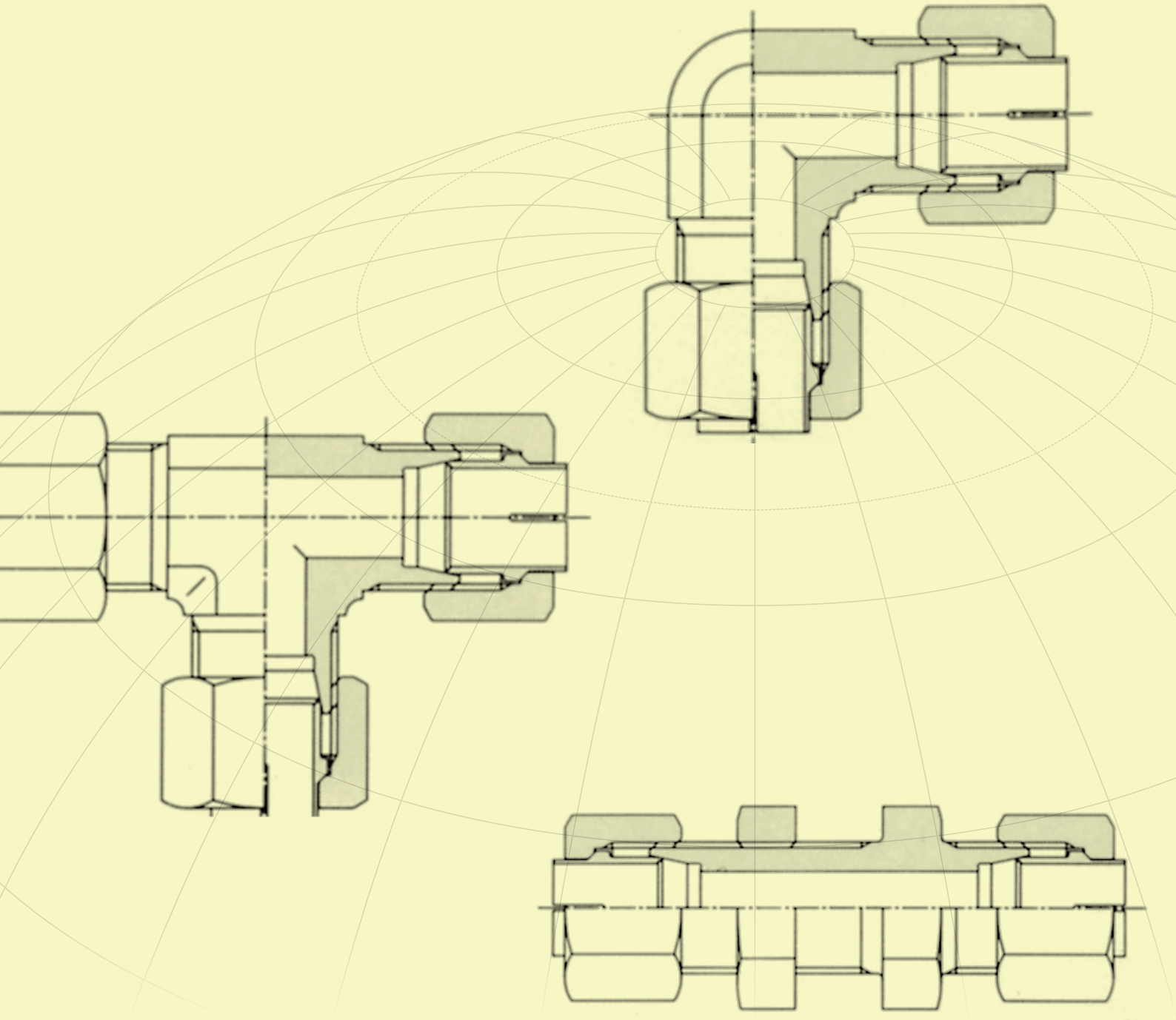
CAT. No. 9341 C

# IHARA

# CE Series Bite Type Fittings for Steel Tube



IHARA SCIENCE CORPORATION

# CE Series Bite Type Fittings for Steel Tube VISUAL INDEX

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**EXPLANATION OF WARNINGS AND CAUTIONS IN THIS CATALOGUE**

⚠ **Warning :** When this sign is ignored and improperly used, there will be danger of accidents occurring that may result in physical injuries and/or death.

⚠ **Caution :** When this sigh is ignored and improperly used, there will be possibility of the product not performing as specified.

CE Series Bite Type Tube Fittings have been developed as fittings for use in hydraulic applications with pressure up to 13.7 MPa (140 Kgf/cm$^2$) such as machine tools. Being more compact in size than conventional fittings and possessing substantially improved vibration resistance and leak prevention, these fittings can be used not only for hydraulic equipment but also for lubrication piping and air piping. For applications where pressure above 13.7 MPa (140 Kgf/cm$^2$) are required, the NE Series Bite Type Tube Fittings are available.

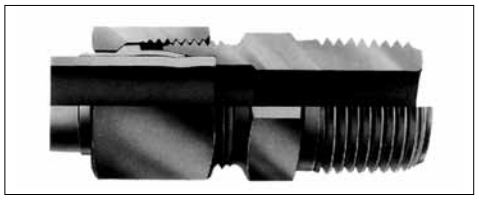
## 1. FEATURES OF CE SERIES BITE TYPE TUBE FITTINGS

1) CE Series Bite Type Tube Fittings do not require welding, threading nor flaring and piping man hour can be saved.
2) The envelope of the sleeve enables strict centering of the piping and contributes to substantially reduce the trouble of off-centering which has been the major cause for leakage in piping.
3) With the function of the envelope with slits which has been analyzed by finite element method, vibration fatigue resistance has been improved by more than 20% (company comparison).
4) Workability has been substantially enhanced by reducing the size to approximately 75% (volumetric comparison) and the tightening torque by 25 to 30% in comparison to the conventional type. This enables performing compact piping within restricted space.
5) Fittings are in accordance with Japan Machine Tool Industrial Society Standard (MAS 206-1991). JIS B 2351 is the popularly known standard applying to bite type fittings but MAS standard has adopted higher bending stress values for vibration resistance test than JIS standard taking into consideration the operating conditions of machine tools. The main dimensions of the fittings are established smaller dimensions.

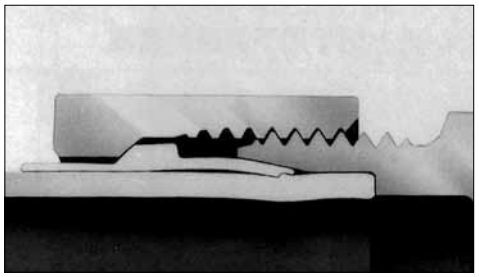
## 2. FUNCTION OF THE CE SERIES BITE TYPE TUBE FITTINGS

The CE Series Bite Type Tube Fitting consists of the fitting body, nut and sleeve.

As the nut is tightened, the sleeve is forced forward in between the tapered surface of the fitting body and the tube, and completely seals the fluid.



As the sleeve is being swaged by the tapered surface of the fitting body, the cutting edge on the forward end of the sleeve bites into the tube and firmly grips the tube. The opposite end of the sleeve is deformed by the tapered surface of the nut and, by firmly holding the tube, relieves stress concentrating at the biting part caused by vibration. The bowing action of the sleeve works as a spring to prevent loosening of the nut.



The envelope at the rear edge of the sleeve spreads the stress generating on the tube at the rear edge on the tube and also improve vibration resistance strength of the tube.

⚠ **Warning** : Intermix other vendors' parts (body, nut, sleeve) with CE fitting parts is strictly prohibited.
It might cause the serious accidents due to the degradation of the fitting performance.

## 3. Specification

Rated pressure: 13.7 MPa (140 Kgf/cm$^2$)

Temperature range: −20 to +3000℃

⚠ **Warning** : Refrain from useing at the pressure more than the specified above.

## 4. Material and Surface Treatment

1) Fitting body and nut

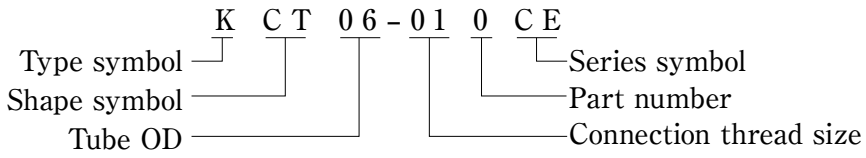
S25C to S48C specified as carbon steel material for machinery construction in JIS G 4051 or material possessing equivalent properties. Material is phosphate coating treated after being machined.

2) Sleeve

Low carbon steel, material with surface hardening treatment is used.

In addition to the standard phosphate coating treatment, other surface treatment such as electro galvanizing can also be available upon request.

## 5. Part Numbering Symbols and Standard Sizes




| Nominal sizes | 06 | 08 | 10 | 12 | 16 | 20 | 25 | 30 |
|---|---|---|---|---|---|---|---|---|
| Tube OD | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 30 |

| Nominal sizes | 01 | 02 | 03 | 04 | 06 | 08 | 10 |
|---|---|---|---|---|---|---|---|
| Connection thread | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1-1/4 |

## 6. Applicable Tubes

The following steel tubes are applicable for use with CE Series Bite Type Tube Fittings:

1) J1S B 2351 Bite type tube fitting for hydraulic application of 25 Mpa (250 Kgf/cm$^2$), Appendix: Precision carbon steel tube: STPS Type 1 and Type 2
2) Japan Hydraulic and Pneumatic Industrial Standard JOHS-102: Precision carbon steel tube for hydraulic piping: OST Type 1 and Type 2
3) Other steel tubes equivalent to above tubes.

## 7. Recommended Wall Thickness of Applicable Tubes

| Wall thickness | Std dimension | 1 | 1.2 | 1.5 | 2 | 2.5 | 3 |
|---|---|---|---|---|---|---|---|
| | Allowance | ±0.15 | ±0.15 | ±0.2 | ±0.2 | ±0.25 | ±0.3 |
| Tube OD | | | | | | | |
| Std dimension | Allowance | | | | | | |
| 6 | ±0.10 | ○ | | | | | |
| 8 | | ○ | | | | | |
| 10 | | ○ | | | | | |
| 12 | | | ○ | | | | |
| 16 | | | | ○ | | | |
| 20 | | | | | ○ | | |
| 25 | | | | | | ○ | |
| 30 | ±0.15 | | | | | | ○ |

Remarks

1. Scope of recommended wall thickness is shown within [ ].
2. ○ indicates recommended wall thickness when using CE Series Bite Type Tube Fittings at the rated pressure of 13.7 Mpa (140 Kgf/cm²). Calculation shall be in accordance with JIS B 2351-1969 and the calculation formula shall be as follows with the tube to be used being OST-2.

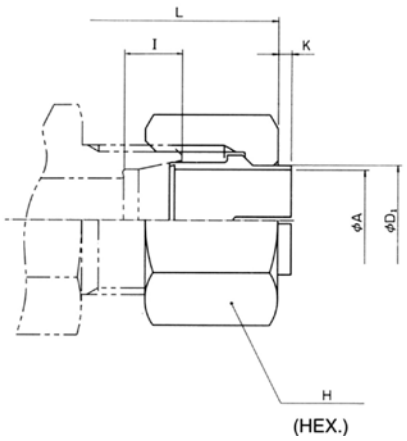
$$t = \frac{d_0 P}{2\sigma max}$$

t : Wall thickness (mm)
$d_0$ : OD (mm)
$\sigma$ max : Allowable stress (88.3 N/mm²)
P : Pressure (13.7 Mpa)

## 8. Sizes and Installation Dimensions

unit: mm

| Applicable Tube OD A | l | $D_1$ | K | Width Across Hex. H |
|---|---|---|---|---|
| 6 | 5.5 | 7.05 | 1.3 | 12 |
| 8 | 5.5 | 9.05 | 1.1 | 14 |
| 10 | 5.5 | 11.15 | 1.1 | 17 |
| 12 | 6.0 | 13.15 | 1.1 | 19 |
| 16 | 8.0 | 17.35 | 1.2 | 27 |
| 20 | 8.0 | 21.75 | 1.0 | 30 |
| 25 | 9.0 | 26.75 | 1.0 | 36 |
| 30 | 9.0 | 31.85 | 1.0 | 41 |



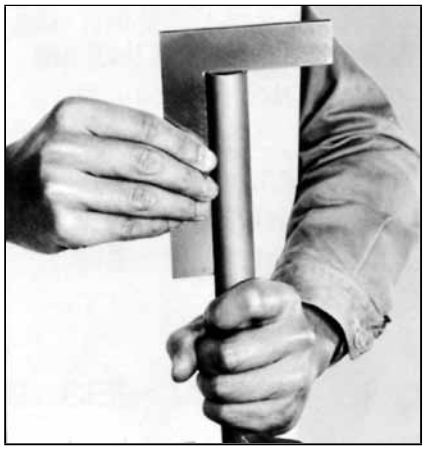

Note: For dimension of "L" refer to individual fittings in text.

## 9. TIGHTENING PROCEDURE

It is imperative that proper tubes are selected and the fittings are correctly tightened for the bite type fittings to fully exhibit it's performance. Bite type fittings can be directly installed and tightened at the job site, but it is recommended to perform presetting as explained below to confirm the condition of the sleeve biting into the tube. Presetting device is available for performing presetting work both efficiently and correctly as well as to obtain a positive connection. Refer to pages 40～41.

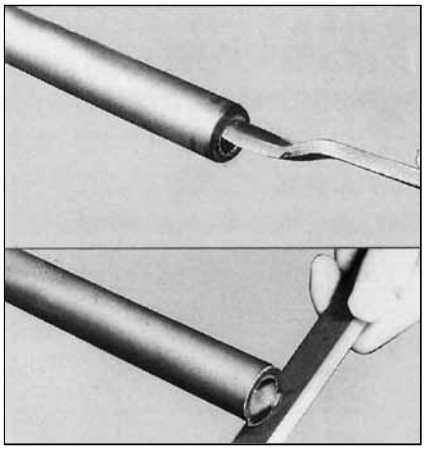
### 1) Presetting

①



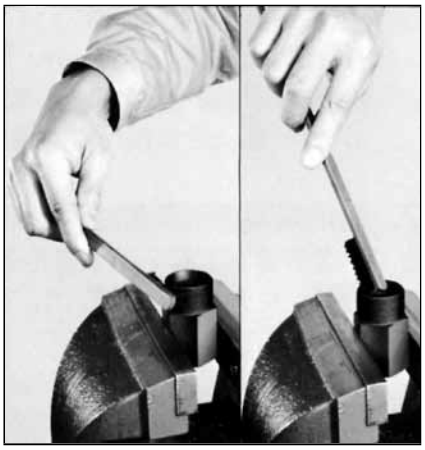
Cut the tube to the required length. The cut edge of the tube should be at a right angle to the tube center line.
The tolerance of a right angle should be 90°± 1°.

②



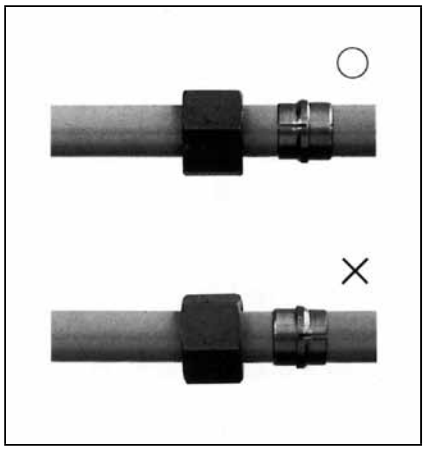
Remove all burrs from the inside and outside at the tube cut end. Exercise care not to deform the tube or cause damages such as deep scratches on the tube outside surface.

③



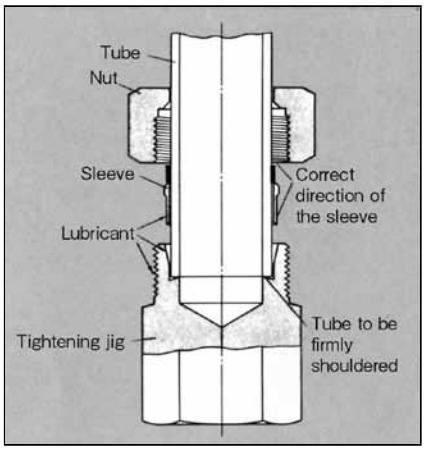
Firmly clamp the tightening jig PJA (refer to page 36) in a bench-vice.
Coat the threads and tapered portion with lubricant

④



Insert the nut and the sleeve in correct order and direction on to the tube.
Particular attention should be made to the direction of the sleeve.

⑤

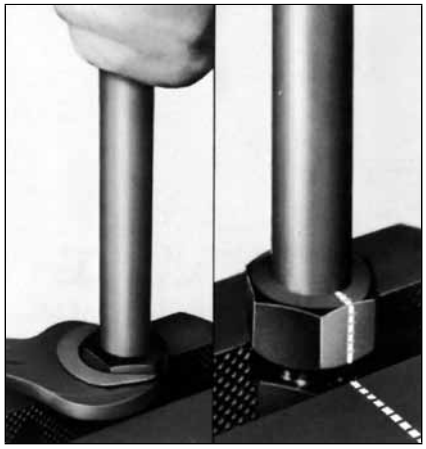



Insert the tube with the nut and the sleeve into the tightening jig.
The tube end must be firmly contacting the shoulder of the tightening jig.

