



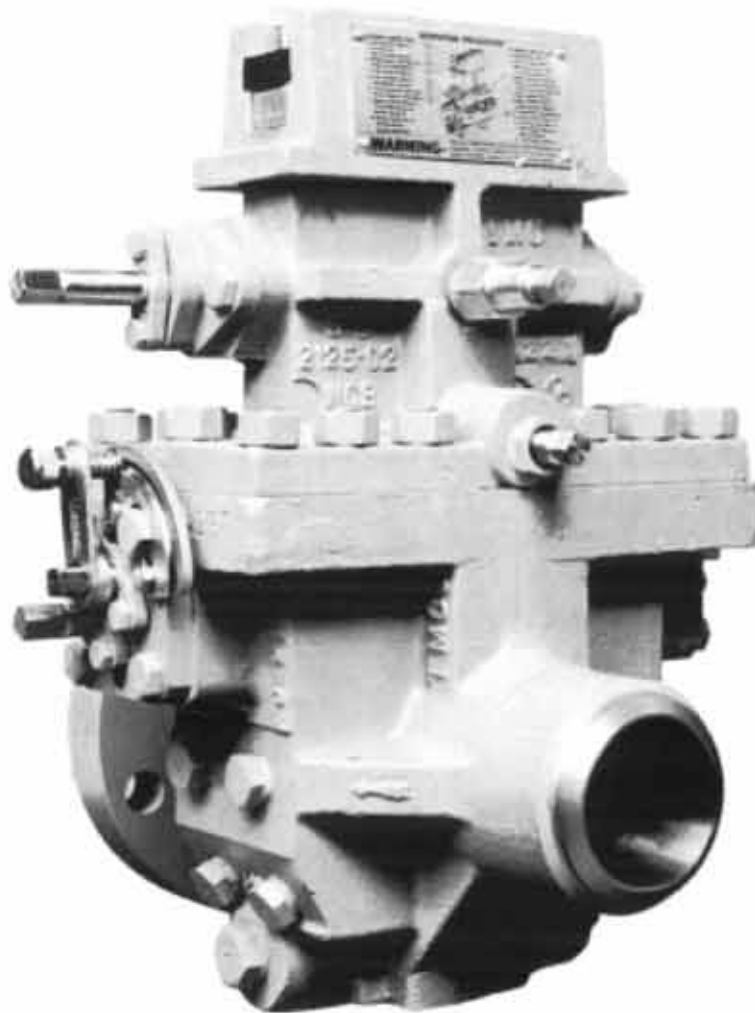
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Title: Instruction for Installation, Operation, & Maintenance of
ANSI Class 150-600 Sure Shot® Dual Chamber Orifice Fittings

Sure Shot®



Ensure that all equipment openings, access plugs, and protective covers are in place to prevent personal injury.

READ AND FOLLOW THE TMC_O, INC. SURE SHOT[®] ORIFICE FITTING OWNER'S MANUAL. PLEASE OBSERVE AND NOTE ALL PRODUCT WARNINGS AND INSTRUCTIONS.

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1.0 INTRODUCTION

1.1 GENERAL

This manual provides installation, operation, and maintenance instructions for use with the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting. It is important to read this manual in its entirety before beginning any of the listed operations, and to observe all warnings, cautions, and notices described herein which are intended to highlight potential safety concerns and may endanger personnel and equipment if ignored.

1.2 DESCRIPTION

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is a Simple, Safe, Accurate, Economical, Grease Free Orifice measurement device, using the principal of differential pressure to measure flow. Features of the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting includes:

1.2.1 COMPONENTS

TOP CLAMPING BAR GASKET

Seals easily by tightening square head clamping bar screws. Non-Asbestos flat gasket is easy to replace.

UPPER CHAMBER END COVER SEAL

Standard HNBR O-Ring. (HNBR) or Hydrogenated Nitrile Butadiene Rubber offers improved wear and extrusion resistance over standard sealing materials. It has excellent chemical compatibility and can be used with oils which have aggressive additives, fluids containing Hydrogen Sulfide, Amines, and Oilfield corrosion inhibitors. The compound also has an extended temperature range (-40° .F. to 300° .F.)

LOWER CHAMBER BODY SEAL

Standard (HNBR) Hydrogenated Nitrile Butadiene Rubber O-Ring that seals between the upper and lower chamber.

PLUG & GEAR SHAFT SEAL

Plug shaft seals consist of Teflon[®] rings. Shaft packing adjustment is achieved by turning the two bolts located on the packing gland follower of each shaft.

Note: The two bolts must be turned evenly to achieve a proper seal. This configuration provides smooth plug shaft operation.

ORIFICE PLATE SEAL (PATENTED)

The orifice plate seal is (HNBR) Hydrogenated Nitrile Butadiene Rubber material bonded to a stainless steel metal insert. This insert retains seal shape, ensuring no protrusion into the bore. This special shape provides a positive seal between the orifice plate and the upstream fitting seat. This conforms to latest AGA 3/API 14.3 and ISO 5167 design specification requirements.

ECENTRIC PLUG (PATENTED)

The eccentric plug provides an effective seal with fewer parts and less maintenance. The plug is CS, coated with Xylan for added corrosion resistance, has SS shafts and Holds a PTFE insert, secured by a SS retainer plate. Together, the assembly Provides the means for isolating the upper and lower chamber.

