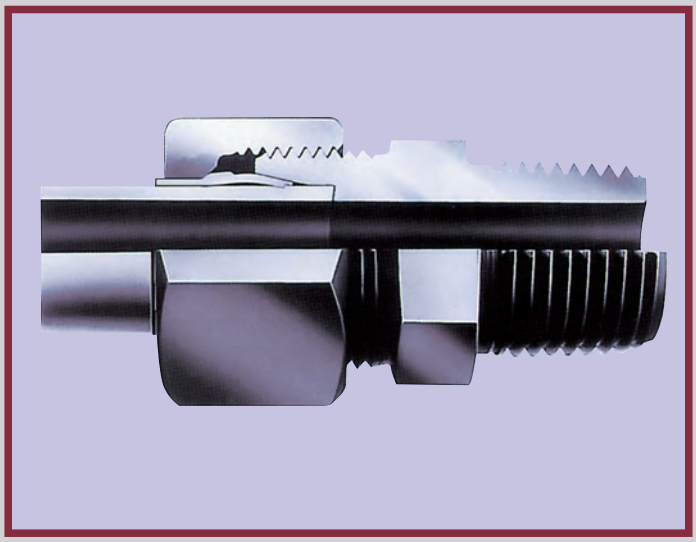
CAT. NO 0401B

IHARA SCIENCE

NE BITE TYPE TUBE FITTINGS



イハラサイエンス株式会社
IHARA SCIENCE CORPORATION

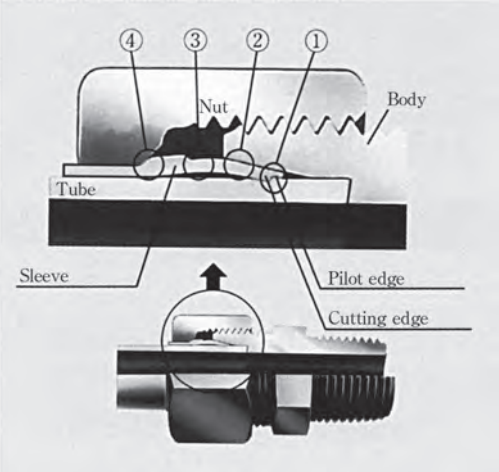
BITE TYPE FITTINGS FOR STEEL TUBES

1. FEATURES OF BITE TYPE FITTINGS

(1) Bite type fittings do not require threading, welding, flaring nor brazing to perform piping and substantial man hour saving can be realized.
(2) Without requiring threading nor welding, thin wall tubes can be used for piping (tube wall thickness are required to be more than 10% of the tube outside diameter due to bite type fitting mechanism and rigidity of the tube, however, the minimum thickness must be more than 1 mm) . Thin wall tubes facilitate bending and enable reducing the number of fittings which will contribute to decrease the weight of the equipment as well as permit compactness.
(3) Even after repeated disassembly and remake, the connection made is both integral and reliable.
(4) Sealing being achieved by metal contact without involving sealing material such as O-ring, application over wide temperature range is feasible.
(5) Fitting material can be selected from carbon steel, stainless steel, brass and other metal to adapt to the conditions of application such as fluid to be handled and the external environment.

2. BITE TYPE FITTING MECHANISM

The bite type fitting consists of 3 components, namely, the body, the nut and the sleeve, and by properly assembling the components and tightening in accordance with the specified procedure, the sleeve will bite into the tube as illustrated in the frgure.



①The cutting edge of the sleeve will bite into the tube to firmly hold the tube and at the same time performs sealing between the sleeve and the tube.
②The outer periphery of the sleeve is tightly pressed along the tapered bore surface of the body and performs sealing between the sleeve and the body.
③The bowing action of the sleeve works as a powerful spring and maintains sealing function over a long period of time as well as prevent the nut from becoming loose by vibration.
④The rear portion of the sleeve is compressed against the outer periphery of the tube and holds the tube as well as relieve stress concentration from vibration to the part where the sleeve bites in to the tube.

The mechanism of the bite type fitting as explained above enables the fitting to completely seal high pressure fluid even where the piping undergo impact, vibration, etc.

3. FEATURES OF SLEEVE WITH ENVELOPE

(1) The envelope of the sleeve enables strict centering of the piping and contributes to substantially reduce the number of the off-centering which has been the major cause for leakage in piping.
(2) The slits on the envelope have enhanced the capability to resist vibration. Fatigue strength has been increased more than 20% in comparison to the conventional NS type bite type fittings. This contributes to reduce the number of failures due to tube damage and loosening of the nut caused by tube vibration.
(3) The body of NE type fitting are interchangeable with NS type fitting body which facilitates making improvements and repairs of existing piping.

With conventional type of bite type fittings, stress distribution to the tube will generate as shown in Figure 2 when tightened.
Repeated bending stress will generate when vibration originating from external vibration, pressure fluctuation, etc. is applied to the piping and can eventually lead to a breakage in the piping.
It has been ascertained that this piping breakage is caused mainly by fatigue failure, and is concentrated mainly at the rear edge of the sleeve (part "A" in the drawing) .
With the NE type bite type fitting, sleeve having envelope with slits on the rear edge has been employed to dissipate and relieve the initial stress at "A" point that generates when the fitting is tightened.
This has improved the stress distribution as shown in Figure 1 and enhanced strength against fatigue.

Figure1
NE Type

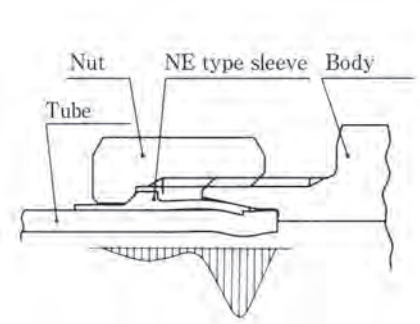
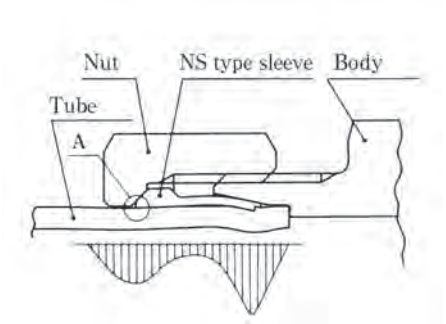


Figure2
NS Type



4. TUBE SELECTION

Tubes that are mainly applicable for use with the fittings are listed below, and steel tubing of (1) , (2) and (6) are particularly adaptable and recommended for piping application with these fittings.

