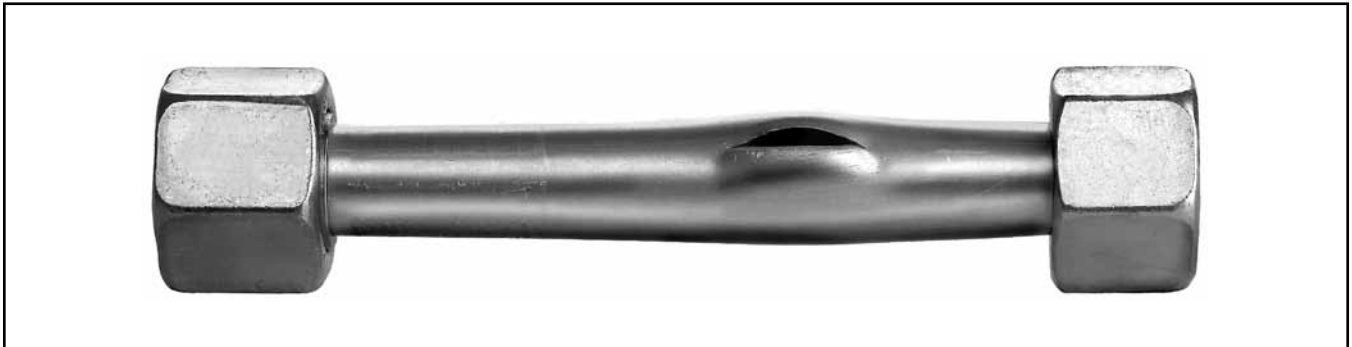


### Safety instructions

#### Tube fittings are safe high-pressure connections



A carefully assembled Parker tube fitting will provide a sealed joint even up to tube burst. Experience has shown that break-downs, re-tightening and leaks can be avoided by following these safety instructions. Please review your fitting procedures.

#### General safety instructions

- Uncompleted assembly will reduce the pressure and vibration capability of a fitting. It can reduce the life cycle time of a connection and leakage can occur. In extreme cases the connection can fail due to tube shear or tube crack.
  - After opening a tube connection, the unit has to be re-tightened with the same force used during prior assembly. Under tightening can result in leakage and can reduce the vibration resistance. Over tightening can reduce the possibilities of repeated assembly. In extreme cases the components can be destroyed.
  - Parker tube fittings are intended solely for connections for fluid applications.
  - Observe tube recommendations. Non-standard materials or tolerances lead to incorrect assembly.
  - Do not use ball bearings, fitting pins or tapered pins, coins or washers instead of the correct Parker blanking plug as blanking parts for 24° cones.
  - Tube connection and fitting body once assembled, should remain together. Fitting body is to be used once only for pre-assembly.
  - Air bleeding of tube fittings which are under pressure can be dangerous.
  - Tube under tension can lead to vibration failure. Tube length and bend angles are to be adhered to precisely. Fix tube lines with tube clamps.
  - Tubes are not to be clamped to one another but to suitable fixed points. Plate brackets, cable connections and fixing elements are not suitable. Tubes are not mountings on which to integrate other components e.g. filters, ventilators or shut-off valves.
  - Prevent oscillation, pressure surges and inherent strain by using flexible hoses for example.
  - Under and over tightening of fittings during assembly reduces the capacity for withstanding pressure and vibration loads and therefore reduces the life of the tube fitting. Leaks from the tube can occur under these circumstances.
  - When dismantling/transporting and re-assembling, make sure that no dirt enters the system, that the connection elements (threads, sealing surfaces) are not damaged, seals are not lost and tubes are not bent or flattened. We recommend the use of suitable protective caps.
  - Disassembled fittings are to be checked for accuracy and damage and replaced if necessary.
  - Do not use hand cutters or tube cutters.
- Dirt and metal contamination can lead to damage to the system and leaks.
  - The operating parameters given (e.g. pressure, temperature, medium compatibility) are to be adhered to.
  - Avoid flow rates > 8 m/s. The resulting forces are high and can destroy the tube lines.
  - Relevant guidelines (e.g. CE, ISO, BG, TÜV, DIN) are to be observed.
  - Weld fittings are manufactured out of weldable materials. No other fittings are suitable for welding.
  - EO-NIROMONT and Parflange LUBSS are high-performance lubricants. The use of other lubricants generally leads to an increase in assembly force.
  - The tools and lubricants recommended by Parker guarantee safe assembly.
  - Components and tooling of different manufacturers are not necessarily compatible. For complete safety, use only Parker components.
  - Fittings are to be handled with care.
  - Tube lines need to be adapted tension free of the relevant connectors before assembly. An easy turning of the nut is required for the complete thread length. Otherwise leakage can occur. In extreme cases with additional vibrations tube cracks can occur.
  - Vibrations have to be clamped by tube clamps. Independent vibrating units need to be separated with hoses. Otherwise tube cracks can occur.

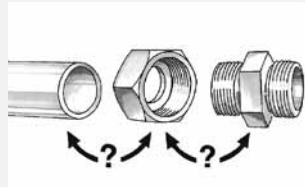
#### Specific safety instructions for assembly

- During a progressive ring and EO-2 fitting assembly the tube has to bottom up in the stud or in the tool. Without tube bottoming the ring cannot bite sufficiently. Under load the connection can fail due to tube shear.
- Correctly flared tubes are essential for leak free performance of Triple-Lok® fittings. Special care must be taken over the flare diameter and surface finish.
- Preset bite type fittings (Progressive ring) need a final assembly according to assembly instructions.
- Stainless steel progressive ring fittings have to be preassembled in hardened tools. Otherwise the connection may fail under load due to tube shear.
- Do not assemble progressive rings and functional nuts on self-made standpipe stud ends. There is a risk of false assembly with the result of connection shear under load.
- The use of steel cutting rings for stainless steel tubes or other unauthorised tool combinations leads to incorrect assembly.

**In case of doubt please contact your Parker representative!**

General

Assembly of Parker tube fittings always follows the same pattern:



**Material combinations**

- Use recommended tube material
- Select suitable components according to tube material



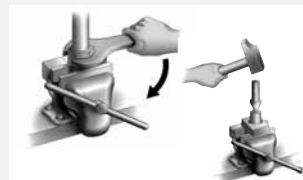
**Tube preparation**

- Cut and deburr thoroughly
- Follow recommendations for minimum straight tube length
- Apply support sleeves when necessary



**Machine assembly**

- Preferred method
- Most efficient method
- Recommended for large EO progressive ring and EO-2
- Parflange® recommended for 37° flaring



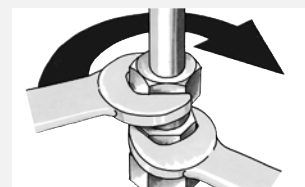
**Manual assembly**

- Economical for assembly of small quantities
- Suitable for small O.D. tube
- For repair work
- Hand flaring does not provide reliable results
- Stainless steel progressive ring fittings need to be assembled with pre-assembly tools



**Assembly check**

- Check assembly tube preparation result
- ⚠ Incorrect assemblies must be corrected or scrapped



















**Final installation**

- Final fitting assembly according to instruction
- Do not assemble under tension
- Clamp onto rigid fixtures
- Tighten tube clamps after final fitting installation

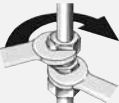
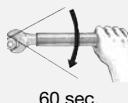

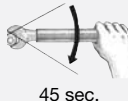



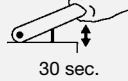

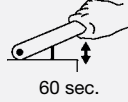

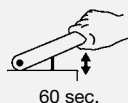
E

Selection of assembly process for bite systems

Workshop machines for industrial assembly					
Process			Product		
Procedure	Equipment	Process/Time*	Economic production qty.	EO progressive ring PSR/DPR	EO-2
Pre-assembly using EOMAT ECO machine		 30 sec.	max. 50 assemblies per day	hydraulic service and on-site installation	ideal for workshop assembly, not ideal for serial production
Pre-assembly using EOMAT UNI machine		 15 sec.	max. 100 assemblies per day	ideal for workshop assembly, not suitable for LL series	ideal for workshop assembly, not suitable for LL series
Pre-assembly using EOMAT PRO machine		 8-12 sec.	min. 100 assemblies per day	ideal for workshop assembly and mass production	ideal for workshop assembly and mass production
Tube forming using EO2-FORM F3 machine		 20 sec.	max. 300 assemblies per day	not applicable	not applicable
Tube forming using EO2-FORM PRO22		 6 sec.	min. 100 assemblies per day	not applicable	not applicable
Tube flaring using Parflare ECO		 30 sec.	max. 50 assemblies per day	not applicable	not applicable
Tube flaring using Parflange® 1025 machine		 45 sec.	max. 100 assemblies per day	not applicable	not applicable
Tube flaring using Parflange® 50 machine		 30 sec.	Basic: max. 500 assemblies per day PRO: 1200 assemblies per day	not applicable	not applicable

\*Average for total assembly time of medium size fitting including assembly check and final tightening

















