

## Seismic Joints and Expansion Loops

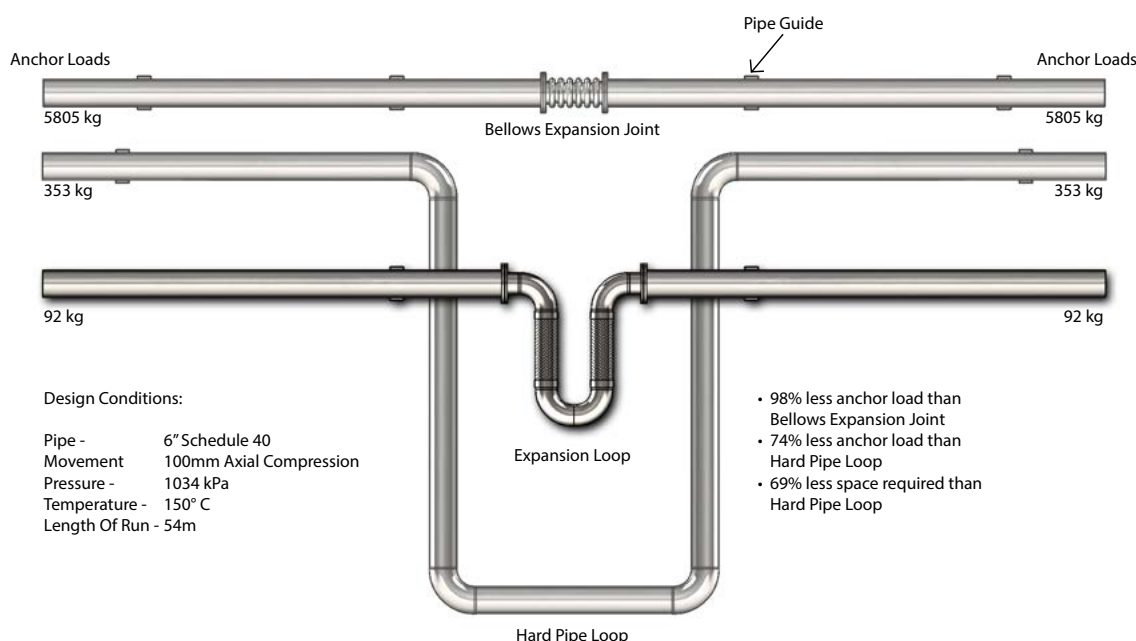


### VITALFLEX® - Seismic Joints and Expansion Loops

Model name: VITALFLEX-U

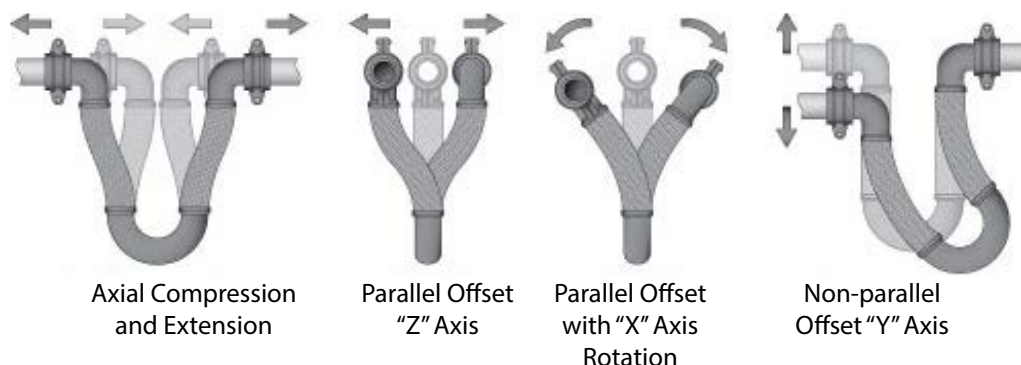
VITALFLEX® seismic joints and expansion loops are engineered to account for the cumulative movement(s) in piping systems. The VITALFLEX® joints have been designed to counter thermal expansion/contraction, offset and rotation.

