

YODOGAWA



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YODOGAWA RASENKAN MFG CO.,LTD.

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sivic

Seismic Isolation Piping System

YODOGAWA

Seismic isolation piping system

for absorbing large relative displacements caused by earthquakes

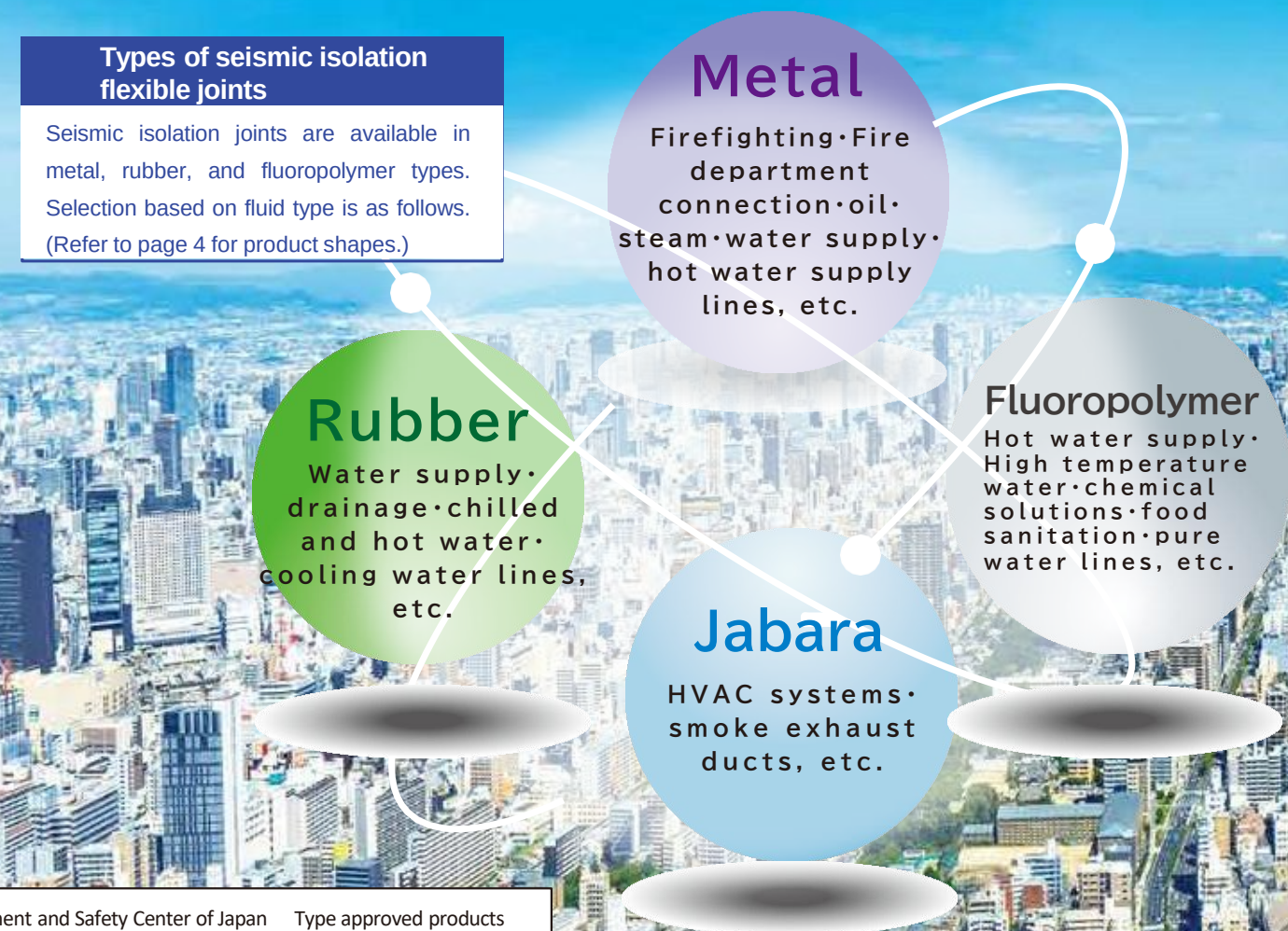
During earthquakes, seismic isolation structures allow buildings to sway slowly, significantly reducing seismic motion.

This function achieves what conventional earthquake-resistant structures could not, such as saving lives, preserving buildings, and protecting assets.

However, even buildings with seismic isolation structures cannot fulfill their intended function if lifelines protection is not adequate. Insufficient protection can lead to secondary disasters, such as water leakage or water supply interruptions during earthquakes.

As a result, the building's functions may temporarily stop, and the true performance expected of a seismic isolation structure cannot fully realized.

Today, as buildings adopting seismic isolation methods spread rapidly, seismic isolation measures for lifelines such as water supply and drainage are becoming increasingly important.



YODOGAWA RASENKAN MFG. CO., LTD.

YODOGAWA

The two facing circles  at the center symbolize the trust relationship between our customers and our company.

