

Products for nuclear power plants



IMPORTANT INFORMATION FOR SAFE USE

- In order to use the product safely, be certain to read and understand the "Installation Manual" before proceeding with any work.
- There are places on these joints that may be sharp so always wear the proper work gloves and appropriately protect hands before performing any work.

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●homepage <https://www.victaulic.co.jp>



Note

Specifications, dimensions, and other product features in this catalog are subject to improvements and changes. Please confirm product specifications before proceeding with design.

Our Products are achieving high quality and high performance water stopping properties.

Utilized in nuclear power plants

Introduction

We are a specialized manufacturer of joints, and is a top manufacturer of steel expansion flexible joints in particular. Steel expansion flexible joints have a rich track record in the infrastructure field, particularly in the nuclear power field, where they were adopted in six 3000A circulating water pipes (underground) in 1981, and have been used at approximately 100 locations in Japan since then.

A regulatory agency has confirmed that our steel expansion flexible joints comply with new regulatory standards as a countermeasure against overflows in circulating water systems within turbine buildings of nuclear power plants. Additionally, steel expansion flexible joints are listed as an example of equipment in [Flood Prevention Equipment Guidelines (JEAG4630-2020)]

We will continue to strive to provide a stable supply of high-quality, high-performance products and we are contribute to the safety operation of nuclear power plants.

Kobe Plant



We provide high quality, high safety, and high performance joints.

Steel expansion flexible pipe

Joints for maintenance and reinforcement

High safety

High quality

High performance

Automatic seal mechanism

Steel expansion flexible pipe(Closer Joint Type Σ2400A)

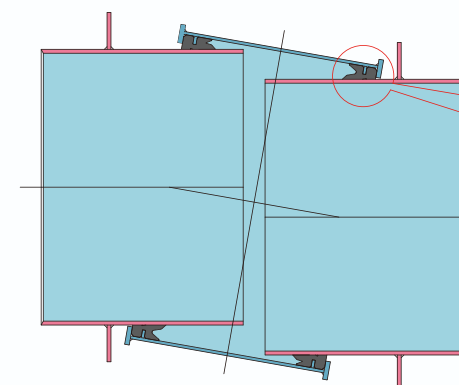
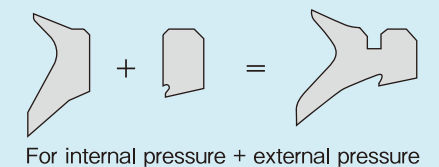


Seal mechanism

Closer Joint Type Σ

Condition where internal water pressure load + eccentricity occurs

Steel expansion flexible pipes absorb twisting and do not affect piping, even if there is significant expansion, contraction, or eccentricity.



Initial surface pressure P0

Internal pressure P

Initial surface pressure P0+ Internal pressure P= Power to stop water

Various joints in nuclear power plants

① Pipe joint(Exposure / For RO equipment)

Jady Coupling 50~80A

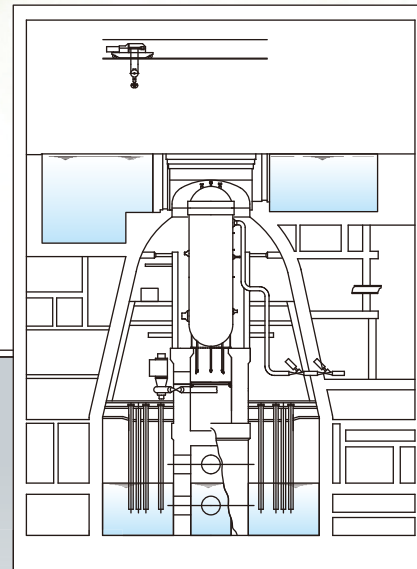


Performance comparison

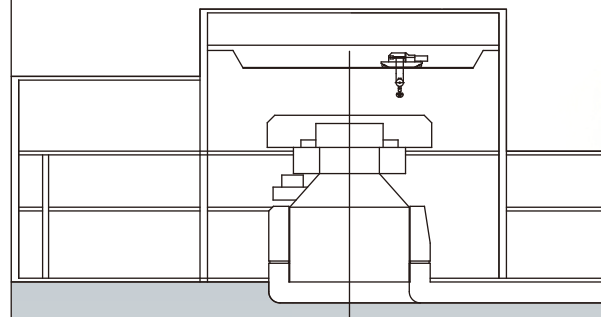
	Expansion/ contraction	Angle	Eccentricity	Twist
①	○	○	○	◎
②・③	◎	◎	◎	◎
④	○	○	○	◎