**Selection of assembly process for bite systems**

Manual assembly for field repair					
Procedure	Process		Economic production qty.	Product	
	Equipment	Process/Time*		EO progressive ring PSR/DPR	EO-2
Direct in fitting		 60 sec.	max. 10 assemblies per week	field repair only, not for efficient production and tubes larger than 22 mm OD, preferred method for PSR, not for stainless steel	field repair only, not for efficient production and tubes larger than 22 mm OD
Pre-assembly in vice		 45 sec.	max. 10 assemblies per week	field repair only, not for efficient production	field repair only, not for efficient production
Flaring in vice		 120 sec.	max. 10 flarings per week	not applicable	not applicable
Pre-assembly using HVM-B device		 30 sec.	max. 50 assemblies per day	final assembly in fitting must be 1/2 turn, not for tubes larger than 15 mm OD, not for stainless steel	not applicable
Pre-assembly using EO-KARRYMAT		 60 sec.	max. 20 assemblies per day	ideal for repair jobs and small on-site installations, not suitable for volume production	ideal for repair jobs and small on-site installations, not suitable for volume production
Tube flaring using KARRYFLARE		 60 sec.	max. 20 flarings per day	not applicable	not applicable

\*Average for total assembly time of medium size fitting including assembly check and final tightening

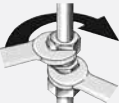
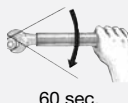

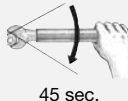



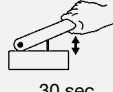

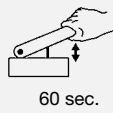

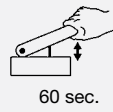


## Selection of assembly process for tube forming systems

Workshop machines for industrial assembly					
Process			Product		
Procedure	Equipment	Process/Time*	EO2-FORM	Triple-Lok®	O-Lok®
Pre-assembly using EOMAT ECO machine		 30 sec.	not applicable	not applicable	not applicable
Pre-assembly using EOMAT UNI machine		 30 sec.	not applicable	suitable for workshop assembly, preferred process is Parflange®	not applicable
Pre-assembly using EOMAT PRO machine		 10 sec.	not applicable	not applicable	not applicable
Tube forming using EO2-FORM F3 machine		 40 sec.	ideal for workshop assembly and serial production	not applicable	not applicable
Tube forming with EO2-FORM PRO22 machine		 6 sec.	ideal for workshop assembly and serial production	not applicable	not applicable
Tube flaring using Parflare ECO machine		 30 sec.	not applicable	ideal for workshop assembly, not recommended for mass production	not applicable
Tube flaring using Parflange® 1025 machine		 45 sec.	not applicable	ideal for workshop assembly, not recommended for mass production, not suitable for assembly of SS tubes over 25 mm	ideal for workshop assembly, not recommended for mass production, not suitable for assembly of SS tubes over 25 mm
Tube flaring using Parflange® 50 machine		 30 sec.	not applicable	ideal for workshop assembly and serial production	ideal for workshop assembly and serial production automatic sleeve feeder available for mass production

\*Average for total assembly time of medium size fitting including assembly check and final tightening

**Selection of assembly process for tube forming systems**

Manual assembly for field repair					
Process			Product		
Procedure	Equipment	Process/Time*	EO2-FORM	Triple-Lok®	O-Lok®
Direct in fitting		 60 sec.	not possible, use EO-2 for field repair	not possible, use 1015 device or hand flaring tools for field repair	not possible, use braze sleeves or hose lines for field repair
Pre-assembly in vice		 45 sec.	not possible, use EO-2 for field repair	not possible, use 1015 device or hand flaring tools for field repair	not possible, use braze sleeves or hose lines for field repair
Flaring in vice		 120 sec.	not applicable	field repair only, not for efficient production, not for stainless steel tubes	not possible, use braze sleeves or hose lines for field repair
Pre-assembly using HVM-B device		 30 sec.	not applicable	not applicable	not applicable
Pre-assembly using EO-KARRYMAT		 60 sec.	not possible, use EO-2 for field repair	not applicable	not applicable
Tube flaring using KARRYFLARE		 60 sec.	not possible, use EO-2 for field repair	ideal for repair jobs and small on-site installations, not suitable for industrial production	not applicable

\*Average for total assembly time of medium size fitting including assembly check and final tightening



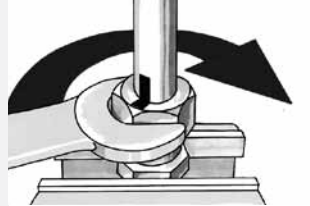
## New EO assembly instructions for 30° final assembly

### Traditional pre-assembly

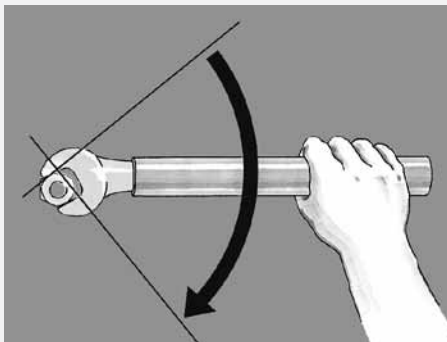
- According to DIN 3859 T2
- Can be used optional as usual
- Machine preset  $\Delta$  manual preset



- Machine presetting: Machine preset corresponding to 1/4 turn of nut



- Manual presetting: Tighten the nut by 1/4 turns



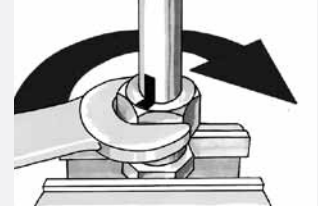
Final assembly  
**Before 90°**  
1/4 turn  
after perceptible rise in force

### Optimized EO pre-assembly

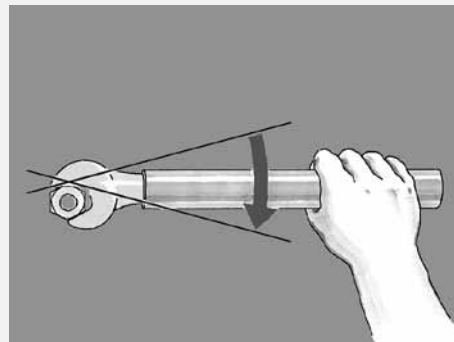
- Machine preset  $\Delta$  manual preset



- Machine presetting: Machine preset corresponding to 1/2 turn of nut

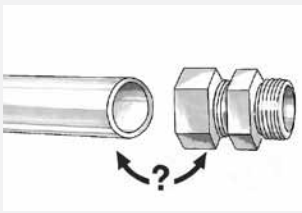


- Manual presetting: Tighten the nut by 1/2 turns



Final assembly  
**Now 30°**  
1/12 turn  
after perceptible rise in force

## EO progressive ring PSR/DPR



### Material combinations

- Select suitable EO progressive ring fitting

Tube material	EO-Fitting body	assembly instructions
Steel	Steel (LL=D-Ring)	
Stainless Steel	Stainless Steel	Pre-assembly by machine or hardened tool required
Copper	Brass (D-Ring)	
Plastic e.g. Polyamide	Steel, Brass, Stainless Steel	Support sleeve E required Check assembly devices for suitability
Stainless Steel	Steel	Stainless Steel DPR must be used Pre-assembly by machine or hardened tool required



### Tube preparation

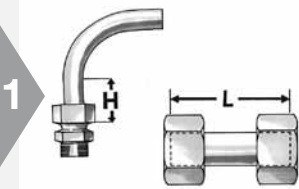
- Cut and deburr thoroughly
- Do not assemble under tension
- Clamp onto rigid fixtures

Min. length straight tube ends

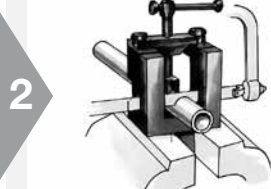
Tube OD	Series L									
	06	08	10	12	15	18	22	28	35	42
L min	39	39	42	42	45	49	53	53	60	60

Tube OD	Series S									
	06	08	10	12	14	16	20	25	30	38
L min	44	44	47	47	54	54	59	68	73	82



- Minimum lengths of straight tube-ends, H=2x nut length
- Use swivel union "GZ" instead of short tubes



- Cut tube squarely
- max ±1° deviation
- ⚠ Do not use pipe cutters
- EO tube-cutting tool (AV) for manual cutting



- Remove internal and external burrs
- max. chamfer 0.3 mm x 45°
- Recommendation: In-Ex Tube Deburring Tool 226



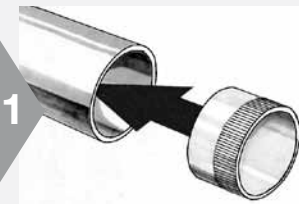
### Support sleeves VH

- Support sleeve VH for thin wall or soft metal tubes (see chart)