EQUALIZER VALVE & STANDARD 1/2" NPT BLEED

Standard Equalizer and bleed valve provide simple function and reliability.

SEAT AND UPPER CHAMBER SEAL

Standard (HNBR) Hydrogenated Nitrile Butadiene Rubber O-Ring

LOWER CHAMBER END COVER SEAL

Standard (HNBR) Hydrogenated Nitrile Butadiene Rubber O-Ring

PRESSURE TAPS AND DRAIN PLUGS

Standard NPT pipe taps conform to AGA 3/API 14.3 and ANSI requirements.

SAFETY LOCK

The Sure Shot[®] spring loaded plunger locks the eccentric plug in the closed position in order to prevent accidental opening while the upper chamber is open. The operator must physically pull the spring loaded plunger to release the safety lock feature to actuate the eccentric plug to an open position. The safety lock also provides the operator with an indication of improper location of the orifice plate carrier in the fitting. When trying to close the Eccentric Plug, if the orifice plate carrier is not properly positioned in the fitting, the safety lock will not return to the closed position. This lets the operator know that he needs to investigate the carrier position before leaving the site.

STANDARD NACE TRIM

Special parts and their associated costs are not needed for applications where H₂S is present. The standard internal materials are fully compliant with the NACE MR-01-75-2000 requirements.

1.2.2 FUNCTIONALITY

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting utilizes an upper and lower chamber (dual chamber) design to precisely position an orifice plate in the center of a flow stream. Fluid flow through the orifice plate generates a differential pressure across the orifice plate. By measuring the resultant pressure drop through pressure taps located in the lower chamber body, and with known or measured fluid process parameters, the flow can be calculated using standard, industry accepted equations.

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting consists of two independent chambers, separated by an Eccentric Plug. Using a XYLAN coated plug sealing to a stainless steel seat, a positive seal is created for pressure and fluid isolation between

the upper and lower chambers. Gear shafts in each chamber allow the insertion and removal of the orifice plate carrier.

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting allows for inspection of and replacement of the orifice plate without depressurization or interruption of process flow. The unique spring loaded safety lock is activated automatically when the Eccentric Plug is in the closed position. This feature also assists to provide precise open and close positioning of the eccentric plug.

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is a greaseless fitting with few moving parts. The eccentric isolation plug is one moving part, which can be checked or changed without removing the upper chamber of the fitting. All shafts can be reversed or inspected without removing the upper chamber of the fitting.

Note: These procedures must be performed when the fitting is depressurized.

TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fittings “fully conform” to the AGA 3 / API 14.3 requirements, ISO 5167, ANSI Flange Standards, ASTM Material Specifications and NACE MR-01-75-2000 Edition (for internal wetted parts).

When venting the Upper Chamber via the Bleed Valve (35) or draining the Lower Chamber (33), the operator should refer to his internal company policies and procedures with regard to releasing any process fluids which may endanger maintenance or operations personnel. If necessary, the fluid should be directed to a safe area using the threaded connections available.

TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fittings come standard with telemetry taps on both sides of the orifice fitting and drain plugs located on each side at the bottom of the fitting.

Spare Parts may be ordered on line via the following website link: www.tmcousa.com or you may contact us directly by phone @ 713-465-3255. When ordering spare parts, please specify fitting serial number, size and item no. from General Parts list 1.3.

