

Skotch[®] Trifecta

Gas and Oil Safety Shut-Off Valve System



ITT

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Introduction

ITT Corporation, Engineered Valves has been an innovator and producer of valves for over fifty years. These valves have gained extensive usage in many industries including power generation, pulp and paper, refining, chemical process, pharmaceutical/bioprocessing and pollution control.

Our Lancaster, Pennsylvania facility produces the complete line of Skotch® Trifecta valve systems. Starting with raw material machining, welding, assembly, final inspection and shipment, a commitment to quality is evident throughout the process.

Unique Skotch® Trifecta valve systems are specifically designed to provide safe and reliable shutoff for fuel gas and oil service. These valve systems have been utilized for over 25 years and are in service on boilers and burners around the world.

Because Skotch® Trifecta systems are custom built for each project, we are able to modify our standard offerings to suit our customer's various applications. Whether it involves specialty materials or components, Skotch® Trifecta valve systems will simplify your installation and operation while increasing safety and reliability.



Fabricated Body Gas Valve Systems



ITT

ENGINEERED FOR LIFE

Skotch® Trifecta Gas Valve Systems

A safer, more reliable engineered system for automated burner shutoff of gas service in your plant.

When you are burning flammable or fuel gases, you need an automated shutoff system you can count on for safe, reliable performance – every time. No leaks. No out-of-sequence operation.

And that's where Engineered Valves Group can help. Skotch valves are unique gas burner shutoff valve systems designed and manufactured with innovative technology.

The Skotch Trifecta T4000F valve systems offer a superior alternative to conventional multiple-valve packages. The Skotch Trifecta is a complete valve system contained within a single housing. Fail-closed models, which include

appropriate accessories, are Factory Mutual (FM) approved as automatic gas safety shutoff valves. Ruggedly constructed, the Trifecta system provides all the blocking and venting functions needed for safe automated gas burner operation.

Engineered Valves offers T4000 series valve systems in a broad range of sizes to meet the needs of any capacity gas burner or igniter. When necessary, valves can be specially configured to address specific requirements for piping design and support, and hazardous location classifications.



Shown are eight T4300F (3 inch) Skotch Trifecta gas valve systems replacing the need for twenty-four independently actuated valves. Installation time and space are reduced considerably.

Skotch® Trifecta Gas Valve Systems

A Look at the Problem

Strings of separate valves or multiple valve manifolds are frequently used to provide automated burner shutoff in fuel gas applications. Such arrangements often consist of a vent valve and two block valves, with each valve being driven by a separate actuator.

Failure of all actuators to operate in sequence is a concern. Sometimes a single operator is mechanically linked to drive both block valves in tandem. In such a configuration, obstruction or linkage problems that affect one valve will prevent the other from closing, so the advantage of using a double block is lost.

In many systems, vent valves are direct solenoid operated, with no provision for ensuring positive closure. The result can be continuous leakage into vent piping when the block valves are open. Installation of the conventional three-valve system can require as many as nine different connections. The Skotch Trifecta system requires only three simple connections; inlet, outlet, and vent. In addition, the Trifecta automatically gives you the correct vent size based on the recommendations of NFPA and IRI.

Engineered Valves created the T4000 series as a fully integrated system engineered for gas burner shutoff applications. The result is elimination of performance problems and a device that offers continuous, reliable, trouble-free service in your most critical applications.



T4600F (6 inch) Skotch Trifecta gas valves are installed above the burner level in the horizontal position, which reduces burner front clutter.

Skotch® Trifecta T4000F Series Gas Valves

The patented Skotch Trifecta T4000F series fabricated body valve system is a safe, cost-effective, reliable alternative to multiple valves and manifolds found in fuel gas systems. Used in applications where double block and vent is required, the T4000F combines the function of two independent block valves with a normally open vent valve in a single, compact unit. This makes it ideal for boilers, furnaces and process heating equipment firing natural gas, propane, and other fuel gas.

A single actuator mechanically opens the two block valves and closes the vent, assuring that the valves operate in sequence. Use of independent spring-to-close block valves ensures that obstructing one valve does not prevent the other from closing. The Trifecta valve system has no exposed linkage that can be damaged and requires no adjustments for proper operation.

Because Skotch Trifecta valve systems are custom built for each application, we are able to modify our standard offerings to suit customer needs. Installation flexibility is increased since the outlet and vent ports can be rotated at 90° increments, and the valves can be mounted in any orientation. The valve system is completely self-contained and all necessary accessories are provided, including position indication switches and junction box.

Skotch Trifecta gas valve systems have been proven as a superior alternative to multiple valves systems by decreasing installation space, time, and costs while increasing safety and reliability.

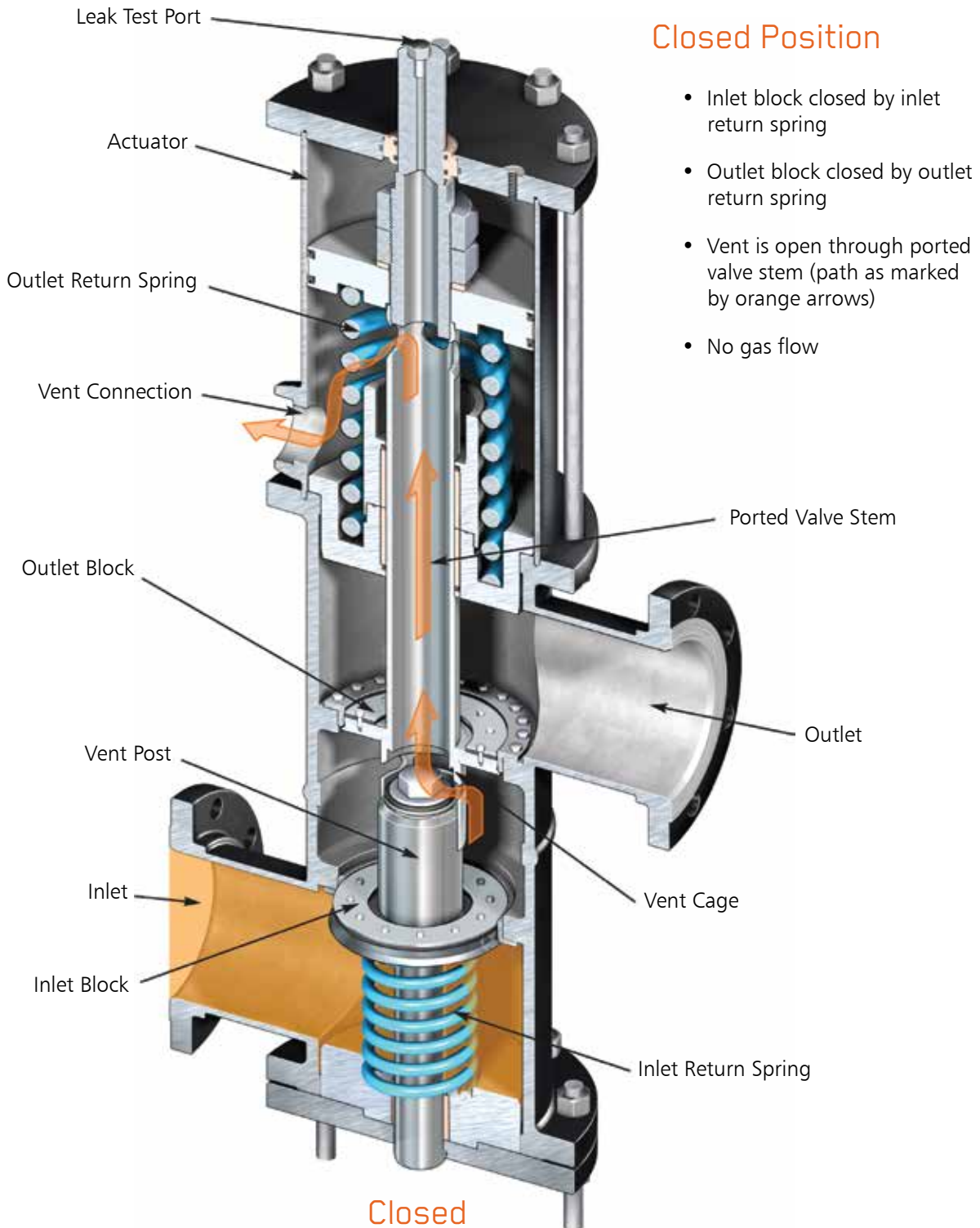
Features and Benefits

- Provides all necessary block and vent functions in a single integral unit
- Use of a single actuator ensures reliable in sequence operation. Block valve closure springs are independent for reliable closure
- Fabricated design allows for installation flexibility
- Compact design saves space
- All three valves provide ANSI/FCI 70-2 Class VI shutoff with over-travel and metal-to-metal back up seats
- Complies with NFPA and IRI's recommended good design practices for vent port size
- Outlet and vent ports can be rotated at 90° increments, and the valves can be mounted in any orientation
- Built in test port to allow leakage testing while valve is in line
- No external linkage; rugged enclosure protects all components
- Designed for in-line maintenance



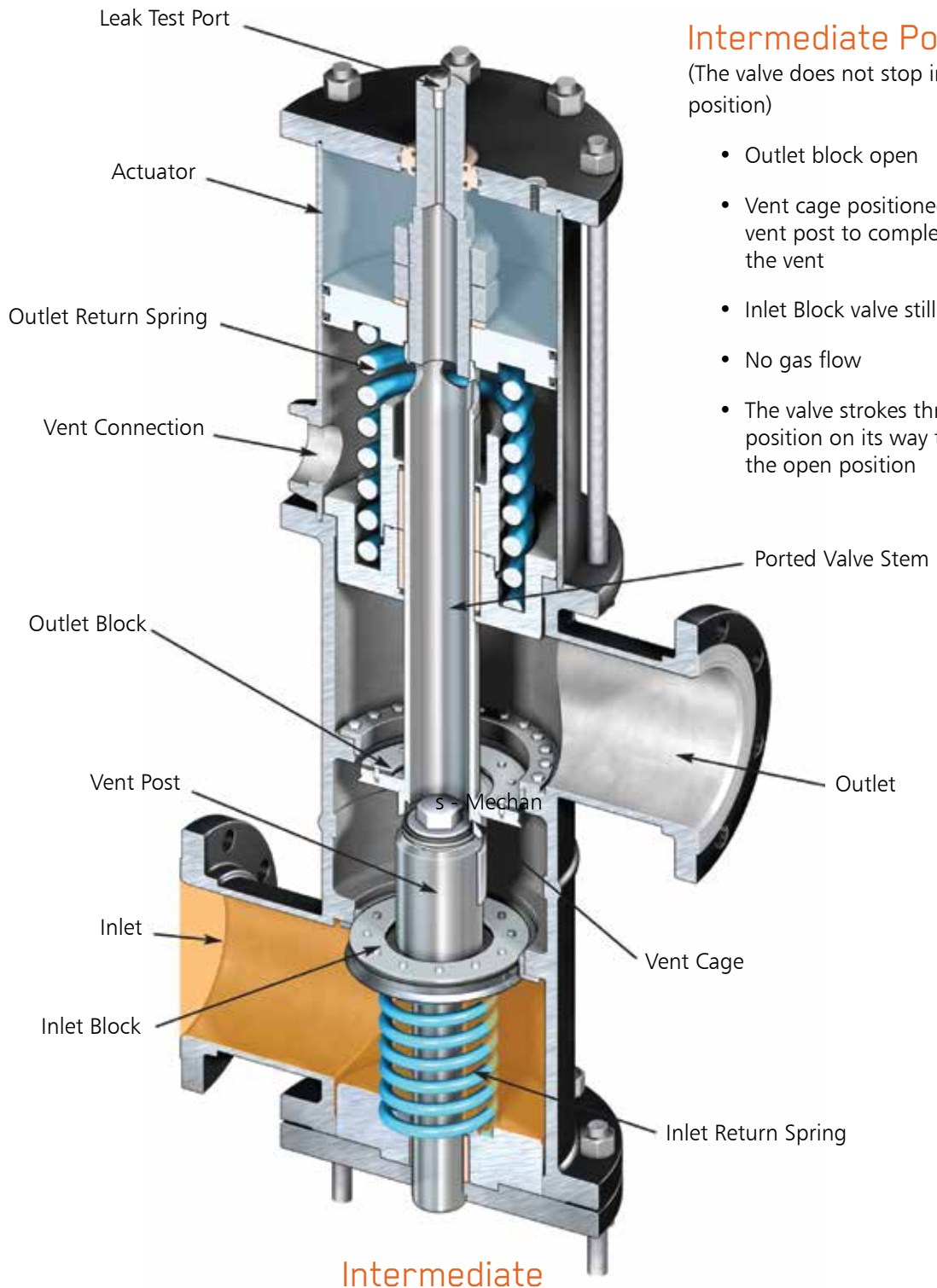
Skotch® Trifecta T4000F

Operating Sequence for the T4000F in the Closed Position



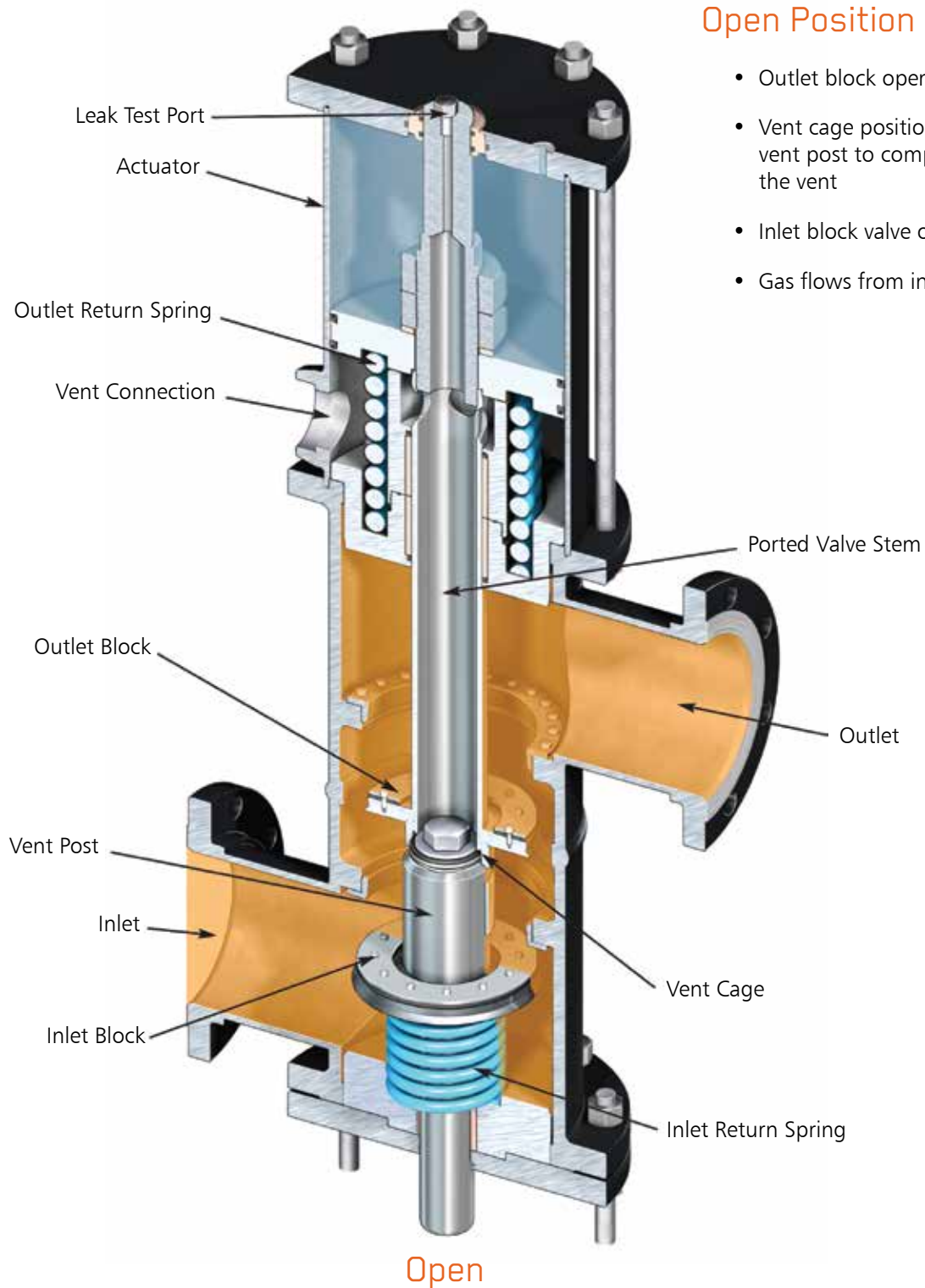
Skotch® Trifecta T4000F

Operating Sequence for the T4000F in the Intermediate Position



Skotch[®] Trifecta T4000F

Operating Sequence for the T4000F in the Open Position



Skotch® Trifecta T4000F

Specifying Configurations 2" through 6"

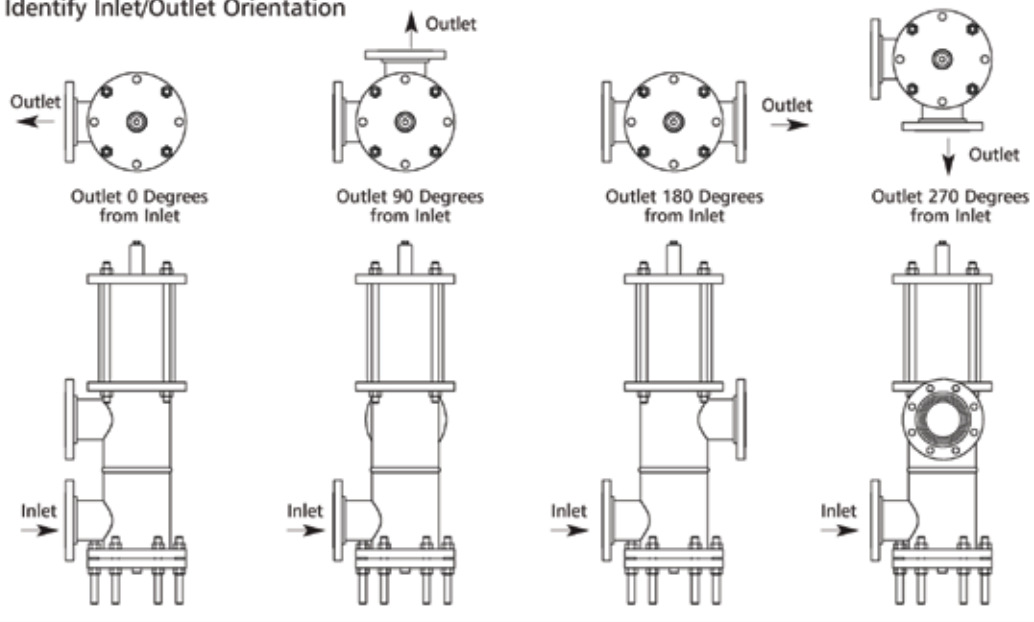
T4000F Body Configurations

The two-inch (T4200F) through six-inch (T4600F) valve systems are fabricated design. As a result, outlet and vent connections as well as the junction box can be located at

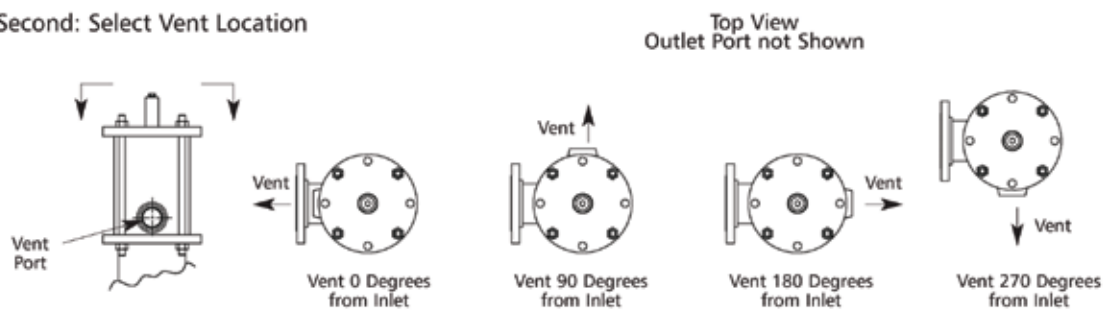
any point in 90° in relation to the inlet connection. Listed here are standard orientations from which to choose.

Note: Vent and junction box should not be in the same location.

