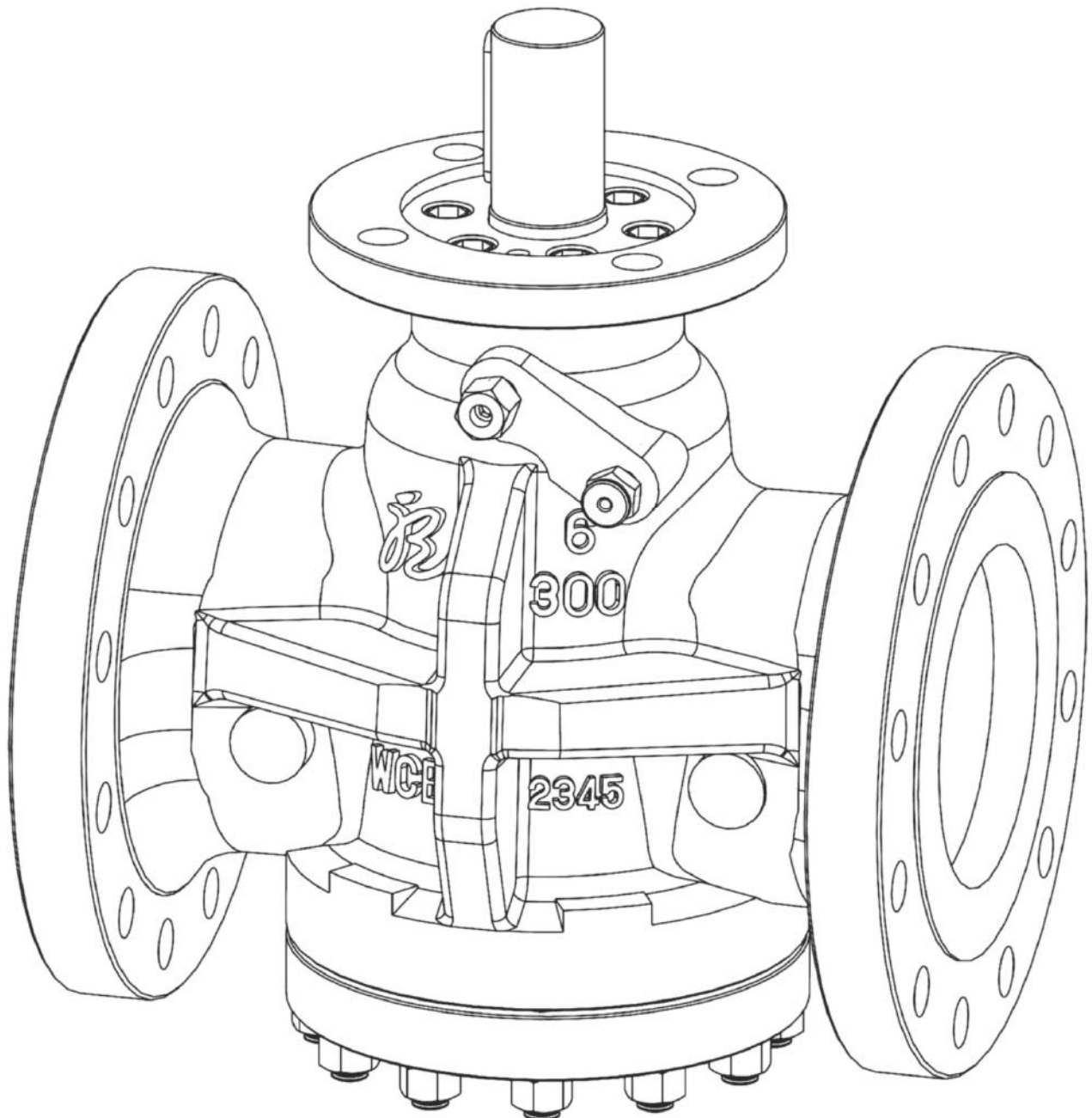