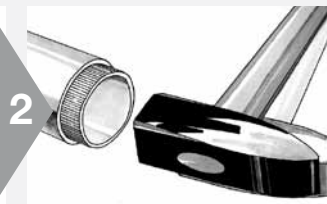


### Tube insert E

- Support sleeve E for plastic tubes



- Insert support sleeve like shown

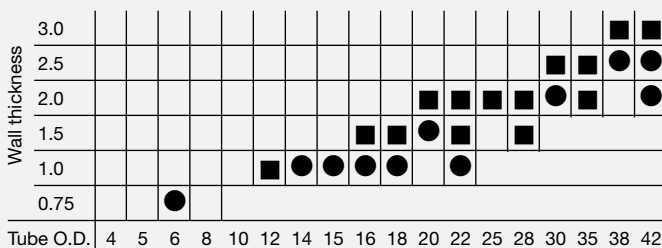


- Drive VH into tube-end

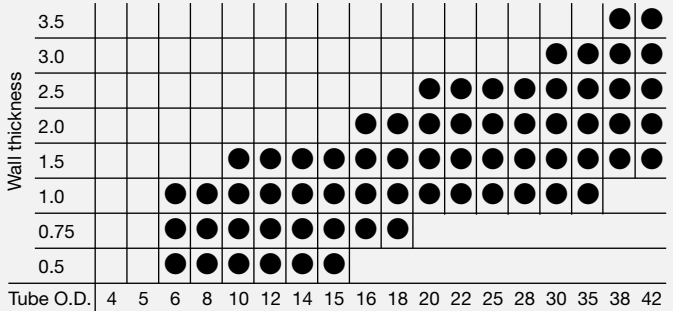
- Support sleeve required
- Support sleeve required for heavily loaded lines (vibrations)

#### VH selection chart for EO Progressive Ring

For steel tubes material ST 37.4 and for stainless steel tubes material 1.4571 and 1.4541




For soft metal tubes (e. g. copper)






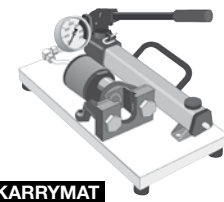
EO progressive ring PSR/DPR



**EOMAT PRO**



**EOMAT UNI**




**EO-KARRYMAT**

**100% Pre-assembly with EOMAT/EO-KARRYMAT**

- Preferred method
- Most efficient method
- ⚠ HVMB-device not suitable for 100% assembly of PSR fittings

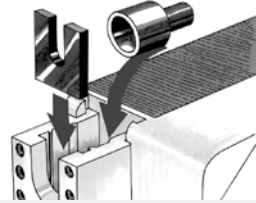
Automatik	
12-L PSR/DPR	
Counter	123
Lifetime MOK	123456

**1**

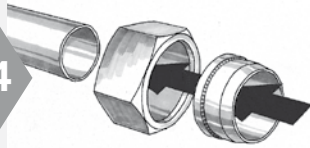


Ok?

**3**



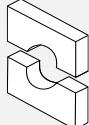
**4**



- EOMAT ECO/UNI and EO-KARRYMAT: Adjustment according to pressure chart on machine (PSR/DPR) Reduction of preset pressures for tube materials softer than steel and stainless steel required
- EOMAT PRO: Automatic tool recognition
- Non-EOMAT-machines: Check suitability

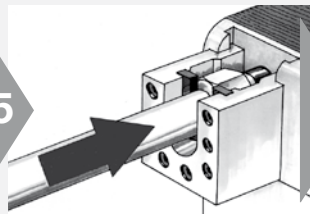
- ⚠ Use genuine Parker assembly cone „MOK“
- Control (see checking instructions)
- Clean and lubricate assembly cone and thread regularly
- For EOMAT PRO use assembly cone “MOK...PRO” with transponder chip

- Insert proper tools
- Clean and lubricate assembly cones regularly
- EO-KARRYMAT: Close valve on handpump
- 2-piece backing plates for 35-L and 42-L




- Slide nut and progressive ring as shown onto the end of the tube

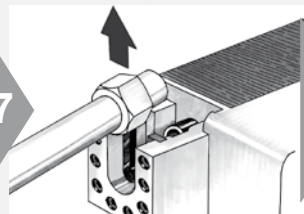
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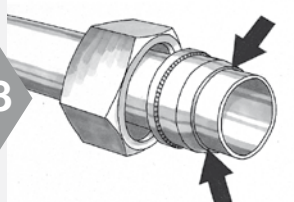
**6**




**7**



**8**



- Place tube with progressive ring and nut into the die
- Press tube-end firmly into the assembly cone





- Hold tube firmly
- EOMAT: Press and hold start button
- Use support and foot switch for long tubes
- EO-KARRYMAT: Operate handpump until assembly pressure is reached

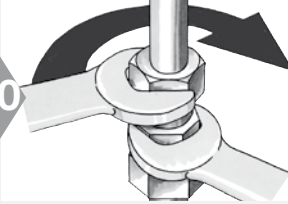
- After completion of pre-assembly, remove the tube for assembly check
- EO-KARRYMAT: Open valve on handpump

- ⚠ Check to make sure that a visible collar covers the front of the first cutting edge
- It does not matter if the ring can be rotated on the tube-end

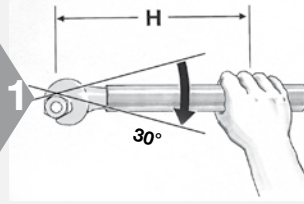
**9**

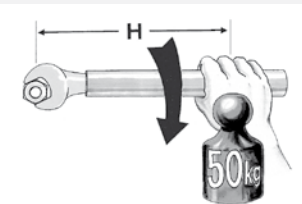
**10**



**11**



**Spanner length**



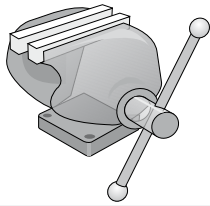
- Use distance gauge AKL for checking in mass production

- Assemble fitting until wrench-tight (without spanner extension)
- ⚠ Mark position of nut
- ⚠ The body must be held rigid

- ⚠ Then tighten fitting firmly by 30° (½ flat)
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)
- Assembly torques are available on request

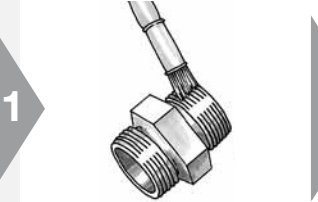
Size	Spanner length H [mm]
22-L	400
28-L 20-S	500
35-L 25-S	800
42-L 30-S	1000
48-L 38-S	1200

## EO progressive ring PSR/DPR

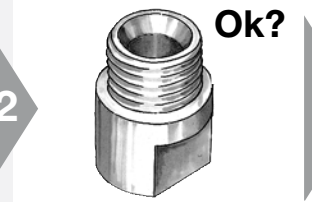


### Pre-assembly with hardened tool VOMO

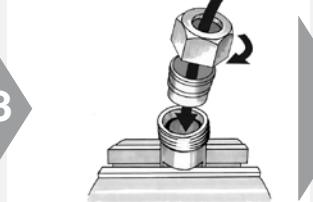
- Reliable method for repair jobs
- Only economic for assembly of small quantities
- ⚠ Stainless steel EO progressive rings must be pre-assembled using a hardened tool (VOMO)
- For tubes over 25 mm, EO-KARRYMAT/EOMAT is recommended



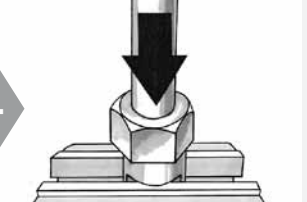
- 1
- ⚠ For stainless steel assembly threads must be lubricated
  - Use EO-NIROMONT special high-performance lubricant for stainless steel fittings



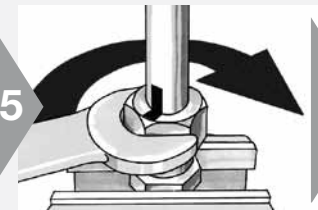
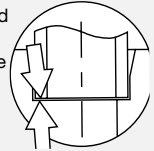
- 2
- Ok?
- Control (see checking instructions)
  - Cones of pre-assembly bodies must be checked regularly (after 50 pre-assemblies) with cone templates (KONU)
  - Clean and lubricate assembly cone and thread regularly



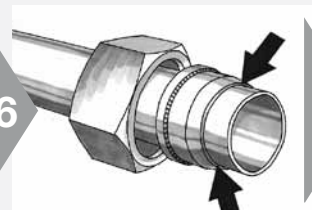
- 3
- Use pre-assembly tool VOMO
  - Fitting body may be used one time only (not for stainless steel)
  - Screw on nut until finger-tight



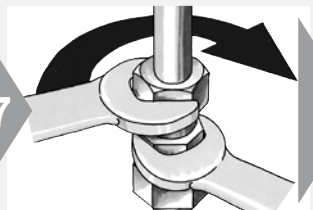
- 4
- ⚠ Press tube-end firmly into the assembly cone



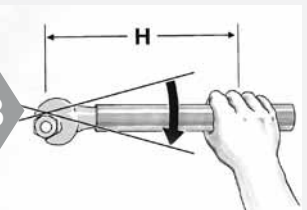
- 5
- ⚠ Mark position of the nut
  - Tighten the nut by 1½ turns
  - ⚠ Recommended to use spanner extension for sizes over 20 mm O.D.



