January 2015 - Rev. 00

VFA Series Butterfly Valves

SUMMARY

Figure 1. *Type VFA-MR Butterfly Valve*

INTRODUCTION

Scope of Manual

This manual provides instructions for installation, shutdown, maintenance and spare parts ordering for the VFA series butterfly valves.

Product Description

The butterfly valves series VFA are "wafer" flangeless type and are used typically in gas reducing stations for a on-off service.

This series of butterfly valves is designed basically for transmission/distribution grids of the natural gas and for industrial/commercial applications.

This product has been designed to be used with fuel gases of 1st and 2nd family according to EN 437, and with other non aggressive and non fuel gases. For any other gases, other than natural gas, please contact your local sales agent.

The following versions are available:

VFA : Lever operated

VFA-MR : Gear operated

VFA-MRO : Gear operated for use with absorbing odorizing systems

P.E.D. CATEGORIES AND FLUID GROUP

This product is Pressure Equipment classified in the following categories in according to Directive 97/23/EC PED.

Table 1. *P.E.D. Categories And Fluid Group*

Type	CATEGORY	FLUID GROUP
DN 50 PN 16 - ANSI 150	I	1
DN 65 ÷ 150 PN 16 - ANSI 150	II	
DN 200 PN 16	II	
DN 250 PN 16	III	
DN 200 ÷ 250 ANSI 150	III	

TARTARINI™

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Process Management

CHARACTERISTICS

Body Sizes and End Connection Styles

VFA • VFA-MR • VFA-MRO

DN 50 - 65 - 80 - 100 - 125 - 150 - 200 - 250

PN 16 - ANSI 150 flanged

WARNING

The pressure/temperature limits indicated in this instruction manual or any applicable standard or code limitation should not be exceeded.

Maximum Operating Inlet Pressure

PN 16: 16 bar

ANSI 150: 19 bar

At average ambient temperature.

Minimum/Maximum Allowable Temperature (TS)

See label

Temperature

Standard Version: Working -10° to 60°C

Low Temperature Version: Working -20° to 60°C

Materials

Body: Steel

Disk: Pressed steel

Shaft: Stainless steel

Gaskets: Nitrile NBR rubber (FKM on request)

LABELLING

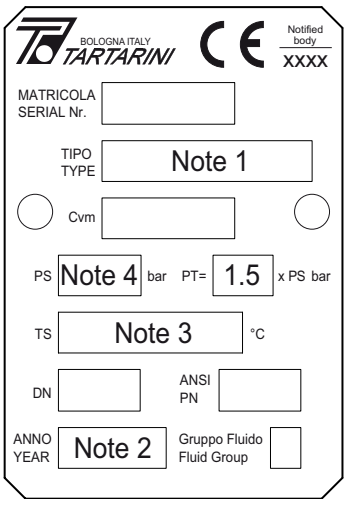

Figure 2. *Label for VFA Series*

Note 1: See “Characteristics”

Note 2: Year of manufacture

Note 3: Temperature class
-10°/60°C or -20°/60°C

Note 4: PN 16 PS: 16 bar
ANSI 150 PS: 19.3 bar

The Category I pressure equipments will not have on label any Notified Body reference.

OVERPRESSURE PROTECTION

The recommended safety pressure limitations are stamped on the valve nameplate (PS). Some type of overpressure protection is needed if the actual inlet pressure exceeds this limits.

Personal injury, equipment damage, or leakage due to escaping fluid or bursting of pressure-containing parts may result if this relief valve is over-pressured or is installed where service conditions could exceed the design operative limits.

Valves operation below the maximum pressure limitations does not preclude the possibility of damage from external sources or debris in the line.

The valves should be inspected for damage after any overpressure condition..

TRANSPORT AND HANDLING

Established transport and handling procedures shall be followed to avoid any damage on the pressure containing parts (valve body) by shocks or anomalous stresses.

In case of necessity of a harness, a nylon harness will have to be used in order to protect the surface and possible valve accessories.

ATEX REQUIREMENTS

WARNING

If the provisions of EN 12186 & EN 12279, national regulations, if any, and specific manufacturer recommendations are not put into practice before installation and if purge by inert gas is not carried out before equipment’s start-up and shut-down operations, a potential external and internal explosive atmosphere can be present in equipment & gas pressure regulating/measuring stations/ installations.