⑥

Finger tighten the nut.

⑦

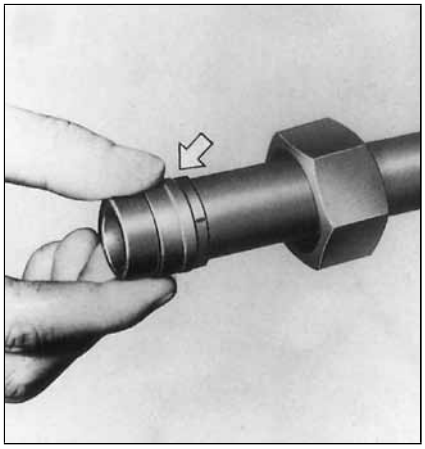


Confirm the grip point.
While turning the tube lightly with the hand, tighten the nut until the tube can no longer be turned. This point is referred to as the grip point. It is at this point that the sleeve begins to bite into the tube. Draw an identification matching mark so that the amount of tightening can be determined.

⑧

Tighten the nut 1-1/4 turn with a spanner from the grip point.
(See note)
With the above procedure the sleeve has firmly bitten and seated into the tube.
**⚠ WARNING: Provide adequate work space and assure safety when tightening the nut. The wrench must be properly fitted to the nut when tightening.**
**⚠ CAUTION: If tightening is insufficient, leakage may occur and the tube may pull out. Excessively tightening the nut can damage the fitting and impair its function.**

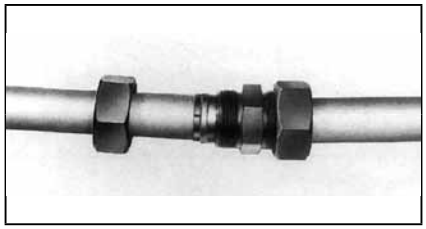
⑨



Loosen the nut and check the sleeve biting condition.
a) The surface of the sleeve should be free of scratches and nicks.
b) The sleeve edge should be several millimeters apart from the tube end.
c) The sleeve should not move axially on the tube although peripheral rotating movement is permissible.

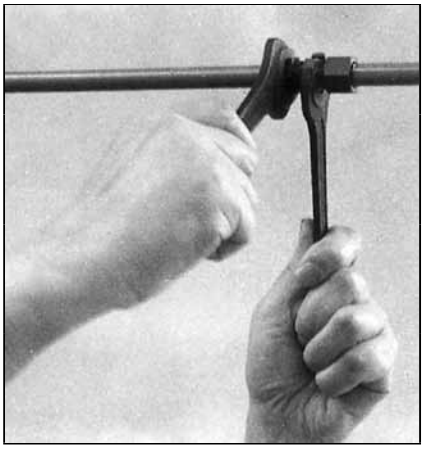
## 2) Resetting

⑩



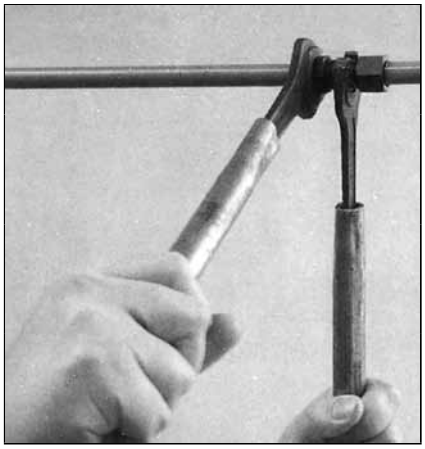
When installing a tube that has been presetted to a fitting body, the surface of the sleeve and the tapered surface on the fitting body must be clean and free from metal cuttings and other foreign materials.
Tighten the nut with the fingers to the fitting body and the nut should be capable of being tightened more than 2 turns.
**⚠ WARNING: Do not disassemble the fitting under pressurized.**
**⚠ CAUTION: After presetting, blow compressed air on the sleeve and the taper bore surface on the fitting body to remove all foreign matters before assembling. If a foreign matter becomes caught, the sealing function can be impaired.**

⑪



Use a standard single head spanner to tighten and search for a point where the torque suddenly increases (this point is referred to as the sharp torque rising point).

⑫



Further tighten the nut 1/4 turn from the sharp torque rising point. To prevent the nut and fitting body from co-ratating, hold the fitting body with another spanner.
**⚠ WARNING: Provide adequate work space and ascertain safety when tightening the nut. The wrench must be properly fitted to the nut when tightening.**
**⚠ CAUTION: If tightening is insufficient, leakage can occur and the tube may slip. Excessively tightening the nut can damage the fitting and impair its function.**

Remark: The tightening standard and number of turns for tube ends of adapters (KLA), reducers (KRE) and adjustable elbows (KLC) as well as plugs (KBA) are not identical to the above.

The procedure for tightening the tube ends for these fittings is:

i ) To preset, tighten the nut 1-3/4 turn from the finger tightened position (position of ⑥).

ii) To reset, tighten the nut 1/6 turn from the sharp torque rising point.

The procedure for tightening the plug is:

i ) Initial tightening:Tighten the nut 1/4 turn from the finger tightened position.

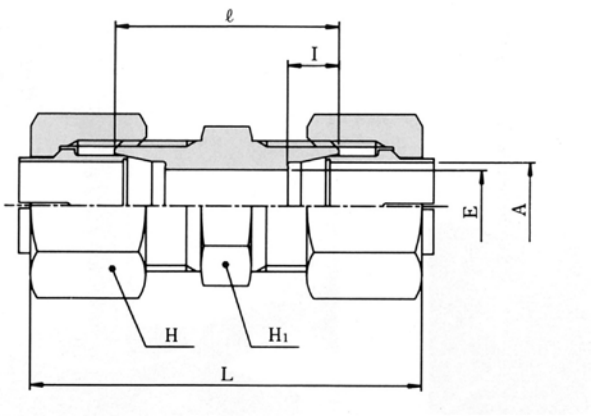
ii) Second tightening and thereafter:Tighten the nut 1/8 to 1/6 turn from the finger tightened position.

### 3) Disassembly and remaking

The bite type fitting assembly can be disassembled simply by loosening the nut.

When the procedures from 2) is followed for remaking after disassembly, disassembly and remaking can be satisfactorily repeated more than 8 times.

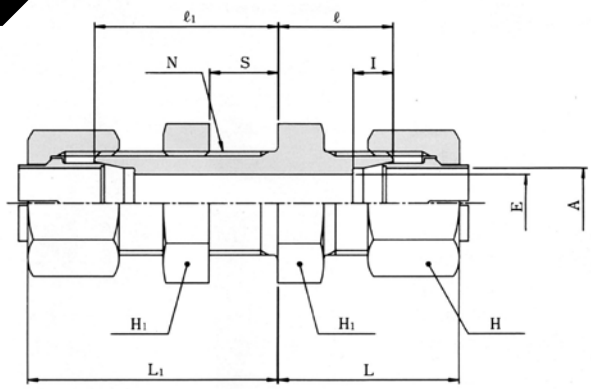
## Union KUA




unit: mm

| Part No. | Tube OD A | E | Hex. | | I | ℓ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|
| | | | $H_1$ | H | | | | |
| KUA06−000CE | 6 | 4.5 | 10 | 12 | 5.5 | 20 | 38.6 | 0.020 |
| KUA08−000CE | 8 | 6 | 12 | 14 | 5.5 | 22 | 42 | 0.030 |
| KUA10−000CE | 10 | 8 | 14 | 17 | 5.5 | 23 | 43 | 0.040 |
| KUA12−000CE | 12 | 10 | 17 | 19 | 6 | 24 | 44 | 0.051 |
| KUA16−000CE | 16 | 13 | 22 | 27 | 8 | 29 | 54.2 | 0.130 |
| KUA20−000CE | 20 | 17 | 27 | 30 | 8 | 30 | 58.6 | 0.154 |
| KUA25−000CE | 25 | 22 | 32 | 36 | 9 | 33 | 62.6 | 0.225 |
| KUA30−000CE | 30 | 26 | 36 | 41 | 9 | 35 | 65.6 | 0.291 |

## Bulkhead Union KSU

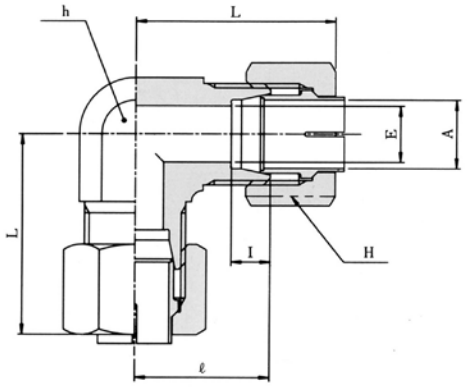



unit: mm

| Part No. | Tube OD A | E | Hex. | | I | $\ell_1$ | ℓ | Approx. $L_1$ | Approx. L | N | Max. S | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $H_1$ | H | | | | | | | | |
| KSU06−000CE | 6 | 4.5 | 14 | 12 | 5.5 | 26 | 13 | 35.3 | 22.3 | M10×1 | 13 | 0.035 |
| KSU08−000CE | 8 | 6 | 17 | 14 | 5.5 | 27.5 | 14.5 | 37.5 | 24.5 | M12×1 | 13 | 0.055 |
| KSU10−000CE | 10 | 8 | 19 | 17 | 5.5 | 29 | 16 | 39 | 26 | M14×1 | 13 | 0.072 |
| KSU12−000CE | 12 | 10 | 22 | 19 | 6 | 29 | 16 | 39 | 26 | M16×1 | 13 | 0.091 |
| KSU16−000CE | 16 | 13 | 27 | 27 | 8 | 34 | 19 | 46.6 | 31.6 | M22×1.5 | 15 | 0.202 |
| KSU20−000CE | 20 | 17 | 32 | 30 | 8 | 36 | 21 | 50.3 | 35.3 | M26×1.5 | 15 | 0.261 |
| KSU25−000CE | 25 | 22 | 36 | 36 | 9 | 37.5 | 22.5 | 52.3 | 37.3 | M32×1.5 | 15 | 0.357 |
| KSU30−000CE | 30 | 26 | 41 | 41 | 9 | 39 | 23.5 | 54.3 | 38.8 | M36×1.5 | 15 | 0.453 |

⚠ **CAUTION : This type of fitting is designed to be used for wall penetration. When used in the place of strong vibration and/or pressure fluctuation, proper vibration measures such as fixing the piping by clamp are required.**

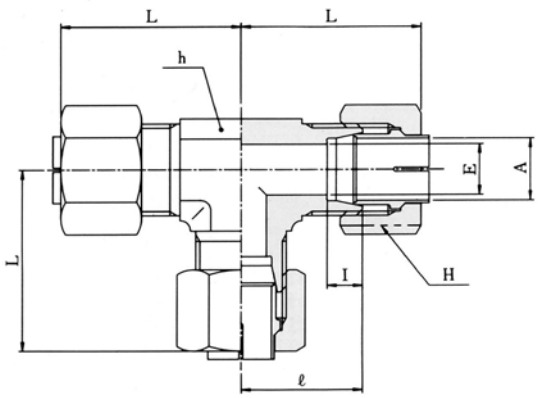
## Union Elbow KLA




unit: mm

| Part No. | Tube OD A | E | Flats h | Hex. H | I | ℓ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|
| KLA06−000CE | 6 | 4.5 | 12 | 12 | 5.5 | 17 | 26.3 | 0.032 |
| KLA08−000CE | 8 | 6 | 12 | 14 | 5.5 | 17.5 | 27.5 | 0.037 |
| KLA10−000CE | 10 | 8 | 14 | 17 | 5.5 | 20 | 30 | 0.055 |
| KLA12−000CE | 12 | 10 | 17 | 19 | 6 | 21 | 31 | 0.080 |
| KLA16−000CE | 16 | 13 | 24 | 27 | 8 | 28 | 40.6 | 0.194 |
| KLA20−000CE | 20 | 17 | 27 | 30 | 8 | 30.5 | 44.8 | 0.234 |
| KLA25−000CE | 25 | 22 | 36 | 36 | 9 | 35.5 | 50.3 | 0.438 |
| KLA30−000CE | 30 | 26 | 41 | 41 | 9 | 39.5 | 54.8 | 0.605 |

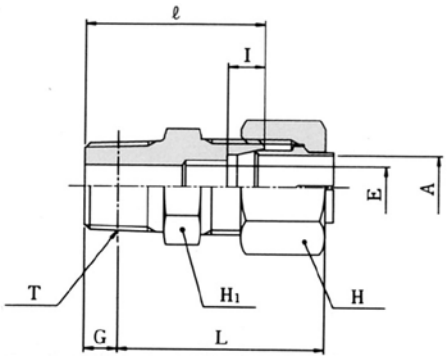
## Union Tee KTA




unit: mm

| Part No. | Tube OD A | E | Flats h | Hex. H | I | ℓ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|
| KTA06−000CE | 6 | 4.5 | 12 | 12 | 5.5 | 17 | 26.3 | 0.044 |
| KTA08−000CE | 8 | 6 | 12 | 14 | 5.5 | 17.5 | 27.5 | 0.053 |
| KTA10−000CE | 10 | 8 | 14 | 17 | 5.5 | 20 | 30 | 0.076 |
| KTA12−000CE | 12 | 10 | 17 | 19 | 6 | 21 | 31 | 0.095 |
| KTA16−000CE | 16 | 13 | 24 | 27 | 8 | 28 | 40.6 | 0.268 |
| KTA20−000CE | 20 | 17 | 27 | 30 | 8 | 30.5 | 44.8 | 0.332 |
| KTA25−000CE | 25 | 22 | 36 | 36 | 9 | 35.5 | 50.3 | 0.572 |
| KTA30−000CE | 30 | 26 | 41 | 41 | 9 | 39.5 | 54.8 | 0.772 |

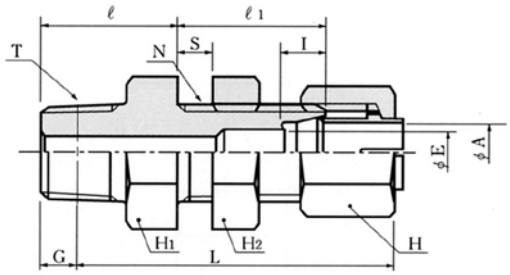
# Male Connector KCT




unit: mm

| Part No. | Tube OD A | (R) T | Minimum Opening E | Gauge Length G | Hex. | | I | ℓ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $H_1$ | H | | | | |
| KCT06−010CE | 6 | ⅛ | 4.5 | 3.97 | 12 | 12 | 5.5 | 22.5 | 27.8 | 0.017 |
| KCT06−020CE | 6 | ¼ | 4.5 | 6.01 | 14 | 12 | 5.5 | 26.5 | 29.8 | 0.024 |
| KCT06−030CE | 6 | ⅜ | 4.5 | 6.35 | 17 | 12 | 5.5 | 29 | 31.9 | 0.039 |
| KCT08−010CE | 8 | ⅛ | 4.5 | 3.97 | 12 | 14 | 5.5 | 23 | 29 | 0.019 |
| KCT08−020CE | 8 | ¼ | 6 | 6.01 | 14 | 14 | 5.5 | 27 | 31 | 0.026 |
| KCT08−030CE | 8 | ⅜ | 6 | 6.35 | 17 | 14 | 5.5 | 29.5 | 33.1 | 0.042 |
| KCT10−020CE | 10 | ¼ | 7 | 6.01 | 14 | 17 | 5.5 | 28 | 32 | 0.032 |
| KCT10−030CE | 10 | ⅜ | 8 | 6.35 | 17 | 17 | 5.5 | 30 | 33.7 | 0.044 |
| KCT12−020CE | 12 | ¼ | 7 | 6.01 | 17 | 19 | 6 | 29 | 33 | 0.038 |
| KCT12−030CE | 12 | ⅜ | 9 | 6.35 | 17 | 19 | 6 | 30 | 33.7 | 0.043 |
| KCT12−040CE | 12 | ½ | 10 | 8.16 | 22 | 19 | 6 | 36 | 37.8 | 0.078 |
| KCT16−030CE | 16 | ⅜ | 9 | 6.35 | 22 | 27 | 8 | 33.5 | 39.8 | 0.092 |
| KCT16−040CE | 16 | ½ | 12 | 8.16 | 22 | 27 | 8 | 37.5 | 41.9 | 0.105 |
| KCT20−040CE | 20 | ½ | 12 | 8.16 | 27 | 30 | 8 | 37.5 | 43.6 | 0.116 |
| KCT20−060CE | 20 | ¾ | 16 | 9.53 | 27 | 30 | 8 | 39.5 | 44.3 | 0.140 |
| KCT25−060CE | 25 | ¾ | 16 | 9.53 | 32 | 36 | 9 | 42.5 | 47.8 | 0.189 |
| KCT25−080CE | 25 | 1 | 20 | 10.39 | 36 | 36 | 9 | 46.5 | 50.9 | 0.249 |
| KCT30−060CE | 30 | ¾ | 16 | 9.53 | 36 | 41 | 9 | 44.5 | 50.3 | 0.253 |
| KCT30−080CE | 30 | 1 | 22 | 10.39 | 36 | 41 | 9 | 47.5 | 52.4 | 0.262 |
| KCT30−100CE | 30 | 1¼ | 26 | 12.7 | 46 | 41 | 9 | 51 | 53.6 | 0.402 |