The upward line  toward infinite possibilities represents always smiling attitude. It represents the high ideal of mutual growth and prosperity between our customers and us.

History

Our company was established in September, 1964 (Showa 39) at 5-24 Tsukuda 4-chome, Nishi-Yodogawa-ku, Osaka, manufacturing and selling metal flexible tubes. We acquired all machinery from Showa Flex Co., Ltd., and started as Yodogawa Rasenkan Mfg. Co., Ltd.

Since then, we have manufactured and sold flexible tubes and expansion joints. With the rapid modernization of industrial facilities, pipelines for transporting steam, oil, air, and water became increasingly important. Responding to the increasing demand for these products year by year, we expanded our Uji Plant in 1973 (Showa 48), becoming a specialized integrated manufacturer, producing from raw tubes to finished products.

Company profile

Company name YODOGAWA RASENKAN MFG. CO., LTD.

Location

- Head office
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Tel : 06 (6475) 2102 Fax : 06 (6475) 2105
- Nagoya Sales Office
2-391 Takabata Nakagawa-ku Nagoya-shi 454-0911 Aichi-ken JAPAN
Tel : 052 (365) 3221 Fax : 052 (365) 3222
- Uji Plant
19 Toichi Makishimacho Uji-shi 611-0041 Kyoto JAPAN
Tel : 0774 (23) 5837 Fax : 0774 (23) 5309

Established September 1964
Main products Flexible Tube , Expansion Joint (Nominal Diameter 6~5,000mm)
Executive officers President Kenichi Suga
Main banks Sumitomo Mitsui Banking Corporation

As a comprehensive manufacturer, Yodogawa Rasenkan Mfg. Co., Ltd. provides the Seismic Isolation Piping System “**sivic**” to protect lifelines.

Your safety, our promise !Lifeline total safety piping system



Seismic
isolation
piping system

S eismic
I solation and
V ibration
I solation
C ontrol

Seismic isolation structures

Seismic isolation is based on the idea of separating the ground and the building with laminated rubber isolators, preventing earthquake seismic energy from transferring to the building. This can reduce the building's sway itself.

Even during major earthquakes, the building only sways horizontally in slow cycles, without damage. Furniture remains upright, tableware does not scatter. Once the earthquake subsides, normal life resumes immediately.

Furthermore, since the seismic input transmitted to the building is significantly reduced, the building can be made slimmer, increasing the freedom in architectural design.

System names		TYPE F (Rubber)	TYPE V (Rubber)	TYPE V Refrigerant gas (Metal)	TYPE V (Metal/Fluoropolymer)		TYPE U (Metal)		TYPE H (Rubber/Metal/ Fluoropolymer)	TYPE C (Rubber/Metal/ Fluoropolymer)	TYPE J
					Rotary joint	Swivel Joint	Rotary joint	Swivel Joint			
Applicable lines	Water supply, Chilled water, Cooling water, Hot water, Reclaimed water		●		●	●	●	●	●	●	
	Chilled and hot water		●			●		●	●	●	
	Drainage/sewage systems	●	●			●			●	●	
	Rainwater/ventilation	●	●						●	●	
	Hot water supply/oil					●		●	●	●	
	Chemical solutions					●			●	●	
	Fire fighting				●		●		●	●	
	Steam					●		●	●	●	
	Medical gas			●	●	●	●	●	●	●	
	Refrigerant			●					●		
	Ducts										●

STAINLESS

Metal type

10K 20K



- Fire service certified
- Fire service rating
- Fire service compliance
- Japan Water Works Association (JWWA)

Applicable lines

(subject to conditions; For air, please consult us separately.)

Water supply	Reclaimed WT	Hot WT supply	Chilled WT	Hot water
Chilled & hot	Drainage	Firefighting	Oil	Medical gas
Air	Steam			

【Operating pressure】

Water・Fire service act No. 31 - 10K : 1.4MPa
Water・Fire service act No. 31 - 20K : 2.8MPa
Fire safety regulation No. 20 - 10K・R10K : 1.0MPa

【Operating temperature】

~100℃ (Consultation required for steam)

RUBBER

Rubber type

10K



Applicable lines

(subject to conditions; For air, please consult us separately.)

Water supply	Reclaimed WT	Chilled WT	Drainage	Rainwater
Seawater	Hot water	Chilled & hot		

【Operating pressure】 0~1.0MPa

【Operating temperature】 -20~70℃

Note : When used as a TYPE F pump-up drainage application, limit the operating pressure to a max. of 0.3MPa.

FLUORINE RESIN

Fluoropolymer type

10K



Applicable lines

(subject to conditions; For air, please consult us separately.)

Water supply	Reclaimed WT	Hot WT supply	Chilled WT	Hot water
Chilled & hot	Drainage	Seawater	Chemical solutions	Antifreeze
Solvents				

【Operating pressure】 0~1.0MPa

【Operating temperature】 -20~100℃

Note : Considering the installation environment of the expansion joints, standard specifications for our SIVIC seismic isolation system adopt flange materials of either SS400 with hot-dip galvanizing or SUSF304 stainless steel.

