



INSTRUCTION MANUAL

KRAVEN BUTTERFLY VALVES ITEM 875 - 876 - 877 , 885 - 886 - 887

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 **Environmentally friendly:** The sections of this manual give instructions for the correct handling of the product and for ensuring environmental protection.

OMAL S.p.A. Benefit Company reserves the right to modify the characteristics and data of its products at any time to improve their quality and durability.

FOREWORD

This Installation and Maintenance Manual has been drawn up in accordance with:

- Directive 2014/68/EU "Pressure Equipment Directive" PED
- Directive 2006/42/EC "Machinery Directive" MD
- Directive 2014/34/EU "Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres" ATEX

The following standards/specifications have also been applied:

UNI CEN/TS 764-6. Pressure Equipment - Part 6: Structure and Content of Operating Instructions

The following are minimum safety instructions for the storage, installation, commissioning, maintenance and end-of-life disposal of butterfly valves.

OMAL S.p.A. Benefit Company accepts no liability for damage caused by improper use, even if only partial, of the information contained in this manual.

Goods of not European Origin

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1. GENERAL CHARACTERISTICS

OMAL butterfly valves are available in WAFER versions in sizes DN 40 to DN 300 and in LUG versions from DN 40 to DN 300. The valves are designed and manufactured to cope with the majority of applications in all sectors of industry with the following main features:

- General requirements according to UNI EN 593.
 - Standardised gauges EN 558 series 20.
 - Tightness according to EN 12266-1 rate A with a differential pressure of 16 bar and 10 bar.
 - Semi-rigid integral seal obtained by vulcanising the elastomer layer onto a rigid support ring.
 - Optimised gasket geometry for perfect adhesion to the valve body and sealing on the flanges without additional elements.
- The tightening of the flanges does not affect the operating torque or the operation of the valve itself.
- The finishing of the butterfly with lapped edges optimises sealing, reduces operating torque and significantly reduces seal wear.
 - Guide bushing on the shaft.
 - Stem-disc coupling made without fasteners (screws, bolts, pins, etc.) to eliminate points at risk of corrosion and breakage and to facilitate disassembly for maintenance or cleaning.
 - Coupling with any drive (pneumatic, electric, manual, etc.) is facilitated by the valve neck with a standardised EN ISO 5211 plane.
 - All metal parts are suitable or adequately treated against corrosion.

2. OPERATING CONDITIONS

2.1 Intercepted fluids

The valves are designed and tested to be operational with all Group 1 fluids according to Directive 2014/68/EU, be they liquid or gaseous. However, it is the responsibility of the user or engineering company in charge of the project to select suitable valve constituent materials for chemical or physical compatibility with the fluid intercepted. OMAL's technical service is available to support customers in choosing the most suitable product. The ultimate responsibility, however, always remains with the user or engineering company concerned.

2.2 Operating pressure

The valves are designed for continuous use at PN 16 bar from DN 40 to DN 300. The use of valves must never exceed the PN pressure value.

2.3 Operating temperature

Series 875 876 877 885 886 887 valves (spheroidal cast iron body EN GJS 400-18 LT) have been dimensioned and tested for continuous operation. The maximum usage limit of these valves depends on the elastomer of the seal.

In detail, the operating limits for the different materials are:

EPDM, EPDM white, EPDM water: -20°C to +120°C; NBR: -20°C to +80°C;

FKM: -12°C to +180°C;

WARNING: The operating temperatures of elastomers are to be understood as approximate temperatures with inert fluids; even slight chemical sensitivities of the elastomers to intercepted fluids can drastically reduce the operating temperature range.

2.4 Lubrication

The valves are lubricated at the factory for normal operating conditions. For maintenance or reassembly work, OMAL S.p.A. recommends checking that the lubricant to be used is suitable for contact with the seal material, the fluid intercepted and the expected operating conditions.

2.5 External Protection

The valves are suitable for both indoor and outdoor installation. The cast iron body is protected against corrosion with a 160÷200 micron thick epoxy paint treatment; the stem is made of stainless steel; and the disc can be supplied in cast iron with a protective nickel, stainless steel or aluminium-bronze alloy coating. This normally enables applications where a protection class of C3M according to ISO 12944-6 is required.

