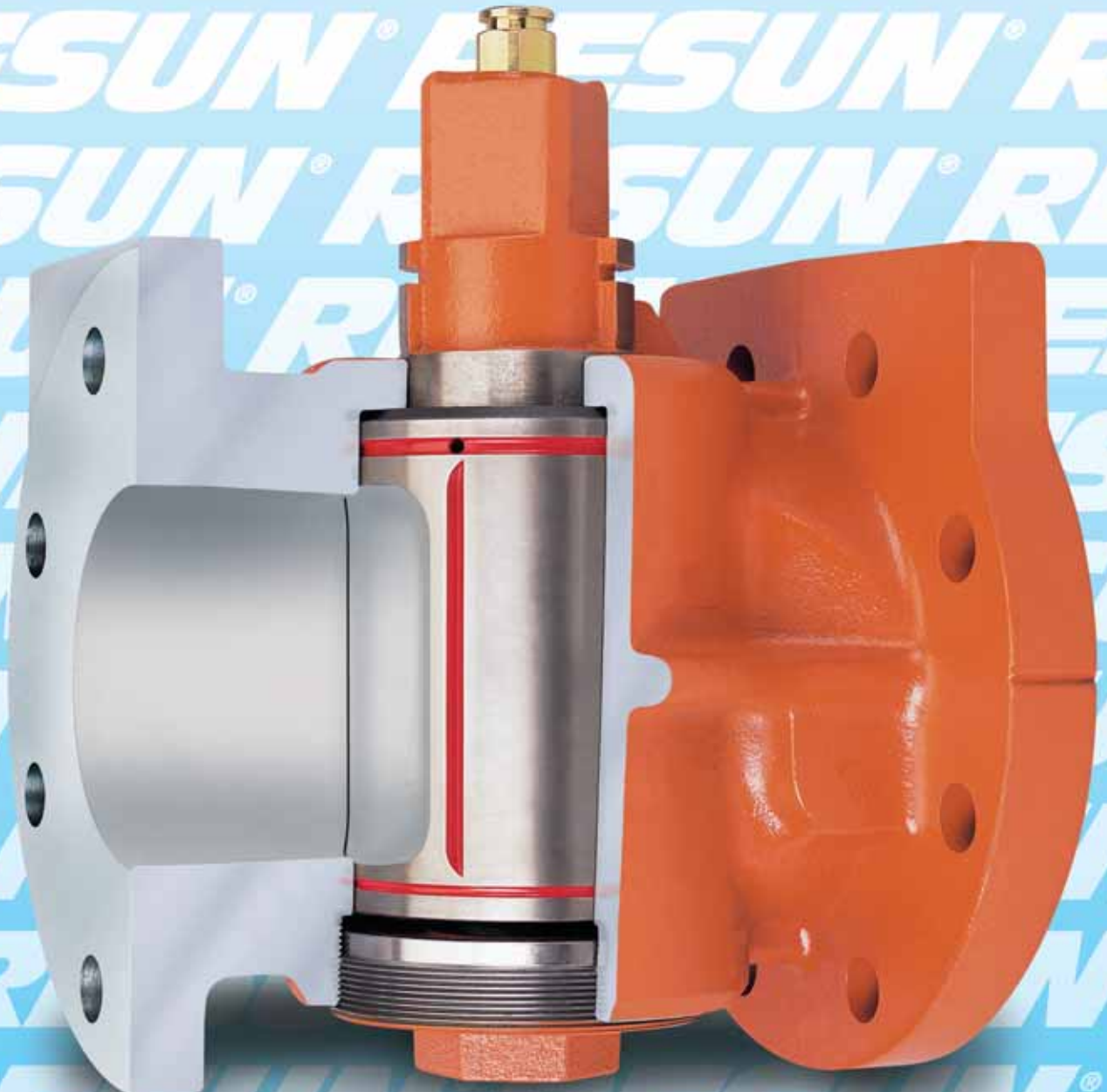
R&M ENERGY SYSTEMS

A Unit of Robbins & Myers, Inc.



RESUN®

CAST IRON LUBRICATED PLUG VALVES

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R&M ENERGY SYSTEMS
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Quality Policy

R&M ENERGY SYSTEMS
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R&M Energy Systems is committed to understanding and fulfilling customer needs through the design, manufacture and delivery of high quality products.

R&M Energy Systems maintains a Quality Management System that is dedicated to continuous improvement through excellence in innovation and employee participation.

Employees are responsible for achieving the quality objectives established by R&M Energy Systems by providing products and services that consistently meet specified requirements.

The RESUN plug valve, industry's "Old Reliable," is used in countless industrial and general utility applications. The following are a few major categories of the many specific applications in which the RESUN valve provides reliable, uninterrupted, leak-free service:

- Chemical and petrochemical processing
- Petroleum gathering and distribution
- Gas distribution systems
- Water and wastewater
- Heating, air conditioning (HVAC)
- Food and beverage processing
- Pulp and paper
- Paint, varnish, lacquer and ink
- Asphalt and other viscous materials
- Cement and ore slurries

Standard material for RESUN plug valves is a high tensile cast iron made to RESUN specifications & in compliance with ASTM A-126 Class B standards. All specifications in this catalog are for valves of this material.

RESUN plug valves can be supplied in ductile iron on special orders.

UL, CGA, and AGA approval is available on valve models so noted in this catalog when specified on the customer's purchase order.

Specific Advantages of the RESUN Plug Valve:

- **Rugged construction –** Large RESUN plug valves can even shear a two-by-four board.
- **Low cost**
- **Readily available**
- **Maximum port openings –** Full pipe area is available to minimize turbulence, erosion and pressure drop.
- **Ease of operation –** Unlike the tapered plugs of other plug valves, the RESUN cylindrical plug turns easily without binding or seizing, at the pressures and temperatures within its operating limits.
- **Minimum maintenance –** Only a small initial charge of sealant is required with occasional recharging for easy operation. The basic construction of the valve simplifies any service or parts replacement which might become necessary.

See RESUN catalog CS for lubricated plug valves manufactured in carbon steel.

R&M Energy Systems will consider any reasonable modification of the plug valve that makes it more appropriate to the needs of the customer.

Round port, full-opening, through-conduit RESUN plug valves are ideal for slurries or other services where only minimum flow restrictions can be tolerated or where any pressure drop is unacceptable.

RESUN multi-port plug valves are available in many flow plans for blending and diverting services.

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The cylindrical plug of the RESUN valve turns easily on a film of sealant, providing a leak-free seal. This design permits maximum port openings through the plug, including full pipe area, a distinct advantage over tapered plugs. And, since tapered plug valves often "lock up" and require re-lubrication each time the valve is to be cycled, the RESUN valve requires only an occasional charge of sealant to operate efficiently.

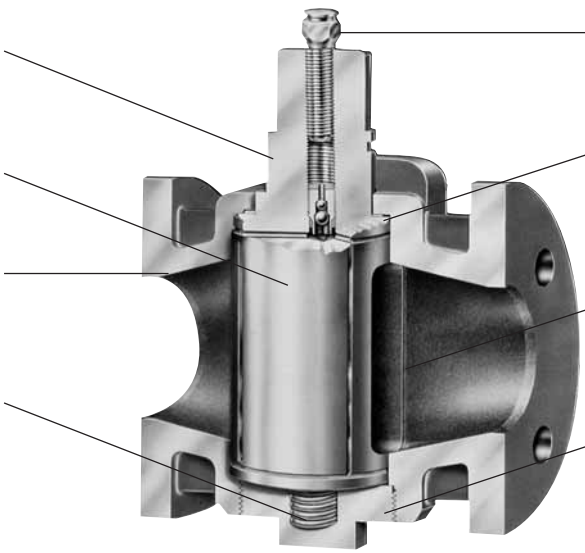
The Key to the RESUN Plug Valve's Success: its Cylindrical Plug Design

PRIMARY FEATURE- Excess sealant discharges around stem, not in the line. With no pressure build-up; no contamination of flow media or fouling of instruments.

CYLINDRICAL PLUG- fits closely, yet turns as easily as a shaft in a journal bearing.

BODY is a one-piece casting.

SPRING thrusts plug and TFE head gasket against head seat.



SEALANT SCREW with giant buttonhead fitting for injection of either bulk or stick sealant.

HEAD GASKET gives tight stem seal.

SEATING SURFACES are not exposed to flow.

BASEPLATE seats tightly, is removable to permit disassembly. (Larger valves have bolted top cover plate).

COMPACT CONSTRUCTION

RESUN valve's compact construction permits installation in tight spaces. The valves install in any orientation without special tools.

PROTECTED SURFACES

All wear surfaces are constantly supplied with fresh sealant, protecting against corrosion and abrasion. Even in the open position, seating surfaces are protected from the flow media.

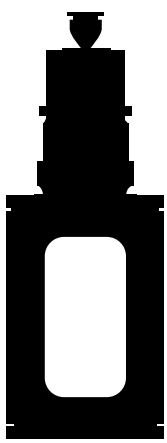
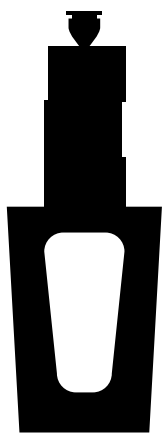
MINIMUM MAINTENANCE

A minimum of regular maintenance (charging with sealant) will keep a RESUN plug valve in top operating condition for long periods. If necessary, the valves can be disassembled, cleaned and reassembled quickly and easily. There are no dead pockets where sealant and contaminants can accumulate or solidify.

TIGHT HEAD SEAL

A specially contoured TFE head gasket, backed up by sealant and spring pressure, creates a tight head seal. The lubricity of the TFE contributes to the ease of operation.

Comparison of RESUN Cylindrical Plug Features with Conventional Tapered Plugs

RESUN Cylindrical Plug		Tapered Plug	
	Larger port opening, including full pipe area.	Restricted openings; no full area.	
	Will not bind; operates easily at all pressures and temperatures within its stated limits.	Can bind under large pressure differential and under high or low temperature. At higher pressures, must be jacked-up to turn.	
	Requires only occasional lubrication for easy operation.	May require lubrication before each operation.	
	Lower consistent torque, smaller, less expensive actuator and less maintenance.	Inconsistent higher torque requires difficult adjustments and larger, more expensive actuator.	

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Rectangular ports are available in both 100% port area and regular port designs. 100% ports are round-cornered and proportioned to provide full flow with minimum turbulence. Regular ports less than 100% opening are preferred where price is the prime factor and where pressure drop and pattern of flow are less critical. With a memory stop and indicator plate, they are ideal as balancing valves.

Round port, 100% opening, through-conduit RESUN valves provide unrestricted flow and are ideal for slurries and heavy viscous mediums, and for service where virtually no pressure drop can be tolerated. This unrestricted flow is an absolute "must" if the piping system is to be internally scraped or pigged to maintain I.D.

Venturi port pattern valves utilize the principles of streamlined flow allowing a reduction in port size while minimizing pressure drop. This design keeps price, bulk and operating torque at a minimum. Available in valves 6" and larger.

Multi-port valves for blending and diverting services are available in several pressures, styles and flow patterns.

Simplicity

Design simplicity contributes to long, trouble-free operation without maintenance other than periodic servicing with sealant. The standard wrench-operated valve consists of only five parts plus body and baseplate.

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RECTANGULAR PORT THREADED

Wrench and worm gear operated, regular opening and full pipe area, 1/2" to 4" sizes, 200 to 800 psi WOG.

ROUNDED PORT THREADED

Wrench and worm gear operated, 1/2" to 4" sizes, 200 psi WOG.

RECTANGULAR PORT FLANGED

Short and long pattern, wrench and worm gear operated, regular opening and full pipe area, 1" to 18" sizes, 150 to 500 psi WOG.

ROUNDED PORT FLANGED

Wrench and worm gear operation, 1" to 12" sizes, 200 psi WOG.

RECTANGULAR PORT VENTURI

Flanged configuration. Wrench and worm gear operation, 150 to 400 psi WOG, 6" to 30" sizes.

TOTALLY ENCLOSED WORM GEAR OPERATORS

Low-torque, compact worm gear operators are totally enclosed for protection of gearing.

TOP-ENTRY CONSTRUCTION

Bolted cover plate standard. Full pipe area: 200, 400 psi WOG: 8" size up- 500 psi WOG: 6" size up- Round Port: 5" size up-Venturi, 200, 400 psi WOG: 10" size up. Multi-port: 6" size up.

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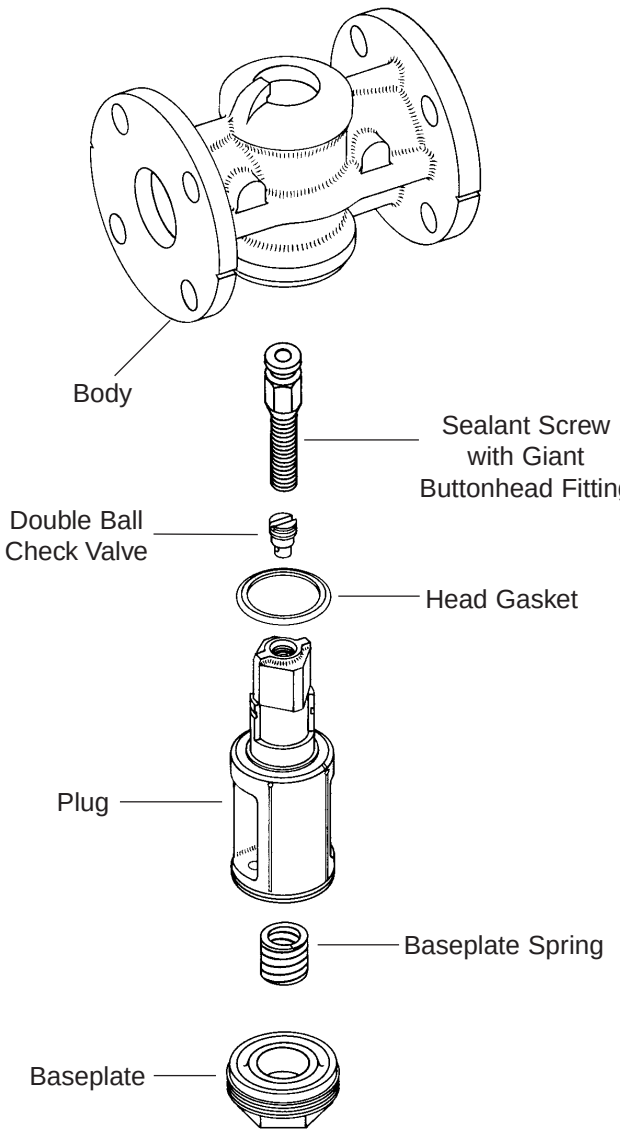
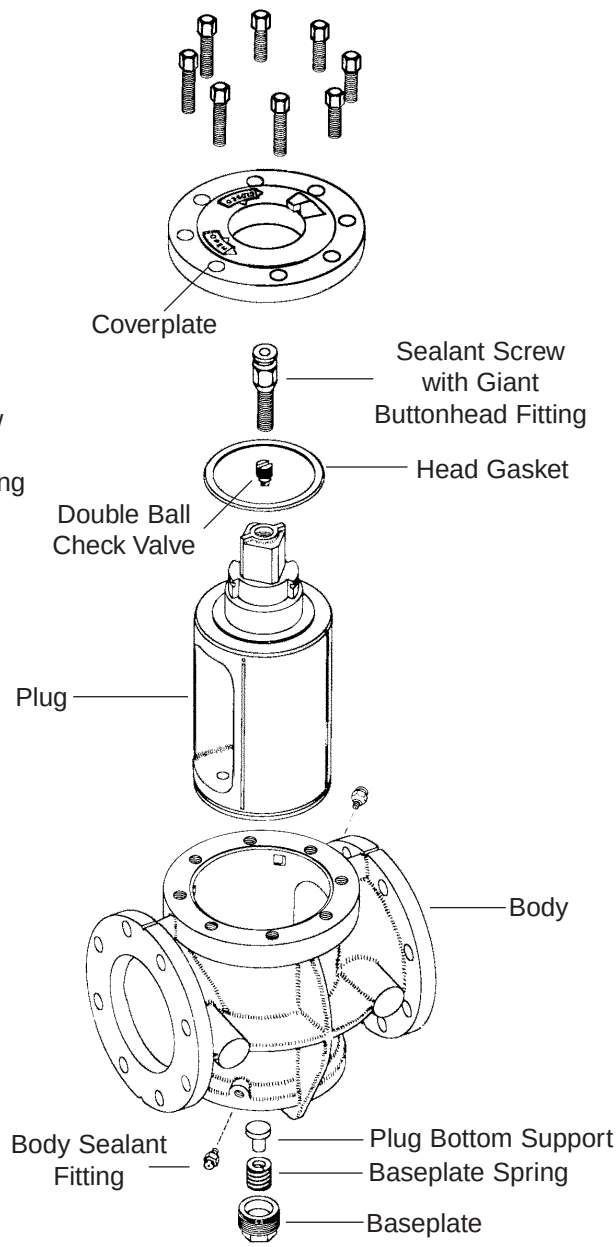
Bottom-Entry Components



Top-Entry Components



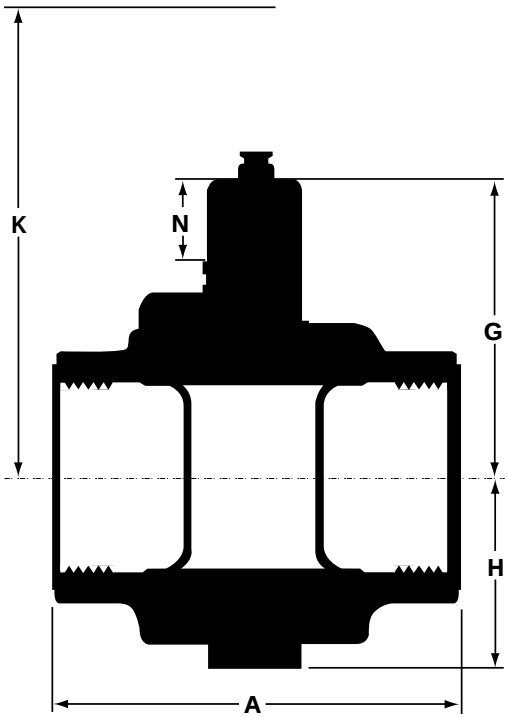
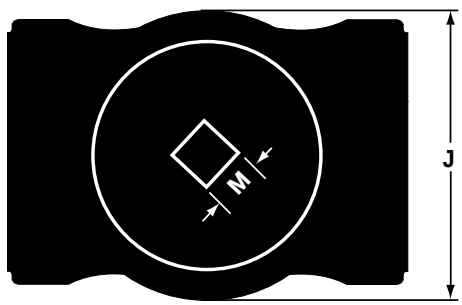


Fig.R-1430
Wrench-Operated

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE



Upon Request

Dimensions -Regular Opening, Rectangular Port Valves R-1430

DESCRIPTION		BOTTOM ENTRY								
SIZE		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
A	End-to-end	3 7/8	3 7/8	3 7/8	5	5	5 3/4	6 3/4	7 1/2	9
H	Center of Port to Bottom of Valve	1 7/8	1 7/8	1 7/8	2 1/8	2 3/8	2 5/8	3 1/8	3 1/4	4 1/4
J	Extreme Width of Body	2 1/2	2 1/2	2 1/2	2 5/8	2 3/4	3 3/8	4 1/4	5	6 1/4
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	5/8
	STEM DATA									
G	Center of Port to Top of Stem	3 5/8	3 5/8	3 5/8	3 5/8	3 5/8	3 7/8	5	5 1/4	6 5/8
K	Clearance to Remove Lubricant Screw	5 7/8	5 7/8	5 7/8	5 7/8	5 3/4	6 1/8	7 1/4	7 1/2	10 1/8
M	Width of Square of Stem	15/16	15/16	15/16	15/16	15/16	15/16	1 1/4	1 1/4	1 3/4
N	Height of Square of Stem	1 3/8	1 3/8	1 3/8	1 3/8	1 1/8	1 1/8	1 3/8	1 3/8	1 7/8
	Wrench	A	A	A	A	A	A	C	C	F
	Wt. (lb.)	4	4	4	5	6	9	15	21	40

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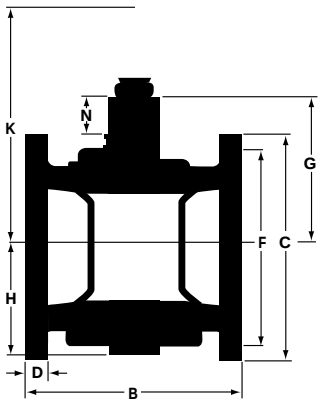
RESUN® Rectangular Port, Regular Opening R-1431

200 PSI WOG-Flanged End
125 PSI SWP

Upon Request

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE
Body Sealant Fitting: Commercial Steel (8", 10" & 12" only).