Piping used in locations subject to seismic conditions have their own set of unexpected random movements. The random motion common to earthquakes, requires that seismic expansion joints be capable of movement in any direction and are able to withstand the acceleration forces.



Significant cost and safety benefits found in VITALFLEX® seismic expansion joints

- It is an inexpensive alternative to dual-tied bellows expansion joints and especially ball joints
- During an earthquake, it protects equipment by allowing boilers, chillers, fan-coil units and other systems to move independently from buildings such as hospitals, high rises and stadiums
- Installation at the connection point, prevents nozzles from cracking or shearing off
- A break in the gas pipe work could start a fire and cause vast damage to the entire building. This Australian Gas Approval (AGA) certified seismic expansion joint will compensate for the movement that occurs during any seismic activity such as an earthquake
- Designed for potable water applications the VITALFLEX® joint can be Watermark certified in accordance with WMTS 520:2016



## Seismic Expansion Joints

Stainless steel is superior to carbon steel, galvanised steel and copper. Where a VITALFLEX® joint connects directly to these materials in a wetted or condensing installation, the adjoining pipework becomes the anode and corrodes at the connection or weld. The stainless joint is the protected member where the dissimilar connecting pipe carries the risk. This applies to galvanised fire main and copper HVAC connections.

When NOT welded and dissimilar metal flanges or threads are bolted or screwed together consider a full dielectric isolation method which can include a isolating gasket, sleeves and washers as a complete kit. This will break the electrolyte path. Verify electrical resistance across the joint after installation and confirm no bypass through supports, brackets, conduit or earthing straps. Seek electrical engineering advice on installation requirements.

Galvanic corrosion is driven by the internal potential difference between the two metals (the voltage gap on the galvanic series). Earthing shifts the absolute electrical potential of the entire system relative to the earth, but the internal gap between the stainless steel and carbon steel remains exactly the same. Galvanic corrosion to happen, you need a metallic path (the weld) and an ion path (the mains water). Earthing does nothing to block the ions travelling through the water from the carbon steel to the stainless steel.

### Installation Guide:

Reduce misalignment of the connecting pipes as any offset will change the design movements of the joint. When installing in any configuration other than with the product in a horizontal down position, the weight of the joint must be support at the elbow connecting the two braided hoses. The recommended supports are wire cable or metal chain. These can be secured to the elbow used a pipe support clamp/bracket or on request to the hanging lugs which can be welded to the elbow in the manufacturing process.

### Typical Installation:

HORIZONTAL  
SIDE



HORIZONTAL  
DOWN



HORIZONTAL  
UP



NESTED



VERTICAL



UNDER-OVER



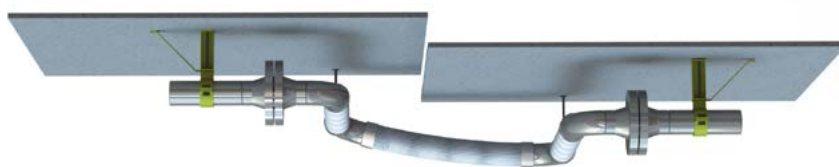
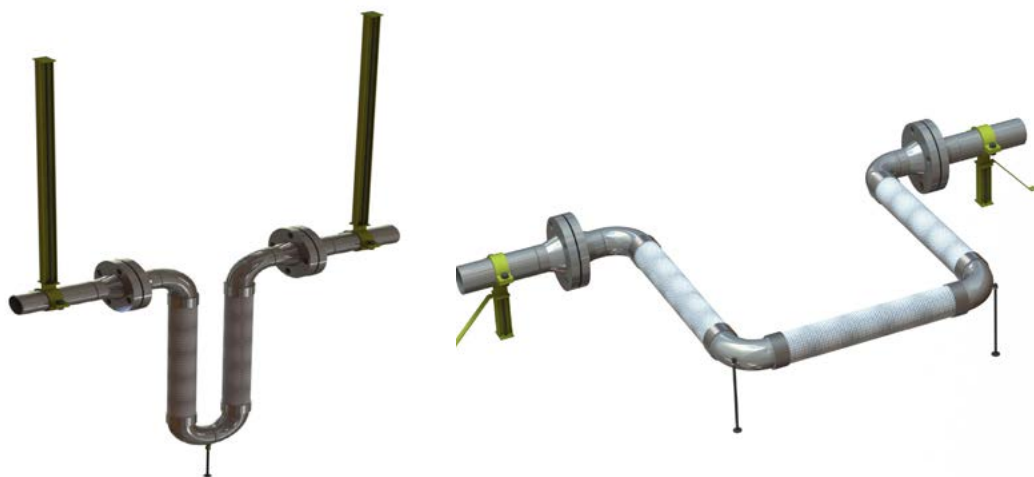
## Seismic Expansion Joints