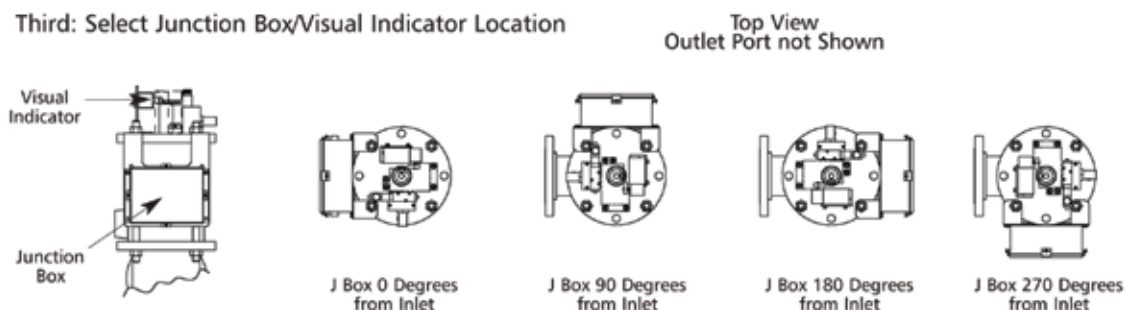
First: Identify Inlet/Outlet Orientation



Second: Select Vent Location

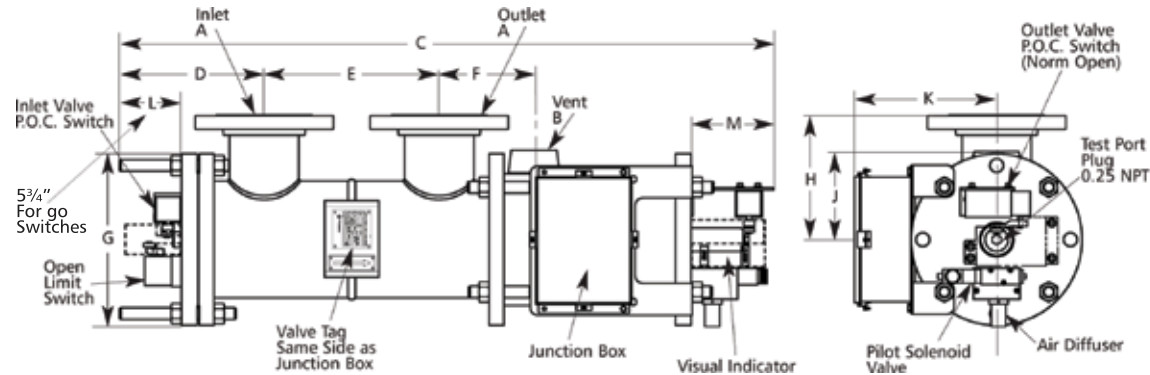


Third: Select Junction Box/Visual Indicator Location



Scotch® Trifecta T4000F

Dimensional Information



T4000F Systems are covered under U.S. Patent No. 4,798,223 and other foreign patents.

General Dimensions (Inches)

Valve Series	Line Size A	Vent Size B	C	D	E	F	G	H	J	K	L	M
T4200F	2.00 R.F. Flange	1.00 FNPT	36.81	9.11	7.50	5.02	9.00	6.00	3.93	9.42	4.50	5.30
T4300F	3.00 R.F. Flange	1.25 FNPT	40.79	8.69	10.12	5.53	11.00	7.50	5.54	9.63	4.00	5.30
T4400F	4.00 R.F. Flange	2.00 FNPT	42.08	9.31	11.27	6.10	11.00	7.93	5.63	9.63	4.00	5.30
T4600F	6.00 R.F. Flange	2.50 FNPT	55.38	11.06	15.00	8.13	13.50	11.00	7.38	11.42	5.25	5.88

General Dimensions (Metric)

Valve Series	C	D	E	F	G	H	J	K	L	M
T4200F	935.0	231.4	190.5	127.5	228.6	152.4	99.8	239.3	114.3	134.6
T4300F	1036.1	220.7	257.0	140.5	279.4	190.5	140.7	244.6	101.6	134.6
T4400F	1068.83	236.5	286.3	154.9	279.4	201.4	143.0	244.6	101.6	134.6
T4600F	1406.65	280.93	381.0	206.5	342.9	279.4	187.5	290.1	133.35	149.4

Specifications for the T4000F

Design Pressure and Temperature:

Max. operating pressure – 50 PSIG

Max operating temperature – 180°F

Shutoff Classification:

All ports soft seated with metal to metal backup

New valve: meets or exceeds ANSI/FCI 70-2

Class VI

Durability: meets or exceeds FM 7400 standard
for Safety Shutoff Valves (SSOV)

Sizes & Weights:

Series	Line Size	Vent Size	Weight*
T4200F	2"	1"	137 lbs
T4300F	3"	1 1/4"	240 lbs
T4400F	4"	2"	265 lbs
T4600F	6"	2 1/2"	515 lbs

*Approximate depending on options selected

Cv Ratings:

T4200F – 80

T4300F – 167

T4400F – 245

T4600F – 430

End Connections:

Inlet/Outlet: ANSI B16.5 Cl 150 Raised Face Flange

Vent: ANSI B2.1 Female NPT, Sch 40 or 80 Spigot, Butt weld
(CL 150 Raised face flange optional)

Actuation:

T4x05 – Fail in last position

T4x06 – Fail closed, FM approved

T4x07 – Fail closed, non-FM approved

Pneumatic Supply: 70 to 120 PSIG clean, dry air

Ambient Temperature Rating:

Standard: 140°F (FM approved)

Optional: 180°F (non-FM approved)

Construction Materials:

Body: ASTM A105 Carbon Steel

Trim: 6061 – T6 Aluminum, ASTM AS11 Type 316SS

Seals: Buna-N standard; Consult factory for Viton options

Electrical Rating:

Standard – Nema 1, 3, 4, 13

Optional – Nema 7, 9 (Class 1 Div 2 Gr B, C, D)

Pilot Solenoid Voltages:

110 VAC, 220 VAC 50/60 Hz

12, 24, 48, 125 VDC

Switch Rating: 10 Amps at 125 VAC

Ingress Protection: 4, 4X, 6P

Stroke:

T4200: 3"

T4300: 3.5"

T4400: 4"

T4600: 5"

Orientation: May be installed in any orientation



FM Approved for valves which fail in the closed position and incorporate appropriate options.

Skotch® Trifecta T4000F

Flow Capacity Charts

2" through 6"

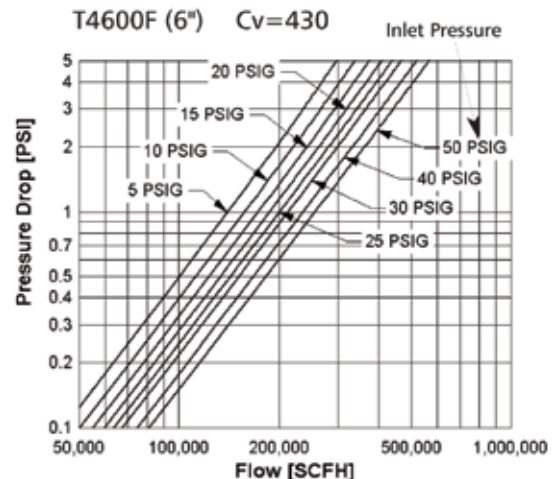
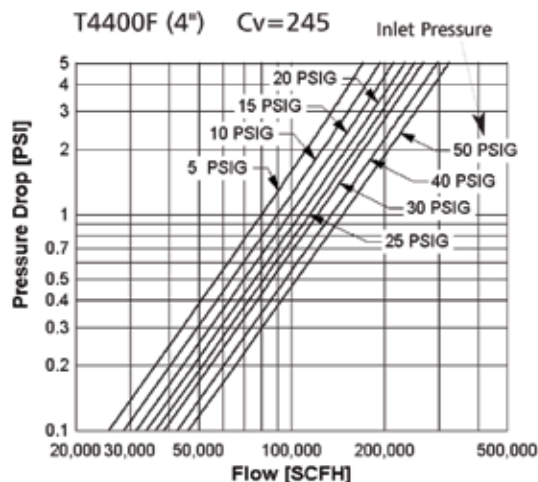
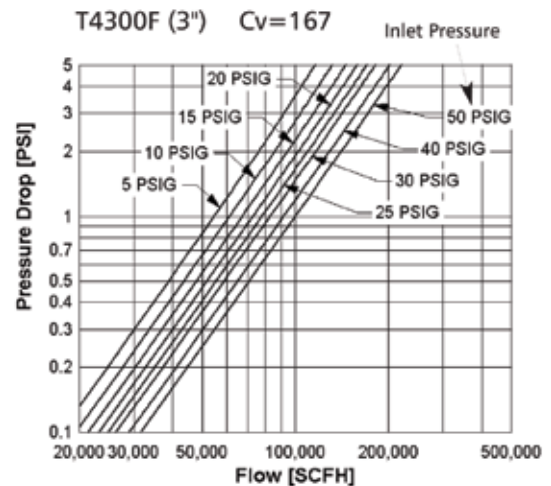
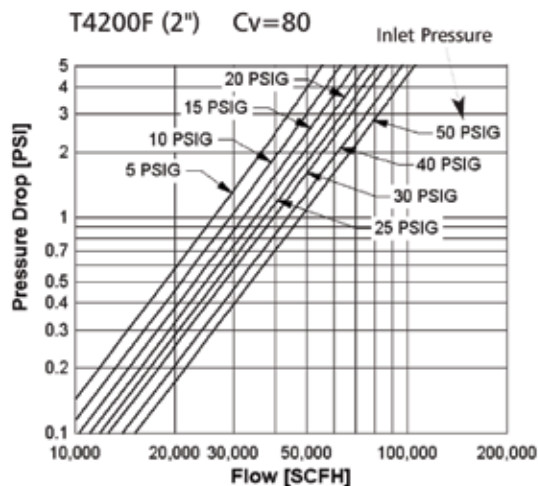
The following charts depict the relationship between flow (SCFH) and pressure drop (PSI) for 2 inch through 6 inch Trifecta valves. Data is given at various inlet pressures (PSIG). Follow known flow up the chart until you intersect the known operating pressure. Where the two lines intersect, look to the left for the pressure drop.

Example: 3" valve system with 100,000 SCFH natural gas flow operating at 15 PSIG inlet pressure the pressure drop will be 2.3 PSI. Selecting a 4" valve system with the same conditions will result in a pressure drop of 1.0 PSI

Estimated pressure drops are reported for the entire Trifecta double block and vent system.

Figures can be used to compare relative performance of the various valve sizes. Please note that calculations do not take into effect external piping elements, such as reducers, tees, and elbows. When comparing this data with that of other manufacturers, please ensure any comparison figure estimates the performance over two block valves closely-coupled and not just a single valve.

For other process conditions, calculations may be performed using the Cv values noted in valve specification data, or contacting the factory. Calculations are based on natural gas at 0.65 specific gravity, 60 degrees F.



Calculations are based on natural gas at 0.65 specific gravity, 60 degrees F.

Scotch[®] Trifecta T4000F

Principles of Operation

Opening

1. With the block valves closed and the vent open, gas enters the inlet port and is blocked by two flow-to-close plugs (the inlet and outlet block). To positively prevent fuel leakage into an idle burner, the chamber between is vented to atmosphere through the ported outlet valve stem. (Figure 1)

2. Pneumatic pressure at the top of the actuator cylinder moves the piston downward, compressing the outlet return spring and forcing the outlet block open. The cage slides down over the post until the machined surfaces inside the cage come in contact first with a spring-energized soft seal, and then with a metal back-up seat, closing the vent. (Figure 2)

3. With the vent closed, the system continues to stroke, pushing the inlet block open, so that gas begins to flow. A travel stop halts valve movement after full stroke is achieved. (Figure 3)

Closing

1. To close the valve and open the vent, pilot air is exhausted from the actuator. Return springs drive the inlet and outlet valves toward their seats. (Figure 3)

2. As the inlet valve enters its seat ring, gas flow is isolated. The inlet block moves through its overtravel until contact is made with the metal back-up seat to fully close the inlet valve (Figure 2)

3. As the outlet valve continues moving toward its seat, the cage separates from the post, opening the vent. The outlet block enters the seat ring, isolating the vent from downstream piping. When the outlet block contacts the metal back-up seat, the system is fully closed. (Figure 1)

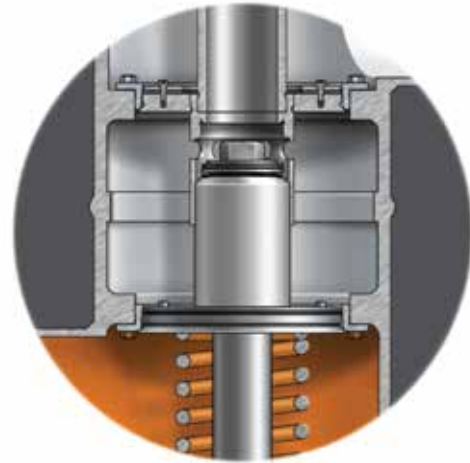


Figure 1

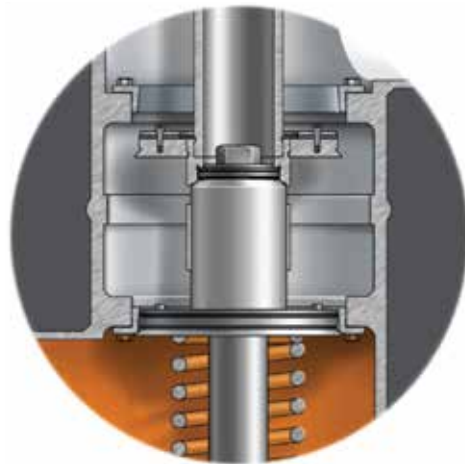


Figure 2

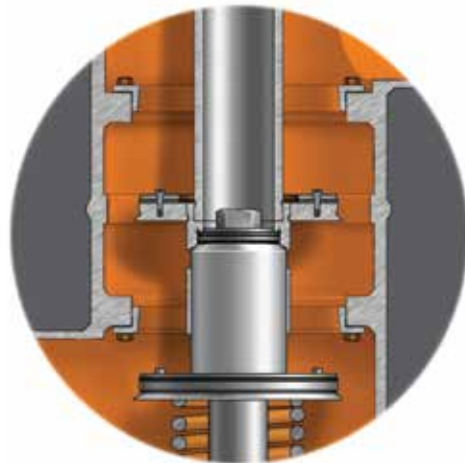


Figure 3

Cast Body Gas Valve Systems



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Skotch® Trifecta T4000C Series Gas

For larger igniters and smaller main burners, the patented Skotch Trifecta T4000C series cast-body valve system is a safe, cost-effective, reliable alternative to the multiple valves and manifolds found in fuel gas systems.

Used in applications where double block and vent is required, the T4000C combines the functions of two independent block valves with a normally open vent valve in a single, compact unit making it ideal for boilers, furnaces, and process heating equipment firing natural gas, propane, or other fuel gas. The unique design includes three ports: inlet, outlet, and vent. The cast steel body contains two valve plugs – an inlet and outlet block. The chamber between is open to vent through the ported inlet stem.

Flow-to-close inlet and outlet blocks are sized for full flow to minimize pressure loss; increasing inlet pressure forces the blocks tighter on their seats. Soft seals with over-travel and metal-to-metal back up seats ensure positive ANSI/FCI 70-2 Class VI closure. Proof-of closure (POC) switch is standard.

Advantages of using the T4000C valve system vs. conventional multiple valve and manifold setups include:

- Compact for easier installation
- Less maintenance and lower cost of ownership
- Available Factory Mutual (FM) approved configurations (fail closed only)
- No out-of-sequence operation
- Can be installed in any orientation

Because the T4000C valves operate using a single actuator, problems such as out-of-sequence operation, jamming, and maladjustment of linkage drive systems are eliminated.



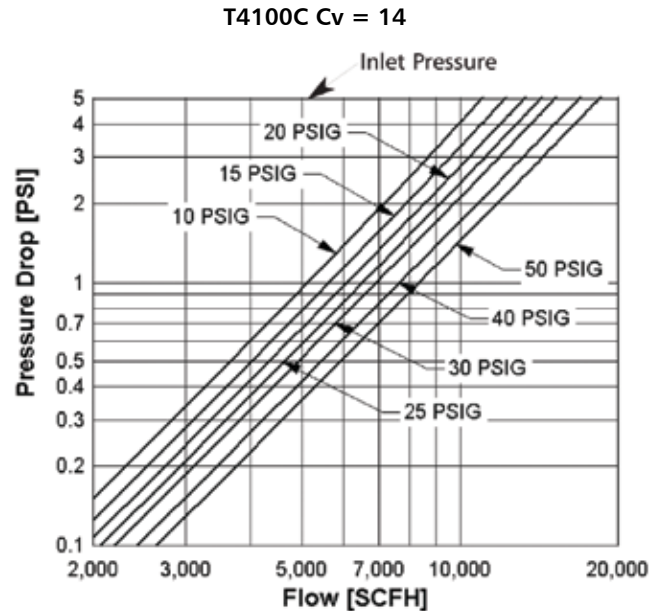
Scotch[®] Trifecta T4000C

Flow Capacity for the T4100C

The following chart depicts the relationship between flow (SCFH) and pressure drop (PSI) for the T4100C Scotch Trifecta valve system. Data is given at various inlet pressures (PSIG). Follow known flow up the chart until you intersect the known operating pressure. Where the two lines intersect, look to the left for the calculated pressure drop.

T4100C example: With 10,000 SCFH flow operating at 15 PSI the calculated pressure drop will be 3.3 PSI.

Calculations are based on natural gas at 0.65 specific gravity, at 60° F.



Specifications for the T4100C

Design Pressure and Temperature:

Max. operating pressure: 50 PSIG

Operating temperature range: -20°F to 150°F

Shutoff Classification:

All ports soft seated with metal to metal backup

New valve: meets or exceeds ANSI/FCI 70-2
Class VI

Durability: meets or exceeds FM 7400 standard
for Safety Shutoff Valves (SSOV)

Inlet/Outlet Size: 1" Sch. 40 (Sch. 80 optional)

Weight: Approximately 35 lbs depending on options selected

CV Rating: 14

End Connections:

Inlet/Outlet: Sch. 40 or 80 Spigot; Butt Weld;
ANSI Class 150 Raised-Face Flange;
Male NPT in Sch. 80; Socketweld

Vent: ANSI B2.1 FNPT

Actuation:

Electropneumatic

T4105C- Fail Last Position

T4106C- Fail Closed (Safe), FM Approved

T4107C- Fail Closed, non-FM Approved

Flow Direction: Left-to-right or right-to-left. Field reversible

Pneumatic Supply: Clean, dry air at 60 to 120 PSIG

Ambient Temperature Rating:

Standard: 140°F (FM approved)

Optional: 180°F (non-FM Approved)

Construction Materials:

Body: ANSI B16.34 compliant; cast carbon steel
per ASTM A216 Gr. WCB

Flanges: ASTM A479 Type 304, ASTM A108 1018

Trim: ASTM Type 300 series stainless steels

Seals: Buna-N standard; Consult factory for
Viton options

Switch / Solenoid Electrical Ratings:

Standard: Nema 1, 3, 4, 13

Optional: Nema 7, 9 (Class 1 Div 2 Gr. B, C, D)

Solenoid Supply Voltages:

110 VAC, 220 VAC 50/60 Hz

12, 24, 48, 125 VDC

Switch Rating:

Internal Switches - 7 Amps @ 120 VAC

External Switches - 10 Amps @ 125 VAC

Ingress Protection:

Standard: Nema 4

Optional: Nema 4X

Stroke: ~ 1"

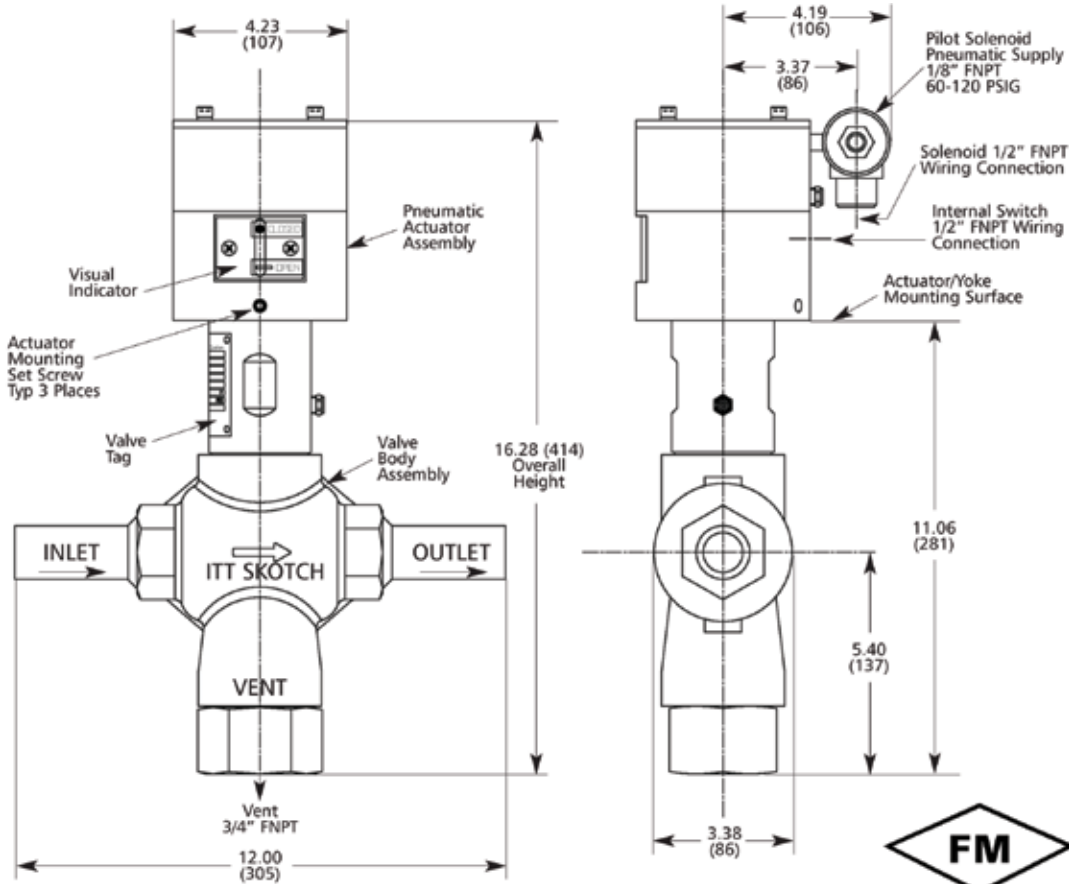
Orientation: May be installed in any orientation



FM Approved for valves which fail in the closed position and incorporate appropriate options.