2.6 Marking and Classification

OMAL S.p.A. butterfly valves bear the following information imprinted on the body and/or by means of an additional label:

- Trademark and manufacturer's name
- Nominal size
- Nominal pressure
- Casting no.

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- Model/product code
- Min./max. temperature
- Production date
- Materials (body, disc and liner)
- CE marking in accordance with Directive 2014/68/EU and UKCA

3. OPERATION

Butterfly valves can be supplied with a free axle, fitted with a lever or gearbox for manual operation, or equipped with an automatic electric or pneumatic actuation system.

3.1 Lever operation

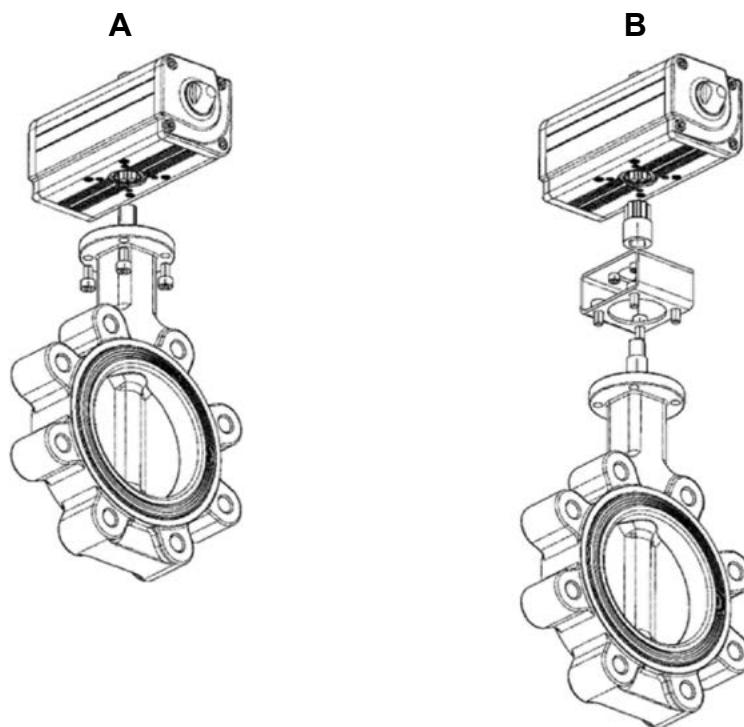
Lever-operated valves must be installed in such a way that, when looking at the lever from above, the valve is closed by turning the lever clockwise and opened by turning it anticlockwise.

When the valve is closed, the lever must be positioned normal to the pipeline; when the valve is open, the lever must be parallel to the pipeline. The levers can be locked (and padlocked if desired) in 10 angular positions equally distributed over the valve stroke.

3.2 Actuator operation

Automatic valves cater for a growing range of applications where it is necessary not only to operate devices remotely, but also to ensure full control, efficiency and service life.

The connection between valve and actuator is direct (A). In special cases, this can be done with a connector and coupling (B).



A) DIRECT ASSEMBLY

Direct assembly of valve and actuator is the best solution to avoid play between the valve stem and the actuator shaft. For direct assembly, the same standard flange connection should be used on both the valve and actuator, as well as the valve stem and actuator shaft dimensions. The use of an adapter may be necessary in some cases.

Once the actuator is mounted to the valve, bolt the two ISO flanges together.

Tightening Torque for Screws/Tie Rods

SIZE	TORQUE Nm
M5	5-6
M6	10-11
M8	20-23
M10	45-50
M12	80-85

4. SAFETY INFORMATION

• The valve is a safe product when installed correctly between flanges on the system; if the valve is to be bench tested, particularly if it is to be pneumatically actuated, appropriate guards must be provided to prevent objects or body parts from becoming pinched between the disc and the valve body.

Attention

- Before installation, carefully check that the pressures and temperatures in the pipeline are compatible with the valve performance declared by the manufacturer. If the butterfly is used as an end-of-line valve, remember that the valve PN is to be understood as 60% of the declared PN for pipeline installation.
- Before carrying out any work on the valve or operating elements, make sure that the system is not under pressure.
- Do not pull out the valve shaft when the valve is mounted on a pressurised pipeline; the disc could be pulled into the pipeline.
- If the valve intercepts hazardous fluids, ensure that the line and the valve itself have been cleaned before disassembly.