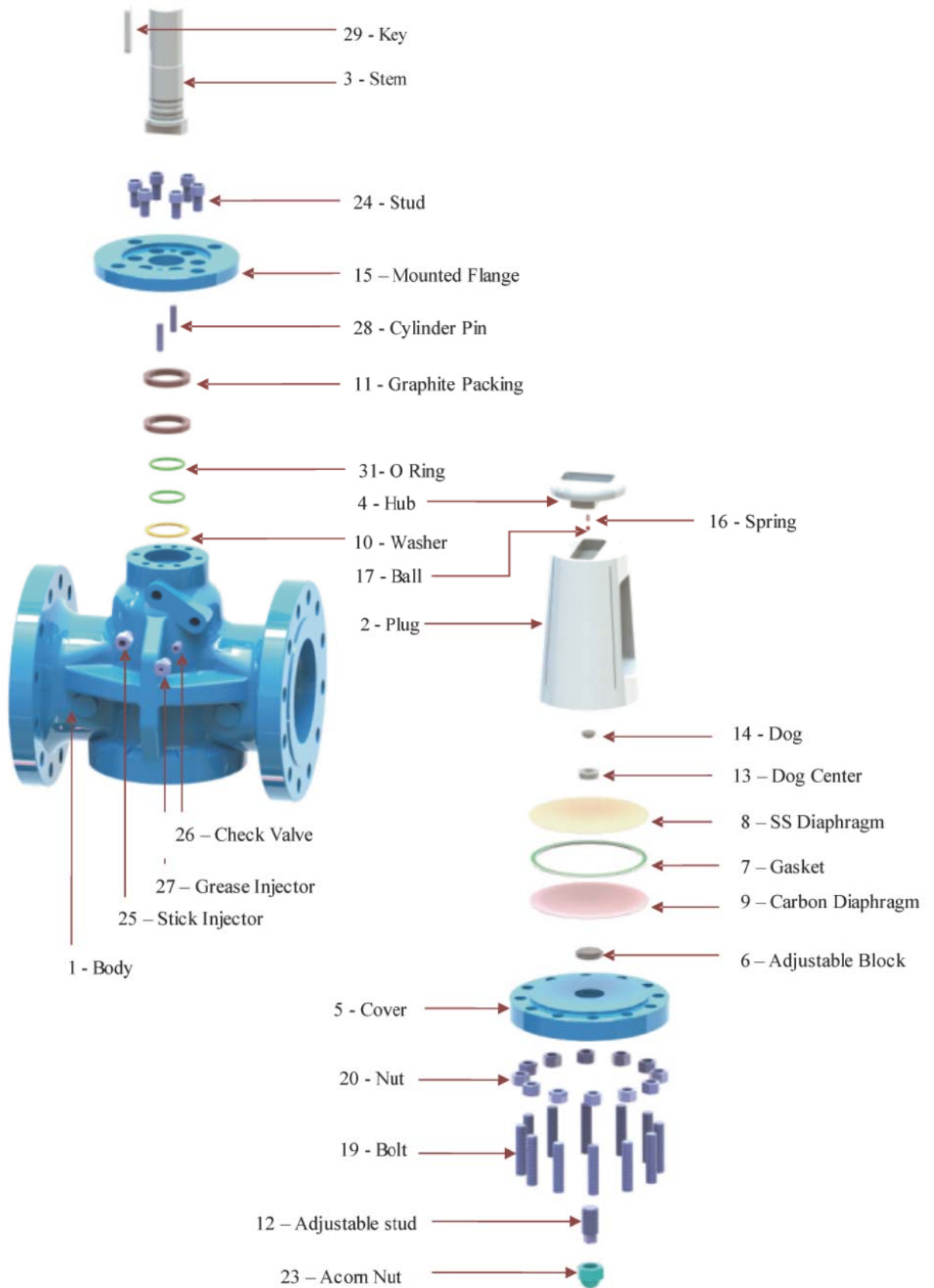