(1) JIS B 2351 Pipes for oil hydraulic service 25 MPa (250 kgf/cm2) , STPS standard pipes for bite type tube fitting:
(2) Japan Oil Hydraulic Industrial Society Standard JOHS-102 Precision carbon steel tube for oil hydraulic piping : OST various types
(3) JIS G 3454 Carbon steel pipes for general service: STPG 370
(4) JIS G 3455 Carbon steel pipes for high pressure service: STS 370
(5) JIS G 3456 Carbon steel pipes for high temperature service: STPT 370
(6) Electric-resistance-welded carbon steel tube for E tube oil hydraulic piping (in-house standard)
(7) SUS 304TP and SUS 316TP specified in stainless steel piping for JIS 3459 piping

⚠CAUTION: In case of using (3), (4), (5) and (7) above, select ones which are cold finished seamless pipes with surface hardness less than HRB 80.

5. STANDARD SPECIFICATION

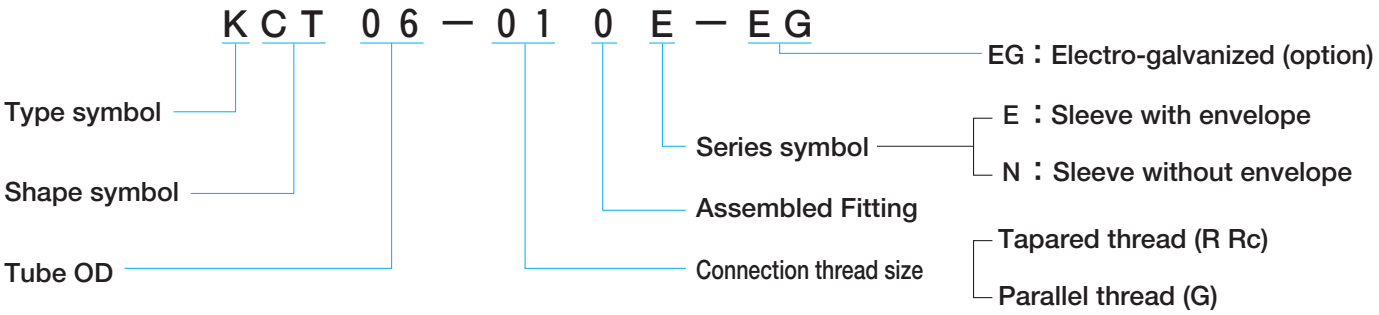
Fitting sizes (Applicable nominal tube)	For mm tube	4~8	10~15	16~25	28~30	35~38	40~50
	For schedule pipe	1/8・1/4	3/8・1/2	3/4		1	1-1/4・1-1/2
Rated pressure	MPa	50	40	31	28	25	21
Temperature range	℃	−20~+250℃					

⚠ WARNING:
Use in excess application is forbidden.

6. MATERIAL

(1) Body and Nut
JIS G 4051 Carbon steel material for machinery structure 25C~S48C or material equivalent.
(2) Sleeve
Carbon steel with surface hardened.
(3) Stainless steel (SUS304 and SUS316) is also available.

7. PART NUMBERS (NOMENCLATURE) AND STANDARD SIZES



mm tube	OD size	4	6	8	10·····30·····50				
	Nominal size	04	06	08	10·····30·····50				
Schedule Pipe	Nominal diameter (B)	1/8	1/4	3/8	1/2	3/4	1	11/4	11/2
	OD size	10.5	13.8	17.3	21.7	27.2	34.0	42.7	48.6
	Nominal size	11	13	17	21	27	34	43	48

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

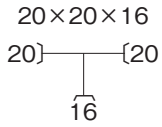
⚠ WARNING:
The intermixing use of bite type fittings parts (body, nut, sleeve) with other company's is forbidden.
Because fittings don't function properly and may cause the serious accident.

8. RUST-PROOFING TREATMENT

Parkerizing is standard surface treatment, but upon request other types such as Electro-galvanized can be applied.

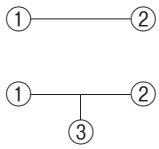
9. WHEN ORDERING

(1) When ordering, specify parts numbers of fittings.
(2) In addition to the fittings listed in this catalog, special design fittings can be produced. Please inquire specification case by case.
(3) When the fttting has different size ends, order as follows:

Fitting with three different size end	

※To preclude ordering error, use symbol as right.

For fitting with different size end, call out as follows:



a. Two the different size ends
With the larger size end as① and the smaller end as② call out in the order of①, ②
b. Three different size ends
With the larger size end on the same center line as① and the smaller size end as② and the remaining end as③, call out in the order of①, ②, and③.

10. Others

Ihara Science Corporation reserves the right to make changes to the specifications and the general appearance of the products of this catalogue without prior notice in order to implement improvements.

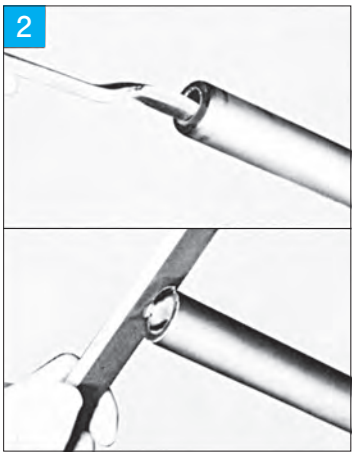
11. TIGHTENING PROCEDURE

It is imperative that proper tubes are selected and the fittings are correctly tightened for the bite type fittings to fully exhibit it's function. Bite type fittings can be directly installed and tightened at the job site, but by performing presetting as explained below the piping operation can be performed smoothly and reliably.
It is recommended to carefully peruse the instruction manual before using.

(1) Presetting

Cut the tube to the required length at a right angle.

⚠CAUTION: Right angle of cut end should be within 90° ±1°.

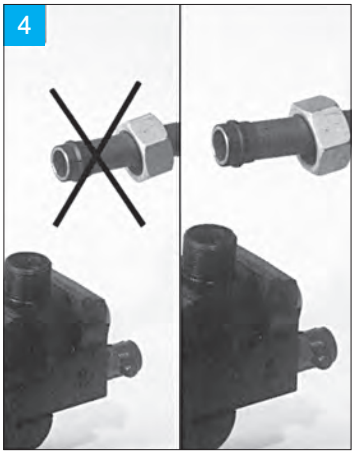


Remove all burrs from the inside of cut end.
Exercise care not to deform the tube or cause damages such as deep scratches on the outside surface.

⚠CAUTION: Handle with care to prevent scratches of more than 0.1 mm depth on the tube surface.

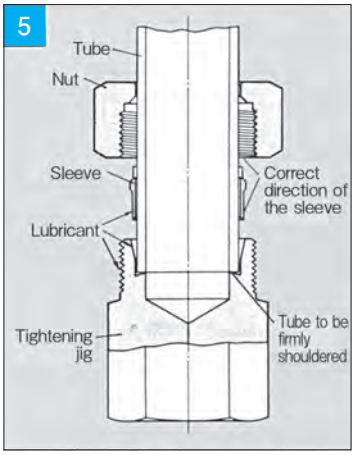
Firmly clamp the tightening jig PJA in a benchvice. Lubricate threads and tapered surface of the bore.

