# Union/Screwed Connection, Rubber Expansion Joints

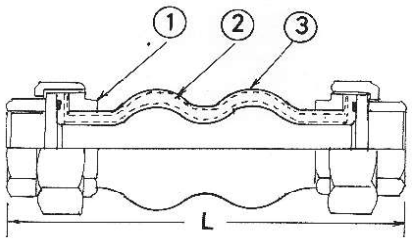
VIMCO

## Features + Application Information

1. Reduces noise and vibration transmission
2. Eliminates stress due to thermal expansion and piping misalignment
3. Precision molded of synthetic rubber
4. Threading standard as per customer specifications (NPT, BSPT)
5. Applicable fluids for standard construction: water (cold, hot or sea), weak acids, alkalis, compressed air etc.
6. Different elastomers are available for other fluids (e.g. oil). Contact factory for technical assistance
7. Synthetic fiber reinforcement
8. Corrosion resistant materials
9. Easy field installation

## Dimensional + Model Selection Data

### FCU models (twin bellow)




Materials (see figure)

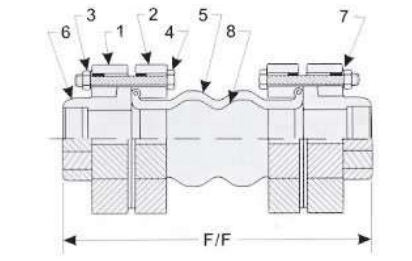
| No. | Part | Material |
|---|---|---|
| 1 | Union | Malleable iron |
| 2 | Reinforcing fabric | Polyester |
| 3 | Tube | EPDM |

### FCU series (twin bellow)

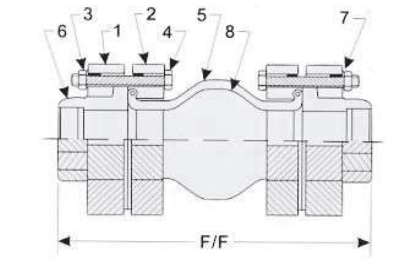
| Model | Size (inches) | Length L (inches) | Axial compression (inches) | Axial elongation (inches) | Transverse deflection (inches) | Angular deflection (deg) | Operating pressure (psig) | Burst pressure (psig) | Temp. range (°F) |
|---|---|---|---|---|---|---|---|---|---|
| FCU-5 | 1/2 | 8 | 7/8 | 1/4 | 7/8 | 30° | 150 | 700 | -4 to 212 |
| FCU-7 | 3/4 | 8 | 7/8 | 1/4 | 7/8 | 30° | 150 | 700 | -4 to 212 |
| FCU-10 | 1 | 8 | 7/8 | 1/4 | 7/8 | 25° | 150 | 700 | -4 to 212 |
| FCU-12 | 1-1/4 | 8 | 7/8 | 1/4 | 7/8 | 25° | 150 | 700 | -4 to 212 |
| FCU-15 | 1-1/2 | 8 | 7/8 | 1/4 | 7/8 | 20° | 150 | 700 | -4 to 212 |
| FCU-20 | 2 | 8 | 7/8 | 1/4 | 7/8 | 15° | 150 | 700 | -4 to 212 |

*Ratings indicated above are for constant pressures at 100°F. For pulsating pressures use 1/2 of rating; for surge pressures use 1/6 of rating. For elevated temperature ratings, consult factory. Expansion joints must be installed per FSA technical handbook guidelines.*

### FCU-T / FCU-TH models (twin bellow)




### FCU-SH models (single bellow)




Materials (see figures)

| No. | Part | Material |
|---|---|---|
| 1,2 | Flanges | Cast SUS 201 |
| 3,4 | Nuts | Zinc plated carbon steel |
| 5 | Tube | EPDM |
| 6 | Threaded union | Cast SUS 201 |
| 7 | Bolts | Zinc plated carbon steel |
| 8 | Reinforcing fabric | Polyester |