Installation, Operating & Maintenance Instructions

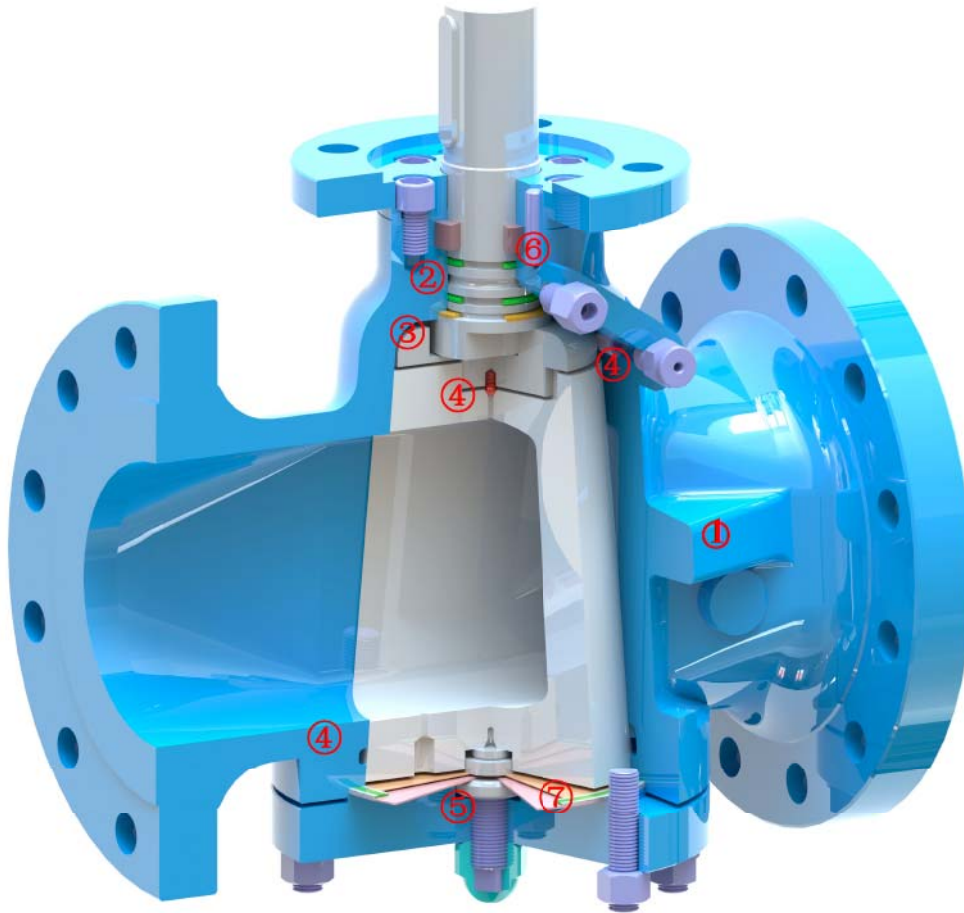
Pressure Balanced Lubricated Plug Valves



1. General Construction



2. Design Advantages



- 1) Not only does Spherical shape body reinforced with ribs ,which is design with FEA, give valves a heavy-wall body, constructed beyond its requirements as a pressure vessel for its maximum rated working pressure to withstand the higher-than-line sealant pressure and expected line stresses, but also reduced the whole valve weight.
- 2) Three passes stem sealing consisting of two O-rings and an emergency sealant sealing which was threaded into the slot on the stem with a sealant injection fitting.
- 3) A big chamber in the body to stock grease in order to lengthen using time for a grease-adding in its applications and the pressure of the plug sealant, acting on the upper face of the plug, is utilized to react against the upward force to reduce the possibility of taper locking.
- 4) A complete and scientific grease sealing system consisting of a check valve, an injection fitting, two connecting slots and two blind slots in the plug and two grease reservation slots in the body makes sure the trim surfaces cover the grease all the time, no leakage takes place during being used.
- 5) A flexible adjusting-plug devise consisting of a dog/dog center, steel washer, an adjustable stud and a corn nut protecting the stud from being rusty guarantees the valves sealed easier and more humanistic.
- 6) Graphite Packing for Stem fire safe;
- 7) SS304+Graphite and steel diaphragm for body/cover firesafe.

3. STORAGE AND PRESERVATION

All valves are dispatched in the open position and it is recommended that they are left in this position during storage. All protective packaging should remain in position until the valve is to be installed. Valves should, where possible, be stored in a clean, dry environment. In-Line Painting. VETZ/FLOWTECH plug valves are suitable for in-line painting. The following areas should be masked with rubberized masking materials or caulk, before shot blasting:

- Top of stem and gland area. - Body-Cover joint.
- Stem sealing compound injector. - Gear box fittings, input shaft, and stop adjusters.
- Sealant fitting. - Top works of bare stem valves that are to be fitted
- Exposed end connections. actuators or extensions.

It is also recommended that above areas be protected with a thick rust inhibitor or grease rather than be painted. This also ensures that no shot gets into the valve, that the wrench and hand wheel operators will fit easily, and the maintenance fittings are not damaged.