Skotch[®] Trifecta T4000C

Dimensional Specifications for the T4100C

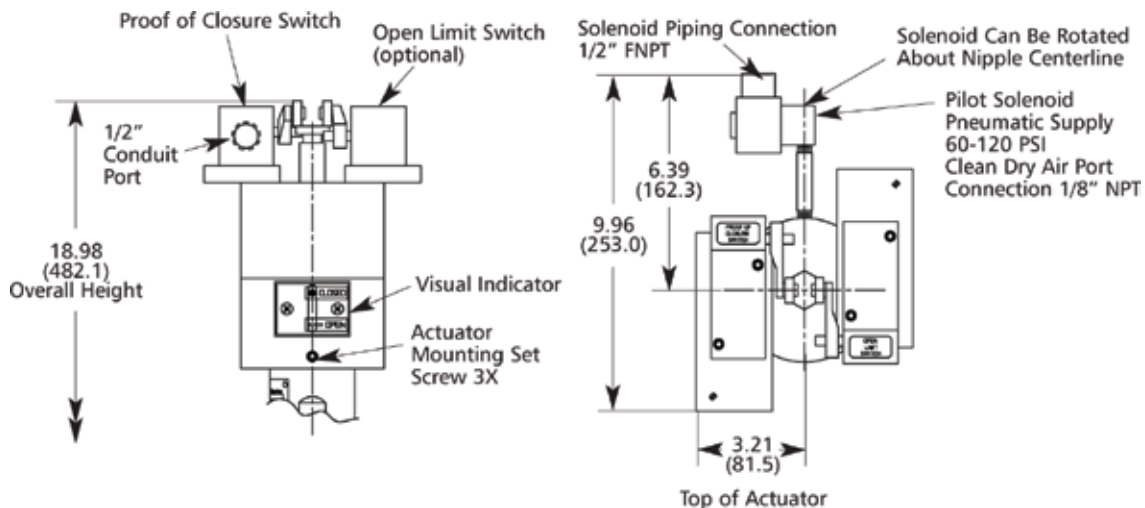


T4000C systems are covered under U.S. Patent No. 5,165,443 and other foreign patents.
Dimensions are inches (mm)

FM
APPROVED

FM Approved for valves which fail in the closed position and incorporate appropriate options.

Externally Mounted Limit Switch Option



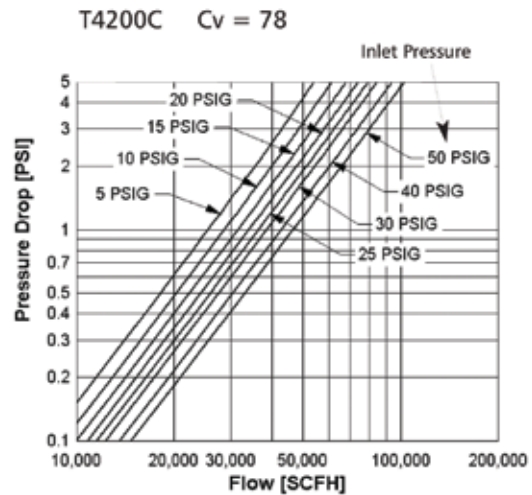
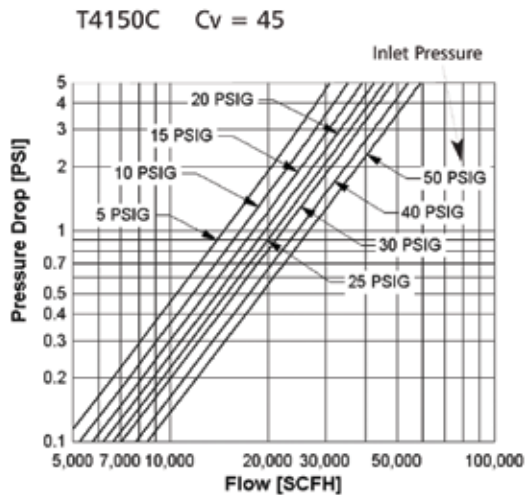
Skotch[®] Trifecta T4000C

Flow Capacity for the T4150C and T4200C

The following chart depicts the relationship between flow (SCFH) and pressure drop (PSI) for the T4150C and T4200C Trifecta valve systems. Data is given at various inlet pressures (PSIG). Follow known flow up the chart until you intersect the known operating pressure. Where the two lines intersect, look to the left for the calculated pressure drop.

T4150C example: With 20,000 SCFH flow operating at 15 PSI the calculated pressure drop will be 1.2 PSI.

Calculations are based on natural gas at 0.65 specific gravity, at 60° F.



Specifications for the T4150C and T4200C

Design Pressure and Temperature:

Max. operating pressure: 60 PSIG
Operating temperature range: -20°F to 180°F

Shutoff Classification:

All ports soft seated with metal to metal backup
New valve: meets or exceeds ANSI/FCI 70-2
Class VI

Durability: meets or exceeds FM 7400 standard
for Safety Shutoff Valves (SSOV)

Sizes & Weights:

Series	Line Size	Vent Size	Weight*
T4150C	1.5"	3/4"	111 lbs
T4200C	2.0"	1"	162 lbs

*Approximate depending on options selected

End Connections:

Inlet/Outlet: ANSI B16.5 Cl 150 Raised Face Flange
Vent: ANSI B2.1 Female NPT, Sch 40 or 80 Spigot, Butt weld
(CL 150 Raised face flange optional)

Actuation:

T4xx5 – Fail in last position
T4xx6 – Fail closed (safe), FM approved
T4xx7 – Fail closed, non-FM approved

Flow Direction:

Left-to-right or right-to-left
Field reversible (consult factory)

Pneumatic Supply: 70 to 120 PSIG clean, dry air

Ambient Temperature Rating:

Standard: 140°F (FM approved)
Optional: 180°F (non-FM Approved)

Construction Materials:

Body: ANSI B16.34 compliant; cast carbon steel per ASTM A216 Gr. WCB
Flanges: ASTM A479 Type 304, ASTM A108 1018
Trim: ASTM Type 300 series stainless steels
Seals: Buna-N standard; Consult factory for Viton options

Switch / Solenoid Electrical Ratings:

Standard: Nema 1, 3, 4, 13
Optional: Nema 7, 9 (Class 1 Div. 2 Gr. B,C,D)

Solenoid Supply Voltages:

110 VAC, 220 VAC 50/60 Hz
12, 24, 48, 125 VDC

Switch Rating: 10 Amps at 125 VAC

Ingress Protection:

Standard: Nema 4
Optional: Nema 4X

Stroke:

~2.3"

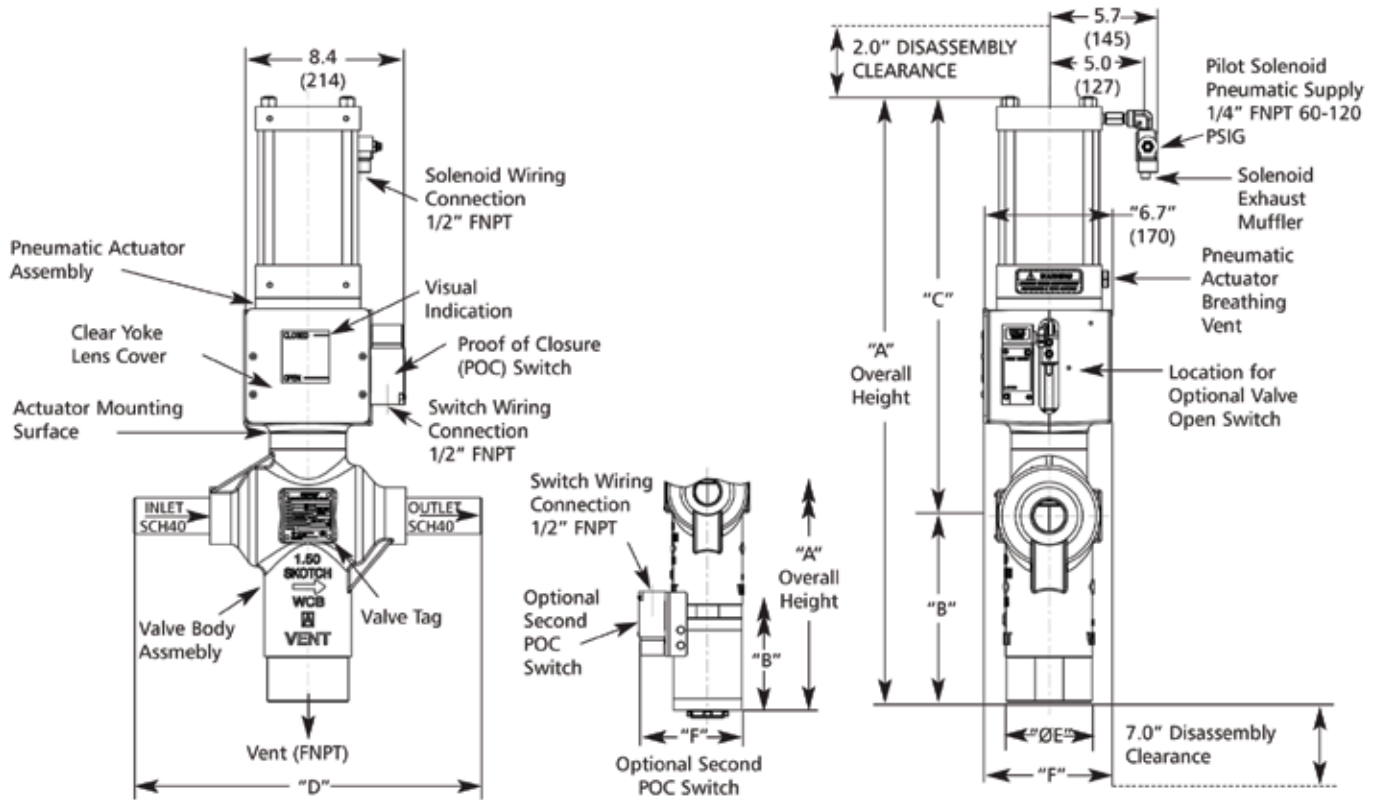
Orientation:

May be installed in any orientation



Skotch® Trifecta T4000C

Dimensional Specifications for the T4150C and T4200C



Model	Pipe Run Size	Vent Connection	Dim "A"	Dim "B"	Dim "C"	Dim "D"	Dim "E" Ø	Dim "F"
T4150C Base	1.5"	0.75" FNPT	31.8 (808)	9.8 (249)	22.0 (559)	18.3 (465)	4.6 (117)	5.6 (142)
T4150C w/ 2nd POC	1.5"	0.75" FNPT	36.9 (937)	14.9 (378)	22.0 (559)	18.3 (465)	4.6 (117)	7.2 (183)
T4200C Base	2.0"	1.0" FNPT	33.5 (851)	10.1 (257)	23.4 (594)	21.8 (554)	5.4 (137)	7.1 (180)
T4200C w/ 2nd POC	2.0"	1.0" FNPT	39.0 (991)	15.5 (394)	23.4 (594)	21.8 (554)	5.4 (137)	8.3 (211)

Dimensions are inches (mm)

T4000C systems are covered under U.S. Patent No. 5,165,443 and other foreign patents.



FM Approved for valves which fall in the close position and incorporate appropriate options.

Scotch® Trifecta T4000C

Principles of Operation

Opening

1. Energizing the actuator extends its output shaft, forcing the valve's outlet stem down to open the outlet block and compress the Actuator spring.

2. As the system opens, a soft vent seal on the bottom of the outlet plug contacts a flat surface on the inside of the inlet plug stem. The spring energized vent seal is compressed until a metal to metal backup seat is made. At this point the outlet is open and the vent is fully closed. (Figure 2)

3. The valve continues to travel through vent closure, driving the inlet plug out of its seat and compressing the inlet spring.

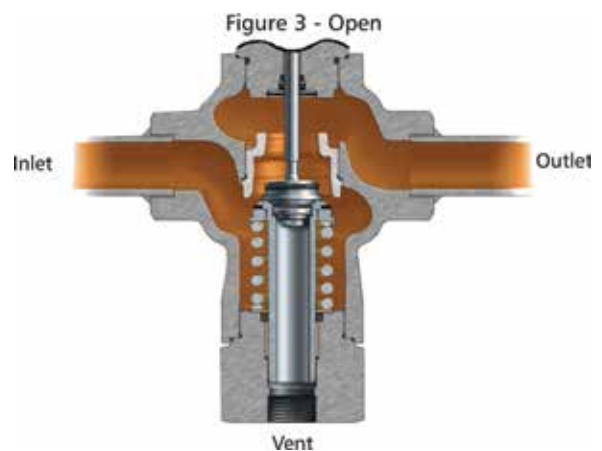
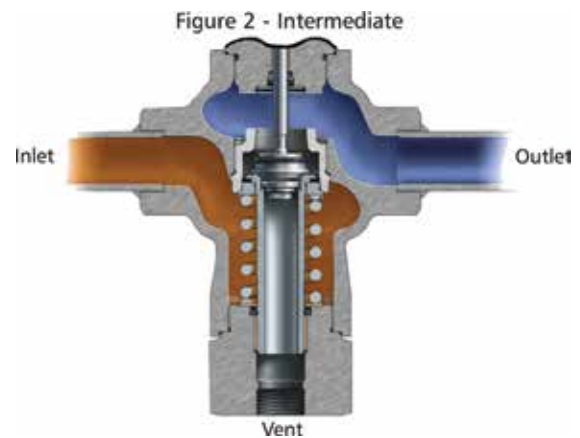
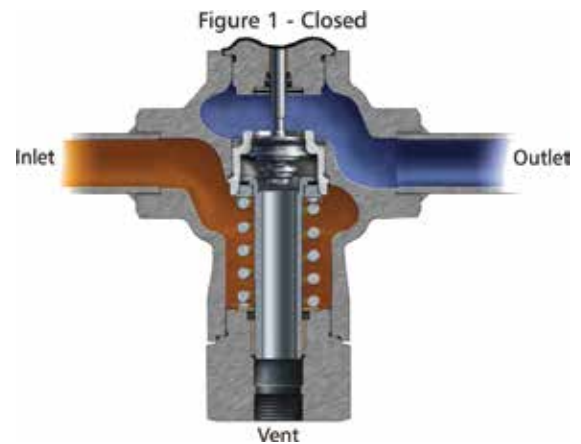
4. When the inlet plug's soft seal clears the seat ring, both blocks are open, the vent is closed, and gas moves from the inlet port to the outlet port. The valve stops at full open. (Figure 3)

Closing

1. For valve shutoff, the actuator is deenergized, causing the valve's two independent return springs to close the block valves. (Inlet block spring and actuator return spring)

2. First, the inlet block closes, making first a soft seal, halting the flow of gas, and then over traveling to make a metal to metal backup seat. Next, the vent opens, relieving down-stream pressure. Finally, the outlet block closes, making a soft seal and then over traveling to make a metal to metal backup seat, isolating the vent from the burner.

3. With the inlet and outlet blocks closed and the vent open, any potential leakage past the inlet valve escapes to vent through the ported inlet stem. This positively ensures no leakage into the burner. (Figure 1)



Oil Valve Systems



ITT

ENGINEERED FOR LIFE

Skotch[®] Trifecta Oil Valve System

A compact high-performance valve system for firing and purging oil-fired burners and igniters.

Need a reliable, cost-effective solution for firing and purging oil burners and igniters? Engineered Valves has the answer. Our Trifecta valve systems offer a number of advantages over conventional valves, and work with all types of burners and igniters - including steam, air, or mechanically atomized.

The result is elimination of performance problems and a device that offers continuous, reliable, trouble-free service in your most important applications.

Strings of separate valves and packaged multiple valve systems are commonly used with oil burners and igniters. Problems inherent in such systems include the possibility of out-of-sequence operation, atomizing media contamination, leakage, or flame out. Additionally, multiple valve packages require more space and may be costly to install and maintain. Burner management logic may be more complex, increasing the cost of the system.

The Skotch Trifecta is a valve system with all components housed within a single valve body. Conventional systems require at least three valves and actuators to accomplish what we provide with a single valve system. We perform all key functions including fuel sequencing, atomizing and purging of the down stream piping. They are designed to comply with NFPA and IRI guidelines. This unique arrangement has been proven in years of trouble-free service on installations worldwide.

Engineered Valves offers a complete line of Skotch valves for every application. In retrofits, each model can be configured to match the valve operating logic of existing burner management systems. These valve systems are compatible with any type fuel oil. We have installations utilizing #2, Bunker C, Crude, and waste oils.

When incorporating appropriate options/accessories, models T1003, T1006, and T506 are Factory Mutual approved for use as a "combination oil safety shut off, atomizing, and purge valve."



The Skotch Trifecta is a complete valve system that provides oil shutoff, purging and atomizing in a single valve

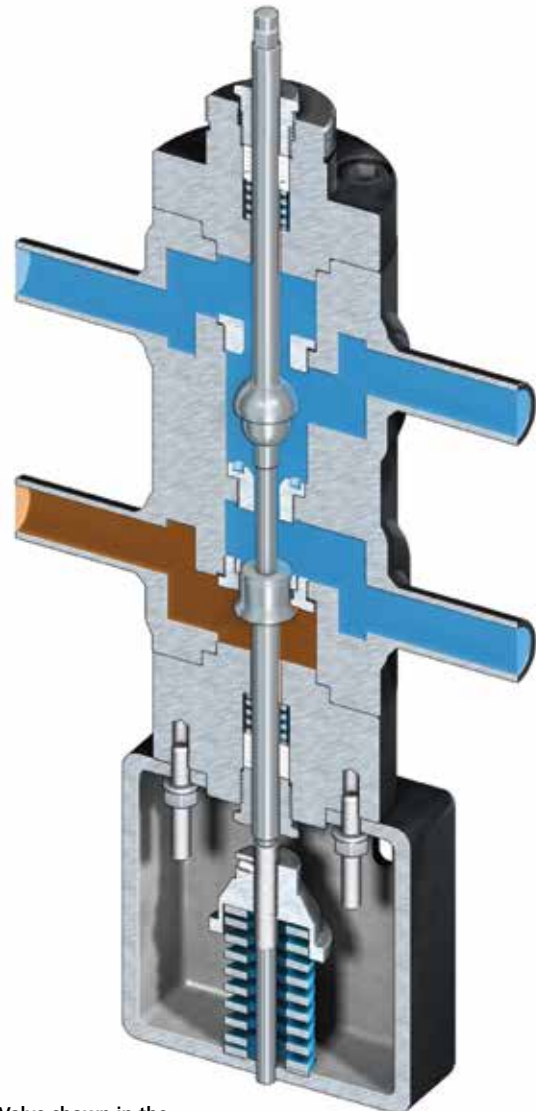


FM Approved for valves which fail in the closed position and incorporate appropriate options.

Scotch[®] Trifecta Oil Valve System

The Scotch Trifecta Valve Systems offer these proven benefits:

- Designed to comply with NFPA and IRI guidelines
- Purge sequence is an integral part of oil valve closure, allowing almost instantaneous switching from firing to purge modes
- Prevents out-of-sequence operation, eliminating contamination of the atomizing or purging media
- Only four piping connections required to install
- Class VI soft seat and metal-to-metal back up seat on the oil side
- Simplified design – no precision adjustments required
- Flexibility in designs to accommodate either retrofits or new installations
- Compact unit takes less space
- Quick and easy installation reduces time and labor cost
- Unit can be completely disassembled in-line for ease of maintenance
- Oil valve over travel allows positive proof of closure
- Models that fail close and contain appropriate accessories are Factory Mutual approved



Scotch Valve shown in the purge (or scavenge) mode.