5. INSTALLATION

- On receipt of the product, check that it has arrived undamaged; avoid installing the product if it shows obvious signs of damage.
- Pay particular attention to the cleanliness of the piping and workplace when installing the valves; the presence of dirt and solid particles is extremely detrimental to the integrity and durability of the seals. If sealants, tape or paste are used, special care must be taken to ensure that these materials do not invade the valve interior and sealing areas.
- If the valve is to intercept aggressive or dangerous fluids, ensure that the valve's constituent materials are compatible with the fluid in use; if in doubt, contact OMAL's technical staff for a detailed assessment of the valve's chemical compatibility.

The installation of OMAL butterfly valves is extremely simple and easy.

To install OMAL butterfly valves, proceed as follows:

- The line flanges must be at a distance that allows free insertion of the valve (fig. 2).
- Never try to force the valve into flanges that are not far enough apart to allow free passage; the sealing areas on the flanges can become irreparably damaged (fig. 1).
- The valve disc must be held in a slightly open position, without the disc itself protruding from the valve gauge.
- Support the butterfly by means of four tie rods which, when passing through the holes on the flanges and through the slots on the valve body, allow an initial rough centring between the flanges. Lightly tighten 4 tie rods (opposite each other) until the valve is lightly secured; ensure accurate centring of the valve body to the pipe flanges (an error of ± 1 mm for DN 50 and, proportionally, ± 5 mm on DN 300 are tolerable). Tighten the 4 tie rods until the valve is securely locked. Fully open the butterfly (fig. 3), and fit and tighten any other tie rods provided by the flanging.

- Bring the valve body into mechanical contact with the flanges, without adding additional liners, in order to ensure an outward seal; do not exceed the prescribed tightening torque for the tie rods used.

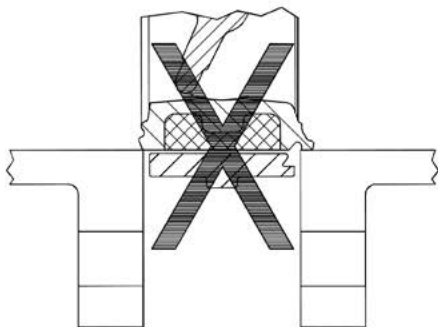


fig. 1

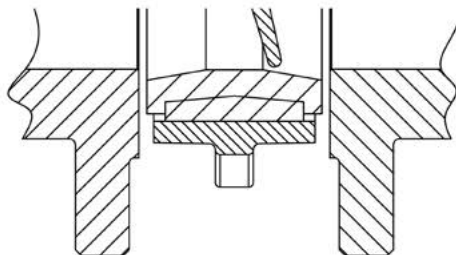


fig. 2

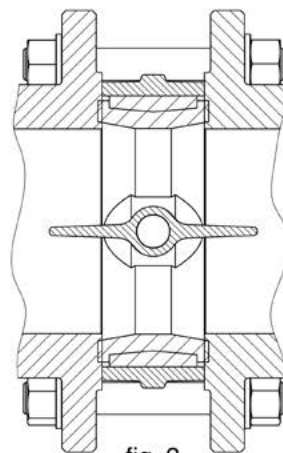


fig. 3

6. MATERIALS AND THEIR DURABILITY

Product efficiency is the result of good and careful maintenance. In order to ensure full reliability of the valve, it is recommended that it be periodically inspected annually and that its functionality be checked during routine maintenance operations, with immediate replacement of parts subject to wear in the event of any leakage, both in the pipeline and outside the valves.

For medium to heavy-duty applications, the replacement times for wear parts for the various types of OMAL valves can typically be summarised in the table below:

DN	40-100	125-300
<i>Num. of cycles</i>	50.000	30.000

7. MAINTENANCE

Maintenance operations must be carried out by authorised and qualified personnel, using suitable tools. Ensure that the system and valve have been cleaned before carrying out any work.