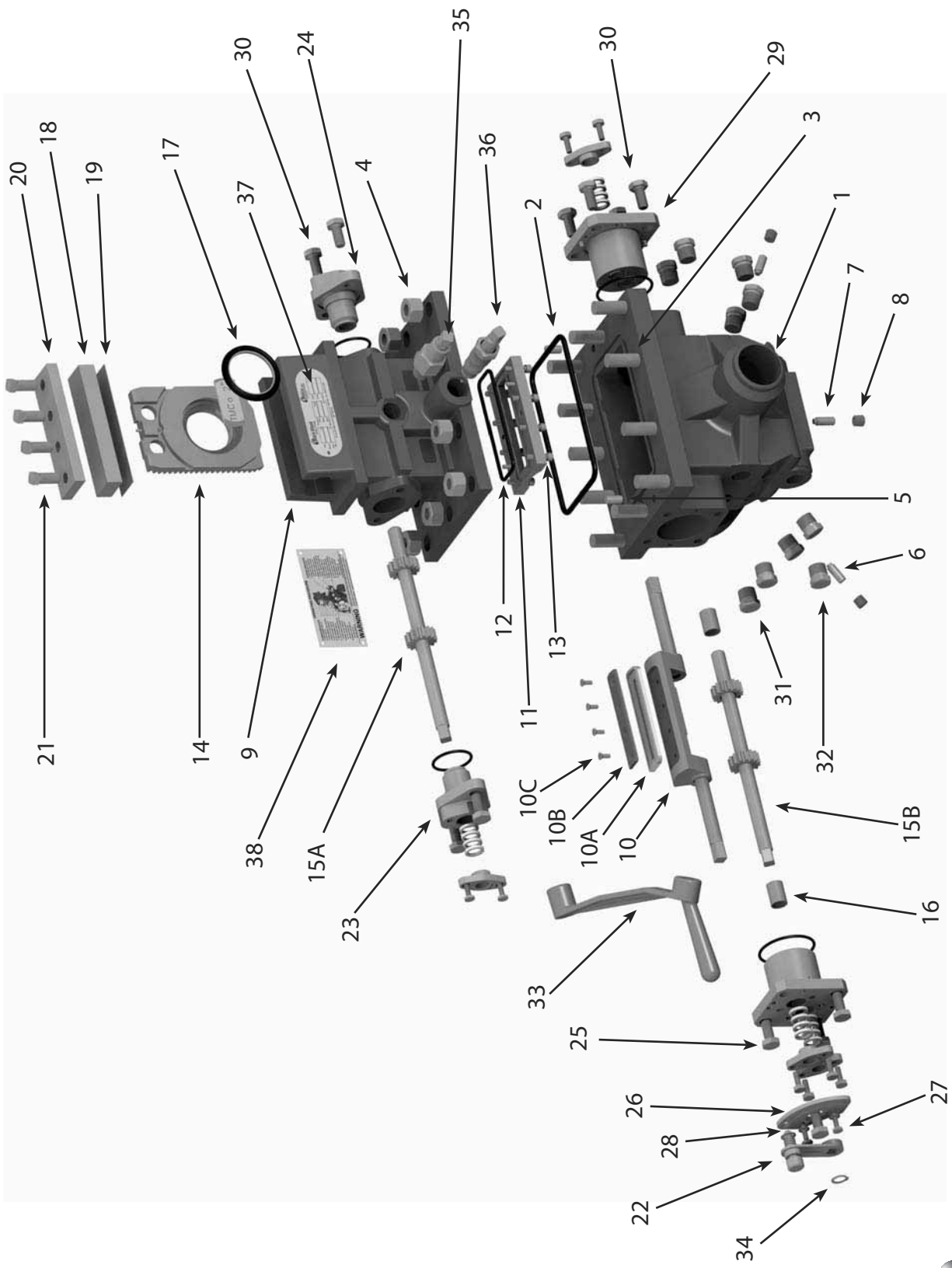
1.3 GENERAL PARTS LIST – NACE TRIM STANDARD

PARTS IDENTIFICATION & MATERIALS LIST QUANTITY BY SIZE

ITEM	DESCRIPTION	MATERIAL	2"	3"	4"	6"	8"	10"	12"
1	Lower Chamber Body	A-216 WCB/WCC	1	1	1	1	1	1	1
2	Lower Cham. Bdy O-Ring	HNBR D70	1	1	1	1	1	1	1
3	Stud, Full Thd.	A-193 Gr B7M	11	14	14	18	18	18	24
4	Nut-Heavy Hex	A-194 Gr 2HM	11	14	14	18	18	18	24
5	Dowel Pin	SS	2	2	2	2	2	2	2
6	Locking Screw, Allen Hd.	Carbon Steel	2	2	2	2	2	2	2
7	Locking Screw, Allen Hd	Carbon Steel	1	1	1	1	1	1	1
8	Plug, Allen Head	Carbon Steel	3	3	3	3	3	3	3
9	Upper Chamber Body	A-216 WCB/WCC	1	1	1	1	1	1	1
10	Eccentric Plug Valve Assembly	CS/SS	1	1	1	1	1	1	1
10A	Insert	PTFE	1	1	1	1	1	1	1
10B	Retainer plate	SS	1	1	1	1	1	1	1
10C	Screw, 10-32 x 1/2" Socket Head	SS	4	5	6	8	10	11	12
11	Seat	CS/SS	1	1	1	1	1	1	1
12	Ecc. Plug Seat O-Ring	HNBR D70	1	1	1	1	1	1	1
13	Screw, Socket Head	SS	8	8	8	10	12	16	16
14	Plate Carrier w/ Plunger	SS	1	1	1	1	1	1	1
15A	Upper Gear Shaft Assembly	SS	1	1	1	1	1	1	1
15B	Lower Gear Shaft Assembly	SS	1	1	1	1	1	1	1
16	Gear Shaft Spacer (Lower Chamber)	SS	2	2	2	2	2	4	4
17	Plate Seal Ring, Patented	SS/ HNBR Bonded	1	1	1	1	1	1	1
18	Sealing Bar, Coated	CS	1	1	1	1	1	1	1
19	Sealing Bar Gasket	Non-Asb Fiber	1	1	1	1	1	1	1
20	Clamping Bar, Coated	CS	1	1	1	1	1	1	1
21	Clamping Bar Screws, Coated	Carbon Steel Gr. 8	4	5	6	7	8	9	10
22	Lock Arm Assembly		1	1	1	1	1	1	1
23*	Upper Cham.Thru Cover Assembly		1	1	1	1	1	1	1
24*	Upper Cham. Blind Cover Assembly		1	1	1	1	1	1	1
25*	Lower Cham. Thru Cover Assembly		1	1	1	1	1	1	1
26	Orientation Plate	SS	1	1	1	1	1	1	1
27	Screw, Hex Head	SS	2	2	2	2	2	2	2
28	Split Washer	SS	2	2	2	2	2	2	2
29*	Lower Cham. Blind Cover Assembly		1	1	1	1	1	1	1
29A	O-Ring	HNBR D70	1	1	1	1	1	1	1
30	Bolt, Hex Head	Carbon Steel Grade 8	12	12	12	12	12	12	12
31	Plug, Hex Head (1/2" NPT)	Carbon Steel	10	8	8	8	8	8	8
32	Plug, Hex Head (3/4" NPT)	Carbon Steel	0	2	2	2	2	2	2
33	Crank Handle, Plated	A 126-B	1	1	1	1	1	1	1
34	Locking Arm Retaining Ring	SS	1	1	1	1	1	1	1
35	Bleed Valve Assembly	CS/SS	1	1	1	1	1	1	1
36	Equalizer Valve Assembly	CS/SS	1	1	1	1	1	1	1
37	Name Tag	SS	1	1	1	1	1	1	1
38	Operating Tag	SS	1	1	1	1	1	1	1

See following page for fitting exploded view.