4. VALVE MARKINGS

4.1 Each valve has the following identification information plate fixed with two rivets to the middle flange of the valve body:

50mm Valves and Larger

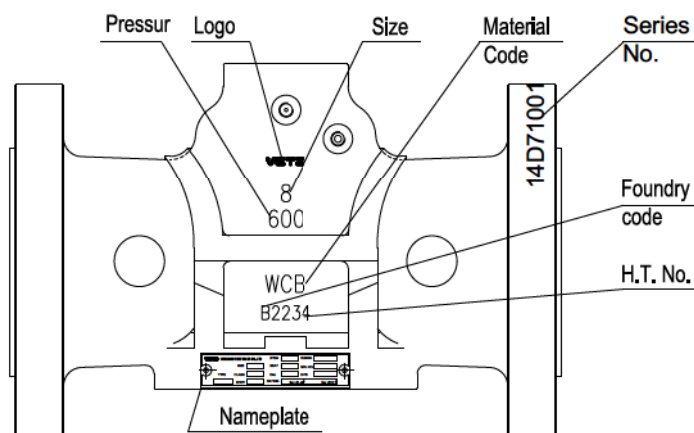
Additional Plate for 40mm Valve

4.2 Product that is not CE marked is classified as SEP (Sound Engineering Practice) and therefore may only be used within the limitations defined in tables 6, 7, 8, & 9 of Schedule 3 of the Pressure Equipment Regulations (Pressure Equipment Directive 97/23/EC).

4.3 Material traceability markings are hard marked on the valve body, cover, and when applicable, on the gland plate.

4.4 Marking and identification of VETZ/FLOWTECH steel valves conforms to ASME B16.34 and MSS-SP-25. It is important to properly identify valves in service to allow for the ordering of replacement parts or address questions or concerns relating to our products. Body markings and information shown on the identification plate helps to properly identify valves, allowing timely and accurate responses to such inquiries. Integrally cast body marking data includes the following information and helps to provide traceability:


- VETZ/FLOWTECH logo • Pressure class • Valve size • The grade of material (i.e. WCB for carbon steel)
- Heat number – on body and bonnet (cast or stamped)
- Series Number (Stamped on the edge of end flange)



The body markings are supplemented by a plate which, depending on valve type and size, is mounted in the most practicable position.

plates bear the following information:

• Series Number • Valve size • Valve Type • Body material • Disc material • Stem material • Seat and trim material • Pressure and temperature rating

VETZ FLOWTECH MACHINERY CO., LTD		STEM	<input type="text"/>	DESIGN	<input type="text"/>
	SIZE	<input type="text"/>	SEAT	<input type="text"/>	SER. NO.
	TYPE	<input type="text"/>	Disc	<input type="text"/>	DATE
<input type="text"/>	CLASS	<input type="text"/>	RATING	<input type="text"/>	
<input type="text"/>	BODY	<input type="text"/>	Bar @ -29? Bar @121?		

5. HEALTH AND SAFETY

When installing or maintaining valves:

- Conduct a risk assessment and eliminate or reduce hazards to an acceptable level.
 - Work in accordance with Safe Systems of Work.
 - Observe all site Health and Safety Rules in particular Permit to Work and Hot Work procedures.
 - Wear all necessary Personal Protective Equipment.
 - Never remove the valve, maintain a joint, or loosen or remove any fastening or fitting unless the line has been fully drained and de-pressurized.
 - Always operate the valve to the open position to ensure that no trapped pressure exists within the cavity.
 - Never handle valves that have been used on harmful substances unless they have been completely decontaminated and certified safe to handle.
 - Never use a valve on a duty which exceeds its prescribed operating parameters. Refer to VETZ/FLOWTECH company. Valves Technical Sales for further performance information.
 - Never modify or alter valves unless the manufacturer has been consulted or recommends such changes.
 - The valve wrenches are only designed for use in operating the valves and must not be used to carry them by. Failure to observe this warning may result in operator injury.
 - Due to the large physical size and weight of some sizes of this product, always use correct lifting methods and equipment when installing, removing and maintaining the product:
Valves of 6" (150mm) nominal size and above, use the two lifting lugs on the body;
Valves of 4" (100mm) nominal size and below, use chains or slings wrapped around the body.
Do not attempt to lift the valve using the sealant fittings, gear unit, handwheel, actuator, wrench, or the tapped hole in the end of the stem.
Always ensure that the valve and operator assembly are correctly supported in their final operating location.
 - Due to the variety of duties on which this product can be employed, it is the end users responsibility to ensure the compatibility of the media with the materials of construction of the product for each specific application (i.e. corrosion and erosion which may affect the integrity of the pressure containing envelope).
 - Before equipment is installed in areas which may be subject to seismic activity or extreme climatic conditions consult VETZ/FLOWTECH Valves Technical Sales.
 - End Flanges: The end flange design of this product has been verified by either:
ASME Boiler and Pressure Vessel Code Section VIII Division 1 calculation method;
Finite Element Analysis in accordance with ASME Boiler and Pressure Vessel Code Section VIII Division 2 - Alternative rules;
Experimental testing as defined in pr EN 12516-3, Valve Design Strength - Part 3 Experimental Method.
- Gaskets: The gaskets used in all methods are Spiral Wound to BS4865 for PN rated Flanges and ASME B16.20 for Class rated flanges. These have Gasket Factors and Design Stresses of 2.5 and 10000 psi respectively for Carbon Steel gaskets, and 3.0 and 10000 psi respectively for Stainless Steel gaskets, as defined in the ASME Boiler and Pressure Vessel Code Section VIII Division 1. If gaskets are used with higher Gasket Factors and Design Stresses than those stated above,