※ ①...When using 2 or more

Reactor building



Turbin building

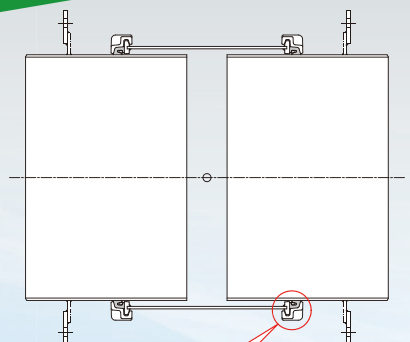
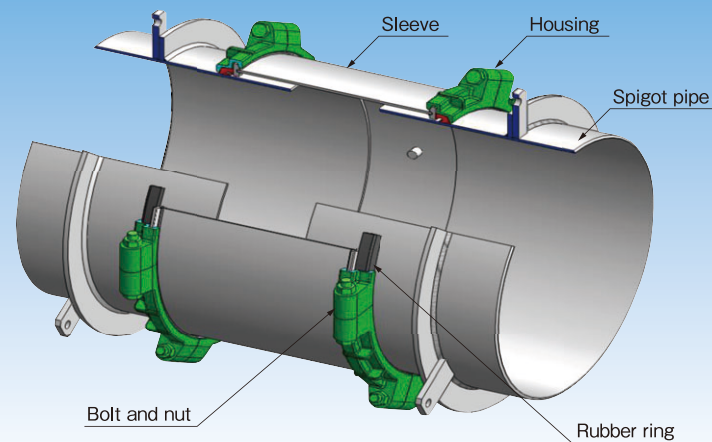


Contributing to the safe and stable operation and maintenance of nuclear power plants.

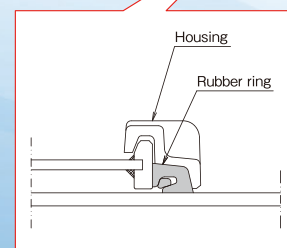
For underground

③ Steel expansion flexible pipe

Closer Joint Type CL 50~2400A



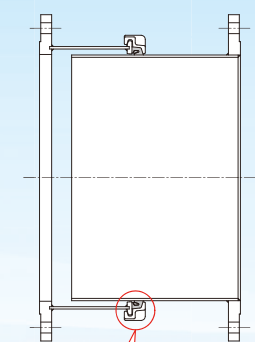
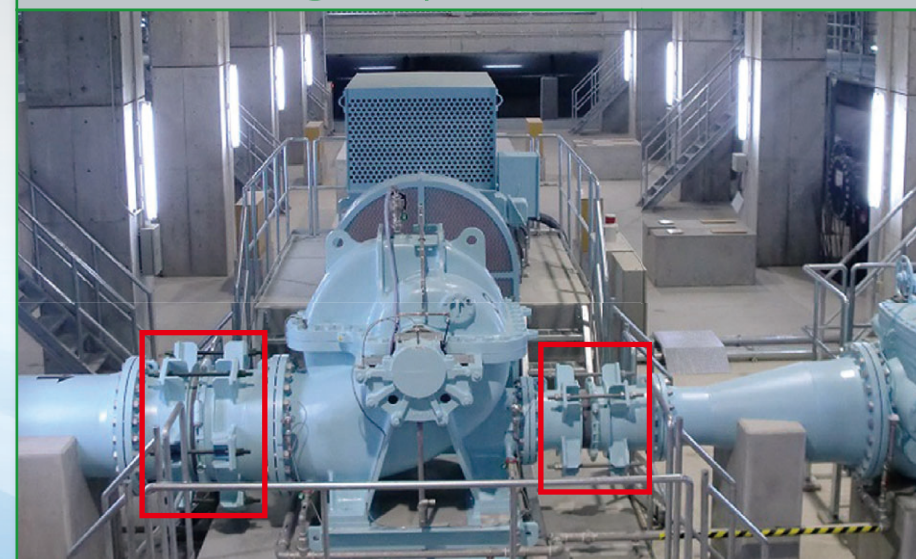
Airtight area



