



DOUBLE ECCENTRIC BUTTERFLY VALVES EVOLUTION

INSTALLATION, OPERATION AND MAINTENANCE MANUAL



TABLE OF CONTENTS

1	GENERAL	3
1.1	Safety	3
1.2	Proper Use	3
1.3	Identification	3
2	TRANSPORT AND STORAGE	5
2.1	Transport	5
2.2	Storage	5
3	PRODUCT FEATURES	5
3.1	Features and Function	5
3.2	Applications	5
3.3	Performance Limits	5
3.4	Permissible and Impermissible Modes of Operation	5
4	INSTALLATION IN THE PIPELINE	6
4.1	Conditions on Site	6
4.2	Installation Location	6
4.3	Installation Position	6
4.4	Flow direction	7
4.5	Assembly Instructions	8
5	SET-UP	9
5.1	Visual Inspection and Preparation	9
5.2	Function Check and Pressure Test	9
6	ACTUATORS	9
7	MAINTENANCE AND REPAIR	10
7.1	General Safety Instructions	10
7.2	Inspection and Operation Intervals	10
7.3	Maintenance and Replacement of Parts	10
7.3.1	Design	10
7.3.2	Recommendations for Wear Parts	10
7.3.3	Cleaning and Lubrication	11
7.3.4	Adjustment of the Disc Axial Position	11
7.3.5	Replacement of the Sealing Ring	11
7.3.6	Adjustment of the Sealing Ring Compression	13
7.3.7	Replacement of the Shafts Sealing	13
8	TROUBLE SHOOTING	16

1 GENERAL

1.1 Safety

This manual for installation, operation and maintenance must be observed and applied at all times.

Arbitrary modifications of this product are not allowed. TALIS will not assume any liability for consequential damage due to non-compliance with these instructions. The installation must be done only by qualified personnel. For further technical information such as dimensions, materials, etc. refer to the respective technical documentation.

TALIS valves are designed and manufactured to the highest standards and their safety of operation is generally ensured. However, the valves may be damaged and be potentially dangerous if they are operated improperly or have not been installed for the intended use.

Before removing any protective devices and/or performing any work on the valves, depressurise the pipeline section and ensure it is free of hazards.

If a valve working as end-of-line valve needs to be opened in a pressurised pipeline, this must be done taking the maximum care to prevent the emerging fluid to avoid causing damages. Care must be also taken when closing the valve to avoid crushing or trapping.

When a valve needs to be dismantled from the pipeline, fluid may emerge from the pipeline or the valve. The pipeline must be completely emptied before dismantling the valve.

1.2 Proper Use

EVOLUTION Butterfly Valve is a shut-off valve designed for installation in pipelines for drinking water and other neutral liquids.

For the respective technical application ranges (operating pressure, temperature...) please refer to the product technical documentation.

For any deviating operating conditions and applications, it must be obtained TALIS written approval.

1.3 Identification


EVOLUTION valves comply with the standard EN19 in relation to identification marking.

The following information is marked on the casting:

- Manufacturer name: TALIS
- DN
- PN
- Body and disc material

Additionally, EVOLUTION valves have a stainless steel plate with the following information, see 1-1:

- TALIS logo
- Model name: EVOLUTION
- Design standard: EN593
- Product code
- Manufacturing date: Day.Month.Year
- Serial number
- Information about valve configuration (see details in table below)
- Fluid temperature limits (for water)
- DN
- Flange drilling
- PFA (Maximum Allowable Pressure)
- Design standard: EN593 / EN1074-2

		EVOLUTION
		Code: DB01007TS
HW: gearbox with handwheel		Date: 23.01.2019
		S/N: 20181114001
EPDM/420/ISEAT/CF8/HW/CC		TS: -10~50°C
DN 400	ISO PN 10	PFA 10 bar
	EN 593	EN 1074-2
		1-1

Information about valve configuration:

Rubber material	Shafts material	Seat	Retaining ring material	Actuation type	Closing direction (*)
EPDM	420	ISEAT: epoxy coated seat	CF8	BSK: Bare Shaft	CC: clockwise closing
NBR		309L: welded stainless steel seat		HW: gearbox with handwheel	AC: anticlockwise closing
				P4E: special gearbox prepared for electric actuator	
				P4P: prepared for pneumatic actuator	

(*): only in case of valves with gearbox

2 TRANSPORT AND STORAGE

2.1 Transport

For transportation to the installation site, the valve must be packed in a safe and stable packaging, suitable for the size and weight of the valve. The valve must be completely protected against any kind of atmospheric influence and external damage. If the valve must be transported under specific climate conditions, as e.g. sea transportation, it must be specially protected against these conditions.

