitate plug rotation with lowered torque requirement
- Plug is nickel plated for corrosion resistance and reduced friction for a lower torque requirement to actuate
- The valve utilizes dual engineered face seals on the seal segments
- The dual static face seals incorporate a self-energizing uni-directional design, each optimized to seal in one direction, to allow for superior sealing in both low- and high-pressure applications
- The SPM® EXL valve's proprietary design utilizes seal segments that are preloaded to the plug through elastomer side segments to provide an initial seal between the dynamic seal surfaces to eliminate sand trapping, decrease washouts and enhanced low- pressure sealing performance

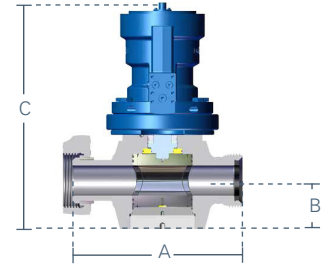
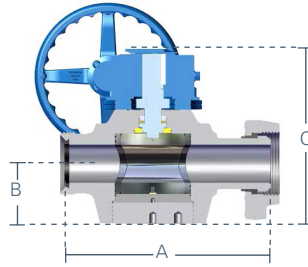
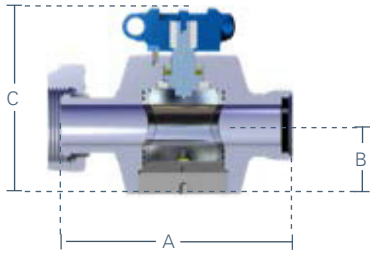


Design Features

- Robust forging with enhanced material specification and "true-bore" I.D.
- Improved grease distribution and convenient access points
- Free-floating plug design provides reliable, adjustment-free operations
- Improved sealing design for better performance across low and high pressures
- Bottom access and engineered tools for convenient maintenance
- Robust actuators for more rapid actuation
- The SPM® EXL Plug valve has a redesigned gear actuator which reduces the overall stack height by 2.74 in / 69.2mm
- CE and DNV certification available



Elastomer side segments interlock with seal segments to provide 900-lb. pre-load force



3" 1502 EXL Plug Valve Specifications

Connection Type	Actuation	Temp	Service Type	Part Number	Dim. A (in / mm)	Dim. B (in / mm)	Dim. C (in / mm)	Inner Dia. (in / mm)	Weight (lb / kg)	Parts Kit	Elastomer Kit	Seal Kit
Hammer Union	Manual	Low	Standard	2A36546	17.00 / 431.8	5.09 / 129.3	13.70 / 348.0	3.00 / 76.2	240 / 108.9	2A37019	2A37096	2A37039
Safety Iron®	Manual	Low	Standard	2A34137	16.00 / 406.4	5.09 / 129.3	13.70 / 348.0	3.00 / 76.2	224 / 101.6	2A37019	2A37096	2A37039
Hammer Union	Gear	Low	Standard	2A36659	17.00 / 431.8	5.09 / 129.3	16.33 / 414.8	3.00 / 76.2	330 / 149.7	2A37019	2A37096	2A37039
Safety Iron®	Gear	Low	Standard	2A36654	16.00 / 406.4	5.09 / 129.3	16.33 / 414.8	3.00 / 76.2	316 / 143.3	2A37019	2A37096	2A37039
Hammer Union	Hydraulic	Low	Standard	2A38171	17.00 / 431.8	5.09 / 129.3	22.63 / 574.8	3.00 / 76.2	406 / 184.2	2A37019	2A37096	2A37039

Note: Other parts or configurations may be available. Contact Weir for specific details.

Note: Listed weights are approximate.

Kit Contents

Parts Kit: plug, seals, side segments, seal segments, grease fitting, backup rings

Seal Kit: seals, backup rings, grease fitting, seal segments

Elastomer Kit: seals, backup rings

Plug Valve Greasing

SPM® plug valves are rugged, field proven products which provide easy operation and dependable service under severe operating conditions in a variety of applications. In order to maximize the valve's performance and longevity, Weir Engineering has identified a grease compound to be used in conjunction with a specific greasing procedure on all existing plug valve assemblies. Valtex 972 grease (stick) has been identified to notably increase the performance in all sizes of SPM® plug valves. It is the responsibility, though, of the end user to implement the proper maintenance procedures. Failure to follow these requirements can result in reduced valve performance and life.