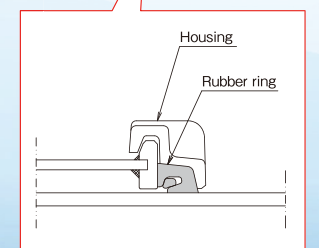
④ Steel expansion joint around valve

※With adjustment function

Flange Adapter 250A・600A



Airtight area

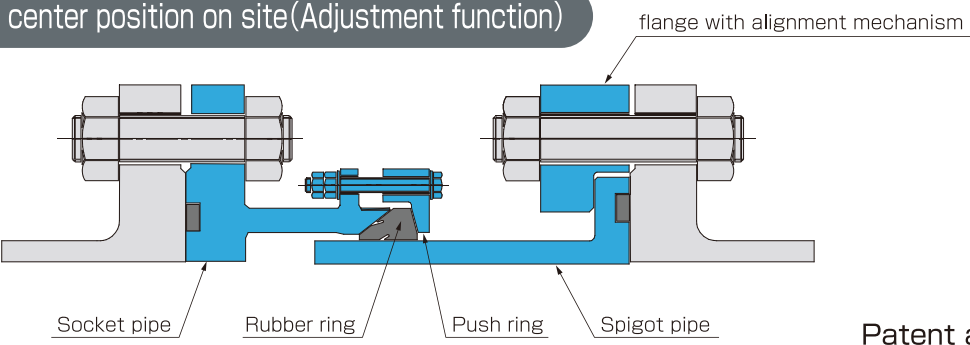


Proposals regarding joints around circulating water pumps and condensers

Flexible joints

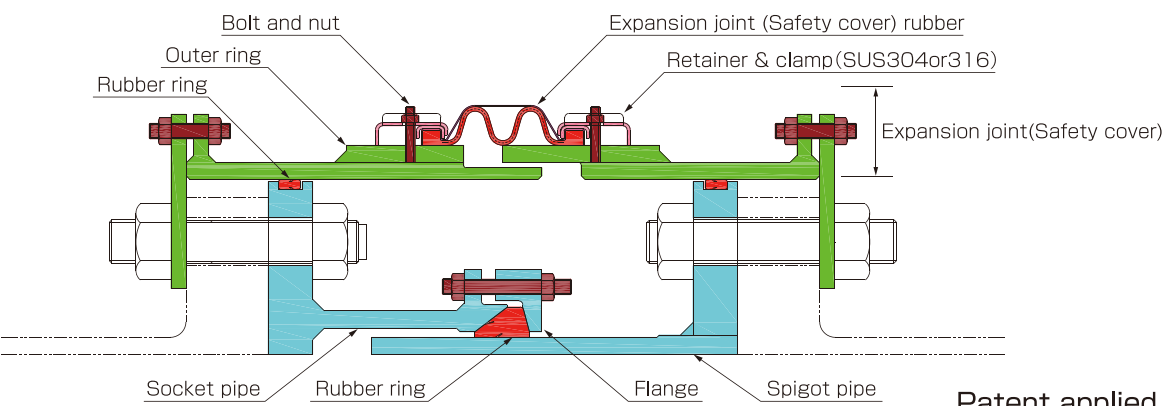
Flange Adapter Type FT-DB

Possible to adjust center position on site(Adjustment function)



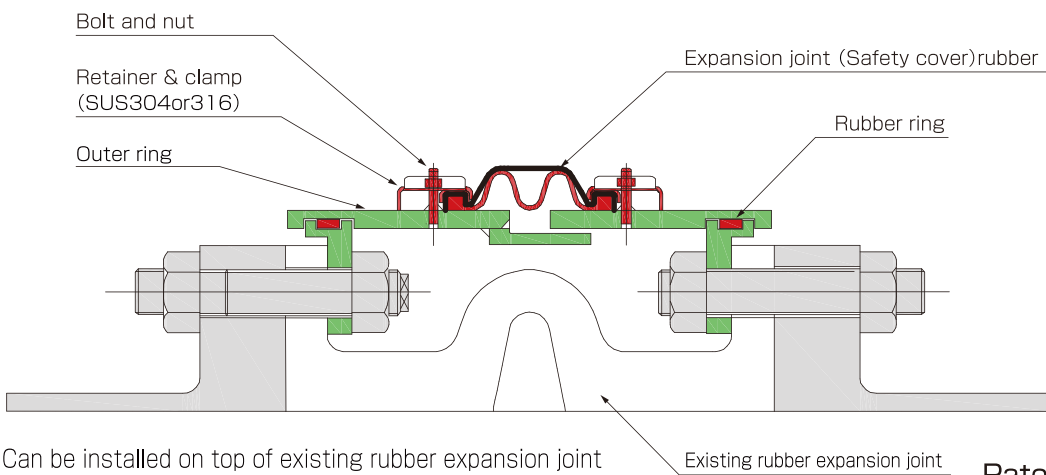
Reducing the amount of overflow

If an earthquake damages existing connections, water can enter the turbine building and electrical equipment. However, you can reduce the amount of overflow per hour by replacing it with type FT-DB.