*Denotes Sub-Assembly Ref. 1.4

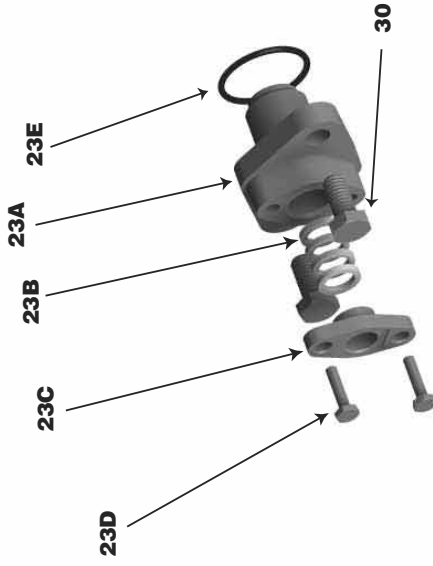


SUB-ASSEMBLIES

ITEM	DESCRIPTION	MATERIAL	2"	3"	4"	6"	8"	10"	12"
23	Upper Cham.Thru Cover Assembly		1	1	1	1	1	1	1
23A	Thru Cover w/Split Bearing	A-216 WCB	1	1	1	1	1	1	1
23B	Packing Ring	Virgin Teflon	4	4	4	4	4	4	4
23C	Cover Gland Follower	A-351 CF8M	1	1	1	1	1	1	1
23D	Screw, Hex Head	Carbon Steel Grade 5	2	2	2	2	2	2	2
23E	O-Ring	HNBR D70	1	1	1	1	1	1	1
24	Upper Cham. Blind Cover Assembly		1	1	1	1	1	1	1
24A	Blind Cover w/ Split Bearing	A-216 WCB	1	1	1	1	1	1	1
24B	O-ring	HNBR D70	1	1	1	1	1	1	1
25	Lower Cham. Thru Cover Assembly		1	1	1	1	1	1	1
25A	Thru Cover w/ Dowels & Split Bearings	A-216 WCB	1	1	1	1	1	1	1
25B	Packing Ring	Virgin Teflon	8	8	8	8	8	8	8
25C	Cover Gland Follower	A-351 CF8M	2	2	2	2	2	2	2
25D	Screw, Hex Head	Carbon Steel Grade 5	4	4	4	4	4	4	4
25E	O-ring	HNBR D70	1	1	1	1	1	1	1
29	Lower Chamber. Blind Cover Assembly		1	1	1	1	1	1	1
29A	Blind Cover w/Dowels & Split Bearings	A-216 WCB	1	1	1	1	1	1	1
29B	Packing Ring	Virgin Teflon	4	4	4	4	4	4	4
29C	Cover Gland Follower	A-351 CF8M	1	1	1	1	1	1	1
29D	Screw, Hex Head	Carbon Steel Grade 5	2	2	2	2	2	2	2
29E	O-Ring	HNBR D70	1	1	1	1	1	1	1
30	Bolt, Hex Head	Carbon Steel Grade 8	12	12	12	12	12	12	12

See following page for sub-assembly exploded view.