### Maintenance Guide:

In the event of seismic activity or if excessive movements may have been applied, the product should be inspected to ensure that it has not incurred damage.

If there is an indication of evidence that the joint may have performed movements outside the design parameters this information should be communicated to Pacific Hoseflex to assess if the joints need to be repaired or replaced.

When the joints are visible a 12 monthly inspection should occur to enforce preventative maintenance.



## Seismic Expansion Joints

### Expansion Joint - U Shape

**Construction:** Annular / Close Pitch

**Profile:** High Flexibility / High Pressure

**Material Available:** 304 / 316 Stainless Steel

**Braid Available:** 304 / 316 Stainless Steel

**Size Available:** 1/4" (06mm) - 16" (500mm)

(Larger sizes upon Request)

**Max Temp:** 700°C

Low | Med | High

Flexibility ☐ ☐ ☒

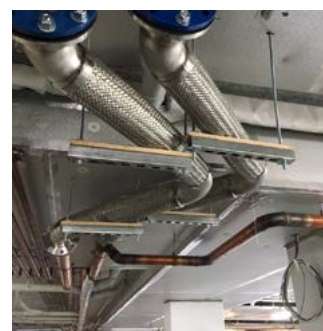
Cycle Life ☐ ☐ ☒

Pressure Rating ☐ ☒ ☐

Chemical Resistance ☐ ☐ ☒

Wall Thickness ☐ ☒ ☐

#### Installation:



#### Couplings:

**VITALFLEX® - Swivel Flange**

**Model Name: VITALFLEX-U-AF4**



**VITALFLEX® - Rolled groove coupling**

**Model Name: VITALFLEX-U-RG**



**VITALFLEX® - Male coupling**

**Model Name: VITALFLEX-U-AF1**



**VITALFLEX® - Female Union coupling**

**Model Name: VITALFLEX-U-AF12**



## Seismic Expansion Joints (U Shape)

### Specifications

#### **Movement range:** Up to +/- 500mm

(Standard catalogue range: 50mm, 75mm, 100mm, 150mm and 200mm)

(Customised movement available upon request from 0 to > 500 mm)

#### **Pressure range:**

##### **WaterMark:** Full Vacuum up to 2500 kPa

(Compressed hose may be considered for negative pressure/vacuum applications)

(Temperature correction factors may apply)

(Pressure restrictions may apply related to pressure rating of end fittings used)

#### **Standards:**

Corrugated Metal Hoses: ISO 10380

AGA Approved: AS 4631 (upon request)

Watermark Approved: WMTS 520 (upon request)

Welding Compliant: AS 4041- Class 1 (upon request)

Seismic Rated: AS 1170 (upon request)

Activfire Certified: AS 2118.1 (upon request)

#### **AGA (Australian Gas Association):** Full

##### **Vacuum up to 1500 kPa**

(Compressed hose may be considered for negative pressure/vacuum applications)

(Temperature correction factors may apply)

(Pressure restrictions may apply related to pressure rating of end fittings used)