# Bulkhead Male Connector KSC

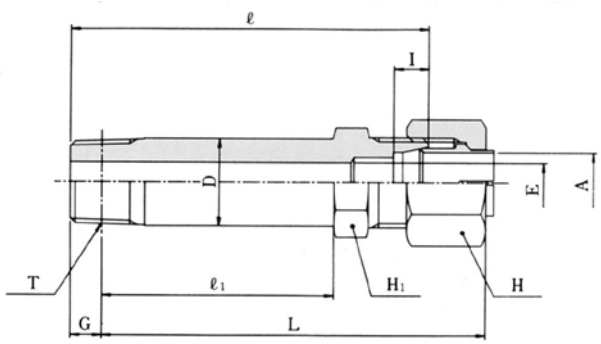



unit: mm

| Part No. | Tube OD A | (R) T | E | Gauge Length G | Hex. | | | I | ℓ | ℓ1 | Approx. L | N | Max. S | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $H_1$ | $H_2$ | H | | | | | | | |
| KSC06−010CE | 6 | ⅛ | 4 | 3.97 | 14 | 14 | 12 | 5.5 | 15 | 26 | 46.3 | M10×1 | 13 | 0.033 |
| KSC06−020CE | 6 | ¼ | 4.5 | 6.01 | 14 | 14 | 12 | 5.5 | 19 | 26 | 48.3 | M10×1 | 13 | 0.038 |
| KSC08−010CE | 8 | ⅛ | 4 | 3.97 | 17 | 17 | 14 | 5.5 | 16 | 27.5 | 49.5 | M12×1 | 13 | 0.051 |
| KSC08−020CE | 8 | ¼ | 6 | 6.01 | 17 | 17 | 14 | 5.5 | 20 | 27.5 | 51.5 | M12×1 | 13 | 0.052 |
| KSC10−020CE | 10 | ¼ | 7 | 6.01 | 19 | 19 | 17 | 5.5 | 21 | 29 | 54 | M14×1 | 13 | 0.066 |
| KSC10−030CE | 10 | ⅜ | 8 | 6.35 | 19 | 19 | 17 | 5.5 | 22 | 29 | 54.7 | M14×1 | 13 | 0.074 |
| KSC12−020CE | 12 | ¼ | 7 | 6.01 | 22 | 22 | 19 | 6 | 21 | 29 | 54 | M16×1 | 13 | 0.094 |
| KSC12−030CE | 12 | ⅜ | 9 | 6.35 | 22 | 22 | 19 | 6 | 22 | 29 | 54.7 | M16×1 | 13 | 0.088 |
| KSC16−030CE | 16 | ⅜ | 9 | 6.35 | 27 | 27 | 27 | 8 | 23 | 34 | 63.3 | M22×1.5 | 15 | 0.163 |
| KSC16−040CE | 16 | ½ | 12 | 8.16 | 27 | 27 | 27 | 8 | 27 | 34 | 65.4 | M22×1.5 | 15 | 0.176 |
| KSC20−040CE | 20 | ½ | 12 | 8.16 | 32 | 32 | 30 | 8 | 29 | 36 | 71.1 | M26×1.5 | 15 | 0.243 |
| KSC20−060CE | 20 | ¾ | 16 | 9.53 | 32 | 32 | 30 | 8 | 31 | 36 | 71.8 | M26×1.5 | 15 | 0.251 |
| KSC25−060CE | 25 | ¾ | 16 | 9.53 | 36 | 36 | 36 | 9 | 32 | 37.5 | 74.8 | M32×1.5 | 15 | 0.357 |
| KSC25−080CE | 25 | 1 | 20 | 10.39 | 36 | 36 | 36 | 9 | 35 | 37.5 | 76.9 | M32×1.5 | 15 | 0.420 |
| KSC30−060CE | 30 | ¾ | 16 | 9.53 | 41 | 41 | 41 | 9 | 32.5 | 39 | 77.3 | M36×1.5 | 15 | 0.430 |
| KSC30−080CE | 30 | 1 | 22 | 10.39 | 41 | 41 | 41 | 9 | 35.5 | 39 | 79.4 | M36×1.5 | 15 | 0.457 |
| KSC30−100CE | 30 | 1¼ | 26 | 12.7 | 46 | 41 | 41 | 9 | 39 | 39 | 80.6 | M36×1.5 | 15 | 0.554 |

⚠ **CAUTION : This type of fitting is designed to be used for wall penetration. When used in the place of strong vibration and/or pressure fluctuation, proper vibration measures such as fixing the piping by clamp are required.**

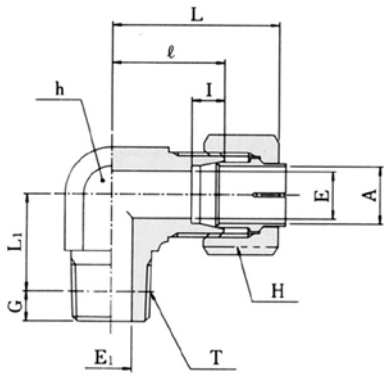
# Extended Male Connector KCC




unit: mm

| Part No. | Tube OD A | (R) T | Minimum Opening E | Gauge Length G | Hex. | | I | D | ℓ | ℓ 1 | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $H_1$ | H | | | | | | |
| KCC06−010CE | 6 | ⅛ | 4 | 3.97 | 12 | 12 | 5.5 | 10.5 | 49.5 | 33 | 54.8 | 0.031 |
| KCC08−010CE | 8 | ⅛ | 4 | 3.97 | 12 | 14 | 5.5 | 10.5 | 51 | 34 | 57 | 0.037 |
| KCC08−020CE | 8 | ¼ | 6 | 6.01 | 14 | 14 | 5.5 | 14 | 55 | 36 | 59 | 0.055 |
| KCC10−020CE | 10 | ¼ | 7 | 6.01 | 14 | 17 | 5.5 | 14 | 57 | 37 | 61 | 0.054 |
| KCC10−030CE | 10 | ⅜ | 8 | 6.35 | 17 | 17 | 5.5 | 17 | 59 | 37.5 | 62.7 | 0.085 |
| KCC12−020CE | 12 | ¼ | 6 | 6.01 | 17 | 19 | 6 | 14 | 59 | 38 | 63 | 0.072 |
| KCC12−030CE | 12 | ⅜ | 9 | 6.35 | 17 | 19 | 6 | 17 | 60 | 38.5 | 63.7 | 0.079 |
| KCC16−030CE | 16 | ⅜ | 9 | 6.35 | 22 | 27 | 8 | 17.5 | 70 | 45 | 76.3 | 0.151 |
| KCC16−040CE | 16 | ½ | 12 | 8.16 | 22 | 27 | 8 | 22 | 74 | 47.3 | 78.4 | 0.178 |
| KCC20−040CE | 20 | ½ | 12 | 8.16 | 27 | 30 | 8 | 27 | 76 | 49.5 | 90.3 | 0.259 |
| KCC20−060CE | 20 | ¾ | 16 | 9.53 | 27 | 30 | 8 | 27 | 79.5 | 51.5 | 84.3 | 0.249 |
| KCC25−060CE | 25 | ¾ | 16 | 9.53 | 32 | 36 | 9 | 27.5 | 86 | 55 | 91.3 | 0.329 |
| KCC25−080CE | 25 | 1 | 20 | 10.39 | 36 | 36 | 9 | 34.5 | 91.5 | 58 | 95.9 | 0.473 |
| KCC30−060CE | 30 | ¾ | 16 | 9.53 | 36 | 41 | 9 | 27.5 | 89.5 | 56.5 | 95.3 | 0.412 |
| KCC30−080CE | 30 | 1 | 22 | 10.39 | 36 | 41 | 9 | 34.5 | 93.5 | 59.5 | 98.4 | 0.471 |
| KCC30−100CE | 30 | 1¼ | 26 | 12.7 | 46 | 41 | 9 | 43 | 98 | 61.3 | 100.6 | 0.743 |

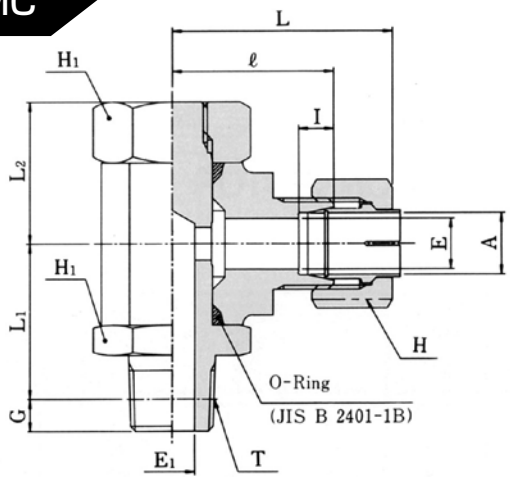
# Male Elbow KLN




unit: mm

| Part No. | Tube OD A | (R) T | E | $E_1$ | Gauge Length G | Flats h | Hex. H | I | ℓ | Approx. L | Approx. $L_1$ | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KLN06−010CE | 6 | ⅛ | 4.5 | 4.5 | 3.97 | 12 | 12 | 5.5 | 17 | 26.3 | 14.5 | 0.027 |
| KLN06−020CE | 6 | ¼ | 4.5 | 7 | 6.01 | 14 | 12 | 5.5 | 17 | 26.3 | 17 | 0.035 |
| KLN08−010CE | 8 | ⅛ | 6 | 4.5 | 3.97 | 12 | 14 | 5.5 | 17.5 | 27.5 | 15 | 0.029 |
| KLN08−020CE | 8 | ¼ | 6 | 7 | 6.01 | 14 | 14 | 5.5 | 17.5 | 27.5 | 18 | 0.038 |
| KLN10−020CE | 10 | ¼ | 8 | 7 | 6.01 | 14 | 17 | 5.5 | 20 | 30 | 18 | 0.046 |
| KLN10−030CE | 10 | ⅜ | 8 | 9 | 6.35 | 17 | 17 | 5.5 | 21 | 31 | 19.7 | 0.066 |
| KLN12−020CE | 12 | ¼ | 10 | 7 | 6.01 | 17 | 19 | 6 | 21 | 31 | 19 | 0.064 |
| KLN12−030CE | 12 | ⅜ | 10 | 9 | 6.35 | 17 | 19 | 6 | 21 | 31 | 19.7 | 0.071 |
| KLN12−040CE | 12 | ½ | 10 | 12 | 8.16 | 24 | 19 | 6 | 24 | 34 | 25.8 | 0.134 |
| KLN16−030CE | 16 | ⅜ | 13 | 9 | 6.35 | 24 | 27 | 8 | 28 | 40.6 | 24.7 | 0.167 |
| KLN16−040CE | 16 | ½ | 13 | 12 | 8.16 | 24 | 27 | 8 | 28 | 40.6 | 25.8 | 0.167 |
| KLN20−040CE | 20 | ½ | 17 | 12 | 8.16 | 27 | 30 | 8 | 30.5 | 44.8 | 27.8 | 0.230 |
| KLN20−060CE | 20 | ¾ | 17 | 16 | 9.53 | 30 | 30 | 8 | 30.5 | 44.8 | 28.5 | 0.258 |
| KLN25−060CE | 25 | ¾ | 22 | 16 | 9.53 | 36 | 36 | 9 | 35.5 | 50.3 | 31.5 | 0.397 |
| KLN25−080CE | 25 | 1 | 22 | 22 | 10.39 | 36 | 36 | 9 | 35.5 | 50.3 | 33.6 | 0.412 |
| KLN30−060CE | 30 | ¾ | 26 | 16 | 9.53 | 41 | 41 | 9 | 39.5 | 54.8 | 34.5 | 0.550 |
| KLN30−080CE | 30 | 1 | 26 | 22 | 10.39 | 41 | 41 | 9 | 39.5 | 54.8 | 36.6 | 0.555 |
| KLN30−100CE | 30 | 1¼ | 26 | 31 | 12.7 | 46 | 41 | 9 | 41 | 56.3 | 42.3 | 0.670 |

# Stud Elbow (Type-C) KMC

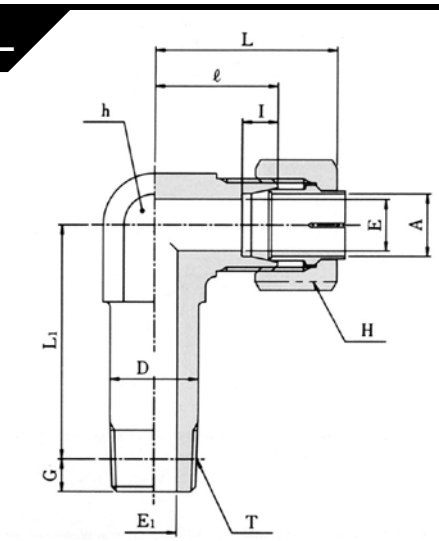



unit: mm

| Part No. | Tube OD A | (R) T | E | $E_1$ | Gauge Length G | Hex. | | I | ℓ | $L_1$ | $L_2$ | Approx. L | O-Ring | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $H_1$ | H | | | | | | | |
| KMC06−010CE | 6 | ⅛ | 4.5 | 4 | 3.97 | 17 | 12 | 5.5 | 19 | 22 | 19 | 28.3 | P9 | 0.078 |
| KMC08−010CE | 8 | ⅛ | 6 | 4 | 3.97 | 17 | 14 | 5.5 | 19.5 | 22 | 19 | 29.5 | P9 | 0.080 |
| KMC08−020CE | 8 | ¼ | 6 | 7 | 6.01 | 22 | 14 | 5.5 | 25.5 | 26 | 23 | 35.5 | P12.5 | 0.150 |
| KMC10−020CE | 10 | ¼ | 8 | 7 | 6.01 | 22 | 17 | 5.5 | 26 | 26 | 23 | 36 | P12.5 | 0.152 |
| KMC12−030CE | 12 | ⅜ | 10 | 9 | 6.35 | 27 | 19 | 6 | 29 | 31 | 28 | 39 | P16 | 0.268 |
| KMC16−040CE | 16 | ½ | 13 | 12 | 8.16 | 27 | 27 | 8 | 31 | 35 | 30 | 43.6 | P18 | 0.342 |
| KMC20−060CE | 20 | ¾ | 17 | 16 | 9.53 | 36 | 30 | 8 | 38 | 44.5 | 38 | 52.3 | P25 | 0.754 |
| KMC25−080CE | 25 | 1 | 22 | 22 | 10.39 | 46 | 36 | 9 | 45.5 | 53.6 | 44 | 60.3 | P32 | 1.264 |
| KMC30−080CE | 30 | 1 | 26 | 22 | 12.7 | 46 | 41 | 9 | 46 | 53.6 | 44 | 61.3 | P32 | 1.712 |

⚠ **CAUTION：Fitting is designed to be fixedly used. Never use it for rotating purpose as replacement of swivel joint.**

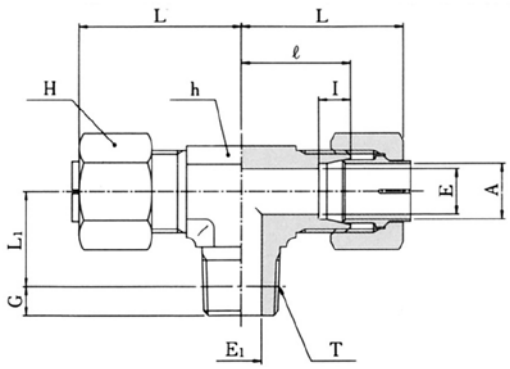
# Extended Male Elbow KLL




unit: mm

| Part No. | Tube OD A | (R) T | E | $E_1$ | Gauge Length G | Flats h | Hex. H | I | D | ℓ | Approx. L | Approx. $L_1$ | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KLL06−010CE | 6 | 1/8 | 4.5 | 4 | 3.97 | 14 | 12 | 5.5 | 12 | 17 | 26.3 | 33 | 0.046 |
| KLL08−010CE | 8 | 1/8 | 6 | 4 | 3.97 | 14 | 14 | 5.5 | 12 | 19.5 | 29.5 | 36 | 0.055 |
| KLL08−020CE | 8 | 1/4 | 6 | 7 | 6.01 | 17 | 14 | 5.5 | 16 | 19.5 | 29.5 | 41 | 0.055 |
| KLL10−020CE | 10 | 1/4 | 8 | 7 | 6.01 | 17 | 17 | 5.5 | 16 | 20 | 30 | 43 | 0.093 |
| KLL10−030CE | 10 | 3/8 | 8 | 9 | 6.35 | 19 | 17 | 5.5 | 18 | 21 | 31 | 45.7 | 0.118 |
| KLL12−020CE | 12 | 1/4 | 10 | 7 | 6.01 | 17 | 19 | 6 | 16 | 21 | 31 | 46 | 0.087 |
| KLL12−030CE | 12 | 3/8 | 10 | 9 | 6.35 | 19 | 19 | 6 | 18 | 21 | 31 | 45.7 | 0.119 |
| KLL16−030CE | 16 | 3/8 | 13 | 9 | 6.35 | 22 | 27 | 8 | 23 | 27 | 39.6 | 61.5 | 0.243 |
| KLL16−040CE | 16 | 1/2 | 13 | 12 | 8.16 | 22 | 27 | 8 | 23 | 27 | 39.6 | 60.8 | 0.230 |
| KLL20−040CE | 20 | 1/2 | 17 | 12 | 8.16 | 27 | 30 | 8 | 26 | 30.5 | 44.8 | 66.8 | 0.357 |
| KLL20−060CE | 20 | 3/4 | 17 | 16 | 9.53 | 30 | 30 | 8 | 28 | 30.5 | 44.8 | 67.5 | 0.369 |
| KLL25−060CE | 25 | 3/4 | 22 | 16 | 9.53 | 36 | 36 | 9 | 35 | 35.5 | 50.3 | 78.5 | 0.410 |
| KLL25−080CE | 25 | 1 | 22 | 22 | 10.39 | 36 | 36 | 9 | 35 | 35.5 | 50.3 | 79.6 | 0.624 |
| KLL30−060CE | 30 | 3/4 | 26 | 16 | 9.53 | 36 | 41 | 9 | 35 | 37 | 52.3 | 78.5 | 0.680 |
| KLL30−080CE | 30 | 1 | 26 | 22 | 10.39 | 36 | 41 | 9 | 35 | 37 | 52.3 | 89.6 | 0.866 |
| KLL30−100CE | 30 | 1 1/4 | 26 | 31 | 12.70 | 46 | 41 | 9 | 44 | 41 | 56.3 | 85.3 | 1.044 |

