



**PENTAIR
HYGIENIC PROCESS VALVES
(FORMERLY KEYSTONE)**

F250/F251

HYGIENIC BUTTERFLY VALVES

INSTALLATION & MAINTENANCE INSTRUCTIONS, TECHNICAL SPECIFICATION

PENTAIR F250/F251

HYGIENIC BUTTERFLY VALVES

INSTALLATION & MAINTENANCE INSTRUCTIONS

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2 INTRODUCTION

2.1 Value use

The PENTAIR F250 and F251 hygienic butterfly valves are universal valves for manual or automated isolation and control.

2.2 Application area

The butterfly valve has been designed for use in the food & beverage, pharmaceutical and light chemical industries.

2.3 Incorrect use

The butterfly valve is not suitable for use in gas systems.

Liquids with hard solid parts cause increased wear to the seat.

3 SAFETY

Prevent that, during maintenance, liquids can pressurize the pipe work in which the valve has been installed.

Prevent that fingers get jammed between disc and seat during operation of a disconnected valve.

During cleaning at elevated temperatures, the butterfly valve can be so hot that touching the surface causes burning.

4 TRANSPORT AND STORAGE

The butterfly valve is packed in a box. This prevents dust and dirt entering the valve interior.

The quality of the seat and flange seal may deteriorate during long-term storage.

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5 INSTALLATION INSTRUCTIONS

5.1 Mounting

The butterfly valves are bi-directional and there is no need to identify upstream and downstream orientation.

Handle operated valves have stop plates with either dual or multiple positions and provide visual indication of the valve position, by either the handle being inline with the disc or by the flats on the bottom of the disc stem where the flats are in line with the disc.

5.2 Installation into pipework

The butterfly valve can be welded in every position in the pipe work.
Remove the seals, disc and bearings before welding.

6 CLEANING AND MAINTENANCE

6.1 Cleaning

The butterfly valve material is resistant to detergents that are commonly used in the food industry, such as a lye (NAOH) or acid (HNO₃) solution of about 2% at a temperature of about 80°C. After cleaning, the system must be rinsed with clean water to prevent corrosion.

6.2 Lead-time

Routine maintenance is not normally necessary.

Only routine checks to ensure all fasteners are tight and that valve is leak free are required.

For special applications (such as highly viscous or crystallizing liquids) the lead-time must be adjusted in consultation with the manufacturer.

6.3 Safety measures during maintenance

When disassembling the butterfly valve, the pipe work must be empty. With disassembled valves, it must be prevented that the pipe work can be filled accidentally by, e.g. starting a pump or activating a valve.

6.4 Grease to be used

Ensure before assembling that all parts are clean and in good condition. Lubricate moving contact surfaces of disc stem, seat and seal(s) with a food grade FDA approved lubricant.

6.5 Disassembling the butterfly valve (See appendix B)

- A Locate handle 6 in closed position.
- B Remove plug 10 from top of handle 6.
- C Remove handle screw 9 and spring washer 7.
- D Remove handle 6 and notch plate 5.
- E Remove body screws 10 and nuts 11.
- F Remove disc and seat assembly.
Take care not to loose the upper and lower bearings 4 located on either side of the disc stem.
- G Remove upper and lower bearings 4.
- H Rotate disc 3 to the open position and stretch seat 2 over bottom of disc stem (short end), then remove seat from disc along the upper disc stem.

6.6 Disassembling the wafer style butterfly valve (See appendix C)

- A Locate handle 6 in closed position.
- B Loosen and remove bolts 10 and nuts 11.
- C Wind two of the inside nuts 13 back against the flanges 14 to clamp the flange between the inner and outer nuts on each of the studs 12.
- D Loosen the outer nuts 13 on flange 14 (approx. 3-4 mm).
- E Wind the two remaining inside nuts 13 back against flange 14 to clamp and separate the flanges with the jacking studs 12.
- F Remove the valve from between the flanges 14.
- G Remove flange seals 15.
- H Remove plug 9 from top of handle 6.
- I Remove handle screw 8 and spring washer 7.
- J Remove handle 6 and notch plate 5.
- K Remove body screws 16 and nuts 17.
- L Separate body halves 1.
- M Remove disc stem 3 and seat 2 assembly.
Take care not to loose the upper and lower bearings 4 located on either side of the disc stem.
- N Remove upper and lower bearings 4.
- O Rotate disc 3 to the open position and stretch seat 2 over bottom of disc stem (short end), then remove seat from disc along the upper stem.