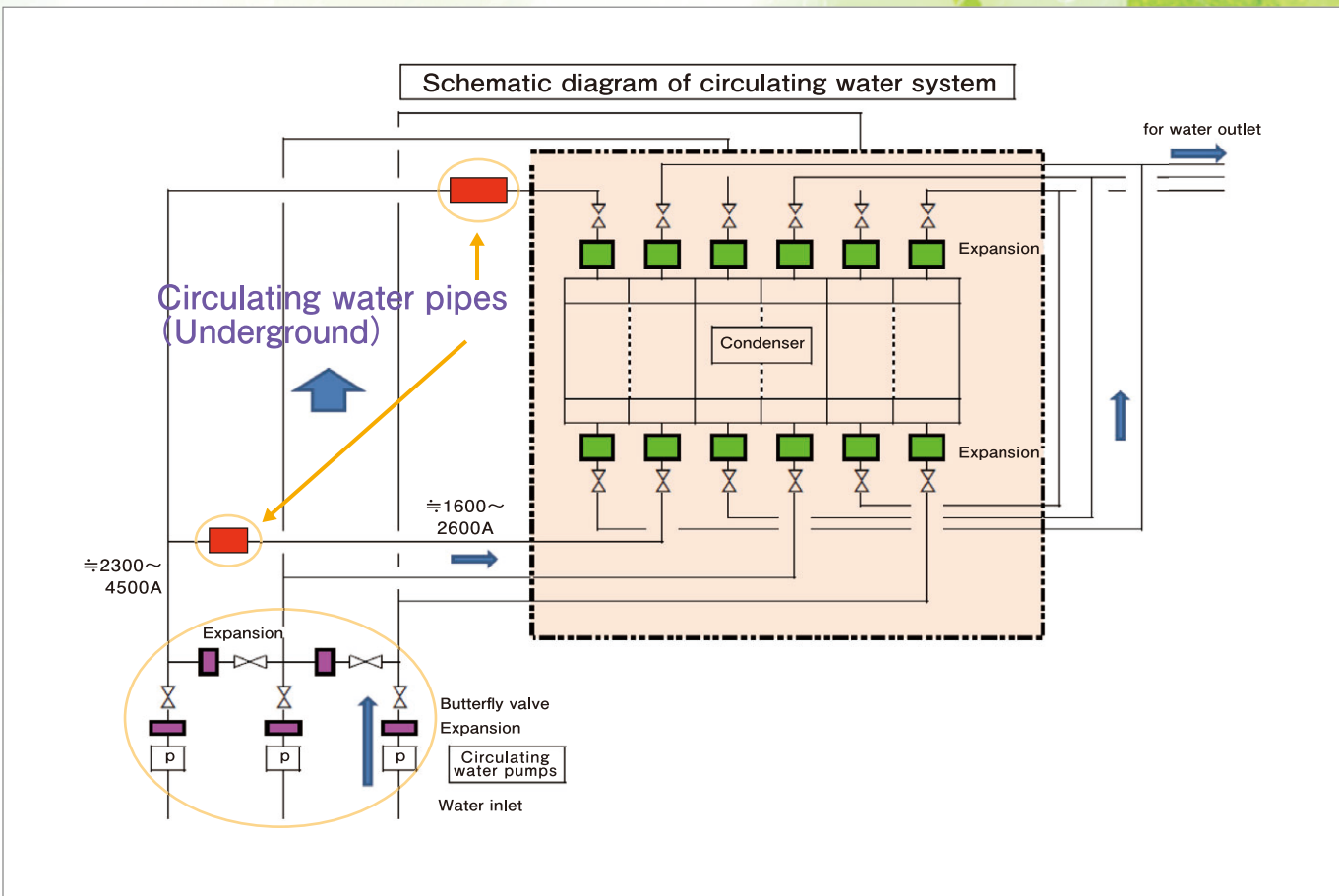


What's expansion joint (Safety cover)

- Although it is possible to reduce the amount of water overflow per hour by replacing rubber expansion joints with flexible joints, expansion joints (safety covers) are used to further improve reliability.
- Expansion joints (Safety covers) can be installed over existing joints around condenser that are not easy to replace. (※However, it can be installed if the installation dimensions can be secured.)