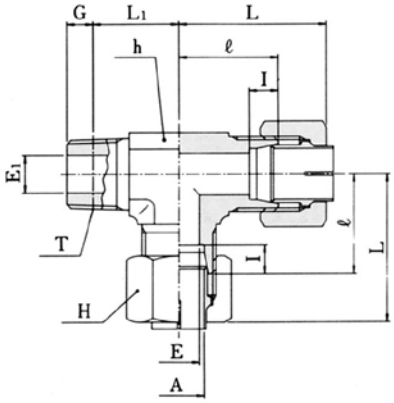
# Male Branch Tee KTN




unit: mm

| Part No. | Tube OD A | (R) T | E | $E_1$ | Gauge Length G | Flats h | Hex. H | I | ℓ | Approx. L | Approx. $L_1$ | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KTN06−010CE | 6 | ⅛ | 4.5 | 4.5 | 3.97 | 12 | 12 | 5.5 | 17 | 26.3 | 14.5 | 0.036 |
| KTN08−010CE | 8 | ⅛ | 6 | 4.5 | 3.97 | 12 | 14 | 5.5 | 17.5 | 27.5 | 15 | 0.044 |
| KTN08−020CE | 8 | ¼ | 6 | 7 | 6.01 | 14 | 14 | 5.5 | 17.5 | 27.5 | 18 | 0.052 |
| KTN10−020CE | 10 | ⅜ | 8 | 7 | 6.01 | 14 | 17 | 5.5 | 20 | 30 | 18 | 0.064 |
| KTN10−030CE | 10 | ⅜ | 8 | 9 | 6.35 | 17 | 17 | 5.5 | 21 | 31 | 19.7 | 0.086 |
| KTN12−020CE | 12 | ¼ | 10 | 7 | 6.01 | 17 | 19 | 6 | 21 | 31 | 19 | 0.088 |
| KTN12−030CE | 12 | ⅜ | 10 | 9 | 6.35 | 17 | 19 | 6 | 21 | 31 | 19.7 | 0.089 |
| KTN16−030CE | 16 | ⅜ | 13 | 9 | 6.35 | 24 | 27 | 8 | 28 | 40.6 | 24.7 | 0.178 |
| KTN16−040CE | 16 | ½ | 13 | 12 | 8.16 | 24 | 27 | 8 | 28 | 40.6 | 25.8 | 0.239 |
| KTN20−040CE | 20 | ½ | 17 | 12 | 8.16 | 27 | 30 | 8 | 30.5 | 44.8 | 27.8 | 0.315 |
| KTN20−060CE | 20 | ¾ | 17 | 16 | 9.53 | 30 | 30 | 8 | 30.5 | 44.8 | 28.5 | 0.357 |
| KTN25−060CE | 25 | ¾ | 22 | 16 | 9.53 | 36 | 36 | 9 | 35.5 | 50.3 | 31.5 | 0.525 |
| KTN25−080CE | 25 | 1 | 22 | 22 | 10.39 | 36 | 36 | 9 | 35.5 | 50.6 | 33.6 | 0.540 |
| KTN30−060CE | 30 | ¾ | 26 | 16 | 9.53 | 41 | 41 | 9 | 39.5 | 54.8 | 34.5 | 0.727 |
| KTN30−080CE | 30 | 1 | 26 | 22 | 10.39 | 41 | 41 | 9 | 39.5 | 54.8 | 36.6 | 0.712 |
| KTN30−100CE | 30 | 1¼ | 26 | 31 | 12.7 | 46 | 41 | 9 | 41 | 56.3 | 42.3 | 1.185 |

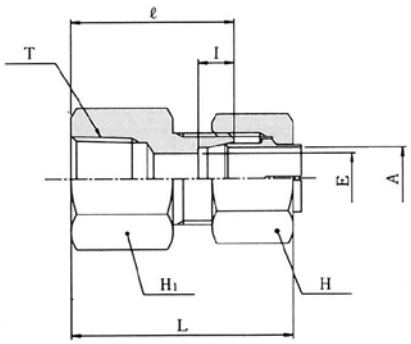
# Male Run Tee KTK




unit: mm

| Part No. | Tube OD A | (R) T | E | $E_1$ | Gauge Length G | Flats h | Hex. H | I | ℓ | Approx. L | Approx. $L_1$ | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KTK06−010CE | 6 | ⅛ | 4.5 | 4.5 | 3.97 | 14 | 12 | 5.5 | 18 | 27.3 | 15 | 0.050 |
| KTK08−010CE | 8 | ⅛ | 6 | 4.5 | 3.97 | 14 | 14 | 5.5 | 18 | 28.5 | 15 | 0.054 |
| KTK08−020CE | 8 | ¼ | 6 | 7 | 6.01 | 17 | 14 | 5.5 | 20.5 | 30.5 | 18 | 0.075 |
| KTK10−020CE | 10 | ¼ | 8 | 7 | 6.01 | 17 | 17 | 5.5 | 21 | 31 | 18 | 0.094 |
| KTK10−030CE | 10 | ⅜ | 8 | 9 | 6.35 | 19 | 17 | 5.5 | 21 | 31 | 19.7 | 0.109 |
| KTK12−020CE | 12 | ¼ | 10 | 7 | 6.01 | 17 | 19 | 6 | 22 | 32 | 19 | 0.092 |
| KTK12−030CE | 12 | ⅜ | 10 | 9 | 6.35 | 19 | 19 | 6 | 22 | 32 | 19.7 | 0.104 |
| KTK16−030CE | 16 | ⅜ | 13 | 9 | 6.35 | 24 | 27 | 8 | 28 | 40.6 | 24.7 | 0.219 |
| KTK16−040CE | 16 | ½ | 13 | 12 | 8.16 | 24 | 27 | 8 | 28 | 40.6 | 25.8 | 0.245 |
| KTK20−040CE | 20 | ½ | 17 | 12 | 8.16 | 27 | 30 | 8 | 30.5 | 44.8 | 27.8 | 0.308 |
| KTK20−060CE | 20 | ¾ | 17 | 16 | 9.53 | 30 | 30 | 8 | 30.5 | 44.8 | 28.5 | 0.355 |
| KTK25−060CE | 25 | ¾ | 22 | 16 | 9.53 | 36 | 36 | 9 | 35.5 | 50.3 | 31.5 | 0.516 |
| KTK25−080CE | 25 | 1 | 22 | 22 | 10.39 | 36 | 36 | 9 | 35.5 | 50.3 | 33.6 | 0.540 |
| KTK30−060CE | 30 | ¾ | 26 | 16 | 9.53 | 41 | 41 | 9 | 39.5 | 54.8 | 34.5 | 0.759 |
| KTK30−080CE | 30 | 1 | 26 | 22 | 10.39 | 41 | 41 | 9 | 39.5 | 54.8 | 36.6 | 0.801 |
| KTK30−100CE | 30 | 1¼ | 26 | 31 | 12.7 | 46 | 41 | 9 | 41 | 56.3 | 42.3 | 0.951 |

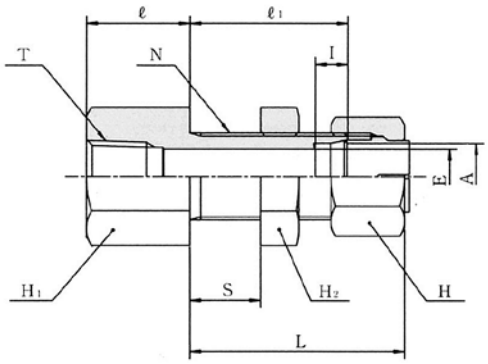
# Female Connector KSA




unit: mm

| Part No. | Tube OD A | (Rc) T | E | Hex. | | I | ℓ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | $H_1$ | H | | | | |
| KSA06−010CE | 6 | ⅛ | 4.5 | 14 | 12 | 5.5 | 23 | 32.3 | 0.019 |
| KSA06−020CE | 6 | ¼ | 4.5 | 19 | 12 | 5.5 | 27 | 36.3 | 0.043 |
| KSA08−010CE | 8 | ⅛ | 6 | 14 | 14 | 5.5 | 23.5 | 33.5 | 0.021 |
| KSA08−020CE | 8 | ¼ | 6 | 19 | 14 | 5.5 | 27.5 | 37.5 | 0.043 |
| KSA10−020CE | 10 | ¼ | 8 | 19 | 17 | 5.5 | 28 | 38 | 0.050 |
| KSA10−030CE | 10 | ⅜ | 8 | 24 | 17 | 5.5 | 30 | 40 | 0.075 |
| KSA12−020CE | 12 | ¼ | 10 | 19 | 19 | 6 | 28 | 38 | 0.052 |
| KSA12−030CE | 12 | ⅜ | 10 | 24 | 19 | 6 | 29 | 39 | 0.072 |
| KSA16−030CE | 16 | ⅜ | 13 | 24 | 27 | 8 | 31 | 43.6 | 0.107 |
| KSA16−040CE | 16 | ½ | 13 | 27 | 27 | 8 | 36.5 | 49.1 | 0.130 |
| KSA20−040CE | 20 | ½ | 17 | 27 | 30 | 8 | 36.5 | 50.8 | 0.135 |
| KSA20−060CE | 20 | ¾ | 17 | 36 | 30 | 8 | 38.5 | 52.8 | 0.215 |
| KSA25−060CE | 25 | ¾ | 22 | 36 | 36 | 9 | 39.5 | 54.3 | 0.235 |
| KSA25−080CE | 25 | 1 | 22 | 41 | 36 | 9 | 43 | 57.8 | 0.343 |
| KSA30−060CE | 30 | ¾ | 26 | 36 | 41 | 9 | 40 | 55.3 | 0.254 |
| KSA30−080CE | 30 | 1 | 26 | 41 | 41 | 9 | 43.5 | 58.8 | 0.385 |
| KSA30−100CE | 30 | 1¼ | 26 | 55 | 41 | 9 | 47 | 62.3 | 0.532 |

# Bulkhead Female Connector KSS

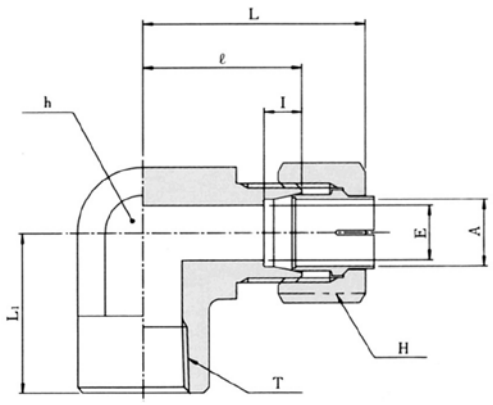



unit: mm

| Part No. | Tube OD A | (Rc) T | E | Hex. | | | I | ℓ1 | ℓ | Approx. L | N | Max. S | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $H_1$ | $H_2$ | H | | | | | | | |
| KSS06−020CE | 6 | ¼ | 4.5 | 19 | 14 | 12 | 5.5 | 26 | 19 | 35.3 | M10×1 | 13 | 0.058 |
| KSS08−010CE | 8 | ⅛ | 6 | 17 | 17 | 14 | 5.5 | 27.5 | 14 | 36.8 | M12×1 | 13 | 0.043 |
| KSS08−020CE | 8 | ¼ | 6 | 19 | 17 | 14 | 5.5 | 27.5 | 19 | 37.5 | M12×1 | 13 | 0.059 |
| KSS10−020CE | 10 | ¼ | 8 | 19 | 19 | 17 | 5.5 | 29 | 19 | 39 | M14×1 | 13 | 0.082 |
| KSS10−030CE | 10 | ⅜ | 8 | 24 | 19 | 17 | 5.5 | 29 | 20 | 39 | M14×1 | 13 | 0.089 |
| KSS12−020CE | 12 | ¼ | 10 | 22 | 22 | 19 | 6 | 29 | 19 | 39 | M16×1 | 13 | 0.081 |
| KSS12−030CE | 12 | ⅜ | 10 | 24 | 22 | 19 | 6 | 29 | 20 | 39 | M16×1 | 13 | 0.098 |
| KSS16−030CE | 16 | ⅜ | 13 | 27 | 27 | 27 | 8 | 34 | 20 | 46.6 | M22×1.5 | 15 | 0.159 |
| KSS16−040CE | 16 | ½ | 13 | 27 | 27 | 27 | 8 | 34 | 25.5 | 46.6 | M22×1.5 | 15 | 0.181 |
| KSS20−040CE | 20 | ½ | 17 | 32 | 32 | 30 | 8 | 36 | 25.5 | 50.3 | M26×1.5 | 15 | 0.229 |
| KSS20−060CE | 20 | ¾ | 17 | 36 | 32 | 30 | 8 | 36 | 27.5 | 50.3 | M26×1.5 | 15 | 0.291 |
| KSS25−060CE | 25 | ¾ | 22 | 36 | 36 | 36 | 9 | 37.5 | 28 | 52.3 | M32×1.5 | 15 | 0.342 |
| KSS25−080CE | 25 | 1 | 22 | 41 | 36 | 36 | 9 | 37.5 | 31.5 | 52.3 | M32×1.5 | 15 | 0.341 |
| KSS30−060CE | 30 | ¾ | 26 | 41 | 41 | 41 | 9 | 39 | 28 | 54.3 | M36×1.5 | 15 | 0.404 |
| KSS30−080CE | 30 | 1 | 26 | 41 | 41 | 41 | 9 | 39 | 31.5 | 54.3 | M36×1.5 | 15 | 0.420 |
| KSS30−100CE | 30 | 1¼ | 26 | 55 | 41 | 41 | 9 | 39 | 35 | 54.3 | M36×1.5 | 15 | 0.611 |

⚠ **CAUTION : This type of fitting is designed to be used for wall penetration. When used in the place of strong vibration and/or pressure fluctuation, proper vibration measures such as fixing the piping by clamp are required.**

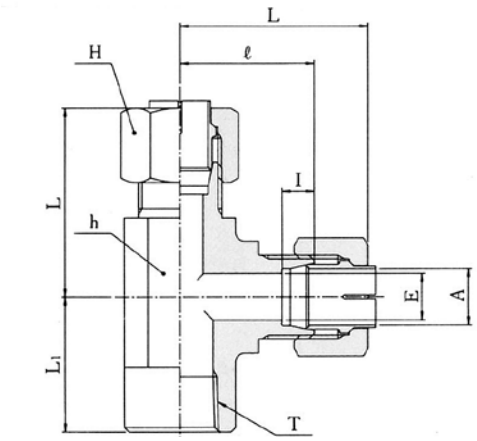
# Female Elbow KLF




unit: mm

| Part No. | Tube OD A | (Rc) T | E | Flats h | Hex. H | I | ℓ | $L_1$ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| KLF06−010CE | 6 | ⅛ | 4.5 | 14 | 12 | 5.5 | 17 | 23 | 26.3 | 0.035 |
| KLF08−010CE | 8 | ⅛ | 6 | 14 | 14 | 5.5 | 17.5 | 23 | 27.5 | 0.046 |
| KLF08−020CE | 8 | ¼ | 6 | 17 | 14 | 5.5 | 20.5 | 27.5 | 30.5 | 0.062 |
| KLF10−020CE | 10 | ¼ | 8 | 17 | 17 | 5.5 | 21 | 27.5 | 31 | 0.060 |
| KLF10−030CE | 10 | ⅜ | 8 | 24 | 17 | 5.5 | 24 | 29 | 34 | 0.123 |
| KLF12−020CE | 12 | ¼ | 10 | 17 | 19 | 6 | 21 | 27.5 | 31 | 0.078 |
| KLF12−030CE | 12 | ⅜ | 10 | 24 | 19 | 6 | 24 | 29 | 34 | 0.128 |
| KLF16−030CE | 16 | ⅜ | 13 | 24 | 27 | 8 | 28 | 29 | 40.6 | 0.163 |
| KLF16−040CE | 16 | ½ | 13 | 30 | 27 | 8 | 30 | 33 | 42.6 | 0.256 |
| KLF20−040CE | 20 | ½ | 17 | 30 | 30 | 8 | 30 | 33 | 44.3 | 0.256 |
| KLF20−060CE | 20 | ¾ | 17 | 36 | 30 | 8 | 35.5 | 36 | 49.8 | 0.380 |
| KLF25−060CE | 25 | ¾ | 22 | 36 | 36 | 9 | 35.5 | 36 | 50.3 | 0.385 |
| KLF25−080CE | 25 | 1 | 22 | 46 | 36 | 9 | 40 | 40 | 54.8 | 0.636 |
| KLF30−060CE | 30 | ¾ | 26 | 41 | 41 | 9 | 40 | 40 | 55.3 | 0.605 |
| KLF30−080CE | 30 | 1 | 26 | 46 | 41 | 9 | 40 | 40 | 55.3 | 0.805 |
| KLF30−100CE | 30 | 1¼ | 26 | 55 | 41 | 9 | 44.5 | 45 | 59.8 | 1.525 |

