IEJP-ISOTECH EXPANSION JOINT EXTERNALLY PRESSURIZED

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File No.: ISOIN-IEJP Date: 11/23/16

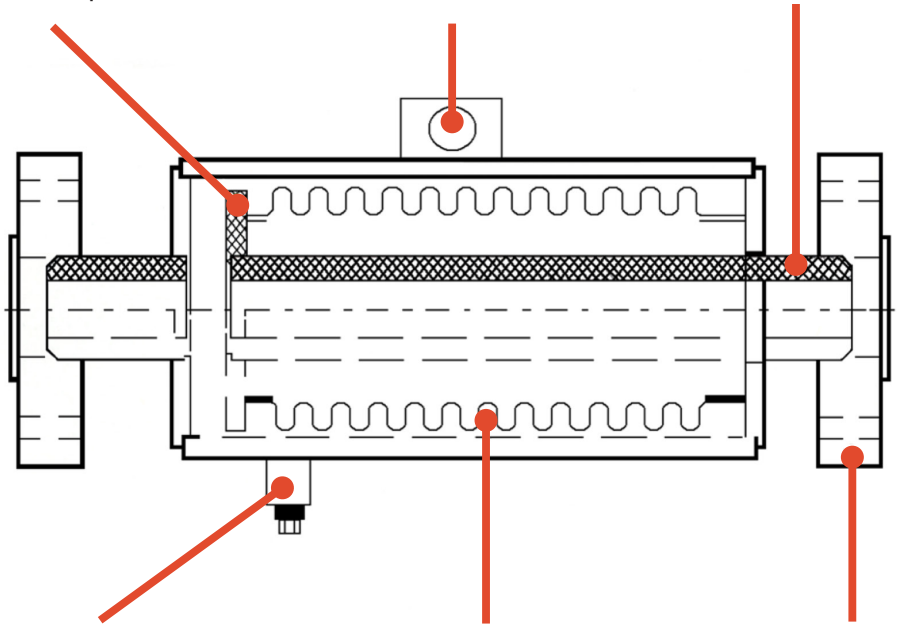
ISOTECH EXTERNALLY PRESSURIZED JOINTS ARE DESIGNED TO REPLACE:

High Maintenance Packed Joints ◉ Space-Confining Pipe Loops ◉ Costly Equalizing Expansion Joints

INTERNAL GUIDE RING
Maintains alignment of inner pipe and housing, prevents contact of bellows with housing, and provides stop for maximum extension

LIFTING LUG
Standard on all units, for ease of installation

LINER
Equivalent to nominal ID size of expansion joint to manage effect of flow.



DRAIN
Standard fitting used to remove media when system is shut down

MULTI-PLY BELLOWS
Laminated bellows offer maximum flexibility and endurance

RAISED FACE SLIP-ON FLANGES

FEATURES:

- Up to 8” of axial motion
- 150 PSI or 300 PSI designs
- Integral Liner
- Custom or standard material selection
- Multiple end fitting options
  - Weld Ends
  - Grooved Ends
  - Raised Face Slip On Flanges

BENEFITS:

- Eliminates the need for multiple joints in a long run
- Meets low or high pressure applications
- Manages effect of flow
- Meets most application needs
- Meets most installation needs