please consult VETZ/FLOWTECH company Valves Technical sales.

Bolting: End flanges for steel valves have been verified by the methods stated above, using bolt design stress values based on those for ASTM A193 B7, B7M, B8, B8M as defined in ASME Boiler and Pressure Vessel Code Section II - Materials - Part D - Properties.

o) Lethal Service. In accordance with the design verification code (ASME Boiler and Pressure Vessel Code Section VIII Division 1) a casting quality factor of 1.0 is allowable for all products except those intended for 'lethal service'. All products for such service must have had non-destructive examination carried out in accordance with Appendix 7 of the code. Refer to VETZ/FLOWTECH company Valves Technical sales.

p) If the processes or environments that the products are used in are likely to cause temperatures (high or low) that may cause injury to personnel if touched, then adequate insulation/protection must be fitted. It is recommended that the insulation allows easy access for maintenance, to the sealant and stem sealing compound fittings, and to the valve operator.

q) If the equipment is to be used on unstable gas duty, ensure that the operational parameters as indicated on the product identification plate cannot be exceeded.

r) This equipment should be protected by other devices to prevent over-pressurization. (i.e. caused by external fire, etc).

s) This equipment must be installed in a system that is designed to prevent excessive forces acting on the flanges, connections, etc.

6. PREPARATION FOR INSTALLATION

All protective packaging must be removed before installation.

If the valve has been in storage for over 6 months, it is recommended that additional sealant be injected prior to operation.

Any excess sealant found around the plug port should be removed by using a scraper.

Clean end connections to remove any unwanted paint or rust inhibitor

Significant problems can arise with any valve installed in an unclean pipeline.

Ensure that the pipeline has been flushed free of dirt, weld spatter, etc. before installation.

The working area should be clean and clear of any debris which could contaminate the valve.

The valve should be fully opened or fully closed during cleaning operations.

Water and inert gases such as carbon dioxide and nitrogen are unlikely to affect the sealant.

If solvents or steam cleaning are used, it is recommended that the valves are reinjected with sealant after completion of the cleaning operation.

7. INSTALLATION INSTRUCTIONS

a) VETZ/FLOWTECH plug valves are bi-directional, and can be installed vertical (stem operating end at the top), horizontal or any angle in between. If the valve is installed in any other position, the operating torque will increase considerably, possibly resulting in seizure. The actuator may need supporting if it is not vertically above the valve. Ensure access to the sealant fitting, stem sealing compound injector, plug loading screw, and any drain plugs. Ensure that the relief valve in the gear unit position indicator cannot discharge where it could cause personal injury.

b) Installation of flanged valves should follow prevailing site standards. Where such standards do not exist the following should be used as a guideline.

c) Flanged joints require compressive loading onto the gasket material as the normal line pressure forces tend to separate the joint. There should be no misalignment between the valve and mating faces.

d) Pipework should have the correct gap to allow for the valve face to face length plus assembled gasket material width.

e) Ensure the pipeline and flange faces are clean and free of any debris which may be detrimental to flange sealing.

- f) Bolting should be of the correct size, length, and material for the duty.
- g) Locate the valve between the pipe ends and slide in the gaskets. It may be necessary to lever the mating flanges gently apart to allow for easy fitting of the gasket. Care should be taken to prevent damage to the sealing surfaces. Correct lifting equipment must be used when handling valves for operator safety - see **Section 5** paragraph k).
- h) Assemble all bolts and loosely tighten. Diametrically and evenly tighten the bolts to the correct torque required for the specific gasket material, per the gasket manufacturers recommendations.
- i) Screwed Ends - Pipe wrenches can be used to grip the valve body adjacent to the connection, while tightening it. Use of a thread sealant is recommended to ensure a pressure tight joint.
- j) Weld Ends - All welding should be performed by qualified welders using approved procedures. If good industry accepted practices are used (such as ASME IX), the heat from the welding will not affect the stem packing, or cause the sealant to decompose. Any post weld heat treatment (PWHT) must be restricted to the heat affected zone.
- k) Hub Ends - To be installed according to the hub end designers installation instructions.
- l) It is recommended that the valves are left in the open position during fitting.