### FCU-T series (twin bellow)

| Model | Size (inches) | Length (F/F) (inches) | Axial compression (inches) | Axial elongation (inches) | Transverse deflection (inches) | Angular deflection (deg) | Operating pressure (psig) | Burst pressure (psig) | Temp. range (°F) |
|---|---|---|---|---|---|---|---|---|---|
| FCU-T-5 | 1/2 | 8 | 7/8 | 1/4 | 7/8 | 30° | 232 | 725 | 14 to 158 |
| FCU-T-7 | 3/4 | 8 | 7/8 | 1/4 | 7/8 | 30° | 232 | 725 | 14 to 158 |
| FCU-T-10 | 1 | 8 | 7/8 | 1/4 | 7/8 | 25° | 232 | 725 | 14 to 158 |
| FCU-T-12 | 1 1/4 | 8 | 7/8 | 1/4 | 7/8 | 25° | 232 | 725 | 14 to 158 |
| FCU-T-15 | 1 1/2 | 8 | 7/8 | 1/4 | 7/8 | 20° | 232 | 725 | 14 to 158 |
| FCU-T-20 | 2 | 8 | 7/8 | 1/4 | 7/8 | 15° | 232 | 725 | 14 to 158 |

### FCU-TH series (twin bellow)

| Model | Size (inches) | Length (F/F) (inches) | Axial compression (inches) | Axial elongation (inches) | Transverse deflection (inches) | Angular deflection (deg) | Operating pressure (psig) | Burst pressure (psig) | Temp. range (°F) |
|---|---|---|---|---|---|---|---|---|---|
| FCU-TH-5 | 1/2 | 6.30 | 3/5 | 2/5 | 3/5 | 20° | 355 | 1066 | 14 to 158 |
| FCU-TH-7 | 3/4 | 6.30 | 3/5 | 2/5 | 3/5 | 20° | 355 | 1066 | 14 to 158 |
| FCU-TH-10 | 1 | 6.30 | 3/5 | 2/5 | 3/5 | 20° | 355 | 1066 | 14 to 158 |
| FCU-TH-12 | 1-1/4 | 8.35 | 3/5 | 2/5 | 4/5 | 30° | 355 | 1066 | 14 to 158 |
| FCU-TH-15 | 1-1/2 | 8.35 | 3/5 | 2/5 | 4/5 | 30° | 355 | 1066 | 14 to 158 |
| FCU-TH-20 | 2 | 8.78 | 3/5 | 2/5 | 4/5 | 30° | 355 | 1066 | 14 to 158 |

### FCU-SH series (single bellow)

| Model | Size (inches) | Length (F/F) (inches) | Axial compression (inches) | Axial elongation (inches) | Transverse deflection (inches) | Angular deflection (deg) | Operating pressure (psig) | Burst pressure (psig) | Temp. range (°F) |
|---|---|---|---|---|---|---|---|---|---|
| FCU-SH-5 | 1/2 | 5.12 | 5/16 | 5/32 | 5/16 | 15° | 355 | 1066 | 14 to 158 |
| FCU-SH-7 | 3/4 | 5.12 | 5/16 | 5/32 | 5/16 | 15° | 355 | 1066 | 14 to 158 |
| FCU-SH-10 | 1 | 5.12 | 5/16 | 5/32 | 5/16 | 15° | 355 | 1066 | 14 to 158 |
| FCU-SH-12 | 1-1/4 | 5.35 | 5/16 | 5/32 | 5/16 | 15° | 355 | 1066 | 14 to 158 |
| FCU-SH-15 | 1-1/2 | 5.35 | 5/16 | 5/32 | 5/16 | 15° | 355 | 1066 | 14 to 158 |
| FCU-SH-20 | 2 | 5.98 | 5/16 | 5/32 | 5/16 | 15° | 355 | 1066 | 14 to 158 |

*Ratings indicated above are for constant pressures at 100°F. For pulsating pressures use 1/2 of rating; for surge pressures use 1/6 of rating. For elevated temperature ratings, consult factory. Expansion joints must be installed per FSA technical handbook guidelines.*