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WORKING PRESSURE @ 650°F												
Size (in)	Axial Compression (in)	Flanged Ends		Weld Ends		Spring Rate	Flanged Ends		Weld Ends		Spring Rate	Effective Area
		OAL	LBS	OAL	LBS		OAL	LBS	OAL	LBS		
1''	4	22 - ½	23	22	19	40	23 - ½	25	23	20	60	7.8''
	6	29 - ¾	30	29 - ¼	26	25	30 - ¾	32	30 - ¼	28	40	
	8	36 - ⅝	35	36 - ⅛	31	20	37 - ⅝	37	37 - ⅛	33	30	
1¼''	4	23	26	22 - ½	20	40	24	33	23 - ½	22	60	7.8''
	6	30	34	29 - ½	29	25	31	41	30 - ½	31	40	
	8	36 - ⅞	39	36 - ⅛	33	20	37 - ⅞	44	37 - ⅜	35	30	
1½''	4	23	26	22 - ½	20	40	24 - ½	33	23- ½	22	60	7.8''
	6	30	35	29 - ½	29	25	31 - ½	38	30 - ½	31	40	
	8	36 - ⅝	39	36 - ⅛	33	20	38 - ⅜	41	37 - ⅜	35	30	
2''	4	23 - ½	44	23	33	40	24 - ½	44	24	35	60	7.8''
	6	30 - ½	56	30	46	25	31 - ½	60	31	48	40	
	8	37 - ⅞	65	37 - ⅞	55	20	38 - ⅜	70	37 - ⅞	58	30	
2½''	4	26 - ⅜	51	25 - ⅞	35	160	27 - ⅜	54	26 - ⅞	37	230	19.8''
	6	33 - ⅜	65	32 - ⅞	50	100	34 - ⅜	68	33 - ⅞	52	150	
	8	43 - ⅜	75	42 - ⅞	60	80	44 - ⅜	79	43 - ⅞	63	120	
3''	4	26 - ⅜	63	25 - ⅞	46	160	27- ⅜	68	26 - ⅞	48	230	19.8''
	6	33 - ⅜	74	32 - ⅞	57	100	34 - ⅜	79	33 - ⅞	60	150	
	8	43 - ⅜	91	42 - ⅞	74	80	44 - ⅜	96	43 - ⅞	78	120	
3½''	4	26 - ⅜	93	25 - ¼	69	160	27 - ⅜	98	26 - ⅞	72	230	19.8''
	6	33 - ⅜	117	32 - ⅞	86	100	34 - ⅜	115	33 - ⅞	90	150	
	8	43 - ⅜	144	42 - ⅞	152	80	44 - ⅜	180	43 - ⅞	163	120	
4''	4	25 - ¾	99	25 - ¼	72	165	26- ¾	121	26 - ¼	74	230	29.5''
	6	33 - ⅝	117	33 - ⅛	89	105	34 - ⅛	127	34 - ⅛	94	150	
	8	39 - ⅝	144	39 - ⅛	116	85	40 - ⅝	156	40 - ⅛	124	120	
5''	4	26 - ⅞	128	26 - ⅜	95	320	27 - ⅞	150	27 - ⅞	97	500	66.8''
	6	34 - ⅞	149	34 - ⅜	116	225	35 - ⅞	175	35 - ⅜	120	350	
	8	44 - ⅜	171	43 - ⅞	138	160	45 - ⅜	195	44 - ⅞	143	250	
6''	4	26 - ⅞	144	26 - ⅜	102	320	27- ⅞	164	27 - ⅜	106	500	66.8''
	6	34 - ⅞	167	34 - ⅜	125	225	35 - ⅞	187	35 - ⅜	130	350	
	8	44 - ⅜	191	43 - ⅞	149	160	45 - ⅜	213	44 - ⅞	155	250	
8''	4	25 - ¼	228	24 - ¾	161	440	26 - ¼	236	25 - ¾	168	600	81''
	6	31 - ¾	265	31 - ¼	198	320	32 - ¾	285	32 - ¼	209	450	
	8	40 - ⅞	302	40 - ⅜	236	220	41 - ⅞	314	41 - ⅜	250	300	
10''	4	25 - ¼	306	24 - ¾	209	490	26 - ¼	336	25 - ¾	216	900	121''
	6	31 - ¾	358	31 - ¼	261	350	32 - ¾	388	32 - ¼	272	670	
	8	40 - ⅞	434	40 - ⅜	337	240	41 - ⅞	483	41 - ⅜	354	450	
12" ALSO AVAILABLE - CONTACT FACTORY FOR DETAILS												

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STORAGE:

1. Store expansion joints in a dry/cool location such as a warehouse.
2. Store flange face down on a pallet or wooden platform.
3. Do not store other heavy items on top of expansion joint(s).
4. Ten-year shelf life can be expected with ideal conditions.

HANDLING:

Do not lift with ropes or bars through the bolt holes. If lifting through the bore, use padding or a saddle to distribute the weight. Do not let expansion joints sit vertically on the edges of the flanges for any period of time. Do not lift on the shipping restraints.