7.1 COMMISSIONING TESTS

All valves are factory tested in accordance with valve industry standards API 6D, API 6A, API 598, or BS.6755 Part 1, unless specified otherwise. If there is an operational need to test the valve at higher pressure, temperature or duration, consult VETZ/FLOWTECH company Valves Technical Sales. If water is used for testing, it is beneficial to dry out the valve internals by flushing the system with dry nitrogen or air, after the testing is completed.

8. OPERATION AND LOCKING DEVICES.

8.1 USE

VETZ/FLOWTECH plug valves are designed to give bubble tight shut off . It is not good practice to leave a plug valve in the partially open (throttled) position as this may cause damage and seat life may be reduced.

VETZ/FLOWTECH plug valves have a ¼ turn operation, (i.e. they have a 90 degree rotation of the plug in operating from the fully open to the fully closed),and close in the clockwise direction when viewed from above the valve stem.

It is possible to see when the valve is open or closed by the position of double-square for wrenched operation or the key for gear box operation in the top of the stem, these two parts being in-line with the plug port.

Do not force valves that will not readily operate.

Never stand downstream of a valve that is being opened to atmosphere.

Valves that are installed where unauthorized personnel can interfere with them should normally have the wrench or handwheel removed, be locked with suitable locking devices, or be chained through the handwheel to prevent operation.

8.2 WRENCH OPERATION

Wrench operated valves have an arrow shaped position indicator on the stopper. The arrow

points in the direction of being opened or closed. The valve locates at the fully open or close when the stopper is stopped to the boss extended from the upper cover along with the arrow to open or close (on or off). Similarly, if the wrench is removed the flats of the stem will also indicate the valve position. The indicator should not be removed as it also functions as the open and close stop by coming into contact with the stop boss extended from the upper cover. To adjust the wrench tube position within the wrench head, remove the retaining screw, reposition the wrench tube, and then refit the retaining screw, and secure the wrench assembly to the stem by screwing the retaining screw into the hole in the top of the stem. When operating the valve the use of excessive side loading on the wrench should be avoided. VETZ/FLOWTECH company wrenches are sized so that the force to operate the valve should be 360 N maximum at the end of the wrench of which length is no longer than twice face to face or end to end dimension unless otherwise agreed.

8.3 GEARBOX OPERATION

All worm gear boxes supplied by VETZ/FLOWTECH company have visible arrow type position indicators on top of the gear housing. 'OPEN' and 'SHUT' positions are cast on top of the gear housing.

The position indicator arrow points to these at the fully opened and closed positions. Secure the gearbox handwheel to the gearbox input shaft by the pin, or by the key and the retaining screw. Ensure that the close direction indicator is visible on the end of the input shaft, and that the retaining screw is tightened down. It is also recommended that the gear unit stops be checked to ensure correct plug port alignment.

8.4 REMOTE OPERATION

Where automation of valves is required, VETZ/FLOWTECH company can supply pneumatic, electric, hydraulic, or gas/hydraulic actuators to cover a wide range of operating torques. Operation will be in accordance with installation, operation and maintenance instructions for the relevant actuator.

Before pressurizing the valve, ensure that all power sources are connected to the actuator, and that all of the actuator functions and accessories are working correctly.

8.5 LOCKING DEVICES

VETZ/FLOWTECH plug valves are arranged with locking devices for securing in the open/close position. For wrench operated valves, a hole is arranged in the stopper and two holes in the upper cover which matches the one in the stopper at the open/close position in order to avoid being tampered, for gearbox operated valves, a locking plate where many holes are made in is fixed onto the gear box handwheel and a locking nose where a hole made in is fixed onto the gear box house which matches the locking plate's hole at the open/close position to carry out the locking function.

9. INJECTION OF VALVE SEALANT

9.1 To maintain the bubble tight shut-off capabilities and to ensure smooth operation of the valve.

9.1.1 FREQUENCY OF SEALANT INJECTION

Service Conditions	Frequency of Sealant Injections
A Infrequent operation, valve either fully opened or fully closed. Non abrasive gases or liquids.	Every 50 operations, minimum once per year.
B Infrequent operation, valve either fully opened or fully closed. Abrasive gases or liquids.	Every 25 operations, minimum of 2 times a year.
C Throttling services and abrasive slurries.	Every 10 operations, minimum of 4 times a year.