- 6
- Assembly check:**
- Loosen nut
  - ⚠ Check to make sure that a visible collar covers the front of the first cutting edge
  - ⚠ It does not matter if the ring can be rotated on the tube-end

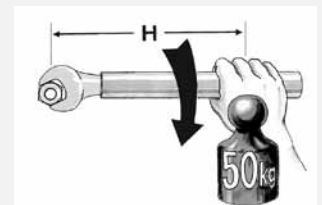


- 7
- Assemble fitting until wrench-tight (without spanner extension)
  - ⚠ Mark position of nut



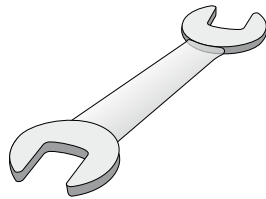
- 8
- ⚠ Then tighten fitting firmly by 30° (½ flat)
  - ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)
  - Assembly torques are available on request
  - ⚠ The body must be held rigid

#### Spanner length



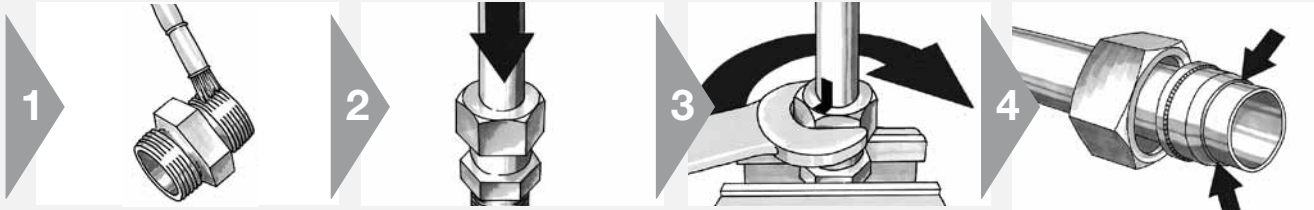
Size	Spanner length H [mm]
22-L	400
28-L 20-S	500
35-L 25-S	800
42-L 30-S	1000
38-S	1200

## EO progressive ring PSR/DPR



### Direct assembly

- Simple procedure for single assemblies of small dimensions
- Not economic for series assembly
- ⚠ Tubes  $\varnothing$  30, 35, 38 and 42 mm must be pre-assembled in vice
- ⚠ Stainless steel connections have to be assembled using pre-assembly tool (VOMO)
- ⚠ Properly cleaned studs ("BE") have to be assembled with pre-assembly tools

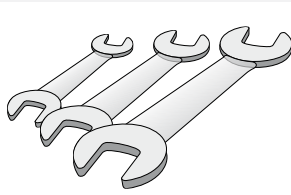


- ⚠ Lubrication of threads will reduce wear and assembly forces
- ⚠ Threads on stainless steel fittings must be lubricated
- ⚠ Use EO-NIROMONT special high-performance lubricant for stainless steel fittings

- Screw on nut until finger-tight
- ⚠ Press tube-end firmly into fitting body

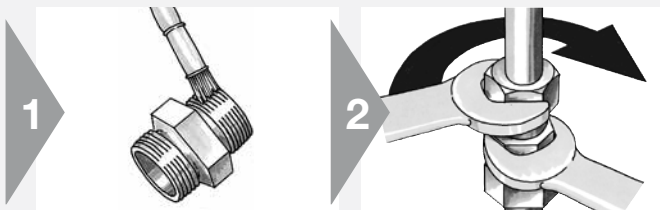
- Mark position of the nut
- Tighten the nut by 1½ turns
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)
- Fitting body may be used one time only

- Assembly check:**
- Loosen nut
  - ⚠ Check to make sure that a visible collar covers the front of the first cutting edge
  - It does not matter if the ring can be rotated on the tube-end



### Repeated assembly

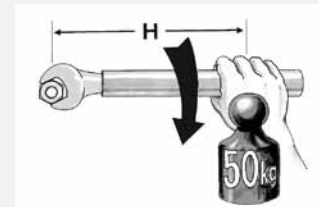
- Each time the tube-end has been disconnected, the fitting must be properly tightened again
- ⚠ EO progressive rings cannot be replaced, once assembled



- ⚠ Threads on stainless steel fittings must be lubricated
- ⚠ Use EO-NIROMONT special high-performance lubricant for stainless steel fittings

- Each time the fitting has been loosened, re-assembly must be performed with the same torque as initial assembly
- The body must be held rigid
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)

#### Spanner length



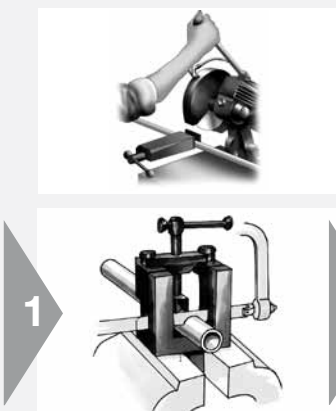
Size	Spanner length H [mm]
22-L	400
28-L 20-S	500
35-L 25-S	800
42-L 30-S	1000
38-S	1200

## EO-2 assembly instructions

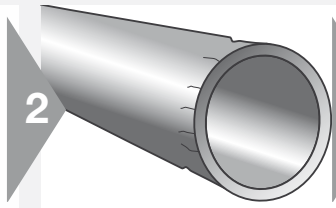
Detailed assembly-instructions are included in each EO-2 product box.  
 Details on EOMAT setting and selection of support sleeves can be found there as well.

### Tube preparation

- Cut and deburr thoroughly
- Do not assemble under tension
- Clamp onto rigid fixtures



- Cut tube squarely
  - max ± 1° deviation
  - ⚠ Do not use pipe cutters
  - EO tube-cutting tool (AV)



- Don't deform tube end at cutting or bending
  - Marks or scratches can result in leakage
  - Thin wall and soft tubes are very sensitive

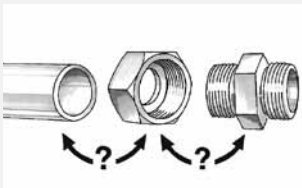


- Remove internal and external burrs
  - max. chamfer 0.3 mm × 45°
  - Seal can be damaged by large burrs

E

### Material combinations

- Select suitable FM-type



	Steel tube	Stainless Steel tube	Plastic tube
Steel fitting	FM...CF	FM...SSA	FM...CF+E
Stainless Steel fitting	—	FM...71	FM...71+E

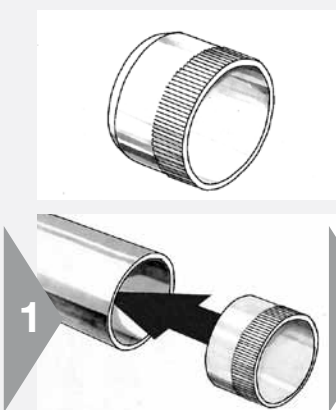
### Tube insert E

- Tube insert E for plastic tubes

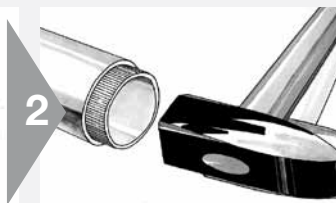


### Support sleeves VH

- Support sleeve VH for thin wall or soft metal tubes



- Support-sleeve selection: see instruction shipped with product



- Drive VH into tube-end

### Use of support sleeves "VH" with EO-2 fittings

Tube O.D.	0.5	0.75	1	1.5	2	2.5	3	3.5	4
4									
6									
8									
10									
12									
14									
15			○						
16									
18									
20									
22									
25									
28									
30									
35									
38									
42					○				

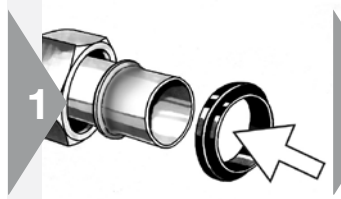
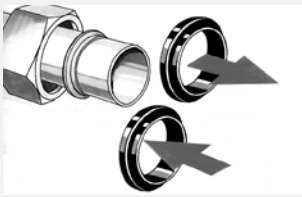
Functional test required for other materials or dimensions not specified.  
 Support sleeve VH **not required** for EO-2 and steel tube.  
 For stainless steel tube functional test required.  
 Support sleeve VH **not required** for EO-2 and steel tube.  
 Support sleeve VH **not required** for EO-2/71 or EO-2/SSA and stainless steel tube.  
 ○ VH **required** for FM/71 and operating pressure above 100 bar.

## EO-2 assembly instructions

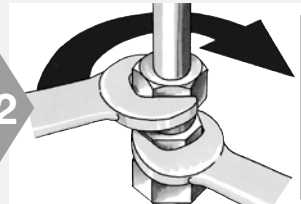
Detailed assembly-instructions are included in each EO-2 product box.  
 Details on EOMAT setting and selection of support sleeves can be found there as well.

