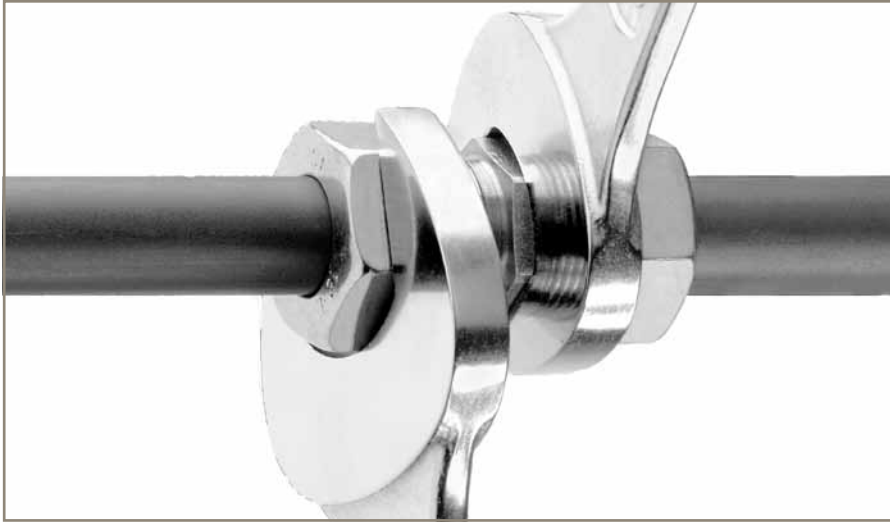

Tube assembly

AI/4015-1/UK

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parker.austria@parker.com

AT – Eastern Europe, Wiener Neustadt
Tel: +43 (0)2622 23501 900
parker.easteurope@parker.com

AZ – Azerbaijan, Baku
Tel: +994 50 2233 458
parker.azerbaijan@parker.com

BE/LU – Belgium, Nivelles
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parker.belgium@parker.com

BY – Belarus, Minsk
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parker.belarus@parker.com

CH – Switzerland, Etoy
Tel: +41 (0)21 821 87 00
parker.switzerland@parker.com

CZ – Czech Republic, Klecany
Tel: +420 284 083 111
parker.czechrepublic@parker.com

DE – Germany, Kaarst
Tel: +49 (0)2131 4016 0
parker.germany@parker.com

DK – Denmark, Ballerup
Tel: +45 43 56 04 00
parker.denmark@parker.com

ES – Spain, Madrid
Tel: +34 902 330 001
parker.spain@parker.com

FI – Finland, Vantaa
Tel: +358 (0)20 753 2500
parker.finland@parker.com

FR – France, Contamine s/Arve
Tel: +33 (0)4 50 25 80 25
parker.france@parker.com

GR – Greece, Athens
Tel: +30 210 933 6450
parker.greece@parker.com

HU – Hungary, Budapest
Tel: +36 1 220 4155
parker.hungary@parker.com

IE – Ireland, Dublin
Tel: +353 (0)1 466 6370
parker.ireland@parker.com

IT – Italy, Corsico (MI)
Tel: +39 02 45 19 21
parker.italy@parker.com

KZ – Kazakhstan, Almaty
Tel: +7 7272 505 800
parker.easteurope@parker.com

NL – The Netherlands, Oldenzaal
Tel: +31 (0)541 585 000
parker.nl@parker.com

NO – Norway, Asker
Tel: +47 66 75 34 00
parker.norway@parker.com

PL – Poland, Warsaw
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

PT – Portugal, Leca da Palmeira
Tel: +351 22 999 7360
parker.portugal@parker.com

RO – Romania, Bucharest
Tel: +40 21 252 1382
parker.romania@parker.com

RU – Russia, Moscow
Tel: +7 495 645-2156
parker.russia@parker.com

SE – Sweden, Spånga
Tel: +46 (0)8 59 79 50 00
parker.sweden@parker.com

SK – Slovakia, Banská Bystrica
Tel: +421 484 162 252
parker.slovakia@parker.com

SL – Slovenia, Novo Mesto
Tel: +386 7 337 6650
parker.slovenia@parker.com

TR – Turkey, Istanbul
Tel: +90 216 4997081
parker.turkey@parker.com

UA – Ukraine, Kiev
Tel +380 44 494 2731
parker.ukraine@parker.com

UK – United Kingdom, Warwick
Tel: +44 (0)1926 317 878
parker.uk@parker.com

ZA – South Africa, Kempton Park
Tel: +27 (0)11 961 0700
parker.southafrica@parker.com

North America

CA – Canada, Milton, Ontario
Tel: +1 905 693 3000

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Asia Pacific

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Parker Hannifin Ltd.
Tachbrook Park Drive
Tachbrook Park,
Warwick, CV34 6TU
United Kingdom
Tel.: +44 (0) 1926 317 878
Fax: +44 (0) 1926 317 855
parker.uk@parker.com
www.parker.com

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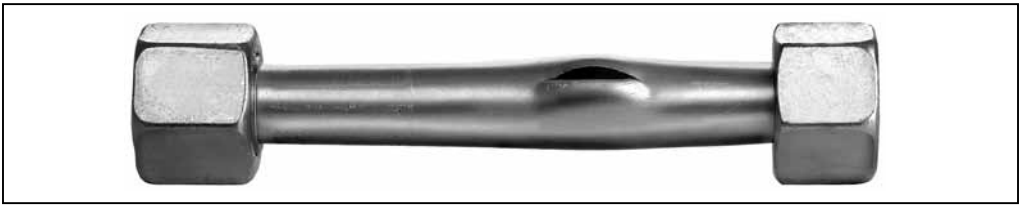
Table of contents: Tube assembly

Table of contents: Fitting assembly



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.

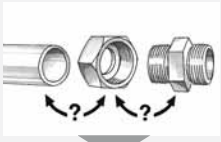
Specific safety instructions for assembly

- 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

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		 30 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		 10 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		 40 sec.	max. 300 assemblies per day	not applicable	not applicable

Workshop machines for industrial assembly

Process			Product		
Procedure	**Equipment**	**Process/Time***	**Economic production qty.**	**EO progressive ring PSR/DPR**	**EO-2**
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

Process			Product		
Procedure	**Equipment**	**Process/Time***	**Economic production qty.**	**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

Manual assembly for field repair

Process			Product		
Procedure	**Equipment**	**Process/Time***	**Economic production qty.**	**EO progressive ring PSR/DPR**	**EO-2**
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 than15 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 usingt 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

Workshop machines for industrial assembly

Process			Product		
Procedure	**Equipment**	**Process/Time***	**EO2-FORM**	**Triple-Lok®**	**O-Lok®**
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

Manual assembly for field repair

Process			Product		
Procedure	**Equipment**	**Process/Time***	**EO2-FORM**	**Triple-Lok®**	**O-Lok®**
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

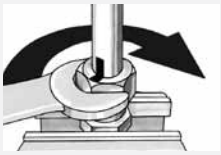
*Average for total assembly time of medium size fitting including assembly check and final tightening

New EO assembly instructions for 30° final assembly

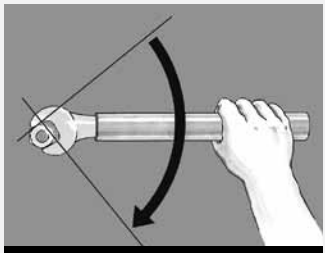
Traditional pre-assembly

- According to DIN 3859 T2
- Can be used optional as usual
- Machine preset ≙ manual preset

- Machine presetting: Machine preset corresponding to 1¼ turn of nut



- Manual presetting: Tighten the nut by 1¼ turns



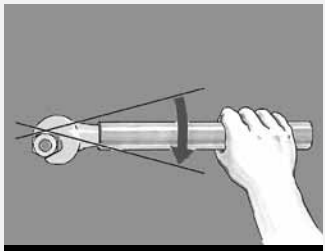
Final assembly
Before 90°
1/4 turn
after perceptible rise in force

Optimized EO pre-assembly

- Machine preset ≙ manual preset

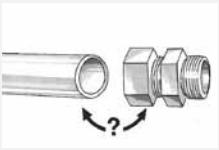
- Machine presetting: Machine preset correspondingto 1½ turn of nut

- Manual presetting: Tighten the nut by 1½ 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

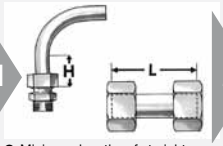
Tube preparation

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

Min. length straight tube ends

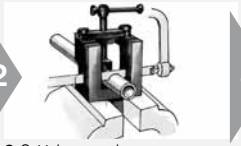
Series L										
Tube OD	06	08	10	12	15	18	22	28	35	42
L min	39	39	42	42	45	49	53	53	60	60
Series S										
Tube OD	06	08	10	12	14	16	20	25	30	38
L min	44	44	47	47	54	54	59	68	73	82

1



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

2



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

3

- Remove internal and external burrs
- max. chamfer 0.3 mm × 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

1

- Insert support sleeve like shown

2

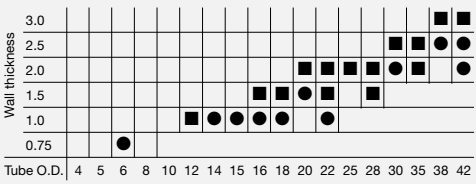
- Drive VH into tube-end

● Support sleeve required

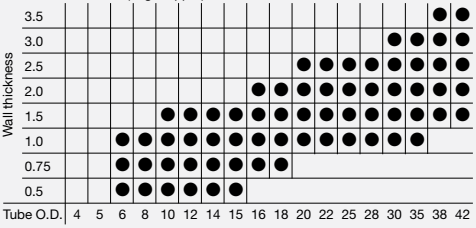
■ Support sleeve required for heavily loaded lines (vibrations)

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

100% Pre-assembly with EOMAT/ EO-KARRYMAT

- Preferred method
- Most efficient method

⚠ HVMB-device not suitable for 100% assembly of PSR fittings

1

Automatik

12-L PSR/DPR

Counter **123**

Lifetime MOK **123456**

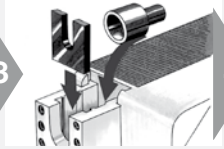
- EOMAT ECO/UNI and EO-KARRYMAT: Adjustment according to pressure chart on machine (PSR/DPR) Reduction of preset pressures for tube materials softer than steel and stainless steel required
- EOMAT PRO: Automatic tool recognition
- Non-EOMAT-machines: Check suitability

2

⚠ Use genuine Parker assembly cone „MOK“

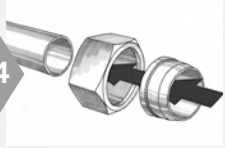
- Control (see checking instructions)
- Clean and lubricate assembly cone and thread regularly
- For EOMAT PRO use assembly cone “MOK...PRO” with transponder chip

3



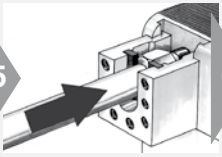
- Insert proper tools
- Clean and lubricate assembly cones regularly
- EO-KARRYMAT: Close valve on handpump
- 2-piece backing plates for 35-L and 42-L