It is important to note the difference between Valtex 972 "stick" and "bulk" grease. While the bulk Valtex 972 grease bears a similar description, it offers a reduced viscosity to that of the stick grease, resulting in decreased performance and longevity of the valve. Also note that a separate

grease, Valtex 1502, should be used to coat certain components during the rebuild process. **Valtex 1502 is not to be used as an operational grease.**

Approved Materials

- Valtex 1502 Assembly Grease
- Valtex 972 Operational Grease or Weir engineering approved grease

Grease Spec	Size	SPM P/N
Valtex 972 – J Stick	8 oz.	P40230
Valtex 972 – V Stick	80 oz.	P32553
Valtex 1502	112 oz.	P36791

Valtex Grease Guns or Engineering approved grease guns:

Grease Gun	Grease Gun Type	Grease Type / Size	SPM P/N
Valtex QS-5000-C	Air/Hydraulic	Valtex 972 – V Stick	2A39533
Valtex Viper QS-1800	Foot Pump	Valtex 972 – J Stick	P40156
Valtex QS-2000A	Air/Hydraulic	Valtex 972 – J Stick	P136985
Valtex 1000-31	Hand Operated	Valtex 972 – K Stick	P138565
Climax 10516	Hand Operated	Valtex 972 – J Stick	P13335
Climax 1700	Air/Hydraulic	Valtex 972 – J Stick	P23792

Plug Valve Grease Procedure (Legacy Plug Valves)

- Flush valve with clean water to wash away any contaminants in the valve.
 - The valve must be in the open position prior to pumping the grease. Pump the operational grease, Val-Tex 972, into the valve using the grease gun.
 - Cycle the valve and grease per the following criteria:
 - Pump to 2000 psi – close and open valve
 - Pump to 4000 psi – close and open valve
 - Pump to 6000 psi – close and open valve
- NOTE:** Air will be heard “popping” during opening and closing. This will allow for a more complete filling of grease in the valve.
- Visually inspect the inside of the valve to determine if the grease is extruding around the sides of the plug.
 - **For Rework Only:** Engineering requires the use of Val-Tex 1502 assembly grease when disassembly and rebuild of the valve is required. Completely coat with grease the O.D. of the plug and seal segments. Reassemble valve using new seal components.

NOTE: The mixing of operational grease types/brands is not recommended. Grease mixing can result in a decrease of valve performance and/or increase the required regreasing frequency.

Weir recommends operational re-greasing at a minimum after every six stages or six valve turn operations.

Plug Valve Grease Procedure (EXL Plug Valves)

Re-kitting Grease Procedure

During the rebuild of the EXL Plug Valve it is imperative that the following grease procedure be followed. A hydraulic grease machine that is capable of delivering grease at pressures above 2,000 psi should be used:

- Assemble valve and position on a secure table with the appropriate end connection (Hammer Union or Safety Iron®)
- Ensure that the plug valve is in the OPEN position
- Position grease end connection onto grease fitting on Side 1 of the plug valve
- Pump grease until the gauge reaches 2,000 psi
- Rotate valve to CLOSED position then back to the OPEN position
- Position grease end connection onto grease fitting on Side 2 of the plug valve
- Pump grease until the gauge reaches 2,000 psi
- Rotate valve to CLOSED position then back to the OPEN position
- Valve is ready for service

Preventative Maintenance Grease Procedure

- After each job, flush valve with clean water to wash away any contaminants in the valve. Upon completion of the job, grease with approved SPM® valve grease to displace contaminants in between valve’s internal components.
- To maximize the valve’s performance and longevity, it is recommended that the lubrication maintenance procedure described below be followed:
 - Verify that the valve is in the OPEN position before pumping grease
 - Using a hand pump grease gun (or grease machine), pump the lever in order to push the grease into the valve. Val-tex 972 (SPM® PN P32552) stick grease is recommended
 - If using a pneumatic grease gun, SPM® PN P28682 grease can be used
 - Grease side of the valve to 2000 psi
 - Close and reopen valve
 - Repeat through grease insert on opposite side of valve. While greasing both sides of the valve is not required, for instance if one side is not accessible, it is recommended to grease from both sides when possible.

Weir recommends operational re-greasing at a minimum after every fracturing job or 20 stages (whichever comes first).