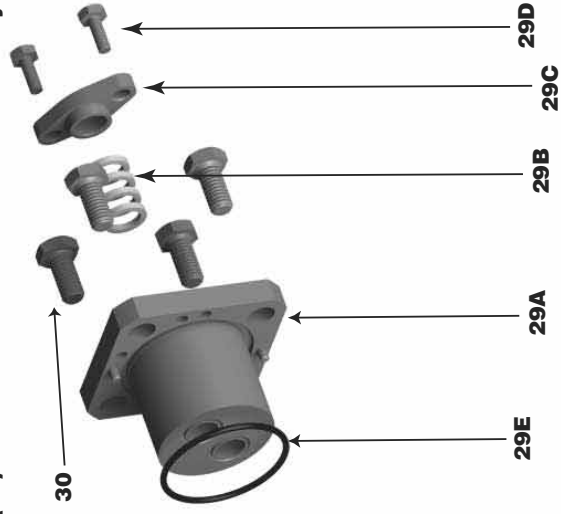
(23) Upper Chamber Thru Cover Assembly



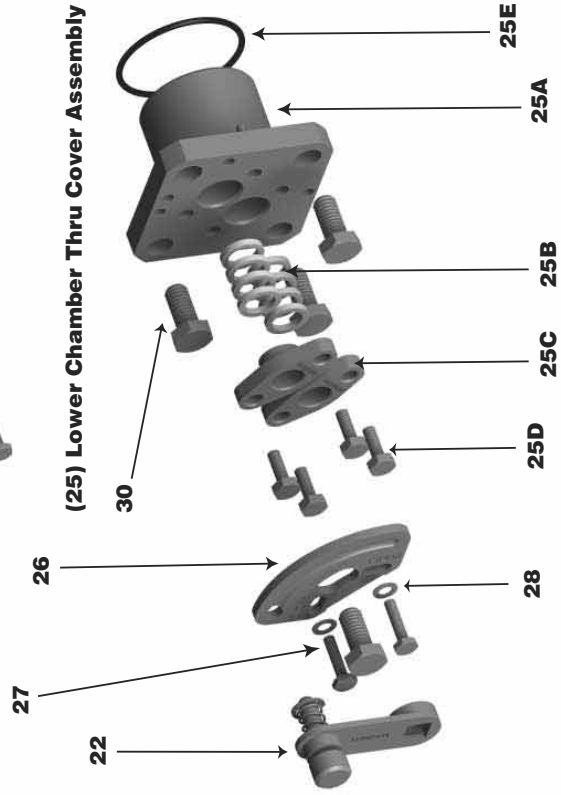
(24) Upper Chamber Blind Cover Assembly



(29) Lower Chamber Blind Cover Assembly



(25) Lower Chamber Thru Cover Assembly



2.0 INSTALLATION

2.1 METER TUBE INSTALLATION

The orifice fitting (meter) is typically installed in a meter run to complete a metering unit. If the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is not already connected to a meter tube, a meter tube which meets the applicable code requirements, such as AGA 3 / API 14.3, should be fabricated and attached to the orifice fitting, inspected, and tested prior to installation in the process line.

Prior to installation of the meter, the meter tube assembly must be cleaned of all dirt, scale, foreign matter, grease, oil, water, or other contaminants.

Personnel installing the meter tube shall ensure the connecting process lines are also cleaned adequately to prevent foreign material from entering the meter tube and or meter during the installation process.

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is shipped with a shipping disc in place of an orifice plate. The shipping disc is installed in the Dual Chamber fitting before shipment and is held in place by the plate seal ring (17). Its purpose is to provide the operator with a means to push the seal ring out of the carrier when installing the orifice plate during meter tube installation. The shipping disc should be discarded when installing the orifice plate.

2.2 SURE SHOT[®] INSTALLATION



**SERIOUS PERSONAL INJURY OR
DEATH OCCURRENCE WARNING**

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is a pressure containing device. Failure to operate the Sure Shot[®] Dual Chamber Fitting as instructed per this manual could result in serious injury or death.

The meter must be installed with the flow arrow indicating the correct flowing direction. The flow directional arrow is cast or stamped into the lower chamber body casting (1) on all Sure Shot[®] Dual Chamber Orifice Fittings.

The orifice meter may be installed in either the horizontal position with the Sealing Bar (18) access at the top, or with the Sealing Bar (18) access rotated to either the right hand or left hand side of the meter. For raised face ANSI Class 600 and above, the downstream companion flange to the meter is required to be a close tolerance female

flange or ring type joint. For raised face ANSI Classes 150 and 300, the downstream companion flange to the meter requires dowel pin alignment.

Adequate maintenance and operating clearance around the meter should be verified prior to final installation. Clearance is required for the crank handle (33) to operate the Upper & Lower Gear Shaft assemblies (15A, 15B), Eccentric Plug (10), and Clamping Bar Square Head screw (21). Adequate clearance for the removal of the Clamping bar should be provided. Also allow adequate clearance for all secondary process equipment connecting to the pressure taps, telemetering taps, and Lower Chamber Body Drain Plug (32).

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is shipped with the Orientation Plate (26) and Lock Arm Assembly (22) factory installed. This device serves to function as a position indicator and safety lock for the Eccentric Plug (10). When the orifice plate carrier is in the lower chamber it will also ensure proper positioning for the orifice plate carrier.

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting does not require a grease gun for lubrication of any parts. The eccentric plug is a greaseless device which provides a seal between the upper and lower chambers of the Sure Shot[®] Dual Chamber Orifice Fitting.

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting requires no additional assembly for installation.

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is factory shipped with the orifice plate carrier / seal ring assembly installed in the lower chamber body of the fitting. The carrier assembly should be removed prior to any field testing. To remove the plate carrier assembly, the following steps should be taken:

- Step 1. First check the fitting to make sure there is no pressure contained in the upper or lower chambers of the fitting from test performed during fabrication. To verify that there is no pressure in the fitting or meter tube open the equalizer valve and Eccentric Plug to relieve any pressure that may be trapped between the upper and lower chambers. Open the Bleed Valve to relieve any remaining pressure in the Sure Shot[®] Dual Chamber Orifice Fitting. If the operator hears pressure, the operator should **STOP** until all pressure has been released before proceeding to remove the orifice plate.
- Step 2. Using the supplied TMC_o crank handle, place crank handle on lower gear shaft and turn gear shaft until carrier engages with upper chamber gear shaft. Place crank handle on upper chamber gear shaft, turn until carrier contacts the bottom of sealing bar. Using TMC_o supplied crank handle loosen clamping bar screws and remove clamping bar. Using TMC_o supplied crank handle place crank handle on upper chamber gear shaft and turn until carrier bumps sealing bar to assist breaking gasket loose from fitting top. After the top gasket is dislodged from upper chamber sealing area, remove sealing bar and gasket from the fitting. Place the TMC_o supplied crank handle on top gear shaft and operate until carrier is removed from fitting.