4

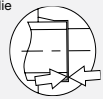


- Slide nut and progressive ring as shown onto the end of the tube

5



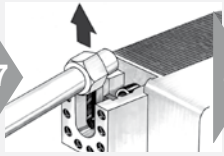
- Place tube with progressive ring and nut into the die
- Press tube-end firmly into the assembly cone



6

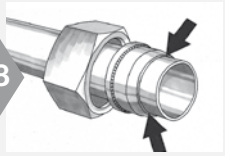
- Hold tube firmly
- EOMAT: Press and hold start button
- Use support and foot switch for long tubes
- EO-KARRYMAT: Operate handpump until assembly pressure is reached

7



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

8



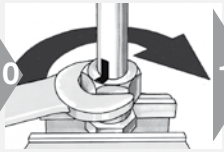
⚠ Check to make sure that a visible collar covers the front of the first cutting edge

- It does not matter if the ring can be rotated on the tube-end

9

- Use distance gauge AKL for checking in mass production

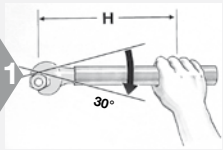
10



- Assemble fitting until wrench-tight (without spanner extension)

⚠ Mark position of nut

11

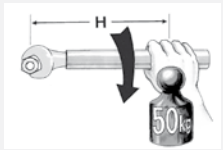


⚠ Then tighten fitting firmly by 30° (½ flat)

⚠ Recommended to use spanner extension for sizes over 20 mm O.D. **(see chart)**

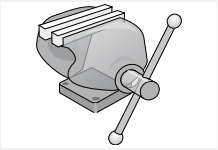
- Assembly torques are available on request

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



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

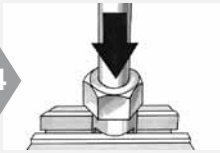
2

- 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

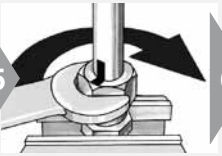
- Use pre-assembly tool VOMO
- Fitting body may be used <u>one</u> time only (not for stainless steel)
- Screw on nut until finger-tight

4



⚠ Press tube-end firmly into the assembly cone

5

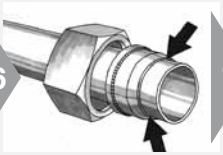


⚠ Mark position of the nut

- Tighten the nut by 1½ turns

⚠ Recommended to use spanner extension for sizes over 20 mm O.D.

6



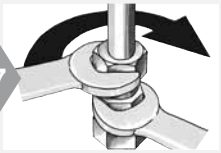
Assembly check:

- 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

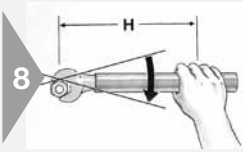
7



- Assemble fitting until wrench-tight (without spanner extension)

⚠ Mark position of nut

8

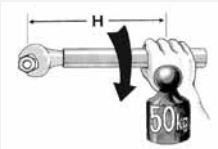


⚠ Then tighten fitting firmly by 30° (½ flat)

⚠ Recommended to use spanner extension for sizes over 20 mm O.D. **(see chart)**

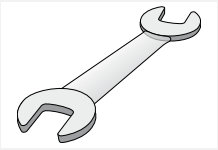
- Assembly torques are available on request

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 ∅ 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

1

⚠ Lubrication of threads will reduce wear and assembly forces

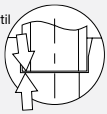
⚠ Threads on stainless steel fittings must be lubricated

⚠ Use EO-NIROMONT special high-performance lubricant for stainless steel fittings

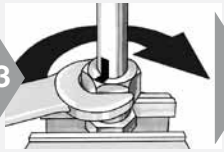
2

- Screw on nut until finger-tight

⚠ Press tube-end firmly into fitting body



3

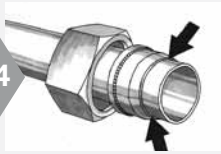


- Mark position of the nut
- Tighten the nut by 1½ turns

⚠ Recommended to use spanner extension for sizes over 20 mm O.D. **(see chart)**

- Fitting body may be used one time only

4

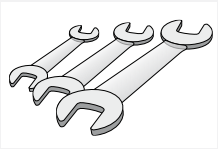


Assembly check:

- 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

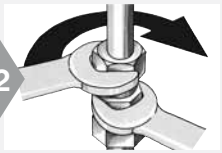
⚠ EO progressive rings cannot be replaced, once assembled

1

⚠ Threads on stainless steel fittings must be lubricated

⚠ Use EO-NIROMONT special high-performance lubricant for stainless steel fittings

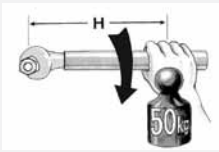
2



- 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

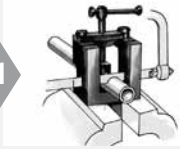
EO-2 assembly instructions

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

1

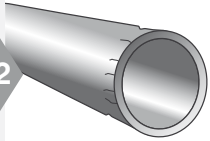


- Cut tube squarely
- max ± 1° deviation

⚠ Do not use pipe cutters

- EO tube-cutting tool (AV)

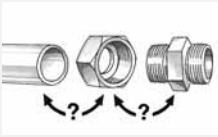
2



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

3

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



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

1

- Support-sleeve selection: see instruction shipped with product

2

- 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					○				

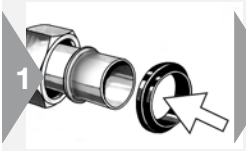
Functional test required for other materials or dimensions not specified.
Support sleeve VH **not required** for EO-2 and steel tube.
For stainless steel tube functional test required.
Support sleeve VH **not required** for EO-2 and steel tube.
Support sleeve VH **not required** for EO-2/71 or EO-2/SSA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

EO-2 assembly instructions

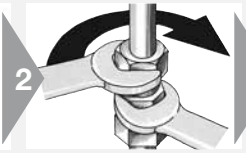
Detailed assembly-instructions are included in each EO-2 product box.
Details on EOMAT setting and selection of support sleeves can be found there as well.

Replacement of sealing ring/Repeated assembly

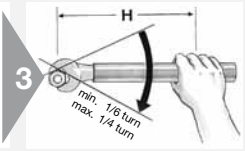
- Sealing ring DOZ can be changed separately



- 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



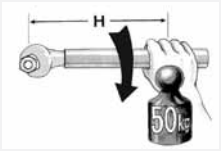
- Assemble fitting until wrench-tight (without spanner extension)



⚠ Then tighten fitting firmly by min $^1/_6$ (max ¼) turn (1 to 1½ flats)

⚠ Recommended to use spanner extension for sizes over 20 mm O.D. **(see chart)**

Spanner length



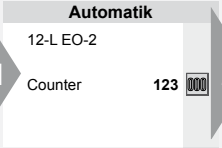
Size		Spanner length H [mm]
22-L		400
28-L	20-S	500
35-L	25-S	800
42-L	30-S	1000
	38-S	1200

EO-2 assembly instructions

Assembly with EOMAT/ EO-KARRYMAT

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

1

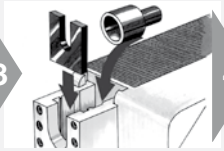


- EOMAT ECO/UNI: Adjustment according to pressure on machine (see instructions shipped with product box)
- EOMAT PRO: Automatic tool recognition
- EO-KARRYMAT: Refer to chart on machine
- Non-EOMAT-machines: check suitability

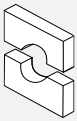
2

⚠ 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

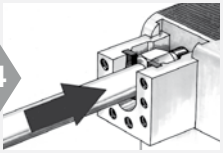
3



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



4

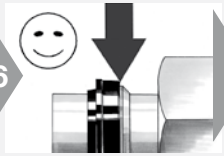


- Place tube with functional nut into the die
- Press tube-end firmly into the assembly cone
- Hold back nut for easy tube insertion

5

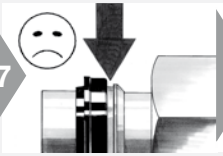
- Hold tube firmly
- EOMAT: Press and hold start button
- Use support and foot switch for long tubes
- EO-KARRYMAT: Operate handpump until assembly pressure is reached. Then open valve on handpump

6



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

7

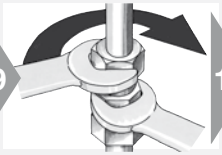


⚠ **Gap not closed:** Check all components, tube, machine, tools and pressure setting
⚠ Repeat assembly with increased pressure if necessary

8

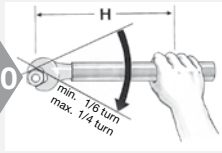
⚠ Threads of stainless steel fittings must be lubricated
⚠ Use EO-NIROMONT special high-performance lubricant for stainless steel fittings

9



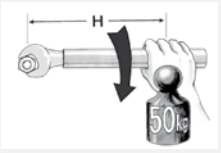
- Assemble fitting until wrench-tight (without spanner extension)

10



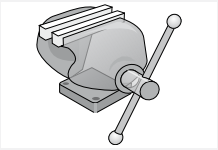
⚠ Then tighten fitting firmly by min 1/6 (max. ¼) turn (1 to 1½ flats)
⚠ Recommended to use spanner extension for sizes over 20 mm O.D. **(see chart)**

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



Assembly in vice

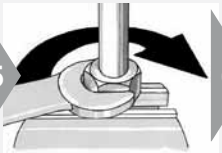
- Reliable method
- Only economic for assembly of small quantities

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

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

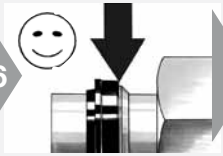
- Push functional nut onto tube-end
- Advantage: Easy tube insertion, particularly large dimensions

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

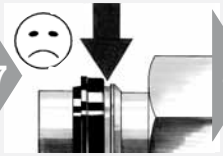


- Tighten until sharp increase of resistance (approx. 1 to 1½ turns)

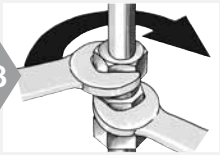
⚠ Recommended to use spanner extension for sizes over 20 mm O.D. **(see chart)**



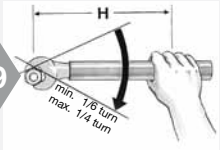
Assembly check:
- Gap between sealing ring and retaining ring must be closed
- A little relaxation (approx. 0.2 mm) is allowed



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

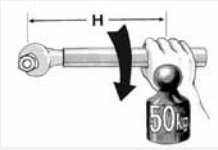


- Assemble fitting until wrench-tight (without spanner extension)



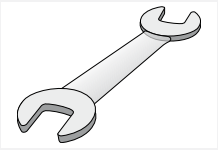
⚠ Then tighten fitting firmly by min $^1/_8$ (max. ¼) turn (1 to 1½ flats)
⚠ Recommended to use spanner extension for sizes over 20 mm O.D. **(see chart)**

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 ∅ 30, 35, 38 and 42 mm must be pre-assembled in vice

1

⚠ Threads on stainless steel fittings must be lubricated

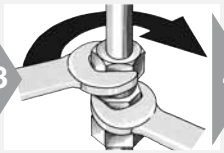
⚠ EO-NIROMONT is a special high-performance lubricant for stainless steel fittings