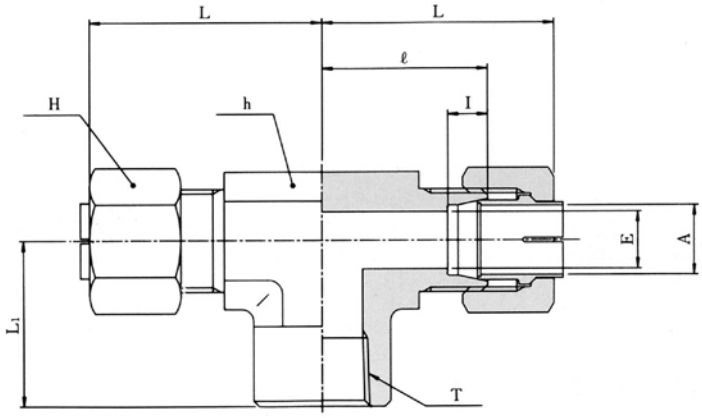
# Female Run Tee KTF




unit: mm

| Part No. | Tube OD A | (Rc) T | E | Flats h | Hex. H | I | ℓ | Approx. L | $L_1$ | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| KTF06−010CE | 6 | ⅛ | 4.5 | 14 | 12 | 5.5 | 18 | 27.3 | 19 | 0.049 |
| KTF08−010CE | 8 | ⅛ | 6 | 14 | 14 | 5.5 | 18 | 28 | 19 | 0.054 |
| KTF08−020CE | 8 | ¼ | 6 | 17 | 14 | 5.5 | 20.5 | 30.5 | 24 | 0.056 |
| KTF10−020CE | 10 | ¼ | 8 | 17 | 17 | 5.5 | 21 | 31 | 24 | 0.090 |
| KTF10−030CE | 10 | ⅜ | 8 | 24 | 17 | 5.5 | 24 | 34 | 29 | 0.090 |
| KTF12−020CE | 12 | ¼ | 10 | 17 | 19 | 6 | 21 | 31 | 24 | 0.085 |
| KTF12−030CE | 12 | ⅜ | 10 | 24 | 19 | 6 | 24 | 34 | 29 | 0.163 |
| KTF16−030CE | 16 | ⅜ | 13 | 24 | 27 | 8 | 28 | 40.6 | 29 | 0.202 |
| KTF16−040CE | 16 | ½ | 13 | 30 | 27 | 8 | 30 | 42.6 | 33 | 0.405 |
| KTF20−040CE | 20 | ½ | 17 | 30 | 30 | 8 | 30 | 44.3 | 33 | 0.359 |
| KTF20−060CE | 20 | ¾ | 17 | 36 | 30 | 8 | 35.5 | 49.8 | 36 | 0.516 |
| KTF25−060CE | 25 | ¾ | 22 | 36 | 36 | 9 | 35.5 | 50.3 | 36 | 0.514 |
| KTF25−080CE | 25 | 1 | 22 | 46 | 36 | 9 | 40 | 54.8 | 40 | 0.595 |
| KTF30−060CE | 30 | ¾ | 26 | 41 | 41 | 9 | 40 | 55.3 | 40 | 0.725 |
| KTF30−080CE | 30 | 1 | 26 | 46 | 41 | 9 | 40 | 55.3 | 40 | 0.889 |
| KTF30−100CE | 30 | 1¼ | 26 | 55 | 41 | 9 | 44.5 | 59.8 | 45 | 1.439 |

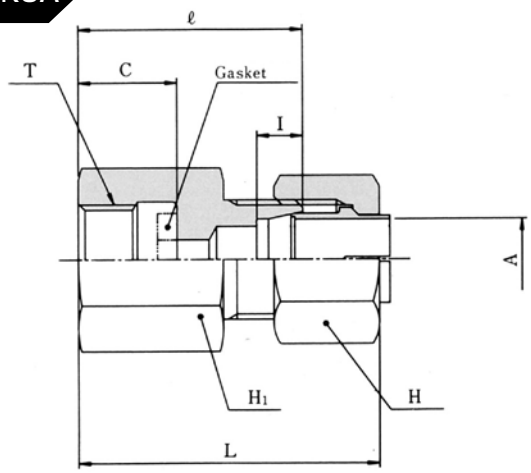
# Female Branch Tee KTH




unit: mm

| Part No. | Tube OD A | (Rc) T | E | Flats h | Hex. H | I | ℓ | Approx. L | $L_1$ | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| KTH06−010CE | 6 | 1/8 | 4.5 | 14 | 12 | 5.5 | 17 | 26.3 | 23 | 0.049 |
| KTH08−010CE | 8 | 1/8 | 6 | 14 | 14 | 5.5 | 17.5 | 27.5 | 23 | 0.054 |
| KTH08−020CE | 8 | 1/4 | 6 | 17 | 14 | 5.5 | 20.5 | 30.5 | 27.5 | 0.056 |
| KTH10−020CE | 10 | 1/4 | 8 | 17 | 17 | 5.5 | 21 | 31 | 27.5 | 0.090 |
| KTH10−030CE | 10 | 3/8 | 8 | 24 | 17 | 5.5 | 24 | 34 | 29 | 0.090 |
| KTH12−020CE | 12 | 1/4 | 10 | 17 | 19 | 6 | 21 | 31 | 27.5 | 0.085 |
| KTH12−030CE | 12 | 3/8 | 10 | 24 | 19 | 6 | 24 | 34 | 29 | 0.163 |
| KTH16−030CE | 16 | 3/8 | 13 | 24 | 27 | 8 | 28 | 40.6 | 29 | 0.202 |
| KTH16−040CE | 16 | 1/2 | 13 | 30 | 27 | 8 | 30 | 42.6 | 33 | 0.405 |
| KTH20−040CE | 20 | 1/2 | 17 | 30 | 30 | 8 | 30 | 44.3 | 33 | 0.359 |
| KTH20−060CE | 20 | 3/4 | 17 | 36 | 30 | 8 | 35.5 | 49.8 | 36 | 0.516 |
| KTH25−060CE | 25 | 3/4 | 22 | 36 | 36 | 9 | 35.5 | 50.3 | 36 | 0.514 |
| KTH25−080CE | 25 | 1 | 22 | 46 | 36 | 9 | 40 | 54.8 | 40 | 0.595 |
| KTH30−060CE | 30 | 3/4 | 26 | 41 | 41 | 9 | 40 | 55.3 | 40 | 0.725 |
| KTH30−080CE | 30 | 1 | 26 | 46 | 41 | 9 | 40 | 55.3 | 40 | 0.889 |
| KTH30−100CE | 30 | 1 1/4 | 26 | 55 | 41 | 9 | 44.5 | 59.8 | 45 | 1.439 |

## Connector For Pressure Gauge KGA

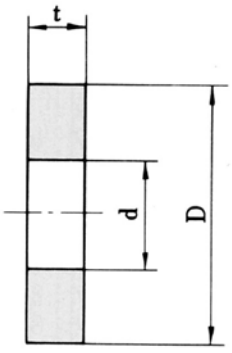



unit: mm

| Part No. | Tube OD A | (G) T | C | Hex. | | I | ℓ | Approx. L | Gasket or KP−B KP−D | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $H_1$ | H | | | | | |
| KGA06−020CE | 6 | ¼ | 14 | 19 | 12 | 5.5 | 28 | 37.3 | −01 | 0.040 |
| KGA06−030CE | 6 | ⅜ | 15 | 24 | 12 | 5.5 | 30 | 39.3 | −02 | 0.066 |
| KGA06−040CE | 6 | ½ | 16 | 30 | 12 | 5.5 | 32 | 41.3 | −03 | |
| KGA08−020CE | 8 | ¼ | 14 | 19 | 14 | 5.5 | 28.5 | 38.5 | −01 | 0.043 |
| KGA08−030CE | 8 | ⅜ | 15 | 24 | 14 | 5.5 | 30.5 | 40.5 | −02 | 0.071 |
| KGA08−040CE | 8 | ½ | 16 | 30 | 14 | 5.5 | 32.5 | 42.5 | −03 | |
| KGA10−020CE | 10 | ¼ | 14 | 19 | 17 | 5.5 | 29 | 39 | −01 | 0.051 |
| KGA10−030CE | 10 | ⅜ | 15 | 24 | 17 | 5.5 | 31 | 41 | −02 | 0.076 |
| KGA10−040CE | 10 | ½ | 16 | 30 | 17 | 5.5 | 33 | 43 | −03 | 0.115 |
| KGA12−020CE | 12 | ¼ | 14 | 19 | 19 | 6 | 29 | 39 | −01 | 0.053 |
| KGA12−030CE | 12 | ⅜ | 15 | 24 | 19 | 6 | 31 | 41 | −02 | 0.069 |
| KGA12−040CE | 12 | ½ | 16 | 30 | 19 | 6 | 33 | 43 | −03 | 0.119 |

Gaskets are not included in the standard pakages, and must be ordered when required.

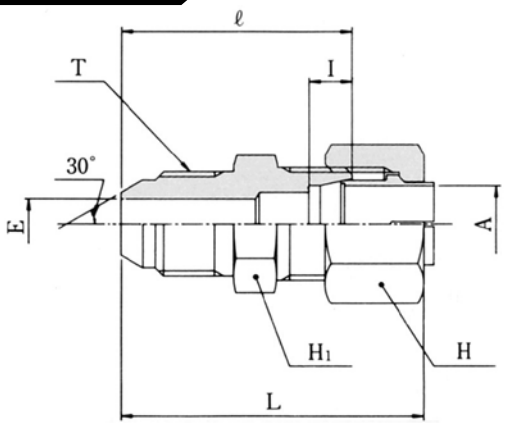
## Gasket KP-B／KP-D




unit: mm

| Part No. | d | D | t | Material |
|---|---|---|---|---|
| KP−B−01 | 6 | 11 | 3 | Chrome Tanning Leather |
| KP−B−02 | 6 | 14 | 3 | |
| KP−B−03 | 6 | 18 | 3 | |
| KP−D−01 | 6 | 11 | 2 | Phosphorus Deoxidized Copper |
| KP−D−02 | 6 | 14 | 2 | |
| KP−D−03 | 6 | 18 | 2 | |

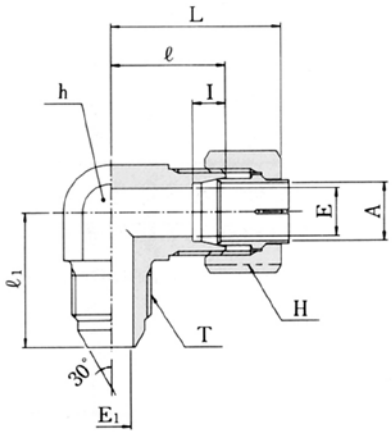
# Male Seat Hose Connection Union KUC




unit: mm

| Part No. | Tube OD A | (G) T | Minimum Opening E | Hex. | | I | ℓ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | $H_1$ | H | | | | |
| KUC08−020CE | 8 | ¼ | 5.5 | 14 | 14 | 5.5 | 29.5 | 39.5 | 0.030 |
| KUC08−030CE | 8 | ⅜ | 6 | 17 | 14 | 5.5 | 32.5 | 42.5 | 0.041 |
| KUC10−020CE | 10 | ¼ | 5.5 | 14 | 17 | 5.5 | 30 | 40 | 0.035 |
| KUC10−030CE | 10 | ⅜ | 8 | 17 | 17 | 5.5 | 33 | 43 | 0.046 |
| KUC12−020CE | 12 | ¼ | 5.5 | 17 | 19 | 6 | 31.5 | 41.5 | 0.043 |
| KUC12−030CE | 12 | ⅜ | 8 | 17 | 19 | 6 | 33 | 43 | 0.049 |
| KUC12−040CE | 12 | ½ | 10 | 22 | 19 | 6 | 36.5 | 46.5 | 0.071 |
| KUC16−030CE | 16 | ⅜ | 8 | 22 | 27 | 8 | 36 | 48.6 | 0.093 |
| KUC16−040CE | 16 | ½ | 10 | 22 | 27 | 8 | 38.5 | 51.1 | 0.105 |
| KUC20−040CE | 20 | ½ | 10 | 27 | 30 | 8 | 39 | 53.3 | 0.132 |
| KUC20−060CE | 20 | ¾ | 16 | 27 | 30 | 8 | 40.5 | 54.8 | 0.140 |
| KUC25−060CE | 25 | ¾ | 16 | 32 | 36 | 9 | 43.5 | 58.3 | 0.192 |
| KUC25−080CE | 25 | 1 | 21.5 | 36 | 36 | 9 | 45 | 59.8 | 0.224 |
| KUC30−060CE | 30 | ¾ | 16 | 36 | 41 | 9 | 44.5 | 59.8 | 0.243 |
| KUC30−080CE | 30 | 1 | 21.5 | 36 | 41 | 9 | 45.5 | 60.8 | 0.252 |

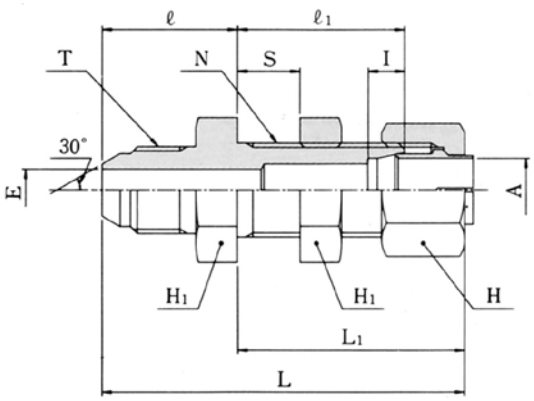
## Male Seat Hose Connection Union Elbow KLD




unit: mm

| Part No. | Tube OD A | (G) T | E | $E_1$ | Flats h | Hex. H | I | $\ell_1$ | $\ell$ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KLD08−020CE | 8 | ¼ | 6 | 5.5 | 14 | 14 | 5.5 | 26 | 17.5 | 27.5 | 0.041 |
| KLD08−030CE | 8 | ⅜ | 6 | 8 | 17 | 14 | 5.5 | 29 | 20.5 | 30.5 | 0.063 |
| KLD10−020CE | 10 | ¼ | 8 | 5.5 | 14 | 17 | 5.5 | 26 | 20 | 30 | 0.048 |
| KLD10−030CE | 10 | ⅜ | 8 | 8 | 17 | 17 | 5.5 | 29 | 21 | 31 | 0.068 |
| KLD12−020CE | 12 | ¼ | 10 | 5.5 | 17 | 19 | 6 | 27 | 21 | 31 | 0.075 |
| KLD12−030CE | 12 | ⅜ | 10 | 8 | 17 | 19 | 6 | 29 | 21 | 31 | 0.073 |
| KLD12−040CE | 12 | ½ | 10 | 10 | 24 | 19 | 6 | 34 | 24 | 34 | 0.137 |
| KLD16−030CE | 16 | ⅜ | 13 | 8 | 24 | 27 | 8 | 32 | 28 | 40.6 | 0.159 |
| KLD16−040CE | 16 | ½ | 13 | 10 | 24 | 27 | 8 | 34 | 28 | 40.6 | 0.170 |
| KLD20−040CE | 20 | ½ | 17 | 10 | 27 | 30 | 8 | 37 | 30.5 | 44.8 | 0.125 |
| KLD20−060CE | 20 | ¾ | 17 | 16 | 30 | 30 | 8 | 41 | 30.5 | 44.8 | 0.264 |
| KLD25−060CE | 25 | ¾ | 22 | 16 | 36 | 36 | 9 | 42 | 35.5 | 50.3 | 0.397 |
| KLD25−080CE | 25 | 1 | 22 | 21.5 | 36 | 36 | 9 | 46 | 35.5 | 50.3 | 0.421 |
| KLD30−060CE | 30 | ¾ | 26 | 16 | 41 | 41 | 9 | 47 | 39.5 | 54.8 | 0.527 |
| KLD30−080CE | 30 | 1 | 26 | 21.5 | 41 | 41 | 9 | 49 | 39.5 | 54.8 | 0.529 |