# Flanged Connection, Rubber Expansion Joints

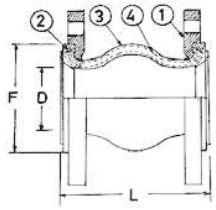
VIMCO

## Features + Application Information

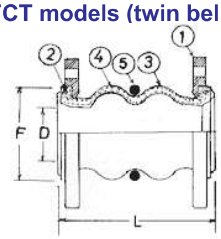
1. Reduces noise and vibration transmission
2. Eliminates stress due to thermal expansion and piping misalignment
3. Precision molded of synthetic rubber
4. Floating flanges drilling standards as per customer specifications (ANSI, BS, DIN, JIS)
5. Applicable fluids for standard construction: water (cold, hot or sea), weak acids, alkalis, compressed air etc.
6. Different elastomers are available for other fluids (e.g. oil). Contact factory for technical assistance
7. Synthetic fiber reinforcement
8. Corrosion resistant materials
9. Easy field installation

## Dimensional + Model Selection Data

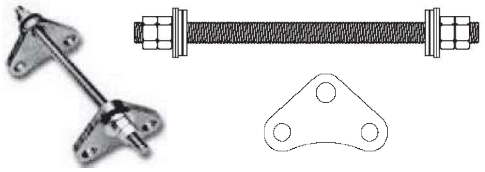
**FCS models (single bellow)**




**FCT models (twin bellow)**




**CRU models (control units)**



Materials (see figures)

| No. | Part | Material |
|---|---|---|
| 1 | Flange | Galvanized steel (drilling available as per ANSI/BS/DIN/JIS) |
| 2 | Reinforcing ring | Carbon steel wire strand |
| 3 | Tube | EPDM |
| 4 | Reinforcing fabric | Polyester |
| 5 | Root ring | Galvanized steel |

Control unit composition:

| Item | Quantity |
|---|---|
| Tie Rod | 1 |
| Gusset | 2 |
| Nuts | 4 |
| Steel / Rubber washer | 2 |