⚠WARNING: The jig must be firmly held in the vice.



Insert the nut first and the sleeve with correct direction on to the tube

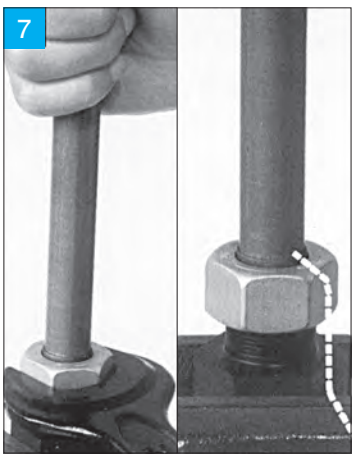
⚠WARNING: Pay particular attention to the direction of the sleeve.
If inserted in the reverse direction, the sleeve can not bite into the tube and result in tube pulling out.



Insert the tube with the nut and the sleeve into the tightening jig.

⚠WARNING: The tube must be inserted until the tube end firmly bottoms on the fitting body shoulder. If the nut is tightened with the tube end not contacting the shoulder, the sleeve will not adequately bite into the tube and result in pulling out of the tube.

Tighten the nut fingertight.



Determine the grip point
While turning the tube lightly with the fingers, tightened the nut until the point is reached where the tube can no longer be turned. This point is referred to as the grip point. It is at this point that the sleeve starts to bite into the tube. Draw identification matching mark so that the amoimt of tightening can be determined.

Tighten the nut 1-1/4 turns with a spanner from the grip point. However for the types of KRE, KHA, KHB, KHC, KHO, KAP which are fittings with tube end configuration with grooves, the tightening from the finger tightened position (photo 6) should be 1-3/4 turn.
With the above procedure the sleeve has been firmly seated into the tube.

⚠WARNING:Provide adequate work space and assure safety when tightening the nut. The wrench must it 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.

Loosen the nut, and check the sleeve.
a) The edge of the sleeve must be a few millimeters from the pipe edge.
b) The sleeve should not move to axial direction though movement to circumferential direction is no problem.

Note: When tightening a number of tube of the same size, it is recommended that the presetting device PSD is used to ensure proper, correct and effective tightening. Refer to page 9~14 for how to use PSD.

(2) Resetting

When assembling a tube that has been presetted to a fitting body, the nut when being tightened with a spanner will reach a point where the torque will suddenly increase. This point is referred to as the sharp torque rising point. The nut is further tightened 1/4 turn from the sharp torque rising point. However, for the tube ends of KRE, KHA, KHB, KHC, KHO and KAP, tighten by turning the nut 1/6 turn from the sharp torque rising point. With the above procedures piping work is completed.

⚠WARNING: Provide adequate work space and ascertain safety when tightening the nut. The wrench must it properly fitted to the nut when tightening.

⚠CAUTION: If tightening is insufficent, leakage can occur and tube may slip. Excessively tightening the nut can damage the fitting and impair its function.

⚠CAUTION: After presetting, blow compressed air on the sleeve and the taper bore surface on the fitting body to remove all foreign materials before assembling. If a foreign material becomes caught, the sealing function can be impaired.

Note: Correct the centering of the tube and fitting so the nut can be smoothly tightened to the fitting body.

(3) Disassembly

The bite type fitting assembly can be disassembled simply by loosening the nut. When remaking is done in accordance with above mentioned resetting procedure (2), disassembly and remaking can be satisfactorily repeated more than 8 times.

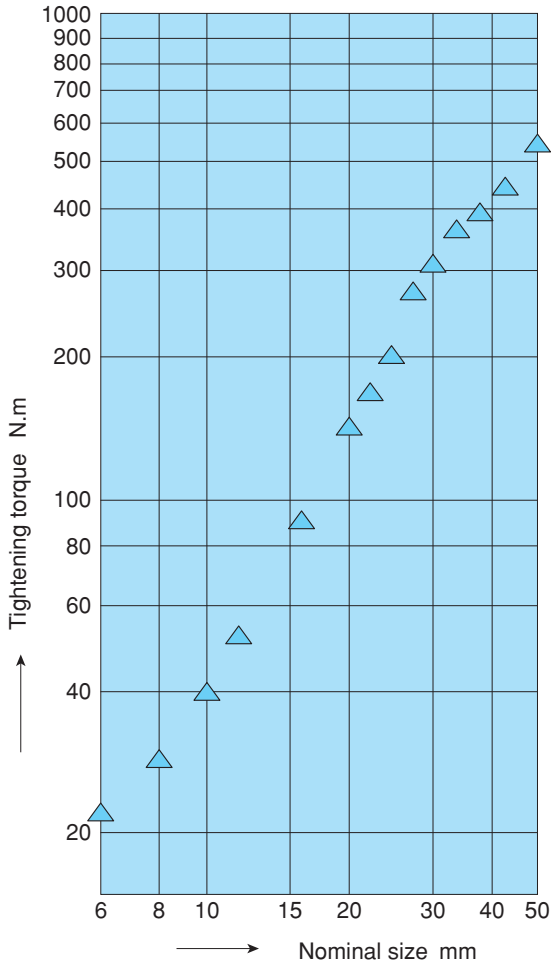
⚠WARNING: Installing and disassembling under pressure is extremely dangerous and must be prohibited.

12. Tightening torque of NE type bite type fittings for steel tube (reference values)

The optimum method of tightening NE type bite type fittings for steel tube is by the number of turns of the nut, but when tightening is to be controlled by the tightening torque, the approximate tightening torque values are as shown in the graph below. This graph shows the relation between the nominal tube size and the proper tightening torque (resetting torque) of the fitting nut.

After preliminary tightening with PSD-S or PSD-B (preliminary tightening device S type and B type), further tighten the nut l/4 turn from the sharp torque rise point as a guideline. The tightening torque will differ with the wall thickness of the tube, tube hardness, off-centering during piping operation, fittings cleaned with acid, alkali, washing fluid, etc., and when reusing of fittings (reduction of lubrication film effect). The graph has been prepared for tubes shown in the table and the fittings are standard specification fittings. When remaking, the torque to be applied should be slightly higher than the previous tightening torque.

Tightening torque values for bite type fittings of steel tubes (reference values)



Tube (OST 2)

OD×Wall thickness mm
6×1.0
8×1.0
10×1.5
12×1.5
16×2.0
20×2.0
22×2.5
25×2.5
28×3.0
30×3.5
35×4.0
38×4.5
42×5.0
50×6.0

13. PRE-SETTING DEVICE MODEL : PSD-S

(1) Structure and Function of Pre-Setting Device PSD-S

This device performs pre-setting by cam mechanism as illustrated in the figure below for bite type fittings within the tube range of 4 to 20 mm outside diameter or 1/8B to 3/8B.
By pressing the lever down, the clamping jig attached to the push rod slides toward the clamping plate by cam action and force the sleeve to bite into the tube.