If a presence of foreign material in the pipelines is foreseen and purge by inert gas is not carried out, the following procedure is recommended to avoid any possible external ignition source inside the equipment due to mechanical generated sparks :

- drainage to safe area via drain lines of foreign materials, if any, by inflow of fuel gas with low velocity in the pipe-work (5m/sec)

In any case,

- provisions of Directive 1999/92/EC and 89/655/EC shall be enforced by gas pressure regulating/measuring station/ installation's end user
- with a view to preventing and providing protection against explosions, technical and/or organizational measures appropriate to the nature of the operation shall be taken (e.g. : filling/exhausting of fuel gas of internal volume of the isolated part/entire installation with vent lines to safe area - 7.5.2 of EN 12186 & 7.4 of EN 12279 ; monitoring of settings with further exhaust of fuel gas to safe area ; connection of isolated part/entire installation to downstream pipeline; ….)
- provision in 9.3 of EN 12186 & 12279 shall be enforced by pressure regulating/measuring station/installation's end user
- external tightness test shall be carried out after each reassembly at installation site using testing pressure in accordance with national rules
- periodical check/maintenance for surveillance shall be carried out complying with national regulations, if any, and specific manufacturer recommendations.

DIMENSIONS AND WEIGHTS

VFA SERIES **VFA-MR AND VFA-MRO SERIES**

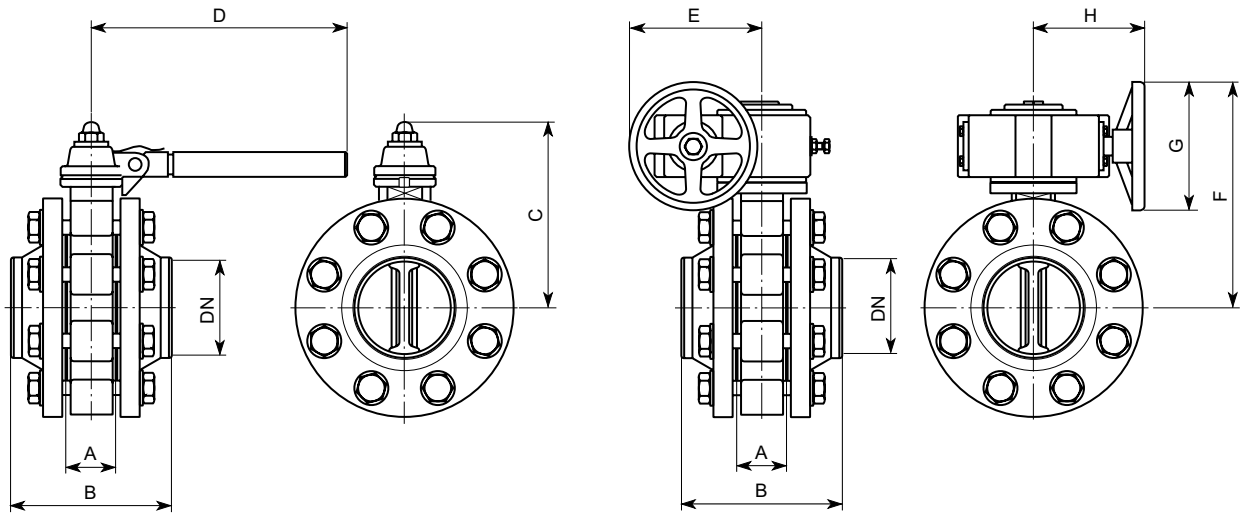

Figure 3. *VFA Series Dimensions*

Table 2. *VFA Series Dimensions (mm) and Weights (kg)*

DN	A	B		C	D	E	F	G	H	WEIGHT	
		PN 16	ANSI 150							VFA	VFA-MR VFA-MRO
50	43	136	173	147	470	160	190	125	120	11.5	14
65	46	139	189	157			200			14	16
80	46	149	189	163			205			18	20
100	52	159	208	174			215			21	23
125	56	169	237	209	490	300	335	300	168	28.5	35
150				227			345			36	42
200	60	187	267	252			375			51	57
250	68	214	278	239	530		430			97	103

INSTALLATION

WARNING

Only qualified personnel should install or service a butterfly valve.

Butterfly valves should be installed, operated, and maintained in accordance with international and applicable codes and regulations, and Emerson instructions.

Clean out all pipelines before installation of the regulator and check to be sure the regulator has not been damaged or has collected foreign material during shipping.

Possible fails that cause the shutdown of the valve can create hazard conditions.