| Pipe Size | Dimensions | | | Model | Axial compression | Axial elongation | Transverse deflection | Angular deflection | Model | Axial compression | Axial elongation | Transverse deflection | Angular deflection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (inches) | L (inches) | D (inches) | F (inches) | | (inches) | (inches) | (inches) | (deg) | | (inches) | (inches) | (inches) | (deg) |
| **Single Bellow:** | | | | **FCS series** | | | | | **FCS-H series** | | | | |
| 1-1/4 | 6 | 1.58 | 2.72 | FCS-12 | 1/2 | 3/8 | 1/2 | 15° | FCS-12-H | 0.31 | 0.15 | 0.31 | 15° |
| 1-1/2 | 6 | 1.58 | 2.72 | FCS-15 | 1/2 | 3/8 | 1/2 | 15° | FCS-15-H | 0.31 | 0.15 | 0.31 | 15° |
| 2 | 6 | 2.05 | 3.39 | FCS-20 | 1/2 | 3/8 | 1/2 | 15° | FCS-20-H | 0.31 | 0.19 | 0.31 | 15° |
| 2-1/2 | 6 | 2.68 | 4.18 | FCS-25 | 1/2 | 3/8 | 1/2 | 15° | FCS-25-H | 0.47 | 0.23 | 0.39 | 15° |
| 3 | 6 | 3.00 | 4.57 | FCS-30 | 1/2 | 3/8 | 1/2 | 15° | FCS-30-H | 0.47 | 0.23 | 0.39 | 15° |
| 4 | 6 | 4.06 | 5.91 | FCS-40 | 5/8 | 3/8 | 1/2 | 15° | FCS-40-H | 0.70 | 0.39 | 0.47 | 15° |
| 5 | 6 | 5.04 | 7.09 | FCS-50 | 5/8 | 3/8 | 1/2 | 15° | FCS-50-H | 0.70 | 0.39 | 0.47 | 15° |
| 6 | 6 | 5.99 | 8.23 | FCS-60 | 5/8 | 3/8 | 1/2 | 15° | FCS-60-H | 0.70 | 0.39 | 0.47 | 15° |
| 8 | 6 | 7.64 | 10.24 | FCS-80 | 5/8 | 3/8 | 1/2 | 15° | FCS-80-H | 0.98 | 0.55 | 0.86 | 15° |
| 10 | 8 | 9.85 | 12.60 | FCS-100 | 3/4 | 1/2 | 3/4 | 15° | FCS-100-H | 0.98 | 0.55 | 0.86 | 15° |
| 12 | 8 | 11.82 | 14.45 | FCS-120 | 3/4 | 1/2 | 3/4 | 15° | FCS-120-H | 0.98 | 0.55 | 0.86 | 15° |
| 14 | 8 | 12.60 | 16.07 | FCS-140 | 3/4 | 1/2 | 3/4 | 15° | FCS-140-H | 0.98 | 0.62 | 0.86 | 15° |
| 16 | 8 | 14.65 | 18.59 | FCS-160 | 3/4 | 1/2 | 3/4 | 15° | FCS-160-H | 0.98 | 0.62 | 0.86 | 15° |
| 18 | 8 | 16.34 | 20.56 | FCS-180 | 3/4 | 1/2 | 3/4 | 15° | FCS-180-H | 0.98 | 0.62 | 0.86 | 15° |
| 20 | 8 | 17.88 | 22.45 | FCS-200 | 3/4 | 1/2 | 3/4 | 15° | FCS-200-H | 0.98 | 0.62 | 0.86 | 15° |
| 24 | 10 | 22.45 | 27.40 | FCS-240 | 3/4 | 1/2 | 3/4 | 15° | FCS-240-H | 0.98 | 0.62 | 0.86 | 15° |
| 28 | 10 | 26.77 | 31.49 | FCS-280 | 3/4 | 1/2 | 3/4 | 15° | FCS-280-H | 0.98 | 0.62 | 0.86 | 15° |
| **Twin Bellow:** | | | | **FCT series** | | | | | **FCT-H series** | | | | |
| 1-1/2 | 7 | 1.58 | 2.72 | FCT-15 | 2 | 3/4 | 1-3/4 | 35° | FCT-15-H | 1 | 3/5 | 1 | 30° |
| 2 | 7 | 2.05 | 3.39 | FCT-20 | 2 | 3/4 | 1-3/4 | 35° | FCT-20-H | 1 | 3/5 | 1 | 30° |
| 2-1/2 | 7 | 2.68 | 4.18 | FCT-25 | 2 | 3/4 | 1-3/4 | 35° | FCT-25-H | 1 | 3/5 | 1 | 30° |
| 3 | 7 | 3.00 | 4.57 | FCT-30 | 2 | 3/4 | 1-3/4 | 35° | FCT-30-H | 1 | 3/5 | 1 | 30° |
| 4 | 9 | 4.06 | 5.91 | FCT-40 | 2 | 1 | 1-1/2 | 35° | FCT-40-H | 1 | 3/4 | 3/4 | 30° |
| 5 | 9 | 5.04 | 7.09 | FCT-50 | 2 | 1 | 1-1/2 | 35° | FCT-50-H | 1 | 3/4 | 3/4 | 30° |
| 6 | 9 | 5.99 | 8.23 | FCT-60 | 2 | 1 | 1-1/2 | 35° | FCT-60-H | 1 | 3/4 | 3/4 | 30° |
| 8 | 13 | 7.64 | 10.24 | FCT-80 | 2-1/4 | 1 | 1-1/4 | 30° | FCT-80-H | 1 | 3/4 | 3/4 | 30° |
| 10 | 13 | 9.85 | 12.60 | FCT-100 | 2-1/4 | 1 | 1-1/4 | 30° | FCT-100-H | 1 | 3/4 | 3/4 | 30° |
| 12 | 13 | 11.82 | 14.45 | FCT-120 | 2-1/4 | 1 | 1-1/4 | 30° | FCT-120-H | 1 | 3/4 | 3/4 | 30° |
| 14 | 14 | 12.60 | 16.07 | FCT-140 | 1-1/2 | 3/4 | 1-1/4 | 20° | FCT-140-H | 3/4 | 3/4 | 3/4 | 20° |
| 16 | 14 | 14.65 | 18.59 | FCT-160 | 1-1/2 | 3/4 | 1-1/4 | 20° | FCT-160-H | 3/4 | 3/4 | 3/4 | 20° |
| 18 | 14 | 16.34 | 20.56 | FCT-180 | 1-1/2 | 3/4 | 1-1/4 | 20° | FCT-180-H | 3/4 | 3/4 | 3/4 | 20° |
| 20 | 14 | 17.88 | 22.45 | FCT-200 | 1-1/2 | 3/4 | 1-1/4 | 20° | FCT-200-H | 3/4 | 3/4 | 3/4 | 20° |
| 24 | 14 | 22.84 | 27.17 | FCT-240 | 1-1/2 | 3/4 | 1-1/4 | 20° | FCT-240-H | 3/4 | 3/4 | 3/4 | 20° |