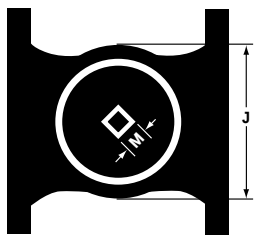
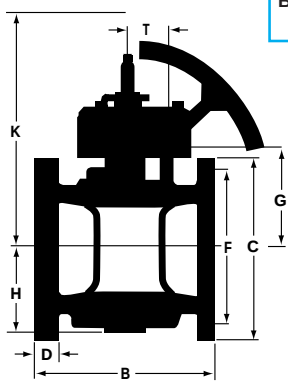


Fig.R-1431
Wrench-Operated



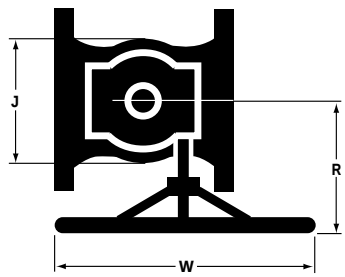


Fig.R-1431 WGA
Worm Gear-Operated

Dimensions -Regular Opening, Rectangular Port Valves R-1431

DESCRIPTION		BOTTOM ENTRY											
SIZE		1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
B	Face-to-Face Flanged	5 1/2	6	6 1/2	7	7 1/2	8	9	10	10 1/2	11 1/2	13	14
H	Center of Port to Bottom of Valve	1 7/8	2 5/8	2 3/8	2 5/8	3 1/8	3 1/4	4 1/4	5 1/8	5 1/8	6 1/8	7 5/8	9 3/4
J	Extreme Width of Body	2 1/2	3 7/8	3	4	4 3/4	5 1/2	6 7/8	7 1/2	7 1/2	10	12	13 1/2
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	3/8	3/8	5/8	5/8	5/8	5/8	5/8	5/8
FLANGE DATA													
C	Diameter of Flanges	4 1/4	4 5/8	5	6	7	7 1/2	9	10	11	13 1/2	16	19
D	Thickness of Flanges	7/16	1/2	9/16	5/8	11/16	3/4	15/16	15/16	1	1 1/8	1 3/16	1 1/4
E	No. and Size of Bolts	4-1/2	4-1/2	4-1/2	4-5/8	4-5/8	4-5/8	8-5/8	8-3/4	8-3/4	8-3/4	12-7/8	12-7/8
F	Diameter of Bolt Circle	3 1/8	3 1/2	3 7/8	4 3/4	5 1/2	6	7 1/2	8 1/2	9 1/2	11 3/4	14 1/4	17
STEM DATA													
G	Center of Port to Top of Stem	3 5/8	3 7/8	3 5/8	3 7/8	5	5 1/4	6 5/8	7 1/2	7 1/2	8 1/2	10 3/4	13 1/4
K	Clearance to Remove Lubricant Screw	5 7/8	6 1/8	5 3/4	6 1/8	7 1/4	7 1/2	10 1/8	10 7/8	10 7/8	11 7/8	14 1/8	16 5/8
M	Width of Square of Stem	15/16	15/16	15/16	15/16	1 1/4	1 1/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	2
N	Height of Square of Stem	1 3/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 7/8	1 7/8	1 7/8	1 7/8	2 1/8	2 3/8
	Wrench	A	A	A	A	C	C	F	H-24	H-24	H-30	H-36	K-36
	Wt. (lb.)	6	10	10	20	28	38	66	87	96	158	248	387
WORM GEAR-OPERATED													
K	Clearance to Remove Lubricant Screw								13	13	14	16 1/4	18 3/4
R	Center of Port to Handwheel Face								11	11	11	12 1/4	12 3/4
S	Center of Port to Center of WGA Shaft								7	7	7 15/16	10 3/8	13 5/4
T	Center of Plug Stem to Center of WGA Shaft								2 9/16	2 9/16	2 9/16	3 1/8	4 7/8
W	Diameter of WGA Handwheel								12	12	12	16	16

Flanges are drilled to ANSI B.16.1 Class 125 Cast Iron Flange Standard unless otherwise specified. No deduction for valves faced only. Bolt holes are drilled 1/8" larger than bolts.

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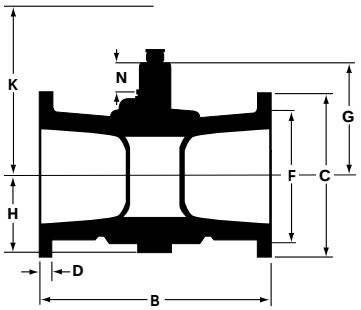


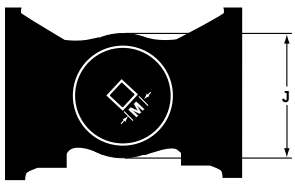
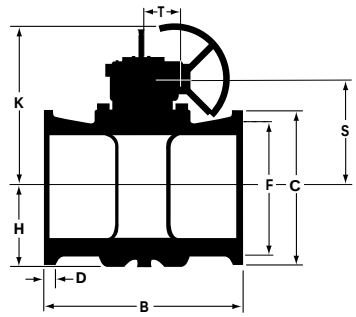


Fig.DV-151
Wrench-Operated
6"-10" 200 PSI WOG 125 PSI SWP



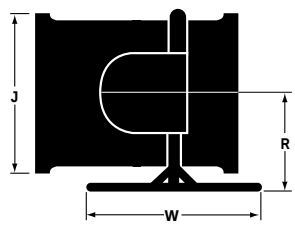


Fig.DV-151 WGA
Worm Gear-Operated

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
***Cover Plate:** ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE
***Bolts:** Steel A 193 Grade 5
***Body Sealant Fitting:** Commercial Steel (Also Available on 10" Size)
***Plug Bottom Rest:** Commercial Steel

**Applicable only to top entry designs*

Dimensions -Venturi Pattern, Rectangular Port Valves DV-151

DESCRIPTION		BOTTOM ENTRY		
SIZE		6	8	10
B	Face-to-Face Flanged	15 1/2	18	21
H	Center of Port to Bottom of Valve	5 1/8	6 1/8	6 7/8
J	Extreme Width of Body	9 1/2	11 3/8	13 3/8
L	Diameter of Sealant Stick	5/8	5/8	5/8
FLANGE DATA				
C	Diameter of Flanges	11	13.5	16
D	Thickness of Flanges	1	1 5/8	1 3/16
E	No. and Size of Bolts	8-3/4	12-7/8	12-7/8
F	Diameter of Raised Face	9 1/2	11 7/8	14 1/4
WRENCH OPERATED				
G	Center of Port to Top of Stem	7 1/2	8 1/2	9 1/8
K	Clearance to Remove Lubricant Screw	10 7/8	11 7/8	12 1/2
M	Width of Square of Stem	1 3/4	1 3/4	1 3/4
N	Height of Square of Stem	1 7/8	1 7/8	1 7/8
	Wrench	H-24	H-30	H-36
	Wt. (lb.)	110	213	324
WORM GEAR-OPERATED				
K	Clearance to Remove Lubricant Screw	14 9/16	15 9/16	16 3/16
R	Center of Port to Handwheel Face	10 1/8	10 1/8	10 1/8
S	Center of Port to Center of WGA Shaft	7	7 7/8	9
T	Center of Plug Stem to Center of WGA Shaft	2 9/16	2 9/16	3 1/8
	Diameter of WGA Handwheel	12	12	16

Flanges are drilled to ANSI B.16.1 Class 125 Cast Iron Flange Standard unless otherwise specified.
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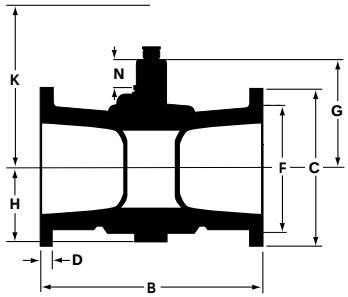


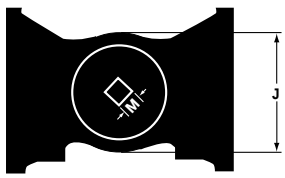
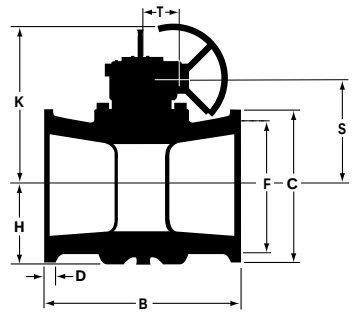


Fig.DV-251
Wrench-Operated

6"-10" 400 PSI WOG **250 PSI SWP**



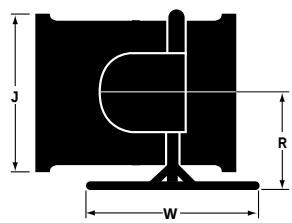


Fig.DV-251 WGA
Worm Gear-Operated

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
***Cover Plate:** ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE
***Bolts:** Steel A 193 Grade 5
***Body Sealant Fitting:** Commercial Steel
(Also Available on 10" Size)
***Plug Bottom Rest:** Commercial Steel

**Applicable only to top entry designs*

Dimensions -Venturi Pattern, Rectangular Port Valves DV-251

DESCRIPTION		BOTTOM ENTRY		
SIZE		6	8	10
B	★Face-to-Face Flanged Raised Face	16 3/8	19	22 3/8
H	Center of Port to Bottom of Valve	5 1/8	6 1/8	6 7/8
J	Extreme Width of Body	9 3/8	11 3/8	13 1/2
L	Diameter of Sealant Stick	5/8	5/8	5/8
FLANGE DATA				
C	Diameter of Flanges	12 1/2	15	17 1/2
D	★Thickness of Flanges	1 7/16	1 5/8	1 7/8
E	No. and Size of Bolts	12-3/4	12-7/8	16-1
F	Diameter of Raised Face	9 5/8	11 7/8	14 1/8
WRENCH OPERATED				
G	Center of Port to Top of Stem	7 1/2	8 1/2	9 1/8
K	Clearance to Remove Lubricant Screw	10 7/8	11 7/8	12 1/2
M	Width of Square of Stem	1 3/4	1 3/4	1 3/4
N	Height of Square of Stem	1 7/8	1 7/8	1 7/8
	Wrench	H-24	H-30	H-36
	Wt. (lb.)	151	256	389
WORM GEAR-OPERATED				
K	Clearance to Remove Lubricant Screw	14 9/16	15 9/16	16 3/16
R	Center of Port to Handwheel Face	10 1/8	10 1/8	13 1/8
S	Center of Port to Center of WGA Shaft	7	8 1/4	10
T	Center of Plug Stem to Center of WGA Shaft	2 9/16	3 1/8	4 5/8
W	Diameter of WGA Handwheel	12	16	16

Flanges are drilled to ANSI 250 PSI Cast Iron Flange Standard unless otherwise specified. No deduction for valves faced only. Bolt holes are drilled 1/8" larger than bolts.
★ Includes 1/16" raised face.

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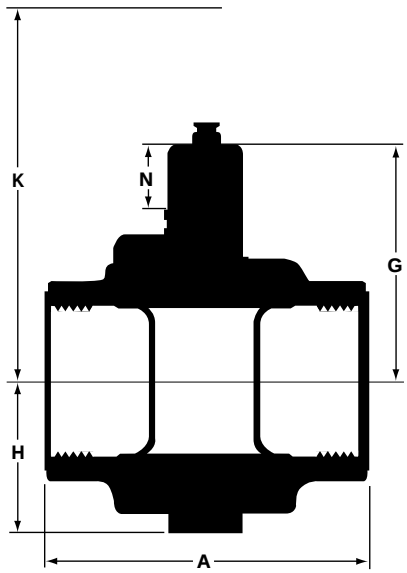
RESUN® Rectangular Port, Full Pipe Area D-125/D-250 200/400 PSI WOG-Threaded End



Upon Request

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE

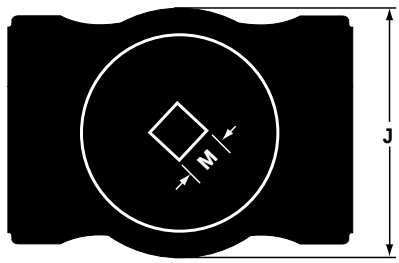


Fig.D-125
Wrench-Operated
200 PSI WOG
125 PSI SWP

Fig.D-250
Wrench-Operated
400 PSI WOG
250 PSI SWP

Dimensions -Full Pipe Area, Rectangular Port Valves D-125

DESCRIPTION		BOTTOM ENTRY								
SIZE		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
A	End to End	3 7/8	3 7/8	3 7/8	5	5	6	6 3/4	7 1/2	10
H	Center of Port to Bottom of Valve	2 1/8	2 1/8	2 1/8	2 3/8	2 5/8	3 1/8	3 1/4	4 1/4	5 1/8
J	Extreme Width of Body	2 1/2	2 1/2	2 1/2	2 5/8	3	4 1/4	5	6 1/4	7 1/2
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	3/8	3/8	3/8	5/8	5/8
STEM DATA										
G	Center of Port to Top of Stem	3 5/8	3 5/8	3 5/8	3 5/8	3 7/8	5	5 1/4	6 5/8	7 1/2
K	Clearance to Remove Lubricant Screw	5 7/8	5 7/8	5 7/8	5 7/8	6 1/4	7 1/4	7 1/2	10 1/16	10 15/16
M	Width of Square of Stem	15/16	15/16	15/16	15/16	15/16	1 1/4	1 1/4	1 3/4	1 3/4
N	Height of Square of Stem	1 3/8	1 3/8	1 3/8	1 1/8	1 1/8	1 3/8	1 3/8	1 7/8	1 7/8
	Wrench	A	A	A	A	A	C	C	F	H-24
	Weight	4	4	4	7	8	12	18	34	61

Dimensions -Full Pipe Area, Rectangular Port Valves D-250

DESCRIPTION		BOTTOM ENTRY								
SIZE		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
A	End to End	3 7/8	3 7/8	3 7/8	5	5	6	6 3/4	7 1/2	10
H	Center of Port to Bottom of Valve	2 1/8	2 1/8	2 1/8	2 3/8	2 5/8	3 1/8	3 1/4	4 1/4	5 1/8
J	Extreme Width of Body	2 1/2	2 1/2	2 1/2	2 5/8	3	4 1/4	5	6 1/4	7 1/2
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	3/8	3/8	3/8	5/8	5/8
STEM DATA										
G	Center of Port to Top of Stem	3 5/8	3 5/8	3 5/8	3 5/8	3 7/8	5	5 1/4	6 5/8	7 1/2
K	Clearance to Remove Lubricant Screw	5 7/8	5 7/8	5 7/8	5 7/8	6 1/4	7 1/4	7 1/2	10 1/16	10 15/16
M	Width of Square of Stem	15/16	15/16	15/16	15/16	15/16	1 1/4	1 1/4	1 3/4	1 3/4
N	Height of Square of Stem	1 3/8	1 3/8	1 3/8	1 1/8	1 1/8	1 3/8	1 3/8	1 7/8	1 7/8
	Wrench	A	A	A	A	A	C	C	F	H-24
	Weight	4	4	5	7	8	14	20	34	63

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RESUN® Rectangular Port, Full Pipe Area D-126

200 PSI WOG-Flanged End-(Short Pattern) 125 PSI SWP

Upon Request

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
***Cover Plate:** ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE
***Cover Plate Bolts:** Steel A 193 Grade 5
***Body Sealant Fitting:** Commercial Steel (Also Available on 6" Size)
***Plug Bottom Rest:** Commercial Steel

**Applicable only to top entry designs*

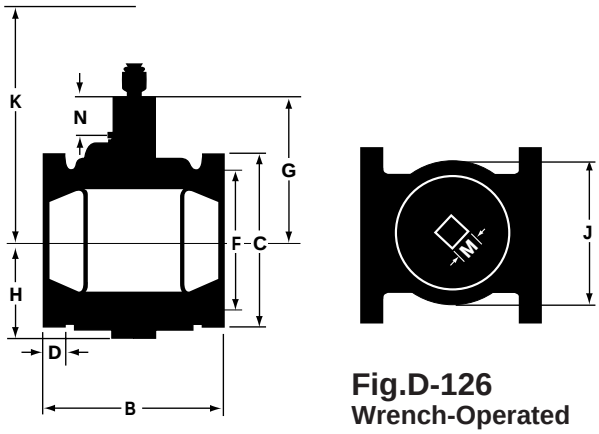

Fig.D-126
Wrench-Operated

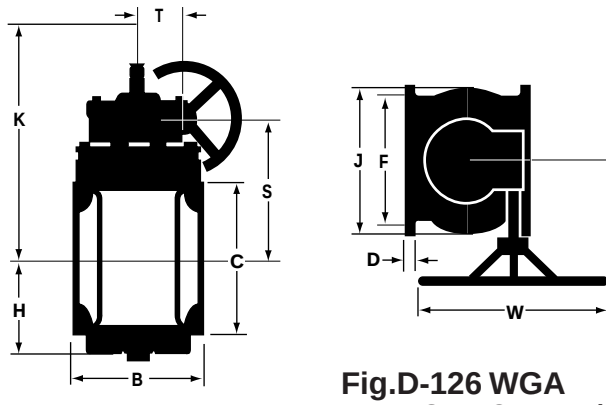

Fig.D-126 WGA
Worm Gear-Operated

Dimensions -Full Pipe Area, Rectangular Port Valves D-126

DESCRIPTION		BOTTOM ENTRY									TOP ENTRY		
SIZE		1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10 †	12 †
B	Face to Face Flanged	5 1/2	6	6 1/2	7	7 1/2	8	9	10	10 1/2	11 1/2	13	14
H	Center of Port to Bottom of Valve	2 1/8	2 5/8	2 5/8	3 1/8	3 1/4	4 1/4	5 1/8	6 1/8	6 7/8	9 1/8	10 7/8	11 7/8
J	Extreme Width of Body	2 1/2	3 13/16	3 13/16	4 1/4	5	6 1/4	7 1/2	9 3/4	10 3/4	13 1/2	15 1/2	16 1/2
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	3/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8
	FLANGE DATA												
C	Diameter of Flanges	4 1/4	4 5/8	5	6	7	7 1/2	9	10	11	13 1/2	16	19
D	Thickness of Flanges	7/16	1/2	9/16	5/8	11/16	3/4	15/16	15/16	1	1 1/8	1 3/16	1 1/4
E	No. and Size of Bolts	4-1/2	4-1/2	4-1/2	4-5/8	4-5/8	4-5/8	8-5/8	8-3/4*	8-3/4*	8-3/4*	12-7/8*	12-7/8*
F	Diameter of Bolt Circle	3 1/8	3 1/2	3 7/8	4 3/4	5 1/2	6	7 1/2	8 1/2	9 1/2	11 3/4	14 1/4	17
	STEM DATA												
G	Center of Port to Top of Stem	3 5/8	3 7/8	3 7/8	5	5 1/4	6 5/8	7 1/2	8 1/2	9 1/8	12 7/8	15 1/8	16
K	Clearance to Remove Lubricant Screw	5 7/8	6 1/8	6 1/8	7 1/4	7 1/2	10	10 7/8	11 7/8	12 1/2	16 1/4	18 1/2	19 3/8
M	Width of Square of Stem	15/16	15/16	1 5/8	1 1/4	1 1/4	1 3/4	1 3/4	1 3/4	1 3/4	2 7/16	3	3
N	Height of Square of Stem	1 3/8	1 1/8	1 1/8	1 3/8	1 3/8	1 7/8	1 7/8	1 7/8	1 7/8	2 7/8	3 3/8	3 3/8
	Wrench	A	A	A	C	C	F	H-24	H-30	H-36	L-48	M-60	M-72
	Wt. (lb.)	7	12	13	24	33	50	78	120	170	341	465	553
	WORM GEAR-OPERATED												
K	Clearance to Remove Lubricant Screw							14 9/16	15 9/16	16 1/16	19 13/16	22 3/16	23
R	Center of Port to Handwheel Face							10 1/8	10 1/8	10 1/8	13 1/8	13 1/8	13 1/8
S	Center of Port to Center of of WGA Shaft							6 15/16	7 13/16	8 15/16	12 11/16	14 9/16	15 11/16
T	Center of Plug Stem to Center of WGA Shaft							2 9/16	2 9/16	3 1/8	4 5/8	4 5/8	4 11/16
W	Diameter of WGA Handwheel							12	12	16	16	16	16

Valves 2"-12" interchange with API Pipeline Valve Standard 6-D, 175 PSI class, and with ANSI 125 PSI SWP Cast Iron Flange Wedge Gate Valves (Std. B16.10).