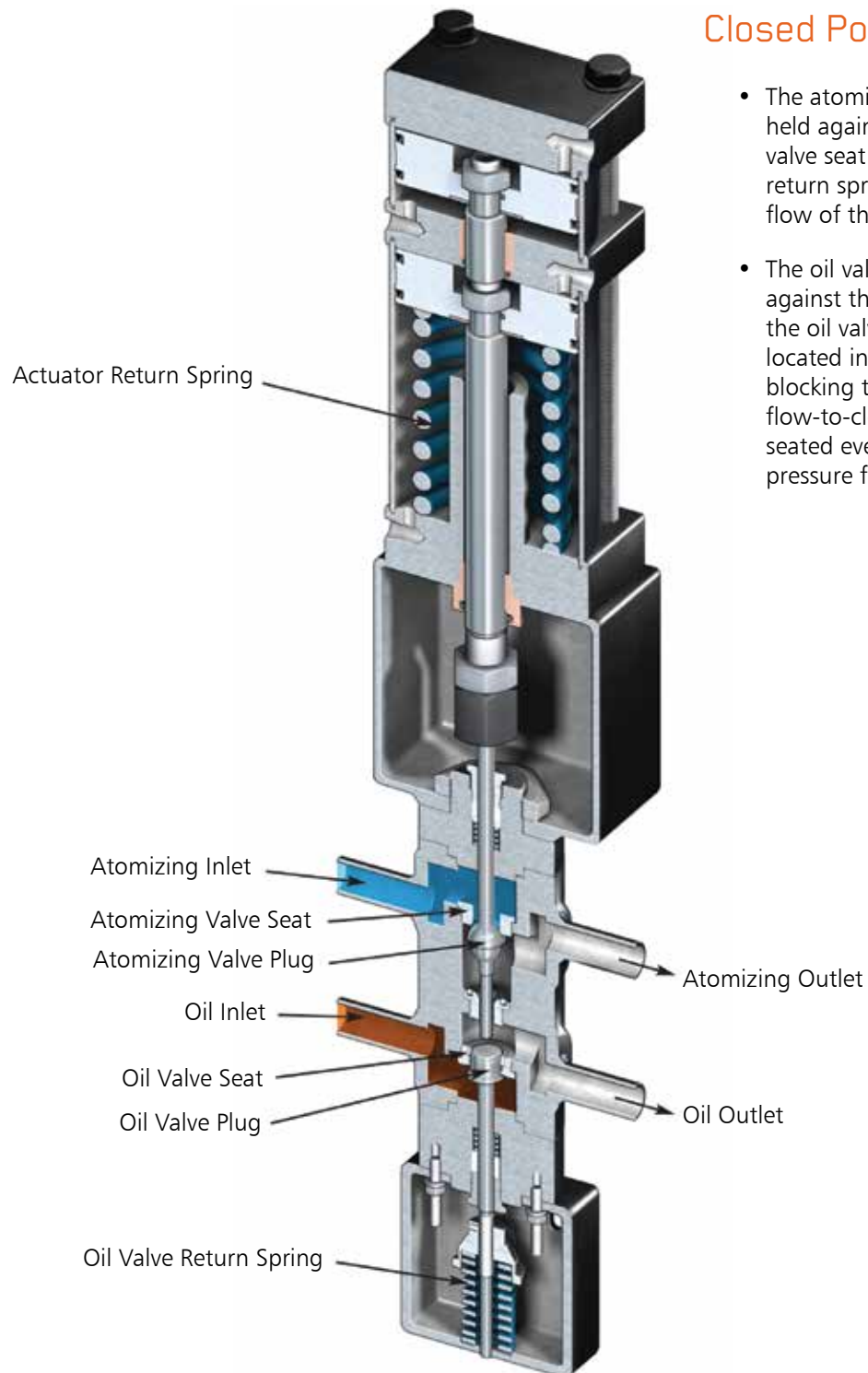
FM Approved for valves which fail in the close-closed position and incorporate appropriate options.

Skotch® Trifecta Oil Valve System

Operating Sequence for the T1000 and T500 in Closed Position

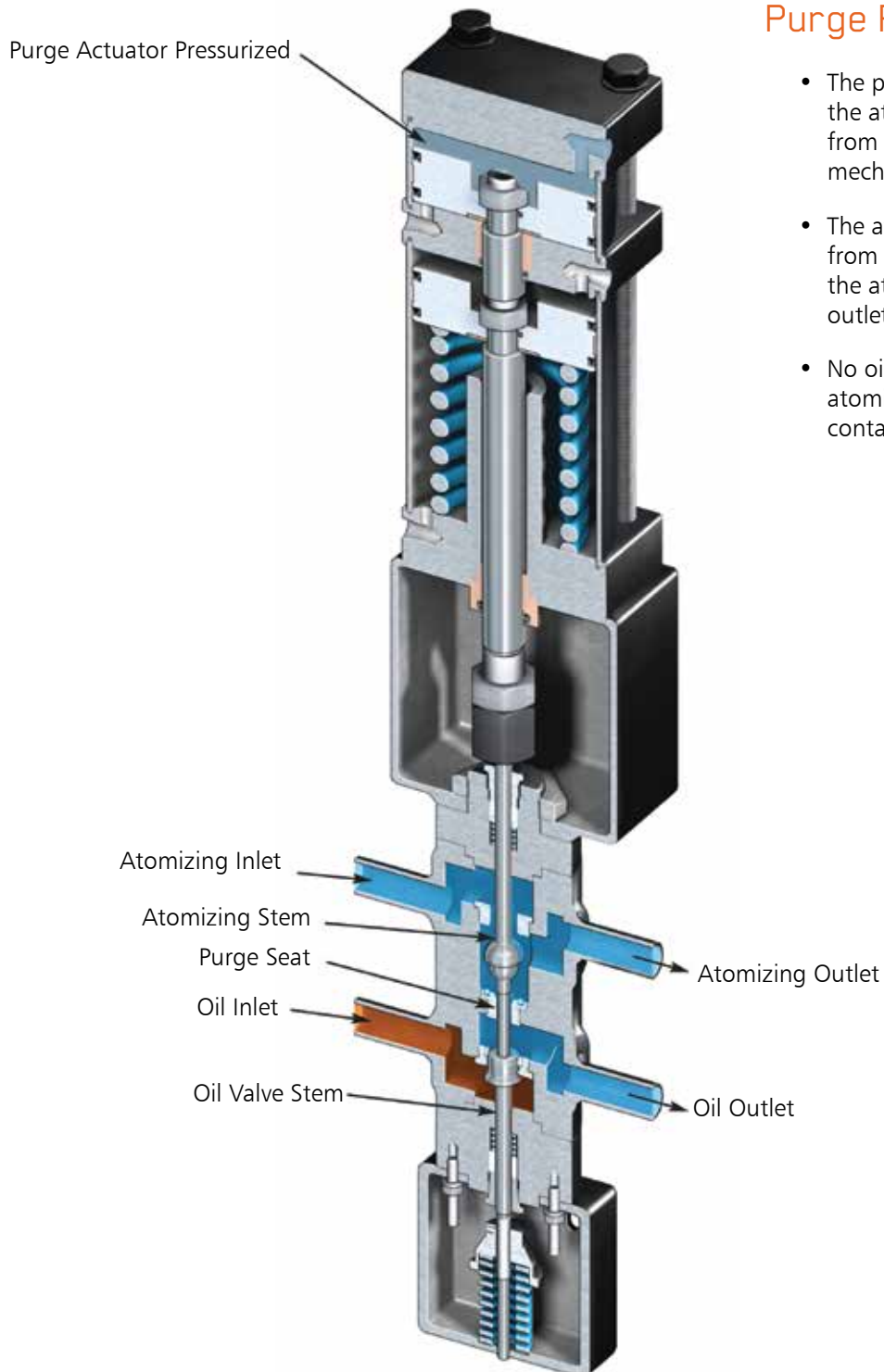
Closed Position

- The atomizing valve plug is held against the atomizing valve seat by the actuator return spring, blocking the flow of the atomizing media.
- The oil valve plug is held against the oil valve seat by the oil valve return spring located in the lower box, blocking the flow of oil. The flow-to-close plug valve is seated even tighter by the oil pressure from the oil inlet.



Skotch[®] Trifecta Oil Valve System

Operating Sequence for the T1000 and T500 in Purge Position

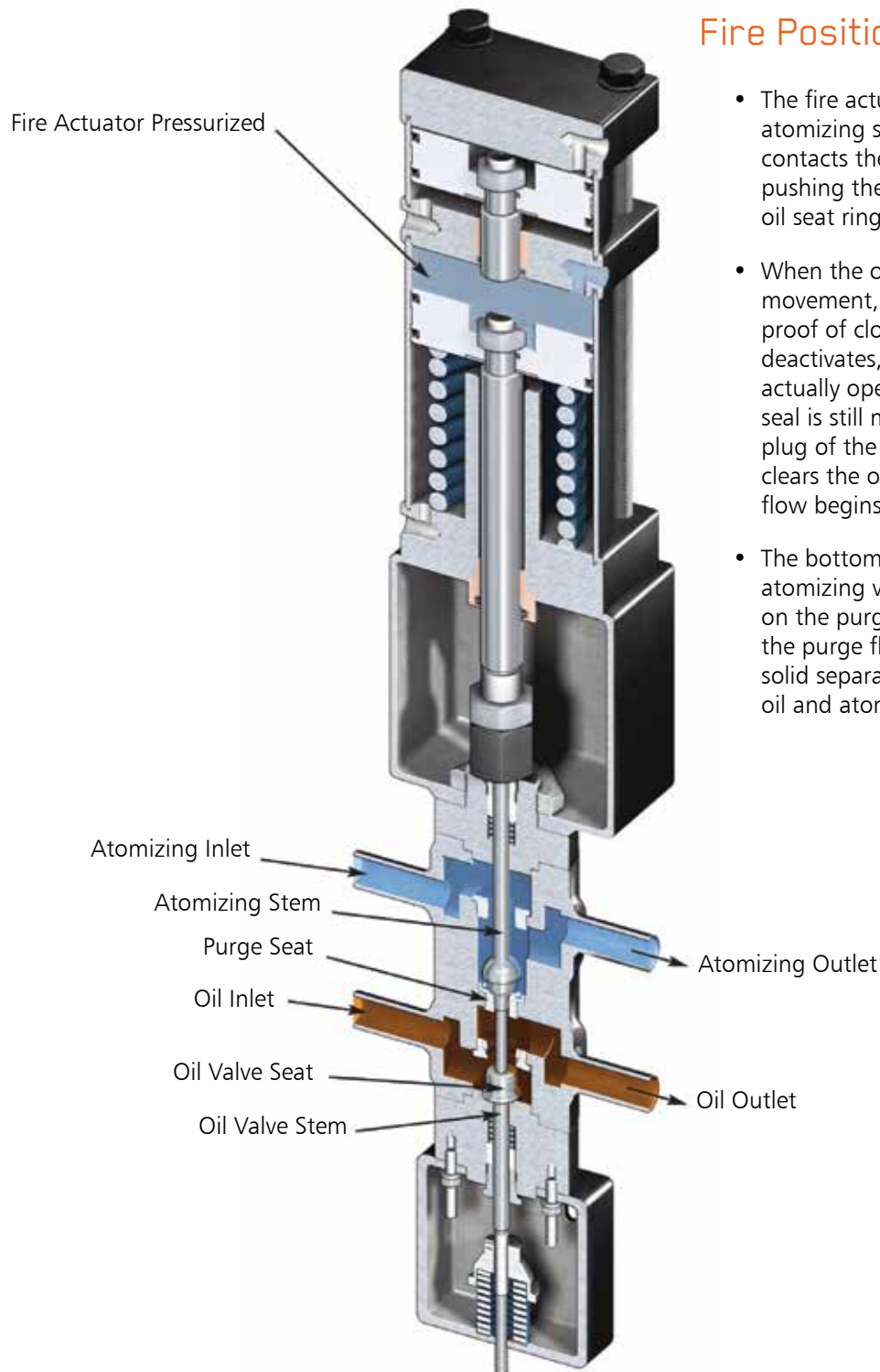


Purge Position

- The purge actuator pushes the atomizing stem down from the closed position to a mechanical stop position.
- The atomizing medium flows from the atomizing inlet to the atomizing outlet and oil outlet (scavenge/purge).
- No oil flow occurs since the atomizing stem has not yet contacted the oil valve stem.

Skotch[®] Trifecta Oil Valve System

Operating Sequence for the T1000 and T500 in Fire Position



Fire Position

- The fire actuator pushes the atomizing stem down and contacts the oil valve stem, pushing the plug out of its oil seat ring.
- When the oil stem begins movement, the oil valve proof of closure switch deactivates, prior to the port actually opening. The soft seal is still made. When the plug of the oil valve stem clears the oil soft seal, oil flow begins.
- The bottom side of the atomizing valve plug seats on the purge seat, stopping the purge flow and provides solid separation between the oil and atomizing medium.

Skotch[®] Trifecta Oil Valve System

Principles of Operation

Closed

- The atomizing valve plug is held against the atomizing valve seat by the actuator return spring, blocking the flow of the atomizing media. (Figure 1)
- The oil valve plug is held against the oil valve seat by the oil valve return spring located in the lower box, blocking the flow of oil. The flow to close plug valve is seated even tighter by the oil pressure from the oil inlet. (Figure 1)
- The oil valve plug and seat consist of two independent seals. A soft seal provides the required overtravel for positive proof of closure indication and class VI shutoff. A flow-to-close metal to metal seal provides a backup to the soft seal for further safety and Class IV shutoff. (Figure 1)

Purge (Scavenge)

- The purge actuator pushes the atomizing stem down from the closed position. (Figure 2)
- The atomizing medium flows from the atomizing inlet through the open atomizing valve seat to the atomizing outlet. It also passes through the open purge seat to the oil outlet providing a full purge from the center of the valve out.
- The purge flow purges the valve and downstream piping of residual fuel during burner shutdown. It can also be used for downstream warm up when used before light off.
- There is no oil flow since the oil valve stem is still fully seated in the oil valve seat. The oil valve proof of closure switch provides positive indication of oil valve closure.

Fire

- The fire actuator pushes the atomizing stem down. The atomizing stem contacts the oil valve stem, pushing the plug out of its oil seat ring.
- The bottom side of the atomizing valve plug seats on the purge seat, stopping the purge flow. When the plug of the oil valve stem clears the oil soft seat, oil flow begins. (Figure 3)
- When the oil stem begins movement, the oil valve proof of closure switch deactivates, prior to the port actually opening. The soft seal is still made.
- The full force of the fire actuator pushes the atomizing valve plug against the purge seat, providing solid separation between the oil and atomizing medium.



Figure 1



Figure 2

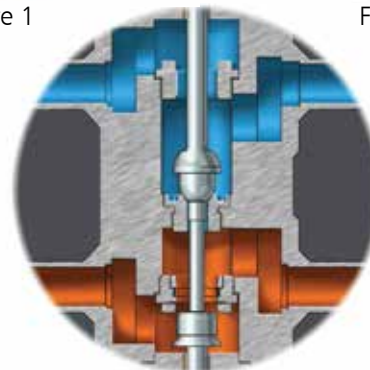


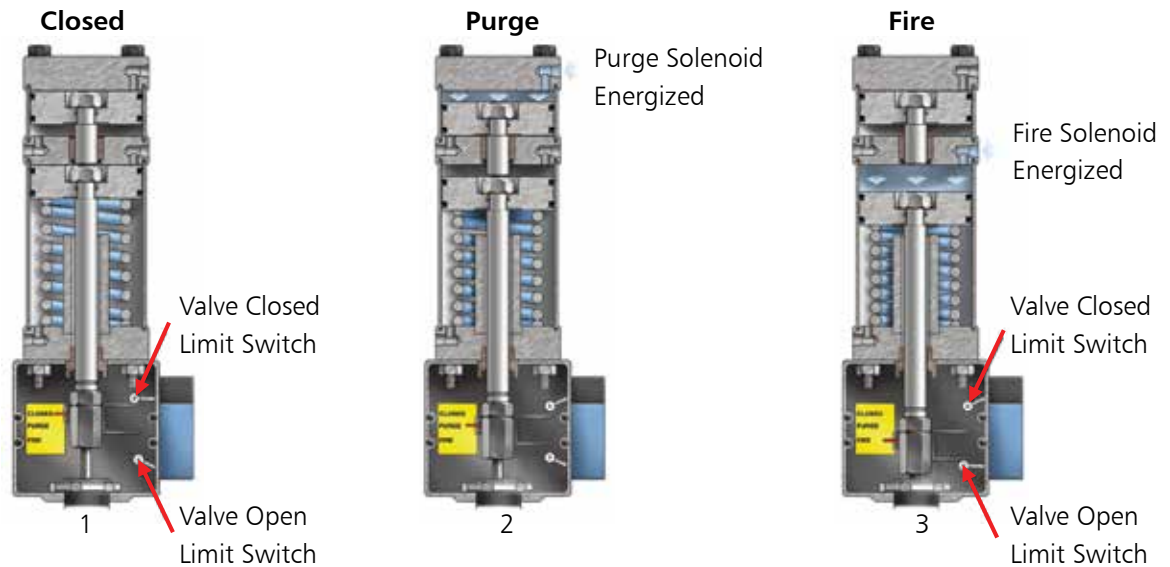
Figure 3



FM Approved for valves which fall in the close position and incorporate appropriate options.

Skotch® Trifecta Oil Valve System

Pneumatic Actuation / Limit Switches



Actuation

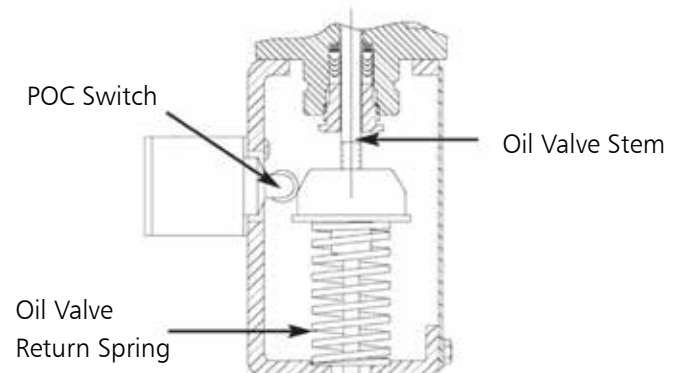
The T505/T506/T507, T1005/T1006/T1007, and T2005/T2006/T2007 valves use a spring-return tandem cylinder for electropneumatic operation with an air supply of 70 to 120 PSI as follows:

- Pressurizing the upper cylinder (Position 2) strokes the Trifecta valve 1/4" to the purge position. No adjustment is needed to achieve proper purging.
- Pressurizing the lower cylinder (Position 3) strokes the valve until the purge plug contacts the purge seat, putting the system in the fire position.
- Exhausting both cylinders (Position 1) allows the actuator spring to return the valve to the closed position. Two pilot solenoid valves control cylinder pressurization.
- Model T505/T1005/T2005 uses dual-coil momentary contact solenoids for energize-to-trip, fail-in-last position operation.
- Model T506/T1006/ uses single-coil, spring return maintained contact solenoids for de-energize to trip, failed-closed operation, and is Factory Mutual approved, when incorporating appropriate accessories. T507/T1007/T2006/T2007 are non-FM.

Valve Limit Switches

1. Position (1) shows valve in closed position. Valve closed limit switch is activated.
2. Position (2) shows valve in purge position. Neither the valve closed limit switch or valve open limit switch are activated.
3. Position (3) shows valve in fire position. Valve open limit switch is activated.

Note: Additionally, Oil "Proof of Closure (POC)" switch is indicated from oil valve stem and would be activated while in position (1). See section of main oil stem below.



Skotch[®] Trifecta Oil Valve System

Custom Engineered Solutions

Specialty Components

ITT Corporation, Engineered Valves has been an industry leader in providing customized solutions to meet the changing requirements of our customers. Since Skotch Trifecta systems are custom built for each project, we are able to accommodate most non-standard requests.

Oil Valve Rack Systems

Oil valve rack systems provide greater savings in installation time and money. The Skotch valve system is attached to the free-standing rack such that the height can be adjusted in the field. The base is drilled for bolt mounting or welding to decking. Engineered Valves can provide strainers, manual shut-off valves, gauges, check valves, and recirculation valves as required. As a result the full system can be hydrotested and all welds verified at the factory.

In addition to rack systems, Engineered Valves can provide specialty materials to suit your specific needs. Specialty components such as proximity switches, feedback position transmitters and components utilized in corrosive and hazardous conditions are also available.

Cooling Steam Option

A cooling steam option provides drilled orifices in the atomizing seat ring providing a constant cooling steam (or air) flow requirement while a burner is not in service. While the valve is closed a small amount of atomizing media flows through the atomizing and oil outlets, as shown in the view to the right. Our patented cooling steam option was a result of a custom-engineered design that removed the need for an extra valve and/or operator interface.

Please consult our factory for your custom-engineered design application.