### Operating pressure

| Series | Size | PSIG |
|---|---|---|
| FCS | up to 12" | 215 |
| | 14" to 28" | 115 |
| FCS-H | up to 12" | 362 |
| | 14" to 28" | 232 |
| FCT | up to 12" | 227 |
| | 14" to 24" | 113 |
| FCT-H | up to 12" | 355 |
| | 14" to 24" | 227 |

*Ratings indicated above are for constant pressures at 100°F. For pulsating pressures use 1/2 of rating; for surge pressures use 1/6 of rating. For elevated temperature ratings, consult factory.*

### Operating temp. range

| Series | °F |
|---|---|
| FCS | 14 to 240 |
| FCS-H | 14 to 194 |
| FCT | -4 to 212 |
| FCT-H | 14 to 170 |

### Control Units

| Size | Units / Joint |
|---|---|
| up to 8" | 2 |
| 10" to 24" | 4 |

*Control units must be installed on unanchored systems or when test / surge / operating pressure exceeds the rating below:*

| Size | Pressure |
|---|---|
| up to 4" | 150 psig |
| 5" to 10" | 135 psig |
| 12" to 14" | 90 psig |
| 16" to 24" | 45 psig |

*Expansion joints must be installed per FSA technical handbook guidelines.*

# Stainless Steel Expansion Joints

VIMCO

## Features + Application Information

1. Reduces noise and vibration transmission
2. Vibration absorption and piping misalignment correction
3. Eliminates stress due to thermal expansion and piping misalignment
4. Engineered bellow design ensures equal stress distribution through entire length
5. Corrosion resistant materials
6. Easy field installation

## Dimensional + Model Selection Data

### JF-500-T models


Materials (see figure)

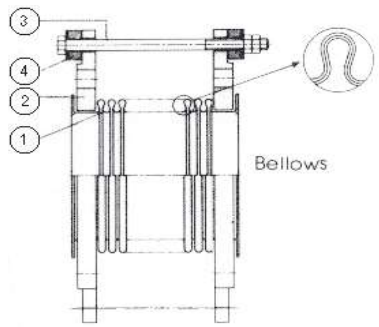
| No. | Part | Description |
|---|---|---|
| 1 | Bellows | SUS304 (SUS316 option) |
| 2 | Braids | SUS304 |
| 3 | Tube end | SUS304 |

### JF-500-T series (threaded connection)

| Model | Nominal bore (inches) | Total length (inches) | Bellows O.D. (inches) | Axial movement (inches) | Max. lateral offset (inches) | Operating pressure (psi) | Temp. range (°F) |
|---|---|---|---|---|---|---|---|
| JF-500-T-5 | 1/2 | 10 | 0.75 | ± 0.60 | .78 | 300 | -122 to +780 |
| JF-500-T-7 | 3/4 | 10 | 1.06 | ± 0.60 | .78 | 300 | -122 to +780 |
| JF-500-T-10 | 1 | 10 | 1.28 | ± 0.60 | .78 | 300 | -122 to +780 |
| JF-500-T-12 | 1-1/4 | 10 | 1.81 | ± 0.60 | .70 | 300 | -122 to +780 |
| JF-500-T-15 | 1-1/2 | 12 | 2.20 | ± 0.60 | .62 | 300 | -122 to +780 |
| JF-500-T-20 | 2 | 12 | 2.76 | ± 0.60 | .59 | 300 | -122 to +780 |

*Pressure ratings indicated above are based on 68°F ambient temperature. For elevated temperature ratings, consult factory.*

### JF-500 / JF-500-H models




Materials (see figure)

| No. | Part | Description |
|---|---|---|
| 1 | Bellows | SUS304 (SUS316 option) |
| 2 | Flange | AISI 1015 (SUS304 option) |
| 3 | Tie Rods | S25C |
| 4 | Gasket | Rubber |