Absorption of large displacement, space-saving design

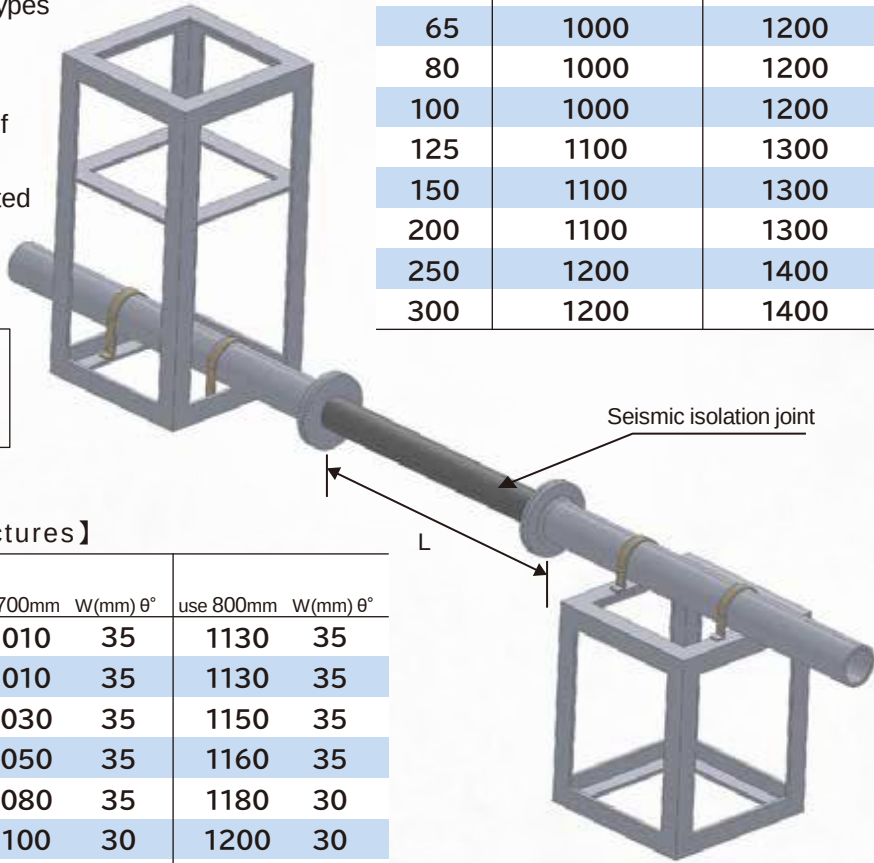
Absorption of vertical, horizontal and diagonal displacement

Cost-effective seismic isolation system

Drainage Rainwater Ventilation

- A single seismic isolation joint absorbs all types of displacement, offering space-saving installation and excellent workability.
- Performs effectively against a wide range of seismic movements
- Performs well under a wide range of repeated displacement

Note : When used as a TYPE F pump-up drainage application, limit the operating pressure to a max. of 0.3MPa.



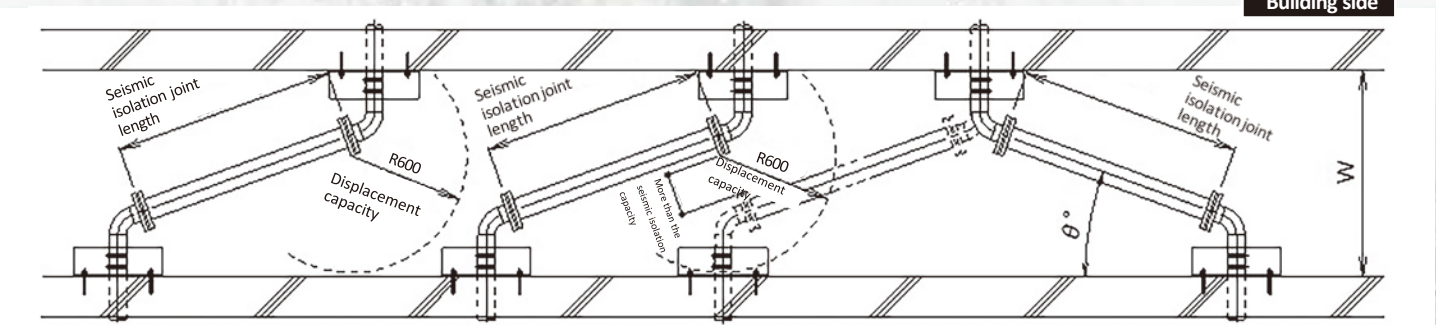
【Dimensions】

DN (A)	use 300~700mm	use 800mm
	L	L
20	1000	1200
25	1000	1200
32	1000	1200
40	1000	1200
50	1000	1200
65	1000	1200
80	1000	1200
100	1000	1200
125	1100	1300
150	1100	1300
200	1100	1300
250	1200	1400
300	1200	1400