Application examples of steel expansion flexible pipes in the nuclear power plants



Circulating water pipes(Underground)

•The allowable eccentricity and expansion/contraction amount have been improved by reviewing the design standards. (RHRS sea water system, DG sea water system)

Around the Circulating water pumps(Exposure)

•The amount of water overflow can be reduced by replacing the existing rubber expansion joints with our steel expansion flexible pipes.

Around the Condensers(Exposure)

•The amount of water overflow can be reduced by installing an expansion joints (Safety cover) over the existing rubber expansion joints.

Products name	Type	Diameter	Underground	Exposure	Pressure classification	Performance/Applications	Place of use
Closer Joint※	Type Multi Def	2000~2900	◎	◎	1.0MPa	Expansion/contraction/eccentricity/bending/twist	Circulating water (Exposure) (Underground)
		3000~3600	◎	◎	0.5MPa		
	Type CL	50~1800	◎	◎	1.0MPa~2.9MPa※		
		2000~2400	◎	◎	1.0MPa		
Flange Adapter※	Type FA-CB	50~1800	△	◎	1.0MPa~2.9MPa	Expansion/contraction/bending/twist	Around the Circulating water pumps
		2000~2400	△	◎	1.0MPa		
Flexible joint※	Type FT-DB	2400~3000	△	◎	1.0MPa	Expansion/contraction/bending/twist Center position adjustment function	Around the Condensers
Expansion joint (Safety cover)※	※Note 1	2400~3000	△	◎	1.0MPa	Expansion/contraction/bending/twist	

※Pipe type---Steel pipes, SUS pipes, FR pipes, etc./ Designed according to pipe type and diameter

※Pressure classification---Type CL 500A pipes have a proven track record in 3.45Mpa RHRS system (compatible with atmospheric and negative pressure)

※Note 1---Designed after on-site survey (measurement)

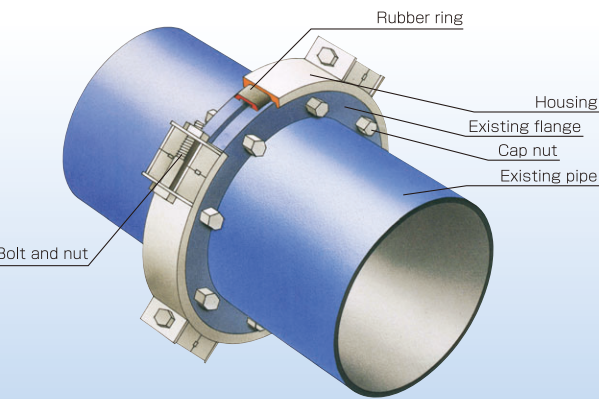
◎ Available △ Can be used depending on conditions (please contact us)

Joints for maintenance and reinforcement

Flange reinforcement joints

※Flange reinforcement joints are used in thermal power plants and nuclear power plants.

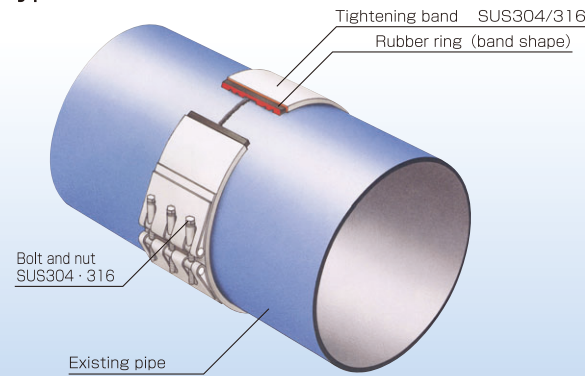
Type RJF



Reinforcement joints for weld beads etc.