9.1.2 SEALANT INJECTION EQUIPMENT




VETZ/FLOWTECH valves have 'Giant Buttonhead' sealant fittings, unless the customer specifies special fittings such as sub-sea. To inject sealant, a high pressure sealant gun with a 'Giant Buttonhead' coupler is required. The gun should also have a pressure gauge reading to at least 10,000 psi.

9.1.3 VALVE SEALANTS AND LUBRICANTS

Only sealants recommended for TAPER plug valves should be used. VETZ/FLOWTECH supplies sealants for most services and there are other manufacturers who also make good sealants. If you already have a particular valve sealant in use at a facility, we will advise on the suitability for use in VETZ/FLOWTECH valves.

Type	Ingredient	service Conditions	Equal Specification
7903 oil-proof sealing grease	Inorganic chemical stiffened oil with anti-oxygenizing and corrosion proof agents, light yellow gluey material	Fuel, lubricant, water and gas @-10°~150°	Aviation S7108T; NOSOL UTA
7605		Fuel, lubricant, water and gas @-10°~150°	
7602 high temp. grease stick	Inorganic chemical stiffened oil with solid reinforcements, white or light yellow stick	Vapor, Acid, NH4 etc. Used at 10.29MPa or 530°	G22/G42; CROSBY C6; Climax750; Masonlilan5
7603 stem grease stick	Poly chemical stiffened oil with solid reinforcements, black elastic stick	Oil, Water and Gas @400° or above	

Photos for Sealant Greases

7903	7605	7602
		

We strongly recommend against the following types of sealant:

Sealant supplied by cylindrical/parallel plug valve manufacturers. These are of much higher viscosity than taper plug valves require and will substantially increase the valve torque. _
Commercially available lubricating grease such as bearing grease. These greases do not have the chemical resistance, lubricating and sealing properties required by taper plug valves. Sealants with a high level of bentonite clay filler. With this type of sealant the base oil evaporates (particularly on dry gas services) leaving behind a hard layer of clay filler which can make the valve hard to operate and even seize up.

9.1.4 INJECTING SEALANT

Use the following instructions in conjunction with the sealant gun manufacturers instructions. Sealant can be injected with the valve in-line and on pressure.

9.1.4.1 POSITION

If possible the valve should be fully opened or fully closed, to ensure that all four plug sealant grooves are connected to the sealant supply. If the valve is partially open, injection is less effective as only two of the grooves are connected to the supply.

9.1.4.2 SEALANT FITTING

Clean the 'Giant Buttonhead' fitting on the valve. In particular scrape off any paint build-up away from the small hole in the end of the fitting.

9.1.4.3 FILL THE GUN

Ensure the gun is filled and primed with the taper plug valve sealant. Follow the gun manufacturers instructions to fill the gun.

9.1.4.4 ATTACH THE GUN

Slide the 'Giant Buttonhead' coupler on the end of the gun hose, over the valve's 'Giant Buttonhead' fitting, ensuring that the lip of the coupler fits into the groove in the fitting. If the gun has an isolating valve on the coupler or elsewhere, open this valve.

9.1.4.5 START PUMPING

Inject sealant either by pumping the handle on a manual gun, or connecting the air supply to the pneumatic gun. Monitor the pressure gauge during the sealant injection process. For sealant to flow onto the valve seats, enough sealant at sufficient pressure has first to be injected to overcome the line pressure, to fill any cavities in the sealant chamber and grooves, and to overcome the flow resistance through the valve sealant system. Sealant is flowing onto the seats when the pressure gauge on the gun is significantly higher than the line pressure and falls slowly. On low pressure VETZ/FLOWTECH valves off pressure, a minimum of 2000 psi sealant pressure is needed to ensure proper injection of sealant onto the seats. With a valve that is regularly injected with sealant, the sealant pressure will quickly build up. A valve that has not been well maintained could require a significant amount of sealant to be injected before pressure builds up and sealant flows onto the seats. See **section 10** - 'Trouble Shooting Guide' for potential injection problems.

9.1.4.6 DISCONNECT

After injection of sufficient sealant, relieve the internal pressure in the gun, and disconnect it from the 'Giant Buttonhead' fitting. CAUTION: The sealant gun should not be connected or disconnected while it still has internal pressure.