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6.7 Assembling the butterfly valve (See appendix B)

- A Stretch seat 2 over bottom of disc stem (short end), then place seat from disc along the upper stem and rotate disc 3 to the open position
- B Place upper and lower bearings 4
- C Place disc and seat assembly between body halves 1.
- D Fit body screws 10 and nuts 11, tighten to recommended torques.
Valves DN 25 to DN 65 = 14 Nm, DN 80 to DN 150 = 19 Nm.
- E Fit notch plate 5 over the disc stem and locate lugs on notch plate in body.
- F Fit handle 6 to the disc stem so that the handle is parallel to the disc.
- G Fit the handle screw 8, spring washer 7 and plug 9.
- H As the valve is already installed in the pipeline use the position indicator on the valves bottom stem to ensure the valve disc is in the desired position (flats are in line with disc).
- I Cycle test the valve and inspect for leakage at plant start up.

6.8 Assembling the wafer style butterfly valve (See appendix C)

- A Stretch seat 2 over bottom of disc stem (short end), then place seat on disc along the upper stem and rotate disc 3 to the open position
- B Place upper and lower bearings 4
- C Place disc and seat assembly between body halves 1.
- D Fit body screws 16 and nuts 17, tighten to recommended torque's.
Valves DN 25 to DN 65 = 14 Nm, DN 80 to DN 150 = 19 Nm.
- E Place flange seals 15.
- F Place the valve between the flanges 14.
- G Wind two of the inside nuts 13 back against the body halves 1.
- H Fit body screws 10 and nuts 11 and outer nuts 13.
- I Fit notch plate 5 over the disc stem and locate lugs on notch plate in body.
- J Fit handle 6 to the disc stem so that the handle is parallel to the disc
- K Fit the handle screw 8, spring washer 7 and plug 9.
- L As the valve is already installed in the pipeline use the position indicator on the valves bottom stem to ensure the valve disc is in the desired position (flats are in line with disc).
- M Cycle test the valve and inspect for leakage at plant start up.

6.9 Failures

- Leakage along the disc stem or between the body halves 1.
Check seat 2.
Check product pressure (must be below 10 bar).
- Leakage between body halves 1 and flanges 14 (butterfly valve wafer style).
Check flange seals 15.
- Water hammer during closing.
Increase the closing time.

PENTAIR F250/F251

HYGIENIC BUTTERFLY VALVES

APPENDIX A – TECHNICAL SPECIFICATION

BUTTERFLY VALVE ORDERING CODE

- F250 for imperial tubing (inch sizes)
- F251 for metric tubing (mm sizes)

BUTTERFLY VALVE MATERIAL

All metal parts that come into contact with the liquid are made of stainless steel according to W. Nr. 1.4404. The other metal parts are made of stainless steel W. Nr. 1.4301. The bearings are made of POM.

SEAT AND FLANGE SEAL MATERIAL

The seat can be made of:

- VMQ (white) – FDA
- EPDM (black) – FDA
- NBR (black) – FDA
- FPM (red)

The flange seal (butterfly valve wafer style) is made of EPDM - FDA. Alternatives are available..

LIQUID OPERATING PRESSURE

The maximum liquid operating pressure is 10 bar, the minimum is full vacuum, both at 20°C.

OPERATING TEMPERATURE

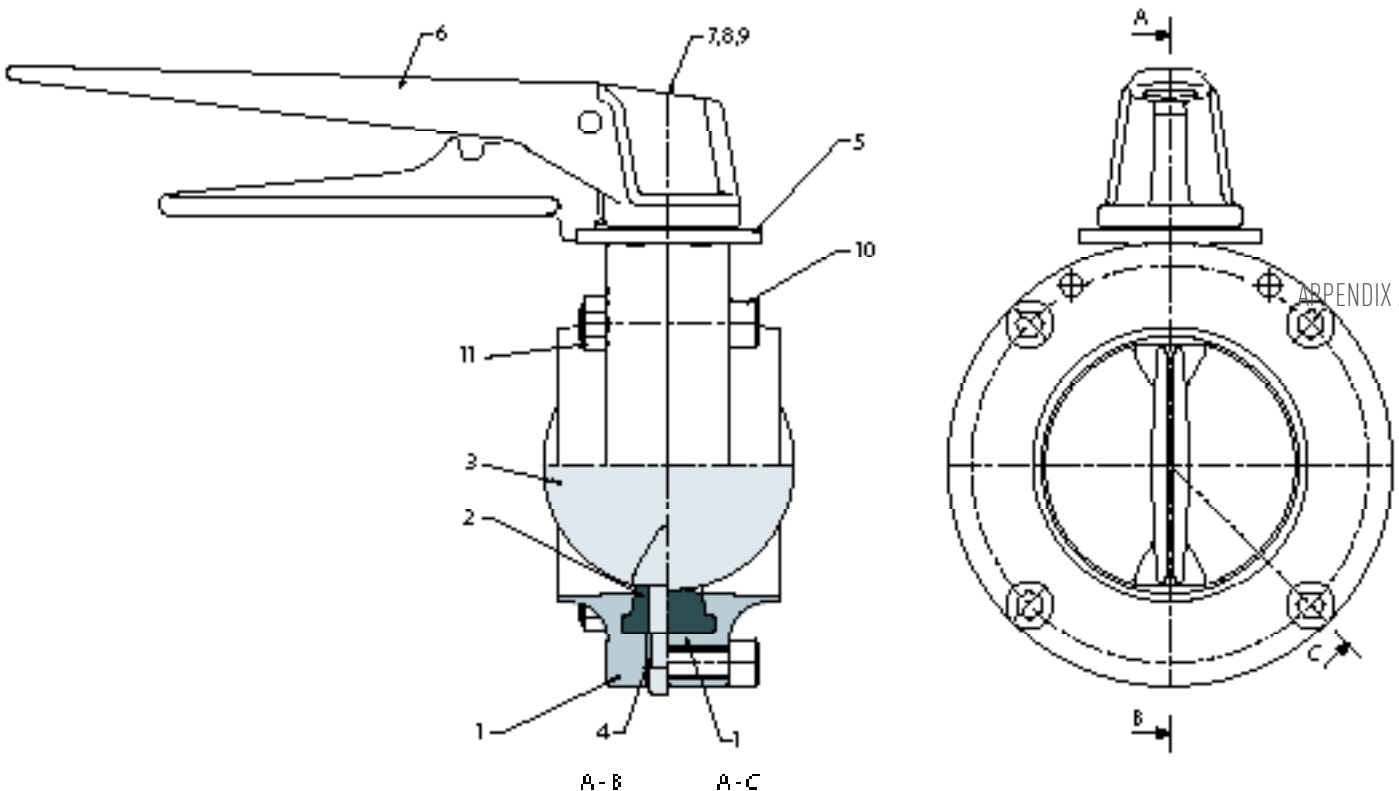
Butterfly valves with standard seat and flange seal can resist temperatures between minus 10 and 95°C.

