BROEN
VALVE TECHNOLOGIES

BROEN BALLOMAX® BALL VALVES

TRUNNION MOUNTED – FOR DISTRICT HEATING AND DISTRICT COOLING

BROEN
VALVE TECHNOLOGIES

Climate change is our common challenge

Energy efficiency is one of the greatest challenges of our times and for district energy BROEN delivers ready solutions to meet the globally rising demand for energy efficiency.

Based on the heritage from leading edge innovations in Danish district heating, BROEN Ballomax® offers the most comprehensive range of proven ball valves for distribution and transmission of district energy in residential, commercial and industrial applications and are today a key component in district heating and district cooling networks throughout the world.

BROEN A/S is ISO 9001:2015 and ISO 14001:2015 certified.

Our brand is our promise.

ABOUT BROEN

In 1948 Poul Broen established the company BROEN, which was among the pioneers, when district heating took off in Denmark. In 1982 the BROEN Ballomax® ball valve for district heating was launched. We strive to develop and improve products that use nature's resources as efficiently as possible.

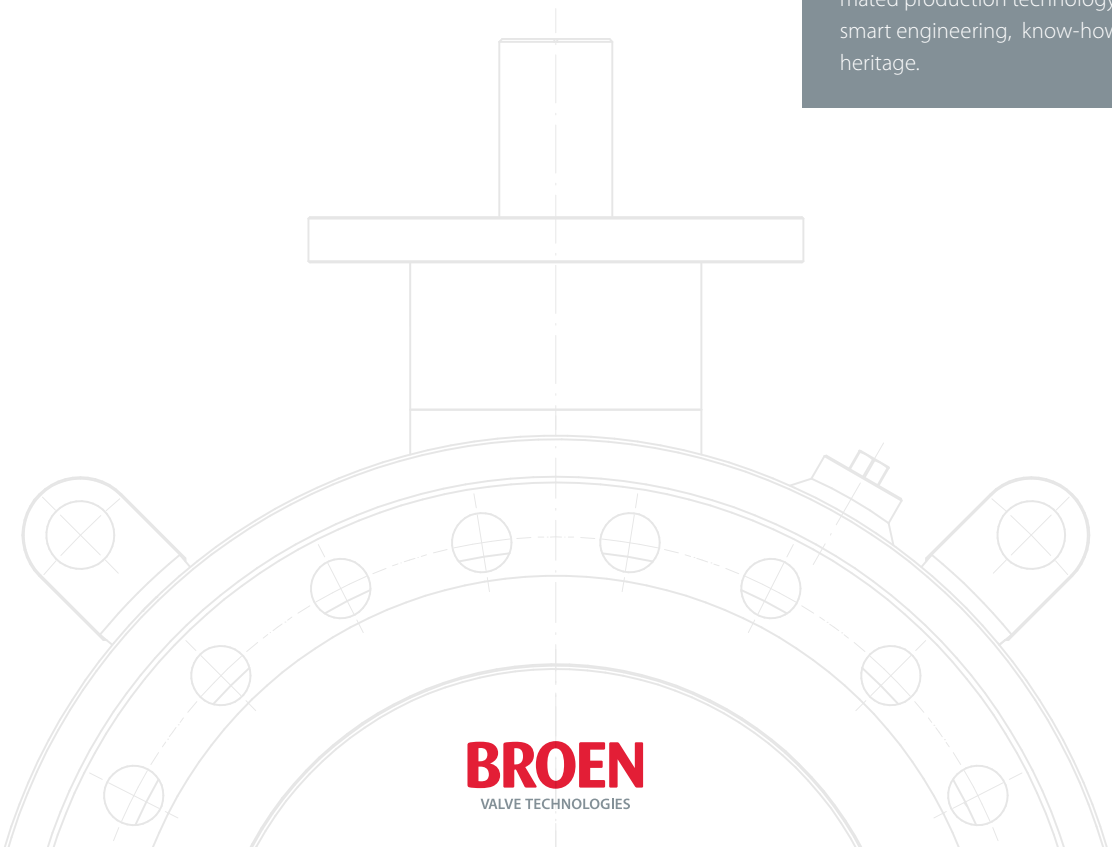
In 1993 BROEN was acquired by Aalberts Industries and today we have more than 15,000 colleagues operating from more than 200 locations in more than 30 countries. Aalberts Industries (AALB) is listed at the EuroNext Stock Exchange, NL