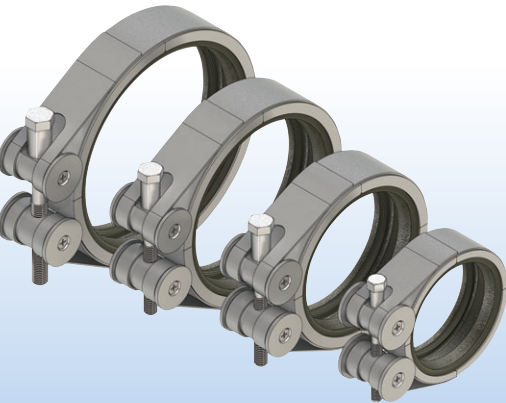
※Flange reinforcement joints are used in thermal power plants and nuclear power plants. Reinforces cracks in pipe weld beads

Type RB



Reinforcement joints for welded bead of bent pipes

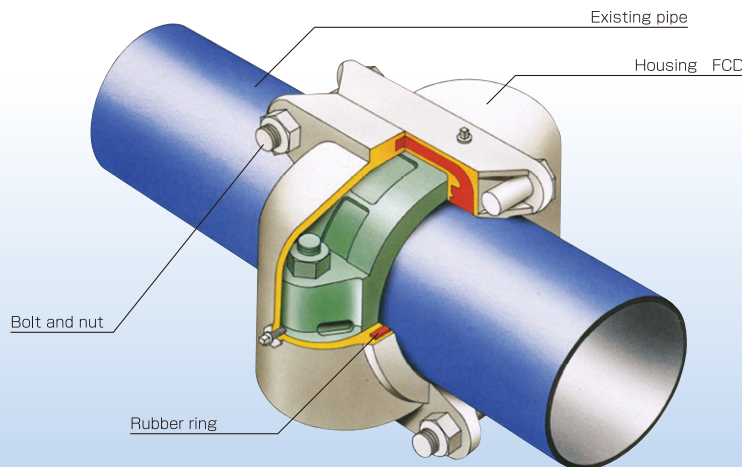
※Flange reinforcement joints are used in and nuclear power plants. (Maximum operating pressure 1.6MPa)



Reinforcement joints for welded parts(elbow) of bent pipes. Can be installed with one bolt. Applicable to reinforce not only weld beads on bend pipes but also weld beads on straight pipes. Joints with diameters of 80A to 150A are available.

Mechanical joints・reinforcement joints for welded bead

Mechanical joints and reinforcement joints are used in thermal power plants(2.0MPa)



In addition to mechanical joints, we have a track record of reinforcing welded bead parts of straight pipes and bend pipes.

Joints for maintenance and reinforcement

Reinforced joints for turbine building joints

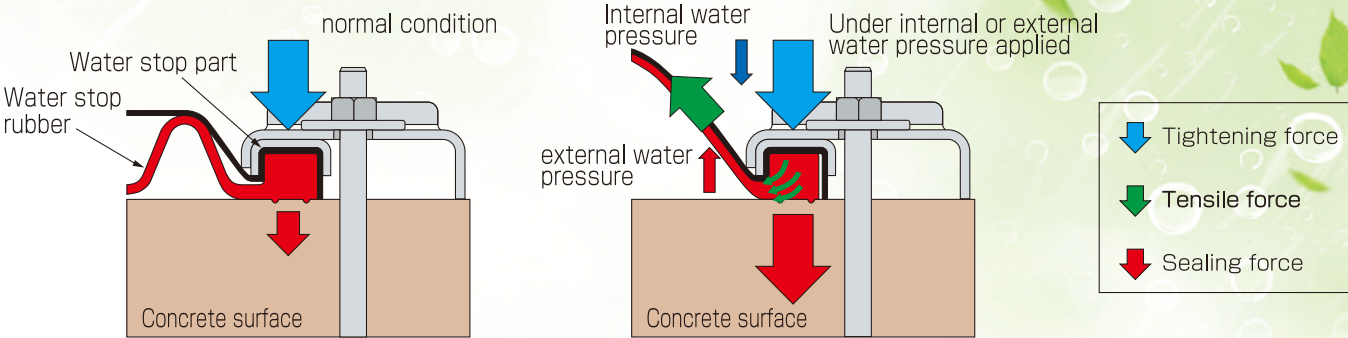
※Reinforcement joints are used in thermal power plants(Spillway)

Usefulness

- Water supply facilities (water distribution reservoirs, water purification reservoirs, sedimentation reservoirs, etc.) Seismic reinforcement of joints
- Sewerage facilities (aeration tank, sedimentation reservoirs, pipe gallery, etc.) Seismic reinforcement of joints
- Seismic reinforcement of joints in communal ditches
- Seismic reinforcement of joints in other facilities

Features

- A self-sealing structure is adopted, and the sealing force is strengthened when internal or external water pressure is applied.