2

⚠ Press tube-end firmly into the assembly cone

- Push back nut for easy tube insertion

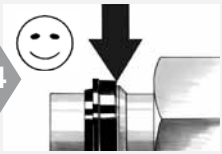
3



- 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



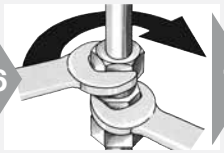
Assembly check:

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

5

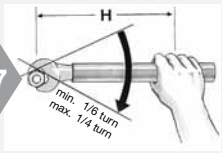
⚠ **Gap not closed:** Check all components including tube

6



- Assemble fitting until wrench-tight (without spanner extension)

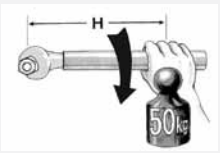
7



⚠ Then tighten fitting firmly by min $^{1}/_{6}$ (max ¼) turn (1 to 1½ flats)

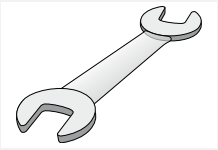
⚠ Recommended to use spanner extension for sizes over 20 mm O.D. **(see chart)**

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

Checking instructions for EO assembly tools



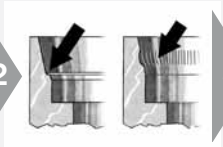
VOMO tools for manual pre-assembly in vice MOK for use in EO assembly machines

⚠ 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

1

- Clean cone surface for checking

2



- Visual checks:
  Cone must be free of wear, damage or cracks

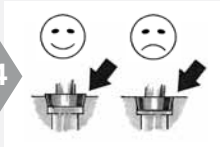
3

- Check for deformation of geometry

⚠ Special cone template KONU must be used

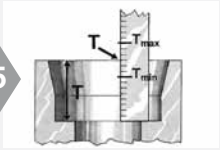
- KONU cone templates are precision measuring devices and must be handled accordingly

4



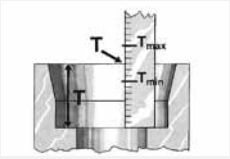
- Check contour:
  The rear of the template must protrude slightly above the top face of the cone or may be flush

5



- Check insertion depth

⚠ Deviations from the insertion depth can cause leakages



- Insertion depth T

Table: Tool for presetting tool (MOK and VOMO)

Type	T_{min}	T_{max}		Typ	T_{min}	T_{max}
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

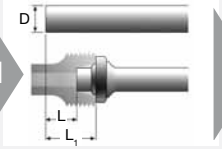
Material selection chart

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

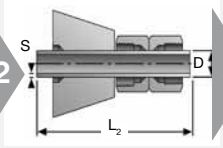
- Cut and deburr thoroughly
- Cut and bend tubes exactly

1



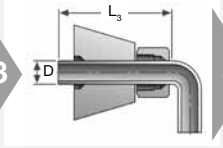
- Take extra length into account **(see tube preparation chart)**

2



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

3



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

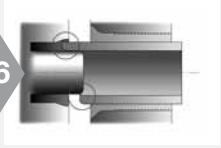
4

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

5

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

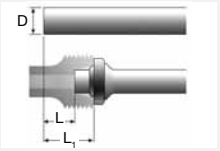
6



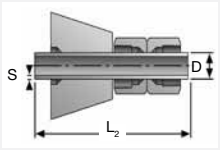
- Chips, dirt, internal or external burrs and paint prevent correct tube insertion
- ⚠ Dirty tubes result in worn-out or damaged tools

EO2-FORM assembly instructions

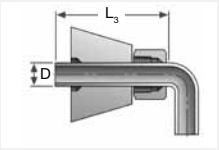
Tube preparation chart – Series L



● Extra length



● Minimum tube length



● Minimum straight length before bend

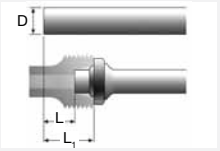
● Minimum clearance of U-shape bends

Tube-OD Series	S Wall thickness	L Steel ± 0.5	L Stainless Steel ± 0.5	L_1 Steel	L_1 Stainless Steel	L_2	L_3
6L	1.0	6.0	6.0	13.0	13.0	90	63
	1.5	6.0	6.0	13.0	13.0		
8L	1.0	5.5	5.5	12.5	12.0	92	65
	1.5	5.5	5.5	12.5	12.5		
	2.0	5.0		12.0	12.5		
10L	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		

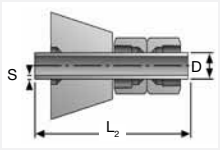
Tube-OD Series	S Wall thickness	L Steel ± 0.5	L Stainless Steel ± 0.5	L_1 Steel	L_1 Stainless Steel	L_2	L_3
12L	1.0	4.5	5.0	11.5	12.0	95	70
	1.5	5.5	5.5	12.5	12.5		
	2.0	5.0	5.5	12.0	12.5		
15L	1.5	5.5	7.0	12.5	14.0	102	75
	2.0	5.5	6.5	12.5	13.5		
	2.5	5.5		12.5			
18L	1.5	5.5	7.0	13.0	14.5	110	80
	2.0	5.5	7.0	13.0	14.5		
	2.5	6.0		13.5			
	3.0	6.0		13.5			
22L	1.5	6.0	7.5	13.5	15.0	120	90
	2.0	6.5	7.5	13.5	15.0		
	2.5	7.0	7.5	14.5	15.0		
	3.0	7.0		14.5			
28L	1.5	5.5	6.5	13.0	14.0	140	98
	2.0	6.5	7.5	14.0	15.0		
	2.5	7.0	8.0	14.5	15.5		
	3.0	7.0		14.5			
35L	2.0	7.0	8.5	17.5	19.0	170	115
	3.0	8.5	10.5	19.0	21.0		
	4.0						
	5.0						
42L	2.0	7.5	8.0	18.5	19.0	190	125
	3.0	9.0	10.5	20.0	21.5		
	4.0	9.0		20.0			

EO2-FORM assembly instructions

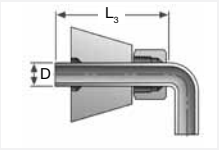
Tube preparation chart – Series S



● 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_1 Steel	L_1 Stainless Steel	L_2	L_3
6S	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
8S	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
10S	1.5	5.0	6.0	12.5	13.5		
	2.0	5.0	6.0	12.5	13.5		

Tube-OD Series	S Wall thickness	L Steel ± 0.5	L Stainless Steel ± 0.5	L_1 Steel	L_1 Stainless Steel	L_2	L_3
12S	1.5	5.0	6.5	12.5	14.0	100	72
	2.0	5.0	6.0	12.5	13.5		
16S	1.5	5.0	6.5	13.0	14.5	108	78
	2.0	5.5	6.5	13.5	14.5		
	2.5	5.5	6.5	13.5	14.5		
	3.0	5.0	6.0	13.0	14.0		
20S	2.0	7.0	8.5	17.5	19.0	135	98
	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			
25S	2.0	8.5	10.0	20.5	22.5	155	112
	2.5	8.5	10.0	20.5	22.5		
	3.0	8.5	10.5	20.5	23.0		
	4.0	8.5		20.5			
30S	3.0	8.5	10.5	22.0	24.0	165	122
	4.0	9.5	11.0	23.0	24.5		
	5.0	8.5		22.0			
38S	2.5		10.0		26.0	190	135
	3.0	10.0	10.0	26.0	26.0		
	3.5	10.0		26.0			
	4.0	10.0	12.0	26.0	28.0		
	5.0	11.0	13.0	27.0	29.0		
	6.0	11.5		27.5			
	7.0	11.5		27.5			

EO2-FORM assembly instructions

Tube forming with EO2-FORM F3

- Reliable forming method
- Reliable process

1

⚠ Change tool only when drive switched off (button OFF)
⚠ Obey safety instructions
⚠ Do not operate machine without tooling

2

- Open doors to access tools and handling devices
- Tool handling devices are stored in middle on top

3

- Select suitable forming pin according to tube material, outer diameter and wall thickness

4

- Check forming pin for dirt, wear and damage

5

- Use magnetic holder to insert forming pin
- Turn clockwise to lock bayonet fixture

6

- Tilt magneto holder to remove handle

7

- Select suitable clamping die set according to tube outer diameter

⚠ Keep stainless tube clamping dies seperate from other tube materials to prevent contact corrosion

8

- Check clamping dies for dirt, wear and damage
- Use wire-brush to remove metal particles from grip surfac

9

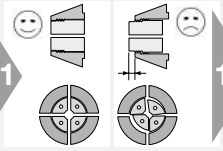
- Use pistol to handle clamping die set
- Pull and hold handle to grab die set

10

- 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

11



⚠ Front surfaces must be completely flat
⚠ Die segments must fit without gaps

12

- 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”

13

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

14

- ● 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

15

- ● 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

16

- ● 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

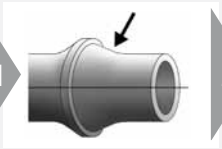
Assembly check

- Check assembly result

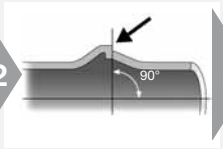
⚠ Incorrect assemblies must be scrapped

Tube OD check

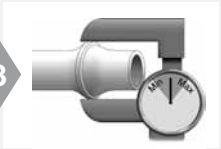
Tube Ø-Series	min Ø [mm]	max Ø [mm]
6-L/S	8.4	10.3
8-L/S	10.5	12.3
10-L	12.8	14.3
12-L	14.8	16.3
15-L	18.5	20.3
18-L	21.5	24.0
22-L	26.0	27.8
28-L	32.0	33.8
35-L	39.5	42.5
42-L	46.5	49.5
10-S	13.5	15.5
12-S	15.5	17.5
16-S	19.5	21.5
20-S	24.5	27.5
25-S	30.0	34.0
30-S	35.0	39.0
38-S	43.0	47.0



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

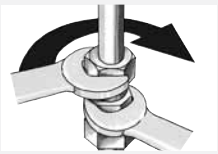


- Check contour: Contact surface for sealing ring (arrow) must be flat, at right angle to tube



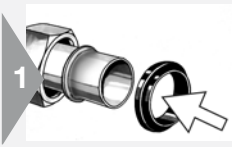
- Check outer diameter Ø … **(see chart)**

⚠ Incorrect tube-ends must be scrapped. Tools must be cleaned and checked



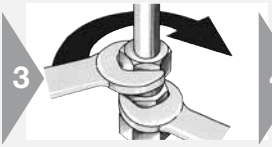
Installation

⚠ Tube must fit without tension

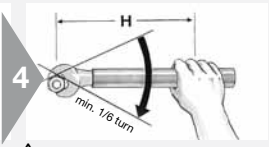


- Place sealing ring (DOZ) onto tube-end

- 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)

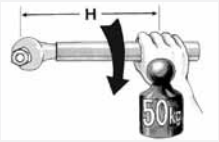


⚠ Then tighten fitting firmly by 1/6 turn (1 flat)

⚠ 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

Weld fitting

Weld fitting assembly

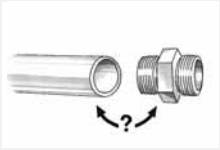
- EO weld nipple and weld fitting

⚠ Use weldable material

⚠ Depending on application or project specification, special requirements may apply for: Tube preparation, welding process, operator qualification, inspection of welding connection and surface finish