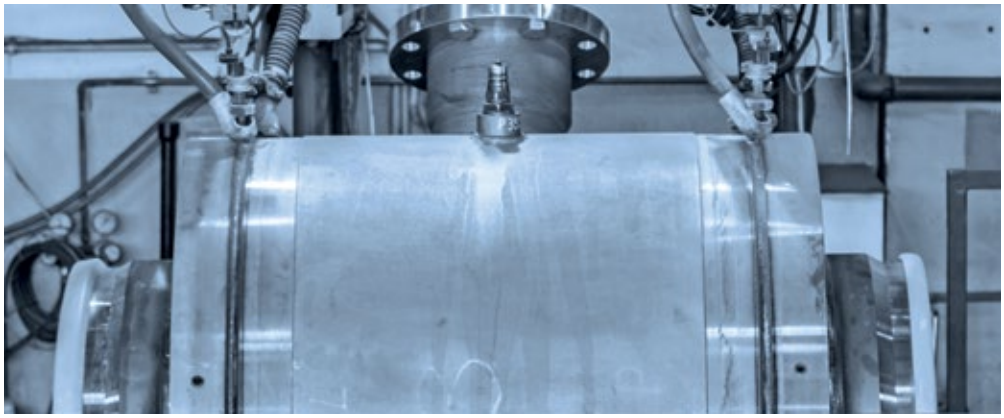
VISION AND VALUES

Our vision is simple: Be the best in valve technology. Strong values are the foundation for our business and with the same shared vision they link us together as one company across borders and time zones on 3 continents.

TOWARDS NEW OPPORTUNITIES

BROEN acquired DZT valves (PL) in 1997 and ZAWGAZ and Armatura in 2008. We focus our approach and strive to develop lean and flow efficient valve designs with efficient and automated production technology as the result of smart engineering, know-how and our strong heritage.





BROEN Ballomax® – our response

For more than 30 years the reliable design of BROEN Ballomax® has proven itself and it remains the best choice in district heating today.

Thus, BROEN Ballomax® is competitive when it comes to Low Cost of Ownership - the valve lasts as long as the district heating network.

BROEN offers complete solutions for district energy – valves, actuators, gears, flanges and spindle extenders.

The most recognized valve technology is not something we just claim, but something we have to live up to every single day.

To us quality is not just a key to market access – it goes far beyond that.

BROEN Ballomax®is your certainty of energy efficiency, reliability and low operating costs.

BROEN Ballomax® energy dfficiency - designed to last.

- PED 2014/68/EU – module H
- EN12266-1 and -2
- EN488:2015

Fully welded trunnion mounted ball valves

For demanding district energy applications

BROEN Ballomax® trunnion mounted ball valves are manufactured according to the strictest requirements for valves. High quality materials are – together with district heating expertise collected over several decades – the essential components of the best valves.

Trunnion valves feature a double bearing construction, which means that the ball is anchored both at the top and at the bottom. This increases the life of the seals and reduces the friction and torque significantly, when the valve is activated. Which in turn means, that savings can be achieved when choosing gear.

The energy-optimized design ensures minimal pressure loss, making the optimal choice when dimensioning for energy optimization.

Valves equipped with a drain valve – commonly called a "tell-tale valve" – ensures, that the dead space between the ball and the valve body can be emptied completely, so that it is possible to determine if the valve closes 100% tightly – hence its name Double Block and Bleed. This feature, can be further supplied with a tube and a ball valve to facilitate accessibility and operation.

Our trunnion valves are tested according to EN 12266-1 and -2, and are delivered with full traceability

The valves are designed to the highest temperature demands and are suitable for steam, super-heated water, hot water and cooling.

BROEN Ballomax® trunnion valves feature a small volume of cavity, as the ball is close to the body.

Scope of supply

DN150-1400 | Full bore | Reduced bore
PN16 - PN25 - PN40
Heating - Cooling | -20°C to +250°C

Trunnion mounted ball valves
Fully welded

Installation above ground level in buildings, installation channels and wells:

- Full bore | Reduced bore
- Weld-Weld | Flange-Flange
- Coated surface
- PN16 - PN25 - PN40
- DN50-1000 (nominal sizes up to 1400 on request)

Installation below ground level EN488:2015:

- Full bore | Reduced bore
- Weld-Weld
- Sand blasted surface
- PN25
- DN150-1000 (nominal sizes up to 1400 on request)

Certificates:

- DBB by Bureau Veritas
- PED 2014/68/EU – module H
- 3.1 certificate according to EN 10204
- EN 12266-1 and 2

Certificates:

- EN 488:2015
- PED 2014/68/EU – module H
- 3.1 certificate according to EN 10204
- EN 12266-1 and 2

Options:

- Corrosion protection up to C5
- DBB outlet valve
- Base feet
- Stainless steel ball
- Variable stem extension
- DBB outlet valve lockable
- Lubrication system

Options:

- Stainless steel ball
- Variable stem extension
- Insulation

Actuation: Manual, electric or other

Tested and adjusted prior to delivery

Fully welded trunnion mounted ball valves

Our fully welded BROEN Ballomax® trunnion mounted ball valves can be delivered for operation above ground level with a range of features and advantages:

- Small volume of cavity, as the ball is close to the body
- Our Double Block and Bleed (DBB) system is certified by Bureau Veritas
- With DBB, the tightness can be controlled while, the valve is in operation
- Lubrication system is standard from DN350 upwards
- 3.1 traceability certificate according to EN10204
- The valve can be delivered either as full bore or reduced bore
- Delivery with or without base plate

Technical features:

- Produced according to PED 2014/68/EU – module H
- Functional and pressure test according to EN 12266-1 and -2
- Flange dimensions according to EN 1092-1
- Butt-weld ends according to EN 12627
- Actuator mounting flange ISO 5211
- Electronickel coated ball
- Optional stainless steel ball

Ballomax®

DESIGNED TO LAST

DN150-1000 | Full or reduced bore
PN16 - PN25 - PN40
Temp. -20°C to max. +250°C *

* Temperature ranges according to sealing materials.

Anti blow-out proof stem design

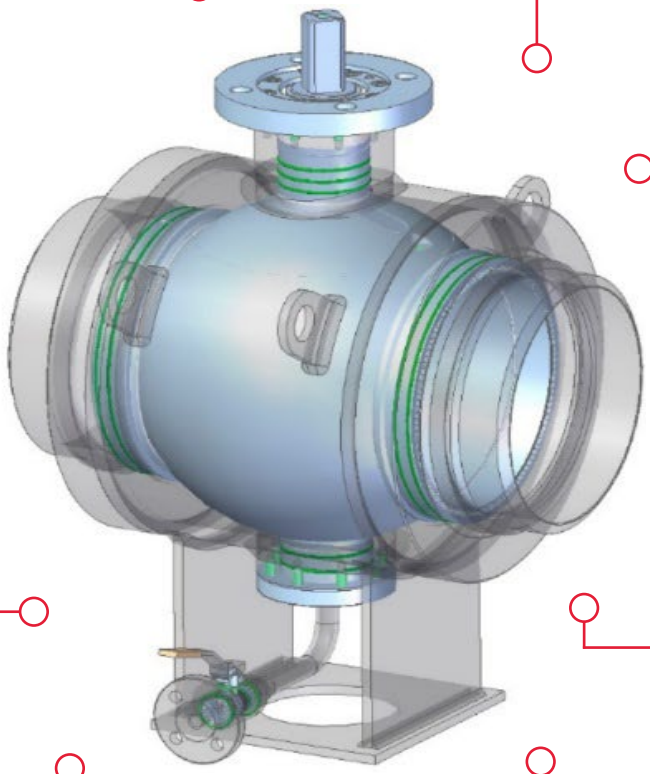
The anti blow-out design prevents the stem from blowing out after disassembly of the stem sealing top cover, while the valve is under pressure.

ISO connection

According to ISO5211.

Solid ball

Solid balls secure that the valves have a low fluid resistance and consequently high Kvs values.



Flanged or welded ends

Valves can be delivered with flanges or with welding ends.

Fully welded body – designed to last

The fully welded bodies will comply or even exceed requirements for valves used in district heating systems and in industrial applications.

Water and steam applications

Optional lubrication system

– standard from DN350.

Single Piston feature

Pressure relieving.

Certified DBB

Here illustrated with optional outlet valve. Also available with lockable outlet valve.

Base plate

Available on request.