9.1.4.7 OPERATE THE VALVE

It is desirable but not essential, to operate the valve either partially or fully after injecting sealant, to help spread the sealant over the entire seating surfaces.

9.4 ROTATING PLUG THROUGH 180 DEGREES

Most VETZ/FLOWTECH plug valves are used where the flow is always in one direction. As VETZ/FLOWTECH are primarily downstream seating, the downstream seat takes the brunt of the wear and tear from normal usage. Typically the downstream face of the plug erodes first and causes leakage. There can be instances where the downstream plug seat is eroded while the upstream plug seat is still in good condition - by rotating the plug through 180 degrees, the good condition plug seat becomes the downstream seat and leakage will be stopped or substantially reduced, so extending the valve life.

CAUTION: Do not undertake this procedure with product flowing through the valve.

9.4.1 ROTATING THE PLUG ON WRENCH OPERATED VETZ/FLOWTECH VALVES

The 'Q' shaped position indicator plate attached to the stem, stops the valve from being rotated more than 90 degrees. To rotate through 180 degrees, slide the snap-ring and position indicator plate off the valve stem and rotate the plug one half turn using the correct VETZ/FLOWTECH wrench. Refit the position indicator plate and snap-ring. Retest the valve seats as appropriate.

9.4.2 ROTATING THE PLUG ON GEAR OPERATED VETZ/FLOWTECH VALVES.

This is a complicated procedure and should not be undertaken lightly. First fully open the valve using the gear. Then unbolt and remove the gear from the valve, noting how it was positioned. Operate the gear back through 90 degrees and then fit it back on the valve with the stem and gear key-ways aligned. Operate the valve 90 degrees using the gear and then remove the gear as before and operate it back through 90 degrees. Refit the gear, aligning the key-ways, and bolt on the gear. The plug and gear have now been rotated through 180 degrees. Retest the valve seats as appropriate.

10. TROUBLE SHOOTING GUIDE FOR VETZ/FLOWTECH PLUG VALVES

PROBABLE CAUSES LISTED IN DESCENDING LIKELIHOOD ORDER.

Item	Trouble	Probable cause	Remedy (see section)
10.1	Hard to Operate	A. Lack of sealant B. Low temperature C. Dried out sealant D. Damaged gear operator E. Plug overloaded into seat	A. Inject sealant (9.1) B. Inject low-temperature sealant and/or insulate the valve C. Flush the valve with valve flush. Follow manufacturers instructions. Consult Flowtech for recommended sealant. D. Consult Flowtech E. Reset plug (9.3.2.3)
10.2	Will not fully open or close	A. Improper setting of gear operator stops B. Debris in the line	A. Reset stops for proper operation B. Clean the line

CONTINUOUS

Item	Trouble	Probable cause	Remedy (see section)
10.3	Leaks across seats	A. Lack of sealant B. Incorrect sealant C. Plug set incorrectly D. Damaged seats	A. Inject sealant (9.1) B. Consult Flowtech with service details C. Adjust plug loading screw (9.3.2.2) D. Rotate plug through 180 degrees (9.4) or consult Flowtech
10.4	Leaks at stem	A. Lack of stem sealing compound	A. Inject stem sealing compound (9.2)
10.5	Leaks at stem Gear unit	A. Lack of stem sealing compound	A. Inject stem sealing compound (9.2)
10.6	Leaks at cover	A. Cover bolting loose - If this does not reseal cover then suspect : B. Damaged cover seal	A. Tighten cover bolts B. Remove from service, and consult Flowtech
10.7	Leaks through sealant fitting *	A. Ball check not seated B. Loose sealant check valve C. Damaged check valve	A. Inject sealant to clean and reseal check valve B. Remove from pressure and tighten check valve C. Remove from pressure and replace check valve
10.8	Leaks through valve body	A. Casting defect, internal corrosion or erosion	A. Remove from line and consult Flowtech

NOTE *: Injecting sealant into a valve that is leaking through the sealant fitting is normally a temporary fix, not a cure.

10.9 Actuated Valves

Resolving operation problems on pressure balance plug valves fitted with pneumatic, electric, hydraulic or gas/hydraulic actuators should be undertaken using the above recommendations in conjunction with the operator manufacturer instructions.

11. OVERHAUL AND REPAIR

If by following the maintenance instructions in Section 9 and the Trouble Shooting Guide, Section 10, you are unable to get the pressure balance plug valve to operate and seal correctly, then please contact FLOWTECH company.