SERVICE CONDITIONS:

Make sure the expansion joint rating for temperature, pressure, movements, and selection of materials match the system requirements. Contact the manufacturer if the system requirements exceed those of the expansion joint selected.

ALIGNMENT:

Expansion Joints are not designed to make up for piping misalignment errors. Check with the manufacturer if piping misalignment is present.

ANCHORING:

The main function of expansion joints is to compensate for axial pipe thermal expansion. Metal expansion joints must have the protection of adequate anchoring against the internal and thrust pressures of the media to prevent damage. Anchoring must be installed as close to the down stream end of the expansion joint as possible, with the originating equipment serving as the opposite anchor. Anchors must prevent pipe movement in any direction. Hangers or pipe pedestals cannot be considered to be anchors as they offer no restriction against side or end motion.

When designing an anchor for a metal expansion joint, consult the internal thrust force table from the appropriate expansion joint catalog. The weight of piping, valves, and media, as well as the resistance of the piping to deflection, must be included as part of the design weight and strength of an anchor.

Anchors are required whenever a piping system changes direction. Expansion joints should be located as close as possible to anchor points. For additional expansion joint protection, it is recommended that control rods be installed on the expansion joint to prevent excessive movements from occurring due to pressure thrust of the line.

GUIDES:

Expansion joints must be properly guided and anchored in accordance with EJMA standards.
Refer to = Pipe Guides Spacing Diagram‘ on following page.

PIPE SUPPORT:

Piping must be supported so expansion joints do not carry any pipe weight.

MATING FLANGES:

Install the expansion joint flange against the mating pipe flanges and install bolts so that the bolt head is against the expansion joint flange. Bolts should be installed from the bellows side (so that the bolt heads are adjacent to the bellows) to insure that the bolts do not interfere with the bellows during periods of compression. Flange-to-flange dimensions of the expansion joint must match the required opening.

Make sure mating flanges are clean and are matched to the type supplied with the expansion joint. Gaskets of appropriate material, size and temperature ratings must be used in all flange-to-flange type installations.

BOLT TORQUE:

Tighten bolts in stages by alternating around the flange. Never tighten an expansion joint to the point that there is metal-to-metal contact between the expansion joint flange and the mating flange.

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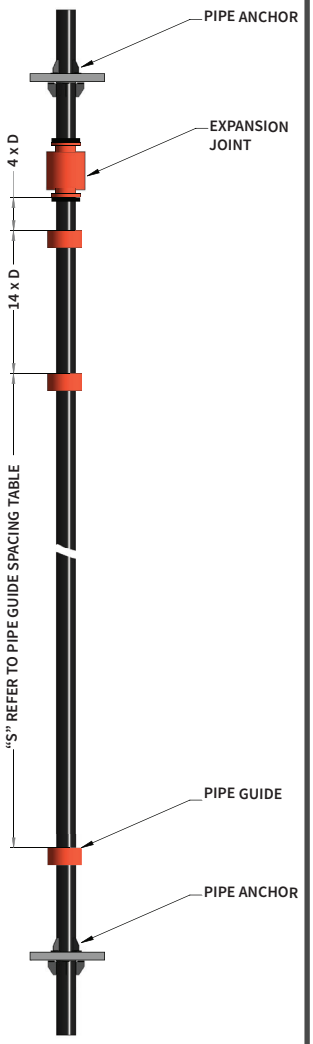
ADDITIONAL TIPS:

1. Insulation or thermal blankets over a metal expansion joint should be supplied by the expansion joint manufacturer to preclude the use of corrosive chloride bearing insulation materials. Insulation should be installed to permit easy access to the flange area, to check bolting.
2. Do not weld in the near vicinity of a non-shrouded expansion joint without protecting the expansion joint from damaging weld splatter.
3. If an expansion joint is to be installed underground, or will be submerged in water, contact the manufacturer for specific guidelines.
4. Consider ordering a spare expansion joint. The cost of downtime of a critical expansion joint far exceeds the cost of a spare unit placed and protected in reserve on-site.
5. Standard expansion joints are shipped pre-set to handle 80% of their rated axial traverse in compression and 20% in extension. In stall in this pre-set position as the ratio is proper for most heating and processing lines.
6. Whenever possible, install the expansion joint next to an anchor as indicated below not exceeding maximum distance to the 1st guide with at least two concentric pipe guides on the opposite side of the joint. Added guides are required to prevent bowing or bending of the pipe.
7. When an expansion joint is placed elsewhere in the line, at least two concentric guides must be used on each side of the joint with added joints installed as recommended below.
8. The inside of all piping must be clean before installing and testing the expansion joints. Expansion joints should not be subjected to hydrostatic pressure tests beyond their rated working pressure.
9. Secure all anchors and guides before testing. Remove shipping bars prior to testing.
10. Expansion joints must be removed from the lines while the system is being tested hydro-statically at pressure exceeding allowable working pressure.
11. Expansion Joints fabricated with flow liners must be installed with the flow arrow pointing in the same direction of the media flow.
12. Single externally-pressurized expansion joints must be installed with the moving end adjacent to the moving end of the pipe responding to the thermal expansion induced during system heat-up.
13. **Failure to install according to instructions will void warranty.**



PIPE GUIDES-SPACING DIAGRAM

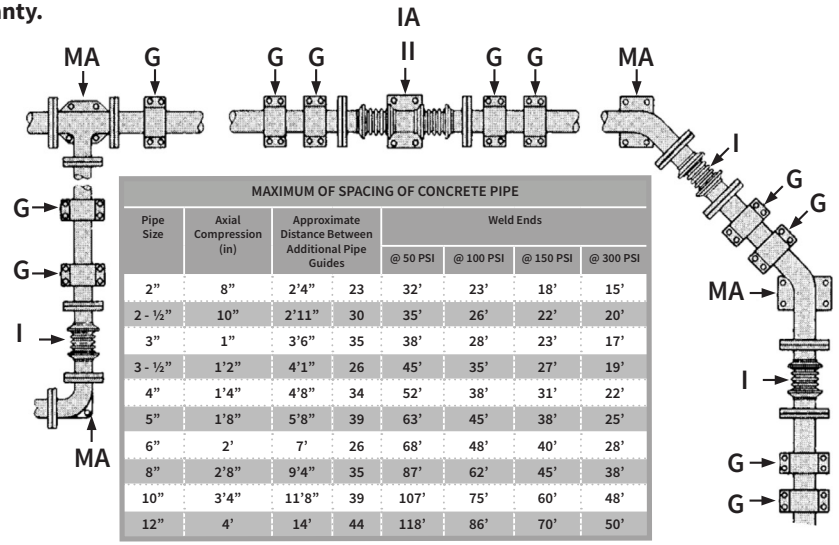
MA = Main Anchor. Install at every change of direction, and at the start and finish of the piping system.

IA = Intermediate Anchor.

G = Concentric Pipe Guides.

I= ISOTECH Single Expansion Joint / Pump Connector

II= ISOTECH Dual Expansion Joint with integral intermediate anchor base (IA)



MAXIMUM OF SPACING OF CONCRETE PIPE

Pipe Size	Axial Compression (in)	Approximate Distance Between Additional Pipe Guides		Weld Ends @ 50 PSI	Weld Ends @ 100 PSI	Weld Ends @ 150 PSI	Weld Ends @ 300 PSI
2”	8”	2’4”	23	32’	23’	18’	15’
2 - ½”	10”	2’11”	30	35’	26’	22’	20’
3”	1”	3’6”	35	38’	28’	23’	17’
3 - ½”	1’2”	4’1”	26	45’	35’	27’	19’
4”	1’4”	4’8”	34	52’	38’	31’	22’
5”	1’8”	5’8”	39	63’	45’	38’	25’
6”	2’	7’	26	68’	48’	40’	28’
8”	2’8”	9’4”	35	87’	62’	45’	38’
10”	3’4”	11’8”	39	107’	75’	60’	48’
12”	4’	14’	44	118’	86’	70’	50’