Skotch® Trifecta T505 / T506 / T507 Oil

Pneumatic Actuated - Igniter and Smaller Main Oil Burner Systems

System Description

The Skotch Trifecta is a valve system with all components housed within a single valve body. Conventional systems require at least three valves and actuators to accomplish what we provide with a single valve system. We perform all key functions including fuel sequencing, atomizing, and purging of the down stream piping.

Model T505 is a fail-in-last-position precision-built switching valve system, while Models T506/T507 are designed to fail in the closed position. Both offer Trifecta's proven performance advantages over separate valves or packaged multiple valve systems, including:

- Prevention of out-of-sequence operation, eliminating contamination of the atomizing or purging media.
- Purge sequence is an integral part of our valve closure, allowing almost instantaneous switching from firing to purging modes.

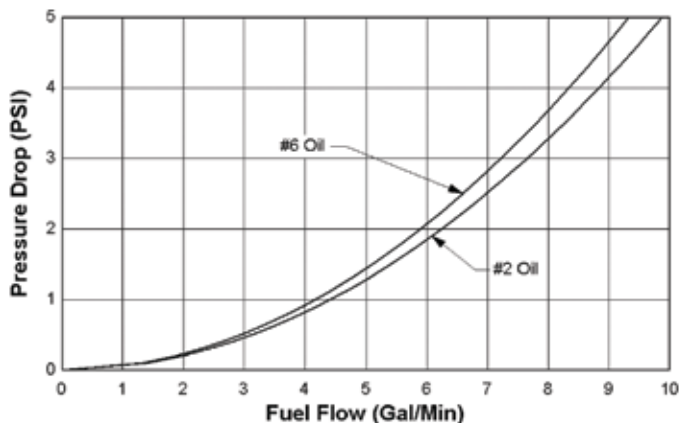
Application

The compact T500 valves are used with oil fired igniters and smaller main burners requiring steam or air atomization. All models are completely self contained, and all necessary accessories are provided, including position indication switches and junction box.

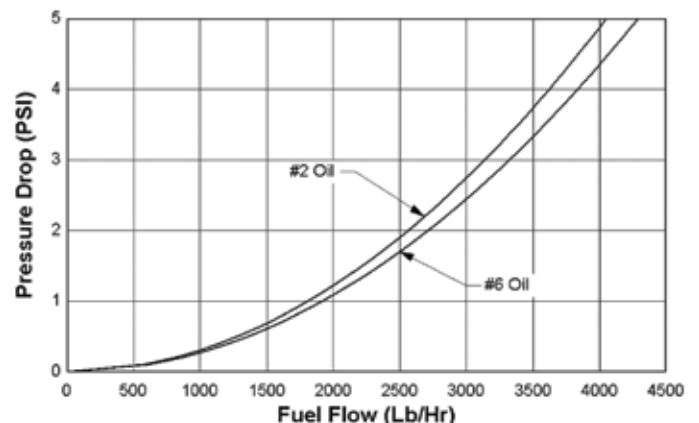
When incorporating appropriate options/accessories, model T506 is Factory Mutual approved for use as a "combination oil safety shutoff, atomizing, and purge valve."



T505/T506/T507 Valve Systems

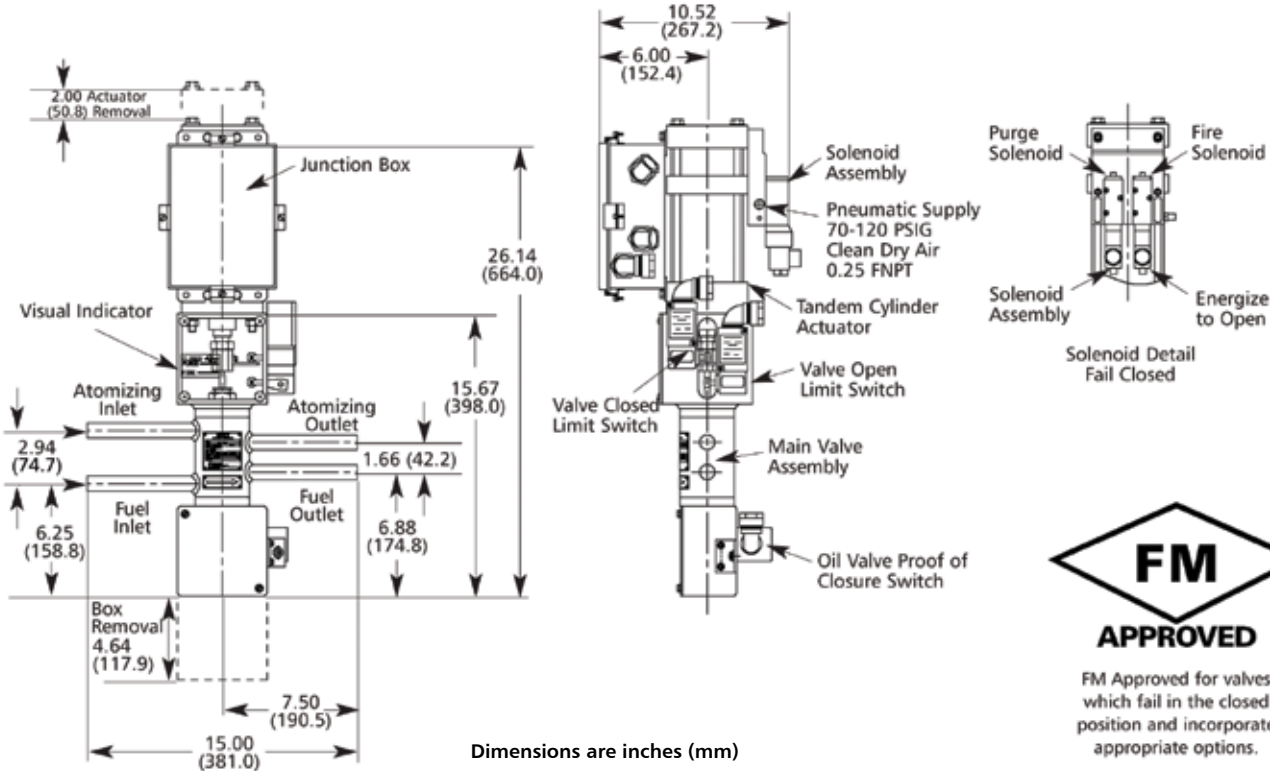


T505/T506/T507 Valve Systems



Skotch® Trifecta T505 / T506 / T507

Dimensional Specifications for the T505/T506/T507



Specifications for the T505 / T506 / T507

Design Pressure and Temperature:

Standard Valve: 300 PSIG @ 450°F

Shutoff Classification:

Per ANSI/FCI 70-2

Atomizing seat – Meets or exceeds CL. IV

Purge seat – Meets or exceeds CL. IV

Fuel seat – Meets or exceeds CL. VI

Durability: Meets or exceeds FM 7400 standard for safety shutoff valves (SSOV)

Weight: Approximately 42 lbs per valve assembly

CV Rating:

Atomizing Cv – 4.2

Purge Cv* – 1.8

Fuel Cv – 4.0

End Connections:

Sch. 40 or 80 Spigot, Butt Weld,

Male NPT in Sch. 80, Socketweld

Actuation:

T505: Fail Last (non-FM approved)

T506: Fail Closed (FM approved)

T507: Fail Closed (non-FM approved)

Flow Direction: Left-to-right or right-to-left.

Field reversible (consult factory)

Air Supply Pressure: 70-120 PSIG – Clean, dry air

Ambient Temperature Rating:

Standard: 140°F (FM approved)

Optional: 180°F (FM Approved)

Switch / Solenoid Electrical Ratings:

Standard: Nema 1, 3, 4, 13

Optional: Nema 7, (Class Div 2, consult factory)

Solenoid Supply Voltages:

110 VAC, 220 VAC, 50/60 Hz

12, 24, 48, 125 VDC

Switch Rating:

10 Amps at 125 VAC

Ingress Protection: Nema 4, 4X

Stroke: 7/8" for both models

Operating Speed:

Opening – Approximately 0.6 seconds, maximum determined by speed control option.

Closing – Oil valve closure in approximately 1 second, full closure in approximately 2 seconds

Failure Mode:

Closed or last position upon electric or pneumatic failure.

*Note: Total Atomizing flow in Purge position is limited to the atomizing Cv.

Skotch® Trifecta T1005 / T1006 / T1007 Oil

Pneumatic Actuated - Main Burner Oil Valve Systems

System Description

The Skotch Trifecta is a valve system with all components housed within a single valve body. Conventional systems require at least three valves and actuators to accomplish what we provide with a single valve system. We perform all key functions including fuel sequencing, atomizing and purging of the down stream piping.

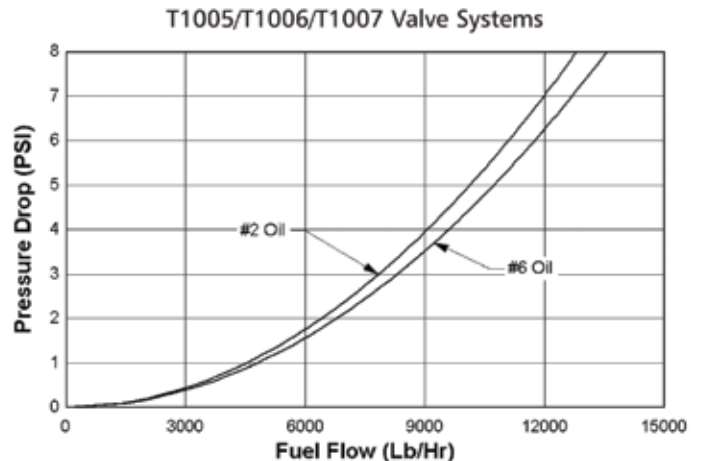
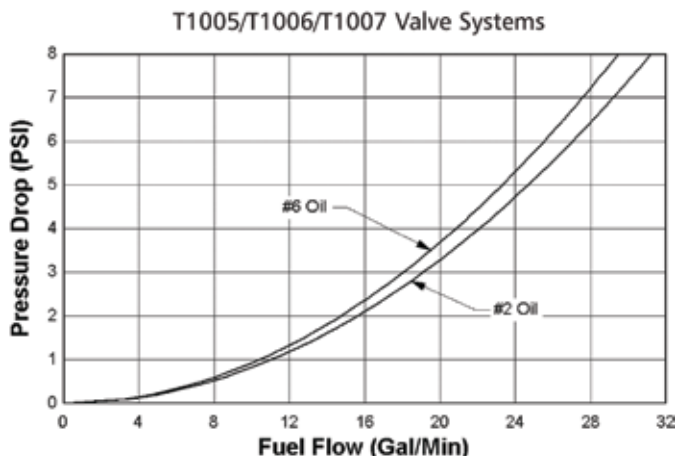
Model T1005 is a fail-in-last-position precision switching valve system, while Models T1006 and T1007 are designed to fail in the closed position. Both offer Trifecta's proven performance advantages over separate valves or packaged multiple valve systems, including:

- Prevention of out-of-sequence operation, eliminating contamination of the atomizing or purging media.
- Purge sequence is an integral part of our valve closure, allowing almost instantaneous switching from firing to purging modes.

Application

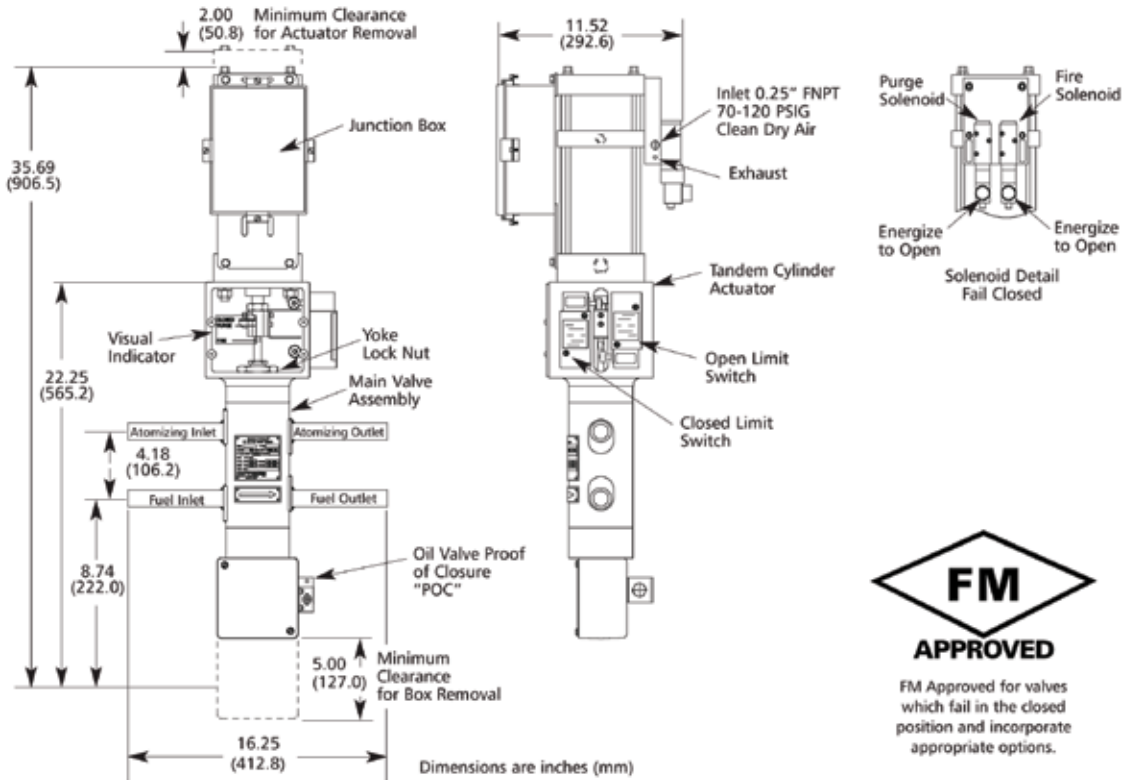
The T1005/T1006/T1007 valves are used with oil fired burners requiring steam or air atomization. All models are completely self contained, and all necessary accessories are provided, including position indication switches and junction box.

When incorporating appropriate options/accessories, model T1006 is Factory Mutual approved for use as a "combination oil safety shutoff, atomizing, and purge valve."



Scotch[®] Trifecta T1005 / T1006 / T1007

Dimensional Specifications for the T1005 / T1006 / T1007



Specifications for the T1005 / T1006 / T1007

Design Pressure and Temperature:

Standard Valve: 300 PSIG @ 450°F

Optional: 600 PSIG (fuel) @ 450°F

Shutoff Classification:

Per ANSI/FCI 70-2

Atomizing seat – Meets or exceeds CL. IV

Purge seat – Meets or exceeds CL. IV

Fuel seat – Meets or exceeds CL. VI

Durability: Meets or exceeds FM 7400 standard for safety shutoff valves (SSOV)

Size: 3/4" or 1"

Weight: Approximately 85 lbs per valve assembly

CV Rating:

Atomizing Cv – 10.2

Purge Cv* – 3.5

Fuel Cv – 10.0

End Connections:

Sch. 40 or 80 Spigot, Butt Weld, ANSI CL. 300

Raised Face Flange, socketweld,

Male NPT in Sch. 80

Actuation:

T105: Fail Last (non-FM approved)

T106: Fail Closed (FM approved)

T107: Fail Closed (non-FM approved)

Flow Direction: Left-to-right or right-to-left.

Field reversible (consult factory)

Air Supply Pressure: 70-120 PSIG – Clean, dry air

Ambient Temperature Rating:

Standard: 140°F (FM approved)

Optional: 180°F (FM Approved)

Switch / Solenoid Electrical Ratings:

Standard: Nema 1, 3, 4, 13

Optional: Nema 7 Class 1 Div 2

Nema 7 Class 1 Div 1 (consult factory)

Solenoid Supply Voltages:

110 VAC, 220 VAC, 50/60 Hz

12, 24, 48, 125 VDC

Switch Rating:

10 Amps at 125 VAC

Ingress Protection: Nema 4, 4X

Stroke: 1 1/4" for both models

Operating Speed:

Opening – Approximately 0.8 seconds, maximum determined by speed control option.

Closing – Oil valve closure in approximately 1 second, full closure in approximately 2 seconds

Failure Mode:

Closed or last position upon electric or pneumatic failure.

Maximum Differential Pressure: Equal to design rating

Skotch[®] Trifecta T1001 / T1003 / T1004 Oil

Electrohydraulic Actuated - Main Burner Oil Valve Systems

System Description

The Skotch Trifecta is a valve system with all components housed within a single body utilized with oil fired burners requiring steam or air atomization. Model T1001 is a fail-in-last-position precision built switching valve system, while Models T1003 and T1004 are designed to fail in the closed position. Both offer Trifecta's proven performance advantages over separate valves or packaged multiple valve systems, including:

- Prevention of out-of-sequence operation, eliminating contamination of the atomizing or purging media.
- Purge sequence is an integral part of our valve closure, allowing almost instantaneous switching from firing to purging modes.

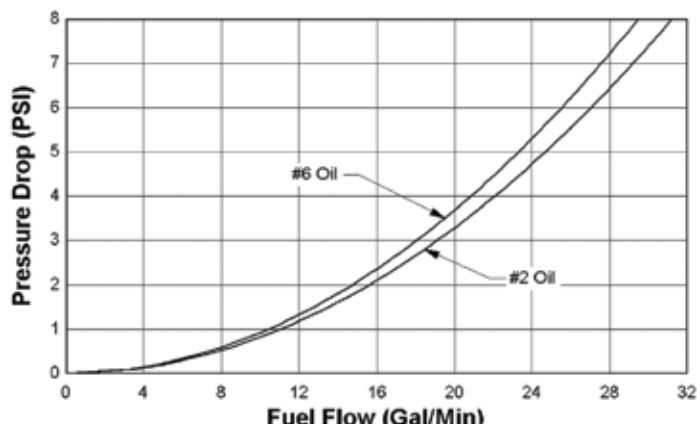


Application

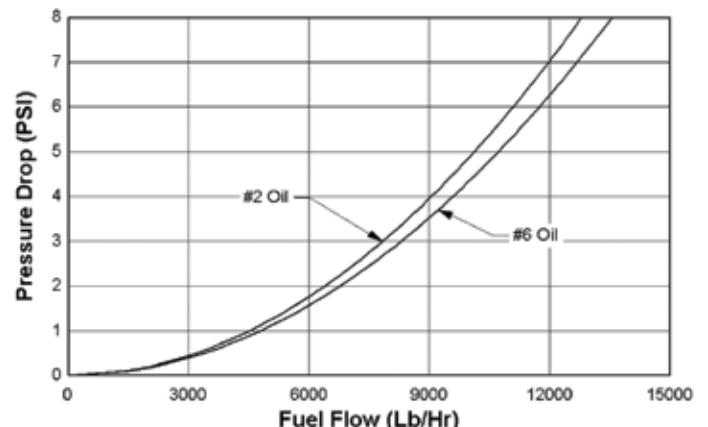
The T1001/T1003/T1004 valves use an electrohydraulic actuator requiring only 110VAC power. Operation is as follows:

- Signaling the valve to move from closed to purge or fire causes an internal pump to pressurize a cylinder and push the atomizing valve stem down.
- A force limit stops the actuator when the atomizing valve contacts the purge seat and the valve is in the fire position.
- Signaling the valve to move from fire to purge or closed causes two dump valves to open, relieving hydraulic pressure and allowing a spring to move the valve stem up.
- Model T1001 uses normally closed dump valves for energize to trip, fail-in-last-position operation.
- Model T1003 uses normally open dump valves for deenergize to trip, fail closed operation. This version is Factory Mutual approved, when incorporating appropriate accessories.