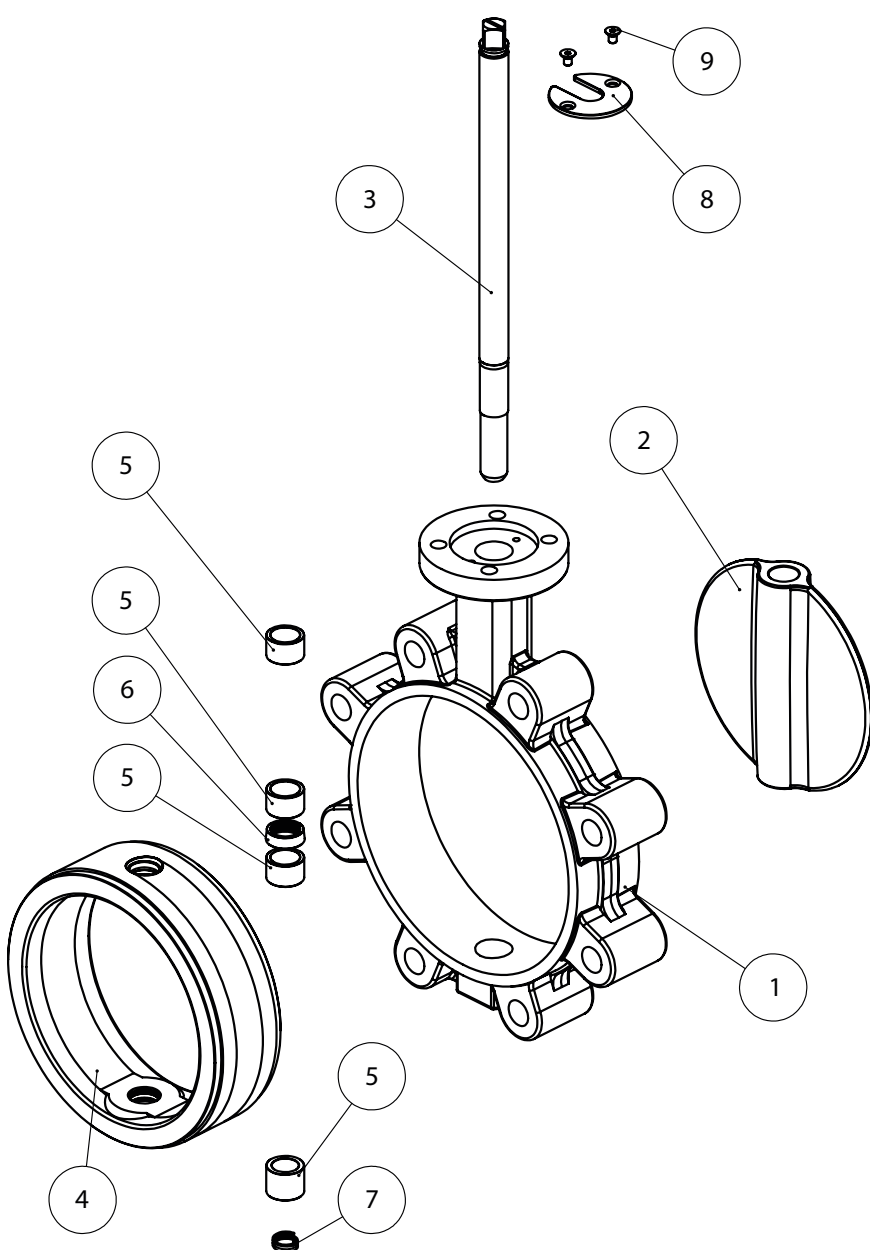
- Use a screwdriver to loosen the screws (9) on the anti-ejector disc.
- Levering on the stem split, remove the anti-ejector disc (8) and pull out the shaft (3).
- Remove the disc (2). The operation is facilitated if the disc is rotated a few degrees from the closed position.
- Remove the main seal (4). The use of a hydraulic press with a thrust disk diameter 15 mm larger than the valve DN is recommended.
- Bushings (5) are not normally replaced during maintenance. If it is necessary to remove them, please contact our technical department, who will give instructions.
- Place the O-rings in the appropriate seats of the main seal after they have been thoroughly greased.
- Insert the main seal (3) into the valve body, aligning the shaft passage holes with the relevant holes in the body as best as possible.
- Insert the disc (2), aligning the shaft passage holes with the corresponding holes in the seal as best as possible. Keep the disc rotated a few degrees.
- Reposition the shaft in its housing, taking care to correctly align the gap with the position of the disc. Slight resistance may occur during insertion due to misalignment of the components; force the shaft in moderately and check the alignment of the components again if necessary.
- Insert the anti-ejection disc before it is fully inserted and secure it with the screws once the shaft is in place.
- Always carry out a tightness test of the valve before putting the system back into service.