Flanges are drilled to ANSI 125 PSI Cast Iron Flange Standard ANSI B.16.1 unless otherwise specified. No deduction for valves faced only. Bolt holes are drilled 1/8" larger than bolts.

*Includes 4 tapped holes this size on each flange, 2 at top and 2 at bottom, for cap screws or studs.

†Has some reduction in port area.

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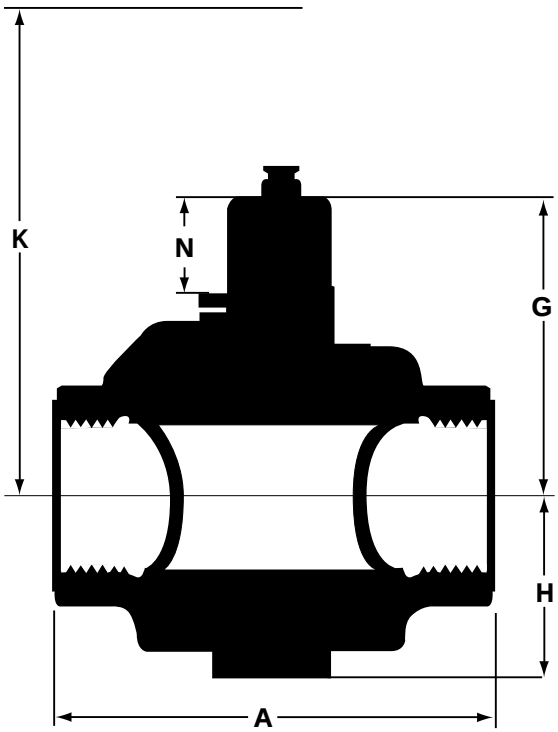
Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE



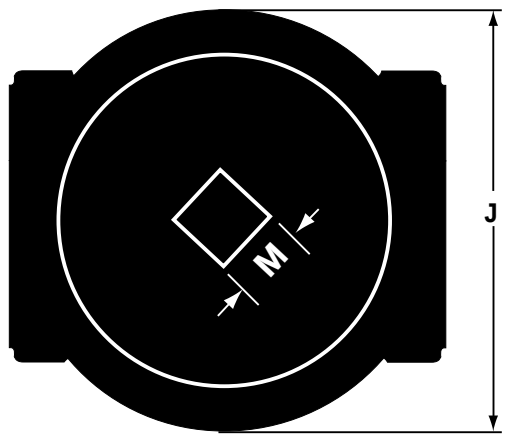


Fig.D-450
Wrench-Operated

Dimensions -Full Pipe Area, Round Port Valves D-450

DESCRIPTION		BOTTOM ENTRY								
SIZE		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
A	End to End	3 5/8	3 5/8	4 1/4	5 1/4	5 1/2	7 1/2	8	8 1/2	11 1/2
H	Center of Port to Bottom of Valve	2	2	2 1/8	2 5/8	2 1/2	3 3/8	3 5/8	4 1/8	5 1/4
J	Extreme Width of Body	2 1/2	2 1/2	3 1/8	4 1/8	4 3/8	6	6 5/8	7 1/4	10 1/4
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	3/8	3/8	3/8	5/8	5/8
STEM DATA										
G	Center of Port to Top of Stem	3 3/8	3 3/8	3 3/8	3 7/8	3 7/8	5 1/8	5 3/8	6 1/4	7 1/8
K	Clearance to Remove Lubricant Screw	5 5/8	5 5/8	5 5/8	6 1/8	6 1/8	7 3/8	7 5/8	9 5/8	10 1/2
M	Width of Square of Stem	15/16	15/16	15/16	15/16	15/16	1 1/4	1 1/4	1 3/4	1 3/4
N	Height of Square of Stem	1 1/8	1 1/8	1	1	1	1 3/8	1 5/16	1 7/8	1 7/8
	Wrench	A	A	A	A	A	C	C	F	H-30
	Weight (lbs.)	4	4	6	12	13	26	36	54	101

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RESUN® Round Port, Full Pipe Area D-451

200 PSI WOG-Flanged End
125 PSI SWP

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
***Cover Plate:** ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE
***Cover Plate Bolts:** Steel A 193 Grade 5
***Body Sealant Fitting:** Commercial Steel
***Plug Bottom Rest:** Commercial Steel
**Applicable only to top entry designs*

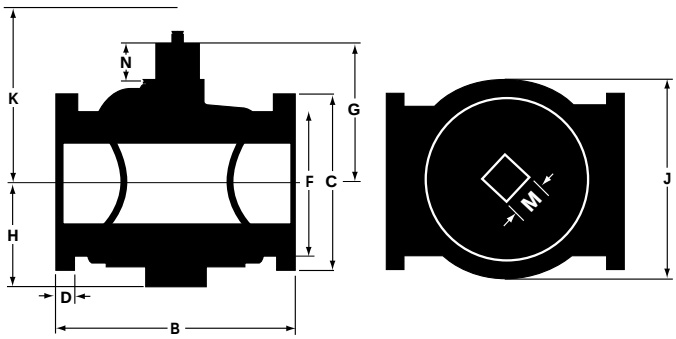

Fig.D-451
Wrench-Operated

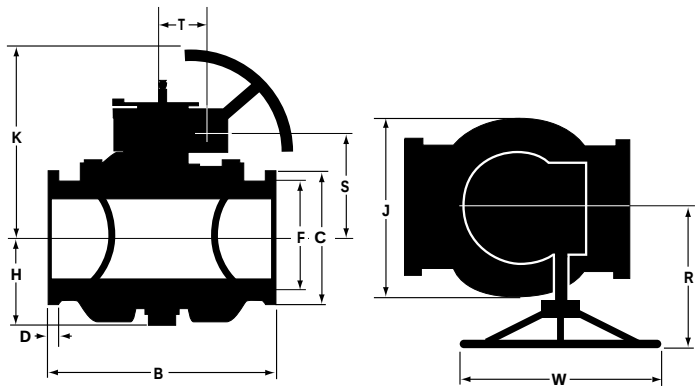

Fig.D-451 WGA
Worm Gear-Operated

Dimensions -Full Pipe Area, Round Port Valves D-451

DESCRIPTION		BOTTOM ENTRY							TOP ENTRY
SIZE		1	1 1/4	1 1/2	2	2 1/2	3	4	6
B	Face to Face Flanged	5 1/2	6	6 1/2	7 1/2	8 1/4	9	12	18
H	Center of Port to Bottom of Valve	2 1/8	2 5/8	2 5/8	3 3/8	3 3/8	4 1/8	5 1/4	6 7/8
J	Extreme Width of Body	3 1/2	4 1/8	4 3/8	6	7	8 1/4	10 1/4	14 1/2
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	3/8	5/8	5/8	5/8
FLANGE DATA									
C	Diameter of Flanges	4 1/4	4 5/8	5	6	7	7 1/2	9	11
D	Thickness of Flanges	7/16	1/2	9/16	5/8	11/16	3/4	15/16	1
E	No. and Size of Bolts	4-1/2	4-1/2	4-1/2	4-5/8	4-5/8	4-5/8	8-5/8	8-3/4
F	Diameter of Bolt Circle	3 1/8	3 1/2	3 7/8	4 3/4	5 1/2	6 1/2	7 1/2	9 1/2
STEM DATA									
G	Center of Port to Top of Stem	3 3/8	3 3/4	3 7/8	5 1/8	5 1/2	6 3/8	7 1/4	10
K	Clearance to Remove Lubricant Screw	5 3/8	5 3/4	5 7/8	8 1/8	8 3/8	10 1/8	11	14 1/4
M	Width of Square of Stem	15/16	15/16	1 7/8	1 1/4	1 1/4	1 3/4	1 3/4	2 7/16
N	Height of Square of Stem	1	1	1	1 3/8	1 5/16	1 7/8	1 7/8	2 11/16
	Wrench	A	A	A	C	C	F	H-30	L-48
	Wt. (lb.)	9	15	18	35	43	66	118	320
WORM GEAR-OPERATED									
K	Clearance to Remove Lubricant Screw							14 3/8	17
R	Center of Port to Handwheel Face							10	13 1/8
S	Center of Port to Center of of WGA Shaft							7 5/16	9 7/8
T	Center of Plug Stem to Center of WGA Shaft							2 9/16	4 5/8
W	Diameter of WGA Handwheel							12	16

Flanges are drilled to ANSI 125 PSI Cast Iron Flange Standard ANSI B.16.1 unless otherwise specified.
No deduction for valves faced only. Bolt holes are drilled 1/8" larger than bolts.

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In blending and diverting services, RESUN multi-port valves boost efficiency and reduce valving, piping and maintenance costs. They come in 3-way/2 port, 3-way/3 port and 4-way/4 port types, and in many flow plans.

Transflo plugs, available in all multi-port designs, have wider-than-standard ports to prevent cut-off between flow positions.

Proportioning plugs permit flow to be proportioned between two outlets.

Standard Types, Sizes and Pressures

Multi-Port Full Pipe Area Valves

200 psi WOG, 400 psi test, 125 psi SWP

Wrench-Operated

1/2"-2", Threaded

90˚ Turn - 3-way/2-port, 3-way/3-port, 4-way/4-port
180˚ Turn - 3 way/2 port, 3-way/3-port
360˚ Turn - 3-way/3-port

2 1/2"-4", Threaded

90˚ Turn - 3-way/2-port, 3-way/3-port, 4-way/4-port
180˚ Turn - 3-way/3-port
360˚ Turn - 3-way/3-port

1"-8", Flanged

90˚ Turn - 3-way/2-port, 3-way/3-port, 4-way/4-port
180˚ Turn - 3-way/3-port
360˚ Turn - 3-way/3-port

Worm Gear-Operated

4"-8", Flanged

90˚ Turn - 3-way/2-port, 3-way/3-port, 4-way/4-port
180˚ Turn - 3-way/3-port*
360˚ Turn - 3-way/3-port*

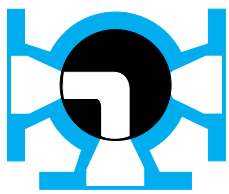
**Any multi-port with WGA and 180˚ or 360˚ rotation will require a special gear. Consult factory for pricing.*

3-Way valve, threaded

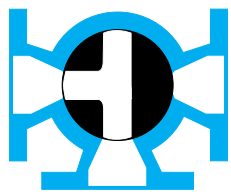
3-Way valve, flanged

4-Way valve, threaded

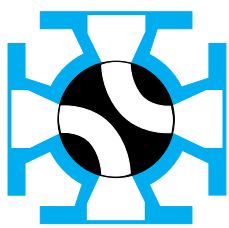
4-Way valve, flanged



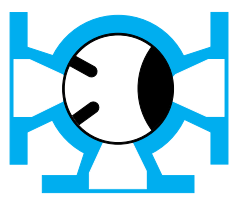
3-Way 2-Port



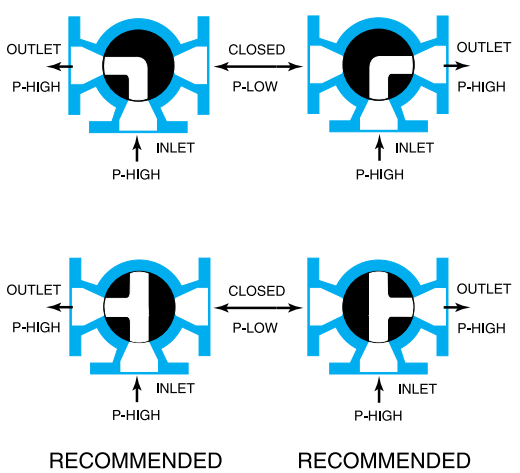
3-Way 3-Port



4-Way 4-Port



Transflo Plug



The RESUN multi-port valves are designed and recommended for service as depicted. Pressure on the closed port will inhibit the valve's sealing ability and may lead to leakage. Consult the factory for additional information.

NOTE: P-LOW must be substantially lower than P-HIGH.

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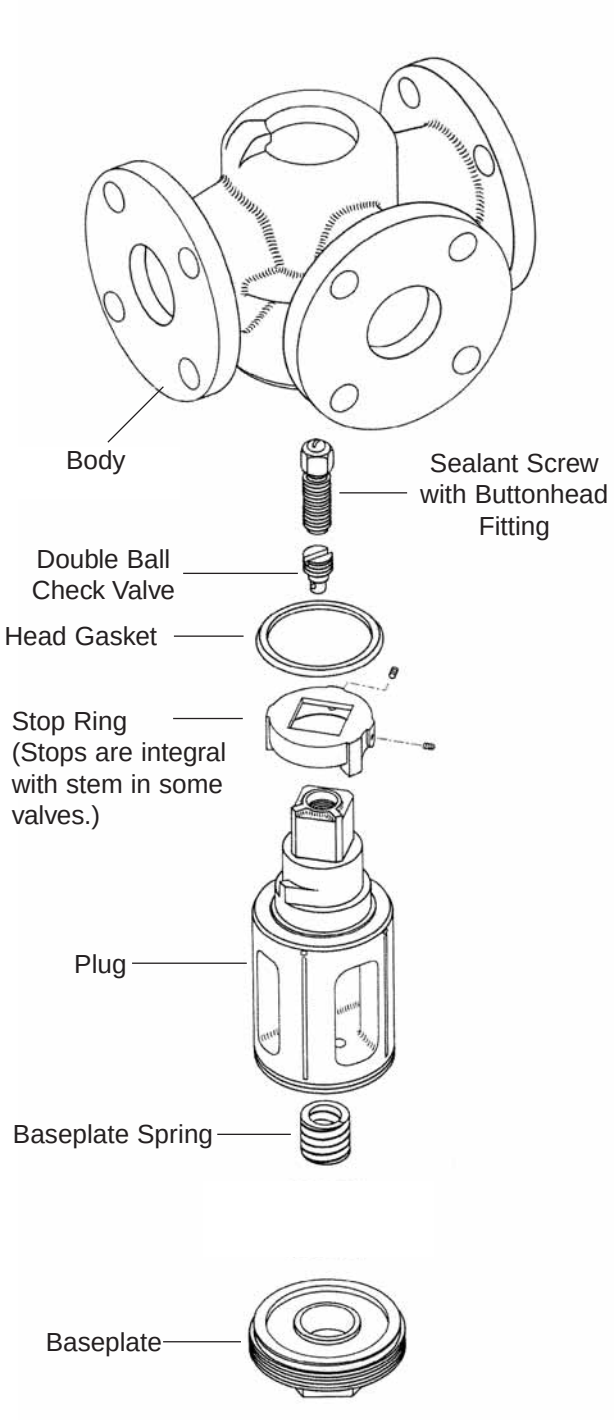
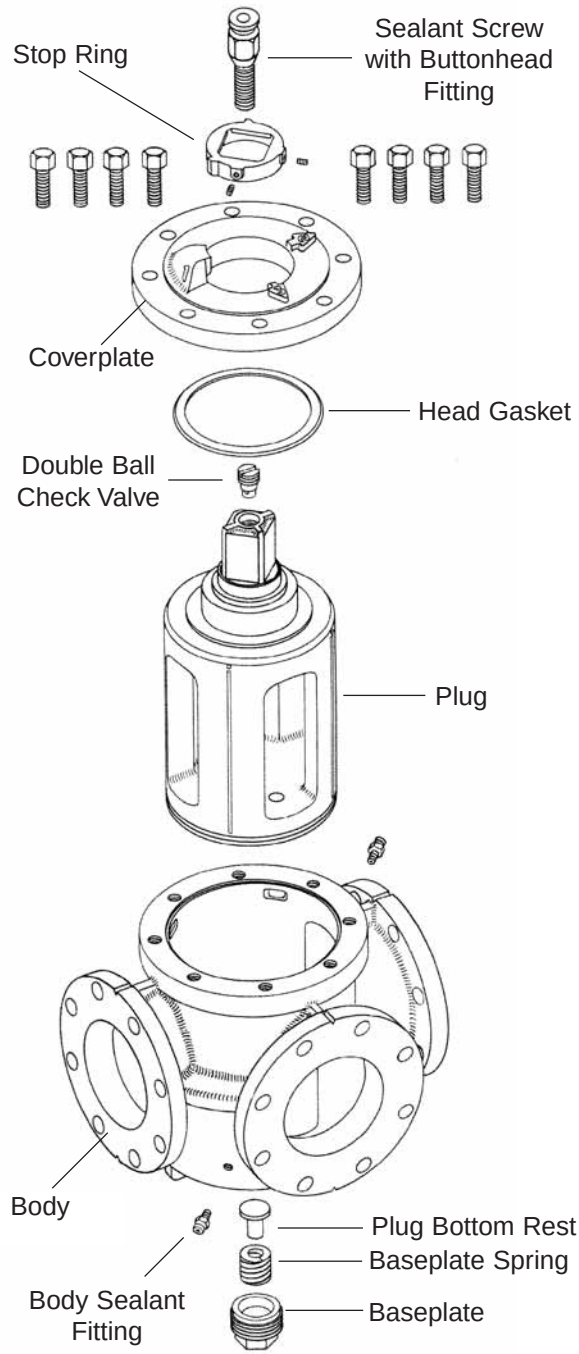
Bottom-Entry Components



Top-Entry Components



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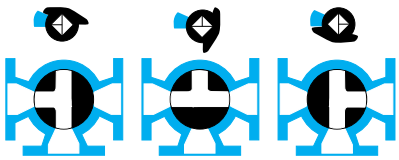
Standard Sizes and Types

RESUN multi-port valves come in 3-way/2-port, 3-way/3-port, and 4-way/4-port types. They are manufactured in the full pipe area, rectangular port design in a complete range of sizes, from 1/2" through 12".

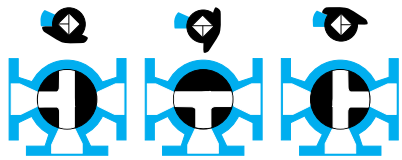
Round port valves are also available in a limited number of sizes. Details available on request. Transflo plugs have wider than standard ports to prevent cut-off between flow positions (See page 28). Special configurations such as 3-way/4-port, 4-way/2-port and 4-way/3-port are available. Consult factory.