# Male Seat Hose Connection Bulkhead Union KUE

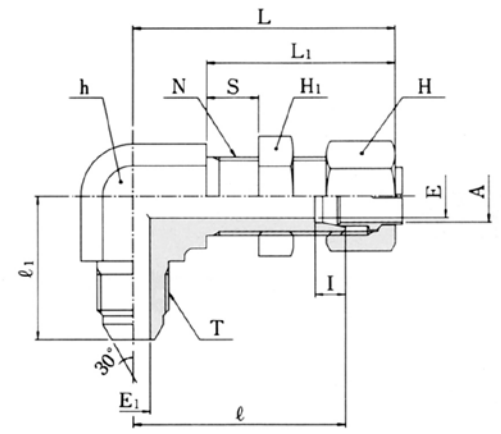



unit: mm

| Part No. | Tube OD A | (G) T | Minimum Opening E | Hex. | | I | ℓ1 | ℓ | Approx. L1 | Approx. L | N | Max. S | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | H1 | H | | | | | | | | |
| KUE08−020CE | 8 | ¼ | 5.5 | 17 | 14 | 5.5 | 27.5 | 22 | 37.5 | 59.5 | M12×1 | 13 | 0.050 |
| KUE08−030CE | 8 | ⅜ | 6 | 17 | 14 | 5.5 | 27.5 | 24 | 37.5 | 61.5 | M12×1 | 13 | 0.059 |
| KUE10−020CE | 10 | ¼ | 5.5 | 19 | 17 | 5.5 | 29 | 23 | 39 | 62 | M14×1 | 13 | 0.068 |
| KUE10−030CE | 10 | ⅜ | 8 | 19 | 17 | 5.5 | 29 | 25 | 39 | 64 | M14×1 | 13 | 0.074 |
| KUE12−020CE | 12 | ¼ | 5.5 | 22 | 19 | 6 | 29 | 23.5 | 39 | 62.5 | M16×1 | 13 | 0.095 |
| KUE12−030CE | 12 | ⅜ | 8 | 22 | 19 | 6 | 29 | 25 | 39 | 64 | M16×1 | 13 | 0.089 |
| KUE12−040CE | 12 | ½ | 10 | 22 | 19 | 6 | 29 | 27 | 39 | 66 | M16×1 | 13 | 0.101 |
| KUE16−030CE | 16 | ⅜ | 8 | 27 | 27 | 8 | 34 | 25.5 | 46.6 | 72.1 | M22×1.5 | 15 | 0.170 |
| KUE16−040CE | 16 | ½ | 10 | 27 | 27 | 8 | 34 | 28 | 46.6 | 74.6 | M22×1.5 | 15 | 0.177 |
| KUE20−040CE | 20 | ½ | 10 | 32 | 30 | 8 | 36 | 30.5 | 50.3 | 80.8 | M26×1.5 | 15 | 0.220 |
| KUE20−060CE | 20 | ¾ | 16 | 32 | 30 | 8 | 36 | 32 | 50.3 | 82.3 | M26×1.5 | 15 | 0.247 |
| KUE25−060CE | 25 | ¾ | 16 | 36 | 36 | 9 | 37.5 | 33 | 52.3 | 85.3 | M32×1.5 | 15 | 0.332 |
| KUE25−080CE | 25 | 1 | 21.5 | 36 | 36 | 9 | 37.5 | 33.5 | 52.3 | 85.8 | M32×1.5 | 15 | 0.337 |
| KUE30−060CE | 30 | ¾ | 16 | 41 | 41 | 9 | 39 | 33 | 54.3 | 87.3 | M36×1.5 | 15 | 0.332 |
| KUE30−080CE | 30 | 1 | 21.5 | 41 | 41 | 9 | 39 | 34 | 54.3 | 88.3 | M36×1.5 | 15 | 0.418 |

⚠ **CAUTION : This type of fitting is designed to be used for wall penetration. When used in the place of strong vibration and/or pressure fluctuation, proper vibration measures such as fixing the piping by clamp are required.**

## Male Seat Hose Connection Bulkhead Elbow KLH

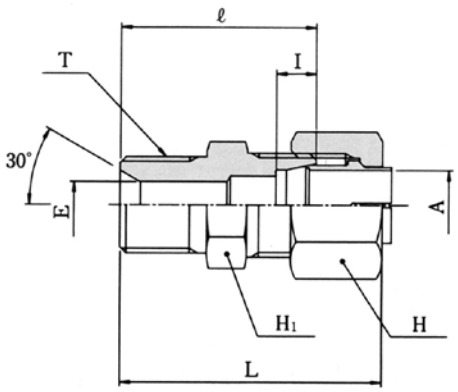



unit: mm

| Part No. | Tube OD | (G) T | E | $E_1$ | Flats h | Hex. | | I | $\ell_1$ | $\ell$ | Approx. $L_1$ | Approx. L | N | Max. S | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $H_1$ | H | | | | | | | | |
| KLH08−020CE | 8 | ¼ | 6 | 5.5 | 19 | 17 | 14 | 5.5 | 28 | 45 | 37.5 | 55 | M12×1 | 13 | 0.101 |
| KLH08−030CE | 8 | ⅜ | 6 | 8 | 19 | 17 | 14 | 5.5 | 30 | 45 | 37.5 | 55 | M12×1 | 13 | 0.104 |
| KLH10−020CE | 10 | ¼ | 8 | 5.5 | 19 | 19 | 17 | 5.5 | 28 | 46.5 | 39 | 56.5 | M14×1 | 13 | 0.109 |
| KLH10−030CE | 10 | ⅜ | 8 | 8 | 19 | 19 | 17 | 5.5 | 30 | 46.5 | 39 | 56.5 | M14×1 | 13 | 0.113 |
| KLH12−020CE | 12 | ¼ | 10 | 5.5 | 22 | 22 | 19 | 6 | 30 | 47 | 39 | 57 | M16×1 | 13 | 0.123 |
| KLH12−030CE | 12 | ⅜ | 10 | 8 | 22 | 22 | 19 | 6 | 31 | 47 | 39 | 57 | M16×1 | 13 | 0.150 |
| KLH12−040CE | 12 | ½ | 10 | 10 | 24 | 22 | 19 | 6 | 35 | 49 | 39 | 59 | M16×1 | 13 | 0.189 |
| KLH16−030CE | 16 | ⅜ | 13 | 8 | 27 | 27 | 27 | 8 | 34 | 56 | 46.6 | 68.6 | M22×1.5 | 15 | 0.275 |
| KLH16−040CE | 16 | ½ | 13 | 10 | 27 | 27 | 27 | 8 | 36 | 56 | 46.6 | 68.6 | M22×1.5 | 15 | 0.282 |
| KLH20−040CE | 20 | ½ | 17 | 10 | 32 | 32 | 30 | 8 | 38 | 64 | 50.3 | 78.3 | M26×1.5 | 15 | 0.409 |
| KLH20−060CE | 20 | ¾ | 17 | 16 | 32 | 32 | 30 | 8 | 40 | 64 | 50.3 | 78.3 | M26×1.5 | 15 | 0.410 |
| KLH25−060CE | 25 | ¾ | 22 | 16 | 41 | 36 | 36 | 9 | 42 | 67 | 52.3 | 81.8 | M32×1.5 | 15 | 0.659 |
| KLH25−080CE | 25 | 1 | 22 | 21.5 | 41 | 36 | 36 | 9 | 43 | 67 | 52.3 | 81.8 | M32×1.5 | 15 | 0.690 |
| KLH30−060CE | 30 | ¾ | 26 | 16 | 41 | 41 | 41 | 9 | 42 | 70 | 54.3 | 85.3 | M36×1.5 | 15 | 0.610 |
| KLH30−080CE | 30 | 1¼ | 26 | 21.5 | 41 | 41 | 41 | 9 | 43 | 70 | 54.3 | 85.3 | M36×1.5 | 15 | 0.758 |

⚠ **CAUTION : This type of fitting is designed to be used for wall penetration. When used in the place of strong vibration and/or pressure fluctuation, proper vibration measures such as fixing the piping by clamp are required.**

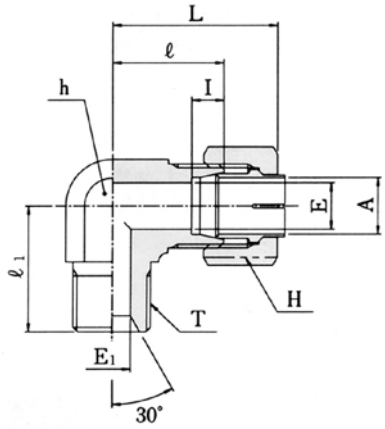
# Female Seat Hose Connection Union KUD




unit: mm

| Part No. | Tube OD A | (G) T | Minimum Opening E | Hex. | | I | ℓ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | $H_1$ | H | | | | |
| KUD08−020CE | 8 | ¼ | 5.5 | 14 | 14 | 5.5 | 26.5 | 36.5 | 0.029 |
| KUD08−030CE | 8 | ⅜ | 6 | 17 | 14 | 5.5 | 29.5 | 39.5 | 0.038 |
| KUD10−020CE | 10 | ¼ | 5.5 | 14 | 17 | 5.5 | 27 | 37 | 0.033 |
| KUD10−030CE | 10 | ⅜ | 8 | 17 | 17 | 5.5 | 30 | 40 | 0.043 |
| KUD12−020CE | 12 | ¼ | 5.5 | 17 | 19 | 6 | 28 | 38 | 0.040 |
| KUD12−030CE | 12 | ⅜ | 8 | 17 | 19 | 6 | 30 | 40 | 0.046 |
| KUD12−040CE | 12 | ½ | 10 | 22 | 19 | 6 | 34.5 | 44.5 | 0.071 |
| KUD16−030CE | 16 | ⅜ | 8 | 22 | 27 | 8 | 33.5 | 46.1 | 0.093 |
| KUD16−040CE | 16 | ½ | 10 | 22 | 27 | 8 | 36.5 | 49.1 | 0.105 |
| KUD20−040CE | 20 | ½ | 10 | 27 | 30 | 8 | 36.5 | 50.8 | 0.126 |
| KUD20−060CE | 20 | ¾ | 16 | 27 | 30 | 8 | 38.5 | 52.8 | 0.131 |
| KUD25−060CE | 25 | ¾ | 16 | 32 | 36 | 9 | 41.5 | 56.3 | 0.183 |
| KUD25−080CE | 25 | 1 | 21.5 | 36 | 36 | 9 | 44.5 | 59.3 | 0.226 |
| KUD30−060CE | 30 | ¾ | 16 | 36 | 41 | 9 | 43 | 58.3 | 0.238 |
| KUD30−080CE | 30 | 1 | 21.5 | 36 | 41 | 9 | 45 | 60.3 | 0.256 |

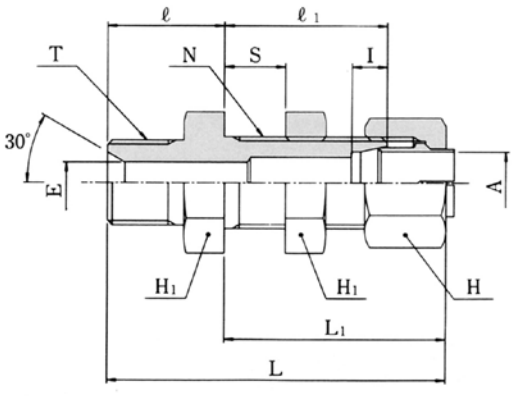
# Female Seat Hose Connection Union Elbow KLE




unit: mm

| Part No. | Tube OD A | (G) T | E | $E_1$ | Flats h | Hex. H | I | $\ell_1$ | $\ell$ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KLE08−020CE | 8 | ¼ | 6 | 5.5 | 14 | 14 | 5.5 | 24 | 17.5 | 27.5 | 0.042 |
| KLE08−030CE | 8 | ⅜ | 6 | 8 | 17 | 14 | 5.5 | 26.5 | 20.5 | 30.5 | 0.063 |
| KLE10−020CE | 10 | ¼ | 8 | 5.5 | 14 | 17 | 5.5 | 24 | 20 | 30 | 0.048 |
| KLE10−030CE | 10 | ⅜ | 8 | 8 | 17 | 17 | 5.5 | 26.5 | 21 | 31 | 0.067 |
| KLE12−020CE | 12 | ¼ | 10 | 5.5 | 17 | 19 | 6 | 25 | 21 | 31 | 0.067 |
| KLE12−030CE | 12 | ⅜ | 10 | 8 | 17 | 19 | 6 | 26.5 | 21 | 31 | 0.073 |
| KLE12−040CE | 12 | ½ | 10 | 10 | 24 | 19 | 6 | 33 | 24 | 34 | 0.141 |
| KLE16−030CE | 16 | ⅜ | 13 | 8 | 24 | 27 | 8 | 30 | 28 | 40.6 | 0.164 |
| KLE16−040CE | 16 | ½ | 13 | 10 | 24 | 27 | 8 | 33 | 28 | 40.6 | 0.179 |
| KLE20−040CE | 20 | ½ | 17 | 10 | 27 | 30 | 8 | 35 | 30.5 | 44.8 | 0.174 |
| KLE20−060CE | 20 | ¾ | 17 | 16 | 30 | 30 | 8 | 38 | 30.5 | 44.8 | 0.267 |
| KLE25−060CE | 25 | ¾ | 22 | 16 | 36 | 36 | 9 | 41 | 35.5 | 50.3 | 0.407 |
| KLE25−080CE | 25 | 1 | 22 | 21.5 | 36 | 36 | 9 | 43 | 35.5 | 50.3 | 0.413 |
| KLE30−060CE | 30 | ¾ | 26 | 16 | 41 | 41 | 9 | 44 | 39.5 | 54.8 | 0.550 |
| KLE30−080CE | 30 | 1 | 26 | 21.5 | 41 | 41 | 9 | 46 | 39.5 | 54.8 | 0.570 |

# Female Seat Hose Connection Bulkhead Union KUF

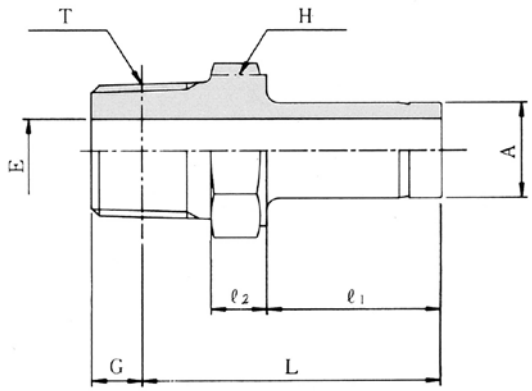



unit: mm

| Part No. | Tube OD A | (G) T | Minimum Opening E | Hex. | | I | ℓ1 | ℓ | Approx. L1 | Approx. L | N | Max. S | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | H1 | H | | | | | | | | |
| KUF08−020CE | 8 | ¼ | 5.5 | 17 | 14 | 5.5 | 27.5 | 19 | 37.5 | 56.5 | M12×1 | 13 | 0.051 |
| KUF08−030CE | 8 | ⅜ | 6 | 17 | 14 | 5.5 | 27.5 | 21 | 37.5 | 58.5 | M12×1 | 13 | 0.059 |
| KUF10−020CE | 10 | ¼ | 5.5 | 19 | 17 | 5.5 | 29 | 20 | 39 | 59 | M14×1 | 13 | 0.067 |
| KUF10−030CE | 10 | ⅜ | 8 | 19 | 17 | 5.5 | 29 | 22 | 39 | 61 | M14×1 | 13 | 0.073 |
| KUF12−020CE | 12 | ¼ | 5.5 | 22 | 19 | 6 | 29 | 20 | 39 | 59 | M16×1 | 13 | 0.093 |
| KUF12−030CE | 12 | ⅜ | 8 | 22 | 19 | 6 | 29 | 22 | 39 | 61 | M16×1 | 13 | 0.094 |
| KUF12−040CE | 12 | ½ | 10 | 22 | 19 | 6 | 29 | 25 | 39 | 64 | M16×1 | 13 | 0.102 |
| KUF16−030CE | 16 | ⅜ | 8 | 27 | 27 | 8 | 34 | 23 | 46.6 | 69.6 | M22×1.5 | 15 | 0.185 |
| KUF16−040CE | 16 | ½ | 10 | 27 | 27 | 8 | 34 | 26 | 46.6 | 72.6 | M22×1.5 | 15 | 0.180 |
| KUF20−040CE | 20 | ½ | 10 | 32 | 30 | 8 | 36 | 28 | 50.3 | 78.3 | M26×1.5 | 15 | 0.240 |
| KUF20−060CE | 20 | ¾ | 16 | 32 | 30 | 8 | 36 | 30 | 50.3 | 80.3 | M26×1.5 | 15 | 0.241 |
| KUF25−060CE | 25 | ¾ | 16 | 36 | 36 | 9 | 37.5 | 31 | 52.3 | 83.3 | M32×1.5 | 15 | 0.328 |
| KUF25−080CE | 25 | 1 | 21.5 | 36 | 36 | 9 | 37.5 | 33 | 52.3 | 85.3 | M32×1.5 | 15 | 0.338 |
| KUF30−060CE | 30 | ¾ | 16 | 41 | 41 | 9 | 39 | 31.5 | 54.3 | 85.8 | M36×1.5 | 15 | 0.425 |
| KUF30−080CE | 30 | 1 | 21.5 | 41 | 41 | 9 | 39 | 33.5 | 54.3 | 87.8 | M36×1.5 | 15 | 0.428 |