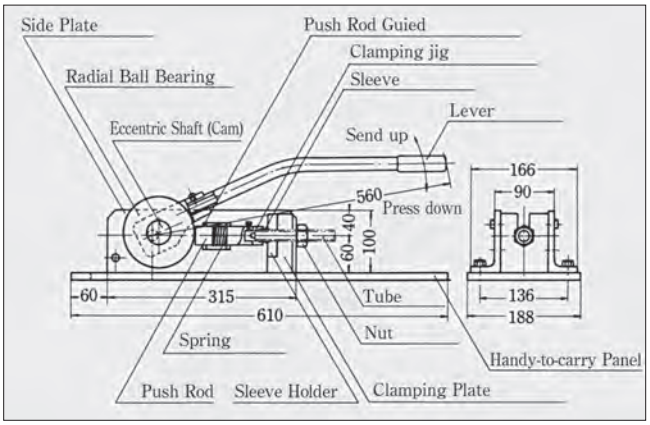


Figure 1. Pre-setting device mechanism Weight : 17kgs.

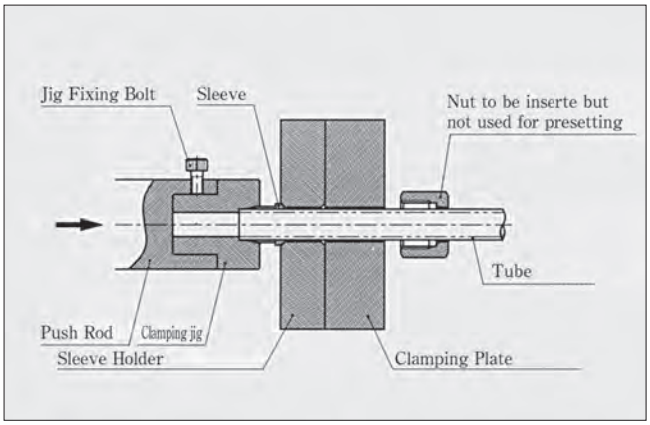


Figure 2. Detailed drawing of pre-setting components

(2) STANDARD COMPONENTS

For pre-setting with this device (PSD-S) it will be necessary to select clamping jig and sleeve holder applicable to the outside diameter of the tube to be used.
The clamping jigs and sleeve holders are not included with the pre-setting device and must be separately ordered.

Tube OD	Clamping jig	Sleeve holder
4	PJS04−000N (PSD−SJ−4)	PJU04−00SN (PSD−SU−4)
6	PJS06−000E (PSD−SJ−6)	PJU06−00SE (PSD−SU−6E)
8	PJS08−000E (PSD−SJ−8)	PJU08−00SE (PSD−SU−8E)
10	PJS10−000E (PSD−SJ−10)	PJU10−00SE (PSD−SU−10E)
12	PJS12−000E (PSD−SJ−12)	PJU12−00SE (PSD−SU−12E)
15	PJS15−000E (PSD−SJ−15)	PJU15−00SE (PSD−SU−15E)
16	PJS16−000E (PSD−SJ−16)	PJU16−00SE (PSD−SU−16E)
18	PJS18−000E (PSD−SJ−18)	PJU18−00SE (PSD−SU−18E)
20	PJS20−000E (PSD−SJ−20)	PJU20−00SE (PSD−SU−20E)
1/8B	PJSII−000N (PSD−SJ−G1/8)	PJU11−00SN (PSD−SU−G1/8)
1/4B	PJS13−000E (PSD−SJ−G1/4)	PJU13−00SN (PSD−SU−G1/4)
3/8B	PJS17−000N (PSD−SJ−G3/8)	PJU17−00SN (PSD−SU−G1/8)

(3) CAUTION

I) Cut the tube at a right angle and remove all burrs from the outside and inside of the cut tube end.

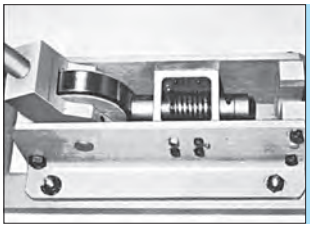
⚠CAUTION: Cut the tube aiming at an angle of 90° ±1° outer surface of the tube must be free from the scratched damage of more deeper than 0.1mm.

2) In case of bent tube, the straight portion of the tube must be longer than 80mm from both tube ends.

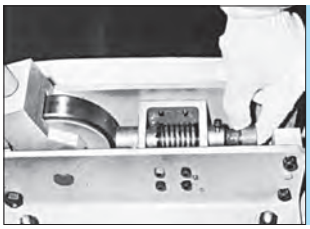
3) Lubricate the moving parts of the device with oil timely.

⚠CAUTION: Do not modify the device and jigs. The device may not function properly when modification has been performed.

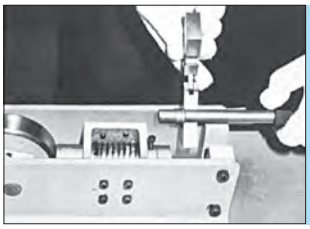
(4) OPERATION PROCEDURE OF PRE-SETTING DEVICE PSD-S



①Raise the lever and open space between the push rod and the clamping plate.

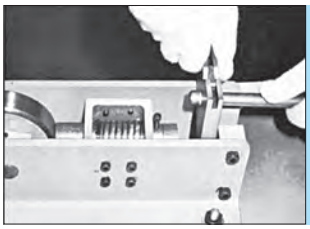


②Attach a clamping jig of the same size as the tube.



③Insert the nut and the sleeve into the tube with correct order and direction, and set the sleeve holder between the nut and the sleeve.

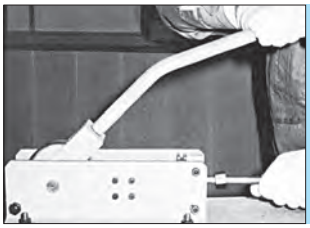
⚠WARNING: Make sure the correct direction of sleeve. If the sleeve is facing the incorrect direction, the sleeve will not bite into the tube and tube slippage failure will result.



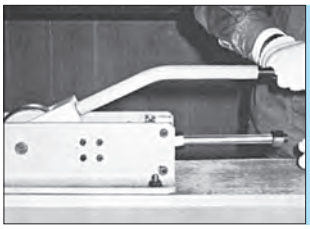
④Mount the tube with the nut and the sleeve on the pre-setting device.

⑤The tube end must be contacting and seated firmly against the shoulder of the clamping jig.

⚠WARNING: When clamping is performed with the tube end not contacting the shoulder of the pre-setting device, biting into the tube will not be satisfactory and cause the tube to slip.

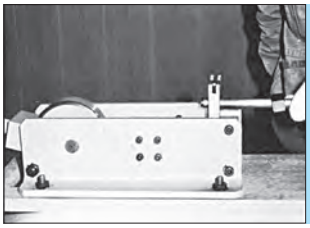


⑥Push down on the lever.