Standard Flow Plans

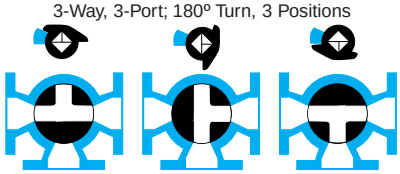
FLOW PLAN 1
3-Way, 3-Port; 180° Turn, 3 Positions



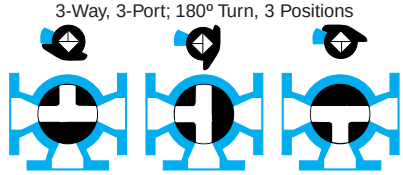
FLOW PLAN 2
3-Way, 3-Port; 180° Turn, 3 Positions



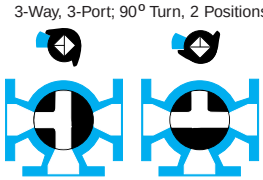
FLOW PLAN 3
3-Way, 3-Port; 180° Turn, 3 Positions



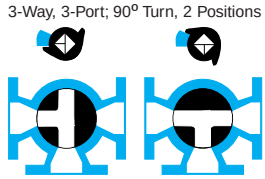
FLOW PLAN 4
3-Way, 3-Port; 180° Turn, 3 Positions



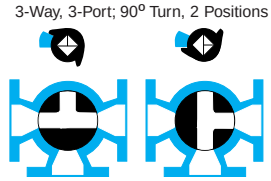
FLOW PLAN 5
3-Way, 3-Port; 90° Turn, 2 Positions



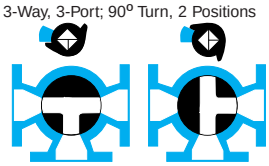
FLOW PLAN 6
3-Way, 3-Port; 90° Turn, 2 Positions



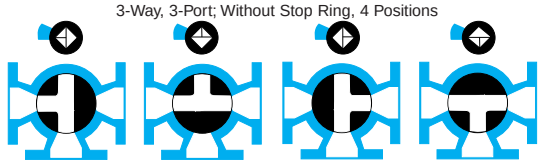
FLOW PLAN 7
3-Way, 3-Port; 90° Turn, 2 Positions



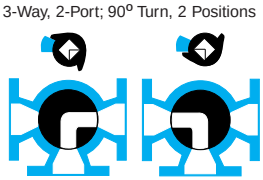
FLOW PLAN 8
3-Way, 3-Port; 90° Turn, 2 Positions



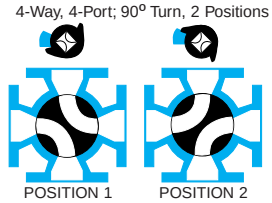
FLOW PLAN 9
3-Way, 3-Port; Without Stop Ring, 4 Positions



FLOW PLAN 10
3-Way, 2-Port; 90° Turn, 2 Positions

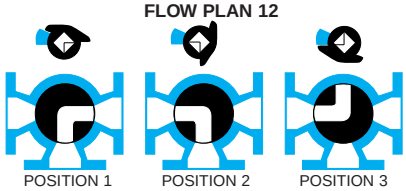


FLOW PLAN 11
4-Way, 4-Port; 90° Turn, 2 Positions

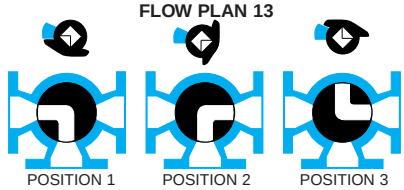


3-Way/2-Port, 180° Turn

FLOW PLAN 12



FLOW PLAN 13

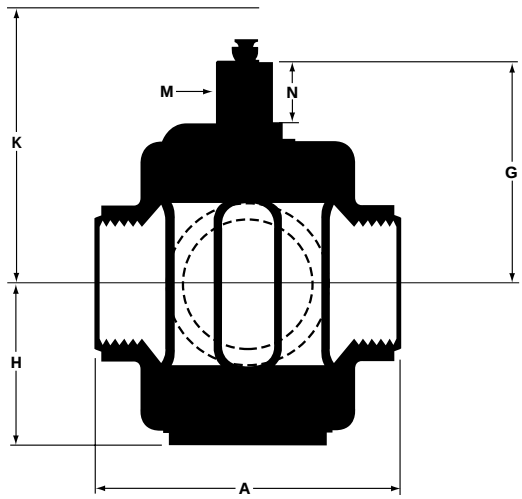


Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE

Fig. D-951/D-953
400 PSI WOG
800 PSI TEST - 250 PSI SWP
2 1/2" - 3" Sizes

Fig. D-951/D-953
200 PSI WOG
400 PSI TEST - 125 PSI SWP
2 1/2" - 3" Sizes



Dimensions -Multi-Port Full Pipe Area Valves (3-Way Valves) D-951, D-953

DESCRIPTION		BOTTOM ENTRY							
SIZE		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	End to End	3 5/8	3 5/8	4 3/8	5 3/4	5 3/4	6 3/4	7 1/2	8 1/4
H	Center of Port to Bottom of Stem	2 1/8	2 1/8	2 5/8	3 1/4	3 1/4	3 1/2	4 1/8	5 1/4
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	3/8	3/8	3/8	5/8
STEM DATA									
G	Center of Port to Top of Stem	3 3/8	3 3/8	3 1/2	4 1/4	4 1/4	5 5/8	5 7/8	7 1/2
K	Clearance to Remove Lubricant Screw	5 3/8	5 3/8	5 1/2	6 1/4	6 1/4	8 3/8	8 7/8	11 1/4
M	Width of Square of Stem	15/16	15/16	15/16	15/16	15/16	1 1/4	1 1/4	1 3/4
N	Height of Square of Stem	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 7/8
	Wrench	A	A	A	A	A	C	C	F
	Weight (lbs.)	5	5	8	15	15	24	35	57

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Fig. D-952
90° Turn, 3-way/2-port
200 PSI WOG
400 PSI TEST - 125 PSI SWP
1" - 8" Sizes, Wrench Operated
Flow Plan 10

Fig. D-952
180° Turn, 3-way/2-port
200 PSI WOG
400 PSI TEST - 125 PSI SWP
1" - 8" Sizes, Wrench Operated
Flow Plans 12, 13

Fig. D-952 WGA
90° Turn, 3-way/2-port
200 PSI WOG
400 PSI TEST - 125 PSI SWP
4" - 8" Sizes, Worm Gear-Operated
Flow Plan 10

Fig. D-952 WGA
180° Turn, 3-way/2-port*
200 PSI WOG
400 PSI TEST - 125 PSI SWP
Flow Plans 12, 13

Fig. D-954
90° Turn, 3-way/3-port
200 PSI WOG
400 PSI TEST - 125 PSI SWP
1" - 8" Sizes, Wrench Operated
Flow Plans 5,6,7,8

Fig. D-954 WGA
90° Turn, 3-way/3-port
200 PSI WOG
400 PSI TEST - 125 PSI SWP
4" - 8" Sizes, Worm Gear-Operated
Flow Plans 5,6,7,8

Fig. D-954
180° Turn, 3-way/3-port*
200 PSI WOG
400 PSI TEST - 125 PSI SWP
1" - 8" Sizes, Wrench Operated
Flow Plans 1,2,3,4

Fig. D-954 WGA
180° Turn, 3-way/3-port*
200 PSI WOG
400 PSI TEST - 125 PSI SWP
4" - 8" Sizes, Worm Gear-Operated
Flow Plans 1,2,3,4

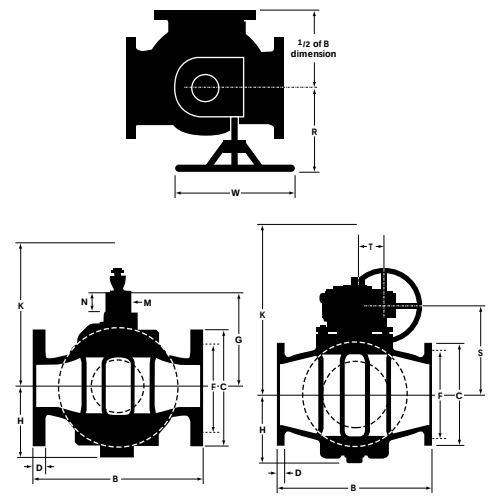
Fig. D-954
360° Turn, 3-way/3-port*
200 PSI WOG
400 PSI TEST - 125 PSI SWP
1" - 8" Sizes, Wrench Operated
Flow Plan 9

Fig. D-954 WGA
360° Turn, 3-way/3-port*
200 PSI WOG
400 PSI TEST - 125 PSI SWP
4" - 8" Sizes, Worm Gear-Operated
Flow Plan 9

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
***Cover Plate:** ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE
***Cover Plate Bolts:** Steel A 193 Grade B5
***Body Sealant Fitting:** Commercial Steel
***Plug Bottom Rest:** Commercial Steel

**Applicable only to top entry designs*



Dimensions -Multi-Port Full Pipe Area Valves (3-Way Valves) D-952, D-954

DESCRIPTION		BOTTOM ENTRY							TOP ENTRY	
SIZE		1	1 1/2	2	2 1/2	3	4	5	6	8
B	Face to Face Flanged	6 1/2	6 3/4	9	10	11 1/2	14	14	17	20
H	Center of Port to Bottom of Valve	2 5/8	3 1/4	3 1/2	4 1/8	5 1/4	6	7 3/8	8 1/2	10 1/4
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	5/8	5/8	5/8	5/8	5/8
	FLANGE DATA									
C	Diameter of Flanges	4 1/4	5	6	7	7 1/2	9	10	11	13 1/2
D	Thickness of Flanges	7/16	9/16	5/8	11/16	3/4	15/16	15/16	1	1 1/8
E	No. and Size of Bolts	4-1/2	4-1/2	4-5/8	4-5/8	4-5/8	8-5/8	8-3/4	8-3/4	8-3/4
F	Diameter of Bolt Circle	3 1/2	3 7/8	4 3/4	5 1/2	6	7 1/2	8 1/2	9 1/2	11 3/4
	STEM DATA									
G	Center of Port to Top of Stem	3 1/2	4 1/4	5 3/8	5 7/8	7 1/2	8 1/2	9 3/8	12	14 7/8
K	Clearance to Remove Lubricant Screw	5 1/2	6 1/4	8 3/8	8 7/8	11 1/4	12 1/4	13 1/8	16 1/4	19 1/8
M	Width of Square of Stem	15/16	15/16	1 1/4	1	1 3/4	1 3/4	1 3/4	2 7/16	3
N	Height of Square of Stem	1 1/8	1 1/8	1 3/8	1 3/8	1 7/8	2	2	3	3 5/8
	Wrench	A	A	C	C	F	H-30	H-36	L-48	M-60
	Wt. (lb.)	12	20	38	52	84	152	215	412	691
	WORM GEAR-OPERATED									
K	Clearance to Remove Lubricant Screw						15 1/2	16 7/16	19 1/16	21 15/16
R	Center of Port to Handwheel Face						10 1/8	10 1/8	13 1/8	13 1/8
S	Center of Port to Center of of WGA Shaft						8 1/16	9 1/2	11 13/16	14 3/8
T	Center of Plug Stem to Center of WGA Shaft						2 9/16	3 1/8	4 5/8	4 11/16
W	Diameter of WGA Handwheel						12	16	16	16

Flanges are drilled to ANSI 125 PSI Cast Iron Flange Standard ANSI B.16.1 unless otherwise specified. No deduction for valves faced only. Bolt holes are drilled 1/8" larger than bolts.

*Any multi-port with WGA and 180° or 360° rotation will require a Special Gear. Consult factory for pricing.

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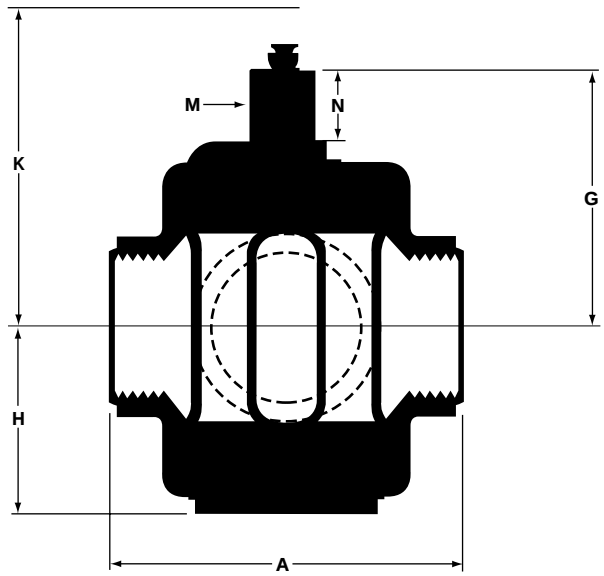
Fig. D-961
90˚ Turn, 4-way/4-port
400 PSI WOG
800 PSI TEST - 250 PSI SWP
2 1/2" - 3" Sizes, Flow Plan 11

Fig. D-961
90˚ Turn, 4-way/4-port
200 PSI WOG
400 PSI TEST - 125 PSI SWP
2 1/2" - 3" Sizes, Flow Plan 11

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE



Dimensions -Multi-Port Full Pipe Area Valves (4-Way Valves) D-961

DESCRIPTION		BOTTOM ENTRY							
SIZE		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	End to End	3 5/8	3 5/8	4 3/8	5 3/4	5 3/4	6 3/4	7 1/2	8 1/4
H	Center of Port to Bottom of Stem	2 1/8	2 1/8	2 5/8	3 1/4	3 1/4	3 1/2	4 1/8	5 1/4
L	Diameter of Sealant Stick	3/8	3/8	3/8	3/8	3/8	3/8	3/8	5/8
STEM DATA									
G	Center of Port to Top of Stem	3 3/8	3 3/8	3 1/2	4 1/4	4 1/4	5 5/8	5 7/8	7 1/2
K	Clearance to Remove Lubricant Screw	5 3/8	5 3/8	5 1/2	6 1/4	6 1/4	8 3/8	8 7/8	11 1/4
M	Width of Square of Stem	15/16	15/16	15/16	15/16	15/16	1 1/4	1 1/4	1 3/4
N	Height of Square of Stem	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 7/8
	Wrench	A	A	A	A	A	C	C	F-18
	Weight (lbs.)	5 1/2	5 1/2	9	16	16	25	35	58

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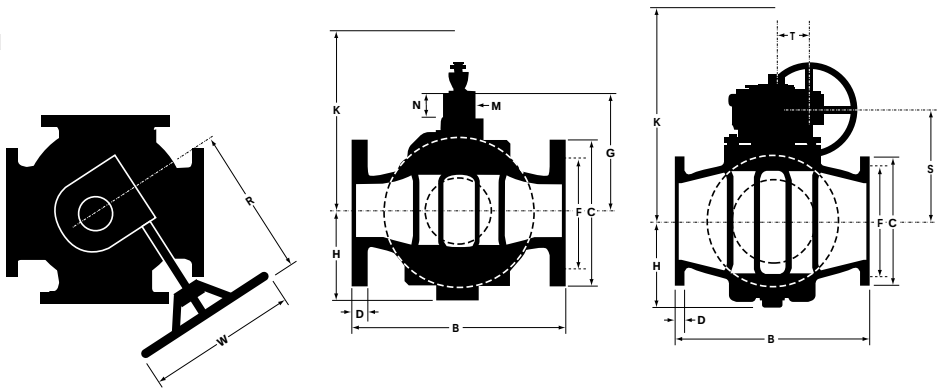
Fig. D-962
90° Turn, 4-way/4-port
200 PSI WOG
400 PSI TEST - 125 PSI SWP
1½" - 8" Sizes, Wrench-Operated
Flow Plan 11

Fig. D-962 WGA
90° Turn, 4-way/4-port
200 PSI WOG
400 PSI TEST - 125 PSI SWP
4" - 8" Sizes, Worm Gear-Operated
Flow Plan 11

Materials of Construction

Body: ASTM A 126 Class B
Plug: ASTM A 126 Class B
Baseplate: ASTM A 126 Class B
***Cover Plate:** ASTM A 126 Class B
Baseplate Spring: Stainless Steel 17-7
Sealant Screw: Commercial Steel
Double Ball Check Valve: Commercial Steel
Gasket: Glass Filled TFE
***Cover Plate Bolts:** Steel A 193 Grade 5
***Body Sealant Fitting:** Commercial Steel
***Plug Bottom Rest:** Commercial Steel
**Applicable only to top entry designs*



Dimensions -Multi-Port Full Pipe Area Valves (4-Way Valves) D-962

DESCRIPTION		BOTTOM ENTRY					TOP ENTRY	
SIZE		1 1/2	2	2 1/2	3	4	6	8
B	Face to Face Flanged	6 3/4	9	10	11 1/2	14	17	20
H	Center of Port to Bottom of Valve	3 1/4	3 1/2	4 1/8	5 1/4	6	8 1/2	10 1/4
L	Diameter of Sealant Stick	3/8	3/8	3/8	5/8	5/8	5/8	5/8
FLANGE DATA								
C	Diameter of Flanges	5	6	7	7 1/2	9	11	13 1/2
D	Thickness of Flanges	9/16	5/8	11/16	3/4	15/16	1	1 1/8
E	No. and Size of Bolts	4-1/2	4-5/8	4-5/8	4-5/8	8-5/8	8-3/4	8-3/4
F	Diameter of Bolt Circle	3 7/8	4 3/4	5 1/2	6	7 1/2	9 1/2	11 3/4
STEM DATA								
G	Center of Port to Top of Stem	4 1/4	5 3/8	5 7/8	7 1/2	8 1/2	12	14 7/8
K	Clearance to Remove Lubricant Screw	6 1/4	8 3/8	8 7/8	11 1/4	12 1/4	16 1/4	19 1/8
M	Width of Square of Stem	15/16	1 1/4	1 1/4	1 3/4	1 3/4	2 7/16	3
N	Height of Square of Stem	1 1/8	1 3/8	1 3/8	1 7/8	2	3	3 5/8
	Wrench	A	C	C	F	H-30	L-48	M-60
	Wt. (lb.)	24	44	58	93	172	401	698
WORM GEAR-OPERATED								
K	Clearance to Remove Lubricant Screw					15 1/2	19 1/16	20 7/16
R	Center of Port to Handwheel Face					10 1/8	13 1/8	16 1/8
S	Center of Port to Center of of WGA Shaft					8 1/16	11 15/16	14 3/8
T	Center of Plug Stem to Center of WGA Shaft					2 9/16	4 5/8	4 11/16
W	Diameter of WGA Handwheel					12	16	16

Flanges are drilled to ANSI 125 PSI Cast Iron Flange Standard ANSI B.16.1 unless otherwise specified.
No deduction for valves faced only. Bolt holes are drilled 1/8" larger than bolts.

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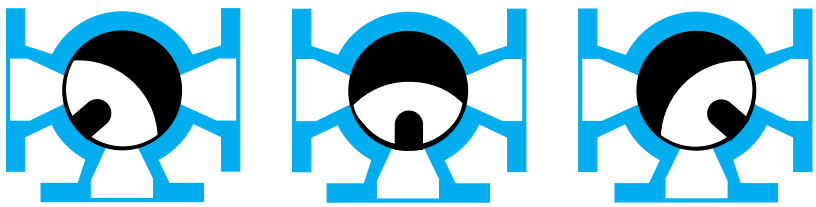
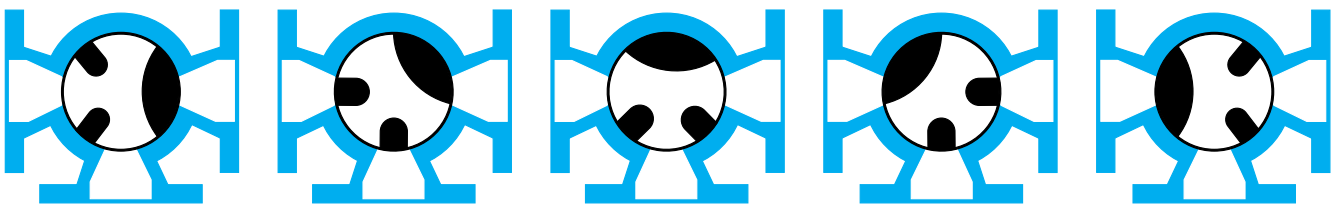
Transflo Plugs

Transflo plugs, which have wider-than-standard ports to prevent cut-off between flow positions, are available for 3-way/2-port and 3-way/3-port valves in all flow plans. To order, specify Transflo plug, in addition to usual ordering information.

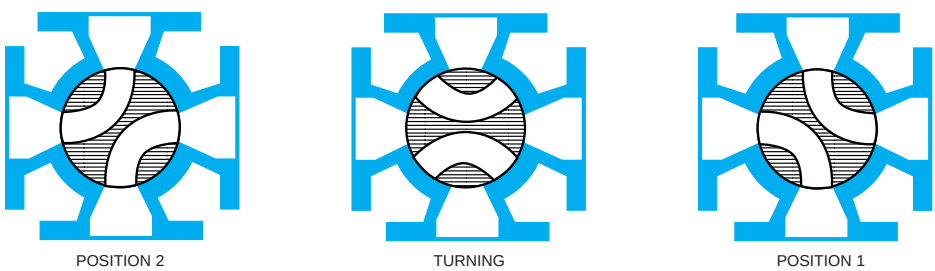
Transflo, 3-Way/2-Port



Transflo, 3-Way/3-Port



Transflo, 4-Way/4-Port

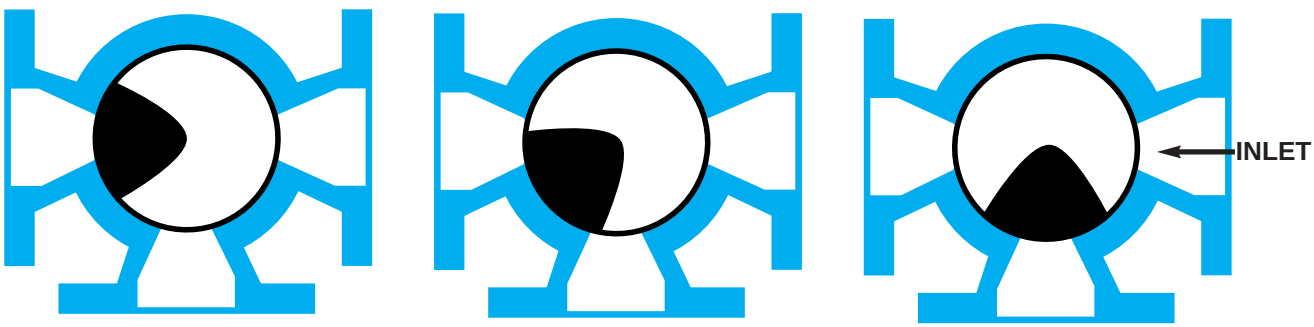


Proportioning Plugs

The proportioning plug is a quarter-section plug at the level of the body ports, but of full round construction above and below the ports. The quarter-section design permits flow to be proportioned between two outlets. The proportioning plug turns 90˚. It is available for all 3-way valves in either right-hand or left-hand construction. To order, specify valve size, pressure, end connection, method of operation and right-hand or left-hand proportioning plug.