Tube preparation

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

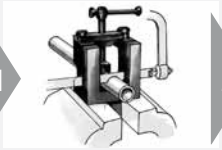


Material combinations

- Select suitable tube material

Fitting material	Tube specification
Steel	Weldable Steel
Stainless Steel	Weldable Stainless Steel

1

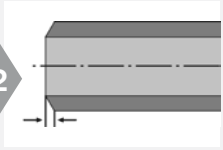


- Cut tube squarely
- max ±1° deviation

⚠ Do not use pipe cutters

- EO tube-cutting tool (AV) for manual cutting

2



- Bevel tube-end similar to weld nipple bevel

Assembly

3

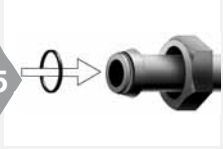
- Slide nut onto tube-end
- Weld fitting onto tube-end
- Fitting and tube must be aligned

⚠ Remove all elastomeric seals before welding

4

- Clean weld
- Calibrate inner diameter
- Check welding quality
- Surface protection if necessary

5



- Assemble O-ring
- Lubricate O-ring for easy assembly
- Avoid damage or twisting of O-ring

6

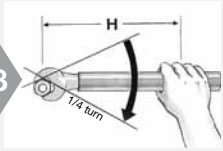
⚠ Threads of stainless steel fittings must be lubricated

⚠ Use EO-NIROMONT special high-performance lubricant for stainless steel fittings

7

- Assemble fitting until wrench-tight (without spanner extension)

8



⚠ Then tighten fitting firmly by ¼ turn (1½ flats)

O-Lok® assembly instructions

Tube selection

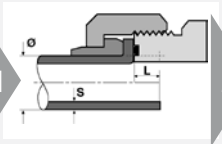
- Select suitable tube material

Steel tube		Stainless Steel tube	
Cold drawn seamless	Welded & redrawn	Cold drawn seamless	
NF A 49330	NF A 49341		
ISO 3304 R	DIN 2393	NF A 49341	
DIN 2391C pt 1	BS 3602/2	DIN 17458 DA/T3	
BS 3602 pt1	SAE J525	ASTM A 269	1.4571 on request
SAE J524			

Tube preparation

- Cut and deburr thoroughly

1

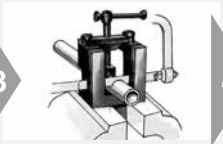


- Calculate tube length before cutting
- Add extra length “L”

2

- Minimum length of straight tube-ends **(see chart below)**

3



- Cut tube squarely
- max. ±1° deviation

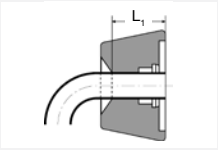
⚠ Do not use pipe cutters

- Use tube-cutting tool AV for manual cutting

4

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

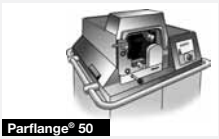
⚠ Proper deburring and cleaning of inner diameter essential for sealing surface quality



Metric tube [mm]		Minimum straight length	Extra length ~ L [mm] for Tube Wall thickness							
Tube Ø	Wall thickness	to start to bend L1 [mm]	1	1.5	2	2.5	3	3.5	4	5
6	1.0 – 1.5	40	4.5	5.5						
8	1.0 – 2.0	40	5.0	5.0						
10	1.0 – 2.0	40	2.5	4.0	3.5					
12	1.0 – 3.0	50	3.5	4.5	4.5	4.0	4.0			
14	1.5 – 2.0	50			5.0					
15	1.0 – 2.0	50		4.5	5.0					
16	1.5 – 3.0	50		3.0	3.0	3.0	2.5			
18	1.5 – 2.0	50		6.0	5.5					
20	2.0 – 3.5	50			3.5	4.0	4.0	3.5		
22	1.5 – 2.5	50			6.5	7.0				
25	2.0 – 4.0	50				4.0	4.5		4.0	
28	1.5 – 3.0	50			6.0	7.0				
30	2.0 – 4.0	50			5.0		5.0		5.0	
32	2.0 – 4.0	50					3.5		3.5	
35	2.0 – 3.0	50					7.0			
38	2.0 – 5.0	50					5.0		5.0	4.5
50	3.0	50					4.0			

Inch tube [inch]		Minimum straight length	Extra length ~ L [mm] Tube Wall thickness									
Tube Ø	Wall thickness	to start to bend L1 [mm]	0.028″	0.035″	0.049″	0.065″	0.083″	0.095″	0.109″	0.120″	0.134″	0.156″	0.188″
1/4″	0.020 – 0.065	40	4.5	5.0	4.0								
3/8″	0.020 – 0.095	40		3.5	3.5	4.0	4.0	4.0					
1/2″	0.028 – 0.095	50		3.5	3.5	3.5	3.5	3.5					
5/8″	0.035 – 0.120	50			4.0	4.0	3.0	4.5	4.0	4.5			
3/4″	0.035 – 0.156	50			4.0	4.0	3.0	2.5	3.5	4.0	4.5		
1″	0.035 – 0.188	50				3.5	3.5	2.5	4.5	4.5	5.0		
1 1/4″	0.049 – 0.188	50					4.0	3.0	3.0	3.0	4.0	4.5	4.5
1 1/2″	0.049 – 0.220	50				4.5	4.5	5.0	5.0	5.0	5.0	6.0	5.5
2″	0.083 – 0.120	50					4.0	4.0		5.0			

O-Lok® assembly instructions



Parflange® 50

Parflange® 1025

O-Lok® machine flanging and assembly

- Preferred method
- Most efficient method
- Parflange® recommended

1

Parflange® machines:
- Select flaring pin according to tube dimensions
- Use special “SS” pin for stainless steel tube
- Pin must be clean and free of wear, damage and metal particles
- Keep flaring pin clean and lubricate regularly

2

- Select flanging dies according to tube dimensions
- Use special “SS” dies for stainless steel tube to avoid contact corrosion
- Grip surface must be clean and free of wear
- Use only genuine Parker tooling for flanging O-Lok®

3

- Load pin into machine
- Ensure lubricating system is filled with EO-NIROMONT (LUBSS)

4

- Place sleeve in lower die half
- Locate upper die half onto lower half

5

- Place the dies in the die housing
- 50: Close safety cover

6

- Slide nut onto tube before flanging!
- Open threads towards machine

7

⚠ Press tube firmly into the die against the tube stop

8

- Pull down the handle to clamp the tube in the dies (1025)
- 1040/50 die clamping automatic in cycle
- Press button to start flanging cycle

⚠ Keep hands clear off the working area

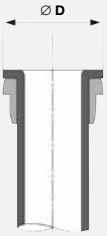
9

- Parflange® 1025: Unclamp the dies
- Remove tube from machine
- Use die separator to free tube
- Parflange® 1040/50: Die unclamping is automatic

O-Lok® assembly instructions

Checking of flange

- Clean flange for inspection
- ⚠ Check sealing surface for cracks, burrs, scratches and pitting
- Dimensional check of the flare
- Flare O.D. should not exceed outside sleeve diameter
- Flare O.D. should not be less than smaller diameter of front of sleeve
- When in doubt, measure



Tube O.D.		∅ D	
mm	In.	min. [mm]	max. [mm]
6	1/4″	12.10	12.75
8		14.85	15.75
10	3/8″	14.85	15.75
12	1/2″	18.00	18.90
14		22.20	23.45
15		22.20	23.45
16	5/8″	22.20	23.45
18		26.60	27.85
20	3/4″	26.60	27.85
22		32.95	34.20
25	1″	32.95	34.20
28		39.35	40.55
30		39.35	40.55
32	1 1/4″	39.35	40.55
35		47.25	48.50
38	1 1/2″	47.25	48.50
50	2″	58.90	60.60

Installation in fitting

- Lubricate O-ring
- ⚠ Steel fittings: No thread lubrication
- ⚠ Stainless steel fittings: Lubrication required
- EO-NIROMONT is a special high-performance lubricant for stainless steel fittings
- Thread nut onto body
- Tighten to full metal contact
- Mark body and nut as quality check
- Tighten to recommended torque level
- Recommended: Tighten with spanner the number of flats indicated α
- 1 flat = 60°

Tightening recommendation

Metric tube [mm]	Inch tube [inch]	SAE dash size	SAE thread	Assembly torque Nm -0% + 10%		α flats from wrench resistance method*	
				Steel	Stainless Steel	Tube	Swivel nut
6	1/4″	–4	9/16-18	25	32	1/4 – 1/2	1/2 – 3/4
8	5/16″	–6	11/16-16	40	50	1/4 – 1/2	1/2 – 3/4
10	3/8″	–6	11/16-16	40	50	1/4 – 1/2	1/2 – 3/4
12	1/2″	–8	13/16-16	65	70	1/4 – 1/2	1/2 – 3/4
14		–10	1-14	80	100	1/4 – 1/2	1/2 – 3/4
15		–10	1-14	80	100	1/4 – 1/2	1/2 – 3/4
16	5/8″	–10	1-14	80	100	1/4 – 1/2	1/2 – 3/4
18		–12	1 3/16-12	115	145	1/4 – 1/2	1/3 – 1/2
20	3/4″	–12	1 3/16-12	115	145	1/4 – 1/2	1/3 – 1/2
22		–16	1 7/16-12	150	190	1/4 – 1/2	1/3 – 1/2
25	1″	–16	1 7/16-12	150	190	1/4 – 1/2	1/3 – 1/2
28		–20	1 11/16-12	190	235	1/4 – 1/2	1/3 – 1/2
30		–20	1 11/16-12	190	235	1/4 – 1/2	1/3 – 1/2
32	1 1/4″	–20	1 11/16-12	190	235	1/4 – 1/2	1/3 – 1/2
35		–24	2-12	245	305	1/4 – 1/2	1/3 – 1/2
38	1 1/2″	–24	2-12	245	305	1/4 – 1/2	1/3 – 1/2
50	2″	–32	2 1/2-12	–	490	–	–

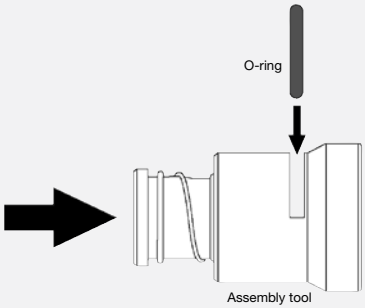
* "Flats From Wrench Resistance" Method for steel and stainless steel

O-Lok® assembly instructions

O-Lok®: Replacement of O-ring

- Parker CORG assembly tool should be used for O-Lok® fitting with captive O-ring groove (O-Lok®)

- Insert the O-ring into the slot located on the side of the tool
- Position the open end of the tool over the tube-end of the fitting
- Push the piston of the tool until the O-ring is released into the fitting groove



- Function of Parker CORG assembly tool

Triple-Lok® assembly instructions

Tube selection

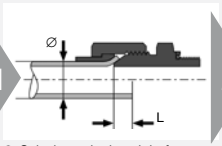
- Select suitable tube material

Steel tube		Stainless steel tube
Cold drawn seamless	Welded & redrawn	Cold drawn seamless
NF A 49330	NF A 49341	
ISO 3304 R	DIN 2393	NF A 49341
DIN 2391C pt 1	BS 3602/2	DIN 17458 DA/T3
BS 3602 pt1	SAE J525	ASTM A 269
SAE J524		