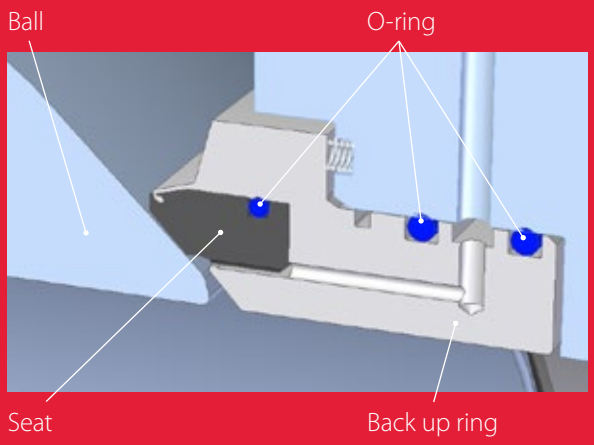
General sealing system and stem sealing

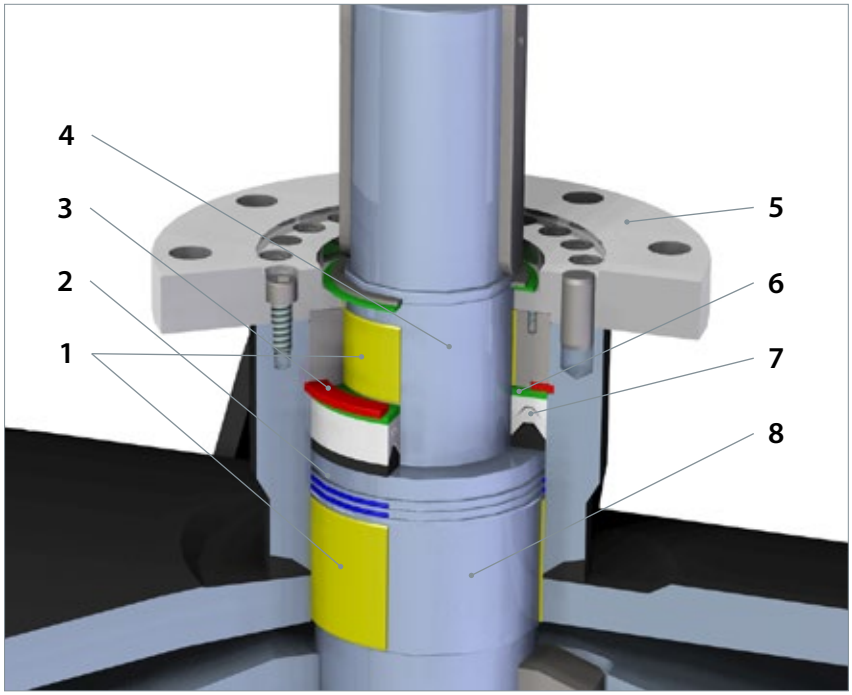
Installation above ground level in buildings, installation channels and wells

Ball sealing system

The ball sealing system is a flexible sealing, where the sealing touches the surface of the ball and secures tightness class "A" according to EN 12266-1 and ISO5208.

The sealing is made of PTFE with a carbon content of 20% and is chambered in the metallic seat ring. The PTFE C density element is in permanent contact with the spherical surface by the spiral springs. O-ring seals made of high-quality EPDM seal the seat ring chamber against the housing guide.





For temperatures < 150°C: Sealing provided from O-ring EDPM
For temperatures > 150°C: Sealing provided from O-ring FFKM

Stem sealing description

The design of our stem sealing has proven itself for years and is a heritage of the Zawgaz trunnion ball valve design, which has now been updated and engineered as integrated part of the BROEN trunnion mounted ball valves.

The sealing of the stems used in the valves manufactured by BROEN depends on the operating temperatures of the valve and the working medium, for which the given valve is dedicated.

No.	Component	Description
1	Bearing	
2	O-ring	< 150°C EPDM / > 150°C FFKM
3	Split ring cotter	Stainless steel / 1.4021 / AISI 420 / X20Cr13
4	Stem	Stainless steel / 1.4021 / AISI 420 / X20Cr13

No.	Component	Description
5	ISO flange	P335NH +Ni-Cr
6	Washer	Stainless steel / 1.4021 / AISI 420 / X20Cr13
7	Packing and sealing	PTFE & PTFE+C
8	Sleeve	Stainless steel / 1.4021 / AISI 420 / X20Cr13