During transportation, the valve must be placed on one of its flanges, see 2-1.

For transport purposes and to support assembly, the lifting devices such as cables and belts must only be attached to the valve body. The actuator or gearbox are not suitable for this purpose.

EVOLUTION valves size DN500 and larger are provided with lifting holes located on the flanges, see 2-2.

2.2 Storage

EVOLUTION valves should be stored with the disc partially open in order not to compress the sealing ring unnecessarily, see 2-3.

The elastomeric parts must be protected against direct sunlight and/or UV light in order to guarantee the long-term sealing function. The valves should be stored in a clean and dry environment and avoid direct heat. They should be covered against dust and foreign matter.

The valves can be stored under a temperature range between -20°C and $+50^{\circ}\text{C}$, protected by adequate covers. If the valve storage temperature is below 0°C , it should be warmed at least up to $+5^{\circ}\text{C}$ before installation.



2-1



2-2



2-3

3 PRODUCT FEATURES

3.1 Features and Function

EVOLUTION valves are suitable for in-line and end-of-line installations.

The design of EVOLUTION valves is of an eccentric valve with a double offset of the disc. In closed position the disc is perpendicular to the direction of the flow. To close or open the valve, the disc must be turned 90° .

The sealing is provided by a sealing ring fixed to the disc by a stainless steel retaining ring (or retaining segments). In closed position, the sealing ring is pressed to the conical seat surface of the body and seals in both flow directions. Due to the double offset design, the sealing ring is completely uncompressed when the valve is in slightly open position. If required, the sealing ring can be disassembled without dismantling the valve (see section 7.3.5.).

3.2 Applications

EVOLUTION valves should only be used in media with no risk of clogging.

The valves are suitable for the following media:

- drinking water and other neutral liquids
- raw water

In case of different media, TALIS needs to be consulted.

In the standard version, EVOLUTION valves are manufactured with EPDM seals. The use of the valve with media containing gas or oil may result in the destruction of the seals and therefore is not allowed.

3.3 Performance Limits

3.3.1. Cavitation

EVOLUTION valves are designed for on-off use. If the valves are used in non-closed position to control the flow, the maximum flow velocity, pressures and cavitation limits must be considered.

3.3.2. Maximum Flow Velocity

EVOLUTION butterfly valves are designed to be suitable for the maximum flow velocities according to the standard EN593, which are the following for liquid media:

- PN10: 3 m/s
- PN16: 4 m/s

3.4 Permissible and Impermissible Modes of Operation

The operating pressure must not exceed the maximum allowable pressure (PFA).

EVOLUTION valves equipped with gearbox have mechanical limit stops to ensure a correct open and closed position. The stops have been set and sealed at the factory, see 3-1.



4 INSTALLATION IN THE PIPELINE

4.1 Conditions on Site

When installing the valve between two pipeline flanges, these must be coplanar and aligned. If not aligned, it may result in high loads, stressing heavily the valve body during operation, which may eventually lead to fracture.

When installing the valve into the pipeline, make sure it is as tension free as possible. The gap between flanges must be big enough to avoid damaging the coating of the valve flange during the installation. The pipeline flanges must not be pulled towards the valve during installation.

In case some works near the valve could cause dirt (painting, welding...) the valve must be protected.

4.2 Installation Location

It must be provided enough space to allow checks and maintenance works during valve operation life.

If the valve is installed as end-of-line, make sure that the free outlet side is not accessible for any kind of interference.