### Replacement of sealing ring/Repeated assembly

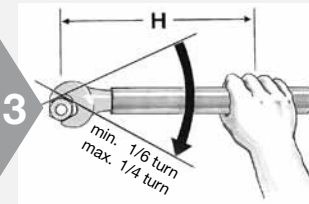
- Sealing ring DOZ can be changed separately



- After disassembly, sealing ring can be pulled of the tube-end
- Check for damage and replace if necessary
- Abrasion on outer rubber parts does not effect performance

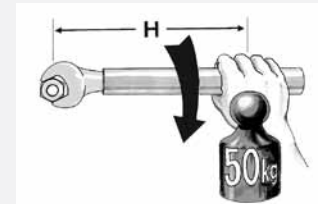


- Assemble fitting until wrench-tight (without spanner extension)
- ⚠ The body must be held rigid



- ⚠ Then tighten fitting firmly by min  $\frac{1}{8}$  (max  $\frac{1}{4}$ ) turn (1 to  $1\frac{1}{2}$  flats)
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)

Spanner length



Size	Spanner length H [mm]
22-L	400
28-L 20-S	500
35-L 25-S	800
42-L 30-S	1000
38-S	1200

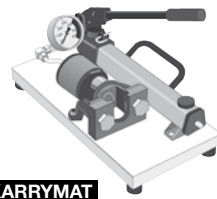
EO-2 assembly instructions



EOMAT PRO



EOMAT UNI



EO-KARRYMAT

Assembly with EOMAT/EO-KARRYMAT

- Preferred method
- Most efficient method
- HVM-B device is not suitable for EO-2

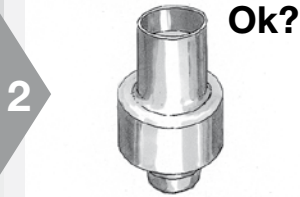
Automatik

12-L EO-2

Counter

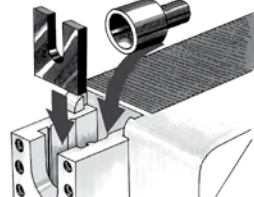
123

1

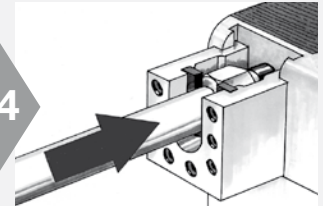


Ok?

3



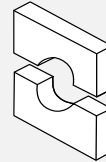
4



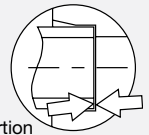
- EOMAT ECO/UNI: Adjustment according to pressure on machine (see instructions shipped with product box)
- EOMAT PRO: Automatic tool recognition
- EO-KARRYMAT: Refer to chart on machine
- Non-EOMAT-machines: check suitability

- ⚠ Use genuine Parker assembly cone "MOKEO2"
  - Check according to MOK checking instructions
  - For EOMAT PRO use assembly cone "MOK...PRO" with transponder chip.
- Advantages: easy and safe assembly

- Insert proper tools
- 2-piece tube backing plates for 35-L and 42-L
- EO-KARRYMAT: Close valve on handpump



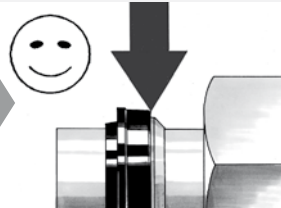
- Place tube with functional nut into the die
- Press tube-end firmly into the assembly cone
- Hold back nut for easy tube insertion



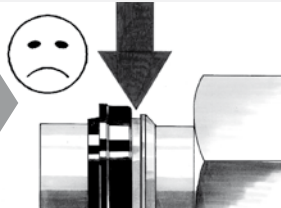
5



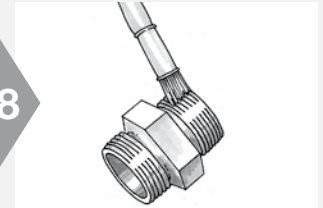
6



7



8



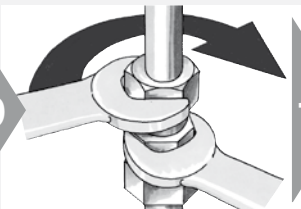
- Hold tube firmly
- EOMAT: Press and hold start button
- Use support and foot switch for long tubes
- EO-KARRYMAT: Operate handpump until assembly pressure is reached. Then open valve on handpump

- Assembly check:**
- Gap between sealing ring and retaining ring must be closed
  - A little relaxation (approx. 0.2 mm) is allowed

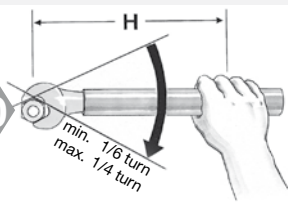
- ⚠ Gap not closed:**
- ⚠ Check all components, tube, machine, tools and pressure setting
  - ⚠ Repeat assembly with increased pressure if necessary

- ⚠ Threads of stainless steel fittings must be lubricated
- ⚠ Use EO-NIROMONT special high-performance lubricant for stainless steel fittings

9



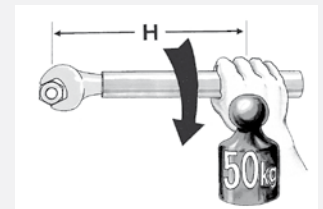
10



- Assemble fitting until wrench-tight (without spanner extension)
- ⚠ The body must be held rigid

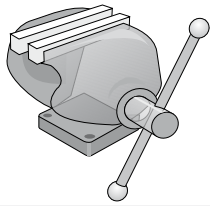
- ⚠ Then tighten fitting firmly by min 1/6 (max. 1/4) turn (1 to 1 1/2 flats)
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)

Spanner length



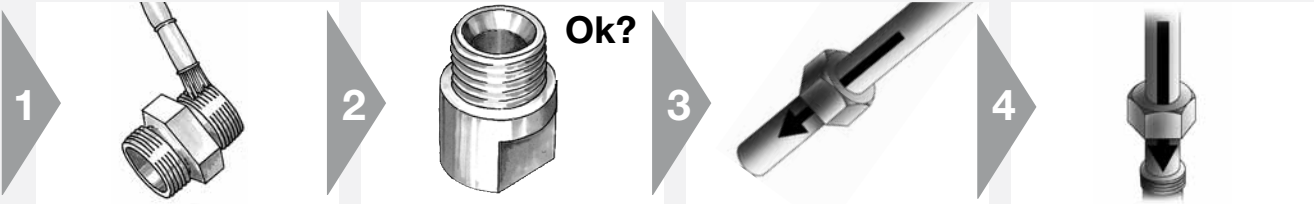
Size	Spanner length H [mm]
22-L	400
28-L 20-S	500
35-L 25-S	800
42-L 30-S	1000
38-S	1200

EO-2 assembly instructions



**Assembly in vice**

- Reliable method
- Only economic for assembly of small quantities

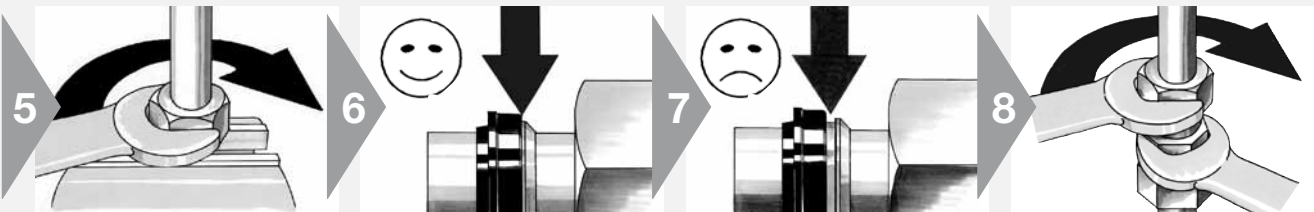
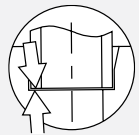


- 1
- ⚠ Threads on stainless steel fittings must be lubricated
  - ⚠ Use EO-NIROMONT special high-performance lubricant for stainless steel fittings

- 2
- Ok?**
- Check according to VOMO checking instructions
  - Use pre-assembly tool VOMO
  - Fitting body may be used one time only and components must stay together

- 3
- Push functional nut onto tube-end
  - Advantage: Easy tube insertion, particularly large dimensions

- 4
- ⚠ Press tube-end firmly into the assembly cone
  - Screw on nut until finger-tight

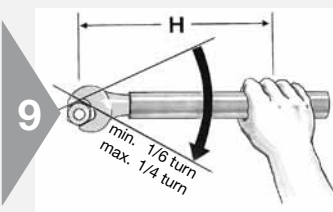


- 5
- Tighten until sharp increase of resistance (approx. 1 to 1½ turns)
  - ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)

- 6
- Assembly check:**
- Gap between sealing ring and retaining ring must be closed
  - A little relaxation (approx. 0.2 mm) is allowed

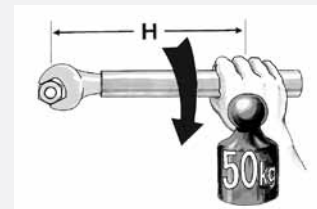
- 7
- ⚠ **Gap not closed:** Repeat assembly with increased torque. Check gap again.