BROEN VALVE TECHNOLOGIES

Double Block and Bleed

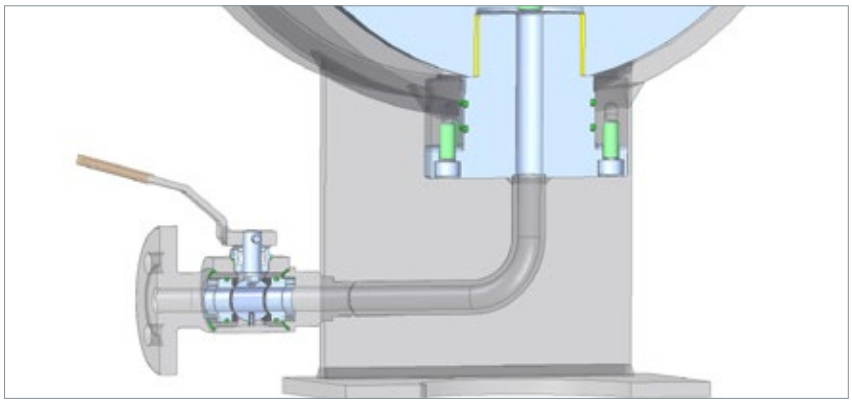
Installation above ground level in buildings, installation channels and wells

Certified Double Block and Bleed (DBB)

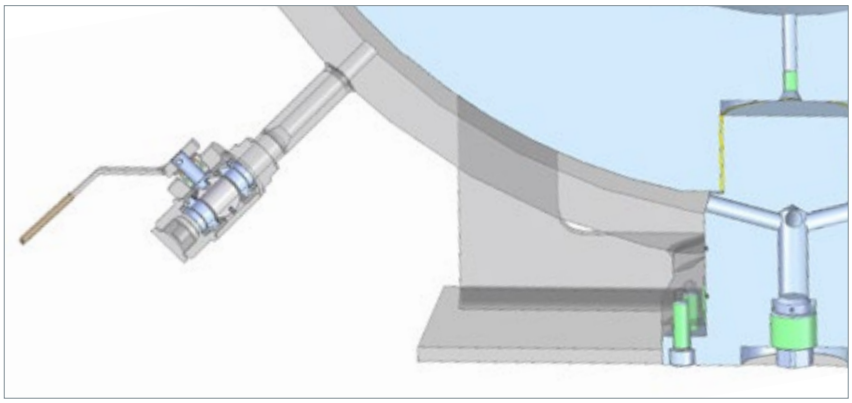
The DBB feature allows the release of pressure closed in the cavity between the ball and the body. It enables to check the tightness of the valve, while the valve is still installed.

The DBB system ensures the simultaneous upstream and downstream sealing, while also permitting the release of the overpressure in the cavity, in both fully open and fully closed positions.

DBB from BROEN is certified by Bureau Veritas.



Open position



Closed position

BROEN Ballomax® can be delivered with DBB outlet valve placed different places on the valve body.
BROEN Ballomax® Trunnion is delivered with DBB outlet at the bottom as standard.
The drain allows the pressure in the cavity to be released manually, as well as the tightness of the valve to be checked, without the need to shut down the pipeline.

Gears and actuators

Installation above ground level in buildings, installation channels and wells

The synergy of configuring the right gear to the task and making a ball valve operate seamlessly for years is a specialist task and at BROEN we strive to deliver ready solutions, that will operate with a minimum of downtime. We know, that the valve's availability to operate is a core function for customers' applications.

BROEN delivers a wide range of competitive actuation possibilities, that we know will secure the availability to operate the valve for many years.

BROEN is able to deliver valves with actuators from any proven supplier.

We counsel and advice our customers all the way to ensure, that valve, gears and cabling are optimized to each other and we deliver regulated and commissioned valves to validate the operation of the valves.

BROEN Worn gear
A sturdy and solid manual gear of high quality.

BROEN Planetary gear
A sturdy and solid manual gear of high quality.

Electric gears
We supply customer specific ball valves with custom built pre-adjusted electric gears from leading gear manufacturers.

Ever since BROEN was established
our passion for valve technology has been
a major part of our core competences.

Our brand is our promise.

Installation below ground level | EN 488:2015 (EHP003)

Our fully welded trunnion mounted valves can be delivered for operation below ground with a range of features:

In addition to standard height, BROEN offers the optimal possibility for columns with stem extensions according to customers requests are possible.

All trunnion mounted valves will be supplied with 3.1 traceability certificates in order to document the quality of the valve.

Technical features:

- Positioning indicator – ball position indicated on the top of the spindle
- Produced according to EN 488:2015
- Produced according to PED 2014/68/EU – module H
- Functional and pressure tested according to EN 12266-1 and -2
- Butt-weld ends tested according to EN 12627
- Actuator mounting flange ISO 5211
- Electronickel coated ball
- Optional stainless steel ball

DN 150-1000 | Full bore or reduced bore
PN25
Temp. -20°C to max. +200°C *

* Temperature ranges according to sealing materials.