Proportioning Plug, Right-Hand

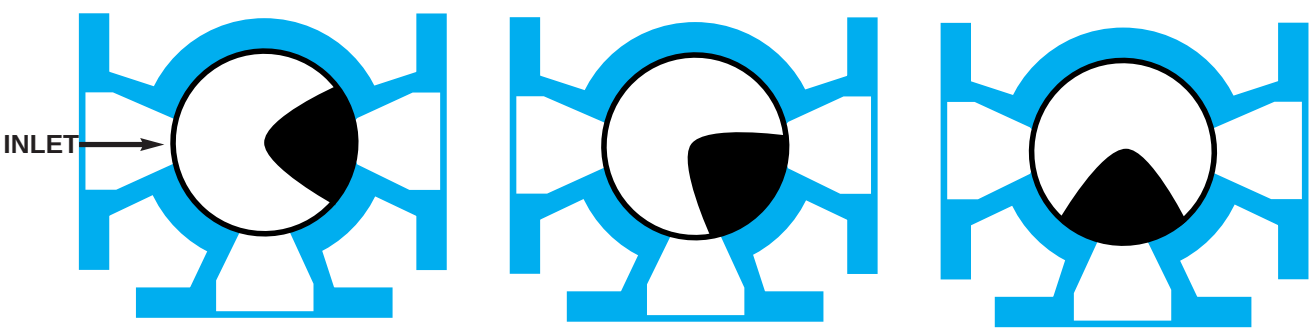
Flow Plan 7



NORMAL OPERATING POSITION | MIXING POSITION | BYPASS POSITION

Proportioning Plug, Left-Hand

Flow Plan 5



NORMAL OPERATING POSITION | MIXING POSITION | BYPASS POSITION

RESUN steam-jacket baseplates permit a constant supply of steam or hot oil to be circulated to maintain viscous substances such as asphalt, tar, paste, chocolate or wax at flowing consistency. The large area baseplate conducts heat with maximum efficiency, yet is lighter and requires less space than a side jacket and is available for all standard valves including multi-ports. To order, specify size and figure number of standard valve and add "WITH STEAM-JACKET BASEPLATE." When valves are ordered complete with steam-jacketed baseplates, please specify the application.

	DESCRIPTION	1/2	3/4	1	1 1/4 THD	1 1/4 FLG	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12*
	Regular Opening and Venturi (see Valve Detail - pgs. 8-12, 18)																
C	Distance between Pipe Taps	—	—	2	2	—	2	2	2	2	—	2 1/2	2 1/2	2 1/2	3 1/2	3 1/2	3 1/2
D	OD of Steam-Jacket Baseplate	—	—	4	4	—	4	4	4	4	—	4 3/4	4 3/4	4 3/4	7 1/8	7 1/8	7 1/8
H	Center of Port to Bottom of Valve	—	—	3 15/16	3 15/16	—	3 1/4	4 1/2	5 1/8	5 15/16	—	6 1/8	7	7	7 5/16	8 3/4	10 13/16
	Pipe Thread	—	—	1/2	1/2	—	1/2	1/2	1/2	1/2	—	1/2	1/2	1/2	3/4	3/4	3/4
	Full Pipe Area, 200 & 400 PSI (see Valve Detail - pgs. 13-17)																
C	Distance between Pipe Taps	2	2	2	2	2	2	2	2	2 1/2	2 1/2	2 1/2	3 1/2	3 1/2	—	—	—
D	OD of Steam-Jacket Baseplate	4	4	4	4	4	4	4	4	4 3/4	4 3/4	4 3/4	7 1/8	7 1/8	—	—	—
H	Center of Port to Bottom of Valve	3 15/16	3 15/16	3 15/16	4 1/4	4 1/2	4 1/4	4 3/4	5 5/16	6 1/8	6 3/4	7	7 5/16	7 9/16	—	—	—
	Pipe Thread	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	3/4	3/4			
	Round Port (see Valve Detail - pgs. 19-20)																
C	Distance between Pipe Taps	2	2	2	2	2	2	2 1/2	2 1/2	2 1/2	—	3 1/2	—	—	—	—	—
D	OD of Steam-Jacket Baseplate	4	4	4	4	4	4	4 3/4	4 3/4	4 3/4	—	7 1/8	—	—	—	—	—
H	Center of Port to Bottom of Valve	3 15/16	3 15/16	4 1/8	4 9/16	4 9/16	4 5/8	5 3/16	5 1/2	5 7/8	—	5 11/16	—	—	—	—	—
	Pipe Thread	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	—	3/4					
	Multi-Port (see Valve Detail - pgs. 24-27)																
C	Distance between Pipe Taps	2	2	2	2	—	2	2	2 1/2	2 1/2	—	3 1/2	3 1/2	—	—		
D	OD of Steam-Jacket Baseplate	4	4	4	4	—	4	4	4 3/4	4 3/4	—	7 1/8	7 1/8	—	—		
H	Center of Port to Bottom of Valve	3 1/4	3 1/4	4 7/16	5 5/16	—	5 5/16	5 9/16	6 1/16	7 1/8	—	7 1/4	8	—	—		
	Pipe Thread	1/2	1/2	1/2	1/2	—	1/2	1/2	1/2	1/2	—	3/4	3/4	—	—		

*Regular Opening
†Add weight of Standard Valve to obtain total weight of Steam-Jacketed Valve.

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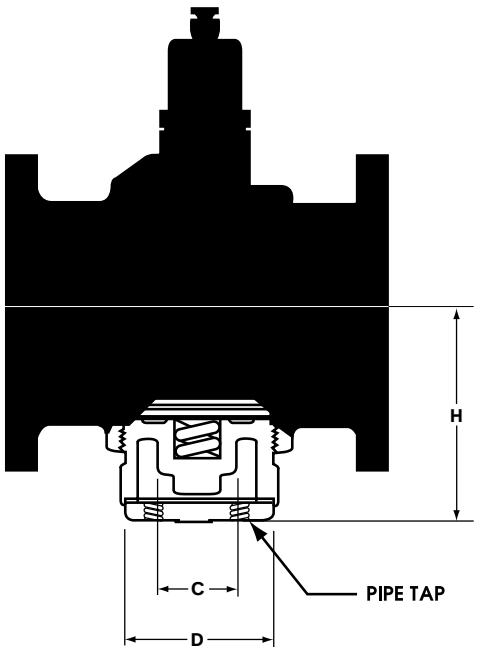

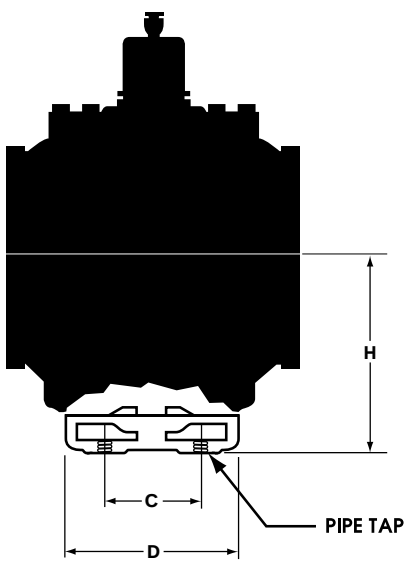

DESCRIPTION		6	8	10	12
	Full Pipe Area, Short Pattern (see Valve Detail - pgs. 8-12, 18)				
C	Distance Between Pipe Taps		6	6	6
D	OD of Steam-Jacket Baseplate		9 7/8	9 7/8	9 7/8
H	Center of Port to Bottom of Valve		11 3/4	13 5/8	14 5/8
	Pipe Thread		3/4	3/4	3/4
	Wt. (lb.) +		35+	35+	35+
	Full Pipe Area (see Valve Detail - pgs. 13-17)				
C	Distance Between Pipe Taps		6	6	6
D	OD of Steam-Jacket Baseplate		9 7/8	12	12
H	Center of Port to Bottom of Valve		12	14 3/8	15 3/4
	Pipe Thread		3/4	3/4	3/4
	Wt. (lb.) +		35+	50+	50+
	Round Port (see Valve Detail - pgs. 19-20)				
C	Distance Between Pipe Taps	6	6		
D	OD of Steam-Jacket Baseplate	9 7/8	12		
H	Center of Port to Bottom of Valve	9 5/8	11 3/8		
	Pipe Thread	3/4	3/4		
	Wt. (lb.) +	35+	50+		
	Multi-Port (see Valve Detail - pgs. 24-27)				
C	Distance Between Pipe Taps	6	6		
D	OD of Steam-Jacket Baseplate	9 7/8	12		
H	Center of Port to Bottom of Valve	11 1/8	11 3/4		
	Pipe Thread	3/4	3/4		
	Wt. (lb.) +	35+	50+		

*Regular opening only

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Dial Indicators, Pointers and Memory Stop Accessories

Dial indicators, pointers and memory stops for balancing are available on regular opening, 1" through 8" and full area valves, 1/2" through 6".

To order a valve with dial indicator, pointer and memory stop, add "WITH DIAL INDICATOR, POINTER AND MEMORY STOP," to other required valve components.

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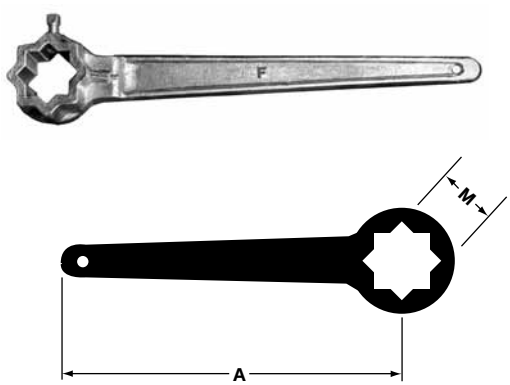
To order wrenches, please furnish the appropriate information from this catalog section. Consult dimensions table to find the standard wrench designation (A, C, F, H, etc.) for your valve.

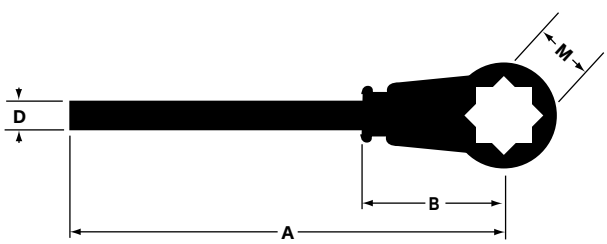
Standard and One-Way

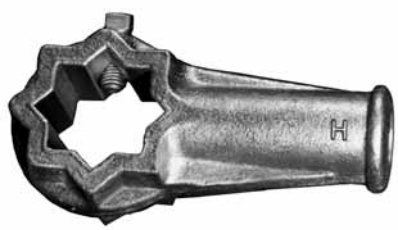
Standard types A, C and F are one-piece wrenches for valve sizes up to and including 3" full pipe area. One way wrenches are designed to fit the valve in only one position. Handle not furnished unless specified.

STANDARD AND ONE-WAY				
	Standard	A	C	F
	One-Way	A1	C1	F1
	Wt. (lb.)	1	2	4 1/2
A	Effective Wrench Length (Inches)	7	12	18
M	Wrench Square	31/32	1 9/32	1 25/32



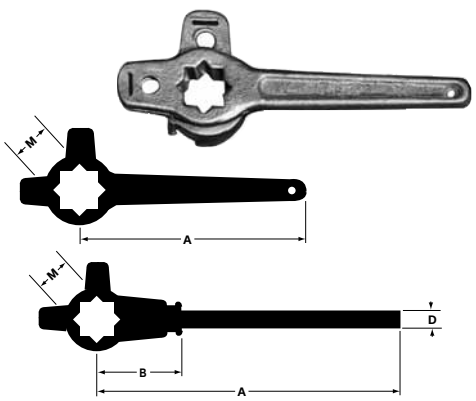
STANDARD WRENCH-HEAD FOR SIZES OVER 3 INCHES					
	Type	H	K	L	M
	Wrench Head				
	Wt. (lb.)	4 1/2	8 1/2	7 1/2	20
B	Effective Wrench Head Length (Inches)	5 1/2	6 7/8	6 3/4	9 1/4
M	Wrench Square	1 13/16	2 1/32	2 17/32	3 3/32
	Standard Lengths Available				
A	Effective Wrench Length (Inches)	24, 30, 36	24, 30, 36, 48, 60	48	48, 60, 72
D	Diameter of Wrench Handle Handle	1 Cold Rolled Steel	1 11/16 (1 1/4 Std. Pipe)	1 11/16 (1 1/4 Std. Pipe)	1 29/32 (1 1/2 Std. Pipe)





Standard Lock Wrenches

Designed for locking and sealing in either open or closed position. On removal of lock or seal, valve is operated without removal of wrench. These are for straightway valves only. (For multi-ports, use a locking/sealing device.)



STANDARD LOCK WRENCHES					
	Type	A-3*	C-3*	F-3*	H-3**
	Wrench Head				
	Wt. (lb.)	1 1/2	3	6	6 1/2
B	Effective Wrench Head Length (Inches)				5 1/2
M	Wrench Square	31/32	1 9/16	1 25/32	1 25/32
	Standard Lengths Available				
A	Effective Wrench Length (Inches)	7	12	18	24, 30, 36
D	Diameter of Wrench Handle				1 Cold Rolled Steel

* For same valves as standard wrenches A, C, F respectively.
**For same valves as standard wrench H.

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For locking and sealing in either open or closed position. Remove to operate valve. Separate wrench required. Please order by type number.

VALVE TYPE				
	REGULAR OPENING	VENTURI	FULL PIPE AREA	ROUND PORT
VALVE SIZE (INCHES)	DEVICE TYPE NO.			
1/2 - 3/4	L-50		L-50	L-50
1	L-50		L-50	L-51
1 1/4	L-50		L-50	L-61
1 1/2	L-50		L-51	L-61
2	L-51		L-52†	L-63
2 1/2	L-52		L-53	L-63
3	L-53		L-54†	L-65
4	L-54		L-55	L-66
5	L-55			
6	L-55	L-55	L-57†	L-67
8			L-58	
10	L-57R	L-57		
12		L-58		

* Device cannot be applied in field on these valves. Plug stem must be machined.
† No locking device available for 6" 500 psi valves and 2". 3" and 4" 800 psi valves.

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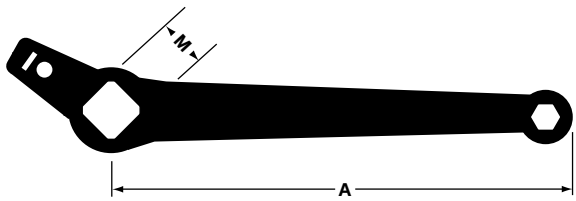
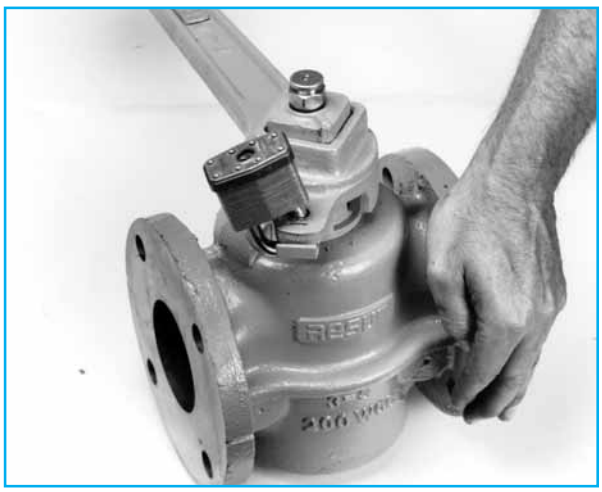
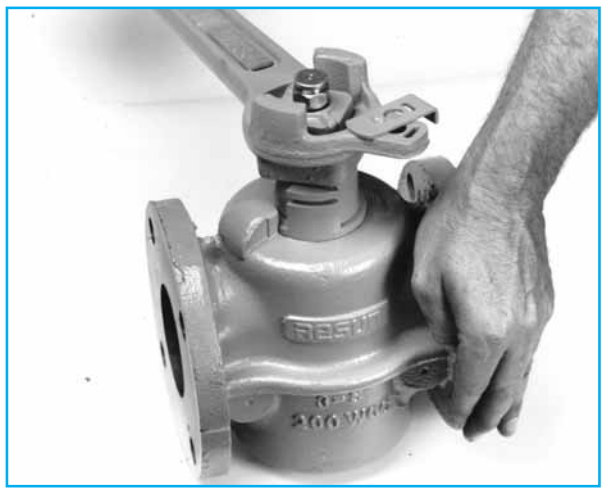
Double-locking wrench has heavy-duty stops which prevent accidental operation when wrench is properly positioned and locked. The wrench is used for locking and sealing in either open or closed position. Wrench is removed and turned over to operate valve. Available for regular opening valves through 4", most full pipe area valves through 3". Please order by type number.





Padlocked

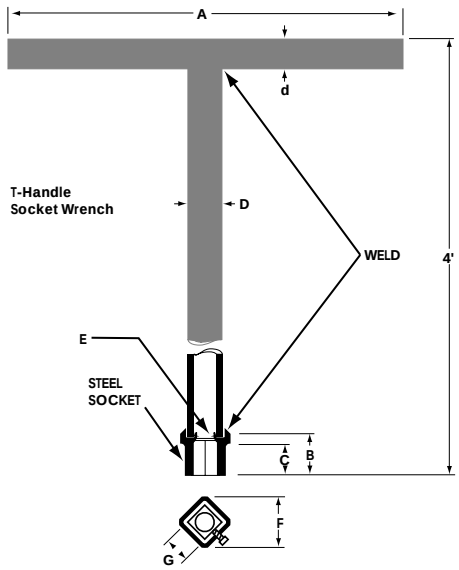


Operating Valve

"TEXAS-STYLE" LOCKING WRENCH					
Wrench Type No.	A-4	A-41	C-4	C-41	F-4
Regular Opening – Valve Size	1, 1 1/4, 1 1/2	2	2 1/2	3	4
Full Pipe Area – Valve Size	1/2, 3/4, 1, 1 1/4	1 1/4, 1 1/2	2	2 1/2	3, 4
Working Pressure PSI WOG	200, 400	200, 400, 500	200, 400, 500	200, 400, 500	200, 400
Wt. (lb.)	1 1/2	1 1/2	3	3	6
A–Effective Wrench Length (inches)	7	7	12	12	18
M–Wrench Square	31/32	31/32	1 9/32	1 9/32	1 25/32

Not available for D-450 or D-451.

T-handle socket wrenches for operation of valves located under flooring, grating, catwalks, etc. are available with integral handle or with handle socket for sliding handle. Wrench sockets are integral; they can also be supplied separately.



In the Table to the right, the proper wrench for use directly on the valve stem is listed in the column entitled "Socket Wrench No." If this wrench is used, no adapter is required. Wrench No. S-51 with 2" square socket, can be employed to operate a wide range of valves when used with the correct adapter, listed in the right-hand column of this table.

Adapter A-1 — Adapts 2" wrench socket to $^{15}/_{16}$" valve stem.

Adapter A-2 — Adapts 2" wrench socket to $1^{1}/_{4}$" valve stem.

Adapter A-3 — Adapts 2" wrench socket to $1^{3}/_{4}$" valve stem.

Adapter A-4 — Adapts 2" wrench socket to $2^{7}/_{16}$" valve stem.

Adapter A-5 — Adapts 2" wrench socket to 3" valve stem.