MATERIALS

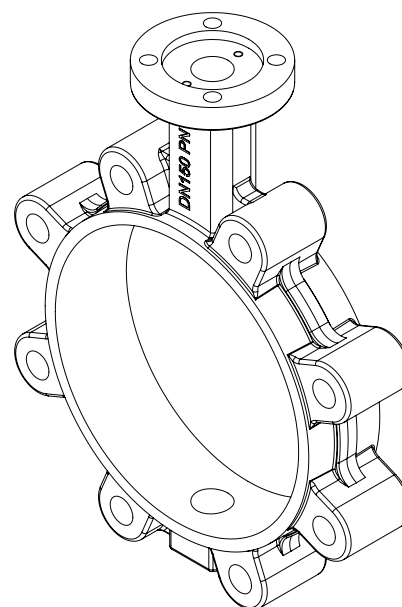
1	Body	EN GJS 400-18 LT
2	Disc	A351 CF8M (316 S.S.), EN GJS 450-10
3	Upper shaft	A276 S42000 (420 S.S.)
4*	Liner	EPDM-NBR-FKM
5*	Bush	Epoxy resin
6*	Shaft seal	EPDM-NBR-FKM
7	Spring antistatic device	Stainless steel
8	Anti blow-out system	Carbon steel
9	Screw	Stainless steel

* Components of spare part kit KGK...

If other valve materials are required, please contact our offices.



LUG BODY



ATTENTION

Proper maintenance is recommended by following leakage and functional tests on the valves before putting them back into operation. The use of spare parts not supplied by OMAL (directly or indirectly) may impair the proper functioning and safety of the valves. OMAL shall not be liable for any malfunction following maintenance not performed in accordance with the instructions in this manual.

8. ATEX VERSIONS

Valves in ATEX configuration are suitable for use in potentially explosive atmospheres in accordance with the requirements of Directive 2014/34/EU. They are GROUP II Category 2 equipment, suitable for Zone 1 & 2 GAS and 21 & 22 DUST according to the following distinction:

BUTTERFLY VALVE WAFER TYPE, LUG TYPE ITEM 875-876-877-885-886-887									
VALVE MARKING	CE	Ex	LINER	PAINTING	SIZE	"ATMOSPHERE OUTSIDE THE VALVE"	"ATMOSPHERE INSIDE THE VALVE"	GAS	DUST
II 2G Ex h IIC T6..T2 Gb X II 2D Ex h IIIC T85°C..T 215°C Db X			NBR, EPDM, EPDM WATER	< 200 micron (std)	DN40 - DN200	POTENTIALLY EXPLOSIVE (G) Gas group IIC (D) Dust group IIIC		1 2	21 22
					DN250 - DN300				
II 2G Ex h IIB T6..T2 Gb X II 2D Ex h IIIC T85°C..T 215°C Db X				> 200 micron	DN40 - DN200	POTENTIALLY EXPLOSIVE (G) Gas group IIB (D) Dust group IIIC			
					DN250 - DN300				

BUTTERFLY VALVE WAFER TYPE, LUG TYPE ITEM 875-876-877-885-886-887									
VALVE MARKING	CE	Ex	LINER	PAINTING	SIZE	"ATMOSPHERE OUTSIDE THE VALVE"	"ATMOSPHERE INSIDE THE VALVE"	GAS	DUST
II 2G Ex h IIC T6..T2 Gb X II 2D Ex h IIIC T85°C..T 215°C Db X			FKM, EPDM WHITE, PTFE	< 200 micron (std)	DN40 - DN200	POTENTIALLY EXPLOSIVE (G) Gas group IIC (D) Dust group IIIC	POTENTIALLY EXPLOSIVE (G) Gas group IIB (D) Dust group IIIC	1 2	21 22
					DN250 - DN300		NOT EXPLOSIVE		
II 2G Ex h IIB T6..T2 Gb X II 2D Ex h IIIC T85°C..T 215°C Db X				> 200 micron	DN40 - DN200	POTENTIALLY EXPLOSIVE (G) Gas group IIB (D) Dust group IIIC	POTENTIALLY EXPLOSIVE (G) Gas group IIB (D) Dust group IIIC		
					DN250 - DN300		NOT EXPLOSIVE		