⑦Clamp down on the lever until it can no longer be pressed.

⚠CAUTION: Press down on the lever until firmly contacting.



⑧Lift up the lever to loose the clamp and remove the tube with the two-piece sleeve holder.
The presetting operation completed.

(5) FINAL TIGHTENING

The tube that have been pre-set is now ready to be installed to the fitting body at the piping site.
In the installing operation, the tightening torque while tightening the nut with a spanner will suddenly increase upon reaching a certain point called (sharp torque rise point), then from this point turn additionally l/4 turn to complete the installation.

⚠WARNING: Perform tightening of the nut on firm footing, and ascertain the safety of the surrounding.
⚠CAUTION: Insufficient tightening can result in leakage and tube slippage.
⚠CAUTION: Clean the sleeve after pre-setting and the taper bore of the fitting body with cloth and blow clean with compressed air before assembling. When foreign material becomes caught, sealing function can be impaired.

14. PRE-SETTING DEVICE Model : PSD-B

(1) Structure and Function of Pre-Setting Device PSD-B

This device performs pre-setting of bite type fittings within the tube range of 22 to 50mm outside diameter or 1/2B to 1-1/2B by toggle mechanism application as illustrated in the figure below. Upon reguest, the device for 6mm to 20mm diameter will be available.
By turning the handle in the right direction, the clamping jig attached to the moving flange slides toward the fixed flange A by the toggle mechanism and forces the sleeve to bite into the tube.

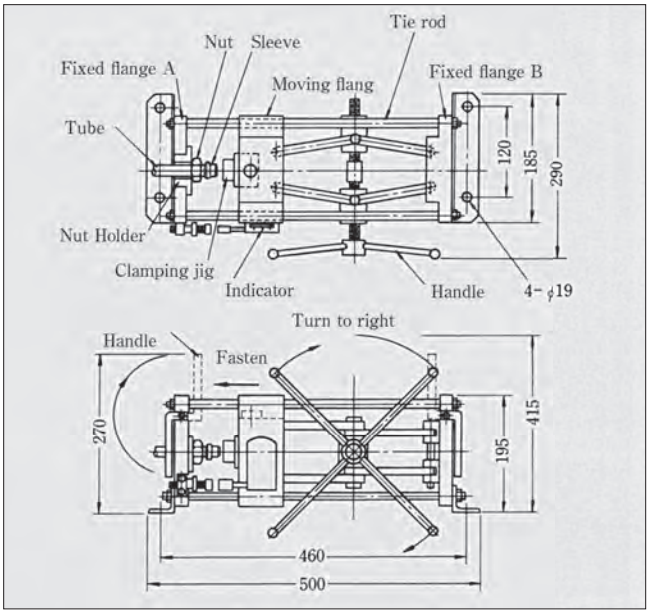


Figure 1. Diagram of pre-setting device. Weight :33kgs.

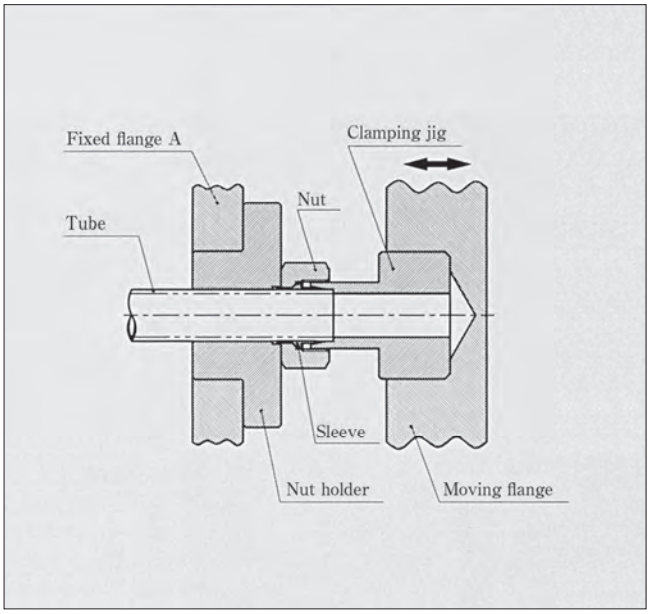


Figure 2. Details of clamping mechanism

(2) Standard Components (sold separately)

For pre-setting with this device(PSD-B), it will be necessary to select clamping jig and sleeve holder that are applicable to the outside diameter of the tube to be used from the Table below.
The clamping jig and nut holder are not included in the pre-setting device and must be separately purchased.

Outside of Tube	Clamping Jig	Sleeve Holder	Outside of Tube	Clamping Jig	Sleeve Holder
22	PJB22−000E (PSD−BJ−22E)	PJU22−00BE (PSD−BU−22E)	42	PJB42−000N (PSD−BJ−42N)	PJU42−00BN (PSD−BU−42)
25	PJB25−000E (PSD−BJ−25E)	PJU25−00BE (PSD−BU−25E)	50	PJB50−000N (PSD−BJ−50N)	Useless
28	PJB28−000E (PSD−BJ−28E)	PJU28−00BE (PSD−BU−28E)	1/2B	PJB22−000E (PSD−BJ−21N)	PJU22−00BE (PSD−BU−22)
30	PJB30−000E (PSD−BJ−30E)	PJU30−00BE (PSD−BU−30E)	3/4B	PJB27−000N (PSD−BJ−27N)	PJU28−00BE (PSD−BU−28)
35	PJB35−000E (PSD−BJ−35E)	PJU35−00BE (PSD−BU−35E)	1B	PJB34−000N (PSD−BJ−34N)	PJU35−00BE (PSD−BU−35)
38	PJB38−000N (PSD−BJ−38N)	PJU38−00BE (PSD−BU−38)	11/4B	PJB43−000N (PSD−BJ−43N)	PJU42−00BN (PSD−BU−42)
40	PJB40−000N (PSD−BJ−40N)	PJU40−00BN (PSD−BU−40)	11/2	PJB48−000N (PSD−BJ−48N)	Useless

(3) CAUTION

I) Cut the tube at a right angle to the center line, and remove all burrs from the outside and inside of the cut tube end.

⚠CAUTION: Aim at obtaining 90° ±1° at the cutting angle of the tube end. Handle with care to prevent scratching deeper than 0.1 mm on the tube surface.

2) In case of bent tube, the straight portion of the tube must be longer than 80mm from the tube end.

3) Lubricate the moving parts of the device with oil.

⚠CAUTION: Do not perform modification on the device and jig. The device may not function properly when modified.

(4) OPERATION PROCEDURE OF PRE-SETTING DEVICE PSD-S

I) Turn the handle to the left(counter clockwise) and open space between the moving flange and stationary flange A. Attach a nut holder which is corresponding to the tube diameter to the stationary flange A and a clamping jig to the moving flange.