### JF-500 / JF-500-H series (flanged connection)

| Model | Nominal bore (inches) | Total length (inches) | Bellows O.D. (inches) | Axial movement (inches) | Max. lateral offset (inches) | Operating pressure (psi) | Temp. range (°F) |
|---|---|---|---|---|---|---|---|
| JF-500-20 | 2 | 6 | 2.75 | ± 0.60 | .59 | 150 | -122 to +780 |
| JF-500-25 | 2-1/2 | 6 | 3.40 | ± 0.60 | .55 | 150 | -122 to +780 |
| JF-500-30 | 3 | 6 | 3.99 | ± 0.60 | .47 | 150 | -122 to +780 |
| JF-500-40 | 4 | 6 | 5.03 | ± 0.60 | .39 | 150 | -122 to +780 |
| JF-500-50 | 5 | 6 | 6.16 | ± 0.60 | .31 | 150 | -122 to +780 |
| JF-500-60 | 6 | 6 | 7.22 | ± 0.60 | .23 | 150 | -122 to +780 |
| JF-500-80 | 8 | 8 | 9.21 | ± 0.60 | .31 | 150 | -122 to +780 |
| JF-500-100 | 10 | 8 | 11.37 | ± 0.60 | .23 | 150 | -122 to +780 |
| JF-500-120 | 12 | 8 | 13.42 | ± 0.60 | .19 | 150 | -122 to +780 |
| JF-500-140 | 14 | 9 | 15.43 | ± 0.60 | .19 | 150 | -122 to +780 |
| JF-500-160 | 16 | 9 | 17.83 | ± 0.60 | .19 | 150 | -122 to +780 |
| JF-500-180 | 18 | 9 | 19.84 | ± 0.60 | .19 | 150 | -122 to +780 |
| JF-500-200 | 20 | 9 | 21.81 | ± 0.60 | .19 | 150 | -122 to +780 |
| JF-500-240 | 24 | 10 | 25.79 | ± 0.60 | .19 | 150 | -122 to +780 |
| JF-500-300 | 30 | 11 | 31.89 | ± 0.60 | .19 | 150 | -122 to +780 |
| JF-500-H-20 | 2 | 6 | 2.75 | ± 0.60 | .59 | 370 | -122 to +780 |
| JF-500-H-25 | 2-1/2 | 6 | 3.40 | ± 0.60 | .55 | 370 | -122 to +780 |
| JF-500-H-30 | 3 | 6 | 3.99 | ± 0.60 | .47 | 370 | -122 to +780 |
| JF-500-H-40 | 4 | 6 | 5.03 | ± 0.60 | .39 | 370 | -122 to +780 |
| JF-500-H-50 | 5 | 6 | 6.16 | ± 0.60 | .31 | 370 | -122 to +780 |
| JF-500-H-60 | 6 | 6 | 7.22 | ± 0.60 | .23 | 370 | -122 to +780 |
| JF-500-H-80 | 8 | 8 | 9.21 | ± 0.60 | .31 | 370 | -122 to +780 |
| JF-500-H-100 | 10 | 8 | 11.37 | ± 0.60 | .23 | 370 | -122 to +780 |
| JF-500-H-120 | 12 | 8 | 13.42 | ± 0.60 | .19 | 370 | -122 to +780 |
| JF-500-H-140 | 14 | 9 | 15.58 | ± 0.60 | .19 | 370 | -122 to +780 |
| JF-500-H-160 | 16 | 9 | 17.95 | ± 0.60 | .19 | 370 | -122 to +780 |
| JF-500-H-180 | 18 | 9 | 19.96 | ± 0.60 | .19 | 370 | -122 to +780 |
| JF-500-H-200 | 20 | 10 | 21.93 | ± 0.60 | .19 | 370 | -122 to +780 |
| JF-500-H-240 | 24 | 11 | 25.79 | ± 0.60 | .19 | 370 | -122 to +780 |
| JF-500-H-300 | 30 | 11 | 31.89 | ± 0.60 | .19 | 370 | -122 to +780 |

*Pressure ratings indicated above are based on 68°F ambient temperature. For elevated temperature ratings, consult factory.*