【Installation dimensions between structures】

DN (A)	use 500mm	W(mm)	θ°	use 600mm	W(mm)	θ°	use 700mm	W(mm)	θ°	use 800mm	W(mm)	θ°
20	790	20		910	25		1010	35		1130	35	
25	810	22.5		930	25		1010	35		1130	35	
32	830	22.5		950	25		1030	35		1150	35	
40	830	20		950	25		1050	35		1160	35	
50	850	20		960	25		1080	35		1180	30	
65	870	20		980	25		1100	30		1200	30	
80	910	20		990	25		1110	30		1210	30	
100	980	20		1060	22.5		1140	30		1240	30	
125	1000	15		1100	20		1210	25		1320	25	
150	1070	15		1160	20		1250	25		1360	25	
200	1170	10		1280	15		1340	22.5		1460	22.5	
250	1290	10		1390	15		1480	20		1550	20	
300	1370	5		1470	10		1560	15		1690	20	

Ensuring seismic isolation clearance (for displacement capacity : 600mm)

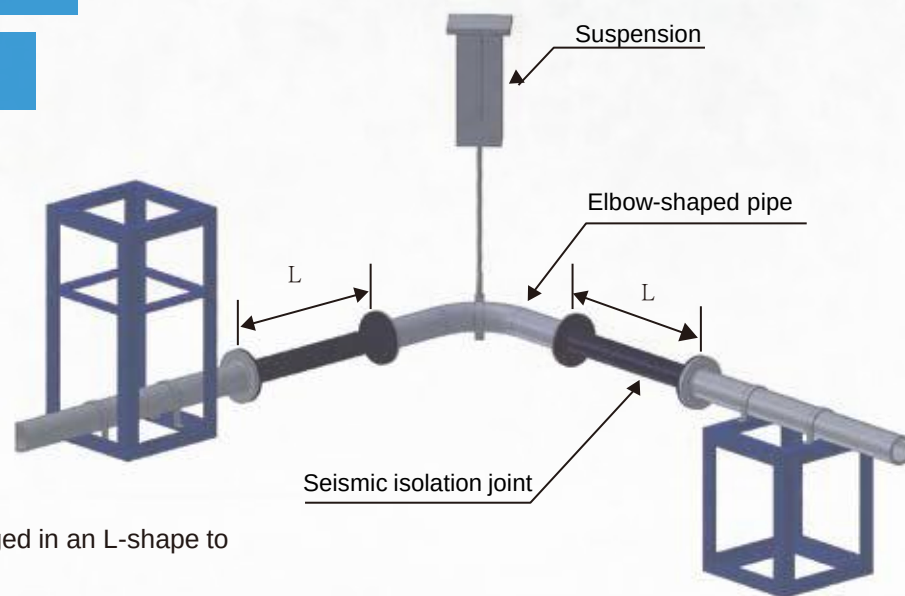


- When installing multiple seismic isolation joints in parallel for diagonal installation, ensure a clearance greater than the displacement capacity from the flange ends.
- Installation that intrudes into the dotted line area of R600 (displacement capacity) may cause interference during an earthquake and cannot be supported.
- Please consider the diagonal installation angle with consideration for the nominal diameter and joint length.

TYPE H

Seismic isolation system combining a ceiling-supported suspension and 2-L shaped seismic isolation joints

Seismic isolation system combining a ceiling-supported suspension and 2-L shaped seismic isolation joints

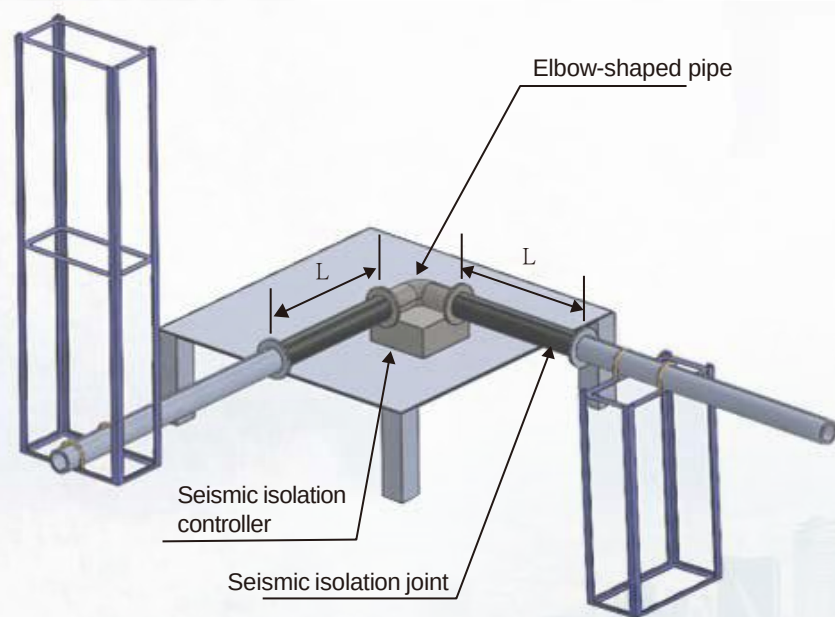


- Two seismic isolation joints are arranged in an L-shape to follow relative displacement.
- The seismic isolation joints are suspended and supported by a suspension system.
- Applicable up to 300A
- Fire service act No. 31 • Fire safety regulation No. 20 • compatible with compliant products (metal type)
- Certified by Japan Water Works Association (JWWA) (metal type)