Tube preparation

- Cut and deburr thoroughly

1



- Calculate tube length before cutting
- Add extra length "L"

2

- Minimum length L_1 of straight tube-ends **(see chart below)**

3

- Cut tube squarely
- max. ±1° deviation

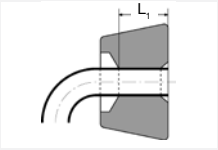
⚠ Do not use pipe cutters

- Use tube cutting tool AV for manual cutting

4

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

⚠ Proper deburring and cleaning of inner diameter essential for sea-ling surface quality



Tube preparation chart

Metric tube [mm]		Inch tube [inch]		Extra length	Minimum straight length	Flare Ø
Tube Ø	Wall thickness	Tube Ø	Wall thickness	~ L [mm]	to start to bend L1 [mm]	Ø D [mm]
6	1.0 – 1.5	1/4″	0.020 – 0.065	2.0	40	8.6 – 9.7
8	1.0 – 1.5	5/16″	0.020 – 0.065	2.0	40	10.2 – 11.3
10	1.0 – 1.5	3/8″	0.020 – 0.065	2.0	42	11.7 – 12.7
12	1.0 – 2.0	1/2″	0.028 – 0.083	2.5	43	16.0 –17.3
14	1.5 – 2.0			2.5	52	19.3 – 20.2
15	1.0 – 2.5			2.5	52	19.3 – 20.2
16	1.5 – 2.5	5/8″	0.035 – 0.095	2.5	52	19.3 – 20.2
18	1.5 – 3.0			3.0	56	23.4 – 24.7
20	2.0 – 3.0	3/4″	0.035 – 0.109	3.0	57	23.4 – 24.7
22	1.5 – 3.0			3.0	58	26.5 – 27.8
25	2.0 – 3.0	1″	0.035 – 0.120	3.0	58	29.7 – 31.0
28	1.5 – 3.0			4.0	65	37.6 – 38.9
30	2.0 – 3.0			4.0	65	37.6 – 38.9
32	2.0 – 3.0	1 1/4″	0.049 – 0.120	4.0	65	37.6 – 38.9
35	2.0 – 3.0			4.0	70	43.2 – 45.3
38	2.0 – 4.0	1 1/2″	0.049 – 0.120	4.0	70	43.2 – 45.3
42*	2.0 – 3.0			5.0	80	52.0 – 54.8
50	2.0 – 3.5	2″	0.058 – 0.134	5.0		59.2 – 61.2

* Tube OD 42 mm:
• 1015: not suitable
• KARRYFLARE: special flaring pin KARRYFLARE/FPIN42 required

Triple-Lok® assembly instructions

37° Flaring Parflange®-Process

- Preferred method
- Most efficient method
- Parflange® recommended

Parflange® 50

Parflange® 1025

1

- Select flaring pin according to tube dimensions
- Use special “SS” pin for stainless steel tube
- Pin must be clean and free of wear and damage
- Load tooling into machine
- Keep flaring pin clean and lubricate regularly

2

- Select flaring dies according to tube dimensions
- Use special “SS“ dies for stainless steel tube
- Grip surface must be clean and free of wear
- Use only genuine Parker tooling for flaring Triple-Lok®

3

- Load tooling into machine
- Keep sliding surfaces clean and lubricated
- 50: Close safety cover
- Ensure lubricant system is filled with EO-NIROMONT (LUBSS)

4

- Slide nut and sleeve as shown onto the tube-end

5

- ⚠ Press tube firmly into the die against the tube stop
- Parflange® 1025: Operate clamping lever
- Parflange® 1040/50: Automatic tube clamping

6

- Hold tube firmly
- Press start button
- ⚠ Keep hands clear off the working area

7

- Parflange® 1025: Unclamp the dies
- Parflange® 1040/50: Die unclamping is automatic
- Remove tube from machine
- Use die separator to free tube

Triple-Lok® assembly instructions

37° Flaring with EOMAT/KARRYFLARE

- Preferred method
- Most efficient method
- Parflange® recommended


EOMAT UNI


KARRYFLARE

1

- Flaring pin is integrated in flaring block
- Pin must be clean and free of wear and damage
- Keep flaring pin clean
- KARRYFLARE: Flaring pin for 42 mm tube O.D. must be fitted with flat face on top

2

- Select flaring dies according to tube O.D.
- Grip surface must be clean and free of wear
- Use only genuine Parker tooling for flaring Triple-Lok®
- Keep sliding surfaces clean and lubricated

3

- Slide nut and sleeve as shown onto the tube-end

4

- Lubricate tube-end inside
- Lubricant EO-NIROMONT recommended

5

⚠ Press tube firmly into the die against the tube stop
- KARRYFLARE: Close valve on handpump
- KARRYFLARE: Keep lid closed

6

- EOMAT UNI: Adjustment according to pressure on machine
- EOMAT III/A: Menu selection (FLARE)
- KARRYFLARE: Refer to chart on machine
- Non-EOMAT-machines: check suitability

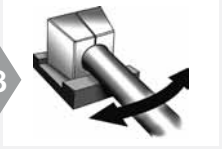
7

- Hold tube firmly
- EOMAT: Press and hold start button
- KARRYFLARE: Operate hand-pump until assembly pressure is reached

⚠ Keep hands clear off the working area

⚠ KARRYFLARE: Do not exceed max pressure 400 bar

8

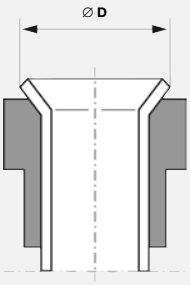


- KARRYFLARE: Open valve on handpump
- Remove tube from machine
- Use die separator to free tube

Triple-Lok® assembly instructions

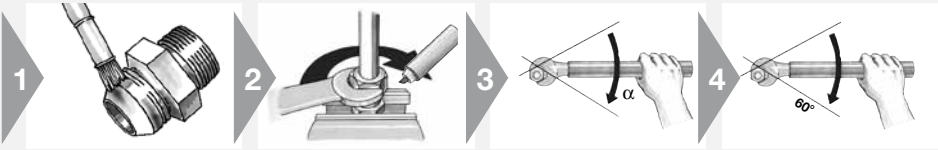
Checking the flare

- Clean flare for inspection
- ⚠ Visual check sealing surface for cracks, burrs, scratches and pitting
- Dimensional check of the flare
- Flare O.D. should not exceed outside sleeve diameter
- Flare O.D. should not be less than smaller diameter of front of sleeve
- When in doubt, measure



Tube O.D.		Ø D	
mm	inch	Min.	Max.
6	1/4″	8.6	9.7
8	5/16″	10.2	11.3
10	3/8″	11.7	12.7
12	1/2″	16.0	17.3
14		19.3	20.2
15		19.3	20.2
16	5/8″	19.3	20.2
18		23.4	24.7
20	3/4″	23.4	24.7
22	7/8″	26.5	27.8
25	1″	29.7	31.0
28		37.6	38.9
30		37.6	38.9
32	1 1/4″	37.6	38.9
35		43.2	45.3
38	1 1/2″	43.2	45.3
42		52.0	54.8
50	2″	59.2	61.2

Installation



- Steel fittings: No lubrication
- ⚠ Stainless steel fittings: Lubrication required
- Use EO-NIROMONT special high-performance lubricant for stainless steel fittings
- Thread nut onto body
- Tighten to full metal contact (finger tight)
- Mark body and nut as quality check
- Tighten with spanner the number of flats indicated
- Use spanner extension for larger fittings (28 mm)
- 1 flat = 60°

Tightening recommendation

Metric Tube [mm]	Inch tube [inch]	SAE thread	α flats from finger tight method*		Assembly torque Nm –0% + 10%	
			tube	Swivel nut	Steel	Stainless steel
6	1/4″	7/16-20	2″	2″	15	30
8	5/16″	1/2-20	2″	2″	20	40
10	3/8″	9/16-18	1 1/2″	1 1/4″	30	60
12	1/2″	3/4-16	1 1/2″	1″	60	115
14		7/8-14	1 1/2″	1″	75	145
15		7/8-14	1 1/2″	1″	75	145
16	5/8″	7/8-14	1 1/2″	1″	75	145
18		1 1/16-12	1 1/4″	1″	110	180
20	3/4″	1 1/16-12	1 1/4″	1″	110	180
22	7/8″	1 3/16-12	1″	1″	135	225
25	1″	1 5/16-12	1″	1″	175	255
28		1 5/8-12	1″		260	295
30		1 5/8-12	1″	1″	260	295
32	1 1/4″	1 5/8-12	1″	1″	260	295
35		1 7/8-12	1″		340	345
38	1 1/2″	1 7/8-12	1″	1″	340	345
42		2 1/4-12	1″	1″	380	400

* “Flats From Finger Tight” Method for steel and stainless steel

Checking instructions for O-Lok®/Triple-Lok® tools

Tools for Parflange® machines

⚠ 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 pin for checking

2

- Visual check:
  Surface must be free of wear and damage

3

- Clean die halves for checking

⚠ Do not disassemble

- Fixing pins must not be loose or damaged

4

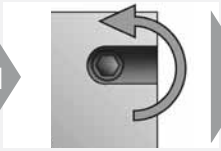
- Visual check:
  Grip surface must be clean and free of wear
- Use wire-brush to remove metal particles from grip surface

Adjustment of Parflange® dies

- Parflange® dies can be adjusted to correct deviations of flare diameter

⚠ Re-adjustment of dies will not help if general machine setting is incorrect or components are damaged (worn tube-stop, lose screw connections)

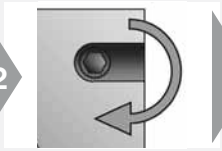
1



- To reduce the flare diameter, turn the screws anti-clockwise

⚠ Re-adjust both screws simultaneously

2



- To increase the flare diameter, turn the screws clockwise

⚠ Re-adjust both screws simultaneously

- 1 click ≙ approx. 0.05 mm ∅

3

- Adjust the screws in small stages
- Then check flare diameter

⚠ Lock screws to prevent misadjustment

Flange-Seal assembly instructions

Tube selection

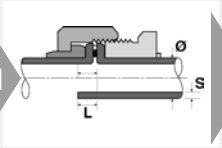
- Select suitable tube material

Steel tube	
Cold drawn seamless	Welded & drawn
NF A 49330	NF A 49341
ISO 3304 R	DIN 2393
DIN 2391C pt 1	BS 3602/2
BS 3602 pt1	SAE J525
SAE J524	

Tube preparation

- Cut and deburr thoroughly

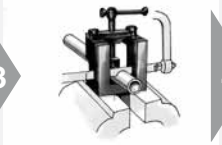
1



2

- Calculate tube length before cutting
- Add extra length "L" **(see chart below)**
- Minimum length of straight tube-ends **(see chart below)**

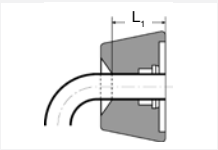
3



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

4

- Remove internal and external burrs
- max. chamfer 0.3 mm × 45°
- Recommendation: In-Ex Tube Deburring Tool 226
- ⚠ Proper deburring and cleaning of inner diameter essential for sealing surface quality