#### **Temperature range:** -276 °C to 700 °C

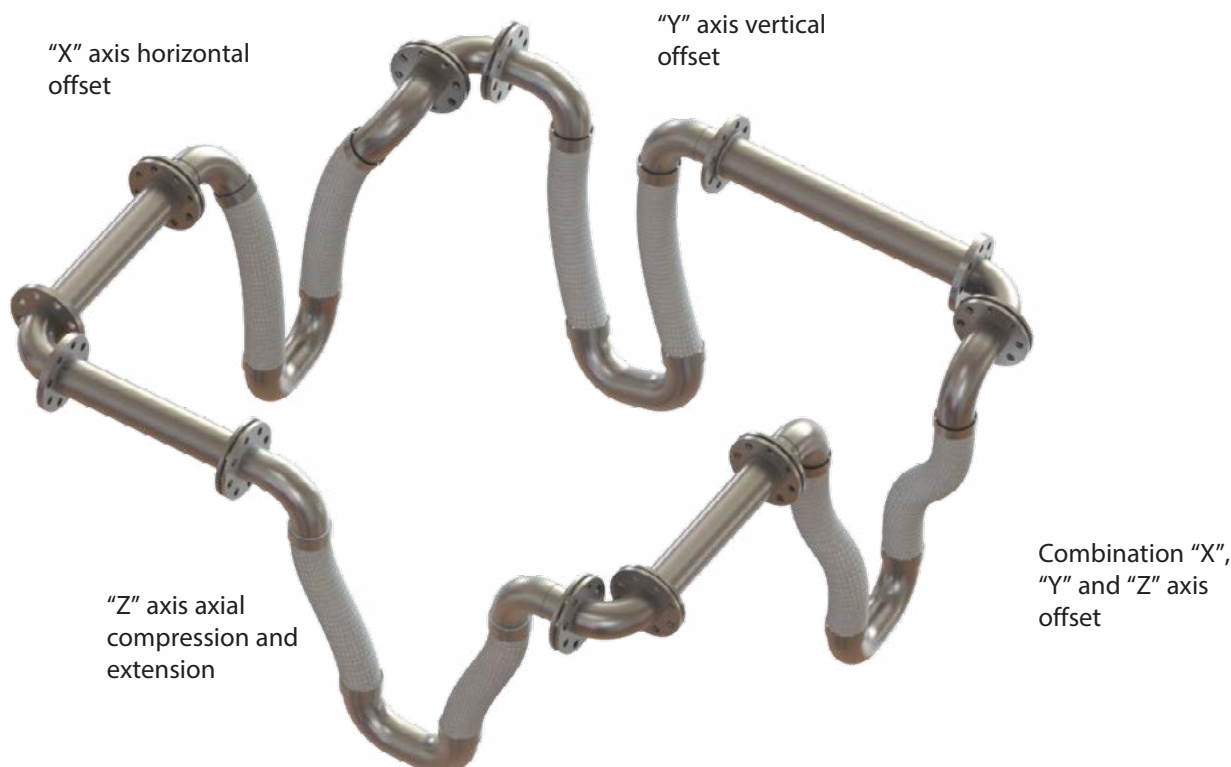
(Restrictions from applicable standards for assemblies and end fittings may apply)

(Calculated values available for single braided hose MAOP, double braided hose MAOP, 100 kPa, 500 kPa, 800 kPa, 1000 kPa, 1200 kPa,, 1500 kPa, 2000 kPa 2500 kPa)

#### **Pressure thrust range:** 0.01 kN to 147.39 kN

(Calculated values available for single braided hose MAOP, double braided hose MAOP, 100 kPa, 500 kPa, 800 kPa, 1000 kPa, 1200 kPa,, 1500 kPa, 2000 kPa 2500 kPa)

**Unit weight range:** Refer to technical catalogue for unfilled and filled water values  
(Available on request)



## Seismic Expansion Joints

### Expansion Joint - U Shape

**Construction:** Annular / Close Pitch

**Profile:** High Flexibility / High Pressure

**Material Available:** 304 / 316 Stainless Steel

**Braid Available:** 304 / 316 Stainless Steel

**Size Available:** 1/4" (06mm) - 16" (500mm)

(Larger sizes upon Request)

**Max Temp:** 700°C

Low | Med | High

Flexibility ☐ ☐ ☒

Cycle Life ☐ ☐ ☒

Pressure Rating ☐ ☒ ☐

Chemical Resistance ☐ ☐ ☒

Wall Thickness ☐ ☒ ☐

#### Construction

##### Use:

Used in a variety of applications and locations where subject to seismic conditions or large amounts of pipework movement. The random motion common to earthquakes requires that seismic expansion joints to be capable of movement in any direction.