TYPE C

Seismic isolation system combining a floor-supported controller

with two L-shaped seismic isolation joints



- Two seismic isolation joints are arranged in an L-shape to follow relative displacement.
- The seismic isolation joints are supported from the floor by a controller.
- Fire service act No. 31 • Fire safety regulation No. 20 compatible with compliant products (metal type)
- Certified by Japan Water Works Association (JWWA) (metal type)

Applicable range

	Fire service certified(No.31)	Metal type	Rubber type	Fluoropolymer type
		JWWA compliant Fire service rating (No. 20) Standard product	JWWA compliant Standard product	
Max. operating pressure	1.4MPa (10KF) 2.8MPa (20KF)	1.0MPa (10KF)	1.0MPa (10KF)	20A~32A—1.0MPa 125A—0.8MPa 40A+50A—0.8MPa 150A—0.6MPa 65A~100A—1.0MPa
Max. operating temperature	−60~150℃	−60~100℃	−20~70℃	−20~100℃

Water use • Fire service act No. 31 10K • Fluoropolymer type

DN (A)	use 500mm	use 600mm	use 700mm	use 800mm
	L	L	L	L
20	1100	1300	1500	1700
25	1100	1300	1500	1700
32	1100	1300	1500	1700
40	1200	1300	1500	1700
50	1200	1400	1600	1700
65	1200	1400	1600	1800
80	1300	1500	1700	1900
100	1400	1600	1800	2000
125	1500	1700	1900	2100
150	1600	1800	2000	2200
200	1900	2100	2400	2700

Water use • Fire service act No. 31 20K Fire safety regulation No. 20 10K • R10K

DN (A)	use 500mm	use 600mm	use 700mm	use 800mm
	L	L	L	L
20	1200	1400	1700	1900
25	1200	1400	1700	1900
32	1200	1400	1700	1900
40	1200	1400	1700	1900
50	1300	1400	1700	1900
65	1400	1500	1700	1900
80	1500	1700	1800	1900
100	1600	1800	1900	2000
125	1800	1900	2000	2100
150	1900	2100	2200	2300
200	2200	2300	2400	2500
250	2400	2500	2700	2800
300	2500	2700	2900	3000

Rubber type

DN (A)	use 500mm	use 600 ~ 700mm	use 800mm
	L	L	L
20	700	900	1000
25	700	900	1000
32	700	900	1000
40	700	900	1000
50	700	900	1000
65	700	900	1000
80	700	900	1000
100	700	900	1000
125	800	1000	1100
150	800	1000	1100
200	800	1000	1100
250	900	1100	1200
300	900	1100	1200

TYPE F Movement Test



Normal operation



Elongation



Compression

TYPE V (Metal · Fluoropolymer type)

Space-saving installation with a single vertical seismic isolation joint

Applicable lines

(subject to conditions; For air, please consult us separately.)



- Short face-to-face dimension with a single seismic isolation joint !
- Performs effectively against a wide range of seismic movements
- Fire service act No. 31 · Fire safety regulation No. 20 · compatible with compliant products (metal type)
- Certified by Japan Water Works Association (JWWA) (metal type)
- Compatible with most chemicals and solvents (Fluoropolymer type)

Water use · Fire service act No. 31 10K (Metal type)

DN (A)	Rotary joint W	Swivel joint W	use 500mm L (L1)	use 600mm L (L1)	use 700mm L (L1)	use 800mm L (L1)
20	117	145	1100 900	1300 1100	1400 1100	1600 1300
25	137	145	1100 900	1300 1100	1400 1100	1600 1300
32	170	145	1200 1000	1400 1200	1500 1200	1700 1400
40	170	160	1200 1000	1400 1200	1500 1200	1800 1500
50	170	170	1300 1100	1500 1300	1600 1400	1900 1700
65	170	190	1300 1100	1500 1300	1600 1400	1900 1700
80	181	205	1500 1400	1600 1400	1800 1600	2000 1800
100	191	220	1500 1400	1700 1500	1800 1600	2100 1900
125	191	250	1600 1500	1700 1500	2000 1800	2200 2000
150	191	280	1600 1500	1800 1600	2000 1800	2300 2100

Water use · Fire service act No. 31 20K (Metal type)