- 8
- Assemble fitting until wrench-tight (without spanner extension)
  - ⚠ The body must be held rigid



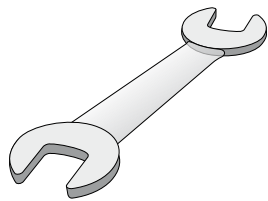
- 9
- ⚠ Then tighten fitting firmly by min 1/6 (max. 1/4) turn (1 to 1½ flats)
  - ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)

**Spanner length**



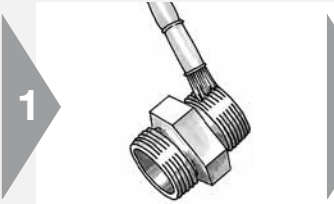
Size	Spanner length H [mm]
22-L	400
28-L 20-S	500
35-L 25-S	800
42-L 30-S	1000
38-S	1200

EO-2 assembly instructions



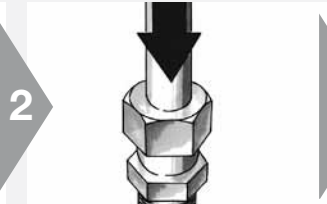
**Direct assembly**

- Simple procedure for single assemblies of small dimensions
- Not economic for series assemblies
- ⚠ Tubes  $\varnothing$  30, 35, 38 and 42 mm must be pre-assembled in vice



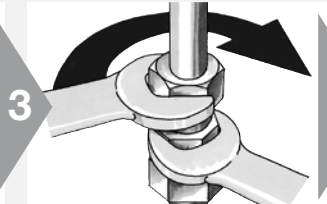
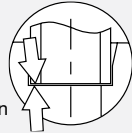
1

- ⚠ Threads on stainless steel fittings must be lubricated
- ⚠ EO-NIROMONT is a special high-performance lubricant for stainless steel fittings



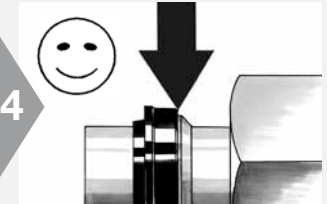
2

- ⚠ Press tube-end firmly into the assembly cone
- Push back nut for easy tube insertion



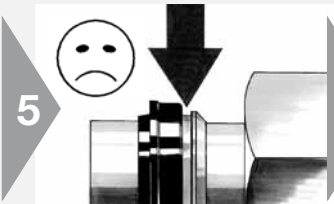
3

- Tighten until sharp increase of resistance (approx. 1 to 1½ turns)
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)



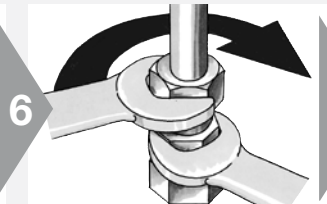
4

- Assembly check:**
- Gap between sealing ring and retaining ring must be closed
  - A little relaxation (approx. 0.2 mm) is allowed



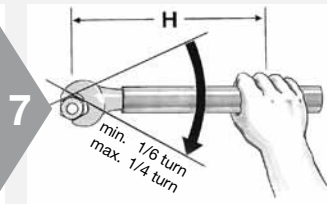
5

- ⚠ **Gap not closed:**
- Check all components including tube



6

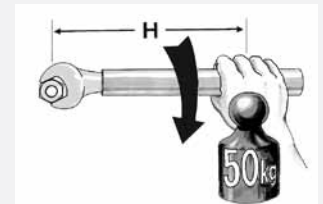
- Assemble fitting until wrench-tight (without spanner extension)
- ⚠ The body must be held rigid



7

- ⚠ Then tighten fitting firmly by min 1/6 (max 1/4) turn (1 to 1½ flats)
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)

**Spanner length**

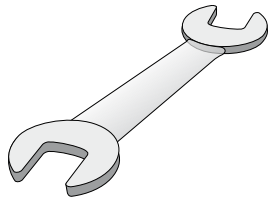


Size	Spanner length H [mm]
22-L	400
28-L 20-S	500
35-L 25-S	800
42-L 30-S	1000
38-S	1200

E

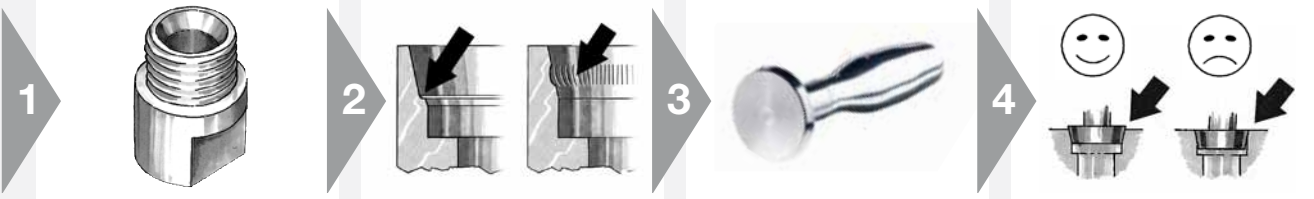


Checking instructions for EO assembly tools

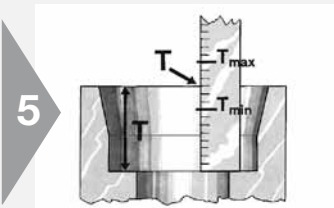


**VOMO tools for manual pre-assembly in vice**  
**MOK for use in EO assembly machines**

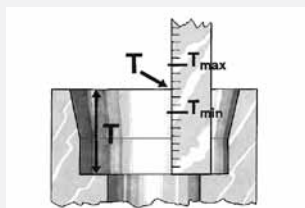
- ⚠ Use of damaged, worn or non-suitable tooling may result in fitting failure or machine damage
- ⚠ Tools must be checked regularly, at least after 50 assemblies
- ⚠ Worn tools must be replaced ⚠ Use only genuine Parker tools
- ⚠ Tools must be kept clean and lubricated



- Clean cone surface for checking
- Visual checks: Cone must be free of wear, damage or cracks
- Check for deformation of geometry
  - ⚠ Special cone template KONU must be used
  - KONU cone templates are precision measuring devices and must be handled accordingly
- Check contour: The rear of the template must protrude slightly above the top face of the cone or may be flush



- Check insertion depth
- ⚠ Deviations from the insertion depth can cause leakages

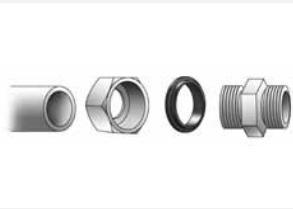


- Insertion depth T

Table: Tool for presetting tool (MOK and VOMO)

Type	T <sub>min</sub>	T <sub>max</sub>	Typ	T <sub>min</sub>	T <sub>max</sub>
6-L	6.95	7.05	6-S	6.95	7.05
8-L	6.95	7.05	8-S	6.95	7.05
10-L	6.95	7.05	10-S	7.45	7.55
12-L	6.95	7.05	12-S	7.45	7.55
15-L	6.95	7.05	14-S	7.95	8.05
18-L	7.45	7.55	16-S	8.45	8.55
22-L	7.45	7.55	20-S	10.45	10.55
28-L	7.45	7.55	25-S	11.95	12.05
35-L	10.45	10.55	30-S	13.45	13.55
42-L	10.95	11.05	38-S	15.95	16.05

## EO2-FORM assembly instructions



### Material combinations

- Select suitable materials
- See catalogue for exact tube specifications

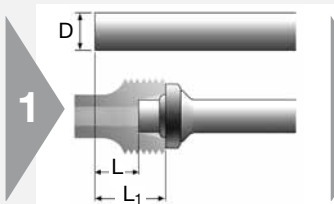
### Material selection chart

Tube material	Fitting and nut material	Sealing material
Steel	Steel	Steel/NBR or Steel/FKM
Stainless Steel	Stainless Steel	Stainless/Steel FKM/NBR
Stainless Steel	Steel	Steel/NBR or Steel/FKM

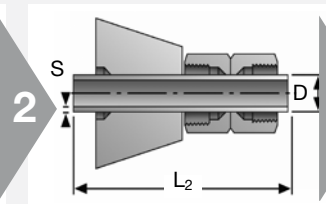


### Tube preparation

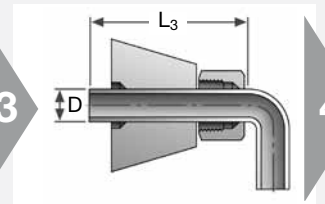
- Cut and deburr thoroughly
- Cut and bend tubes exactly



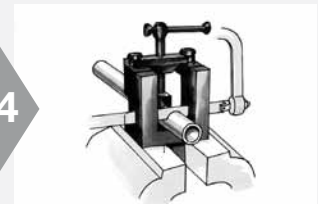
- Take extra length into account (see tube preparation chart)



- Minimum lengths  $L_2$  of straight tubes (see chart)