T1001/T1003/T1004 Valve Systems

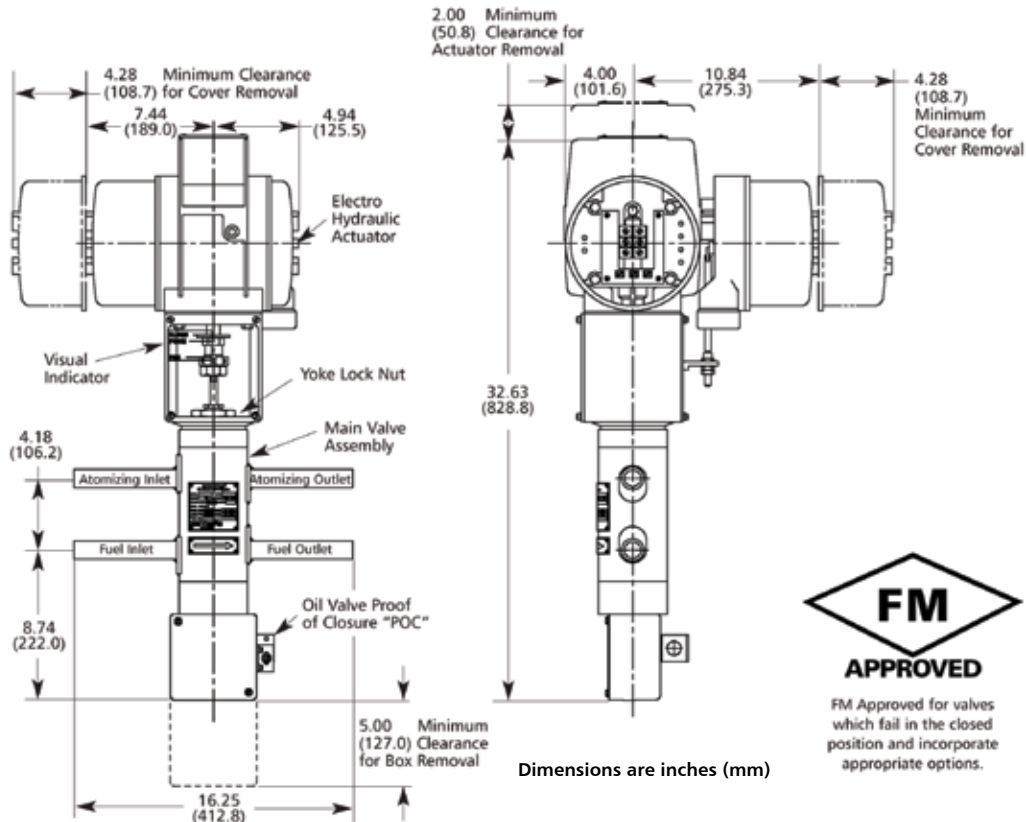


T1001/T1003/T1004 Valve Systems



Scotch® Trifecta T1001 / T1003 / T1004

Dimensional Specifications for the T1001 / T1003 / T1004



Specifications for the T1001 / T1003 / T1004

Design Pressure and Temperature:

Standard Valve: 300 PSIG @ 450°F
Optional: 1100 PSIG (fuel) @ 450°F

Shutoff Classification:

Per ANSI/FCI 70-2

Atomizing seat – Meets or exceeds CL. IV

Purge seat – Meets or exceeds CL. IV

Fuel seat – Meets or exceeds CL. VI

Durability: Meets or exceeds FM 7400 standard for safety shutoff valves (SSOV)

Size: 3/4" or 1"

Weight: Approximately 85 lbs per valve assembly

CV Rating:

Atomizing Cv – 10.0

Purge Cv* – 3.5

Fuel Cv – 10.0

End Connections:

Sch. 40 or 80 Spigot, Butt Weld, ANSI CL. 300

Raised Face Flange, socketweld,

Male NPT in Sch. 80

Actuation:

T1001: Fail Last (non-FM approved)

T1003: Fail Closed (FM approved)

T1004: Fail Closed (non-FM approved)

Flow Direction: Left-to-right or right-to-left.

Field reversible (consult factory)

Ambient Temperature Rating: Standard: 175°F (FM approved)

Switch / Solenoid Electrical Ratings: Nema 4 and 13 standard

Solenoid Supply Voltages:

Auxiliary Switches SPDT – 15 Amps @ 125 VAC

Proof of Closure Switch – 10 Amps @ 125 VAC

Ingress Protection: Nema 4, 4X

Stroke: 1 1/4" for both models

Operating Speed:

Opening – Approximately 25 seconds

Closing – Oil valve closure in approximately 1 second, full closure in approximately 2 seconds

Failure Mode:

Closed or last position upon electric or pneumatic failure.

Maximum Differential Pressure: Equal to design rating

Voltages: 110 VAC, 50/60 Hz

*Note: Total Atomizing flow in Purge position is limited to the atomizing Cv.

Scotch® Trifecta T2005 / T2006 / T2007 Oil

Mechanically Atomized Main Burner Oil Valve System with Pneumatic Actuator

System Description

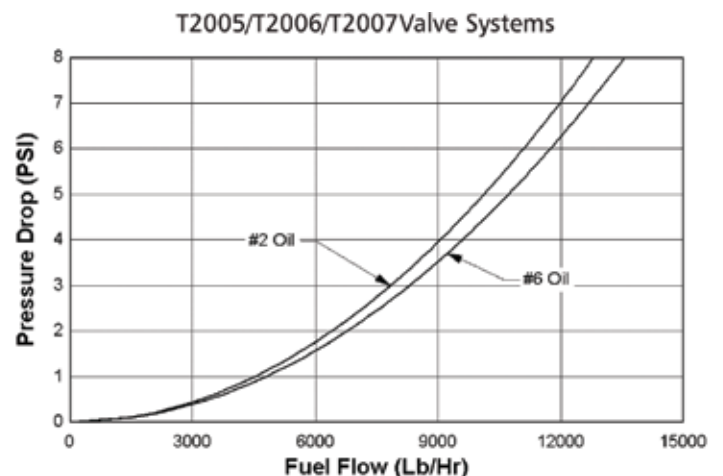
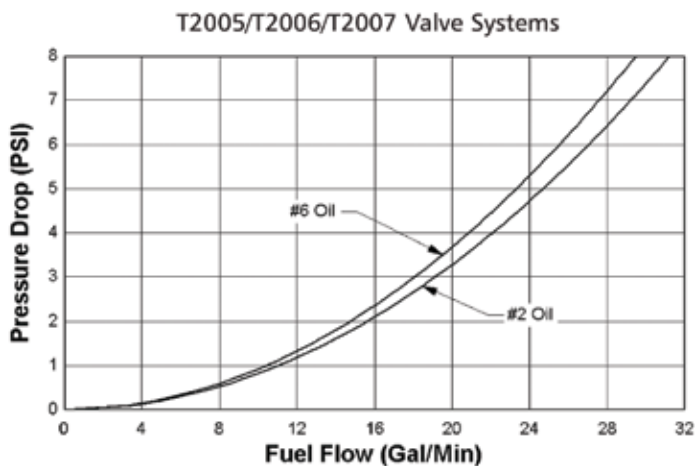
The Scotch Trifecta is a valve system with all components housed within a single valve body. Conventional systems require multiple valves and actuators to accomplish what we provide with a single valve system. We perform all key functions including fuel sequencing and purging of the down stream piping.

An extension of the successful T1005/T1006/T1007 series, the T2000 valve system provides the same proven performance advantages over separate valves, or packaged multiple valve systems, including:

- Prevention of out-of-sequence operation, eliminating contamination of the purging media.
- Purge sequence is an integral part of our valve closure, allowing almost instantaneous switching from firing to purging modes.

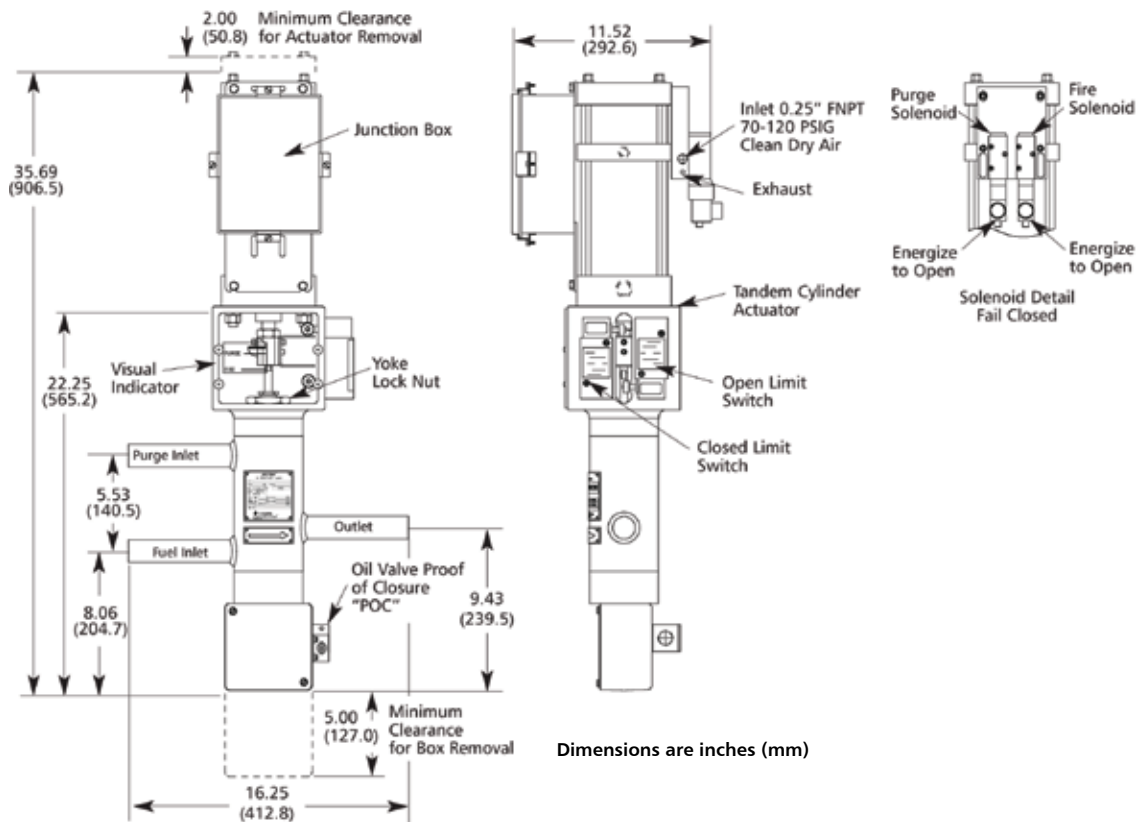
Application

The T2000 valve systems are used with oil fired burners requiring straight Mechanical Atomization. These valve systems are completely self contained, and Engineered Valves provides all necessary accessories, such as indicator switches and junction boxes. While the straight mechanically atomized system is shown here, we can also provide systems for Wide Range Tip Return systems employing return and recirculation of the oil. Please consult factory for more information.



Scotch® Trifecta T2005 / T2006 / T2007

Dimensional Specifications for the T2005 / T2006 / T2007



Specifications for the T2005 / T2006 / T2007

Design Pressure and Temperature:

Standard Valve: 300 PSIG @ 450°F

Optional: 600 PSIG (fuel) @ 450°F

Shutoff Classification:

Per ANSI/FCI 70-2

Atomizing seat – Meets or exceeds CL. IV

Purge seat – Meets or exceeds CL. IV

Fuel seat – Meets or exceeds CL. VI

Size: 3/4" or 1"

Weight: Approximately 85 lbs per valve assembly

CV Rating:

Purge Cv – 3.5

Fuel Cv – 10.0

End Connections:

Sch. 40 or 80 Spigot, Butt Weld, ANSI CL. 300

Raised Face Flange, socketweld,

Male NPT in Sch. 80

Actuation:

T2005: Fail Last (non-FM approved)

T2007: Fail Closed (non-FM approved)

Flow Direction: Left-to-right or right-to-left.

Field reversible (consult factory)

Air Supply Pressure: 70-120 PSIG – Clean, dry air

Ambient Temperature Rating:

Standard: 140°F (non-FM approved)

Optional: 180°F (non-FM Approved)

Switch / Solenoid Electrical Ratings:

Standard: Nema 1, 3, 4, 13

Optional: Nema 7, Class 1 Div 2

Nema 7, Class 1 Div (consult factory)

Solenoid Supply Voltages:

110 VAC, 220 VAC, 50/60 Hz

12, 24, 48, 125 VDC

Switch Rating: 10 Amps at 125 VAC

Ingress Protection: Nema 4, 4X

Stroke: 1 1/4" for both models

Operating Speed:

Opening – Approximately .8 seconds, maximum determined by speed control.

Closing – Oil valve closure in approximately 1 second, full closure in approximately 2 seconds

Failure Mode:

Closed or last position upon electric or pneumatic failure.

Maximum Differential Pressure: Equal to design rating

Scotch® Trifecta T2001 / T2003 / T2004 Oil

Mechanically Atomized Main Burner Oil Valve System with Electrohydraulic Actuator

System Description

The Scotch Trifecta is a valve system with all components housed within a single valve body. Conventional systems require multiple valves and actuators to accomplish what we provide with a single valve system. We perform all key functions including fuel sequencing and purging of the down stream piping.

An extension of the successful T1005/T1006/T1007 series, the T2000 valve system provides the same proven performance advantages over separate valves, or packaged multiple valve systems, including:

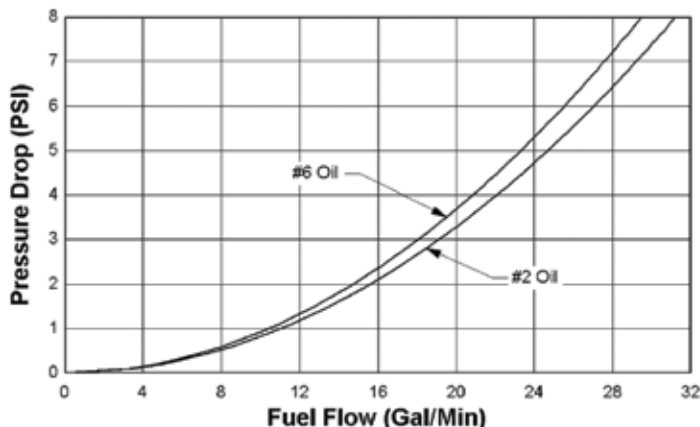
- Prevention of out-of-sequence operation, eliminating contamination of the purging media.
- Purge sequence is an integral part of our valve closure, allowing almost instantaneous switching from firing to purging modes.

Application

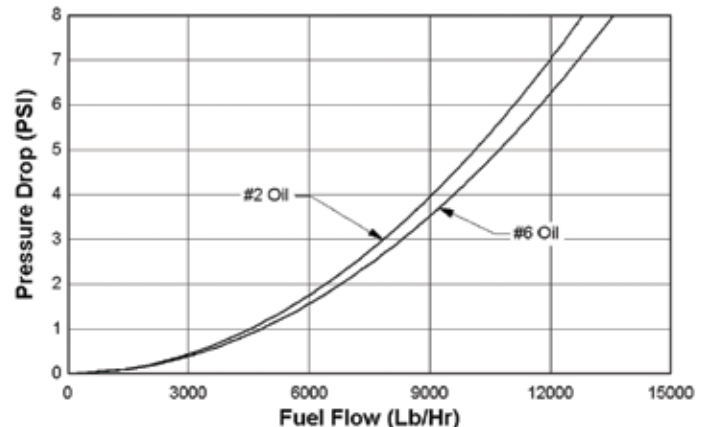
The T2000 valve systems are used with oil fired burners requiring straight Mechanical Atomization. These valve systems are completely self contained, and all necessary accessories are provided, such as indicator switches and junction boxes. While the straight mechanically atomized system is shown here, we can also provide systems for Wide Range Tip Return systems employing return and recirculation of the oil. Please consult factory for more information.



T2001/T2003/T2004 Valve Systems

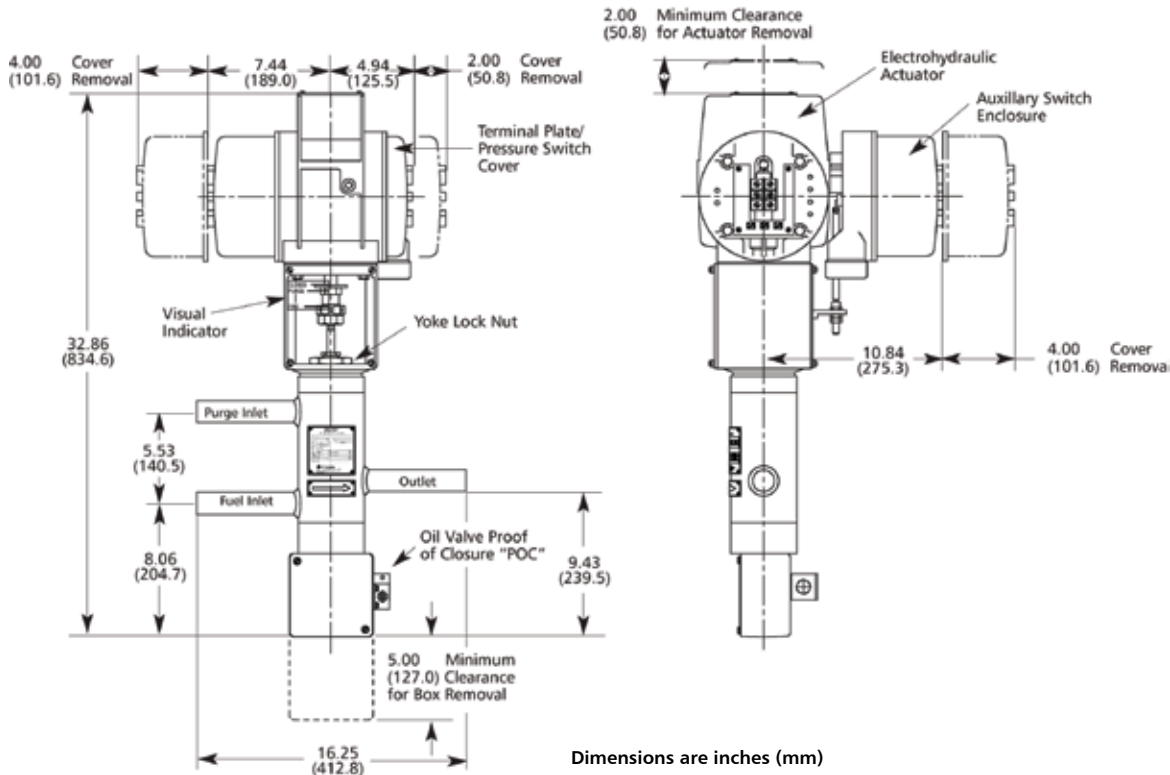


T2001/T2003/T2004 Valve Systems



Skotch[®] Trifecta T2001 / T2003 / T2004

Dimensional Specifications for the T2001 / T2003 / T2004



Specifications for the T2001 / T2003 / T2004

Design Pressure and Temperature:

Standard Valve: 300 PSIG @ 450°F

Optional: 1400 PSIG (fuel) @ 450°F

Shutoff Classification:

Per ANSI/FCI 70-2

Atomizing seat – Meets or exceeds CL. IV

Purge seat – Meets or exceeds CL. IV

Fuel seat – Meets or exceeds CL. VI

Size: 3/4" or 1"

Weight: Approximately 85 lbs per valve assembly

CV Rating:

Purge Cv – 3.5

Fuel Cv – 10.0

End Connections:

Sch. 40 or 80 Spigot, Butt Weld, ANSI CL. 300

Raised Face Flange, socketweld,

Male NPT in Sch. 80

Actuation:

T2001: Fail Last (non-FM approved)

T2004: Fail Closed (non-FM approved)

Flow Direction: Left-to-right or right-to-left.

Field reversible (consult factory)

Ambient Temperature Rating: Standard: 175°F (non-FM approved)

Switch / Solenoid Electrical Ratings: Standard: Nema 4, 13

Solenoid Supply Voltages:

110 VAC, 220 VAC, 50/60 Hz

12, 24, 48, 120 VDC

Switch Rating: 10 Amps at 125 VAC

Ingress Protection: Nema 4, 4X

Stroke: 1 1/4" for both models

Operating Speed:

Opening – Approximately 25 seconds

Closing – Oil valve closure in approximately 1 second,
full closure in approximately 2 seconds

Failure Mode:

Closed or last position upon electric or pneumatic failure.