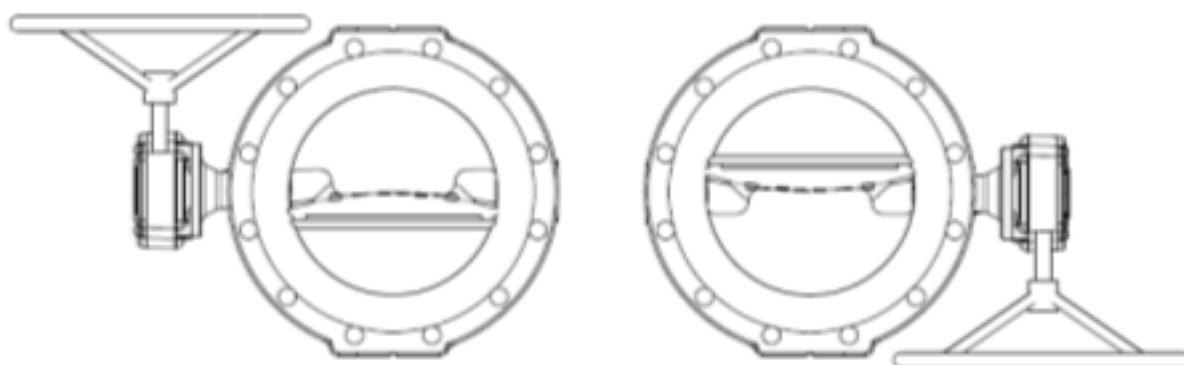
In case of the valve is going to work with contaminated media, a filter must be installed upstream of the valve to prevent malfunction.

EVOLUTION valves should be installed if possible a minimum of 5-6 x DN from other line elements such as elbows, pumps, control valves, etc. Sometimes this is not feasible, but it is important to achieve as much distance as possible to avoid irregular flow which could disturb the valve function and increase wear by being placed in turbulent zones.

Where the butterfly valve is connected to a check valve or pump, keep enough space between them to ensure the disc does not interfere with the adjacent equipment, usually around 1 x DN.

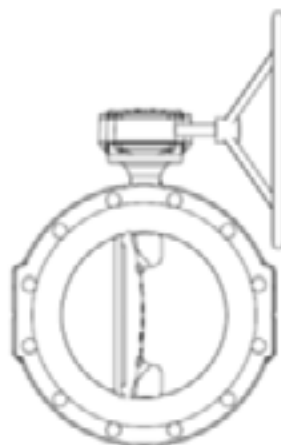
4.3 Installation Position

The preferred installation for EVOLUTION valves of all sizes is with the shafts in horizontal position (with the gearbox facing upwards or downwards):



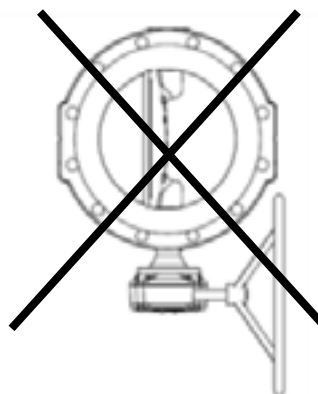
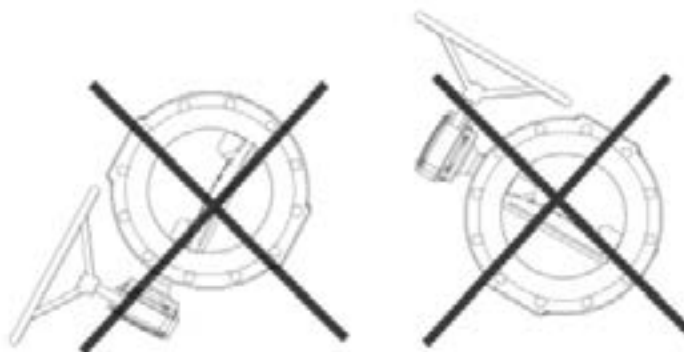
INSTALLATION / OPERATION / MAINTENANCE

EVOLUTION valves can also be installed with the shafts in vertical position. This is not the preferred installation because the valve may suffer more wear and tear due to the disc weight. EVOLUTION is designed with an adjustable disc position system. The lower cover design allows axial adjustment of the disc position over time.