Metric tube [mm]		Minimum straight length	Extra length – L [mm] for tube wall thickness							
Tube ∅	Wall thickness	to start to bend L1 [mm]	1	1.5	2	2.5	3	3.5	4	5
6	1.0 – 1.5	50	4.5	5.5						
8	1.0 – 2.0	50	5.0	5.0						
10	1.0 – 2.0	50	2.5	4.0	3.5					
12	1.0 – 2.5	50	3.5	4.5	4.5	4.0				
16	1.5 – 3.0	50		3.0	3.0	3.0	2.5			
20	2.0 – 3.5	65			3.5	4.0	4.0	3.5		

Inch tube [inch]		Minimum straight length	Extra length – L [mm] for tube wall thickness [inch]									
Tube ∅	Wall thickness	to start to bend L1 [mm]	0.028″	0.035″	0.049″	0.065″	0.083″	0.095″	0.109″	0.120″	0.134″	0.156″	0.188″
1/4″	0.020 – 0.065	40	4.5	5.0	4.0								
3/8″	0.020 – 0.095	40		3.5	3.5	4.0	4.0	4.0					
1/2″	0.028 – 0.095	50		3.5	3.5	3.5	3.5	3.5					
5/8″	0.035 – 0.120	50			4.0	4.0	3.0	4.5	4.0	4.5			
3/4″	0.035 – 0.134	50			4.0	4.0	3.0	2.5	3.5	4.0	4.5		

Flange-Seal assembly instructions

Parflange® 50

Parflange® 1025

Flange-Seal machine flanging and assembly

- Preferred method
- Most efficient method
- Parflange® recommended

1

Parflange® machines:
- Select flaring pin according to tube dimensions
- Use standard O-Lok® pins
- Pin must be clean and free of wear, damage and metal particles
- Keep flaring pin clean and lubricate regularly

2

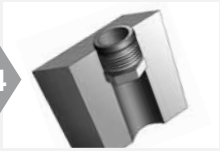
- Select flanging dies according to tube dimensions
- Use special Flange-Seal dies
- Grip surface must be clean and free of wear
- Use only genuine Parker tooling for flanging

⚠ Note limitation on wall thickness for tube-tube connections

3

- Load pin into machine
- Ensure lubricating system is filled with EO-NIROMONT (LUBSS)
- 50: Close safety cover

4



- Place threaded sleeve (LHP) in lower die half
- Locate upper die half onto lower half

5

- Place the dies in the die housing

6

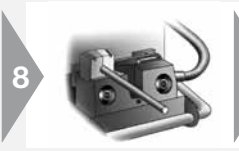
⚠ Press tube firmly into the die against the tube stop

7

- Pull down the handle to clamp the tube in the dies (1025)
- 50 die clamping automatic in cycle
- Press button to start flanging cycle

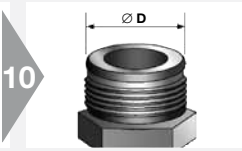
⚠ Keep hands clear off the working area

Flange-Seal assembly instructions



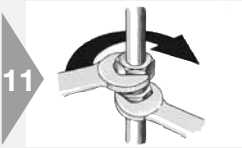
- Parflange® 1025: Unclamp the dies
- Remove tube from machine
- Use die separator to free tube
- Parflange® 1040/50: Die unclamping is automatic

- Clean flange for inspection
- ⚠ Check sealing surface for cracks, burrs, scratches and pitting



- Dimensional check of the flare

Tube O.D.		∅ D	
mm	inch	min. [mm]	max. [mm]
6	1/4″	12.10	12.75
8		14.85	15.75
10	3/8″	14.85	15.75
12	1/2″	18.00	18.90
16	5/8″	22.20	23.45
20	3/4″	26.60	27.85



- Place seal into loose tube nut
- Tighten to full metal contact
- Tighten to recommended torque level

Tightening recommendation

Metric tube [mm]	Inch tube [inch]	SAE dash size	SAE thread UN/UNF-2A	Assembly torque Nm –0% + 10% Steel
6	1/4″	-4	9/16-18	25
8	5/16″	-6	11/16-16	40
10	3/8″	-6	11/16-16	40
12	1/2″	-8	13/16-16	65
16	5/8″	-10	1-14	80
20	3/4″	-12	1 3/16-12	115

System component guide – Flange-Seal system
Metric tubes

Tube O.D. (mm)	Con. dash size	Flange-Seal fitting	Seal element	Die tool*	Pin tool
6	4	LHMPS6	4PLS	M4018006XxxxMLHP	B3018006XxxxM
8	6	LHMPS8	6PLS	M4018008XxxxMLHP	B3018008XxxxM
10	6	LHMPS10	6PLS	M4018010XxxxMLHP	B3018010XxxxM
12	8	LHMPS12	8PLS	M4018012XxxxMLHP	B3018012XxxxM
16	10	LHMPS16	10PLS	M4018016XxxxMLHP	B3018016XxxxM
20	12	LHMPS20	12PLS	M4018020XxxxMLHP	B3018020XxxxM

*xxx: Insert tube wall thickness according to tooling list
*Example 1: Metric tube tooling for 8×1.5 mm
Die: M4018008x1.5MLHP
Pin: B3018008x1.5M

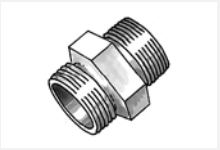
System component guide – Flange-Seal system
Inch tubes

Tube O.D. (inch)	Con. dash size	Flange-Seal fitting	Seal element	Die tool*	Pin tool
1/4″	4	4LHP-S	4PLS	M4004Xxxx180LHP	B4004Xxxx180
3/8″	6	6LHP-S	6PLS	M4006Xxxx180LHP	B4006Xxxx180
1/2″	8	8LHPS	8PLS	M4008Xxxx180LHP	B4008Xxxx180
5/8″	10	10LHP-S	10PLS	M4010Xxxx180LHP	B4010Xxxx180
3/4″	12	12LHP-S	12PLS	M4012Xxxx180LHP	B4012Xxxx180

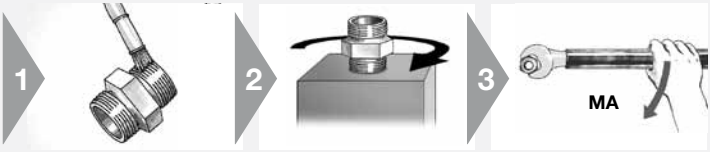
*xxx: Insert tube wall thickness according to tooling list
*Example 2: Inch tube tooling for 1/2×0.083″
Die: M4008x083180LHP
Pin: B4008x083180

Port connections

Assembly of metric straight port connections



- Metric Thread
  DIN ISO 6149-2/3
  ISO 9974-2/3
  DIN 3859-T2



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

- Screw in until handtight

- Then tighten according to chart

Assembly torques for zinc plated steel fittings with metric thread in ports made of steel

Product Series	Tube O.D.	Thread size T mm	Straight male stud fittings with port tapping: Form A for sealing washer Nm	Form B with face Nm	Form E with ED sealing Nm	Form F with O-ring sealing Nm	O-ring with sealing and retaining ring	Non-return valves: RHV/RHZ Form E with ED sealing Nm	EO Banjo fittings: WH/TH Nm	SWVE Nm	Adjustable ends: O-ring and retaining ring Nm	O-ring Nm	Blanking plugs: VSTI-ED Form E mit ED sealing Nm ⚠	VSTI-OR Form F with O-ring sealing Nm
	6	M 10×1.0	9	18	18	15	18	18	18	18	18	15	12	20
	8	M 12×1.5	20	30	25	25	35	25	45	35	35	25	25	35
	10	M 14×1.5	35	45	45	35	45	35	55	50	45	35	35	45
	12	M 16×1.5	45	65	55	40	55	50	80	60	55	40	50	55
EO L Triple-Lok®	15	M 18×1.5	55	80	70	45	70	70	100	80	70	45	65	70
	18	M 22×1.5	65	140	125	60	160	125	140	120	180	60	90	100
	22	M 26×1.5	90	190	180	100*	250	145	320	130	180	100	135	
	28	M 33×2.0	150	340	310	160	310	210	360		310	160	225	310
	35	M 42×2.0	240	500	450	210	450	360	540		450	210	360	330
	42	M 48×2.0	290	630	540	260	540	540	700		600	260	360	420
	6	M 12×1.5	20	35	40	35		35	45	35	35	35	25	35
	8	M 14×1.5	35	55	40	45		45	55	50	60	45	35	45
	10	M 16×1.5	45	70	70	55		55	80	60	95	55	50	55
	12	M 18×1.5	55	110	90	70		70	100	80	120	90	65	70
EO S O-Lok®	14	M 20×1.5	55	150	125	80		100	125	110			80	80
	16	M 22×1.5	65	170	135	100		125	135	120	190	100	90	100
	20	M 27×2.0	90	270	180	170		135	320	135	190	170	120	170
	25	M 33×2.0	150	410	310	310		210	360		500	310	225	310
	30	M 42×2.0	240	540	450	330		360	540		600	330	360	330
	38	M 48×2.0	290	700	540	420		540	700		600	420	360	420

Tolerance of tightening torques listed in above table: +10 %
Note: Lubricate stud with hydraulic oil before screwing in! *Thread M 27×2.0

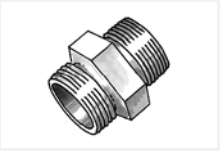
⚠ Assembly in ports made of materials, which are strongly differing in strength and friction from steel, usually requires modified torques.

A reduction of torque is always required, when the turning angle from fingertight to the recommended torque is more than 30°!

In this case it is recommended to reduce the torque:

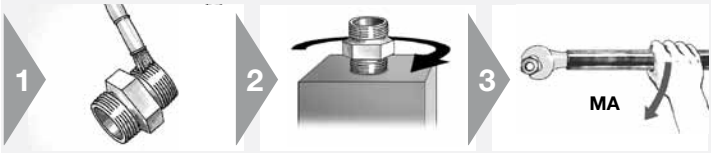
Port material	Hardness	Torque reduction by
Steel, with use of high performance lubrication (e.g. additive to hydraulic oil)	All	10 %
Ductile cast iron (e.g. GGG 50)	All	10 %
Aluminium	HB 150	15 %
	HB 125	20 %
	HB 100	30 %
	< HB 100	35 %

Port connections



Assembly of BSPP straight port connections

- BSPP Thread G
  ISO 1179-I
  DIN 3859-T2



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

- Screw in until handtight

- Then tighten according to chart

Assembly torques for zinc plated steel fittings with metric thread in ports made of steel

Product Series	Tube O.D.	Thread size T Inch	Straight male stud fittings with port tapping: Form A for sealing washer Nm	Form B with cutting-face Nm	Form E with ED-sealing Nm	with O-ring sealing and retaining-ring	Non-return valves RHV/RHZ Form E with ED-sealing	EO Banjo fittings WH/TH Nm	SWVE Nm	Adjustable ends O-ring and retaining-ring Nm	Blanking plugs VSTI-ED Form E with ED-sealing Nm ⚠
	6	G 1/8 A	9	18	18	18	18	18	18	18	13
	8	G 1/4 A	35	35	35	35	35	45	40	35	30
	10	G 1/4 A	35	35	35	35	35	45	40	35	
	12	G 3/8 A	45	70	70	70	50	70	65	70	60
EO L Triple-Lok®	15	G 1/2 A	65	140	90	90	85	120	90	110	80
	18	G 1/2 A	65	100	90	90	65	120	90	110	
	22	G 3/4 A	90	180	180	180	140	230	125	180	140
	28	G 1 A	150	330	310	310	190	320		310	200
	35	G 1 1/4 A	240	540	450	450	360	540		450	400
	42	G 1 1/2 A	290	630	540	540	540	700		540	450
	6	G 1/8 A								25	13
	6	G 1/4 A	35	55	40		45	45	40	55	30
	8	G 1/4 A	35	55	40		45	45	40	55	(30)
	10	G 3/8 A	45	90	80		60	70	65	90	60
	12	G 3/8 A	45	90	80		60	70	65	90	(60)
EO S O-Lok®	14	G 1/2 A	65	150	115		145	120	90	110	80
	16	G 1/2 A	65	130	115		100	120	90	110	(80)
	20	G 3/4 A	90	270	180		145	230	125	115	140
	25	G 1 A	150	340	310		260	320		420	200
	30	G 1 1/4 A	240	540	450		360	540		550	400
	38	G 1 1/2 A	290	700	540		540	700		600	450

Tolerance of tightening torques listed in above table: +10%
Note: Lubricate stud with hydraulic oil before screwing in!
*Thread M 27×2.0

⚠ Assembly in ports made of materials, which are strongly differing in strength and friction from steel, usually requires modified torques.
A reduction of torque is always required, when the turning angle from fingertight to the recommended torque is more than 30°!