AIR SUPPLY ACTUATOR F 257

- Double acting: 3–8 bar
- Spring return: 5,5–8 bar

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APPENDIX B – ASSEMBLY DRAWING F250/F251



ORDERING (SPARE) PARTS

When ordering spare parts, please include the following information:

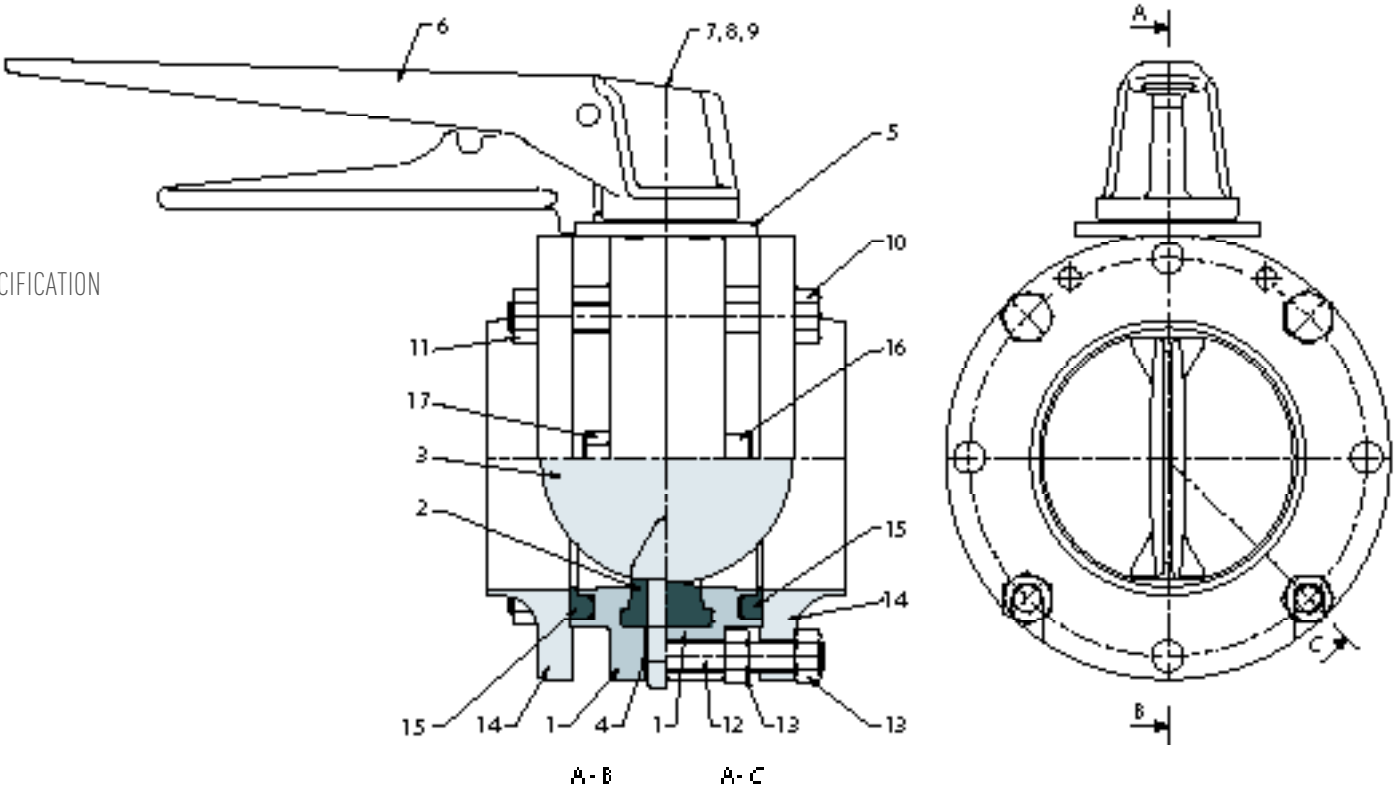
- The butterfly valve ordering code.
See appendix A.
- The size of the butterfly valve.
- The part ref. no.
- The quality of the seat..