⚠ **WARNING:** Place the device on a stable work bench and firmly fix the device to the work bench so that the device will not turn over or fall during use.

⚠ **CAUTION:** Firmly fix the nut holder and clamping jig with securing bolts.

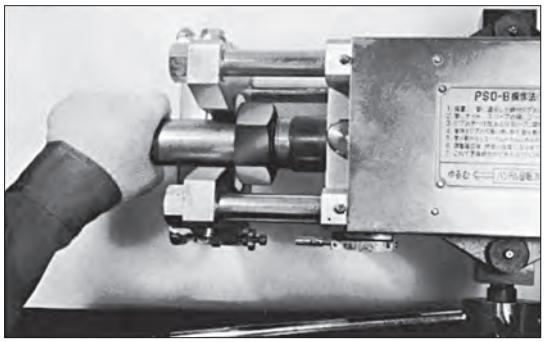


Photo 1

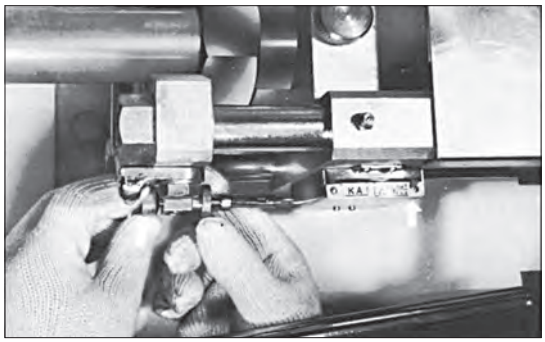


Photo 2

2) Insert the nut and the sleeve into the tube, with correct sequence and direction and set between the nut holder and the clamping jig as shown in Photo 1.
Lubricate the tapered part of the jig and the sleeve with lubricant.

⚠ **WARNING:** If the nut or the sleeve is inserted into the tube facing the wrong direction, it may cause the damage of fitting and slipping-off the tube.

3) Insert the tube into the pre-setting device so that the tube end contacts the shoulder of the pre-setting device. Clamp with the handle while slightly moving the tube circumferentially (turning to the right).
When the tube no longer moves, temporarily stop clamping with the handle and set the pointer on the indicator to “0 (Zero)” scale.
Fix the adjustment screw.

⚠ **WARNING:** When clamping is performed with the tube end not contacting the shoulder in the pre-setting device, biting effect into the tube will be insufficient and cause the tube to slip.

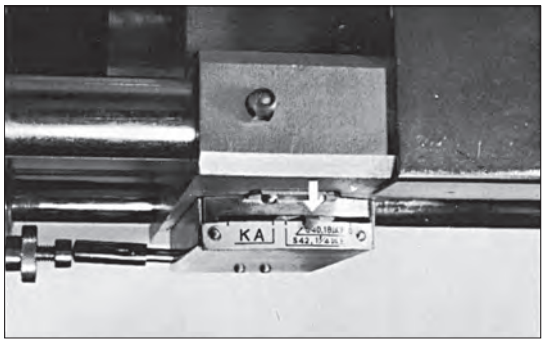


Photo 3

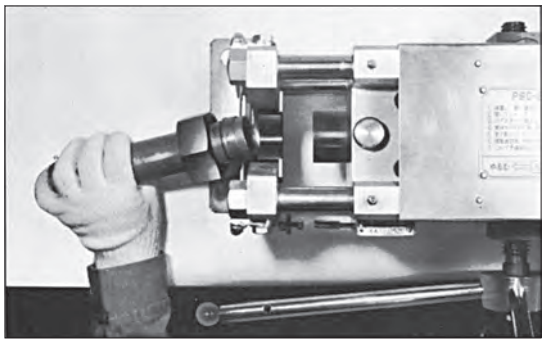


Photo 4

4) After adjusting the indicator, clamp by turning the handle until the pointer points to the required point on the scale. (In photo 3, the pointer is pointing to the center on the scale.)

⚠ **WARNING:** Inadequate clamping can result in leakage and tube slippage. However, excessive clamping can cause damage of fitting.

5) Loosen by turning the handle (to the left) and remove the tube.
This completes the pre-setting procedure.

Note: An operation procedure plate is attached on the top cover of the device and can be used as reference.

(5) 本締付け／FINAL TIGHTENING

The tube that have been pre-set is now ready to be installed to the fitting body at the piping site.
In the installing operation, the tightening torque while tightening the nut with a spanner will suddenly increase upon reaching a certain point(sharp torque rise point), and from this point an additional l/4 turn will complete the final tightening.

⚠WARNING: Perform tightening of the nut on firm footing, and ascertain the safety of the surrounding.
⚠CAUTION: Insufficient tightening can result in leakage and tube slippage.
⚠CAUTION: Clean the sleeve after pre-setting and the taper bore of the fitting body with cloth and blow clean with compressed air before assembling. When foreign matter becomes caught, sealing function can be impaired.