T-HANDLE SOCKET WRENCHES								
	Socket No.	S-10	S-20	S-30	S-50	S-50	S-40	S-60
B	Socket Height	$2^{1}/_{8}$	$2^{3}/_{8}$	3	$3^{7}/_{8}$	$3^{7}/_{8}$	$4^{7}/_{16}$	$5^{9}/_{16}$
C	Available Stem Engagement	$1^{1}/_{4}$	$1^{1}/_{2}$	$2^{1}/_{4}$	$2^{1}/_{2}$	$2^{1}/_{2}$	$2^{1}/_{2}$	$3^{1}/_{2}$
E	ID of Socket Diameter	$1^{11}/_{16}$	$1^{11}/_{16}$	$1^{15}/_{16}$	$1^{15}/_{16}$	$1^{15}/_{16}$	$2^{25}/_{64}$	$2^{25}/_{64}$
F	Square Corner to Corner	$2^{3}/_{16}$	$2^{1}/_{2}$	$3^{3}/_{8}$	$4^{1}/_{16}$	$4^{1}/_{16}$	$4^{3}/_{4}$	$5^{9}/_{16}$
G	Stem Square	$^{31}/_{32}$	$1^{9}/_{32}$	$1^{25}/_{32}$	$2^{1}/_{32}$	$2^{1}/_{32}$	$2^{17}/_{32}$	$3^{3}/_{32}$
	Wrench no.	S-11	S-21	S-31	S-51*	S-51†	S-41	S-61
A	Handle Length (Inches)	18	24	36	36	48	48	60
D	Diameter of Drive**	$1^{1}/_{4}$	1	$1^{1}/_{2}$	$1^{1}/_{2}$	$1^{1}/_{2}$	2	2
d	Diameter of Wrench**	1	1	1	1	$1^{1}/_{2}$	$1^{1}/_{2}$	$1^{1}/_{2}$
	Wt. (lb.)	12	13	19	19	20	22	25

*Standard **Pipe Size †Special

SIZE, INCHES	TYPE	SOCKET WRENCH NO.	OR SOCKET WRENCH NO. 3-51 AND ADAPTER NO.
$^{1}/_{2}$ - $1^{1}/_{2}$ 1 - 2	Full Pipe Area Round Port Multi-port Regular Opening	S-11	A-1
2 - $2^{1}/_{2}$ $2^{1}/_{2}$ - 3	Full Pipe Area (200, 400, 500 PSI) Round Port Multi-port Regular Opening	S-21	A-2
3 - 5 4, 6 6	Full Pipe Area (200, 400, 500 PSI) Round Port Multi-port, Full Area Regular Opening Full Pipe Area (200, 400 PSI) Venturi Multi-port, Reg. Opening	S-31	A-3
6	Full Pipe Area (500 PSI)	S-51 (Spec.)	
6*	Round Port Multi-port, Full Area	S-41	A-4*
8	Regular Opening Venturi Multi-port, Reg. Opening	S-31	A-3
8*	Full Pipe Area (200, 400 PSI)	S-41	A-4*
10	Regular Opening Venturi (200, 400 PSI)	S-31	A-3
10	Venturi (500 PSI)	S-51 (Spec.)	
10*	Regular Opening Multi-port, Reg. Opening	S-41	A-4*
10* 12*	Full Pipe Area Full Pipe Area (200 PSI)	S-61	A-5*
12	Regular Opening	S-51 (Spec.)	
12*	Venturi (200, 400 PSI)	S-41	A-4*
14*	Venturi (200, 400 PSI)	S-61	A-5*

*On this size valve, use S-52 Special wrench and listed adapter where torque/service conditions permit wrench operation. If mechanical advantage is required, wrench S-51 (Standard or Special) may be used on worm gear operator.

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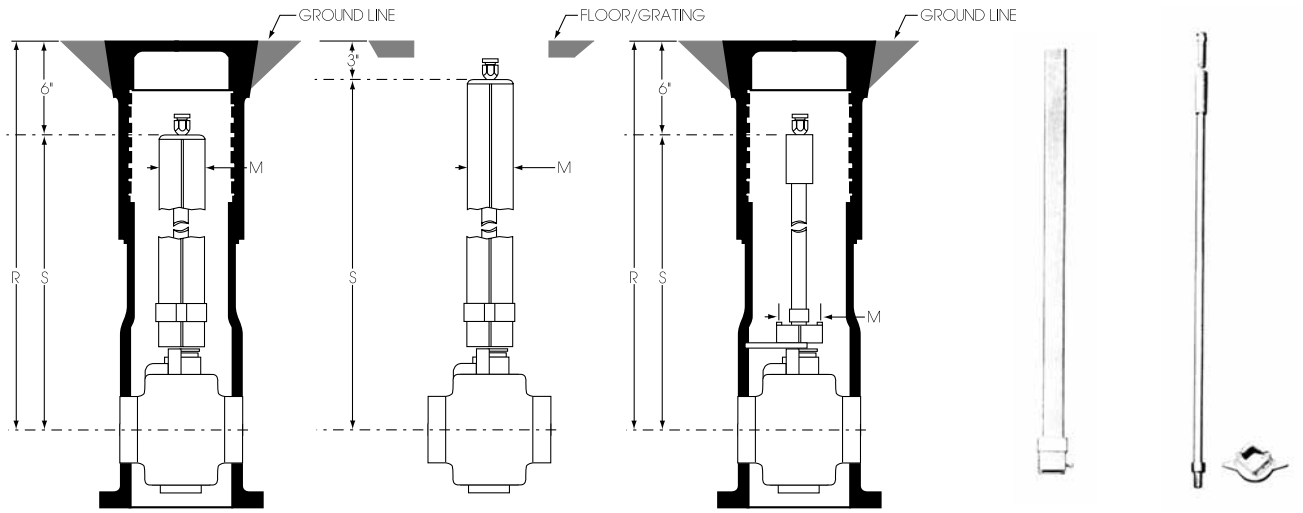
High head and low head extensions, fabricated to the customer's requirements, facilitate the operation and servicing of RESUN wrench-operated valves installed underground, beneath flooring, or in other locations difficult to access.

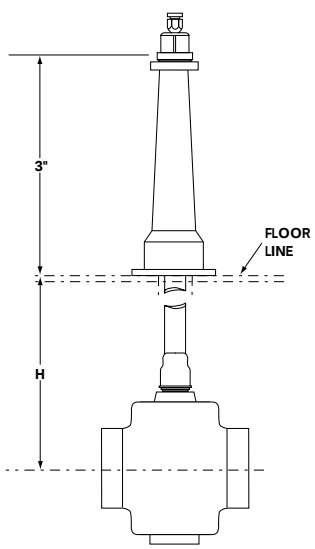
The high head extension consists of a tubular extension which fits the operating stem and an extended sealant screw. A standard wrench or T-handle socket wrench is applied to the top of the high head extension to operate the valve.

The low head extension consists of an extended sealant screw with sealant fitting. Valves using the low head extension are operated by a hollow T-handle socket wrench which slips over the extended sealant screw and fits a 2" square stem adapter attached to the valve stem.

T-handle socket wrench is ordered separately (see page 35.)



1. HIGH HEAD EXTENSION 2. HIGH HEAD EXTENSION 3. LOW HEAD EXTENSION HIGH HEAD LOW HEAD



To order extensions:

1. State figure number of valve.
2. If valve is buried and protected by valve box (illustration 1 and 3), state dimension R, centerline of valve to groundline.
3. If valve is not buried, but is to be operated from above through a grating, from a platform, etc. (illustration 2) state desired dimension S, centerline of valve to exact end of extension. Allow minimum clearance of 3" for sealant screw between extension and floor line.

High and low head extensions are shipped completely assembled. Required diameter of valve box shaft is $5^{1}/_{4}$". R&M Energy Systems does not supply valve boxes.

Dimension M = 2" square on all wrench-operated valves with stem square of 2" or smaller. $2^{7}/_{16}$" square when valve stem is $2^{7}/_{16}$" square.

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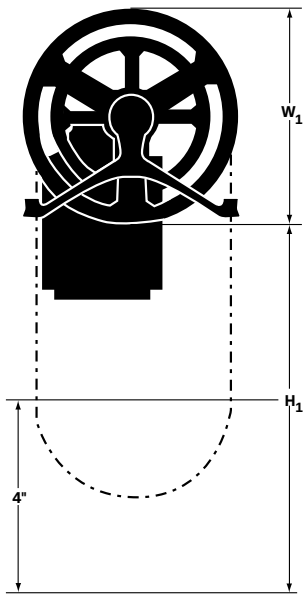
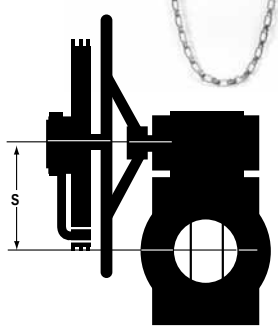
To facilitate gear operation of overhead valves, chainwheels can be furnished. The design of RESUN chainwheels permits easy installation or removal when valves are already installed.

Coated lock link pattern chain is supplied with chainwheel in the sizes shown. Use formula provided for calculating length of chain required.

To order a chainwheel:

- With valve-specify valve figure number and add "WITH WORM GEAR OPERATOR AND CHAINWHEEL."
- For valve already in service-specify chainwheel and chain only and advise handwheel rim diameter.
- State length of chain desired.





Formula for Estimating Chain Length for Worm Gear-Operated Valves

L=Chain length required.

H_1=Distance from floor to centerline of valve.

S=Distance from centerline of valve to centerline of worm gear shaft.

Chainwheel Size and Number

RESUN's standard Chainwheel no. 4 has 22" diameter and a 5/0 chain size. To estimate chain length for worm gear-operated valves, use this formula: **$L=[(H_1-4')+S]2+4'3"$**

CHAINWHEEL DIMENSIONS

Valve Type		Valve Size											
		4	5	6	8	10	12	14	16	18	20	24	30
Regular Opening	S		7	7	7 15/16	10 3/8	13 1/4						
Full Pipe Area, Short Pattern	S	6 15/16	7 13/16	8 15/16	12 11/16	14 9/16	15 11/16						
Full Pipe Area, Long Pattern, 200 PSI	S	6 15/16	7 13/16	8 15/16	12 3/8	14 11/16	17 13/16	18 1/2	20 15/16				
Full Pipe Area, Long Pattern, 400 PSI	S	7 1/8	8 7/16	10 13/16	13 9/16	15 13/16	16 15/16						
Full Pipe Area, Long Pattern, 500 PSI	S	7 7/8		11 3/16									
Venturi, 200* PSI	S			7	7 7/8	9	12 15/16	14 7/8	15 3/8	18 1/16	19 7/16	21 9/16	23 15/16
Venturi, 400 PSI	S			7	8 1/4	10	12 7/8	14 13/16	15 7/8	17 1/4	18 5/8	20 3/4	
Round Port	S	7 5/16	9	9 7/8	11 13/16	14 7/8	17 1/16						
Multi-port, Full Area	S	8 1/16	9 1/2	11 13/16*	14 3/8	18 1/8	19 5/8						

*150 psi in 14" through 30" sizes.
†11 15/16" 4-way/4-port valves.

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Sealants are shown by number, with service categories listed for their suitability. Numbers without suffix G are stick grade. Numbers with suffix G are gun grade, available in cartridges and bulk.

SEALANT NUMBER	FORMS AVAILABLE	TEMPERATURE RANGE	SUITABLE FOR	UNSUITABLE FOR	COLOR
24 24-G	Sticks Cartridges or Bulk	0 to 250˚F 0 to 225˚F	Aqueous solutions of alkalies, organic acids, salts, alcohols, dyes, seawater, caustic and strong chemicals.	Liquid Hydrocarbons	Cream
58 58-G	Sticks Cartridges or Bulk	0 to 385˚F 0 to 350˚F	Petroleum fuels, oils and waxes, gasoline, kerosene, aviation and jet fuels, propylene, benzene, toluene, butadiene, xylene, styrene and cumene.	Strong Amines Alkalies Air	Brown
62 62-G	Sticks Cartridges or Bulk	-15 to 250˚F -20 to 225˚F	Natural and manufactured gas, air and non-corrosive gases. Sewage, sludge and cold water services. UL-approved.	Liquid Hydrocarbons	Black
101 101-G	Sticks Cartridges or Bulk	-20 to 450˚F	Air and natural or manufactured gas, hot water, steam asphalt, tar or pitch. Salt solutions, ammonia liquors, strong chemicals, glycerine and glycols. Also useful for food products, vegetable oils and fatty acids, *food and pharmaceutical applications as determined suitable by user. Lowest operating torque at extremely low temp.	Liquid Hydrocarbons	White
103 103-G	Sticks Cartridges or Bulk	-20 to 400˚F	Special purpose sealant for natural gas service and glycol dehydration units. Also suitable for liquid hydrocarbons and aqueous solutions. Silicone free.	Alcohols and Ketones	Tan
104 104-G	Sticks Cartridges or Bulk	0 to 450˚F	Multi-purpose sealant for petroleum solvents, fuels and oils, crude distillates, butane, propane, wet fuel gases, glycols, salt solutions and aqueous solutions. Natural or manufactured and liquefied petroleum gases. Best sealant at high pressure. Silicone free.	Strong Amines Alkalies Air	Green
104W 104W-G	Sticks Cartridges or Bulk	-20 to 400˚F	Same as 104 except thinner consistency for use in environments below +10˚ F. Will not seal as well as 104 at higher temperatures.	same as 104	Green
375	Cartridges or Bulk	-15 to 250˚F	Extra soft lubricant for freeing hard operating valves on water and gas services. Resistant to water, dilute acids and alkalies. Silicone free.		Black

*Food products should be determined satisfactory at the discretion of the user.

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This table is intended as a general indication of the chemical resistance of RESUN sealants and may be used as a guide to sealant selection. Sealant specifications, page 41, should be consulted for high and low temperature limitations of the suggested sealants and a more detailed description of service categories.

In cases not covered by a recommendation, it is advisable to contact your local RESUN representative or the manufacturing plant in Tomball, Texas. When requesting sealant recommendations, please furnish the following information:

1. Size and description of valve
2. Name or description of flow medium
3. Operating temperature or high and low temperature
4. Operating pressure
5. Whether stick or gun injection is preferred

SERVICE	SEALANT NO.
Absorption Oil	**58**, 103, 104
Acetaldehyde	**58**, 103
Acetate Solvents	**58**, 103
Acetic Acid	24, **101**
Acetic Anhydride	24, **101**
Acetone	24, **101**
Acetylene Gas	24, **103**
Acetylene Generator Waste	24, **101**
Acid Sludge	24, **101**
Acrylonitrile	**58**, 103
Agitator Draw-off, Refinery	**58**, 103, 104
Air	62, 103
Alcohols Methyl or Ethyl	24, **101**
Alcohols Higher	24, **101**
Alkalies	24, **101**
Alums	24, **101**
Aluminum Acetate	24, **101**
Aluminum Chloride, Anhydrous	24, **101**
Aluminum Resinate	24, **101**
Aluminum Sulfate	24, **101**
Aluminum Salt Solutions	24, **101**
Ammonia Gas or Liquid	24, **101**
Ammonia Liquor	24, **101**
Ammonia Recovery Lines	24, **101**
Ammonia Saturators	24, **101**
Ammonium Chloride	24, **101**
Ammonium Hydroxide	24, **101**
Ammonium Nitrate	24, **101**
Ammonium Phosphate	24, **101**
Ammonium Salt Solutions	24, **101**
Ammonium Sulfate	24, **101**
Ammonium Sulfate Liquor	24, **101**
Amyl Acetate	**58**, 103
Amyl Alcohol	24, **101**
Amyl Chloride	**58**, 103
Aniline	24, **101**, 103, 104
Aniline Oils-Hydrocarbon	**58**, 103
Aniline Oils-Aqueous	24, **101**
Animal Oils	58, **101**, 103, 104
Aqueous Solutions	24, 101, **103**
Aromatic Solvents	**58**, 103
Arsenic Acid	24, **101**
Arsenic Trichloride	24, **101**
Asphalt	**101**
Asphalt Emulsions	**101**
Asphalt Paints	**101**
Barium Carbonate	24, **101**
Barium Chloride	24, **101**
Barium Hydroxide	24, **101**
Barium Salt Solutions	24, **101**
Barium Sulfate	24, **101**
Barytes	24, **101**
Beer	24, **101**
Benzaldehyde (Tincture)	24, **101**
Benzaldehyde (Pure)	**101**
Benzene (Benzol)	**58**, 103
Benzine (Petroleum Ether)	**58**, 103
Benzoate of Soda	24, **101**
Benzoic Acid	24, **101**
Bicarbonate of Soda	24, **101**
Bituminous Paints	**58**, 103, 104
Black Liquor, Paper Industry	24, **101**
Blast Furnace Gas	62, **101**
Bleach Liquor (Calcium Hypochlorite)	24, **101**
Blood Plasma	**101**
Blue Gas	62, **101**
Boiler Blow-Off (Steam)	24, **101**
Boiler Feed Water	24, **101**
Borax	24, **101**
Boric Acid	24, **101**
Brake Fluid	24, **101**
Bright Stock Petroleum	**58**, 103, 104
Brines	24, **101**
Bulk Stations	**58**, 103, 104
Bunker Oils (Fuel Oils)	**58**, 103, 104
Butadiene	**58**, 103, 104
Butane, Gas or Liquid	**58**, 103, 104
Butyric Acid	**24**
Calcium Chloride	24, **101**
Calcium Hydroxide	24, **101**
Calcium Hypochlorite	24, **101**
Calcium Salt Solutions	24, **101**
Calcium Sulfate	24, **101**
Carbolic Acid (Phenol Solution)	24, **101**
Carbon Dioxide Gas or Liquid	62, **101**
Carbon Disulfide	**101**
Carbon Monoxide Gas	62, **101**
Carbon Tetrachloride	**58**, 103
Carbonic Acid (Carbon Dioxide Solution)	24, **101**
Casein Paints	24, **101**
Casing Head Gas	58, **103**, 104
Castor Oil	24, **101**
Caustic Cell Liquors	24, **101**
Caustic Potash (Potassium Hydroxide)	24, **101**
Caustic Soda (Sodium Hydroxide)	24, **101**
Cellosolve Solvents	**58**, 103
Cellulose Acetate	**58**, 103
Cement Slurries	24, **101**
Chestnut Extract	24, **101**
Chlorinated Paraffin	**58**, 103
Chlorinated Solvents	**58**, 103
Chlorobenzene	**58**, 103
Chrome Tanning Solutions	24, **101**
Chromic Acid	24, **101**
Citric Acid	24, **101**
Clay Slips	24, **101**
Coal Gas	62, **101**
Coal Tar Oils	**58**, 103
Coal Tar Solvents	**58**, 103
Coal Washers	24, **101**
Coconut Oil	**101**
Coke Oven Gas	24, **101**
Condensate	**58**, 103, 104
Continuous Treators, Refinery	**58**, 103, 104
Copper Solution	24, **101**
Copper Sulfate	24, **101**
Corn Oil	**101**
Corn Syrup(Glucose)	24, **101**
Corrosive Gases	24, **101**
Cottonseed Oil	**101**
Creosote Oil	24, **101**
Cresylic Acid (Cresol)	24, **101**
Crude Oil	58, **103**, 104
Crude Oil and Brine	58, **103**, 104
Cumene	**58**, 103
Cutting Oils	**58**, 103, 104
Cyanide Solutions	24, **101**
Denatured Alcohol	24, **101**
Dextrin	24, **101**
Dextrose	24, **101**
Dichlorethylene	**58**, 103
Diesel Fuel	**58**, 103, 104
Diethanolamine	24, **101**
Distillate, Petroleum	**58**, 103, 104
Doctor Solution (Sodium Plumbite)	24, **101**
Doctor Solution and Gasoline	**58**, 103, 104
Downtherm E	**58**, 103, 104
Downtherm SR-1	**58**, 103, 104
Drilling Mud	24, **101**
Drinking Water	24, **101**
Drip Cocks Gas	58, **103**, 104
Drip Oil	**58**, 103
Dry Cleaning Fluid	**58**, 103
Dyes, Oil Soluble	**58**, 103
Dyes, Water Soluble	24, **101**
Elaine Red Oil	**101**
Electrolytic Cell Liquor	24, **101**
Emulsions	24, **101**
Epoxies	24, **101**
Epsom Salts	24, **101**
Ethane Gas	62, 101, **103**, 104
Ethanolamine	24, **101**
Ethers	**58**, 103
Ether Petroleum	**58**, 103, 104
Ethylene Oxide	**58**, 103
Ethyl Acetate	**58**, 103
Ethyl Alcohol (Ethanol)	24, **101**
Ethyl Benzene	**58**, 103
Ethyl Chloride Gas or Liquid	**58**, 103
Ethylene Dibromide	**58**, 103
Ethylene Dichloride	**58**, 103
Ethylene Gas	24,62,**101**,103,104
Ethylene Glycol	24, **101**
Fatty Acids	24, **101**
Fatty Acids and Water	24, **101**
Ferric Chloride	24, **101**
Ferric Nitrate	24, **101**
Ferric Sulfate	24, **101**
Ferrous Chloride	24, **101**
Ferrous Sulfate	24, **101**
Fertilizer Solutions-Nitrate	24, **101**
Phosphate	24, **101**
Sulfate	24, **101**
Filter House Lines	103, **104**
Fish Oil	**101**
Flavoring Extracts	24, **101**
Flue Gas	24, 62, **101**
Fluosilic Acid	24, **101**
Foamite Lines	24, **101**
Food Products	24, **101**
Formaldehyde	24, **101**
Formic Acid	24, **101**
Freon, Gas or Liquid	**58**, 103, 104
Fruit Juices	24, **101**
Fuel Oil	58, **103**, 104
Fuming Sulfuric Acid	24, **101**
Furfural	24, **101**
Fusel Oil (Crude Amyl Alcohol)	24, **101**
Gallic Acid	24, **101**
Gas Drips	58, **103**, 104
Gas Fuel Lines	24, 62, 101, **103**
Gas Liquor (Ammonia Liquor)	24, **101**
Gas, Manufactured	62, 101, **103**, 104
Gas Lifts	58, **103**, 104
Gas, Natural	58, **103**, 104
Gas Odorizers	**101**
Gas Oil	58, **103**
Gasoline, Low Aromatic	58, **103**, 104
Gasoline, High Aromatic	58, **103**
Gelatin	24, **101**
Gin	24, **101**
Glacial Acetic Acid	24, **101**
Glauber's Salt	24, **101**

NOTE: Bold type indicates recommended sealant considering chemical compatibility.
For extreme pressures or temperatures, consult factory.