##### Standards:

Corrugated Metal Hoses: ISO 10380

AGA Approved: AS 4631 (upon request)

Watermark Approved: WMTS 520 (upon request)

Welding Compliant: AS 4041- Class 1 (upon request)

Seismic Rated: AS 1170 (upon request)

Seismic Rated: NZS 4219 - 2009 (upon request)

Activfire Certified: AS 2118.1 (upon request)



#### Specifications

| Hose Size (mm) | Hose Size (inch) | Model           | MOVEMENT (mm) | Dimension A | Dimension B | Pressure (kPa) @ 23 deg c | Hydrostatically Filled Hose weight (kg) (+/- 5%)<br>Excluding all pipe bends and end fittings | Pneumatically Filled Hose weight (kg) (+/- 5%)<br>Excluding all pipe bends and end fittings | Hose Spring Rate (Kg/Cm) | Hose Pipe load (kgs) |
|----------------|------------------|-----------------|---------------|-------------|-------------|---------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------|----------------------|
| 12             | 1/2"             | VITALFLEX-U-12  | 50            | 202         | 245         | 8445                      | 0.131                                                                                         | 0.079                                                                                       | 0.31                     | 1.55                 |
| 20             | 3/4"             | VITALFLEX-U-20  | 50            | 202         | 262         | 7128                      | 0.336                                                                                         | 0.187                                                                                       | 0.73                     | 3.65                 |
| 25             | 1"               | VITALFLEX-U-25  | 50            | 202         | 276         | 5487                      | 0.488                                                                                         | 0.249                                                                                       | 0.75                     | 3.75                 |
| 32             | 1 1/4"           | VITALFLEX-U-32  | 50            | 240         | 329         | 4136                      | 0.909                                                                                         | 0.446                                                                                       | 0.96                     | 4.8                  |
| 38             | 1 1/2"           | VITALFLEX-U-38  | 50            | 279         | 366         | 3840                      | 1.327                                                                                         | 0.616                                                                                       | 1.26                     | 6.3                  |
| 50             | 2"               | VITALFLEX-U-50  | 50            | 355         | 417         | 3930                      | 2.063                                                                                         | 0.941                                                                                       | 1.68                     | 8.4                  |
| 65             | 2 1/2"           | VITALFLEX-U-65  | 50            | 381         | 522         | 2826                      | 4.149                                                                                         | 1.537                                                                                       | 1.64                     | 8.2                  |
| 75             | 3"               | VITALFLEX-U-75  | 50            | 457         | 582         | 2310                      | 5.830                                                                                         | 1.982                                                                                       | 5.27                     | 26.35                |
| 100            | 4"               | VITALFLEX-U-100 | 50            | 610         | 704         | 1654                      | 9.830                                                                                         | 2.881                                                                                       | 5.46                     | 27.3                 |
| 125            | 5"               | VITALFLEX-U-125 | 50            | 762         | 817         | 1316                      | 15.848                                                                                        | 4.503                                                                                       | 5.55                     | 27.75                |
| 150            | 6"               | VITALFLEX-U-150 | 50            | 914         | 934         | 1137                      | 22.321                                                                                        | 5.523                                                                                       | 5.58                     | 27.9                 |
| 200            | 8"               | VITALFLEX-U-200 | 50            | 1219        | 1134        | 1643                      | 40.108                                                                                        | 9.458                                                                                       | 12.21                    | 61.05                |
| 250            | 10"              | VITALFLEX-U-250 | 50            | 1524        | 1410        | 1585                      | 81.140                                                                                        | 23.111                                                                                      | 16.29                    | 81.45                |
| 300            | 12"              | VITALFLEX-U-300 | 50            | 1829        | 1582        | 1110                      | 107.676                                                                                       | 28.433                                                                                      | 26.73                    | 133.65               |