Maximum Differential Pressure: Equal to design rating

Quote & Order Forms



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SKOTCH® TRIFECTA

Specification Data Sheet Oil Fired Burner or Igniter Safety Shutoff Valve Systems Series T500 (1/2" Oil Valve)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
End User: _____ Location: _____ Quantity: _____

- Model Number:** T500 Oil Valve
- Agency Approval:** Factory Mutual No approval required CRN Req'd (Province) _____
- End Connection Size:** 1/2" (T500)
- End Connection Type:** Spigot Butt Weld Socket Weld ^P MNPT ^P (Schedule 80 only)
 Union SW ^P Special Configuration (Consult Factory with needs) ^P
Special Configuration: SS ^P SN ^P SSS ^P
 SNS ^P SSC ^P SNC ^P
- Pipe Schedule:** Schedule 40 Schedule 80
- Fuel Pressure Rating:** 300 PSI (Standard) Special (Consult Factory)
- Steam Temperature Rating:** 450° F (Standard) Special (Consult Factory) ^P
- Trim Option:** Standard Cooling Steam / Air Seat Ring ^P
- Flow Direction:** Left to Right Right to Left
- Ingress Protection:** NEMA 4 NEMA 4X ^P (Al J-Box, S.S. Switches)
- Junction Box:** Yes, (Standard; Nema 4 – CS, Nema 4X – Al) Yes, Optional S.S. ^P
 Yes, Optional Al ^P None Yes, Optional Nema 4 Hinged Cover ^P
- Actuator Type:** Pneumatic None
- Valve Failure Position:** Fail Closed Fail in Last Position (Non-FM Approved)
- Actuator Seal Material:** Buna (Standard) Viton ^P (Recommended for High Ambient Temp.)
- Solenoid Supply Voltage:** 110VAC 220VAC
 125VDC 120VDC 48VDC 24VDC 12VDC
 No Solenoid Special (Consult Factory, Non-FM Approved)
- Hazardous Area Classification:** Non Hazardous (Nema 4)
 Class 1 Division 2 ^P (Nema 7, GO Proximity Only)
 Class 1 Division 1 ^P (Consult Factory, No Junction Box or Conduit Runs Supplied)
- Limit Switch Type:** SPDT DPDT SPDT-SS (NEMA 4X) ^P DPDT-SS (NEMA 4X) ^P
 SPDT – GO Proximity ^P DPDT – GO Proximity ^P
- Ambient Temperature:** Standard (-20° F to 140° F)
 High Temperature (180° F Max)
- Filter Regulator:** No (Standard) Yes (FR1) ^P Yes (FR2) ^P
- Speed Control:** No (Standard) Yes ^P
- Rack:** No (Standard) Single Valve ^P Multiple Valve ^P (Consult Factory)
 Bracket Only ^P
- Wire Gauge:** AWG 16 (Standard) AWG 14 ^P
 AWG 18 (SPDT-GO) AWG 20 (DPDT-GO)
- Wire Termination:** None (Standard) Spade Connector ^P Full Ring Lug ^P

^P Price Adder

Specification Data Sheet Oil Fired Burner or Igniter Safety Shutoff Valve Systems Series T1000 (1.0" Oil Valve)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
End User: _____ Location: _____ Quantity: _____

Model Number: T1000 Oil Valve

Agency Approval: Factory Mutual No approval required CRN Req'd (Province) _____

End Connection Size: 1.0" 3/4"

End Connection Type: Spigot Butt Weld Socket Weld ^P MNPT ^P (Schedule 80 only)
 ANSI 300Flanged ^P ANSI 300Flanges with Oil Strainer ^P
 Special Configuration (Consult Factory with needs) ^P
Special Configuration: SS1 ^P SSS1 ^P SSC1 ^P

Pipe Schedule: Schedule 40 Schedule 80

Fuel Pressure Rating: 300 PSI (Standard) 600 PSI (Non-FM) Special (Consult Factory, Non-FM)

Steam Temperature Rating: 450° F (Standard) Special (Consult Factory) ^P

Trim Option: Standard Cooling Steam / Air Seat Ring ^P

Flow Direction: Left to Right Right to Left

Ingress Protection: NEMA 4 NEMA 4X ^P (AI J-Box, S.S. Switches)

Junction Box: Yes, (Standard; Nema 4 – CS, Nema 4X – AI) Yes, Optional S.S. ^P
 Yes, Optional AI ^P None Yes, Optional Nema 4 Hinged Cover ^P

Actuator Type: Pneumatic Electrohydraulic (Non-Hazardous, Nema 4) None

Valve Failure Position: Fail Closed Fail in Last Position (Non-FM Approved)

Actuator Seal Material (Pneu only): Buna (Standard) Viton ^P (Recommended for High Ambient Temp.)

Solenoid Supply Voltage: 110VAC 220VAC
 125VDC 120VDC 48VDC 24VDC 12VDC
 No Solenoid Special (Consult Factory, Non-FM Approved)

Electrohydraulic Actuator Voltage: 110VAC

Hazardous Area Classification: Non Hazardous (Nema 4)
 Class 1 Division 2 ^P (Nema 7, Pneumatic Act. Only)
 Class 1 Division 1 ^P (Consult Factory, No Junction Box or Conduit Runs Supplied)

Limit Switch Type: SPDT DPDT SPDT-SS (NEMA 4X) ^P DPDT-SS (NEMA 4X) ^P
 SPDT – GO Proximity ^P DPDT – GO Proximity ^P

Ambient Temperature: Standard (-20° F to 140° F Pneu. Act.; 175° F Electrohydraulic Act.)
 High Temperature (180° F Max Pneu Act)

Filter Regulator: No (Standard) Yes (FR1) ^P Yes (FR2) ^P

Speed Control: No (Standard) Yes ^P

Rack: No (Standard) Single Valve ^P Multiple Valve ^P (Consult Factory)
 Bracket Only ^P

Wire Gauge: AWG 16 (Standard) AWG 14 ^P
 AWG 18 (SPDT-GO) AWG 20 (DPDT-GO)

Wire Termination: None (Standard) Spade Connector ^P Full Ring Lug ^P

Choosing selections in bold should result in standard valve and shortest lead times.

^P Price Adder may result in longer than standard lead times. Please check with factory for estimate.

SKOTCH® TRIFECTA

Specification Data Sheet Oil Fired Burner or Igniter Safety Shutoff Valve Systems Series T2000 (1.0" Oil Valve Mechanically Atomized)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
End User: _____ Location: _____ Quantity: _____

- Model Number:** T2000 Oil Valve (Mechanically Atomized)
- Agency Approval:** Valve systems are not Factory Mutual Listed in any configurations.
- End Connection Size:** 1.0" 3/4"
- End Connection Type:** Spigot Butt Weld Socket Weld ^P MNPT ^P (Schedule 80 only)
 ANSI 600 Flanged ^P Special Configuration (Consult Factory with needs) ^P
- Pipe Schedule:** Schedule 40 Schedule 80
- Fuel Pressure Rating:** 300 PSI 600 PSI 1400 PSI (Electrohydraulic)
 Special (Consult Factory)
- Steam Temperature Rating:** 450° F (Standard) Special (Consult Factory) ^P
- Trim Option:** Standard Cooling Steam / Air Seat Ring ^P
- Flow Direction:** Left to Right Right to Left
- Ingress Protection:** NEMA 4 NEMA 4X ^P (Al J-Box, S.S. Switches)
- Junction Box:** Yes, (Standard; Nema 4 – CS, Nema 4X – Al) Yes, Optional S.S. ^P
 Yes, Optional Al ^P None Yes, Optional Nema 4 Hinged Cover ^P
- Actuator Type:** **Pneumatic** Electrohydraulic (Non-Hazardous, Nema 4) None
- Valve Failure Position:** Fail Closed Fail in Last Position
- Actuator Seal Material (Pneu. Only):** Buna (Standard) Viton ^P (Recommended for High Ambient Temp.)
- Solenoid Supply Voltage:** **110VAC** 220VAC
 125VDC 120VDC 48VDC 24VDC 12VDC
 No Solenoid Special (Consult Factory)
- Electrohydraulic Actuator Voltage:** 110VAC
- Hazardous Area Classification:** **Non Hazardous (Nema 4)**
 Class 1 Division 2 ^P (Nema 7, Pneumatic Act. Only)
 Class 1 Division 1 ^P (Consult Factory, No Junction Box or Conduit Runs Supplied)
- Limit Switch Type:** **SPDT** **DPDT** SPDT-SS (NEMA 4X) ^P DPDT-SS (NEMA 4X) ^P
 SPDT – GO Proximity ^P DPDT – GO Proximity ^P
- Ambient Temperature:** Standard (-20° F to 140° F Pneu. Act.; 175° F Electrohydraulic Act.)
 High Temperature (180° F Max Pneu Act)
- Filter Regulator:** No (Standard) Yes (FR1) ^P Yes (FR2) ^P
- Speed Control:** No (Standard) Yes ^P
- Rack:** No (Standard) Single Valve ^P Multiple Valve ^P (Consult Factory)
 Bracket Only ^P
- Wire Gauge:** AWG 16 (Standard) AWG 14 ^P
 AWG 18 (SPDT-GO) AWG 20 (DPDT-GO)
- Wire Termination:** None (Standard) Spade Connector ^P Full Ring Lug ^P

Choosing selections in bold should result in standard valve and shortest lead times.

^P Price Adder may result in longer than standard lead times. Please check with factory for estimate.

Specification Data Sheet Double Block & Vent Gas Safety Shutoff Valve Systems Series T4100C (1.00" Gas Valve)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
 End User: _____ Location: _____ Quantity: _____

- Model Number:** T4100C One Inch Cast Steel Body with 3/4" Vent
- Agency Approval:** **Factory Mutual** **No approval required** CRN Req'd (Province) _____
- End Connection Type:** **Spigot End** **Butt Weld** Socket weld ^P
 ANSI Class 150# Flanges ^P ANSI Class 300# Flanges (Sch 80 only) ^P
 MNPT ^P (sch. 80 only) Special ^P _____
- Flow Direction:** Right to Left Left to Right
 Inverted Right to Left Inverted Left to Right
- Valve Seal Material:** **Buna-N** (Standard) Viton ^P
- Pipe Schedule:** **Schedule 40** Schedule 80
- Failure Position:** Fail Closed Fail in Last Position (Non-FM Approved)
- Solenoid Piping Mat'L:** **Brass** (Standard) Stainless Steel Stainless Steel - Swagelock
- Muffler Breather Vent:** **Brass** (Standard) Stainless Steel
- Speed Control:** None (Standard) Yes
- Solenoid Coil Voltage:** 110VAC 220VAC
 125VDC 48VDC 24VDC 12VDC 115VDC
 Special Voltage (Consult Factory, Non-FM Approved)
- Solenoid Type:** **VERSA** Special (Consult Factory, Non-FM Approved)
- Actuator Type:** Pneumatic
- Limit Switch Type:** **SPDT** **DPDT** SPDT-GO Prox ^P DPDT-GO Prox ^P
 (all switches are SPDT-Plugin Type ^P DPDT-Plugin Type ^P
 externally mounted) Special (Consult Factory, Non-FM Approved)
- Auxiliary Limit Switch:** Open Limit Switch ^P
- Hazardous Area Classification:** Non Hazardous (Standard Nema 4)
 Class 1 Division 2 ^P (Nema 7)
 Class 1 Division 1 ^P
- Ingress Protection:** Nema 4 Nema 4X ^P Nema 6P
- Filter Regulator:** No (Standard) Yes (FR1) ^P Yes (FR2) ^P
- Special Paint:** ITT Standard Black Seaside Paint ^P Special Paint ^P (Consult Factory)
- Rack:** No (Standard) Single Valve Rack ^P Multi-Valves Rack ^P(Consult Factory)

Choosing selections in bold should result in standard valve and shortest lead times.

^P Price Adder may result in longer than standard lead times. Please check with factory for estimate.

SKOTCH® TRIFECTA

Specification Data Sheet Double Block & Vent Gas Safety Shutoff Valve Systems Series T4150C (1.50" Gas Valve)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
End User: _____ Location: _____ Quantity: _____

- Model Number:** T4150C One & Half Inch Cast Steel Body with 3/4" Vent
- Agency Approval:** Factory Mutual No approval required
- End Connection Type:** **Spigot End** **Butt Weld** Socket Weld ^P
 ANSI Class 150# Flanges ^P ANSI Class 300# Flanges ^P
 MNPT ^P (sch. 80 only) Special ^P _____
- Flow Direction:** Right to Left Left to Right
 Inverted Right to Left Inverted Left to Right
- Valve Seal Material:** Buna-N (Standard) Viton ^P
- Pipe Schedule:** Schedule 40 Schedule 80
- Failure Position:** Fail Closed Fail in Last Position (Non-FM Approved)
- Solenoid Piping Mat'L:** **Brass** (Standard) Stainless Steel Stainless Steel - Swagelock
- Muffler Breather Vent:** **Brass** (Standard) Stainless Steel
- Speed Control:** None (Standard) Yes ^P
- Solenoid Coil Voltage:** 110VAC 220VAC
 125VDC 48VDC 24VDC 12VDC 115VDC
 Special Voltage (Consult Factory, Non-FM Approved)
- Solenoid Type:** **Versa** Special (Consult Factory, Non-FM Approved)
- Actuator Type:** Pneumatic
- Limit Switch Type:** **SPDT** **DPDT**
 SPDT-PluginType ^P DPDT-Plugin Type ^P
- Auxiliary Limit Switch:** Open Limit Switch ^P Inlet POC Switch ^P
- Hazardous Area Classification:** Non Hazardous (Standard Nema 4)
 Class 1 Division 2 ^P (Nema 7)
 Class 1 Division 1 ^P (Consult Factory)
- Ingress Protection:** Nema 4 Nema 4X Nema 6P
- Filter Regulator:** No (Standard) Yes (FR1) ^P Yes (FR1) ^P
- Junction Box:** None (Standard) Yes (Nema 4 – CS, Nema 4X – AI) ^P
- Wire Gauge: (w/JBox)** AWG 16 (Standard) AWG 14 ^P
- Wire Termination: (w/JBox)** None (Standard) Spade Connector ^P Full Ring Lug Connector ^P
- Special Paint:** ITT Standard Black Seaside Paint ^P Special Paint ^P (Consult Factory)
- Rack:** No (Standard) Single Valve Rack ^P Multi-Valves Rack ^P(Consult Factory)

Choosing selections in bold will result in a standard valve and shortest lead times.

^P Price Adder may result in longer than standard lead times. Please check with factory for estimate.

SKOTCH® TRIFECTA

Specification Data Sheet Double Block & Vent Gas Safety Shutoff Valve Systems Series T4200C (2.00" Gas Valve)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
End User: _____ Location: _____ Quantity: _____

- Model Number:** T4200C Two Inch Cast Steel Body with 1.0" Vent
- Agency Approval:** Factory Mutual No approval required
- End Connection Type:** **Spigot End** **Butt Weld** Socket Weld ^P
 ANSI Class 150# Flanges ^P ANSI Class 300# Flanges ^P
 MNPT ^P (sch. 80 only) Special ^P _____
- Flow Direction:** Right to Left Left to Right
 Inverted Right to Left Inverted Left to Right
- Valve Seal Material:** Buna-N (Standard) Viton ^P
- Pipe Schedule:** Schedule 40 Schedule 80
- Failure Position:** Fail Closed Fail in Last Position (Non-FM Approved)
- Solenoid Piping Mat'L:** **Brass** (Standard) Stainless Steel Stainless Steel - Swagelock
- Muffler Breather Vent:** **Brass** (Standard) Stainless Steel
- Speed Control:** None (Standard) Yes ^P
- Solenoid Coil Voltage:** 110VAC 220VAC
 125VDC 48VDC 24VDC 12VDC 115VDC
 Special Voltage (Consult Factory, Non-FM Approved)
- Solenoid Type:** **Versa** Special (Consult Factory, Non-FM Approved)
- Actuator Type:** Pneumatic
- Limit Switch Type:** **SPDT** **DPDT**
 SPDT-Plugin Type ^P DPDT-Plugin Type ^P
- Auxiliary Limit Switch:** Open Limit Switch ^P Inlet POC Switch ^P
- Hazardous Area Classification:** Non Hazardous (Standard Nema 4)
 Class 1 Division 2 ^P (Nema 7)
 Class 1 Division 1 ^P (Consult Factory)
- Ingress Protection:** Nema 4 Nema 4X Nema 6P
- Filter Regulator:** No (Standard) Yes (FR1) ^P Yes (FR1) ^P
- Junction Box:** None (Standard) Yes (Nema 4 – CS, Nema 4X – Al) ^P
- Wire Gauge: (w/JBox)** AWG 16 (Standard) AWG 14 ^P
- Wire Termination: (w/JBox)** None (Standard) Spade Connector ^P Full Ring Lug Connector ^P
- Special Paint:** ITT Standard Black Seaside Paint ^P Special Paint ^P (Consult Factory)
- Rack:** No (Standard) Single Valve Rack ^P Multi-Valves Rack ^P(Consult Factory)

Choosing selections in bold will result in a standard valve and shortest lead times.

^P Price Adder may result in longer than standard lead times. Please check with factory for estimate.

SKOTCH® TRIFECTA

Specification Data Sheet Double Block & Vent Gas Safety Shutoff Valve Systems Series T4200F (2.00" Gas Valve)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
End User: _____ Location: _____ Quantity: _____

Model Number: **T4200F Two Inch Fabricated Body, 1.00" vent**

Agency Approval: Factory Mutual No approval required CRN Req'd (Province) _____

Vent Connection Type: **FNPT** ANSI Class 150# Flange ^P

End Connection Type: **ANSI Class 150# Flanges** (Standard) Spigot (Sch 40)
 Butt Weld (Sch 40)

Outlet Test Port: **No (Standard)** OTP ^P (1/2 NPT port on outlet pipe)

Valve Failure Position: Fail Closed Fail in Last (Non-FM Approved)

Valve Seal Material: Buna (Standard) Viton ^P

Inlet / Outlet Flow Orientation: Outlet 0 Degrees from Inlet Outlet 90 Degrees from Inlet
 Outlet 180 Degrees from Inlet Outlet 270 Degrees from Inlet
 Special (Consult Factory with Specific Needs)

Vent Orientation: 0 Degrees from Inlet 90 Degrees from Inlet
 180 Degrees from Inlet 270 Degrees from Inlet
 Special (Consult Factory with Specific Needs)

Junction Box Orientation: Junction Box 0 Degrees from Inlet Junction Box 90 Degrees from Inlet
 Junction Box 180 Degrees from Inlet Junction Box 270 Degrees from Inlet
 No Junction Box Selected Special (Consult Factory) _____

Note: Junction Box cannot be in same orientation as Vent

Solenoid Coil Voltage: **110VAC** 220VAC
 125VDC 48VDC 24VDC 12VDC 115VDC
 Special Voltage (Consult Factory, Non-FM Approved)

Limit Switch Type: **SPDT** SPDT – GO Proximity^P SPDT - SS ^P SPDT - Plug-In ^P
 DPDT DPDT – GO Proximity^P DPDT - SS ^P DPDT - Plug-In ^P

Open Limit Switch: No (Standard) Yes ^P

Filter Regulator: No (Standard) Yes (FR1) ^P Yes (FR2) ^P

Ingress Protection: **NEMA 4** (Standard Nema 4)
 NEMA 4X (Al Junction Box, S.S. Switches) ^P
 NEMA 6P

Hazardous Area Classification: **Non Hazardous (Nema 4)**
 Class 1 Division 2 ^P (Nema 7)
 Class 1 Division 1 ^P (Consult Factory, No Junction Box or Conduit Runs Supplied)

Ambient Temperature: **Standard (-20° F to 140° F)** High Temperature (141° F to 180° F) (Non-FM)

Special Mounting Bracket: **No (Standard)** Special Mounting Bracket ^P (Consult Factory with application needs)

Wire Gauge: **AWG 16 (Standard)** AWG 14 ^P
 AWG 18 (SPDT-GO) AWG 20 (DPDT-GO)

Wire Termination: **None (Standard)** Spade Connector ^P Full Ring Lug ^P

Closure Speed: **STD (< 5 seconds)** 1S ^P (< 1 second) NA (Not Applicable, No Solenoid)

Special Paint: **ITT Standard** Black Seaside Paint ^P Special Paint ^P (Consult Factory)

Choosing selections in bold should result in a standard valve and shortest lead time.

^P Price Adder may result in longer than standard lead times. Please check with factory for estimate.

SKOTCH® TRIFECTA

Specification Data Sheet Double Block & Vent Gas Safety Shutoff Valve Systems Series T4300F (3.00" Gas Valve)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
End User: _____ Location: _____ Quantity: _____

Model Number: **T4300F Three Inch Fabricated Body, 1.25" vent**

Agency Approval: Factory Mutual No approval required CRN Req'd (Province) _____

Vent Connection Type: **FNPT** ANSI Class 150# Flange ^P

End Connection Type: **ANSI Class 150# Flanges** (Standard) Spigot (Sch 40)
 Butt Weld (Sch 40)

Outlet Test Port: **No (Standard)** OTP ^P (1/2 NPT port on outlet pipe)

Valve Failure Position: Fail Closed Fail in Last (Non-FM Approved)

Valve Seal Material: Buna (Standard) Viton ^P

Inlet / Outlet Flow Orientation: Outlet 0 Degrees from Inlet Outlet 90 Degrees from Inlet
 Outlet 180 Degrees from Inlet Outlet 270 Degrees from Inlet
 Special (Consult Factory with Specific Needs)

Vent Orientation: 0 Degrees from Inlet 90 Degrees from Inlet
 180 Degrees from Inlet 270 Degrees from Inlet
 Special (Consult Factory with Specific Needs)

Junction Box Orientation: Junction Box 0 Degrees from Inlet Junction Box 90 Degrees from Inlet
 Junction Box 180 Degrees from Inlet Junction Box 270 Degrees from Inlet
 No Junction Box Selected Special (Consult Factory) _____

Note: Junction Box cannot be in same orientation as Vent

Solenoid Coil Voltage: **110VAC** 220VAC
 125VDC 48VDC 24VDC 12VDC 115VDC
 Special Voltage (Consult Factory, Non-FM Approved)

Limit Switch Type: **SPDT** SPDT – GO Proximity ^P SPDT - SS ^P SPDT - Plug-In ^P
 DPDT DPDT – GO Proximity ^P DPDT - SS ^P DPDT - Plug-In ^P

Open Limit Switch: No (Standard) Yes ^P

Filter Regulator: No (Standard) Yes (FR1) ^P Yes (FR2) ^P

Ingress Protection: **NEMA 4** (Standard Nema 4)
 NEMA 4X (All Junction Box, S.S. Switches) ^P
 NEMA 6P

Hazardous Area Classification: **Non Hazardous (Nema 4)**
 Class 1 Division 2 ^P (Nema 7)
 Class 1 Division 1 ^P (Consult Factory, No Junction Box or Conduit Runs Supplied)

Ambient Temperature: **Standard (-20° F to 140° F)** High Temperature (141° F to 180° F) (Non-FM)

Special Mounting Bracket: **No (Standard)** Special Mounting Bracket ^P (Consult Factory with application needs)

Wire Gauge: **AWG 16 (Standard)** AWG 14 ^P
 AWG 18 (SPDT-GO) AWG 20 (DPDT-GO)

Wire Termination: **None (Standard)** Spade Connector ^P Full Ring Lug ^P

Closure Speed: **STD (< 5 seconds)** 1S ^P (< 1 second) NA (Not Applicable, No Solenoid)

Special Paint: **ITT Standard** Black Seaside Paint ^P Special Paint ^P (Consult Factory)

Choosing selections in bold should result in a standard valve and shortest lead time.