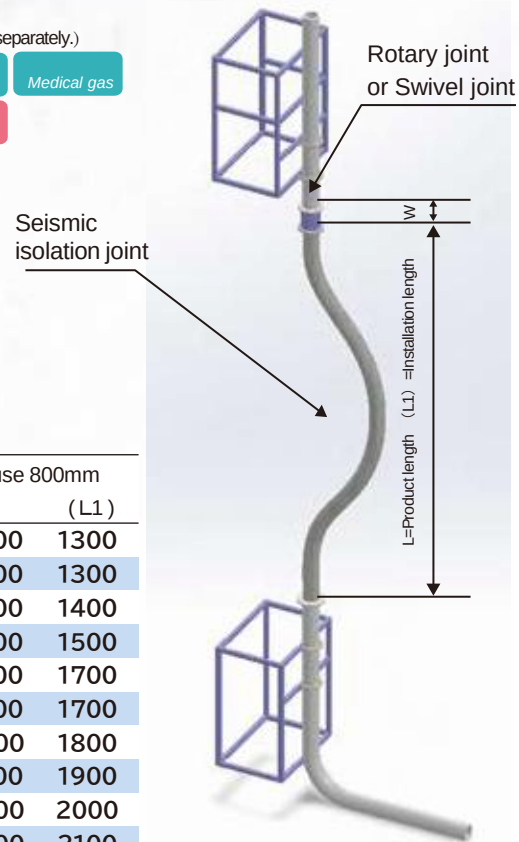
DN (A)	Rotary joint W	Swivel joint W	use 500mm L (L1)	use 600mm L (L1)	use 700mm L (L1)	use 800mm L (L1)
32	170	145	1300 1100	1600 1400	1800 1600	2000 1800
40	170	160	1400 1200	1600 1400	1900 1700	2000 1800
50	170	170	1500 1400	1600 1400	1900 1700	2100 1900
65	170	190	1500 1400	1800 1600	2000 1800	2300 2100
80	181	205	1600 1500	1800 1600	2100 1900	2300 2100
100	191	220	1700 1600	2100 2000	2300 2100	2600 2400
125	191	250	1800 1700	2200 2100	2400 2200	2700 2500
150	191	280	1900 1800	2300 2200	2600 2400	2900 2700

Fire safety regulation No. 20 10K · R10K (Metal type)

DN (A)	Rotary joint W	Swivel joint W	use 500mm L (L1)	use 600mm L (L1)	use 700mm L (L1)	use 800mm L (L1)
20	117	145	1200 1100	1500 1300	1700 1500	1900 1700
25	137	145	1300 1100	1600 1400	1800 1600	2000 1800
32	170	145	1400 1200	1600 1400	1800 1600	2000 1800
40	170	160	1500 1400	1700 1500	2100 1900	2200 2000
50	170	170	1600 1500	1800 1600	2200 2000	2200 2000
65	170	190	1600 1500	1800 1600	2200 2000	2400 2200

Fluoropolymer type 10K

DN (A)	Rotary joint W	Swivel joint W	use 500mm L (L1)	use 600mm L (L1)	use 700mm L (L1)	use 800mm L (L1)
20	—	—	1100 900	1300 1100	1400 1100	1600 1300
25	—	—	1100 900	1300 1100	1400 1100	1600 1300
32	—	—	1200 1000	1400 1200	1500 1200	1700 1400
40	—	—	1200 1000	1400 1200	1500 1200	1700 1400
50	—	—	1200 1000	1400 1200	1500 1300	1700 1400
65	—	—	1300 1100	1500 1300	1600 1400	1800 1500
80	—	—	1400 1200	1600 1400	1700 1500	1900 1600
100	—	—	1400 1200	1600 1400	1800 1600	2000 1700



TYPE V (Rubber type)

Space-saving installation with a single vertical seismic isolation joint Cost-effective seismic isolation system

- Short face-to-face dimension with a single seismic isolation joint !
- Excellent space-saving and workability
- Performs effectively against a wide range of seismic movements
- Performs well under a wide range of repeated displacement

【 Dimensions 】

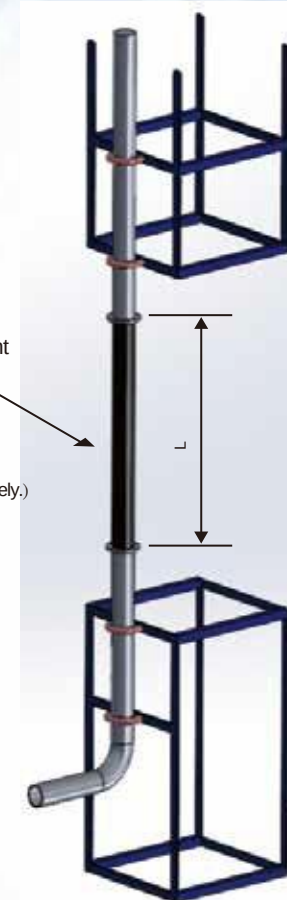
DN (A)	use 300 ~ 600mm L	use 700 ~ 800mm L
20	1500	1600
25	1500	1600
32	1500	1600
40	1500	1600
50	1500	1600
65	1500	1600
80	1500	1600
100	1500	1600
125	1800	1900
150	1800	1900
200	1800	2200
250	1800	2200
300	1800	2200

Applicable lines

(subject to conditions; For air, please consult us separately.)