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SERVICE	SEALANT NO.
Glaze Liquid Ceramic	24, **101**
Glucose	24, **101**
Glue	24, **101**
Glycerine (Glycerol)	24, **101**
Glycols	24, **101**
Grain Alcohol (Ethyl Alcohol)	24, **101**
Grease	58, 103, **104**
Green Liquor, Paper Industry	24, **101**
Gypsum (Calcium Sulfate)	24, **101**
Helium Gas	62, **101**
Hemlock Extract	24, 101
Heptane	**58**, 103, 104
Heat Exchanger Oil	58, 103, **104**
Heavy Oil Coke Plant	103,**104**
Hexane	**58**, 103, 104
Hot Water	24, **101**
Hydraulic Oil	58, 103, **104**
Hydrochloric Acid	24, **101**
Hydrocyanic Acid	24, **101**
Hydrofluoric Acid	24, **101**
Hydrogen Chloride (Anhydrous)	**FL5***
Hydrogen Gas	62, 101, **104**
Hydrogen Peroxide Dilute	24, **101**
Hydrogen Sulfide (Sour Gas)	24, **101**
Industrial Gas Lines	62, **101**
Iso-Butane	**58**, 103, 104
Iso-Octane	**58**, 103, 104
Jet Fuel	**58**, 103, 104
Kerosene	58, **103**, 104
Ketones, Except Acetone	24, **101**
Lactic Acid	24, **101**
Lard	58, **101**
Latex	24, **101**
Lead Arsenate	24, **101**
Licorice Extract	24, **101**
Light Oil Coke Plant	58, 103, **104**
Lignin Liquor	24, **101**
Lime Solutions	24, **101**
Linseed Oil	**101**
Liquefied Petroleum Gas (LPG)	**58**, 103, 104
Lithium Chloride	24, **101**
Loading Racks, Petroleum	58, 103, **104**
Logwood Extract	24, **101**
Low Temperatures	**101**
Lubricating Oil, Petroleum	58, 103, **104**
Lye Solutions	24, **101**
Magnesium Chloride	24, **101**
Magnesium Hydroxide	24, **101**
Magnesium Salt Solutions	24, **101**
Magnesium Sulfate	24, **101**
Maleic Anhydride	**101**
Malt Syrup (Maltose)	24, **101**
Manganous Sulfate	24, **101**
Manufacture Gas	62,101,**103**,104
Mash Distillery	24, **101**
Menhaden Oil	**101**
Mercenzing Solutions	24, **101**
Mercuric Chloride	24, **101**
Mercury	24, **101**
Methane Gas	62,101,**103**,104
Methyl Alcohol (Methanol)	24, **101**
Methyl Chloride, Gas or Liquid	**58**
Methyl Ethyl Ketone	**58**
Methylene Chloride	**58**
Milk	24, **101**
Milk of Lime	24, **101**
Mine Water	24, **101**
Mineral Oil	58, 103, **104**
Mineral Spirits	58, 103, **104**
Molasses	24, **101**
Monochlorbenzene	**58**, 103, 104
Monoethanolamine	24, **101**
Mud Pump Lines	62, **101**
Muriatic Acid	24, **101**
Naphtha, Petroleum	58, 103, **104**
Naphtha Condensers	58, 103, **104**
Naphtha Filter House, Refinery	58, 103, **104**
Naphthalene	**58**
Natural Gas	62,101,**103**,104
Nickel Plating Solutions	24, **101**
Nitre (Potassium Nitrate)	24, **101**
Nitric Acid	24, **101**
Nitro Benzene	**58** 103,
Nitrogen Gas	62, **101**, 104
Nitrogen Solutions (Ammonium Nitrate)	24, **101**
Nitromethane	**58**
Octane	**58**, 103, 104

*Consult Factory for sealant description and pricing.

SERVICE	SEALANT NO.
Oil, Crude	58, 103, **104**
Oil, Petroleum	58, 103, **104**
Oil and Water Mixtures	58, 103, **104**
Oil Tar	103, **104**
Oil of Vitriol	24, **101**
Oleic Acid	**101**
Oleomargarine	24, **101**
Oleo Oil	**101**
Oleum (Fuming Sulfuric Acid)	**FL5***
Olive Oil	**101**
Organic Hydrocarbon Solvents	**58** 103,
Oxalic Acid	24, **101**
Paint, Latex Base	24, **101**
Paint, Oil Base	58, 103, **104**
Paint Thinner	**58**, 103, 104
Palm Oil	24, **101**
Palm Oil and Water	24, **101**
Palmitic Acid	**101**
Paper Stock	24, **101**
Paraffin	58, 103, **104**
Paraffin Oils	58, 103, **104**
Peanut Oil	24, **101**
Pentane	**58**, 103, 104
Perchlorethylene	**58,** 103
Petrolatum	58, 103, **104**
Petroleum Ether	**58**, 103, 104
Petroleum Oil	58, 103, **104**
Phenol	24, **101**
Phosphoric Acid	24, **101**
Phosphorus	24, **101**
Phthalic Anhydride	**101**
Pickling Acids	24, **101**
Pine Resin	**101**
Pitch	**101**
Polyethylene	**58**
Polyisobutylene	58, 103, **104**
Potash (Potassium Carbonate)	24, **101**
Potassium Chloride	24, **101**
Potassium Hydroxide	24, **101**
Potassium Nitrate	24, **101**
Potassium Salt Solutions	24, **101**
Potassium Sulfate	24, **101**
Printing Ink	**58**, 103, 104
Producer Gas	62, **101**
Propane, Gas or Liquid	**58**, 103, 104
Propylene	58, 103, **104**
Prussic Acid	24, **101**
Pulp Lines, Paper Industry	24, **101**
Pyridine	24, **101**
Pyrogallic Acid	24, **101**
Pyroligneous Liquors	24, **101**
Quebracho Extract	24, **101**
Quenching Oil	58, 103, **104**
Rapeseed Oil	58, 103, **104**
Raw Gas Lines	58, 103, **104**
Red Oil (Oleic Acid)	**101**
Residium, Refinery	**101**
Road Oil	58, 103, **104**
Road Tar	**101**
Roofing Tar	**101**
Rosin (Pine Resin)	**101**
Rubber Solvent	**58**, 103
Safflower Oil	**101**
Sal Ammoniac (Ammonium Chloride)	24, **101**
Salicylic Acid	24, **101**
Salt (Sodium Chloride)	24, **101**
Salt Cake (Sodium Sulfate)	24, **101**
Scouring Liquor, Woolen Mills	24, **101**
Sea Water	24, **101**
Sewage	24, **101**
Sewage Gas	62, **101**
Shellac	24, **101**
Shock Absorber Fluid	24, **101**
Silicone Fluids	**58**, 103
Slop, Brewery	24, **101**
Sludge Acid	24, **101**
Slurries (Water)	24, **101**
Soap Solutions	24, **101**
Soda Ash (Sodium Carbonate)	24, **101**
Soda Liquor, Paper Industry	24, **101**
Soda Pulp, Paper Industry	24, **101**
Sodium, Molten	**101**
Sodium Bicarbonate	24, **101**
Sodium Bisulfate	24, **101**
Sodium Borate	24, **101**
Sodium Carbonate	24, **101**
Sodium Chloride	24, **101**
Sodium Hydroxide	24, **101**
Sodium Hypochlorite	24, **101**
Sodium Phenolate	24, **101**

SERVICE	SEALANT NO.
Sodium Phosphate	24, **101**
Sodium Salt Solutions	24, **101**
Sodium Silicate	24, **101**
Sodium Sulfate	24, **101**
Soluble Oils	24, **101**
Solvent Naphtha Coal Tar	**58**, 103, 104
Sour Gasoline	**58**, 103, 104
Sour Wash, Textile Industry	24, **101**
Soy Bean Oil	**101**
Spent Acid	24, **101**
Spent Soap Lye	24, **101**
Stannic Chloride	24, **101**
Starch Solutions	24, **101**
Steam	24, **101**
Stearic Acid	**101**
Stoddard Solvent	58, 103, **104**
Strontium Nitrate	24, **101**
Styrene Monomer	**58**, 103
Sugar Solutions	24, **101**
Sulfonated Oils	103, **104**
Sulfate Liquors	24, **101**
Sulfite Liquors	24, **101**
Sulfur Chloride	24, **101**
Sulfur Dioxide	24, **101**
Sulfur, Molten	**101**
Sulfur Monochloride	**101**
Sulfur, Slurries	24, **101**
Sulfur Trioxide	24, **101**
Sulfuric Acid	24, **101**
Sulfuric Acid (Fuming)	**FL5***
Sulfurous Acid	24, **101**
Sweet Water	24, **101**
Synthesis Gas	62,**101**,103,104
Synthetic Tannins	24, **101**
Syrup	24, **101**
Tall Oil	**101**
Tall Oil (Fatty Acids)	**101**
Tallow	**101**
Tankage Rendering Plants	24, **101**
Tannic Acid	24, **101**
Tanning Liquors	24, **101**
Tar	**101**
Tar Acid (Phenol)	24, **101**
Tar Oil (Creosote)	58, 103, **104**
Tartaric Acid	24, **101**
Tempering Oil	58, 103, **104**
Tetraethyl Lead	**58**, 103
Toluene (Toluol)	**58**, 103
Transformer Oil	58, 103, **104**
Triaryl Phosphate	58, 103, **104**
Trichloracetic Acid	24, **101**
Trichlorethylene	**58**, 103
Tricresyl Phosphate	**58**, 103
Triethanolamine	24, **101**
Trisodium Phosphate	24, **101**, 104
Tung Oil	**101**
Turpentine	**58**, 103
Ucon Fluids	**101**
Vacuum Services	24, **101**
Varnish	**58**, 103
Vat Dyes	24, **101**
Vegetable Dyes	24, **101**
Vegetable Oils	24, **101**
Vegetable Oils & Water	24, **101**
Vegetable Tannins	24, **101**
Vinegar	24, **101**
Vinyl Chloride	**58**, 103
Vinylidene Chloride	**58**, 103
Viscose	**58**, 103
Wash Oil, Coke Plant	**58**, 103
Waste Pickle Liquor	24, **101**
Water, Solutions or Suspensions	24, **101**
Water Gas	24, **101**
Water Glass (Sodium Silicate)	24, **101**
Water Softener	24, **101**
Wax Emulsions	24, **101**
Waxes	58, **101**
Whiskey	24, **101**
Whiskey Mash	24, **101**
White Liquor, Paper Industry	24, **101**
White Water, Paper Industry	24, **101**
Wine	24, **101**
Wood Alcohol (Methyl Alcohol)	24, **101**
Wood Pulp	24, **101**
Wool Scouring Liquors	24, **101**
Wort Beer	24, **101**
Xylene (Xylol)	**58**, 103
Zinc Chloride	24, **101**
Zinc Sulfate	24, **101**

R&M ENERGY SYSTEMS
A Unit of Robbins & Myers, Inc.

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10906 FM 2920
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R&M Energy Systems Canada
3703 - 98th Street
Edmonton, Alberta, Canada T6E 5N2
(800) 661-5659
(780) 437-6316 • Fax: (780) 435-3074

High-quality RESUN plug valve sealants are formulated for specific ladings. Proper servicing procedure and use of the correct RESUN sealant for the application is essential if maximum operating efficiency and longest life are to be obtained from your RESUN valves.

Stick and Gun Sealant Injection

RESUN sealants come in stick grade and gun grade. Stick sealant injection is usually considered most convenient with small numbers of valves or widely separated valves. Grease gun servicing is standard for the largest sizes and may be preferred for smaller sizes if many valves are in service.

Stick grade is especially suitable for high pressure or high temperature services. If desired, these sealants can be injected with a screw-primed grease gun. Stick grade comes in sticks, gun sticks, and bulk.

Gun grade sealants are relatively soft, permitting easier operation at low temperatures and with large valves. Gun grade comes in gun cartridges and in bulk.

MANUAL AVAILABLE ON REQUEST

Sealant Forms and Injection Equipment

STICKS:

3/8", 1/2", 5/8" diameter, convenient lengths.
Specify:
1. Sealant number (pages 41-43)
2. Size of stick (select from Bulletin LPM)
3. Number of boxes (See Bulletin LPM for number of sticks per box)

GUN STICKS:

1 1/4" x 9", 4 per box. For use with grease gun No. 138047.
Specify:
1. Sealant number (pages 41-43)
2. Size of stick
3. Number of boxes

GUN CARTRIDGE:

14 1/2 oz. tube filled with gun grade sealant for use with Grease Gun No. 013867.
Specify:
1. Sealant number (pages 41-43. include suffix G with number)
2. Size of cartridge
3. Number of cartridges

BULK:

1-pt., 1-qt., 1/2 gal., 1-gal. and 5-gal. cans. For use with grease gun No. 138047 or 013867.
Specify:
1. Sealant number (pages 41-43. Include suffix G with number)
2. Size of can
3. Number of cans

Combination Sealant Screw

The sealant screw, combined with giant buttonhead fitting, is standard on RESUN plug valves allowing conversion from stick sealant injections to gun without installation of a separate fitting.

New Style

Body Sealant Screw

Old Style

Combination Sealant Screw Buttonhead Fitting

STANDARD (12" LONG) HOSE WITH BUTTONHEAD COUPLER

For use with grease gun.
Part No. 135860

SCREW-PRIMED GREASE GUN

An extra heavy-duty lever gun for both gun and stick grade sealants.
Part No. 013867 (Hose extra)

SPECIFY: 1. Part number
2. Quantity

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All plug valves shall be of the lubricated plug type as manufactured by R&M Energy Systems, or equal; valves on liquid sludge lines shall have full or nominal pipe size area ports. Port openings in straightway shall be either rectangular or round in shape. All multi-port valves shall be of the rectangular port type, and shall have full or nominal pipe size area ports. Straightway valves to be used on gas lines may be of the reduced port (regular opening) type. Where these valves are used, those with the greatest port width are preferred for minimum turbulence and pressure drop. Plugs of all valves shall be of the cylindrical floating type. Contact between the plug, the line seat and the head seat is maintained by resilient pressure, through the sealant, the liquid or gas being transported, and/or the coil spring.

Valves shall be so constructed that excessive sealant pressure cannot be built up, but that the excessive sealant will be automatically and visibly discharged to the atmosphere around the neck of the plug when predetermined sealant pressures are exceeded.

For wrench-operated valves, at least one wrench is to be supplied for each size and type, except where valves are in convenient manifolds or groups, in which case, one wrench is to be supplied for every four valves.

Extensions or chainwheels with chain are to be supplied where indicated on the plans.

All gear-operated valves shall be equipped with giant buttonhead fittings and shall be properly charged with sealant recommended by the valve manufacturer for the service intended. Full area straightway, rectangular port valves 6" and larger, regular opening valves 8" and larger, full area multi-port and round port valves 5" and larger, shall have giant buttonhead fittings in the valve bodies located in such a manner as to assure proper sealant injection at all times. Grease gun sealant injection shall be used with the contractor furnishing one high pressure grease gun RESUN No. 013867, or approved equal; sealant gun shall be complete with 12" hose and coupler. One year's supply of proper RESUN sealant for each service shall be furnished by the contractor.

Valves used shall be of a type made by a manufacturer who can demonstrate the reliability of his valves by pointing to similar installations which have been in satisfactory service for a period of no less than five years.

The RESUN Lubricated Plug Valve is probably the most versatile valve made. Off the shelf it is suited for a wide variety of applications. The various port openings, the number of sealants available and the easy addition of a steam-jacketed baseplate considerably increases its range of applications. But we don't stop there. There are occasions when a slight change in design will solve a customer's problem such as the following:

In services where product tends to build up on the plug- as in asphalt or chocolate- it may be advisable to reduce the diameter of the plug.

In services where high torque is predictable an extra-heavy stem may be advisable.

In services where sand or other fine slurries pass through the valve it may be advisable to eliminate the balancing ports.

In services where water trapped in the valve may turn to ice relief holes can be drilled in the plug.

Several modifications have been developed in order to better accommodate these applications. These special modifications are referred to as Plate Numbers. Listed below are the more frequently used plate numbers and a description of the type of applications for which they were designed.

Plate Numbers	Application Description
537	Freeze holes for low temperature
1084	Slurry service
1086	Abrasive slurry service (w/o short lube grooves)
1189	Asphalt service, molten sulfur service

When ordering, it is important to specify these plate numbers or the specific application so that the valve can be modified. This will insure that the customer will get the best RESUN valve for the application.

Depending on the nature of the modification, there may be a nominal charge for a particular plate number.

Additional details of the modifications and illustrations are available from R&M Energy Systems' plant.