Step 3. Re-install the Clamping Bar Gasket, Sealing Bar, and Clamping Bar with Square Head screws and tighten the screws to the recommended torque values of a recommended torque, see table 5.3 for torque values

Step 4. Complete a post installation inspection before starting field testing procedures.

2.3 METER OR METER TUBE PRESSURE TEST

 **DANGER**

**SERIOUS PERSONAL INJURY OR
DEATH OCCURRENCE WARNING**

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is a pressure containing device. Failure to operate the Sure Shot[®] Dual Chamber Fitting as instructed per this manual could result in serious injury or death.

Pressure testing of the Meter Tube with the installed meter should be conducted prior to placing the meter in service. Internal company field testing procedures should be followed. Please also reference Sure Shot Installation procedures, para 2.2 above

2.4 ORIFICE PLATE INSTALLATION

 **DANGER**

**SERIOUS PERSONAL INJURY OR
DEATH OCCURRENCE WARNING**

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is a pressure containing device. Failure to operate the Sure Shot[®] Dual Chamber Fitting as instructed per this manual could result in serious injury or death.

Bring complete meter tube to operating pressure.
To install the Orifice Plate Carrier (14) and Orifice Plate, follow the procedures described in paragraph 4.2

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is now ready for service operation as a measurement device.

3.0 OPERATING INSTRUCTIONS



DANGER

SERIOUS PERSONAL INJURY OR DEATH OCCURRENCE WARNING

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting is a pressure containing device. Failure to operate the Sure Shot[®] Dual Chamber Fitting as instructed per this manual could result in serious injury or death.

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting design allows the operator to remove the Plate Carrier Assembly (14) without interruption or shutdown of the process flow. Separation of the Upper Chamber Body (9) and Lower Chamber Body (1) is accomplished by an Eccentric Plug (10). The Lower Chamber Body (1) houses the Plate Carrier Assembly (14) and the orifice plate during all flow measurement functions. The Upper Chamber Body (9) provides a transfer chamber for Orifice Plate removal or inspection via the Plate Carrier Assembly (14).

The Plate Carrier with ball plunger Assembly (14) is factory set with a three pin alignment configuration that properly aligns the orifice plate concentrically within the process flow stream. Positioning of the adjustment screws are factory set at the TMC_o, Inc. manufacturing facility and are field adjustable only by a qualified technician. If adjustment is required please contact TMC_o Inc. by phone @ 713-465-3255 before tampering or altering the factory set adjustments in any manner.

At the top of the Plate Carrier Assembly (14) is a ball plunger. When the Eccentric Plug (10) is rotated to the closed position, a machined surface on the Eccentric Plug contacts the Ball Plunger. A constant, downward (compressive) force is applied to the top of the Plate Carrier (14) to maintain it in the correct vertical orientation relative to the flow stream, along with the three alignment screws (6,7) mentioned earlier. The ball plunger limits movement of the carrier in the upward position which might occur during vibration, turbulent flow or back turning the lower gear shaft after eccentric plug is closed in the locked position.

The Plate Carrier with ball plunger Assembly (14) is transferred between the Lower and Upper Chambers (1, 9) by two gear shafts. One gear rack is located on each side of the Plate carrier Assembly (14). In each chamber, two gears are attached to a SST shaft, known as the Gear Shaft Assembly (15A, 15B). When rotated, the pinion gears of the Gear Shaft Assembly (15A, 15B) will engage with the gear racks on the Plate Carrier Assembly (14), which allows the carrier to move between the upper and lower chambers of the fitting during routine orifice plate inspections or orifice plate changes during normal operation.

4.0 ORIFICE PLATE REMOVAL INSTRUCTIONS

With the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting operating at line pressure with an Orifice Plate located in the flow stream, the following steps should be followed to safely remove the Plate Carrier Assembly (14).

- Step 1. Verify the Bleed valve is in the closed position by turning the valve stem clock wise until it stops.
- Step 2. Open the Equalizer Valve (36) by turning the valve stem counter clock wise one full turn. This action equalizes pressures between the Upper Chamber (9) and Lower Chamber (1). Allow approximately (10) ten seconds to equalize the two chambers.
- Step 3. Pull back the spring loaded indicating Lock Plunger (22). Next take the TMC_o, Inc. supplied crank handle and place it on the Eccentric Plug shaft and rotate the Eccentric Plug (10) to the open position. The Lock Plunger will travel freely down the orientation plate groove until the Eccentric Plug comes to its full open position.
- Step 4. Using the TMC_o, Inc. supplied crank handle (33), slowly rotate the Lower Gear Shaft Assembly (15B) until the Plate Carrier (14) has advanced upward from the Lower Chamber Body (1) and engages with the gears of the Upper Gear Shaft Assembly (15A). Rotate the Upper Gear Shaft Assembly (15A) until the Plate Carrier (14) has advanced fully into the Upper Chamber Body (9) and stops against the bottom of the Sealing Bar (18).
- Step 5. Once the Plate Carrier (14) is completely out of the Lower Chamber Body (1), close the Eccentric Plug (10) by placing the TMC_o, Inc. supplied crank handle on the Eccentric Plug shaft. Turn the shaft until the spring loaded lock plunger falls into the designated hole located on the safety lock orientation plate. The Eccentric Plug is now in the closed position. The isolation of the Upper Chamber Body (9) from the Lower Chamber Body (1) is now complete.
- Step 6. Close the Equalizer Valve (36) by turning the valve stem clock wise.
- Step 7. Open the Bleed Valve (35) by turning the valve stem counter clock wise.