^P Price Adder may result in longer than standard lead times. Please check with factory for estimate.

SKOTCH® TRIFECTA

Specification Data Sheet Double Block & Vent Gas Safety Shutoff Valve Systems Series T4400F (4.00" Gas Valve)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
End User: _____ Location: _____ Quantity: _____

Model Number: T4400F Four Inch Fabricated Body, 2.00" vent

Agency Approval: Factory Mutual No approval required

Vent Connection Type: FNPT ANSI Class 150# Flange ^P

End Connection Type: ANSI Class 150# Flanges (Standard) Spigot (Sch 40)
 Butt Weld (Sch 40)

Outlet Test Port: No (Standard) OTP ^P (1/2 NPT port on outlet pipe)

Valve Failure Position: Fail Closed Fail in Last (Non-FM Approved)

Valve Seal Material: Buna (Standard) Viton ^P

Inlet / Outlet Flow Orientation: Outlet 0 Degrees from Inlet Outlet 90 Degrees from Inlet
 Outlet 180 Degrees from Inlet Outlet 270 Degrees from Inlet
 Special (Consult Factory with Specific Needs)

Vent Orientation: 0 Degrees from Inlet 90 Degrees from Inlet
 180 Degrees from Inlet 270 Degrees from Inlet
 Special (Consult Factory with Specific Needs)

Junction Box Orientation: Junction Box 0 Degrees from Inlet Junction Box 90 Degrees from Inlet
 Junction Box 180 Degrees from Inlet Junction Box 270 Degrees from Inlet
 No Junction Box Selected Special (Consult Factory) _____

Note: Junction Box cannot be in same orientation as Vent

Solenoid Coil Voltage: 110VAC 220VAC
 125VDC 48VDC 24VDC 12VDC 115VDC
 Special Voltage (Consult Factory, Non-FM Approved)

Limit Switch Type: SPDT SPDT – GO Proximity^P SPDT - SS ^P SPDT - Plug-In ^P
 DPDT DPDT – GO Proximity^P DPDT - SS ^P DPDT - Plug-In ^P

Open Limit Switch: No (Standard) Yes ^P

Filter Regulator: No (Standard) Yes (FR1) ^P Yes (FR2) ^P

Ingress Protection: NEMA 4 (Standard Nema 4)
 NEMA 4X (Al Junction Box, S.S. Switches) ^P
 NEMA 6P

Hazardous Area Classification: Non Hazardous (Nema 4)
 Class 1 Division 2 ^P (Nema 7)
 Class 1 Division 1 ^P (Consult Factory, No Junction Box or Conduit Runs Supplied)

Ambient Temperature: Standard (-20° F to 140° F) High Temperature (141° F to 180° F) (Non-FM)

Special Mounting Bracket: No (Standard) Special Mounting Bracket ^P (Consult Factory with application needs)

Wire Gauge: AWG 16 (Standard) AWG 14 ^P
 AWG 18 (SPDT-GO) AWG 20 (DPDT-GO)

Wire Termination: None (Standard) Spade Connector ^P Full Ring Lug ^P

Closure Speed: STD (< 5 seconds) 1S ^P (< 1 second) NA (Not Applicable, No Solenoid)

Special Paint: ITT Standard Black Seaside Paint ^P Special Paint ^P (Consult Factory)

Choosing selections in bold should result in a standard valve and shortest lead time.

^P Price Adder may result in longer than standard lead times. Please check with factory for estimate.

SKOTCH® TRIFECTA

Specification Data Sheet Double Block & Vent Gas Safety Shutoff Valve Systems Series T4600F (6.00" Gas Valve)

Quote To: _____ Location: _____ Inquiry / RFQ #: _____
End User: _____ Location: _____ Quantity: _____

Model Number: **T4600F Six Inch Fabricated Body, 2.50" vent**

Agency Approval: Factory Mutual No approval required

Vent Connection Type: **FNPT** ANSI Class 150# Flange ^P

End Connection Type: **ANSI Class 150# Flanges** (Standard) Spigot (Sch 40)
 Butt Weld (Sch 40)

Outlet Test Port: **No (Standard)** OTP ^P (1/2 NPT port on outlet pipe)

Valve Failure Position: Fail Closed Fail in Last (Non-FM Approved)

Valve Seal Material: Buna (Standard) Viton ^P

Inlet / Outlet Flow Orientation: Outlet 0 Degrees from Inlet Outlet 90 Degrees from Inlet
 Outlet 180 Degrees from Inlet Outlet 270 Degrees from Inlet
 Special (Consult Factory with Specific Needs)

Vent Orientation: 0 Degrees from Inlet 90 Degrees from Inlet
 180 Degrees from Inlet 270 Degrees from Inlet
 Special (Consult Factory with Specific Needs)

Junction Box Orientation: Junction Box 0 Degrees from Inlet Junction Box 90 Degrees from Inlet
 Junction Box 180 Degrees from Inlet Junction Box 270 Degrees from Inlet
 No Junction Box Selected Special (Consult Factory) _____

Note: Junction Box cannot be in same orientation as Vent

Solenoid Coil Voltage: **110VAC** 220VAC
 125VDC 48VDC 24VDC 12VDC 115VDC
 Special Voltage (Consult Factory, Non-FM Approved)

Limit Switch Type: **SPDT** SPDT – GO Proximity ^P SPDT - SS ^P SPDT - Plug-In ^P
 DPDT DPDT – GO Proximity ^P DPDT - SS ^P DPDT - Plug-In ^P

Open Limit Switch: No (Standard) Yes ^P

Filter Regulator: No (Standard) Yes (FR1) ^P Yes (FR2) ^P

Ingress Protection: **NEMA 4** (Standard Nema 4)
 NEMA 4X (All Junction Box, S.S. Switches) ^P
 NEMA 6P

Hazardous Area Classification: **Non Hazardous (Nema 4)**
 Class 1 Division 2 ^P (Nema 7)
 Class 1 Division 1 ^P (Consult Factory, No Junction Box or Conduit Runs Supplied)

Ambient Temperature: **Standard (-20° F to 140° F)** High Temperature (141° F to 180° F) (Non-FM)

Special Mounting Bracket: **No (Standard)** Special Mounting Bracket ^P (Consult Factory with application needs)

Wire Gauge: **AWG 16 (Standard)** AWG 14 ^P
 AWG 18 (SPDT-GO) AWG 20 (DPDT-GO)

Wire Termination: **None (Standard)** Spade Connector ^P Full Ring Lug ^P

Closure Speed: **STD (< 5 seconds)** 1S ^P (< 1 second) NA (Not Applicable, No Solenoid)

Special Paint: **ITT Standard** Black Seaside Paint ^P Special Paint ^P (Consult Factory)

Choosing selections in bold should result in a standard valve and shortest lead time.

^P Price Adder may result in longer than standard lead times. Please check with factory for estimate.



Industrial Process

Terms & Conditions of Sale

WARRANTY

(a) Company warrants that on the date of shipment the goods are of the kind and quality described herein and are free of non-conformities in workmanship and material. This warranty does not apply to goods or parts delivered by Company but manufactured by others. (b) Buyer's exclusive remedy for nonconformity in any item of the goods shall be the repair or the replacement (at Company's option) of the item and any affected part of the goods. Company's obligation to repair or replace shall be in effect for a period of one (1) year from initial operation of the goods but not more than eighteen (18) months from Company's shipment of the goods, provided Buyer has sent written notice within that period of time to Company that the goods do not conform to the above warranty. Repair and replacement parts shall be warranted for the remainder of the original period of notification set forth above, but in no event less than 12 months from repair or replacement. At its sole expense, Buyer shall remove and ship to Company any such nonconforming goods and shall reinstall the repaired or replaced goods or parts. Buyer shall grant Company access to the goods at all reasonable times in order for Company to determine any nonconformity in the goods. Company shall have the right of disposal of items replaced by it. If Company is unable or unwilling to repair or replace, or if repair or replacement does not remedy the nonconformity, Company and Buyer shall negotiate an equitable adjustment in the order price, which may include a full refund of the order price for the nonconforming goods. (c) COMPANY HEREBY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE. SPECIFICALLY, IT DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, COURSE OF DEALING AND USAGE OF TRADE. (d) Buyer and successors of Buyer are limited to the remedies specified in this article and shall have no others for a nonconformity in the goods. Buyer agrees that these remedies provide Buyer and its successors with a minimum adequate remedy and are their exclusive remedies, whether Buyer's or its successors' remedies are based on contract, warranty, tort (including negligence), strict liability, indemnity, or any other legal theory, and whether arising out of warranties, representations, instructions, installations, or non-conformities from any cause. Buyer shall assume all responsibility and expense for removal, reinstallation and freight in connection with these remedies. (e) Company neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of its goods. This warranty shall not apply to any goods that: (1) have been repaired or altered outside of Company's factories or authorized service centers, in any manner; or (2) have been subjected to misuse, negligence or accidents; or (3) have been improperly stored or handled or used in a manner contrary to Company's instructions or recommendations; or (4) have design errors due to inaccurate or incomplete information supplied by Buyer or its agents.

LIMITATION OF LIABILITY

NEITHER COMPANY, NOR ITS SUPPLIERS SHALL BE LIABLE, WHETHER IN CONTRACT, WARRANTY, FAILURE OF A REMEDY TO ACHIEVE ITS INTENDED OR ESSENTIAL PURPOSES, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, INDEMNITY OR ANY OTHER LEGAL THEORY, FOR LOSS OF USE, REVENUE OR PROFIT, OR FOR COSTS OF CAPITAL OR OF SUBSTITUTE USE OR PERFORMANCE, OR FOR INDIRECT, SPECIAL, LIQUIDATED, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR ANY OTHER LOSS OR COST OF A SIMILAR TYPE, OR FOR CLAIMS BY BUYER FOR DAMAGES OF BUYER'S CUSTOMERS. COMPANY'S MAXIMUM LIABILITY UNDER THIS CONTRACT SHALL BE THE CONTRACT PRICE. BUYER AND COMPANY AGREE THAT THE EXCLUSIONS AND LIMITATIONS SET FORTH IN THIS ARTICLE ARE SEPARATE AND INDEPENDENT FROM ANY REMEDIES WHICH BUYER MAY HAVE HEREUNDER AND SHALL BE GIVEN FULL FORCE AND EFFECT WHETHER OR NOT ANY OR ALL SUCH REMEDIES SHALL BE DEEMED TO HAVE FAILED OF THEIR ESSENTIAL PURPOSE.

GENERAL

(a) Company will comply with all laws applicable to Company during manufacture and sale of the goods. Purchaser will comply with all laws applicable to Purchaser during operation or use of the goods. (b) The laws of the State of New York shall govern the validity, interpretation and enforcement of any order of which these provisions are a part, without giving effect to any rules governing the conflict of laws. The application of the United Nations Convention on Contracts for the International Sale of Goods shall be excluded. (c) Assignment may be made only with written consent of both parties; provided, however, Company may assign to its affiliate without Buyer's consent. (d) Buyer shall be liable to Company for any attorney's fees and costs incurred by Company in enforcing any of its rights hereunder. This document and any other documents specifically referred to as being a part hereof, constitute the entire contract on the subject matter, and it shall not be modified except in writing signed by both parties. Unless otherwise specified, any reference to Buyer's order is for identification only.

ACCEPTANCE

The determination of compliance with performance guarantees will be based on results of factory tests under controlled conditions with calibrated instruments and tested per standards of the Hydraulic Institute, ISO standards, API standards, or other nationally recognized accreditation standards.

STATUTE OF LIMITATIONS

To the extent permitted by applicable law, any lawsuit for breach of contract, including breach of warranty, arising out of the transactions covered by this order, must be commenced not later than twelve (12) months from the date the cause of action accrued.

SHIPMENT

The term "shipment" means delivery to the initial carrier in accordance with the delivery terms of this order. Company may make partial shipments. Company shall select method of transportation and route, unless terms are f.o.b. point of shipment and Buyer specifies the method and route and is to pay the freight costs in addition to the price. When terms are f.o.b. destination or freight allowed to destination, "destination" means common carrier delivery point - within the continental United States, excluding Alaska - nearest the destination. For movement outside the United States, company shall arrange for inland carriage to port of exit and shall cooperate with Buyer's agents in making necessary arrangements for overseas carriage and preparing necessary documents.

SPECIAL SHIPPING DEVICES

On shipments to a destination in the continental United States or Canada, Company has the right to add to the invoice, as a separate item, the value of any special shipping device (barrel, reel, tarpaulin, cradle, crib and the like) used to contain or protect the goods invoiced, while in transit. Full credit will be given on the return to Company of the device in a reusable condition, f.o.b. destination, freight prepaid.

DELAYS

If Company suffers delay in performance due to any cause beyond its control, including but not limited to act of God, war, act or failure to act of government, act or omission of Buyer, fire, flood, strike or labor troubles, sabotage, or delay in obtaining from others suitable services, materials, components, equipment or transportation, the time of performance shall be extended a period of time equal to the period of the delay and its consequences. Company will give Buyer notice in writing within a reasonable time after Company becomes aware of any such delay.

NONCANCELLATION

Buyer may not cancel or terminate for convenience, or direct suspension of manufacture, except with Company's written consent upon terms agreed to by Company.

STORAGE

Any item of the goods on which manufacture or shipment is delayed by causes within Buyer's control, or by causes which affect Buyer's ability to receive the goods, may be placed in storage by Company for Buyer's account and risk and Buyer shall pay all charges for storage and shipping and incidental expenses.

TITLE AND INSURANCE

Title to the goods and risk of loss or damage shall pass to Buyer at the f.o.b. point, except that a security interest in the goods and proceeds and any replacement shall remain in Company, regardless of mode of attachment to realty or other property, until the full price has been paid in cash. Buyer agrees to do all acts necessary to perfect and maintain said security interest, and to protect Company's interest by adequately insuring the goods against loss or damage from any external cause with Company named as insured or co-insured.

INSPECTIONS / EXPEDITING

The Company restricts access to its facilities and requires seventy two (72) hours notice prior to each visit. Company requires that its agents or employees accompany inspectors/expeditors on their visit(s).

TERMS OF PAYMENT

Unless otherwise stated, all payments shall be by Letter of Credit or Net Thirty (30) Days and in United States dollars, and a pro rata payment shall become due as each shipment is made. If shipment is delayed by Buyer, date of readiness for shipment shall be deemed to be date of shipment for payment purposes. If at any time in Company's judgment Buyer may be or may become unable or unwilling to meet the terms specified, Company may require satisfactory assurances or full or partial payment as a condition to commencing or continuing manufacture or making shipment; and may, if shipment has been made, recover the goods from the carrier, pending receipt of such assurances.

GOODS RETURN

Goods can be returned for credit only after receiving Company's written authorization and shipping instructions. Consignor's name and address must be plainly written on the shipping tag. Special goods fabricated to order are not returnable under any conditions.

PATENTS

Company shall pay costs and damages finally awarded in any suit against Buyer or its vendees to the extent based upon a finding that the design or construction of the goods as furnished, infringes a United States patent (except infringement occurring as a result of incorporating a design or modification at Buyer's request), provided that Buyer promptly notifies Company of any charge of infringement, and Company is given the right at its expense to settle such charge and to defend or control the defense of any suit based upon such charge. Company shall have no obligation hereunder with respect to claims, suits or proceedings, resulting from or related to, in whole or in part, (a) the use of software or software documentation, (b) compliance with Buyer's specifications, (c) the combination with, or modification of, the goods after delivery by Company, or (d) the use of the goods, or any part thereof, in the practice of a process. THIS ARTICLE SETS FORTH COMPANY'S ENTIRE LIABILITY WITH RESPECT TO PATENTS.

BUYER DATA

Timely performance is contingent upon the Buyer supplying to the Company, when needed, all required technical information, including drawing approval, and all required commercial documentation.

NUCLEAR

Buyer represents and warrants that the goods covered by this order shall not be used in or in connection with a nuclear facility or application.

PRICES

The prices stated herein will remain firm for the period up to the stated date of shipment providing the shipment is not delayed by the Buyer. If shipment is delayed by the Buyer beyond the shipment date quoted herein, the prices will be based on the prices in effect at time of shipment, including storage and material handling costs. In no event shall the adjusted price be less than the original order price, including change orders. Prices are F.O.B. Shipping Point, unless otherwise specified. When price includes transportation and other charges pertaining to the shipment of goods, any increase in transportation rates and other charges will be for the account of the Buyer. There will be an extra charge for any test other than that which may be normally run by the Company, or for any test performed to suit the convenience of the Buyer. Any applicable duties or sales, use, excise, value added or similar taxes will be added to the price and invoiced separately.

CONTROLLING PROVISIONS

These terms and conditions shall control with respect to any purchase order or sale of the Company's goods. No waiver, alteration or modification of these terms and conditions whether on Buyer's purchase order or otherwise shall be valid unless the waiver, alteration or modification is specifically accepted in writing and signed by an authorized representative of the Company.

EXPORT

If this transaction involves EXPORT, the following additional terms and conditions shall apply:

- Compliance is required for ALL applicable US export laws, and the export laws of the country from where the goods are exported. Buyer acknowledges that it will comply with all applicable export or re-export restrictions and regulatory requirements in the purchase or resale of Products from the Company. Buyer acknowledges that this may include US export or re-export restrictions and controls in addition to requirements enforced by other international export control regimes, as applicable. Buyer agrees to full disclosure of all parties to a proposed sales transaction, and to comply with all license terms and conditions, destination control statements, or other restrictions on the export or re-export of Products. Buyer agrees that it will not divert such products to any unauthorized party or destination, including embargoed or sanctioned territories or countries. Buyer will include all information pertaining to export classification (ECCN or equivalent), applicable license restrictions, and authorized destination of the Product in its export and shipping documentation.
- **PACKING**
When packing is available, equipment will be packed, boxed or crated in accordance with the Company's standard commercial practice, for underdeck export shipment, unless otherwise agreed.
- **LETTER OF CREDIT**
Unless otherwise specified in writing, payment shall be made by irrevocable letter of credit in form acceptable to Company, confirmed by a major USA bank, acceptable to the Company and providing for payment in full in United States dollars against presentation of United States inland shipping documents and invoices, such letter of credit to be established prior to Company's acceptance of the order. The letter of credit shall also provide that in the event Company is, for any reason beyond its control, prevented from making shipment from Company's factory or delivery at the port of embarkation, a certificate of manufacture of the whole or any part of the goods shall constitute delivery of such whole or any part of the goods and payment in full of any and all drafts drawn against the letter of credit for the goods so "delivered" shall be made upon presentation of such certificates of manufacture in lieu of United States inland shipping documents. In the event that Company is prevented by law, or otherwise, from making shipment from Company's factory or delivery at port of embarkation of the goods or any part thereof, on completion of manufacture, Company reserved the right to place the goods in storage for the Buyer's account and risk. Any charges incurred in this connection will be for the account of the Buyer at cost and will be payable upon demand. In regions where Letters of Credit are not available, surety bonds will be utilized in lieu of the bank guarantee.
- **COMPANY AS AGENT**
If Company makes or arranges for ocean shipment, Company shall act as agent for the Buyer and reserves the right to procure full insurance coverage, including war risk insurance, at the expense of the Buyer. All expenses incurred in this connection will be payable upon demand to the Company. If Company as agent applies for or secures manufacturing, financing, exporting or other licenses required by the United States Government, or any department thereof, Company shall make such applications or secure such licenses solely as agent for the Buyer, and assumes no responsibility therefore.

Visit our website at
www.engvalves.com



ITT Engineered Valves
33 Centerville Road
Lancaster, PA 17603, USA
Tel: +1 (717) 509-2200

**Cam-Line, Cam-Tite, Dia-Flo,
EnviZion, Pure-Flo, Skotch**

ITT Engineered Valves
1110 Bankhead Avenue
Amory, MS 38821, USA
Tel: +1 (662) 256-7185

Fabri-Valve

ITT Bornemann GmbH
31683 Obernkirchen
Germany
Tel: +49 5724 390-0

EnviZion, Pure-Flo