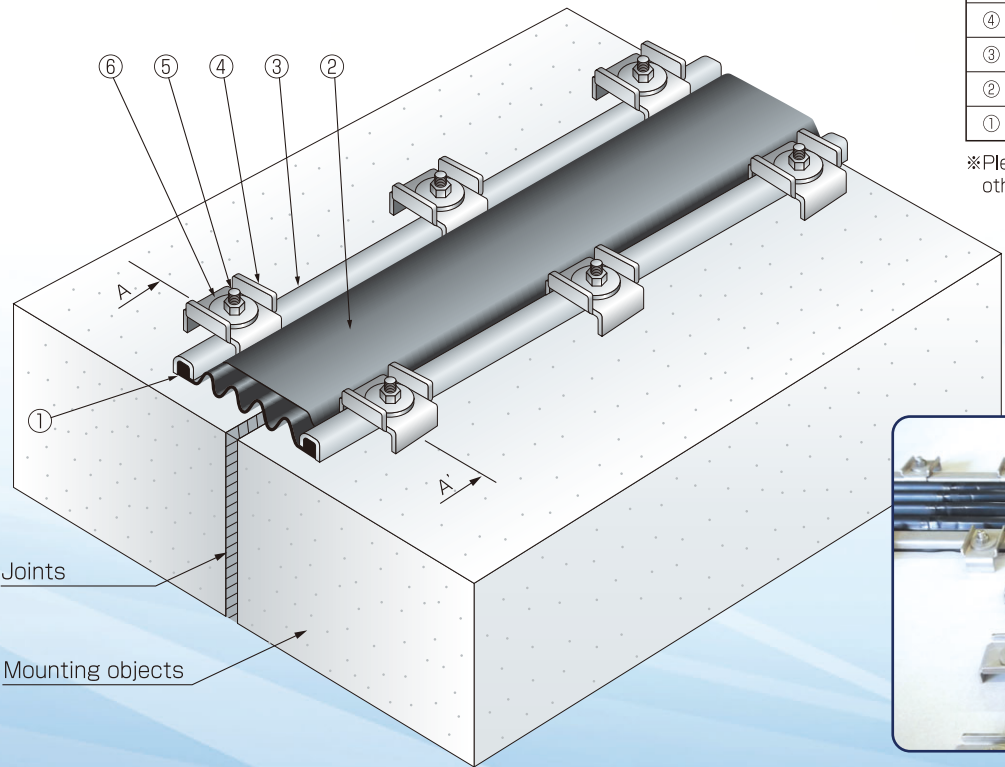
※The sealing mechanism presses the water stop rubber end against the concrete surface via an anchor bolt to stop water.

※The sealing force becomes stronger as the internal water pressure increases and the pressure on the concrete surface increases. Also, when the flexible part is pulled out by external water force, the sealing force becomes stronger due to the increased pressing force of the water stop part in the gap between the retainer (□-shaped holding metal fitting) and the concrete surface.

※Even if the tightening force of the water stop rubber decreases with long-term use, and the sealing force is strengthened when internal or external water pressure is applied. There is no need to drill holes in the waterproof rubber, reducing construction time. This product passes the water quality standards of the Ministry of Health, Labor and Welfare.

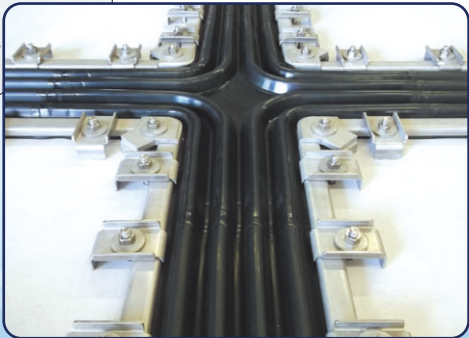
This product is compatible with T-shaped joints and cross-shaped joints. Please contact us for other special joint shapes.

Structure



No.	Name	Material
⑥	Washer	SUS304/SUS316
⑤	Anchor bolt	SUS304/SUS316
④	Clamp	SUS304/SUS316
③	Retainer	SUS304/SUS316
②	Cover rubber	E PDM
①	Water stop rubber	E PDM

※Please contact us regarding materials other than those listed above.