DANGER

**SERIOUS PERSONAL INJURY OR
DEATH OCCURRENCE WARNING**

Opening the Bleed Valve (35) releases any line pressure stored in the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting directly to the atmosphere. Operator

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should review company standard procedures for releasing pressurized fluids to atmosphere. Failure to reference company standard procedures could cause personal injury or death.

Note: Upon complete depressurization of the Upper Chamber Body (9) via the Bleed Valve (36), the operator may remove the Plate Carrier Assembly (14) with the Orifice Plate from the Upper Chamber Body (9).



DANGER

**SERIOUS PERSONAL INJURY OR
DEATH OCCURRENCE WARNING**

Never place any part of your head or body over the top of the dual chamber fitting while mounted in a vertical position or in front of the top of the dual chamber fitting if mounted on its side when removing the orifice plate carrier.

Failure to follow instructions within this manual may result in serious injury or death.

Step 8. Using the Crank Handle (33), loosen the Clamping Bar Square Head Screws (21), but ***Do Not*** remove the clamping bar from the top chamber of the fitting.

Note: The Clamping Bar Square Head Screws (21) should not be removed from the Clamping Bar.

Step 9. Take the TMC_o, Inc. supplied crank handle and place it on the upper gear shaft. Rotate the gear shaft until the carrier bumps the sealing bar. This will help break the gasket seal from the upper chamber and also give the operator a final check to insure all the pressure has been properly removed from the upper chamber.

Step 10. After all pressure has been removed from the upper chamber, the clamping bar can be removed from the top of the fitting.

Step 11. Remove the Sealing Bar (18) and Sealing Bar Gasket (19) from the Upper Chamber Body (9).

Step 12. Place the TMC_o, Inc. supplied Crank Handle (33) on the top gear shaft and rotate the Upper Gear Shaft Assembly (15A) , raising the Plate Carrier Assembly (14) to the top of the fitting for removal and inspection.



DANGER

SERIOUS PERSONAL INJURY OR DEATH OCCURRENCE WARNING

Never place any part of your head or body over the top of the dual chamber fitting while mounted in a vertical position or in front of the top of the dual chamber fitting if mounted on its side when the Clamping Bar (20) is removed from the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting. Never place the Crank handle (33) or any other wrench on the Eccentric Plug and at the same time disengage the Safety Locking Arm (22) when the Clamping Bar (20) is removed from the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting.

Failure to follow instructions within this manual may result in serious injury or death.

4.1 ORIFICE PLATE REPLACEMENT

Step 1. Push in the upstream direction, from the downstream side of the orifice plate evenly to release the seal ring and orifice plate from the orifice plate carrier.

Note: Follow your internal company procedures for inspection of orifice plate

Step 2. Inspect the seal for cuts or damage and replace if necessary.

Step 3. Clean the orifice plate seating area on the plate carrier.

Step 4. Place the orifice plate with the downstream face into the plate carrier seating area.

Step 5. Insert the orifice plate seal ring into carrier with the flat side, facing the orifice plate. Press evenly on the seal ring until it snaps into the orifice plate carrier.

4.2 ORIFICE PLATE INSERTION



DANGER

SERIOUS PERSONAL INJURY OR DEATH OCCURRENCE WARNING

Never place any part of your head or body over the top of the dual chamber fitting while mounted in a vertical position or in front of the top of the dual chamber fitting if mounted on its side when removing the orifice plate carrier. Never place the Crank

handle (33) or any other wrench on the Eccentric Plug Valve and at the same time disengage the Safety Locking Arm (22) when the Clamping Bar (20) is removed from the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting.

Failure to follow instructions within this manual may result in serious injury or death.

Step 1. Insert the Plate Carrier (14) with orifice Plate and seal ring into the Upper Chamber (9). (Ball Plunger at top) With the seal ring side of the carrier facing upstream.

Step 2. Place the TMC_o, Inc. supplied crank handle on the upper gear shaft and back roll two turns. This will help the gear shaft align with the carrier rack as the carrier travels back down in the top of the fitting. Make sure the Plate Carrier (14) is level after the gear is engaged.



CAUTION

EQUIPMENT DAMAGE OR PERSONAL INJURY OCCURRENCE WARNING

Align the Plate Carrier (14) with the Upper Gear Shaft Assembly (15A). Failure to obtain correct alignment may damage the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting or cause the carrier to lodge in the upper chamber.

Step 3. Rotate the Upper Gear Shaft Assembly (15A) to lower the Plate Carrier (14) into the Upper Chamber (9) for the ball plunger to clear the top sealing surface of the Sealing Bar (18) opening in Upper Chamber (9).



CAUTION

EQUIPMENT DAMAGE OR PERSONAL INJURY OCCURRENCE WARNING

Do not lower the Plate Carrier Assembly (14) onto the Eccentric Plug (10) surface as this may damage and result in loss of sealing capability.

Step 4. Install a new Sealing Bar Gasket (19).