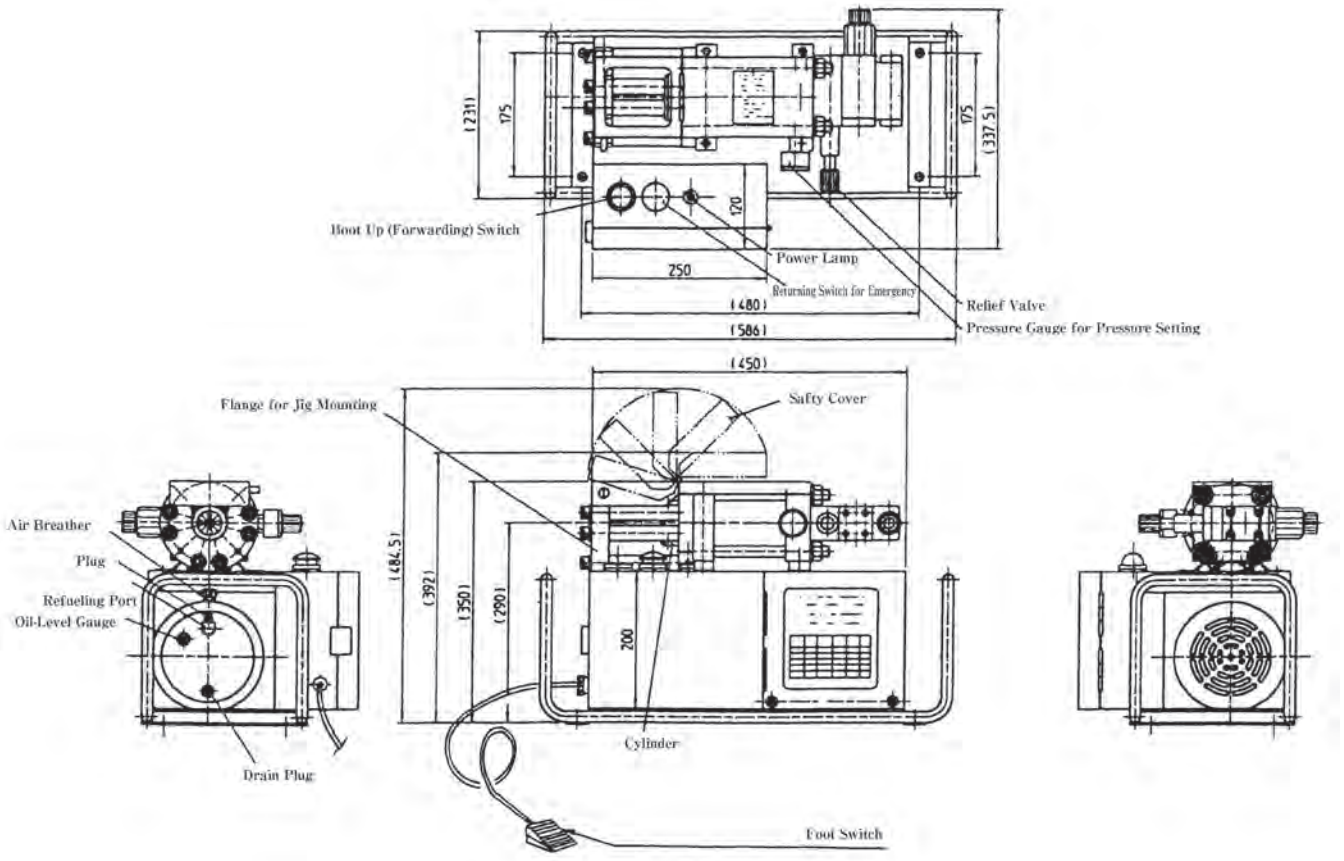
15. Hydraulic Pre-Setting Device MODEL : PSD-HT

The hydraulic pre-setting device enables pre-setting for all sizes of steel tube bite type fittings, and long tube with three dimensional bending which required support with manual type pre-setting device can be performed by one operator with the foot switch.

Operation procedure

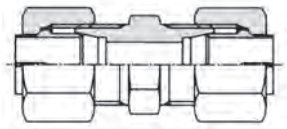
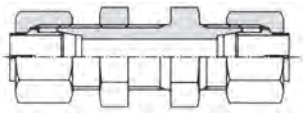
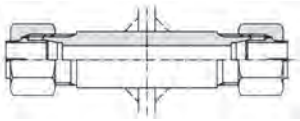
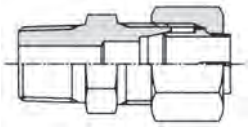
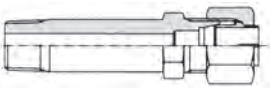
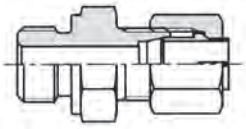
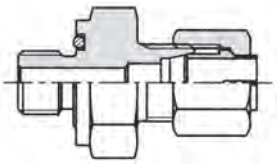
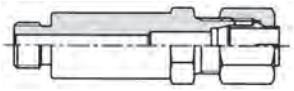
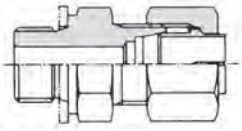
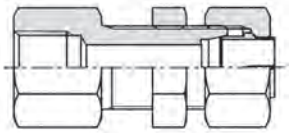
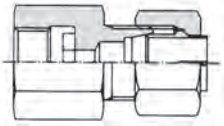
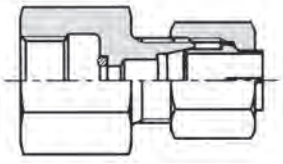
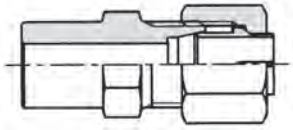
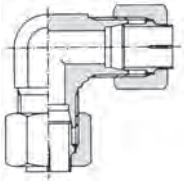
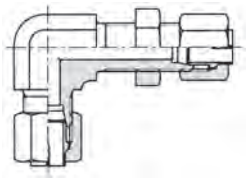
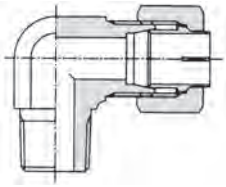
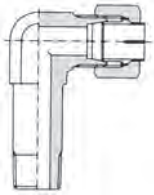
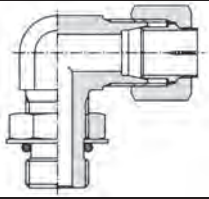
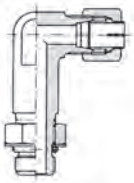
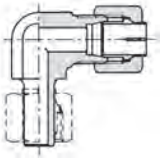
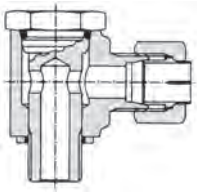
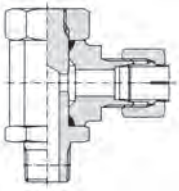
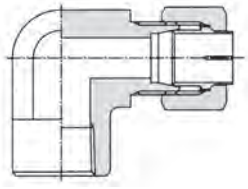
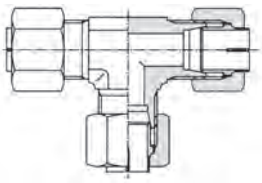
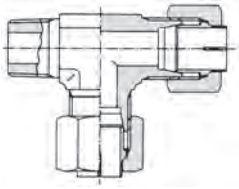
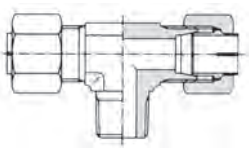
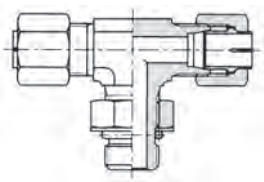
1. Turn on the power and start the hydraulic pump.
2. By turning the relief valve adjustment handle. Set the pre-set pressure as specified per the outer diameter and wall thickness of the tube operating the foot switch.
3. Install the nut and sleeve into the tube and insert the clamping jig to the front of the cylinder.
4. Turn on the foot switch. The cylinder will advance and perform pre-setting.
5. When pre-setting has been completed, the cylinder will automatically return.
6. In case of emergency during operation, push the emergency stop button.

Details of the clamping mechanism



⚠WARNING: Before use, read the operation manual and opertate correctly.