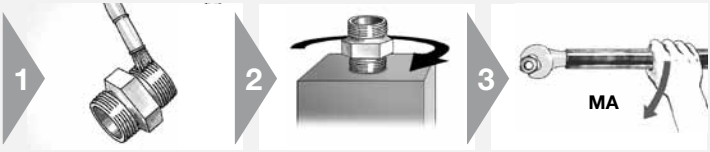
In this case it is recommended to reduce the torque:

Port material	Hardness	Torque reduction by
Steel, with use of high performance lubrication (e.g. additive to hydraulic oil)	All	10 %
Ductile cast iron (e.g. GGG 50)	All	10 %
Aluminium	HB 150	15 %
	HB 125	20 %
	HB 100	30 %
	< HB 100	35 %

Port connections

Assembly of SAE straight port connections

- UN/UNF thread
  ISO 11926-2/3



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

- Screw in until handtight

- Then tighten according to chart

Assembly torques for zinc plated steel fittings with BSPP thread in ports made of steel

Product	Thread size T ISO 11296	Series EO / Triple-Lok® and O-Lok®	
		Assembly torque non-adjustable end	Assembly torque adjustable end
Series	inch	Nm	Nm
EO L Triple-Lok®	7/16-20 UN(F)	23	18
	1/2-20 UN(F)	28	28
	9/16-18 UN(F)	34	34
	3/4-16 UN(F)	60	55
	7/8-14 UN(F)	115	80
	1 1/16-12 UN(F)	140	100
	1 5/16-12 UN(F)	210	150
	1 5/8-12 UN(F)	290	290
	1 7/8-12 UN(F)	325	325
EO S O-Lok®	7/16-20 UN(F)	35	20
	1/2-20 UN(F)	40	40
	9/16-18 UN(F)	46	46
	3/4-16 UN(F)	80	80
	7/8-14 UN(F)	135	135
	1 1/16-12 UN(F)	185	185
	1 5/16-12 UN(F)	270	270
	1 5/8-12 UN(F)	340	340
	1 7/8-12 UN(F)	415	415

Tolerance of tightening torques listed in above table: + 10 %
Note: Lubricate stud with hydraulic oil before screwing in!

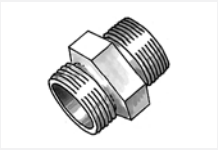
⚠ Assembly in ports made of materials, which are strongly differing in strength and friction from steel, usually requires modified torques.

A reduction of torque is always required, when the turning angle from fingertight to the recommended torque is more than 30°!

In this case it is recommended to reduce the torque:

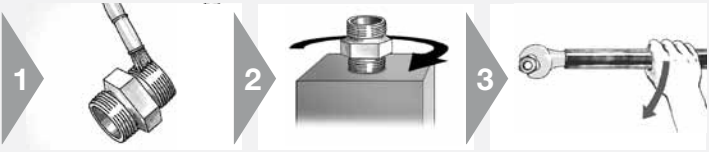
Port material	Hardness	Torque reduction by
Steel, with use of high performance lubrication (e.g. additive to hydraulic oil)	All	10 %
Ductile cast iron (e.g. GGG 50)	All	10 %
Aluminium	HB 150	15 %
	HB 125	20 %
	HB 100	30 %
	< HB 100	35 %

Port connections



Assembly of tapered thread port connections

- NPT / NPTF thread
  ANSI / ASME B 1.20.1 – 1983



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

- Apply teflon tape (1.5 layer) to the taper stud end and screw in handtight

- Then tighten according to chart

Tightening of NPT / NPTF thread

Size	Thread T NPT/F	Assembly TFFT Turns
4	1/8-27 NPT/F	2.0-3.0
6	1/4-18 NPT/F	2.0-3.0
8	3/8-18 NPT/F	2.0-3.0
10	1/2-14 NPT/F	2.0-3.0
12	3/4-14 NPT/F	2.0-3.0
16	1-11.5 NPT/F	1.5-2.5
20	1 1/4 -11.5 NPT/F	1.5-2.5
24	1 1/2-11.5 NPT/F	1.5-2.5

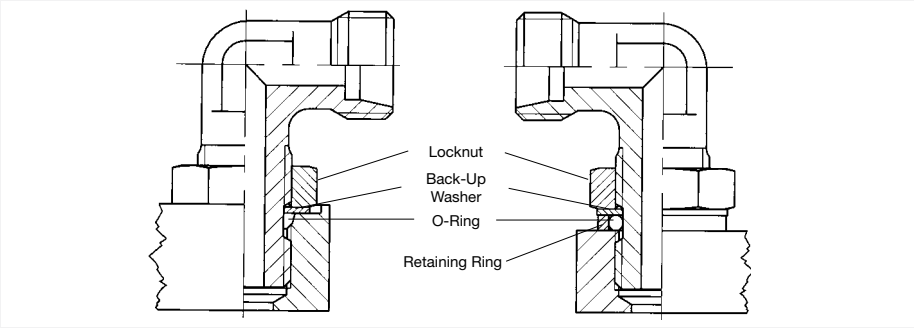
In the EO fitting range only **NPT** threads are manufactured.
In the **Triple-Lok®** and **O-Lok®** fitting range for **steel**
NPTF threads are used, and NPT for stainless steel components.

Adjustable fittings with locknut

Assembly of the orientable joint

(EO: e.g. WEE, VEE, TEE, LEE - Triple-Lok® / O-Lok®: C4, V4, S4, R4)

⚠ Assembly steps must be done in right order



- Fitting *without* Retaining Ring for ISO 6149 or UN/UNF ports
- Fitting *with* Retaining Ring for BSPP or Metric Parallel ports with wide or SMALL spot faces

1

- Screw back locknut as far as possible

⚠ O-ring and back-up washer in the non-threaded section should be placed nearest to the locknut

- Lubricate the O-ring
- With BSPP and metric parallel version slip retaining ring over the O-ring

2

- Screw the fitting in the port by hand until retaining ring or back-up washers bottom

3

- To adjust direction, turn back to a maximum of one full turn

4

- Screw locknut handtight
- Assemble locknut until wrenchtight
- Hold body in desired position and tighten locknut

EO swivels

Assembly of EO swivel nut fittings

(e.g. EW, ET, EL, EGE, RED, VKA, SKA)

- Final assembly of swivel nut fittings must be made in appropriate fittings

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

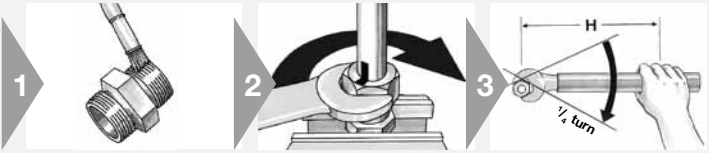
- Screw on nut by hand until handtight

⚠ Then tighten fitting firmly by ¼ turn (1½ flats)

Final assembly of factory pre-assembled EO-standpipe fittings

(e.g. EVW, EVT, EVL, EVGE, KOR)

- For all fittings delivered pre-assembled from the factory the final assembly is performed in the appropriate fitting body



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

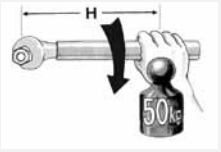
- Assemble fitting until wrench tight (without spanner extension)

⚠ Mark position of nut

⚠ Then tighten fitting firmly by ¼ turn (1½ flats)

⚠ Recommended to use spanner extension for sizes over 20 mm O.D. **(see chart)**

Spanner length



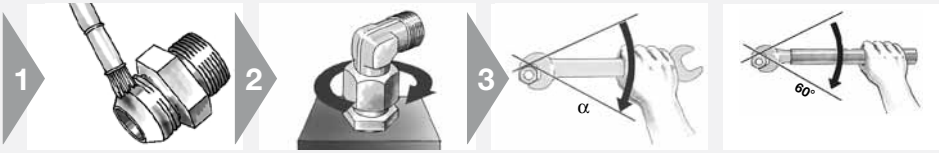
Size		Spanner length H [mm]
18-L	16-S	300
22-L		400
28-L	20-S	500
35-L	25-S	900
42-L	30-S	1200
	38-S	1500

Triple-Lok® / O-Lok® swivels

Assembly of Triple-Lok® and O-Lok® swivel nut fittings

e.g.: Triple-Lok®: C6MX, V6MX, R6MX, S6MX, BBMTX
O-Lok®: C6MLO, V6MLO, S6MLO, R6MLO, A0EL6

- Final assembly of swivel nut fittings must be made in appropriate fittings



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

- Screw on nut by hand until handtight

- Then tighten according to chart

- one flat = 60°

Assembly torques for O-Lok® and Triple-Lok® swivel nut fittings

O-Lok®

Size	Metric tube mm	Inch tube inch	Thread UN/UNF	Nm	FFWR
4	6	1/4″	9/16-18	25	1/2
6	8	5/16″	11/16-16	40	1/2
6	10	5/16″	11/16-16	55	1/2
8	12	1/2″	13/16-16	55	1/2
10	14, 15,16	5/8″	1-14	115	1/2
12	18, 20	3/4″	1 3/16-12	130	1/2
16	22, 25	1″	1 7/16-12	150	1/2
20	28, 30, 32	1 1/4″	1 11/16-12	190	1/2
24	35, 38	1 1/2″	2-12	245	1/2
32	50	2″	2 1/2-12	490	1/2

Triple-Lok®

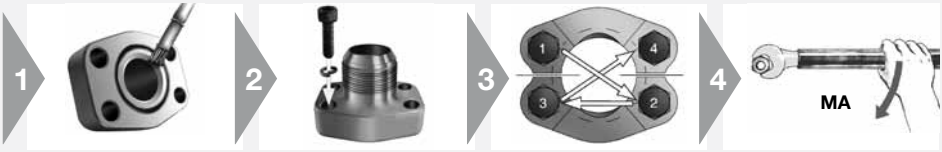
Size	Metric tube mm	Inch tube inch	Thread UN/UNF	Nm	FFFT
4	6	1/4″	7/17-20	15	2
5	8	5/16″	1/2-20	20	2
6	10	3/8″	9/16-18	45	1 1/4
8	12	1/2″	3/4-16	60	1
10	14, 15, **16**	5/8″	7/8-14	75	1
12	18, **20**	3/4″	1 1/16-12	100	1
16	22, **25**	7/8″	1 5/16-12	150	1
20	**30**, 32	1 1/4″	1 5/8-12	180	1
24	38	1 1/2″	1 7/8-12	200	1
28	42		2 1/4-12	220	1
32		2″	2 1/2-12	250	1

Assembly torques shown in chart are for **non-lubricated carbon steel zinc plated components.**
For stainless steel fittings, lubricate all mating surfaces and tighten to upper end of torque tolerance.
Recommended assembly torques are for connections consisting of all Parker manufactured components.