Step 5. Reposition the Sealing Bar (18) onto the Sealing Bar Gasket (19) in the top opening of the Upper Chamber (9).

Step 6. Slide the Clamping Bar (20) onto the top of the Sealing Bar (18).

Step 7. Tighten clamping bar screws to the recommended torque values of table 5.3.



DANGER

SERIOUS PERSONAL INJURY OR DEATH OCCURRENCE WARNING

The correct installation of the Clamping Bar (20) Sealing Bar (18), Sealing Bar Gasket (19), and Clamping Bar Square Head Screws (21) are essential to maintaining a pressure boundary between the process line pressure and atmospheric pressure. Failure to properly install the Gasket, Sealing Bar & Clamping Bar may result in serious injury or death.

- Step 8. Close the Bleed Valve (35) by turning the valve stem clock wise until it stops.
- Step 9. Open the Equalizer Valve (36) by turning the valve stem counter clock wise one full turn. This action equalizes pressures between the Upper Chamber (9) and Lower Chamber (1).
- Step 10. Check for audible and visible leakage by using a leak detection solution.
- Step 11. Pull back the spring loaded Indicating Lock Plunger (22). Next take the TMC_o, Inc. supplied crank handle and place it on the Eccentric Plug shaft and rotate the Eccentric Plug (10) to the open position. The Lock Plunger will travel freely down the orientation plate groove until the Eccentric Plug comes to its full open position.
- Step 12. Rotate the Upper Gear Shaft Assembly (15A) to lower the Plate Carrier (14) to engage the Lower Gear Shaft Assembly (15B). Shift the Crank Handle (33) to the Lower Gear Shaft Assembly (15B) and rotate the Plate Carrier (14) into the Lower Chamber (1). Make sure the Plate Carrier (14) seats firmly on the three pin alignment.
- Step 13. Place the supplied TMC_o, Inc. Crank Handle on the eccentric plug isolation gear shaft and rotate the Eccentric Plug (10) to the CLOSED position. The Lock Plunger will seat itself in the hole adjacent to the 'Close' indicator when full travel is reached.
- Step 14. Close the Equalizer Valve (36) by turning the valve stem clock wise until it stops.
- Step 15. Open the Bleed Valve (35) by turning the valve stem counter clock wise.



DANGER

SERIOUS PERSONAL INJURY OR DEATH OCCURRENCE WARNING

Opening the Bleed Valve (35) releases any line pressure stored in the TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting directly to the atmosphere. Operator should review company standard procedures for releasing pressurized fluids to atmosphere. Failure to reference company standard procedures could cause personal injury or death.

Step 16. Close the Block & Bleed Valve (35) by turning the valve stem clock wise until it stops.

5.0 ADDITIONAL INFORMATION

5.1 RECOMMENDED SPARE PARTS – ONE YEAR OPERATION

Quantity	Item No.	Description	Material
1	2	Lower Chamber Body/Top O-Ring	HNBR
1	12	Seat O-Ring	HNBR
2	17	Plate Seal Ring	SS/HNBR Bonded
5	19	Sealing Bar Gasket	Non Asbestos
2	34	Lock Arm Retaining Ring	SST
16	23B,25B,29B	Packing Ring	Virgin TFE
2	23E,24E	Upper Shaft Cover O-ring	HNBR
2	25E,29E	Lower Shaft Cover O-ring	HNBR

5.2 LUBRICANTS

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting requires no grease or other recommended lubricants for in-service operations. There are no grease fittings on the unit.

The TMC_o, Inc. Sure Shot[®] Dual Chamber Orifice Fitting does contain several static O-Rings. As a general rule, all static seals should be coated with a small amount of inert / process compatible grease before insertion to prevent damage during the seal installation processes. The user is responsible for the proper selection and use of any lubricants. TMC_o Inc. uses a silicone base lubricant on all static o-rings in the initial assembly of the Sure Shot[®] Dual Chamber Orifice Fitting. Manufacturers' instructions for the use of any lubricants must be strictly followed. The user must consider all possible ranges of operating and ambient temperatures, process fluid constituents including any chemical additives.

5.3 CLAMPING BAR SCREW TORQUE TABLE

Size	Press Class	No. Screws	Screw Size	Torque-Ft Lbs
2"	150-600	4	1/2-13 UNC	50
3"	150-600	4	1/2-13 UNC	65
4"	150-600	5	1/2-13 UNC	55
6"	150-600	6	1/2-13 UNC	65
8"	150-600	7	1/2-13 UNC	65
10"	150-600	9	1/2-13 UNC	70
12"	150-600	10	1/2-13 UNC	75

5.4 SURE SHOT® DUAL CHAMBER ORIFICE FITTING STUD TORQUE TABLE

Size	Press Class	No. Studs	Stud Size	Torque – Ft Lbs
2"	150-600	11	5/8-11 UNC	65
3"	150-600	14	5/8-11 UNC	80
4"	150-600	14	5/8-11 UNC	85
6"	150-600	18	5/8-11 UNC	85
8"	150-600	18	5/8-11 UNC	90
10"	150-600	18	3/4-16 UNF	110
12"	150-600	24	3/4-16 UNF	130



10801 Hammerly Blvd.
Suite # 232
Houston, Texas 77043

Direct Phone: (713) 465-3255
Direct Fax: (713) 465-3237
Email: sales@tmcousa.com
www.tmcousa.com