Seismic isolation joint



TYPE V (Refrigerant · Medical gas)

Copper pipe connection · Stainless steel pipe connection Space-saving installation with a single vertical seismic isolation joint

Applicable lines

(subject to conditions; For air, please consult us separately.)

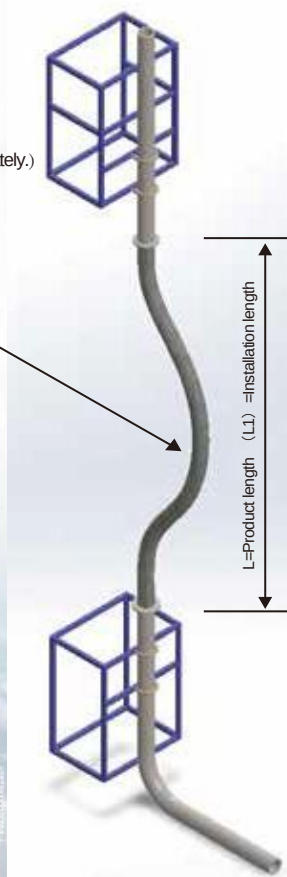


- Short face-to-face dimension with a single seismic isolation joint !
- Excellent space-saving and workability
- Performs effectively against a wide range of seismic movements
- Performs well under a wide range of repeated displacement
- Performs well in absorption of seismic displacement, building expansion movement, and vertical pipe expansion/contraction

【 Dimensions 】

Copper pipe O.Dφ	use 300 ~ 500mm L (L1)	use 600mm L (L1)	use 700mm L (L1)	use 800mm L (L1)
6.35	1300 1100	1500 1200	1700 1400	1800 1500
9.52	1300 1100	1500 1200	1700 1400	1800 1500
12.70	1300 1100	1500 1200	1700 1400	1800 1500
15.88	1300 1100	1500 1200	1700 1400	1800 1500
19.05	1300 1100	1500 1200	1700 1400	1800 1500
22.22	1300 1100	1500 1200	1700 1400	1800 1500
25.40	1300 1100	1500 1200	1700 1400	1800 1500
28.58	1300 1100	1500 1200	1700 1400	1800 1500
31.75	1300 1100	1500 1200	1700 1400	1800 1500
34.92	1300 1100	1500 1200	1700 1400	1800 1500
38.10	1300 1100	1500 1200	1700 1400	1800 1500

Seismic isolation joint



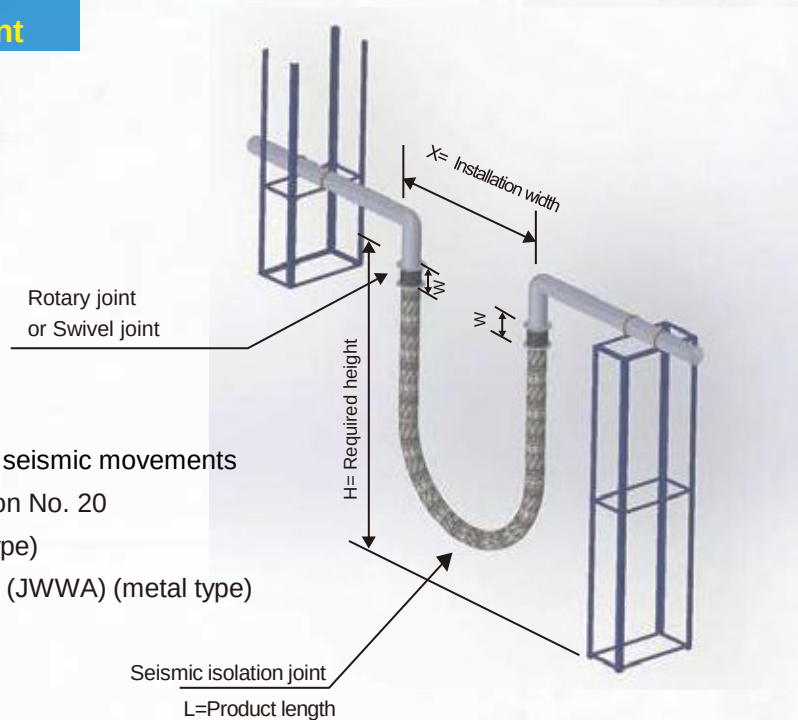
Space-saving installation with a single vertical seismic isolation joint

Applicable lines

(subject to conditions; For air, please consult us separately.)