4-2

Other installation positions are not allowed:

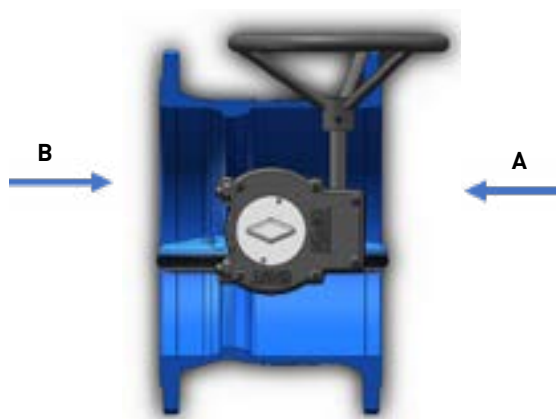


4-3

4.4 Flow direction

EVOLUTION double eccentric butterfly valves are tested to be tight in both directions. Nevertheless, the preferred installation is as shown in picture 4.4 with flow direction A.

This will minimize wear, since the disc is pushed into the seat by the water pressure.



4-4

4.5 Assembly Instructions

EVOLUTION valves are normally delivered with the gearbox and the handwheel separate and not assembled due to storage and transport reasons.

The handwheel is to be assembled after unpacking as follows:

- The connecting pin is delivered attached to the handwheel:
- The gearbox shaft may have one or two holes:



- Select one of the holes and introduce the connecting pin:



INSTALLATION / OPERATION / MAINTENANCE

Before installing the valve, check it for possible damage that may have occurred during transport or storage. The critical components for the performance of the valve, as the seat and the sealing ring must be properly cleaned to remove all dirt and foreign matter.

If the valve needs a repaint, it is important to keep the sealing and the operational parts free of paint. Also, do not cover the identification plate with painting.

Make sure that the proper equipment for lifting are available when installing the valve. The valve must only be lifted by the body. Suspending it by the disc, or gearbox may cause damage of the valve.

In open position, EVOLUTION valve disc may protrude out the overall length of the valve. Make sure there is enough space between the disc and other installations in the pipeline.

Use hexagonal head bolts and nuts with washers in the through holes to connect the pipeline flange with the valve flange. Tighten the bolts following a crosswise pattern to prevent unnecessary tension which may lead to cracks or breaks. The pipeline flanges must not be pulled towards the flange. If the gap between flanges is too big, this must be compensated with thicker gaskets.

The installer must select bolts and nuts suitable for the operating conditions such as pressure, temperature, flange material, operational loads and the gasket. Depending on the gasket and bolts material, very different tightening torque values may be needed. The installer must choose the tightening torque of the flange bolts according to the above parameters. Do not over-tighten the flange bolts as this may result in crack formations in the flanges.

It must be ensured that the flanges of the pipeline to which the valve is going to be connected are aligned and parallel.

If welding works are necessary to do on the pipeline, they must be performed before the valve is installed in order to avoid damage to the seals and coating.

The pipeline must be laid in such a way to prevent harmful pipeline forces being transmitted to the valve body.

5 SET-UP

5.1 Visual Inspection and Preparation

Before putting the valve into operation, a visual inspection of all functional parts must be performed. Check also if all bolted connections have been properly tightened.

5.2 Function Check and Pressure Test

Before putting into operation, the valve must be opened and closed completely one time to ensure a trouble -free operation. The operation of the valve in a dry state normally requires higher actuation torques.

When making a pressure test, the pressure on the closed valve must not exceed the PFA (maximum allowable pressure). In case the valve is going to be buried, the pressure test should be carried out before filling the pipe trench.

A new pipeline system needs to be cleaned before starting operation to remove all foreign particles. Dirt particles and residue in the pipeline may damage the valve function or affect its free movement.

The gearbox and the handwheel size have been selected to allow the operation of the valve by only one person using the handwheel. Extensions for operation are not allowed because the valve may be damaged due to excessive force. In case of valves equipped with gearbox, the 90° degree turn is limited by the limit stops, which have been adjusted at the factory.

6 ACTUATORS

For actuator selection consider the torque values indicated in the product data sheet.

Actuator assembly can only be done on valves with special configuration prepared for actuator. The electric actuator is mounted on the input flange on the gearbox (special option prepared for electric actuator).

For further information about actuators assembly, please refer to actuator manufacturer assembly instructions.