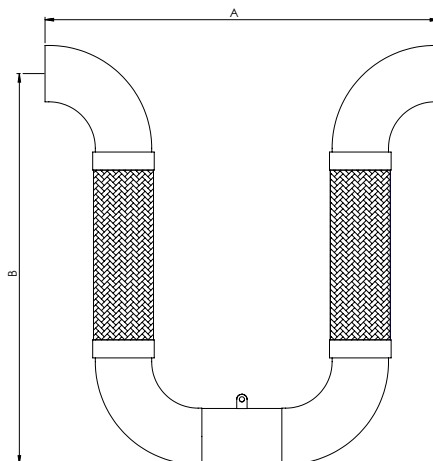
## Seismic Expansion Joints

### Expansion Joint - U Shape

| Hose Size (mm) | Hose Size (inch) | Model           | MOVEMENT (mm) | Dimension A | Dimension B | Pressure (kPa) @ 23 deg c | Hydrostatically Filled Hose weight (kg) (+/- 5%)<br>Excluding all pipe bends and end fittings | Pneumatically Filled Hose weight (kg) (+/- 5%)<br>Excluding all pipe bends and end fittings | Hose Spring Rate (Kg/Cm) | Hose Pipe load (kgs) |
|----------------|------------------|-----------------|---------------|-------------|-------------|---------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------|----------------------|
| 12             | 1/2"             | VITALFLEX-U-12  | 100           | 252         | 322         | 8445                      | 0.190                                                                                         | 0.115                                                                                       | 0.11                     | 1.1                  |
| 20             | 3/4"             | VITALFLEX-U-20  | 100           | 252         | 342         | 7128                      | 0.480                                                                                         | 0.267                                                                                       | 0.25                     | 2.5                  |
| 25             | 1"               | VITALFLEX-U-25  | 100           | 252         | 357         | 5487                      | 0.704                                                                                         | 0.359                                                                                       | 0.28                     | 2.8                  |
| 32             | 1 1/4"           | VITALFLEX-U-32  | 100           | 290         | 422         | 4136                      | 1.308                                                                                         | 0.641                                                                                       | 0.35                     | 3.5                  |
| 38             | 1 1/2"           | VITALFLEX-U-38  | 100           | 329         | 465         | 3840                      | 1.903                                                                                         | 0.884                                                                                       | 0.47                     | 4.7                  |
| 50             | 2"               | VITALFLEX-U-50  | 100           | 405         | 519         | 3930                      | 2.958                                                                                         | 1.350                                                                                       | 0.69                     | 6.9                  |
| 65             | 2 1/2"           | VITALFLEX-U-65  | 100           | 481         | 646         | 2826                      | 5.893                                                                                         | 2.183                                                                                       | 0.61                     | 6.1                  |
| 75             | 3"               | VITALFLEX-U-75  | 100           | 557         | 714         | 2310                      | 8.321                                                                                         | 2.829                                                                                       | 1.99                     | 19.9                 |
| 100            | 4"               | VITALFLEX-U-100 | 100           | 610         | 849         | 1654                      | 13.998                                                                                        | 4.103                                                                                       | 2.07                     | 20.7                 |
| 125            | 5"               | VITALFLEX-U-125 | 100           | 762         | 972         | 1316                      | 22.578                                                                                        | 6.416                                                                                       | 2.15                     | 21.5                 |
| 150            | 6"               | VITALFLEX-U-150 | 100           | 914         | 1100        | 1137                      | 31.749                                                                                        | 7.855                                                                                       | 2.27                     | 22.7                 |
| 200            | 8"               | VITALFLEX-U-200 | 100           | 1219        | 1308        | 1643                      | 56.924                                                                                        | 13.424                                                                                      | 5.47                     | 54.7                 |
| 250            | 10"              | VITALFLEX-U-250 | 100           | 1524        | 1555        | 1585                      | 104.119                                                                                       | 29.657                                                                                      | 8.83                     | 88.3                 |
| 300            | 12"              | VITALFLEX-U-300 | 100           | 1829        | 1795        | 1110                      | 153.002                                                                                       | 40.403                                                                                      | 11.62                    | 116.2                |

#### Note :

- Dimension 'A' and 'B' are approx dimensions without Fitting only and are subject to change without notice.



#### Applications