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Size, Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10**	10	12**	12	14 OD	16 OD	18 OD	20 OD
I D Of Pipe, Inches																	13 1/4	15 1/4		
Std. Pipe Area, Sq. In.	.31	.54	.86	1.50	2.04	3.36	4.79	7.39	12.73	20.01	28.89	50.03	78.85**	78.85	113.10**	113.10	137.89	182.65		
Regular Opening																				
Port Size	29/32 x 1 1/8	29/32 x 1 1/8	29/32 x 1 1/8	29/32 x 1 1/8	15/16 x 1 9/16	1 1/32 x 2	15/16 x 2 11/16	1 19/32 x 3 1/16	2 x 3 15/16		29/16 x 5 1/4	3 x 6 3/4		3 1/2 x 9 1/2		3 1/2 x 13				
Port Area, Sq. In.	.89	.89	.89	.89	1.44	2.03	3.49	4.84	7.66	13.22	13.22	20.03		33.03		45.28				
% of Full Area	287	164	100	60	70	60	73	66	61	66	46	40	64	42		40				
Full Area, 200, 400, 500 PSI																				
Port Size	29/32 x 1 1/8	29/32 x 1 1/8	29/32 x 1 1/8	15/16 x 19/16 * 1 32 x 13/16 ▲	1 1/32 x 2	1 5/16 x 2 11/16	1 19/32 x 3 1/16	2 x 3 15/16	2 9/16 x 5 1/4	3 x 6 3/4	3 3/4 x 8	5 x 10 1/2	5 x 14	6 1/8 x 13 1/4	5 x 16	7 1/2 x 15 3/8	7 1/2 x 17 3/8	10 1/8 x 20		
Port Area, Sq. In.	.89	.89	.89	1.44 * 2.03 ▲	2.03	3.49	4.84	7.66	13.22	20.03	29.78	50.24	68.66**	78.96	78.66**	113.09	128.09	199.17		
% of Full Area	287	164	100	100	100	100	100	100	100	100	100	100	87**	100	70**	100	93	100		
Venturi, 200, 400 PSI																				
Port Size											2 9/16 x 5 1/4	3 x 6 3/4		3 3/4 x 8		5 x 10 1/2	5 x 14	6 1/8 x 13 1/4		
Port Area, Sq. In.											13.22	20.03		29.78		50.24	68.66	78.96		
% of Full Area											46	40		38		44	50	43		
Venturi, 500 PSI																				
Port Size											2 9/16 x 5 1/4	3 x 6 3/4		3 3/4 x 8		5 x 10 1/2	4 5/8 x 12 1/2	5 5/8 x 13 1/4		7 x 16 1/2
Port Area, Sq. In.											13.22	20.03		29.78		50.24	55.61	72.33	113.09	113.24
% of Full Area											46	40		38		44	40	40	48	39
Round Port																				
Port Size	19/32	27/32	1 1/32	1 7/16	1 5/8	2 1/16	2 9/16	3 1/16	4 1/16		6 1/16	8 1/16		10		12				
Port Area, Sq. In.	.31	.55	.86	1.62	2.07	3.34	5.16	7.37	12.96		28.87	51.06		78.54		113.10				
% of Full Area	100	100	100	108	100	100	108	100	100		100	100		100		100				
Multi-Port Full Area																				
Port Size	9/16 x 31/32	9/16 x 31/32	11/16 x 1 1/4	7/8 x 2 5/16	7/8 x 2 5/16	1 3/16 x 2 7/8	1 3/8 x 3 3/8	1 9/16 x 4 3/4	2 1/8 x 6	2 1/2 x 8	3 1/4 x 9	4 1/8 x 12 1/8								
Port Area, Sq. In.	.53	.53	.84	2.03	2.03	3.42	4.66	7.20	12.52	19.60	28.44	48.53								
% of Full Area	170	100	97	135	100	100	97	97	98	98	98	97								

*Threaded valves 200 and 400 PSI
*Full area short pattern
▲Flanged end valves 200 and 400 PSI, threaded valves 500 PSI

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THREADED VALVES SIZE, INCHES	1	1 1/4	1 1/2	2	2 1/2	3	4
STRAIGHTWAY							
Regular Opening	53	66	98	155	270	340	520
Full Pipe Area, 200 PSI	58	105	140	210	320	520	860
Full Pipe Area, 400, 500 PSI	64	120	155	240	350	580	980
Round Port	82	150	220	360	520	820	1,400
MULTI-PORT, FULL AREA							
Straight Run	42	70	90	155	220	340	580
90˚ Turn	26	44	58	94	140	220	370

FLANGED VALVES SIZE, INCHES	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
STRAIGHTWAY									
Regular Opening	56	69	100	160	280	350	520	650	740
Venturi									840
Full Pipe Area, Short Pattern	62	110	150	250	340	560	940	1,450	2,100
Full Pipe Area, Long Pattern	72	130	170	260	390	640	1,100	1,700	2,400
Round Port	96	170	260	450	660	1,050	1,800		4,100
MULTI-PORT, FULL AREA									
Straight Run	43	72	94	160	230	350	600	940	1,350
90˚ Turn	22	45	54	90	130	200	350	540	760

FLANGED VALVES SIZE, INCHES	8	10	12	14	16
STRAIGHTWAY					
Regular Opening	1,100	1,900	2,600		
Venturi	1,250	1,900	3,000	4,000	4,600
Full Pipe Area, Short Pattern	3,600	4,600	4,600		
Full Pipe Area, Long Pattern	4,200	6,400	9,200	11,000	14,000
Round Port	7,400	12,000	17,500		
MULTI-PORT, FULL AREA					
Straight Run	2,400				
90˚ Turn	1,250				

*Flow of water @ 60˚ F in gallons per minute at a pressure drop of one pound per square inch.

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THREADED VALVES SIZE, INCHES	1	1 1/4	1 1/2	2	2 1/2	3	4
STRAIGHTWAY							
Regular Opening	1.7	4.2	4.1	5.9	4.7	8.8	14.9
Full Pipe Area, 200 PSI	1.4	1.7	2.1	3.0	3.4	3.8	5.2
Full Pipe Area, 400, 500 PSI	1.1	1.3	1.7	2.4	2.7	3.0	4.1
Round Port	.7	.8	.8	1.1	1.3	1.5	2.0
MULTI-PORT, FULL AREA							
Straight Run	2.7	3.7	4.8	5.9	7.0	8.6	11.3
90° Turn	6.7	9.2	11.3	14.9	17.5	20.6	27.8

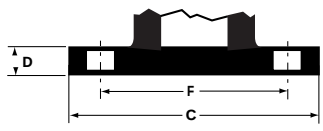
FLANGED END VALVES SIZE, INCHES	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16
STRAIGHTWAY														
Regular Opening	1.5		3.8	5.5	4.2	8.2	14.1	28.0	56.0	96.0	104.0	140.0	–	–
Venturi									42.0	77.0	104.0	94.0	88.0	133.0
Full Pipe Area, Short Pattern	1.2	1.5	1.8	2.6	2.9	3.2	4.4	5.6	6.8	9.0	17.7	42.0	–	–
Full Pipe Area, Long Pattern	.9	1.1	1.4	2.0	2.2	2.4	3.3	4.2	5.1	6.8	8.9	10.5	12.0	14.1
Round Port	.5	.6	.6	.7	.8	.9	1.2		1.8	2.2	2.6	3.0	–	–
MULTI-PORT FULL AREA														
Straight Run	2.5	3.5	4.5	5.5	6.5	8.0	10.5	13.5	16.5	21.0	–	–	–	–
90° Turn	6.5	9.0	11.0	14.5	17.0	20.0	27.0	32.0	40.0	52.0	–	–	–	–

TEMPERATURE FAHRENHEIT	MAXIMUM NON-SHOCK SERVICE PRESSURE, PSIG CATALOG RATING (WOG)					
-20° to 150°F	150	200	300	400	500	800
200°	135	190	280	372	460	—
250°	125	175	260	345	415	—
300°	110	165	240	315	375	—
350°	100	150	220	288	335	—
400°	—	140	200	270	290	—
450°	—	125	—	250	250	—

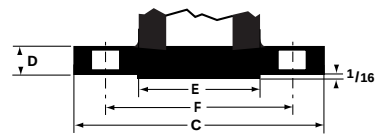
*The Code for Pressure Piping, American Standard ASA B31.1 — 1955, limits the use of cast iron pipe, above or below ground for oil, oil vapor and refinery gas, to a temperature of 300°F.

Flange Dimensions and Drilling Templates

Classes 125 lb. Cast Iron; 150 lb. S.P. Steel



ANSI 125-lb. Cast Iron Flange Standard



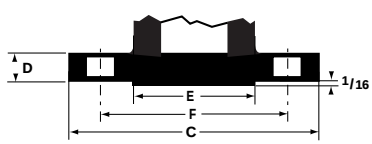
ANSI 150-lb. Steel Flange Standard

DESCRIPTION		NOMINAL PIPE SIZE														
SIZE		1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16
C	Diameter of Flange	4 1/4	4 5/8	5	6	7	7 1/2	8 1/2	9	10	11	13 1/2	16	19	21	23 1/2
D	Thickness of Flange	7/16	1/2	9/16	5/8	11/16	3/4	13/16	15/16	15/16	1	1 1/8	1 3/16	1 1/4	1 3/8	1 7/8
E	Diameter of Raised Face	2	2 1/2	2 7/8	3 5/8	4 1/8	5	5 1/2	6 3/16	7 5/16	8 1/2	10 5/8	12 3/4	15	16 1/4	18 1/2
F	Diameter of Bolt Circle	3 1/8	3 1/2	3 7/8	4 3/4	5 1/2	6	7	7 1/2	8 1/2	9 1/2	11 3/4	14 1/4	17	18 3/4	21 1/4
	Number of Bolts	4	4	4	4	4	4	8	8	8	8	8	12	12	12	16
	Diameter of Bolts	1/2	1/2	1/2	5/8	5/8	5/8	5/8	5/8	3/4	3/4	3/4	7/8	7/8	1	1
	Diameter of Bolt Holes	5/8	5/8	5/8	3/4	3/4	3/4	3/4	3/4	7/8	7/8	7/8	1	1	1 1/8	1 1/8

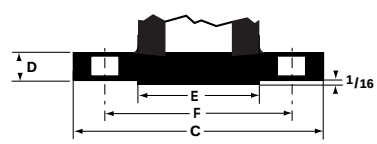
1/16" raised face is included in the minimum thickness of 150 lb. S.P. steel flanges; Class 125 cast iron flanges have plain face.
Drilling templates are in multiples of four, with bolt holes straddling the center lines.

Bolt holes of 150 lb. S.P. steel flanges are not faced; Class 125 cast iron flanges are not spot faced.

Classes 250 lb. Cast Iron; 300 lb. S.P. Steel



ANSI 250-lb. Cast Iron Flange Standard



ANSI 300-lb. Steel Flange Standard

DESCRIPTION		NOMINAL PIPE SIZE														
SIZE		1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16
C	Diameter of Flange	4 7/8	5 1/4	6 1/8	6 1/2	7 1/2	8 1/4	9	10	11	12 1/2	15	17 1/2	20 1/2	23	25 1/2
D	Thickness of Flange	11/16	3/4	13/16	7/8	1	1 1/8	1 3/16	1 1/4	1 3/8	1 7/16	1 5/8	1 7/8	2	2 1/8	2 1/4
E	Diameter of Raised Face, Cast Iron	2 11/16	3 1/16	3 9/16	4 3/16	4 15/16	5 11/16	6 5/16	6 15/16	8 5/16	9 11/16	11 5/16	14 1/16	16 7/16	18 15/16	21 1/16
F	Diameter of Bolt Circle	2	2 1/2	2 7/8	3 5/8	4 1/8	5	5 1/2	6 3/16	7 5/16	8 1/2	10 5/8	12 3/4	17 3/4	16 1/4	22 1/2
	Number of Bolts	4	4	4	8	8	8	8	8	8	12	12	16	16	20	20
	Diameter of Bolts	5/8	5/8	3/4	5/8	3/4	3/4	3/4	3/4	3/4	3/4	7/8	1	1 1/8	1 1/8	1 1/4
	Diameter of Bolt Holes	3/4	3/4	7/8	3/4	7/8	7/8	7/8	7/8	7/8	7/8	1	1 1/8	1 1/4	1 1/4	1 3/8

1/16" raised face is included in the minimum thickness for all sizes of Class 250 cast iron and 300 lb. S.P. steel flanges. Drilling templates are in multiples of four, with bolt holes straddling the center lines.

Bolt holes on cast iron flanges are not spot faced. Bolt holes on steel flanges are spot faced.

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SIZE INCHES	VALVE TYPE																							
	REGULAR OPENING			VENTURI						FULL PIPE AREA, THREADED AND SHORT PATTERN			FULL PIPE AREA LONG PATTERN						ROUND PORT			MULTI-PORT FULL AREA		
	LINE PRESSURE, PSI																							
	0	100	200	0	100	200	300	400	500	0	100	200	0	100	200	300	400	500	0	100	200	0	100	200
1/2	3	4 1/2	6							3	4 1/2	6	3	4 1/2	6	8	10	12	3	4 1/2	6	4	6	8
3/4	3	4 1/2	6							3	4 1/2	6	3	4 1/2	6	8	10	12	3	4 1/2	6	4	6	8
1	3	4 1/2	6							3	4 1/2	6	3	4 1/2	6	8	10	12	5	8	11	6	9 1/2	13
1 1/4	3	4 1/2	6							6	9 1/2	13	6	9 1/2	13	17	21	25	7	13	19	8	16	24
1 1/2	4	6	8							6	9 1/2	13	6	9 1/2	13	17	21	25	8	16	24	8	16	24
2	6	9 1/2	13							7	13	19	7	13	19	26	33	40	15	30	45	14	30	45
2 1/2	7	13	19							12	22	32	12	22	32	43	54	65	25	50	75	20	41	62
3	12	22	32							20	41	62	20	41	62	86	110	134	34	72	110	34	72	110
4	20	41	62							40	83	126	40	83	126	174	222	270	66	146	226	70	160	250
5	40	83	126	40	83	126	174	222	270	66	146	226	66	146	226	314	402		105	255	405	105	255	405
6	40	83	126	66	146	226	314	402	490	90	225	360	90	225	360	510	660	820	170	405	640	190	470	750
8	66	146	226	90	225	360	510	660	820	190	470	750	190	470	750	1050	1350	1675	275	825	1375	335	925	1510
10	105	255	405	190	470	750	1050	1350	1675	225	560	895	400	1000	1600	2250	2900		480	1610	2740	570	1610	2650
12	135	330	525	225	560	895	1250	1605	1960	245	610	975	600	1600	2600	3750	4800		750	2650	4550	1150	3400	5650
14				400	1000	1600	2250	2900	3650				660	1770	2880	4060	5240							
16				600	1600	2600	3750	4800					1200	3600	6000	8500	11000							

Information based on average conditions under specific conditions, torque shown may vary 2 to 1 either way.

How To Order RESUN® Plug Valves

All requirements should be stated at the time of purchase with the understanding that, if the order does not specify other wise, R&M Energy Systems may supply the valve standard in respect to materials, end connections, etc.

The following information is required:

1. **Size** (line size)
2. **Figure number**
3. **Material of construction** (If other than standard)
4. If **power actuator** required, state details (page 30)
5. Other special requirements, like:
   a. Dial indicator for standard straightway valves
   b. Transflo plugs for multi-port valves
   c. 180° Turn stop and port positions for 3-way/2-port valves
   d. High and low head extensions and water-tight gear housing
   e. Steam-Jacketed baseplates
   f. Chainwheels for worm gear-operated valves or double-end chain wrenches for wrench-operated valves
   g. Locking wrenches, socket “T” wrenches, and wrench adapters
   h. Locking and sealing devices for wrench-operated valves

In addition, information as to type of installation, working pressure, temperature, flow medium, and presence of corrosive or abrasive elements will also aid in filling your order.

R&M Energy Systems
10906 FM 2920
Tomball, Texas, U.S.A. 77375
(800) 654-5603
(281) 351-2222 • Fax: (281) 351-6557

R&M Energy Systems Canada
3703 - 98th Street
Edmonton, Alberta, Canada T6E 5N2
(800) 661-5659
(780) 437-6316 • Fax: (780) 435-3074

R&M ENERGY SYSTEMS
TERMS & CONDITIONS OF SALE

1. ACCEPTANCE

1.1 All orders are subject to final acceptance by ROBBINS & MYERS ENERGY SYSTEMS L.P. (DBA and hereinafter referred to as R&M ENERGY SYSTEMS).

2. F.O.B. POINT

2.1 All shipments are F.O.B. R&M ENERGY SYSTEMS Point of Origin or other designated shipping point.

3. PRICES

3.1 All quotations are made for prompt acceptance and any terms quoted therein are subject to change without notice after thirty (30) days from the date of quotation unless specifically stated otherwise on the quotation. Prices or escalation formulas in effect at time of shipment will apply unless otherwise stated in writing.

3.2 Prices are F.O.B. Point of Origin. R&M ENERGY SYSTEMS reserves the right to invoice customer for any and all finished material ready for shipment, when held at customer's request or for other reasons beyond R&M ENERGY SYSTEMS' control. Seller reserves the right to place a service charge on past due accounts at the highest rate permitted by law. Every Sales, Use, Excise or other tax and any charge imposed by law or Common practice to include custom duties, consular fees, insurance charges and other comparable charges to be borne by customer. Prices are in U.S. Dollars.

3.3 All orders are subject to any Federal, State or other Government Regulation that may be in effect or later become effective.

3.4 Charges for Field Installation of Equipment not available during manufacturing process will be borne by Customer unless otherwise stated in writing.

3.5 Prices subject to change without prior notice.

4. MINIMUM BILLING

4.1 Minimum billing of $25 net will be charged per order on any partial shipment requested by customer.

4.2 Change orders and/or "add on" supplements are subject to additional billings commensurate with the cost and will receive individual consideration insofar as minimum billing, freight allowance and discount are concerned.

5. DELIVERIES

5.1 All promises of shipment are estimated as closely as possible based on the availability of materials and capacity at the time and are expressly subject to change due to delays resulting from strikes, differences with workmen, labor troubles, acts of God, Governmental acts and regulations, war or war conditions, riots or civil commotion, sabotage, fires, floods, explosions or other accidents, or to delays to carriers or of subcontractors or in receipt of materials, or to delays occasioned by or arising in connection with obligations to other cause or causes (whether or not of the same general character as those herein specifically enumerated) beyond R&M ENERGY SYSTEMS' reasonable control.

5.2 If additional information or drawing approval is required, promise of shipment will date from receipt of same.

6. DESIGN

6.1 R&M ENERGY SYSTEMS reserves the right to make changes in design and/or materials without notice.

7. CANCELLATIONS

7.1 Orders accepted by R&M ENERGY SYSTEMS are not subject to cancellation by customer except with the consent of R&M ENERGY SYSTEMS and upon terms which will indemnify R&M ENERGY SYSTEMS against loss or damage occasioned by such cancellation.

8. INSPECTION

8.1 Final inspection and acceptance of products must be made at R&M ENERGY SYSTEMS' plant and shall be conclusive except as regards latent defects.

8.2 Customer's representatives may inspect at the plant during working hours prior to shipment in such manner as will not interfere with operations.

9. ENGINEERING AND SERVICE

9.1 Upon request, R&M ENERGY SYSTEMS may provide engineering and/or technical information about its products and their uses; and if feasible may provide personnel to assist buyer in effecting field installation and/or field service.

9.2 Such information service, or assistance so provided, whether with or without charge, shall be advisory only, and buyer agrees to hold R&M ENERGY SYSTEMS harmless from claims for loss from any cause resulting from such advisory or service activity.

10. WARRANTY

10.1 THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS.

10.2 R&M ENERGY SYSTEMS warrants that all products manufactured by it and all repair work performed by it shall be free from defects in workmanship and material when these products are used within the service and pressure range from which they were manufactured. Such warranty shall be binding upon R&M ENERGY SYSTEMS in respect to products for a period of one year from shipment of such products and in respect to repair work for a period of 60 days from completion of such repairs and applies only to materials furnished and work performed in the repair operation.

10.3 If, at any time within such periods, it is established to the satisfaction of R&M ENERGY SYSTEMS that any product manufactured by R&M ENERGY SYSTEMS was defective at time of shipment or any repair work performed by R&M ENERGY SYSTEMS was defective, R&M ENERGY SYSTEMS, at its option, shall repair or exchange such item, F.O.B. place of manufacture or repair or other R&M ENERGY SYSTEMS designated shipping point, or refund the price paid.

10.4 It is understood that the liability of R&M ENERGY SYSTEMS shall be limited to such repair or replacement and that R&M ENERGY SYSTEMS SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY DEFECTS OR FROM ANY CAUSE WHATSOEVER.

10.5 This warranty does not cover deterioration by corrosion or aging of non-metallic parts, including stress corrosion or any other cause of failure other than defects in workmanship and materials.

10.6 Unless repairs to, alterations of, or work done on said products by the buyer shall be specifically authorized in writing by R&M ENERGY SYSTEMS, any warranty applicable thereto shall become null and void.

10.7 R&M ENERGY SYSTEMS does not warrant the performance of any elastomer subjected to severe service due to temperature and/or chemical environment.

11. FREIGHT

11.1 Any freight allowance applies to materials manufactured only by R&M ENERGY SYSTEMS. Delivery by carrier will be at customer's risk.

12. PATENT INFRINGEMENT

12.1 The seller shall not be liable for any damage or costs for any infringement of patents for products which are produced to buyer's specifications and buyer shall assume all responsibility for and save seller harmless from any and all damages, cost, royalties and claims arising out of charges of any infringement.

13. GENERAL

13.1 Acceptance of buyer's order is expressly conditional upon buyer's acceptance of the foregoing terms and conditions of sale. Any additional or different terms proposed by customer are not acceptable unless expressly agreed to in writing by R&M ENERGY SYSTEMS.

13.2 Any shipping discrepancies must be reported within 30 days after receipt of order.

The above supersedes all "Terms & Conditions of Sale" prior to 8/98.

A Unit of Robbins & Myers, Inc.

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