Personal injury, equipment damage, or leakage due to escaping fluid or bursting of pressure-containing parts may result if this valve is over pressured or is installed where service conditions could exceed the limits given in the Specifications section, or where conditions exceed any ratings of the adjacent piping or piping connections.

Additionally, physical damage to the valve could result in personal injury and property damage due to escaping fluid. To avoid such injury and damage, install the regulator in a safe location..

To avoid this, install the butterfly valve:

- In a safe area where the is protected from exposure to physical damage and/or corrosive substances
- service conditions are within valve capabilities

Don't exceed any ratings of the adjacent flanges or piping connections.

Install the valve in any position desired, unless otherwise specified, but be sure flow through the body is in the direction indicated by the arrow on the body.

If using a VFA series butterfly valve on hazardous or flammable gas service, personal injury and property damage could occur due to fire or explosion of vented gas that may have accumulated.

To prevent such injury or damage, provide piping or tubing to vent the gas to a safe, well-ventilated area in accordance also with international and applicable codes and regulations. In particular, when venting a hazardous gas, the piping or tubing should be located far enough away from any buildings or windows so to not create a further hazard, and the vent opening should be protected against anything that could clog it.

For outdoor installations, the butterfly valve should be located away from vehicular traffic.

In order to avoid damaging of the valve disc, special care has to be done in carrying out accurate measurements to assess that it can rotate in the flange of connection and in the pipe without difficulties.

Furthermore, center correctly the valve on the connection flanges.

A suggested bolt tightening sequence is to process "three o'clock, nine o'clock, twelve o'clock, six o'clock, etc.". Not apply never the pressure to only partially installed valve.

Further the ENs 12186 & 12279, where this product is used :

- provide the cathodic protection and electrical isolation to avoid any corrosion

SHUTDOWN

WARNING

To avoid personal injury resulting from sudden release of pressure, isolate the valve from all pressure before attempting disassembly and release trapped pressure from the equipment and pressure line.

In case of disassembly of main pressure retaining parts for checks and maintenance procedures, external and internal tightness tests have to be done according to applicable codes.

MAINTENANCE (See Figure 4 and 5)

WARNING

All maintenance procedures must be carried out only by qualified personnel.

If necessary, contact our technical support representatives or our authorized dealers.

Butterfly valve and its pressure accessories are subject to normal wear and must be inspected periodically and replaced as necessary.

The frequency of inspection/checks and replacement depends upon the severity of service conditions and upon applicable codes and national standards/rules .

In accordance with applicable National or Industry codes, standards and regulations/recommendations, all hazards covered by specific tests after final assembling before applying the CE marking, shall be covered also after every subsequent reassembly at installation site, in order to ensure that the equipment will be safe throughout its intended life.

Before proceeding with any maintenance work, shutoff the gas upstream and downstream from the regulator, also ensure that there is no gas under pressure inside the body by loosening the upstream and downstream connections.

Upon completion, check for leaks using suds.

General Maintenance

a. Turn valve to “close” position and remove “open” control. Servicing mode will depend on the type of valve control.

b. Remove screws (key 23 for sizes DN 50 to DN 200 and key 27 for DN 250), slide off valve body from pipe and replace O-ring (key 7). Note: It may sometimes be necessary to widen counterflanges so as to remove valve.

c. Remove screws (key 12), hub (key 1) and upper bushing (key 9), and replace O-ring (key 13 and 14).

d. On sizes DN 50 to DN 200: Remove dowels (key 6).

   On size DN 250: Remove bush (key 22), pin (key 6) and replace O-ring (key 20 and 21) if worn.

e. Remove shaft (key 4).

f. Remove disk (key 8).

g. Remove screws (key 11) and plate (key 5).

h. Replace gasket unit (key 3) and O-ring (key 6) if worn.

i. On sizes DN 125 to DN 200: remove screws (key 17), plug (key 19) and replace O-ring (key 18 and 24).

   On size DN 250: remove screws (key 19), plug (key 17) and replace O-ring (key 18, 23 and 7).

Reassembly

Lubricates all seals with “MOLYKOTE 55 M” molybdenum grease.

Use the greatest care to avoid damage to seals.

Reassemble by reversing the above steps.

Tighten all screws uniformly to ensure proper sealing.

SPARE PARTS

Spare parts storage shall be done by proper procedures according to national standard/rules to avoid over aging or any damage.