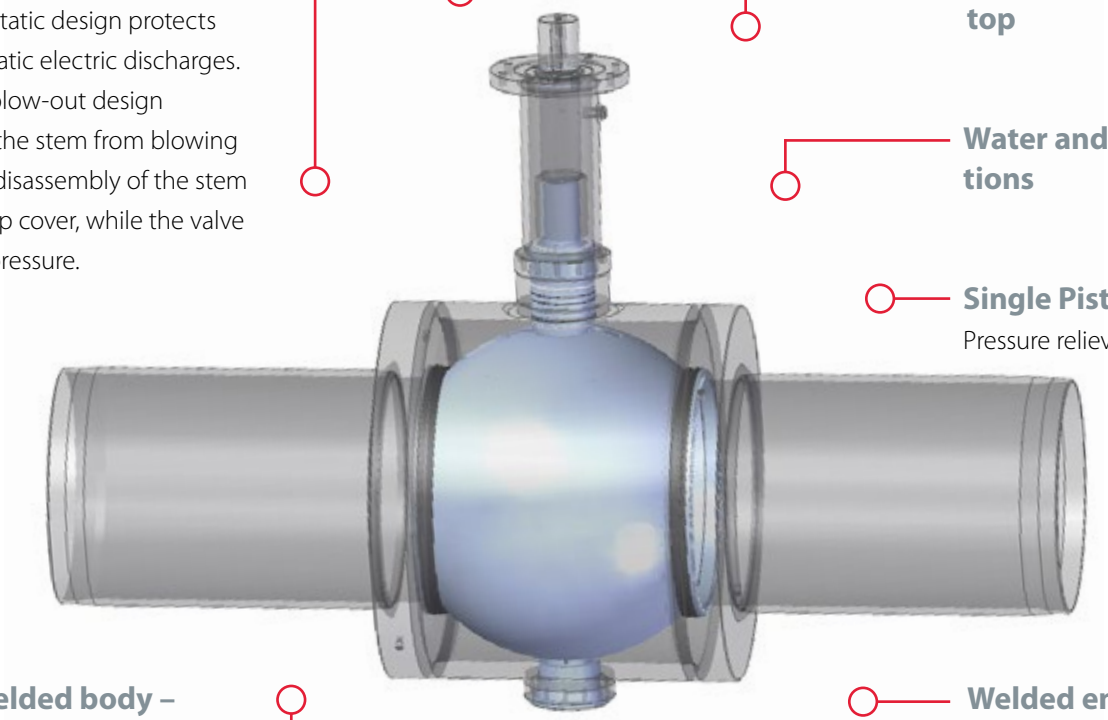
ISO connection according to ISO5211

Optional stem extension
Stem extensions according to customers requests are possible.

Anti blow-out proof stem design
The anti-static design protects against static electric discharges. The anti blow-out design prevents the stem from blowing out after disassembly of the stem sealing top cover, while the valve is under pressure.

Hexagon connection on top

Water and steam applications



Single Piston feature
Pressure relieving effect.

Fully welded body – designed to last
The fully welded bodies will comply or even exceed requirements for valves used in district heating systems and in industrial applications.

Welded ends
Valves are delivered with welding ends.

Solid ball
Solid balls secure, that the valves have a low fluid resistance and consequently high Kvs values.

EN 488:2015
Designed and produced according to EN 488-2015.

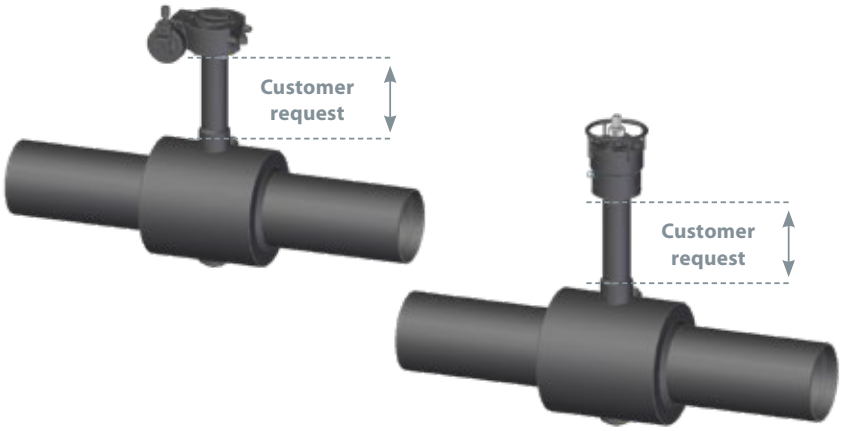
Stem sealing, columns, extensions and insulation

Installation below ground level | EN 488:2015

Stem sealing

The design of our stem sealing has proven itself for years and is a heritage from the proven Zawgaw trunnion ball valve design, which has now been updated and engineered as integrated part of the BROEN trunnion mounted ball valves.