- Water supply
- Reclaimed WT
- Chilled WT
- Medical gas
- Oil
- Hot WT supply
- Hot water

- Short face-to-face dimension with a single seismic isolation joint !
- Performs effectively against a wide range of seismic movements
- Fire service act No. 31 ・ Fire safety regulation No. 20 compatible with compliant products (metal type)
- Certified by Japan Water Works Association (JWWA) (metal type)



Water use ・ Fire service act No. 31 10K (Metal type)

DN (A)	Rotary joint	Swivel joint	use 500mm			use 600mm			use 700mm			use 800mm		
	W		L	X	H	L	X	H	L	X	H	L	X	H
20	117	145	2000	680	1140	2300	780	1300	2600	880	1450	3000	980	1660
25	137	145	2100	720	1200	2400	820	1360	2700	920	1520	3000	1020	1680
32	170	145	2100	740	1240	2500	840	1450	2800	940	1600	3100	1040	1760
40	170	160	2200	750	1290	2500	850	1450	2800	950	1600	3100	1050	1760
50	170	170	2200	770	1290	2500	870	1440	2800	970	1600	3200	1070	1810
65	170	190	2300	800	1340	2600	900	1500	2900	1000	1650	3200	1100	1810
80	181	205	2600	940	1470	2900	1040	1630	3200	1140	1790	3500	1240	1950
100	191	220	2800	1060	1570	3100	1160	1720	3400	1260	1880	3700	1360	2040
125	191	250	3100	1200	1700	3400	1300	1860	3700	1400	2010	4000	1500	2170
150	191	280	3300	1300	1790	3600	1400	1940	3900	1500	2100	4300	1600	2300

Water use ・ Fire service act No. 31 20K (Metal type)

DN (A)	Rotary joint	Swivel joint	use 500mm			use 600mm			use 700mm			use 800mm		
	W		L	X	H	L	X	H	L	X	H	L	X	H
32	170	145	2100	740	1240	2500	880	1450	2800	950	1600	3100	1160	1720
40	170	160	2100	740	1240	2500	840	1450	2800	950	1620	3100	1160	1720
50	170	170	2200	750	1290	2500	840	1450	2800	950	1600	3200	1140	1790
65	170	190	2300	800	1340	2600	900	1500	2900	1040	1630	3200	1140	1790
80	181	205	2600	940	1470	2900	1040	1630	3100	1160	1720	3500	1240	1950
100	191	220	2800	1060	1570	3100	1160	1720	3400	1260	1880	3800	1360	2090

Fire safety regulation No. 20 10K ・ R10K (Metal type)

DN (A)	Rotary joint	Swivel joint	use 500mm			use 600mm			use 700mm			use 800mm		
	W		L	X	H	L	X	H	L	X	H	L	X	H
20	117	145	1900	630	1090	2300	730	1300	2600	830	1460	2900	930	1620
25	137	145	2000	660	1160	2400	760	1370	2700	860	1530	3000	960	1690
32	170	145	2100	680	1250	2400	780	1400	2700	880	1560	3000	980	1720
40	170	160	2300	800	1320	2600	900	1480	2900	1000	1630	3200	1100	1790
50	170	170	2500	890	1400	2800	990	1560	3100	1090	1720	3400	1190	1880
65	170	190	2600	930	1450	2900	1030	1610	3200	1130	1770	3500	1230	1920

Flue, smoke exhaust and air conditioning ducts

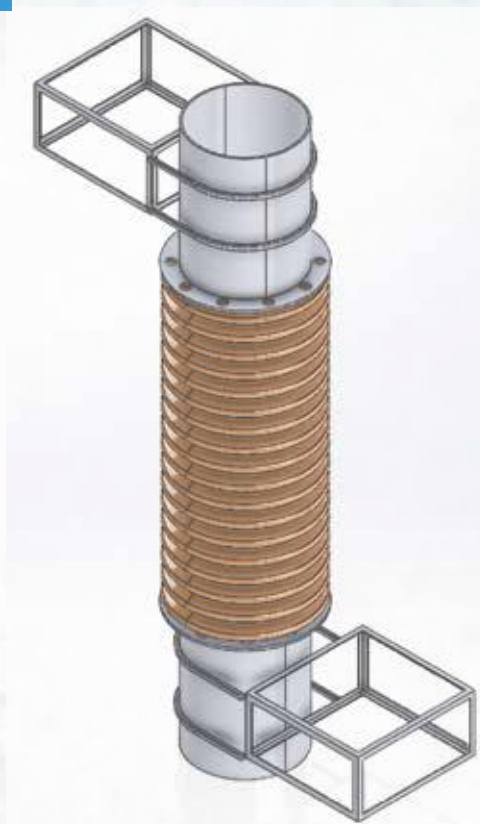
Solutions available for high temperature and other specialized applications

- Bellows structure allows displacement in all directions.
- Most suitable products proposed based on application, installation direction, duct shape, and size.
- Applicable from ambient temperature up to approx. 650°C.



Seismic isolation joint for smoke exhaust

Installation: Chimney seismic isolation section
Operating temperature: approx. 600°C
Seismic displacement capacity: 600mm



Seismic isolation joint for air conditioning

Installation: Air conditioning duct seismic isolation section
Operating temperature: Ambient to approx. 200°C
Seismic displacement capacity: 600mm