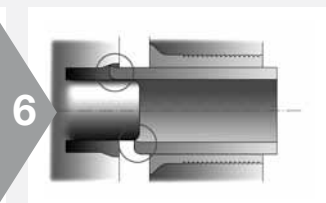
- Minimum lengths  $L_3$  of straight tube-ends before bend (see chart)



- Cut tube squarely
- max  $\pm 1^\circ$  deviation
- ⚠ Do not use pipe cutters
- EO tube-cutting tool (AV) for manual cutting



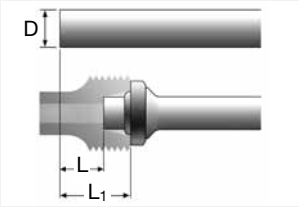
- Remove internal and external burrs
- max. chamfer  $0.3 \text{ mm} \times 45^\circ$
- Recommendation: In-Ex Tube Deburring Tool 226



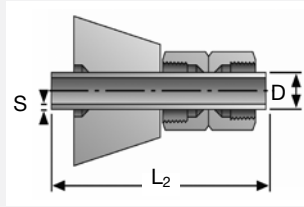
- Chips, dirt, internal or external burrs and paint prevent correct tube insertion
- ⚠ Dirty tubes result in worn-out or damaged tools

**EO2-FORM assembly instructions**

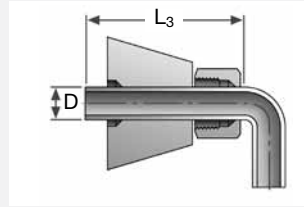
**Tube preparation chart – Series L**



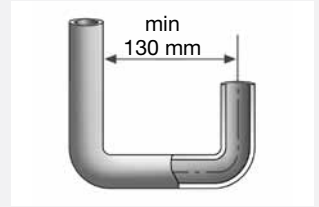
● Extra length



● Minimum tube length



● Minimum straight length before bend

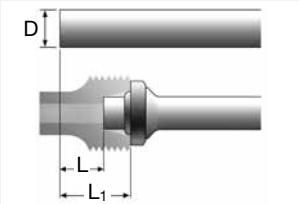


● Minimum clearance of U-shape bends

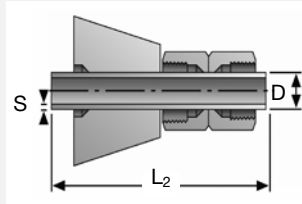
Tube-OD Series	S Wall-thickness	L Steel ± 0.5	L Stainless steel ± 0.5	L <sub>1</sub> Steel	L <sub>1</sub> Stainless Steel	L <sub>2</sub>	L <sub>3</sub>
<b>6L</b>	1.0	6.0	6.0	13.0	13.0	90	63
	1.5	6.0	6.0	13.0	13.0		
<b>8L</b>	1.0	5.5	5.5	12.5	12.5	92	65
	1.5	5.5	5.5	12.5	12.5		
	2.0	5.0		12.0			
	2.5	4.5		11.5			
<b>10L</b>	1.0	5.5	5.5	12.5	12.5	95	68
	1.5	5.0	6.0	12.0	13.0		
	2.0	5.0	6.0	12.0	13.0		
<b>12L</b>	1.0	5.0	5.5	12.0	12.5	95	70
	2.0	5.0	5.5	12.0	12.5		
<b>15L</b>	1.0	5.0	6.0	12.0	13.5	102	75
	1.5	5.0	6.5	12.0	13.5		
	2.0	5.0	6.0	12.0	13.0		
<b>18L</b>	1.5	5.5	7.0	13.0	15.0	110	80
	2.0	5.5	7.0	13.0	15.0		
<b>22L</b>	1.5	6.0	7.5	13.5	15.0	120	90
	2.0	6.5	7.5	14.0	15.0		
	2.5	7.0	7.5	14.5	15.0		
<b>28L</b>	2.0	6.5	7.5	14.0	15.0	140	98
	2.5	7.0	8.0	14.5	15.5		
<b>35L</b>	2.0	7.0	8.5	17.5	19.0	170	115
	3.0	8.5	10.5	19.0	21.0		
<b>42L</b>	2.0	7.5	7.5	18.5	18.5	190	125
	3.0	9.0	10.5	20.0	21.5		
	4.0	9.0		20.0			

**EO2-FORM assembly instructions**

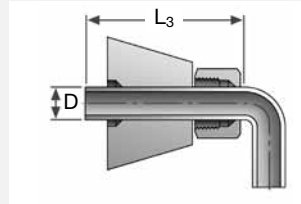
**Tube preparation chart – Series S**



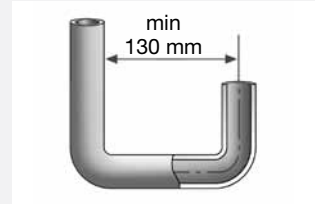
● Extra length



● Minimum tube length



● Minimum straight length before bend



● Minimum clearance of U-shape bends

Tube-OD Series	S Wall-thickness	L Steel ± 0.5	L Stainless Steel ± 0.5	L <sub>1</sub> Steel	L <sub>1</sub> Stainless Steel	L <sub>2</sub>	L <sub>3</sub>
<b>6S</b>	1.0	6.0	6.0	13.0	13.0	92	65
	1.5	6.0	6.0	13.0	13.0		
	2.0	5.5		12.5		95	68
<b>8S</b>	1.0	5.5	5.5	12.5	12.5		
	1.5	5.5	5.5	12.5	12.5		
	2.0	5.0		12.0		100	70
<b>10S</b>	1.5	5.0	6.0	12.0	13.5		
	2.0	5.0	6.0	12.0	13.5		
	3.0	4.5	4.5	12.0	12.0	100	72
<b>12S</b>	1.5	5.0	6.5	12.5	14.0		
	2.0	5.0	6.0	12.5	13.5		
	2.5	5.0	6.0	12.5	13.5		
	3.0	4.5	4.5	12.0	12.0	110	80
<b>16S</b>	2.0	5.5	6.5	13.5	15.0		
	2.5	5.5	6.5	13.5	15.0		
	3.0	5.0	6.0	13.0	14.5	135	98
<b>20S</b>	2.0	7.0	8.5	17.5	19.0		
	2.5	7.0	8.5	17.5	19.0		
	3.0	7.0	8.5	17.5	19.0		
	3.5	7.0		17.5		155	112
<b>25S</b>	2.0	8.5	10.0	20.5	22.0		
	2.5	8.5	10.0	20.5	22.0		
	3.0	8.5	10.0	20.5	22.0		
	4.0	8.5	10.0	20.5	22.0	165	122
<b>30S</b>	3.0	8.5	10.5	22.0	24.0		
	4.0	9.5	11.0	23.0	24.5		
	5.0	8.5		22.0		190	135
<b>38S</b>	3.0	10.0	10.0	26.0	26.0		
	4.0	10.0	11.0	26.0	27.0		
	5.0	11.0	13.0	27.0	29.0		
	6.0	11.5	13.0	27.5	29.0		
	7.0	11.5	13.0	27.5	29.0		

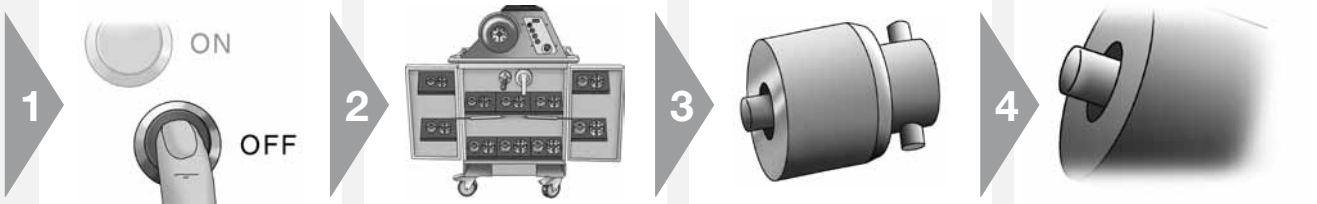


E02-FORM assembly instructions

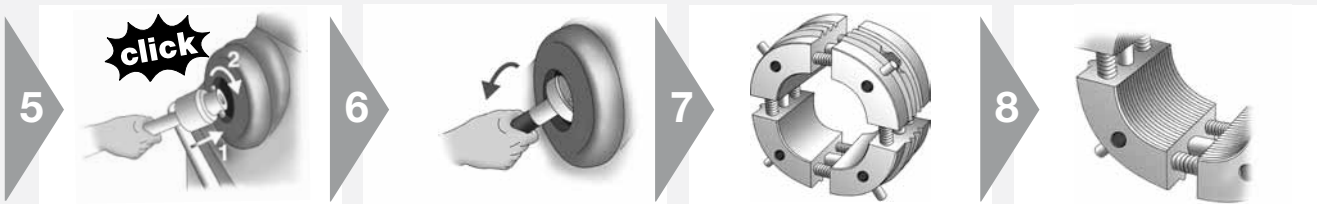


Tube forming with E02-FORM F3

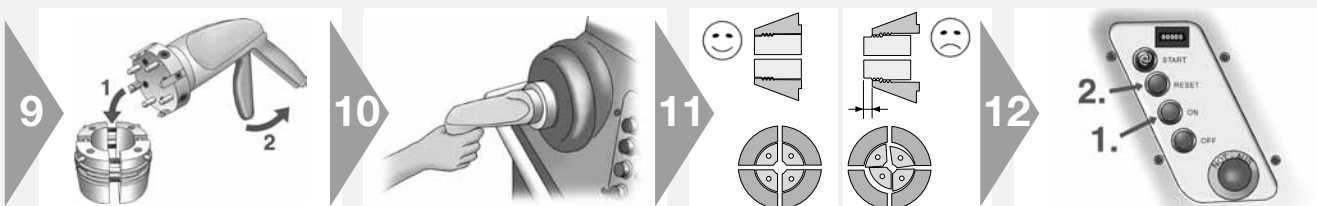
- Reliable forming method
- Reliable process