9. STORAGE

Keep valves in their packaging during storage. Choose clean, not excessively humid locations with temperatures between -10 and +60°C. During storage, the valve must be held in a half-open position to avoid affecting the seal.

If the valves are not packaged, protect the ends to prevent liquids or other substances from entering during storage and damaging the discs or liners.

If valves are stored for long periods of time, periodically inspect their condition: in particular, check for rust, oxidation, peeling paint or even partial unscrewing of closures. It is also recommended to perform a complete opening and closing cycle of vacuum valves at least once per year.

Liners are subject to natural ageing and lose their characteristics: for this reason, after storage periods of more than two years, it is recommended to carry out a functional and tightness check before installing the valve in line.

It is recommended to protect the seals from sunlight as they are subject to UV ageing).

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10. TROUBLESHOOTING

POTENTIAL CONSEQUENCES OF FAILURE	POSSIBLE METHODS OF FAILURE	SOLUTIONS
In-line Valve Leakage	Incomplete disc closure	Check manoeuvring system / Contact OMAL
	Disc liner wear	Replace as per operating manual/maintenance leaflet
	Chemical incompatibility with valve construction materials (liner and/or disc)	Contact OMAL
	Disc wear	Verify compatibility of construction materials with the fluid intercepted / Contact OMAL
Stem Leakage	Damage to liner and O-ring seal	Replace as per operating manual/maintenance leaflet Verify compatibility of construction materials with the fluid intercepted / Contact OMAL
	Damage to body	Contact OMAL
Blocked Valve	Drive system failure	Contact OMAL
	Stem seizure	
	Stem breakage	
	Broken valve actuator connection	
Increased Manoeuvring Time/Jerky Movement	Stem seizure	Contact OMAL
	Liner hardening	Verify compatibility of construction materials with the fluid intercepted / Contact OMAL
	Partial actuator seizure	Contact OMAL
Insufficient Angle of Rotation	Actuator fails to manoeuvre	Check actuator sizing and verify that the supply air pressure is equal to or greater than the nominal pressure stated on the nameplate
	Insufficient air supply pressure	
	Mechanical stop (if present) not properly adjusted	Adjust the stops by giving more stroke
	Possible stem seizure	Contact OMAL
	Possible presence of a blocked foreign body	Dismantle the valve and check its operation on the bench
	Incorrect fastening between actuator and valve	Check fastening and adapter size

11. DISPOSAL OF END-OF-LIFE PRODUCTS

OMAL products are designed so that, once they reach the end of their life, they can be completely disassembled and the various materials can be separated for proper disposal and/or recovery.

Dismantling and disposal/recovery personnel must be qualified and equipped with appropriate personal protective equipment (PPE) according to the size, type and service for which the equipment is intended.

The management of waste produced during installation, extraordinary maintenance or following the decommissioning of the product is governed by the regulations in force in the country where the product is installed; in any case, the following general indications are given:

- Metal components (cast iron, steel, etc.) can be recovered as raw material.
- Seals/sealing elements (NBR, EPDM, FKM, etc.), as contaminated by intercepted fluids and lubrication materials, must be sent for disposal.
- Packaging materials accompanying the product must be delivered to the separate collection system in the local area.

12. DECLARATION OF CONFORMITY

OMAL S.p.A. butterfly valves have been designed, manufactured and tested to meet the requirements of the following European standards and bear the relevant CE conformity marking where required:

- Directive 2014/68/EU "Pressure Equipment Directive" PED and UKCA;
- Directive 2006/42/EC "Machinery Directive" MD;
- Directive 2014/34/EU "Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres" ATEX;
- EC Regulation No. 1907/2006 as amended concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals REACH;