⚠ **CAUTION : This type of fitting is designed to be used for wall penetration. When used in the place of strong vibration and/or pressure fluctuation, proper vibration measures such as fixing the piping by clamp are required.**

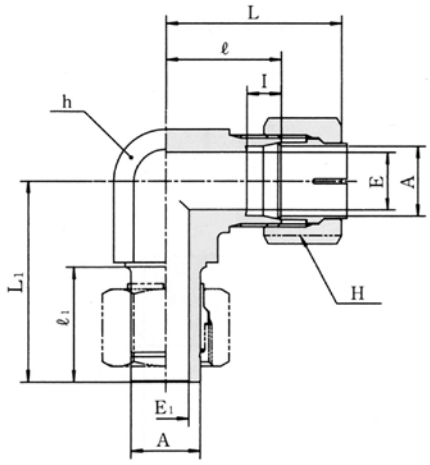
# Adapter KHA




unit: mm

| Part No. | Tube OD A | (R) T | Minimum Opening E | Gauge Length G | Hex. H | ℓ1 | ℓ2 | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|
| KHA06−010CE | 6 | ⅛ | 3 | 3.97 | 10 | 19 | 5 | 30 | 0.011 |
| KHA06−020CE | 6 | ¼ | 3 | 6.01 | 14 | 19 | 7 | 34 | 0.024 |
| KHA08−010CE | 8 | ⅛ | 4 | 3.97 | 10 | 19 | 5 | 30 | 0.013 |
| KHA08−020CE | 8 | ¼ | 5 | 6.01 | 14 | 19 | 7 | 34 | 0.025 |
| KHA10−020CE | 10 | ¼ | 6 | 6.01 | 14 | 19 | 7 | 34 | 0.026 |
| KHA10−030CE | 10 | ⅜ | 6 | 6.35 | 17 | 19 | 7 | 34.6 | 0.039 |
| KHA12−020CE | 12 | ¼ | 8 | 6.01 | 14 | 20 | 7 | 35 | 0.026 |
| KHA12−030CE | 12 | ⅜ | 8 | 6.35 | 17 | 20 | 7 | 35.7 | 0.039 |
| KHA16−030CE | 16 | ⅜ | 9 | 6.35 | 17 | 24 | 7 | 39.7 | 0.044 |
| KHA16−040CE | 16 | ½ | 11 | 8.16 | 22 | 24 | 8 | 42.8 | 0.070 |
| KHA20−040CE | 20 | ½ | 12 | 8.16 | 22 | 26 | 8 | 44.8 | 0.090 |
| KHA20−060CE | 20 | ¾ | 14 | 9.53 | 27 | 26 | 10 | 47.5 | 0.128 |
| KHA25−060CE | 25 | ¾ | 16 | 9.53 | 27 | 28 | 10 | 49.5 | 0.133 |
| KHA25−080CE | 25 | 1 | 18 | 10.39 | 36 | 28 | 11 | 52.6 | 0.221 |
| KHA30−060CE | 30 | ¾ | 16 | 9.53 | 32 | 28 | 10.5 | 50 | 0.218 |
| KHA30−080CE | 30 | 1 | 22 | 10.39 | 36 | 28 | 11 | 52.6 | 0.221 |
| KHA30−100CE | 30 | ¾ | 22 | 12.7 | 46 | 28 | 12 | 54.3 | 0.420 |

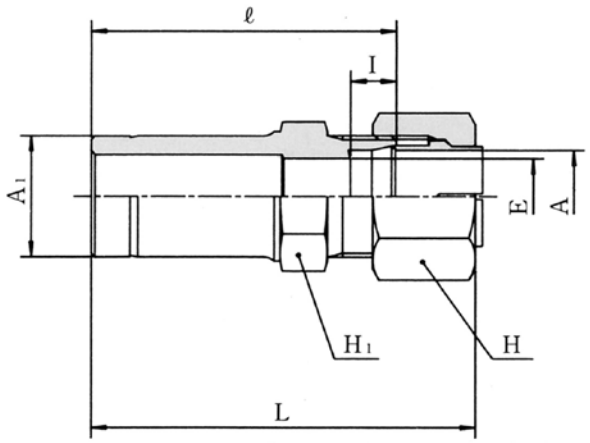
# Adjustable Elbow KLC




unit: mm

| Part No. | Tube OD A | E | $E_1$ | Flats h | Hex. H | I | ℓ | $\ell_1$ | Approx. L | $L_1$ | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KLC10−000CE | 10 | 8 | 6 | 17 | 17 | 5.5 | 20 | 19 | 30 | 34 | 0.054 |
| KLC12−000CE | 12 | 10 | 8 | 17 | 19 | 6 | 20 | 20 | 30 | 35 | 0.063 |
| KLC16−000CE | 16 | 13 | 11 | 27 | 27 | 8 | 30 | 24 | 42.6 | 43 | 0.259 |
| KLC20−000CE | 20 | 17 | 14 | 30 | 30 | 8 | 31 | 26 | 45.3 | 43 | 0.255 |
| KLC25−000CE | 25 | 22 | 18 | 36 | 36 | 9 | 34.5 | 28 | 49.3 | 49 | 0.472 |
| KLC30−000CE | 30 | 26 | 22 | 41 | 41 | 9 | 38 | 28 | 53.3 | 53 | 0.509 |

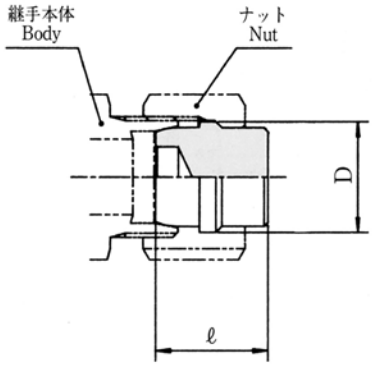
# Reducer KRE




unit: mm

| Part No. | $A_1$ | Tube OD A | Minimum Opening E | Hex. | | I | ℓ | Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | $H_1$ | H | | | | |
| KRE08×060CE | 8 | 6 | 4.5 | 10 | 12 | 5.5 | 32 | 41.3 | 0.020 |
| KRE10×060CE | 10 | 6 | 4.5 | 12 | 12 | 5.5 | 33 | 42.3 | 0.028 |
| KRE10×080CE | 10 | 8 | 6 | 12 | 14 | 5.5 | 33.5 | 43.5 | 0.029 |
| KRE12×060CE | 12 | 6 | 4.5 | 14 | 12 | 5.5 | 35 | 44.3 | 0.036 |
| KRE12×080CE | 12 | 8 | 6 | 14 | 14 | 5.5 | 35.5 | 45.5 | 0.037 |
| KRE12×100CE | 12 | 10 | 8 | 14 | 17 | 5.5 | 36 | 46 | 0.037 |
| KRE16×060CE | 16 | 6 | 4.5 | 17 | 12 | 5.5 | 39 | 48.3 | 0.078 |
| KRE16×080CE | 16 | 8 | 6 | 17 | 14 | 5.5 | 39.5 | 49.5 | 0.079 |
| KRE16×100CE | 16 | 10 | 8 | 17 | 17 | 5.5 | 40 | 50 | 0.078 |
| KRE16×120CE | 16 | 12 | 10 | 17 | 19 | 6 | 40 | 50 | 0.078 |
| KRE20×060CE | 20 | 6 | 4.5 | 22 | 12 | 5.5 | 42 | 51.3 | 0.107 |
| KRE20×080CE | 20 | 8 | 6 | 22 | 14 | 5.5 | 42.5 | 52.5 | 0.109 |
| KRE20×100CE | 20 | 10 | 8 | 22 | 17 | 5.5 | 43 | 53 | 0.109 |
| KRE20×120CE | 20 | 12 | 10 | 22 | 19 | 6 | 43 | 53 | 0.109 |
| KRE20×160CE | 20 | 16 | 13 | 22 | 27 | 8 | 45 | 57.6 | 0.112 |
| KRE25×160CE | 25 | 16 | 13 | 27 | 27 | 8 | 49 | 61.6 | 0.171 |
| KRE25×200CE | 25 | 20 | 17 | 27 | 30 | 8 | 49 | 63.3 | 0.154 |
| KRE30×200CE | 30 | 20 | 17 | 32 | 30 | 8 | 49 | 63.3 | 0.232 |
| KRE30×250CE | 30 | 25 | 22 | 32 | 36 | 9 | 49.5 | 64 | 0.344 |

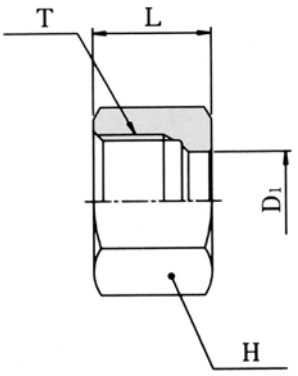
## Plug KBA




unit: mm

| Part No. | Tube OD A | D | ℓ | Weight (kg) |
|---|---|---|---|---|
| KBA06−000CE | 6 | 8.7 | 13.7 | 0.005 |
| KBA08−000CE | 8 | 10.7 | 14.5 | 0.008 |
| KBA10−000CE | 10 | 12.7 | 14.8 | 0.013 |
| KBA12−000CE | 12 | 14.7 | 14.9 | 0.033 |
| KBA16−000CE | 16 | 20 | 18.2 | 0.036 |
| KBA20−000CE | 20 | 24 | 20.1 | 0.053 |
| KBA25−000CE | 25 | 29.3 | 21.2 | 0.098 |
| KBA30−000CE | 30 | 34 | 21.6 | 0.141 |

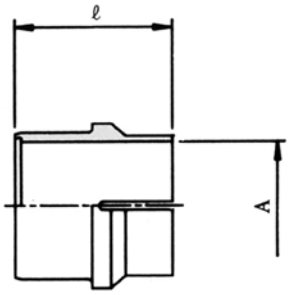
## Nut KKN




unit: mm

| Part No. | Tube OD A | $D_1$ | T | Hex. H | L | Weight (kg) |
|---|---|---|---|---|---|---|
| KKN06−000CE | 6 | 7.05 | M10×1 | 12 | 12 | 00 |
| KKN08−000CE | 8 | 9.05 | M12×1 | 14 | 13 | 00 |
| KKN10−000CE | 10 | 11.15 | M14×1 | 17 | 13.5 | 00 |
| KKN12−000CE | 12 | 13.15 | M16×1 | 19 | 13.5 | 00 |
| KKN16−000CE | 16 | 17.35 | M22×1.5 | 27 | 17 | 00 |
| KKN20−000CE | 20 | 21.75 | M26×1.5 | 30 | 19 | 00 |
| KKN25−000CE | 25 | 26.75 | M32×1.5 | 36 | 20 | 00 |
| KKN30−000CE | 30 | 31.85 | M36×1.5 | 41 | 21 | 00 |

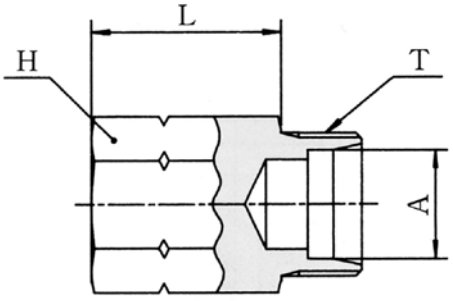
## Sleeve KKO




unit: mm

| Part No. | Tube OD A | ℓ | Weight (kg) |
|---|---|---|---|
| KKO06−000CE | 6 | 11.5 | 00 |
| KKO08−000CE | 8 | 12 | 00 |
| KKO10−000CE | 10 | 12 | 00 |
| KKO12−000CE | 12 | 12 | 00 |
| KKO16−000CE | 16 | 15.5 | 00 |
| KKO20−000CE | 20 | 17 | 00 |
| KKO25−000CE | 25 | 17.5 | 00 |
| KKO30−000CE | 30 | 18 | 00 |

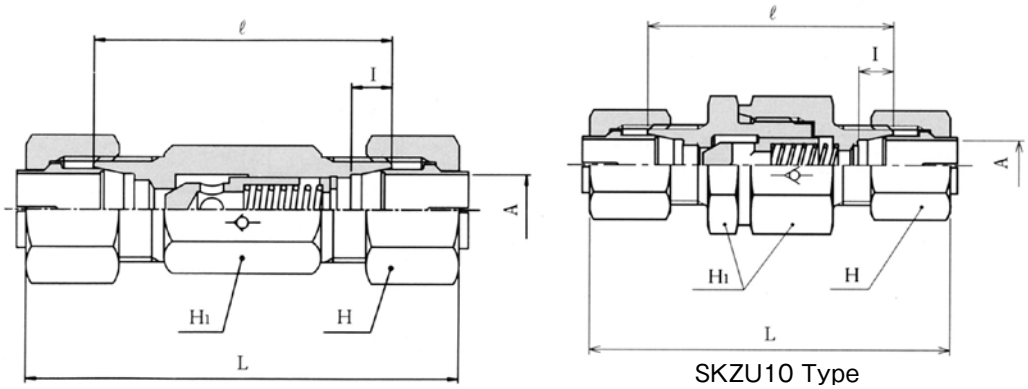
## Presetting Tool PJA




unit: mm

| Part No. | Tube OD A | L | Hex. H | T | Weight (kg) |
|---|---|---|---|---|---|
| PJA06−000CE | 6 | 40 | 17 | M10×1 | 00 |
| PJA08−000CE | 8 | 40 | 17 | M12×1 | 00 |
| PJA10−000CE | 10 | 40 | 17 | M14×1 | 00 |
| PJA12−000CE | 12 | 40 | 17 | M16×1 | 00 |
| PJA16−000CE | 16 | 40 | 27 | M22×1.5 | 00 |
| PJA20−000CE | 20 | 40 | 27 | M26×1.5 | 00 |
| PJA25−000CE | 25 | 40 | 41 | M32×1.5 | 00 |
| PJA30−000CE | 30 | 40 | 41 | M36×1.5 | 00 |

# Union KZU




SKZU10 Type

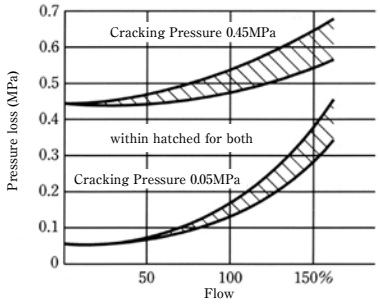
unit: mm

| Part No. | Out. Dia. of Applied Pipe A | | Flow rate ℓ／min | Cracking Pressure MPa | Hex. | | I | ℓ | Fingertight Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal sizes | Out. Dia. | | | $H_1$ | H | | | | |
| SKZU10−050CE | 10 | | 18 | 0.05 | 24 | 17 | 5.5 | 49 | 69 | 0.125 |
| SKZU10−450CE | 10 | | 18 | 0.45 | 24 | 17 | 5.5 | 49 | 69 | 0.125 |
| KZU12−050CE | 12 | | 18 | 0.05 | 19 | 19 | 6 | 51 | 71 | 0.100 |
| KZU12−450CE | 12 | | 18 | 0.45 | 19 | 19 | 6 | 51 | 71 | 0.100 |
| KZU16−050CE | 16 | | 35 | 0.05 | 27 | 27 | 8 | 58 | 83 | 0.252 |
| KZU16−450CE | 16 | | 35 | 0.45 | 27 | 27 | 8 | 58 | 83 | 0.252 |
| KZU20−050CE | 20 | | 60 | 0.05 | 30 | 30 | 8 | 66 | 94.5 | 0.360 |
| KZU20−450CE | 20 | | 60 | 0.45 | 30 | 30 | 8 | 66 | 94.5 | 0.360 |
| KZU25−050CE | 25 | | 95 | 005 | 36 | 36 | 9 | 78 | 107.5 | 0.510 |
| KZU25−450CE | 25 | | 95 | 0.45 | 36 | 36 | 9 | 78 | 107.5 | 0.510 |
| KZU30−050CE | 30 | | 140 | 005 | 41 | 41 | 9 | 89 | 119.5 | 0.904 |
| KZU30−450CE | 30 | | 140 | 0.45 | 41 | 41 | 9 | 89 | 119.5 | 0.904 |

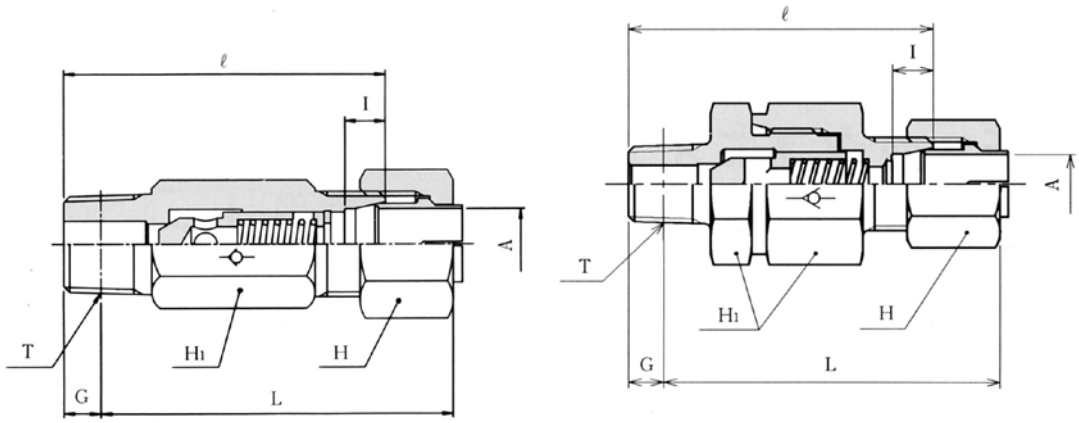
⚠ **CAUTION : Please inquire us when the fitting will be used excepting hydraulic oil.**

## Specifications

Rated pressure　$\phi$10～30:14MPa(140kgf/cm$^2$)
Fluid　Hydraulic Oil
Working temperature　−20～150℃
Flow rate　refer to table on right
Pressure Loss　Pressure loss Vs. flow rate under oil viscosity of 125 SSU (26cSt) is shown in right figure.
Cracking Pressure　The cracking pressure of 0.05MPa (0.5kgf/cm$^2$) and 0.45MPa (4.5kgf/cm$^2$) are available.