NE BITE TYPE TUBE FITTINGS VISUAL INDEX

Union: KUA	Bulkhead Union: KSU	Bulkhead Weld Union: KUW	Male Connector: KCT
			
Extended Male Connector: KCC	Straight Thread Connector: KCO	O-ring Seal Straight Thread Connector: KCD	Straight Thread Extended Male Connector: KCG
			
Straight Thread Connector: KCJ	Female Connector: KSA	Bulkhead Female Socket: KSS	Connector for Pressure Gauge: KGA
			
Connector for Pressure Gauge (O-Ring Seal): KGO	Weld Male Connector: KCW	Union Elbow: KLA	Bulkhead Union Elbow: KSL
			
Male Elbow: KLN	Extended Male Elbow: KLL	O-Seal Male Elbow: KLO	O-Seal Extended Male Elbow: KLG
			
Adjustable Elbow: KLC	Stud Elbow (B type): KMB	Stud Elbow (Ctype): KMC	Female Elbow: KLF
			
Union Tee: KTA	Male Run Tee: KTK	Male Branch Tee: KTN	O-Seal Male Branch Tee: KTO
			

NE BITE TYPE TUBE FITTINGS VISUAL INDEX

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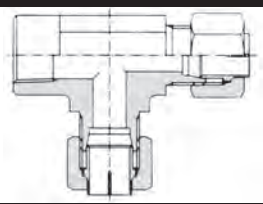
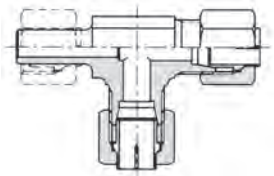
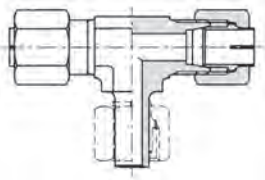
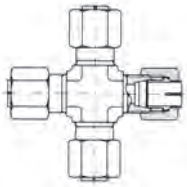
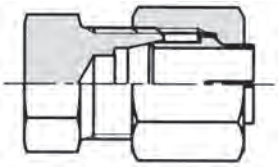
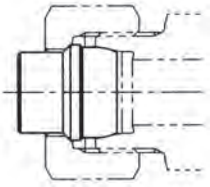
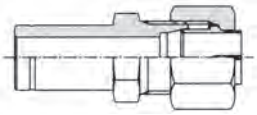
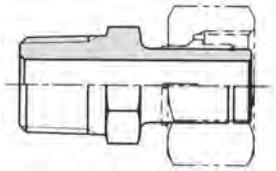
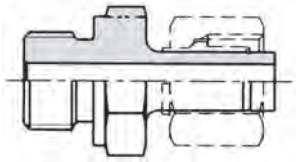
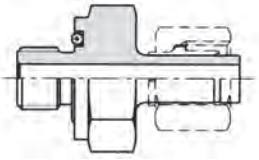
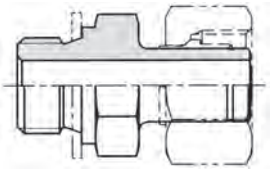
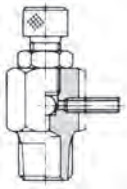
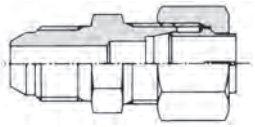
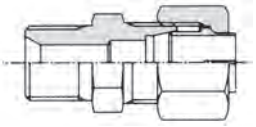
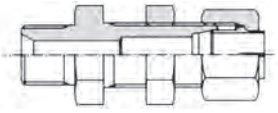
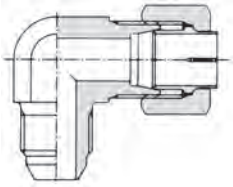
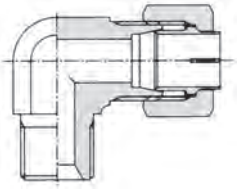
			
Union Cross: KXA	Cap: KCA	Plug: KBA	Reducer: KRE
			
Adapter: KHA	Straight Thread Adapter: KHB	O-Ring Seal Straight Thread Adapter: KHO	Straight ThreadAdapter (For Copper Gasket): KHC
			
Air-Purge Valve: KAP	Air-Purge Valve: SAP	Male Seat Hose Connection Union: KUC	Female Seat Hose Connection Union: KUD
			
Male Seat Hose Connection Bulkhead Union: KUE	Female Seat Hose Connection Bulkhead Union: KUF	Male Seat Hose Connection Union Elbow: KLD	Female Seat Hose Connection Union Elbow: KLE
			
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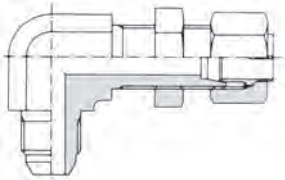	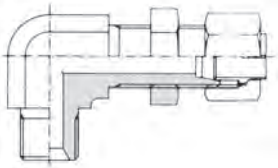	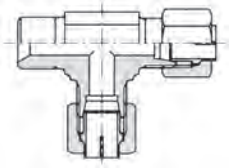	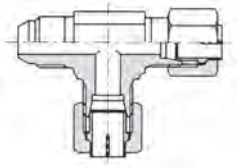
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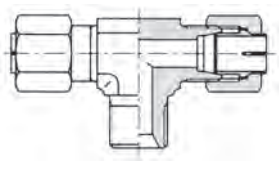
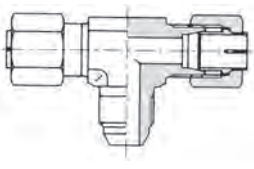
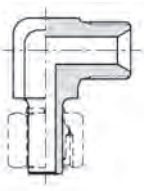
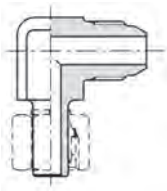
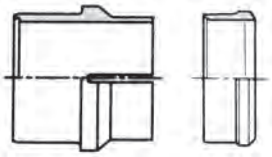
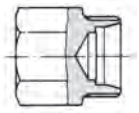
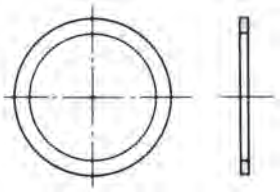
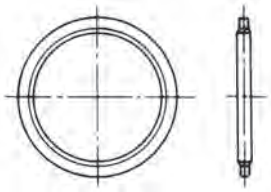
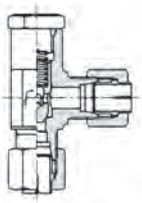
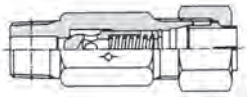
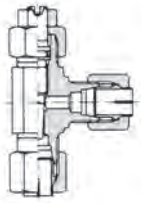
			

NE BITE TYPE TUBE FITTINGS VISUAL INDEX

Nut: KKN	Sleeve: KKO	Hand Presetting Tool: PJA	Copper Gasket: KP-A
			
Bonded Seal: KP-C	**Check Union: KZU**	**Check Elbow: KZL**	**Check Connecter: KZC**
			
Orifice Adjustable Fitting: KTP			
			

Directions meaning shown in this catalogue

⚠**WARNING:** Irregular handling with disregard for this direction can induce physical disability and accidental death.

⚠**CAUTION:** Irregular handling with disregard for this direction can induce fanctional defect of bite tipe fitting.

⚠ **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.

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