The sealing of the stems used in the valves manufactured by BROEN depends on the operating temperatures of the valve and the working medium, for which the given valve is dedicated.



Columns and extensions

The stem extension can be made according to customer requested height and all trunnion mounted ball valves are delivered with the ISO 5211 actuator mounting flange.

Trunnion mounted valves for installation below surface level can be delivered with a flange for actuator mounting of a planetary gear or bevelgear installed on various length columns.

Insulation and operation below ground level

The BROEN Ballomax® Trunnion mounted valves can also be delievered pre-insulated.

BROEN VALVE TECHNOLOGIES

Gears and actuation

Installation below ground level | EN 488:2015

The synergy of configuring the right gear to the task and making a ball valve operate seamlessly for years is a specialist task and at BROEN we strive to deliver ready solutions, that will operate with a minimum of downtime, as we know, that the valve's availability to operate, is a core function for customers' applications.

BROEN delivers a wide range of competitive actuation possibilities, that we know will secure the availability to operate the valve for many years.

BROEN is able to deliver valves with actuators from any proven supplier. We counsel and advice our customers all the way to ensure that valve, gears and cabling are optimized to each other and we deliver regulated and commissioned valves to validate the operation of the valve – also in tough underground conditions.

BROEN Mobile actuator
A manual gear with a mobile actuator for flexible operations, wher the actuation of the valve needs to be transportable.

BROEN Planetary gear
A sturdy and solid manual gear of high quality.

BROEN-Worn gear
A sturdy and solid manual gear of high quality.

Electric gears
We supply customer specific ball valves with custom built electric gears from leading gear manufacturers.

Trunnion mounted ball valves – Reduced flow

Installation above ground level in buildings, installation channels and wells

Size | Pressure | Torque | Kvs values

DN250-400 RP

Torque STD				
DN [bar]	DN250 [Nm]	DN300 [Nm]	DN350 [Nm]	DN400 [Nm]
0-10	277	459	663	858
16	408	676	983	1,279
20	496	821	1,197	1,559
25	605	1,002	1,464	1,909
40	934	1,544	2,266	2,960

Kvs value				
DN	DN250	DN300	DN350	DN400
Kvs [m3/h]	3,410	5,101	7,853	10,443

DN500-800 RP

Torque STD				
DN [bar]	DN500 [Nm]	DN600 [Nm]	DN700 [Nm]	DN800 [Nm]
0-10	1,303	1,969	3,664	6,536
16	1,960	2,926	5,583	10,071
20	2,399	3,564	6,863	12,427
25	2,947	4,361	8,463	15,372
40	4,590	6,754	13,262	24,207

Kvs value				
DN	DN500	DN600	DN700	DN800
Kvs [m3/h]	14,306	22,354	32,188	43,812

Trunnion mounted ball valves – Full flow

Installation above ground level in buildings, installation channels and wells

Size | Pressure | Torque | Kvs values

DN200-350 FB

Torque STD				
DN [bar]	DN200 [Nm]	DN250 [Nm]	DN300 [Nm]	DN350 [Nm]
0-10	277	459	663	858
16	408	676	983	1,279
20	496	821	1,197	1,559
25	605	1,002	1,464	1,909
40	934	1,544	2,266	2,960

Kvs values				
DN	DN200	DN250	DN300	DN350
Kvs [m3/h]	7,264	12,804	21,346	26,076

DN400-800 FP

Torque STD					
DN [bar]	DN400 [Nm]	DN500 [Nm]	DN600 [Nm]	DN700 [Nm]	DN800 [Nm]
0-10	1,303	1,969	3,664	6,536	7,176
16	1,960	2,926	5,583	10,071	10,952
20	2,399	3,564	6,863	12,427	13,469
25	2,947	4,361	8,463	15,372	16,616
40	4,590	6,754	13,262	24,207	26,056

Kvs values					
DN	DN400	DN500	DN600	DN700	DN800
Kvs [m3/h]	34,414	55,005	97,806	132,349	172,107