# Check Connector KZC



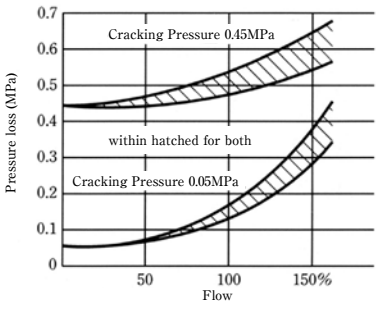

unit: mm

| Part No. | Out. Dia. of Applied Pipe A | | Flow rate ℓ／min | Cracking Pressure MPa | Hex. | | I | ℓ | Fingertight Approx. L | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal sizes | Out. Dia. | | | $H_1$ | H | | | | |
| SKZC10−050CE | 10 | | 18 | 0.05 | 24 | 17 | 5.5 | 53 | 63 | 0.120 |
| SKZC10−450CE | 10 | | 18 | 0.45 | 24 | 17 | 5.5 | 53 | 63 | 0.120 |
| KZC12−050CE | 12 | | 18 | 0.05 | 19 | 19 | 6 | 55 | 58.5 | 0.096 |
| KZC12−450CE | 12 | | 18 | 0.45 | 19 | 19 | 6 | 55 | 58.5 | 0.096 |
| KZC16−050CE | 16 | | 35 | 0.05 | 27 | 27 | 8 | 65 | 69.5 | 0.221 |
| KZC16−450CE | 16 | | 35 | 0.45 | 27 | 27 | 8 | 65 | 69.5 | 0.221 |
| KZC20−050CE | 20 | | 60 | 0.05 | 30 | 30 | 8 | 75 | 80 | 0.331 |
| KZC20−450CE | 20 | | 60 | 0.45 | 30 | 30 | 8 | 75 | 80 | 0.331 |
| KZC25−050CE | 25 | | 95 | 0.05 | 36 | 36 | 9 | 87 | 91.5 | 0.515 |
| KZC25−450CE | 25 | | 95 | 0.45 | 36 | 36 | 9 | 87 | 91.5 | 0.515 |
| KZC30−050CE | 30 | | 140 | 0.05 | 41 | 41 | 9 | 100 | 102.5 | 0.927 |
| KZC30−450CE | 30 | | 140 | 0.45 | 41 | 41 | 9 | 100 | 102.5 | 0.927 |

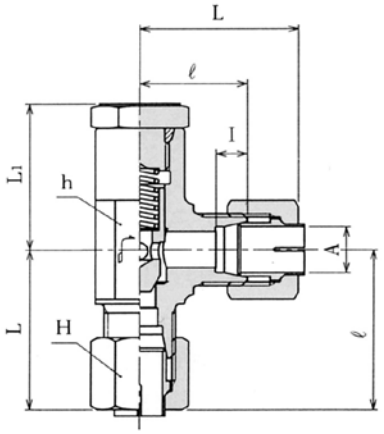
⚠ **CAUTION : Please inquire us when the fitting will be used excepting hydraulic oil.**

## Specifications

Rated pressure　$\phi$10～30:14MPa(140kgf/cm²)
Fluid　Hydraulic Oil
Working temperature　−20～150℃
Flow rate　refer to table on right
Pressure Loss　Pressure loss Vs. flow rate under oil viscosity of 125 SSU (26cSt) is shown in right figure.
Cracking Pressure　The cracking pressure of 0.05MPa (0.5kgf/cm²) and 0.45MPa (4.5kgf/cm²) are available.



# Check Elbow KZL



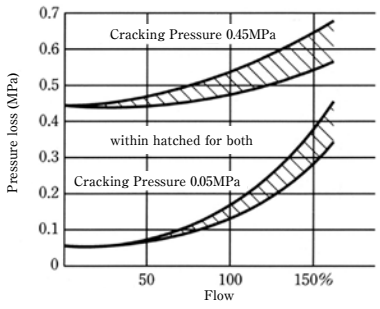

unit: mm

| Part No. | Out. Dia. of Applied Pipe A | | Flow rate ℓ／min | Cracking Pressure MPa | Hex. H | Flats h | I | ℓ | Fingertight Approx. L | $L_1$ | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal sizes | Out. Dia. | | | | | | | | | |
| KZL10−050CE | 10 | | 15 | 0.05 | 17 | 19 | 5.5 | 21 | 31.0 | 32 | 0.146 |
| KZL10−450CE | 10 | | 15 | 0.45 | 17 | 19 | 5.5 | 21 | 31.0 | 32 | 0.146 |
| KZL12−050CE | 12 | | 18 | 0.05 | 19 | 19 | 6 | 21 | 31.0 | 32 | 0.150 |
| KZL12−450CE | 12 | | 18 | 0.45 | 19 | 19 | 6 | 21 | 31.0 | 32 | 0.150 |
| KZL16−050CE | 16 | | 35 | 0.05 | 27 | 27 | 8 | 29 | 41.6 | 40 | 0.373 |
| KZL16−450CE | 16 | | 35 | 0.45 | 27 | 27 | 8 | 29 | 41.6 | 40 | 0.373 |
| KZL20−050CE | 20 | | 60 | 0.05 | 30 | 30 | 8 | 30 | 44.3 | 45 | 0.496 |
| KZL20−450CE | 20 | | 60 | 0.45 | 30 | 30 | 8 | 30 | 44.3 | 45 | 0.496 |
| KZL25−050CE | 25 | | 95 | 0.05 | 36 | 36 | 9 | 33.5 | 48.3 | 52 | 0.581 |
| KZL25−450CE | 25 | | 95 | 0.45 | 36 | 36 | 9 | 33.5 | 48.3 | 52 | 0.581 |
| KZL30−050CE | 30 | | 140 | 0.05 | 41 | 46 | 9 | 42 | 57.3 | 65 | 1.368 |
| KZL30−450CE | 30 | | 140 | 0.45 | 41 | 46 | 9 | 42 | 57.3 | 65 | 1.368 |

⚠ **CAUTION : Please inquire us when the fitting will be used excepting hydraulic oil.**

## Specifications

Rated pressure　$\phi$10～30:14MPa(140kgf/cm$^2$)
Fluid　Hydraulic Oil
Working temperature　−20～150℃
Flow rate　refer to table on right
Pressure Loss　Pressure loss Vs. flow rate under oil viscosity of 125 SSU (26cSt) is shown in right figure.
Cracking Pressure　The cracking pressure of 0.05MPa (0.5kgf/cm$^2$) and 0.45MPa (4.5kgf/cm$^2$) are available.



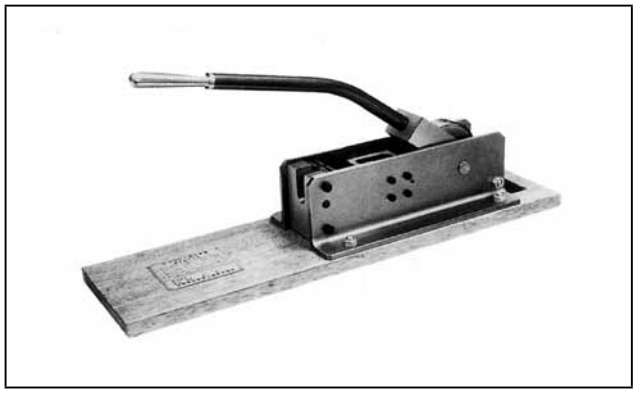
## Hand operating Pre-setting Device

When tightening the same size of fittings in many, useing the device makes the presetting work very efficiently and provides uniform work performance.

Manual and hydraulic operated are available. For manual type, there are two types. Type PSD-S is used for $\phi 6 \sim \phi 20$, and type PSD-BCE is used for $\phi 25 / \phi 30$. For presetting work, another parts which are sold separately are required.

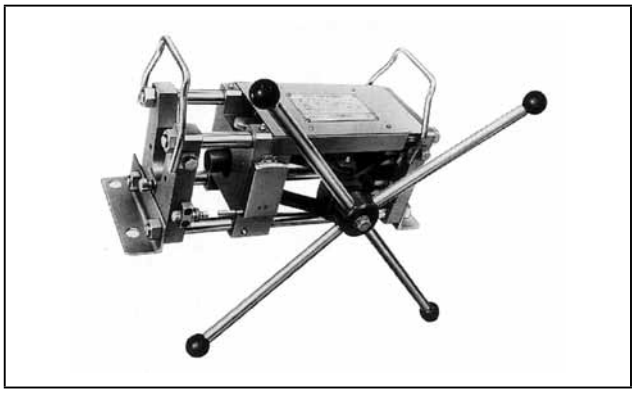
Please select the proper jigs and sleeve receiver corresponding to the size from the table below.

**PSD-S（φ6～φ20）**



| Tube OD | Clampimg Jig | Sleeve Holder |
|---|---|---|
| 6 | PJS06-00CE | PJU06-00SE |
| 8 | PJS08-00CE | PJU08-00SE |
| 10 | PJS10-00CE | PJU10-00SE |
| 12 | PJS12-00CE | PJU12-00SE |
| 16 | PJS16-00CE | PJU16-00SE |
| 20 | PJS20-00CE | PJU20-00SE |

**PSD-BCE（φ25、φ30）**



| Tube OD | Clampimg Jig | Sleeve Holder |
|---|---|---|
| 25 | PJB25-00CE | PJU25-BCE |
| 30 | PJB30-00CE | PJU30-BCE |

**CAUTION**

1. Cut the tube aiming at obtaining cutting angle of 90°±1°. Remove the burrs from outside and inside of the cut tube edge. Exercise not to scratch the surface more than 0.1mm depth.
2. Keep more than 80mm straight length from the tube end.
3. Properly lubricate on the movable parts.
4. Tightening jig and sleeve receiver are consumable parts. Replace them periodically correspond to the use frequency.
5. When tightening, make sure that the tube end bottoms in the jig. In case of the tube is very long, work by two men or prepare the support to keep the tube horizontally.
6. Do not modify the device or parts. Due to the cause of modification, there will be possibility of impairing the performance.

## Hydraulic Pre-setting Device

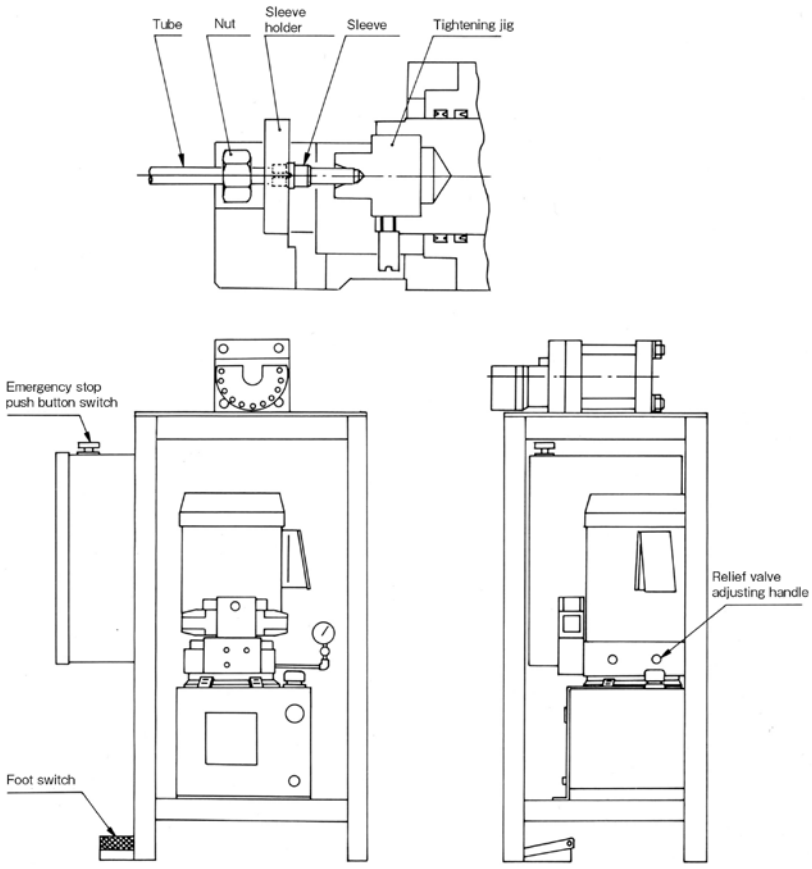
With this equipment preliminary tightening can be performed on the entire CE type fitting sizes. Even for 3-D bent pipe, only one worker can achieve the preset work using foot switch.

Applicable tube sizes: From 6 mm dia. To 30 mm dia.

## Operation procedure

1. Switch on the power for the hydraulic pump.
2. Turn the relief valve adjustment handle and set the preset pressure to the specified pressure in accordance with the outside diameter and the wall thickness of the tube to be used by operating the foot switch.
3 After installing the nut, sleeve and sleeve receiver to the tube, insert the tube into the tightening jig at the front of the cylinder.
4. Set the foot switch to "ON".
   The cylinder will advance and perform preliminary tightening.
5. When preliminary tightening has been performed, the cylinder will automatically return.

## Details of Hydraulic Pre-setting Device



⚠ **WARNING** If you don' t select and handle fittings, valves and related accessories in an adequate manner, it may damage human beings and applicable systems.
Within the responsibility and authorization of users and piping designers, fittings, valves and related accessories shall be adequately selected, assembled, used and maintained based on the applicable conditions and product conformity to the system to be applied. Please read carefully our operation manual and feel free to contact with Ihara if you have any question or request.

# *IHARA SCIENCE CORPORATION*

You can get more information at Home Page.
http://www.ihara-sc.co.jp

## Headquarters/Sales Offices

**Headquarters**
**East Japan Sales Office**
11-3 Takanawa 3-chome Minato-ku,
Tokyo 108-0074 Japan
TEL: +81-3-6721-6981 FAX: +81-3-6721-6991

**Tohoku Sales Office**
5600-3, Higashineko, Oaza, Higashine city,
Yamagata prefecture 999-3701
TEL: +81-237-43-7802 FAX: +81-237-43-7803

**Chubu Sales Office**
Tsukasa Building, 3-14-19, Chiyoda, Naka ward,
Nagoya city, Aichi prefecture 460-0012
TEL: +81-52-323-2627 FAX: +81-52-323-2630

**Kansai Sales Office**
7F, GL Osaka Building, 4-1-18, Tenma, Kita ward
Osaka city, Osaka prefecture 530-0043
TEL: +81-6-6358-9255 FAX: +81-6-6358-9260

**West Japan Sales Office**
1-17-20, Higashizuka, Kurashiki city,
Okayama prefecture 712-8044
TEL: +81-86-455-1811 FAX: +81-86-455-1822

**Kyushu Sales Office**
103, Maison de Sophie, 1-1-8, Onoue, Kumamoto
city, Kumamoto prefecture 862-0913
TEL: +81-96-386-5353 FAX: +81-96-386-5354

## Group Companies

**Yamagata-Ihara Corporation**
5600-3, Higashineko, Oaza, Higashine city,
Yamagata prefecture 999-3701
TEL: +81-237-43-5501 FAX: +81-237-43-5504

**IHARA SCIENCE TAIWAN Co.,Ltd**
No.79, Mingyi St., West Dist.,
Taichung City 403, Taiwan (R.O.C.)
TEL:+886-4-2319-1116 FAX:+886-4-2319-1126

**SUZHOU IHARA SCIENCE Co.,Ltd.**
SHANGHAI OFFICE
UnitJ-11F,Huamin Empire Plaza,
No.728, YanAn Road(W),
Shanghai 200050,R.P.Chaina
TEL:+86-21-5239-9884 FAX:+86-21-5283-3811

**IHARA KOREA Co.,Ltd**
Digital Empire Ⅱ103-905, Sinwon-ro 88,
Yeongtong-Gu, Suwon-Si
Gyeonggi-Do, 443-734, South Korea
TEL : +82-31-695-6800 FAX : +82-31-695-6808

**IHARA SCIENCE USA CORPORATION**
1915 Peters Road, Suite 103 Irving, Texas 75061
TEL:+1-469-586-4671 FAX: +1-469-586-4723

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