PARTS LISTS

VFA Series DN 50 to DN 200 (See Figure 4)

Key	Description
1	Hub
2	Body
3*	Gasket unit
4	Shaft
5	Plate
6	Dowel
7*	O-ring
8	Disk
9	Upper bushing
10	Lower bushing
11	Screw
12	Screw
13*	O-ring
14*	O-ring
15	Label
16	Rivet
17	Screw
18*	O-ring
19	Plug
20*	Gasket
21	Flange
22	Washer
23	Screw

VFA Series DN 250 (See Figure 5)

Key	Description
1	Hub
2	Body
3*	Gasket unit
4	Shaft
5	Plate
6	Pin
7*	O-ring
8	Disk
9	Upper bushing
10	Lower bushing
11	Screw
12	Screw
13*	O-ring
14*	O-ring
15	Label
16	Rivet
17	Plug
18*	O-ring
19	Screw
20*	O-ring
21*	O-ring
22	Bush
24*	Gasket
25	Flange
26	Washer
27	Screw

Rubber parts marked with (*) are supplied in the “spare parts kit”, recommended as stock.

To order the kit it is necessary to communicate to us the type of the valve and its serial number.

SCHEMATIC ASSEMBLIES

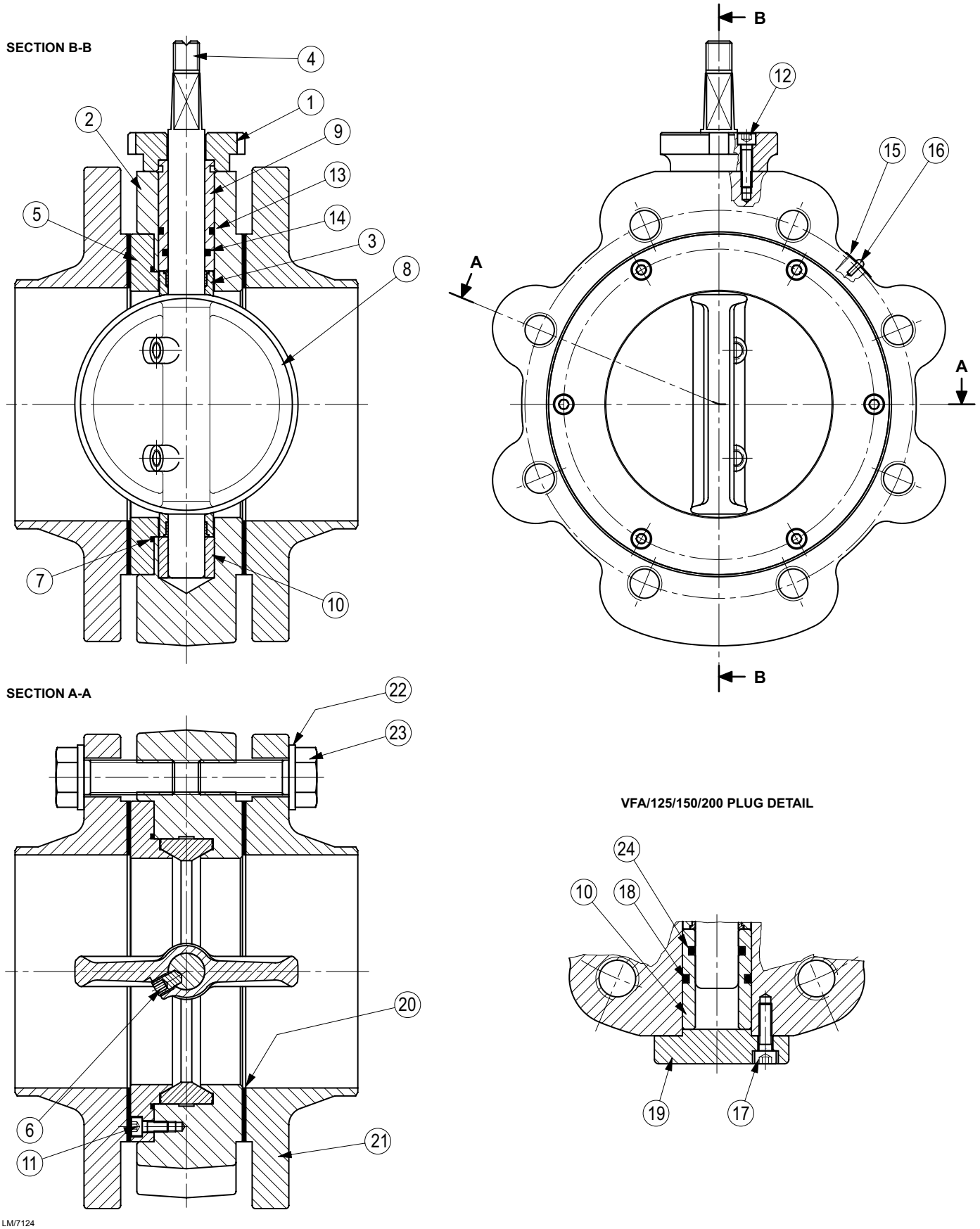

Figure 4. *VFA Butterfly Valve DN 50 to DN 200*

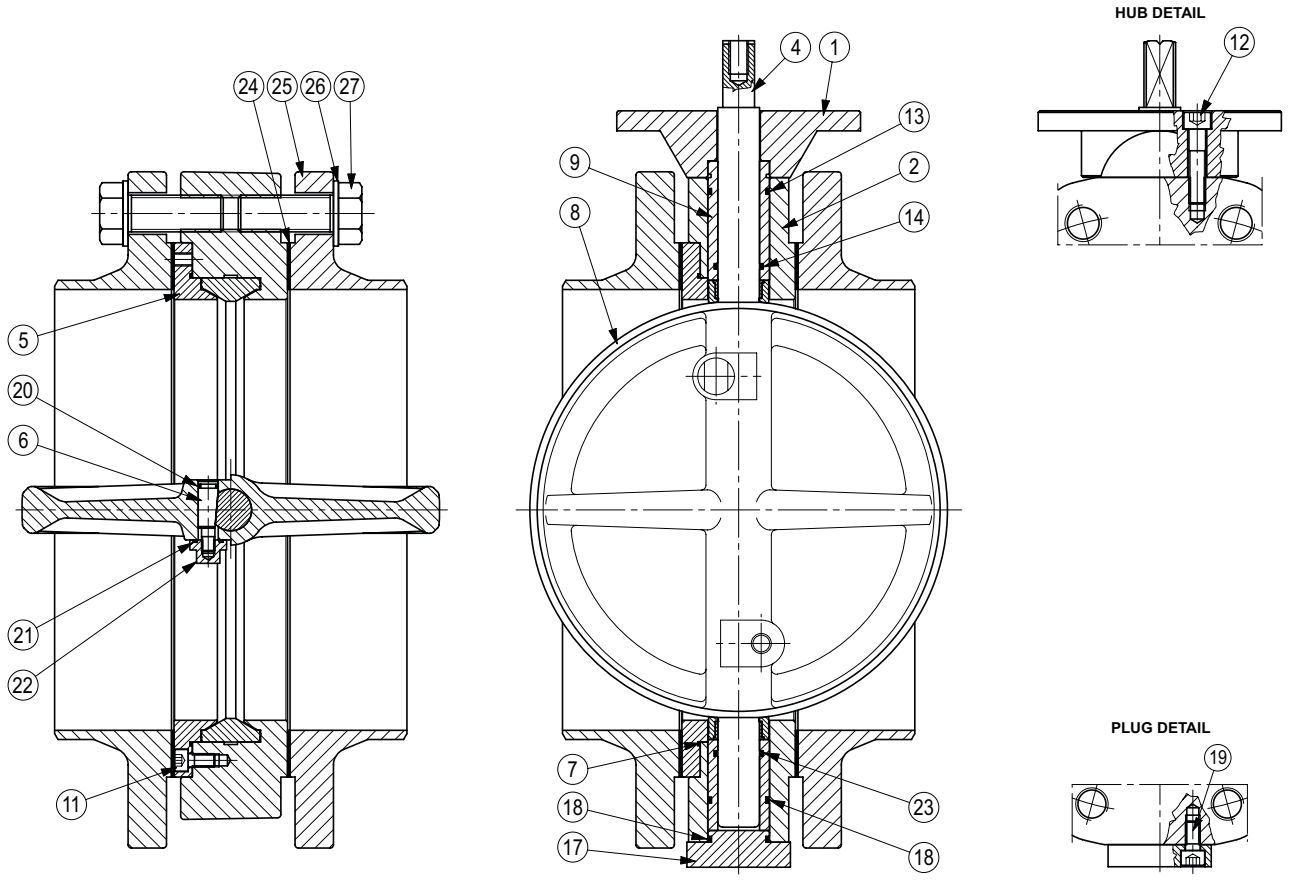

Figure 5. *VFA Butterfly Valve DN 250*

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