PARTS AND SPARE PARTS

Ref. No.	Qty.	Description	Material	Spare part
1	2	Body half	W. Nr. 1.4404	
2	1	Seat	VMQ, EPDM, NBR or FPM	X
3	1	Disc	W. Nr. 1.4404	
4	2	Bearing	POM	X
5	1	Notch plate	W. Nr. 1.4301	
6	1	Handle	Polymer or W. Nr. 1.4301	
7	1	Spring washer	A2	
8	1	Handle screw	A2	
9	1	Plug	Nylon	
10	4/6	Body screw	A2	
11	4/6	Nut	A2	

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APPENDIX C – ASSEMBLY DRAWING F250/F251 WAFER STYLE



ICAL SPECIFICATION

PARTS AND SPARE PARTS

Ref. No.	Qty.	Description	Material	Spare part
1	2	Body half	W. Nr. 1.4404	
2	1	Seat	VMQ, EPDM, NBR or FPM	X
3	1	Disc	W. Nr. 1.4404	
4	2	Bearing	POM	X
5	1	Notch plate	W. Nr. 1.4301	
6	1	Handle	Polymer or W. Nr. 1.4301	
7	1	Spring washer	A2	
8	1	Handle screw	A2	
9	1	Plug	Nylon	
10	4/6	Bolt	A2	
11	4/6	Nut	A2	
12	2	Jacking stud	A2	
13	4	Nut	A2	
14	2	Flange	W. Nr. 1.4404	
15	2	Flange seal	VMQ, EPDM, NBR or FPM	
16	2	Body screw	A2	
17	2	Nut	A2	

ORDERING (SPARE) PARTS

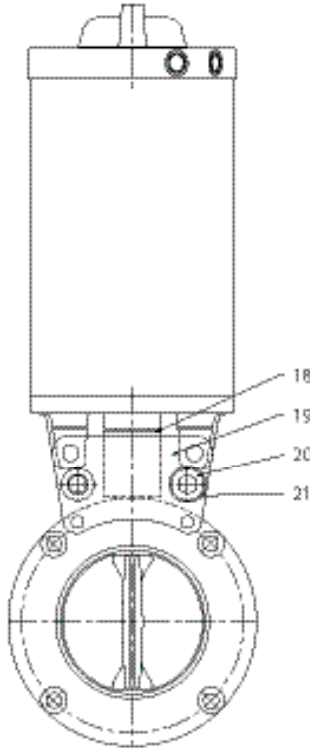
When ordering spare parts, please include the following information:

- The butterfly valve ordering code. See appendix A.
- The size of the butterfly valve.
- The part ref. no.
- The quality of the seat or flange seal.

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APPENDIX D – ACTUATOR F257



MOUNTING PARTS

Ref. No.	Qty.	Description	Material
18	1	Drive boss	W. Nr. 1.4301
19	2	Bridge clamp	W. Nr. 1.4301
20	2	Screw	A2
21	2	Spring washer	A2

ACTUATOR MOUNTING

- A When installing a double acting or spring to close actuator, put the valve in the closed position. When installing a spring to open actuator, put the valve in the open position. The bottom of the disc stem is marked to indicate open or closed position.
- B Remove handle if fitted, see 6.5
- C Fit drive boss 18 onto the valve stem square so that the actuator will be correctly orientated.
- D Position the actuator onto the valve/ drive boss.
- E Introduce the two bridge clamps 19 and

- F While holding the bridge clamps 19 together with one hand, screw in the two screws 20 with spring washers 21 finger tight.
- G Torque up the two screws 20 according to torque values table:

Valve size	Torque (Nm)
25 – 65	14
80 – 100	18
125	22

- H Cycle test actuator to ensure correct operation.



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