Installation below ground level – Reduced bore

Installation below ground level | EN 488:2015

Size | Pressure | Torque | Kvs values

EN 488 DN150-500 RP HEX

Torque

DN [bar]	DN150 [Nm]	DN200 [Nm]	DN250 [Nm]	DN300 [Nm]	DN350 [Nm]	DN400 [Nm]	DN500 [Nm]
0-10	117	177	277	459	663	858	1.303
16	172	261	424	719	1,131	1,391	1,960
20	208	318	516	876	1,382	1,699	2,399
25	254	388	630	1,072	1,695	2,085	2,947

Kvs values

DN	DN150	DN200	DN250	DN300	DN350	DN400	DN500
Kvs [m3/h]	2,208	2,520	4,275	6,680	9,982	13,586	18,469

EN 488 DN150-800 RP ISO

Torque

DN [bar]	DN150 [Nm]	DN200 [Nm]	DN250 [Nm]	DN200 [Nm]	DN300 [Nm]	DN400 [Nm]	DN500 [Nm]	DN600 [Nm]	DN700 [Nm]	DN800 [Nm]
0-10	117	177	277	459	663	858	1,303	1,969	3,664	6,536
16	172	261	424	719	1,131	1,391	1,960	2,926	5,583	10,071
20	208	318	516	876	1,382	1,699	2,399	3,564	6,863	12,427
25	254	388	630	1,072	1,695	2,085	2,947	4,361	8,463	15,372

Kvs values

DN	DN150	DN200	DN250	DN200	DN350	DN400	DN500	DN600	DN700	DN800
Kvs [m3/h]	2,208	2,495	4,275	6,680	9,982	13,586	18,469	28,858	41,555	56,561

BROEN VALVE TECHNOLOGIES

Installation below ground level – Full bore

Installation below ground level | EN 488:2015

Size | Pressure | Torque | Kvs values

EN 488 DN150-700 FP HEX

Torque

DN	DN150	DN200	DN250	DN300	DN350	DN400	DN500	DN600	DN700
[bar]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]
0-10	177	277	459	663	858	1,303	1,969	3,664	6,536
16	261	424	719	1,131	1,391	1,960	2,926	5,583	10,071
20	318	516	876	1,382	1,699	2,399	3,564	6,863	12,427
25	388	630	1,072	1,695	2,085	2,947	4,361	8,463	15,372

Kvs values

DN	150	200	250	300	350	400	500	600	700
Kvs [m3/h]	4,223	7,264	12,804	21,346	26,076	34,414	55,005	97,806	132,349

EN 488 DN150-1000 FP ISO

Torque

DN	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600	DN700	DN800	DN900	DN1000
[bar]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]
0-10	177	277	459	663	858	1,303	1,969	1,969	3,664	6,536	7,176	10,651	13,381
16	261	424	719	1,131	1,391	1,960	2,926	2,926	5,583	10,071	10,952	16,493	20,728
20	318	516	876	1,382	1,699	2,399	3,564	3,564	6,863	12,427	13,469	20,388	25,626
25	388	630	1,072	1,695	2,085	2,947	4,361	4,361	8,463	15,372	16,616	25,256	31,748

Kvs values

DN	150	200	250	300	350	400	450	500	600	700	800	900	1000
Kvs [m3/h]	4,223	7,264	12,804	21,346	26,076	34,414	44,573	55,005	97,806	132,349	172,535	218,364	269,586

BROEN
VALVE TECHNOLOGIES

BROEN Engineered Valve Group

For more than 70 years BROEN has been the global leader in the development and production of valve technology for the control of water, air, gas and oil. BROEN delivers complete solutions for HVAC building installations and is a leading supplier of district energy valves.

We know application and valve technology in depth and in close dialogue with our customers and partners all over the world we create value and reliability with proven valves offering full quality assurance.

BROEN is headquartered in Assens, Denmark and is part of Aalberts Industries NL.

Read more on: **www.broen.com**

BROEN Group locations

Headquarters in Assens, DK

Sales- and productions sites ●

BROEN A/S, Assens (DK)
BROEN SA, Dzierżoniów (PL)
BROEN LLC, Kolomna (RU)
BROEN INC., Houston (US)
BROEN OIL & GAS, Suchy Las & Rogoźno (PL)
BSM Valves B.V., Breda (NL)
Clorius Controls, Dzierżoniów (PL)

Sales companies and offices ○

BROEN, Assens
BROEN, Stockholm
BROEN, Helsinki
BROEN SEI, Romania
BROEN, Beijing
BROEN, Singapore
BROEN, Dusseldorf
BROEN, Moscow
Clorius Controls, Copenhagen
Clorius Controls, Shanghai

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