- ⚠ Change tool only when drive switched off (button OFF)
- ⚠ Obey safety instructions
- ⚠ Do not operate machine without tooling
- Open doors to access tools and handling devices
- Tool handling devices are stored in middle on top
- Select suitable forming pin according to tube material, outer diameter and wall thickness
- Check forming pin for dirt, wear and damage



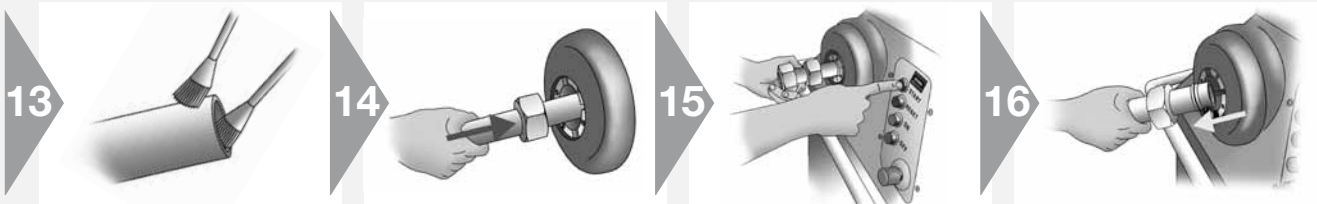
- Use magnetic holder to insert forming pin
- Turn clockwise to lock bayonet fixture
- Tilt magneto holder to remove handle
- Select suitable clamping die set according to tube outer diameter
- ⚠ Keep stainless tube clamping dies separate from other tube materials to prevent contact corrosion
- Check clamping dies for dirt, wear and damage
- Use wire-brush to remove metal particles from grip surface



- Use pistol to handle clamping die set
- Pull and hold handle to grab die set
- Insert clamping die set until it bottoms up (twist pistol for easy insertion)
- Release handle to fix die set
- ⚠ Never operate machine while pistol is inserted
- ⚠ Front surfaces must be completely flat
- ⚠ Die segments must fit without gaps
- Switch on drive (button ON)
- Each time the drive is switched on, the reset button (RESET) must be pressed first
- The automatic tool recognition is initiated
- ⚠ Clamping dies will close, reset button (RESET) must be held until it lights up
- Lighten of reset button (RESET) indicates "ready to start"

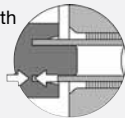
EO2-FORM assembly instructions

E



- ⚠ Make sure tube-end is free of burrs, chips and dirt
- ⚠ Lubricate inside and outside of tube-end
- Use EO-NIROMONT for best performance

- Insert tube-end with nut into open tool until it firmly touches the stop at the end
- ⚠ Press tube-end firmly into the tube stop
- ⚠ Do not turn tube-end anti-clockwise to prevent unlocking forming-pin



- Press and hold start button (@ START) until tube is clamped
- Instead of start-button (@ START), footswitch can be used
- ⚠ Hold tube firmly until clamping dies are closed
- Use support for long tubes
- ⚠ Do not reach into tool area while machine is working

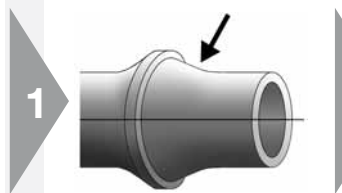
- Tube can be taken out after the clamping dies are open
- Reset button (RESET) lights up and the machine is ready for the next operation
- Check tools regularly (approx. 50 assemblies) for dirt and wear
- Remove tools for cleaning
- Clean clamping dies with wire brush
- Clean forming die using compressed air
- Replace worn-out tooling

## EO2-FORM assembly instructions

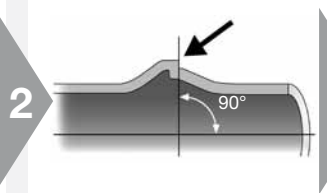


### Assembly check

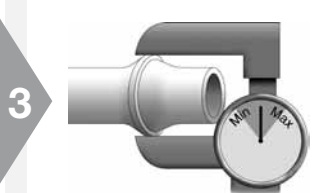
- Check assembly result
- ⚠ Incorrect assemblies must be scrapped



- Sealing surface (arrow) must be free of scratches and damage



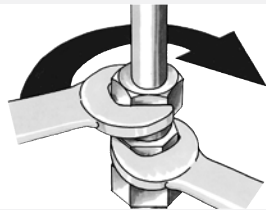
- Check contour: Contact surface for sealing ring (arrow) must be flat, at right angle to tube



- Check outer diameter  $\varnothing$  ... (see chart)
- ⚠ Incorrect tube-ends must be scrapped. Tools must be cleaned and checked

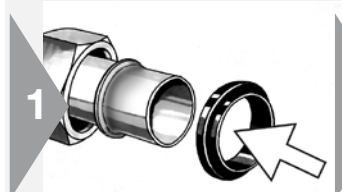
### Tube OD check

Tube $\varnothing$ -Series	min $\varnothing$ [mm]	max $\varnothing$ [mm]
6-L/S	8.3	10.3
8-L/S	10.3	12.3
10-L	12.5	14.3
12-L	14.5	16.3
15-L	18.0	20.3
18-L	21.0	24.0
22-L	25.5	27.8
28-L	31.5	33.8
35-L	39.0	42.5
42-L	46.0	49.5
10-S	13.0	15.5
12-S	15.0	17.5
16-S	19.5	21.5
20-S	24.0	27.5
25-S	29.5	34.0
30-S	34.5	39.0
38-S	42.5	47.0
38x5 (71)	42.0	47.0
38x6 (71)	41.5	47.0

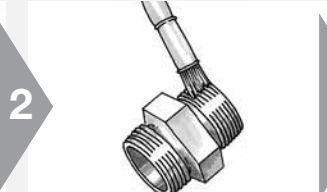


### Installation

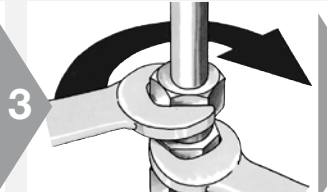
- ⚠ Tube must fit without tension



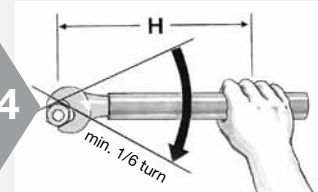
- Place sealing ring (DOZ) onto tube-end



- Threads of stainless steel fittings must be lubricated
- EO-NIROMONT is a special high-performance lubricant for stainless steel fittings

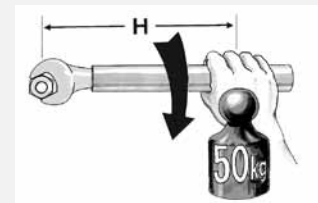


- Tube must fit without tension
- Assemble fitting until wrench-tight (without spanner extension)
- ⚠ The body must be held rigid



- ⚠ Then tighten fitting firmly by 1/6 turn (1 flat)
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)
- ⚠ Incorrect assembly reduces performance and reliability of the connection

### Spanner length



Size	Spanner length H [mm]
22-L	400
28-L 20-S	500
35-L 25-S	800
42-L 30-S	1000
38-S	1200

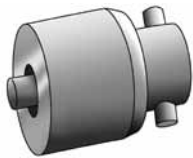
## Checking instructions for EO2-FORM tools



### Forming pin and clamping dies for EO2-FORM machine

- ⚠ Use of damaged, worn or non-suitable tooling may result in fitting failure and damage of machine
- ⚠ Tools must be checked regularly, at least after 50 assemblies
- ⚠ Worn tools must be replaced
- ⚠ Use only genuine Parker tools
- ⚠ Tools must always be kept clean and lubricated

1



- Clean forming pin for checking
- Do not disassemble

2



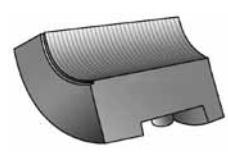
- Visual check:  
Surface must be free of wear and damage
- Use air blowgun to remove chips and dirt

3



- Clean clamping pin for checking
- Do not disassemble
- Pins must not be loose or damaged

4



- Visual check:  
Grip surface must be clean and free of wear
- Use wire-brush to remove metal particles from grip surface

E