Closer Joint Type Σ functional test

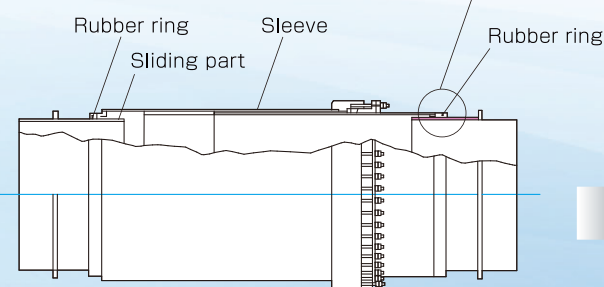
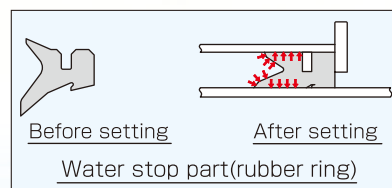


Eccentricity/Expansion
: Standard (basic size)
Max presser : 1.5MPa

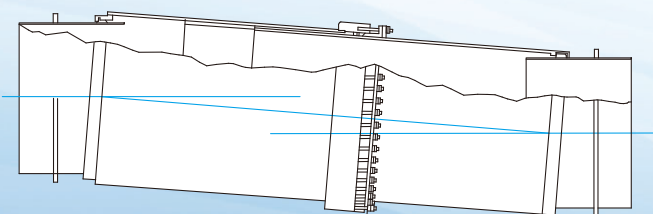
State of maximum displacement



Max Eccentricity : 300mm
Expansion : 1000mm
Max presser : 1.5MPa



State of eccentricity



VICSENSOR II

Ministry of Land, Infrastructure, Transport and Tourism New Technology Information System registered KK-170004-A
1st Infrastructure Maintenance Award Excellence Award Winner

Patented

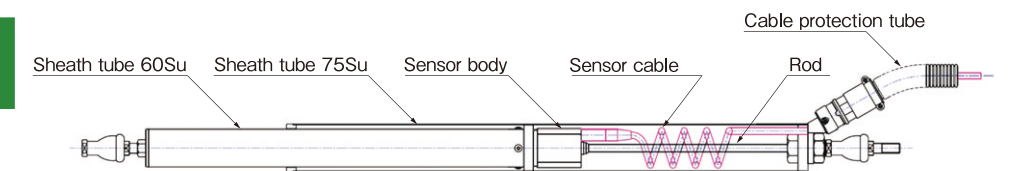
Displacement measuring device for expansion flexible pipes

This is a device that measures the displacement of expansion flexible pipes installed in pipelines.
We have newly developed **a cloud system** as an addition to the conventional Vicsensor II system.

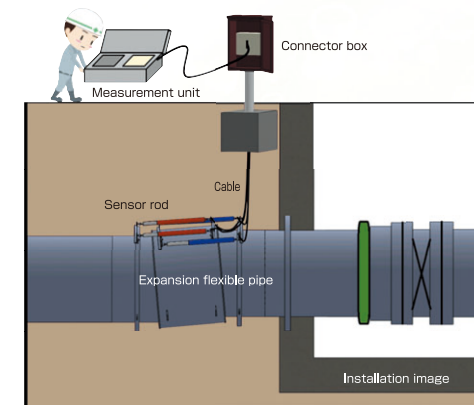
Purpose of installation

- ①VICSENSOR II can accurately grasp the amount of expansion/contraction and eccentricity of expansion flexible pipes in the event of a disaster such as an earthquake, making it possible to quickly and accurately take countermeasures.
- ②Based on displacement measurement results, it is possible to prioritize medium- to long-term reinforcement plans.

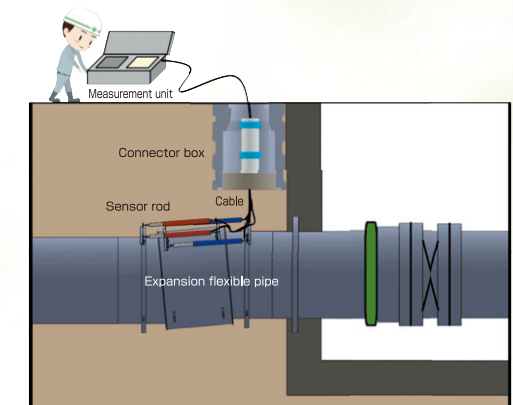
Displacement measuring device



Exposure type



Underground type



VICSENSOR II uses a cloud system to achieve safe and secure pipeline maintenance and management.