Flanges

Assembly of flanges

- SAE flange adapters
- SAE 4 bolt flanges
- Gear pump flanges
- CETOP square flanges



- Make sure sealing surfaces are free of burrs, nicks, scratches or any contamination
- Lubricate the O-ring with system fluid or compatible lubricant

- Position flange and clamp halves
- Place lock washers on bolts and bolt through clamp halves

- Hand tighten bolts
- Torque bolts in diagonal sequence in small increments to the appropriate torque level listed in chart

- Tighten bolts according to chart

3000 PSI Series (Code 61) Flange recommend screw torque

Dash **size**	Flange **size**	Inch screws **(J518)**	Torque **Nm[1])**	Metric screws **(ISO 6162)**	Torque **Nm[1])**
13	1/2″	5/16-18	24	M8	24
19	3/4″	3/8-16	43	M10	50
25	1″	3/8-16	43	M10	50
32	1 1/4″	7/16-14	70	M10	50
38	1 1/2″	1/2-13	105	M12	92
51	2″	1/2-13	105	M12	92
64	2 1/2″	1/2-13	105	M12	92
76	3″	5/8-11	210	M16	210
89	3 1/2″	5/8-11	210	M16	210
102	4″	5/8-11	210	M16	210
127	5″	5/8-11	210	M16	210

6000 PSI Series (Code 62) Flange recommend screw torque

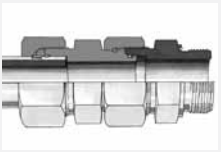
Dash **size**	Flange **size**	Inch screws **(J518)**	Torque **Nm[1])**	Metric screws **(ISO 6162)**	Torque **Nm[1])**
13	1/2″	5/16-18	24	M8	24
19	3/4″	3/8-16	43	M10	50
25	1″	7/16-14	70	M12	92
32	1 1/4″	1/2-13	105	M14	130
38	1 1/2″	5/8-11	210	M16	210
51	2″	3/4-10	360	M20	400

1) Tolerances: max. 10 %
min. 0 %

Hydraulic Flange recommend screw torque

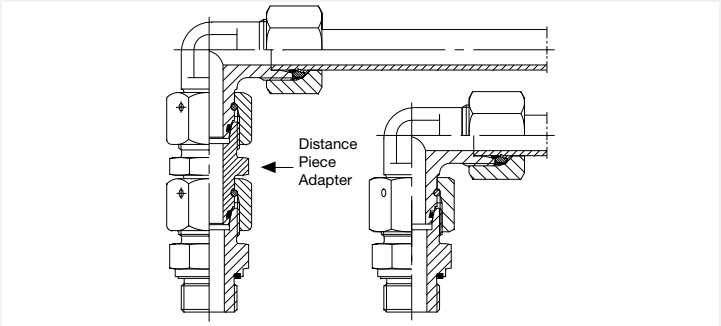
Socket screw bolt circle **(LK)**	Socket head cap **screws**	Tightening torques **Nm[1])**
LK30	M6	10
LK35	M6	10
LK40	M6	10
LK51	M10	49
LK55	M8	25
LK56	M10	49
LK62	M10	49
LK72.5	M12	85

Replacement of an EO Bite type connection

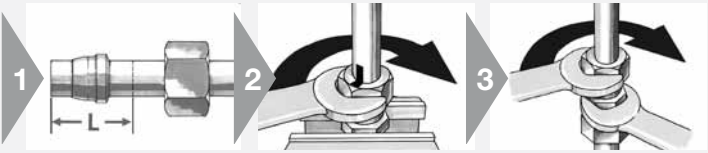


Distance piece adapter DA

- EO distance piece adapters allow replacement of bite type connections on existing pipework easily or retrofitting using EO-2
- The existing tubes can be re-used



- Use as an extension for stacked assemblies



- Cut length L off tube-end (see “DA” chapter I)
- Scrap obsolete nut

- Assemble new EO-2 functional nut or EO PSR/DPR and nut

- Thread on
- Then tighten distance piece adapter onto tube-end

Tube bending

Instructions for EO hand bending equipment

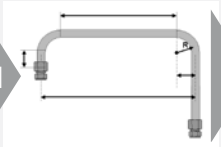
- For on-site piping jobs
- Not for mass production


BAV 6/12


BAV 6/18


BAV 20/25

1

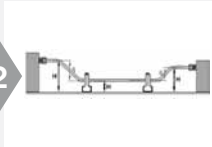


⚠ Think the whole process through and plan each individual step before starting

⚠ First bend and then cut ends to length

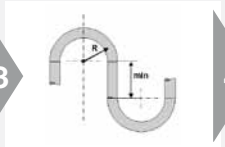
- Gather all dimensions like minimum straight lengths, extra length for flaring, bending radius, tube lengths for bows, etc.

2



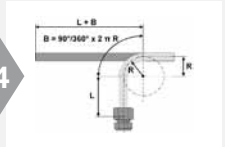
- Consider steps
- Plan for clamping

3



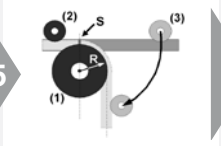
- Check bending equipment specifications for limitations

4



- Start with first elbow
- Leave tube-end longer if in doubt

5



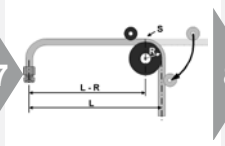
⚠ Mark start of bend on tube (S)

- Adjust tube between bending roll (1), clamping roll (2) and pressure roll (3)
- Bend tube by pulling lever

6

- Check bend angle
- Correct angle if necessary
- Gather all dimensions for next bending operation

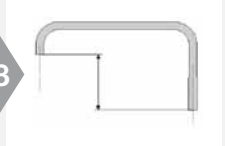
7



⚠ Mark start of bend on tube

- Continue bending
- Check and correct each result before starting next bend

8



- After the last bend, check tube for angles and dimensions
- Now cut both tube-ends to correct length
- Make sure that tube fits without tension

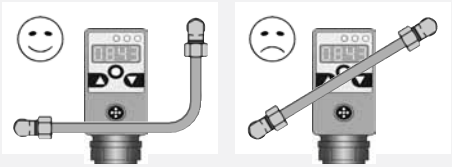
Tube line fabrication guide for leak free systems

Every hydraulic, pneumatic and lubrication system requires some form of tube fabrication and fitting installation for completion. Proper fabrication and installation are essential for the overall efficiency, leak free performance, and general appearance of any system.

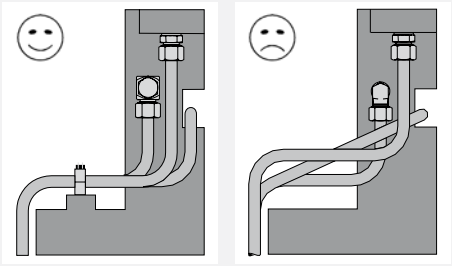
After sizing the tube lines and selecting the appropriate style of fitting, consider the following in the design of your system:

1. Accessibility of joints
2. Proper routing of lines
3. Adequate tube line supports
4. Available fabricating tools

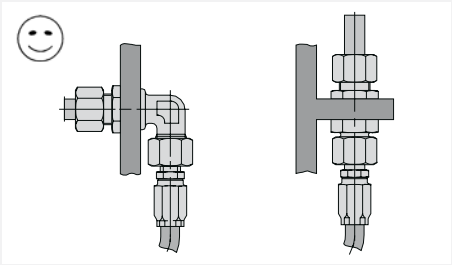
- Keep tube lines away from components that require regular maintenance:



- Right-angled – parallel – clear
- Have a neat appearance and allow for easy trouble-shooting, maintenance and repair:

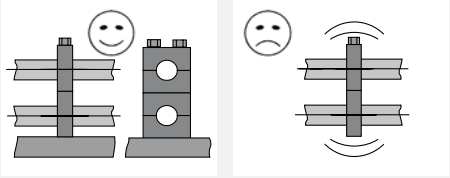


- Example for tube to hose connection:

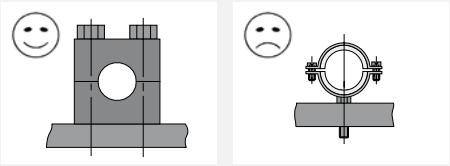


Tube line fabrication guide for leak free systems

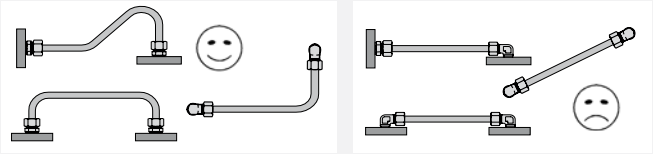
- Do not use tube lines to support other tubes
- Always fix tubes onto a rigid point with tube clamps
- Do not use cable channels to support tubes



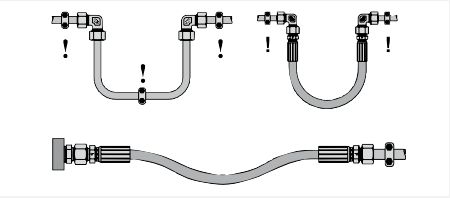
- Use appropriate tube clamps:



- Avoid excessive strain on joint:
  A strained joint will eventually leak



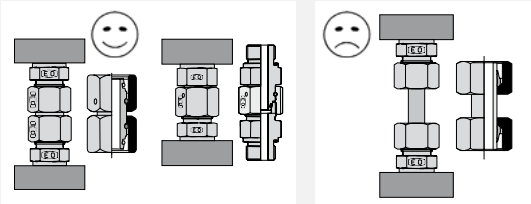
- Allow for expansion effects



- Avoid short tube length:

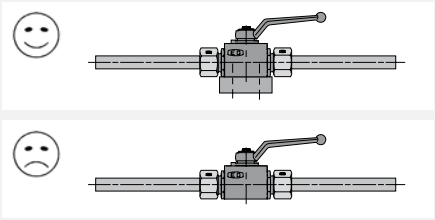
⚠ Short tube lengths increase chance of fatigue fractures

- Use adapter GZR or swivel connector for swivel fittings instead of short tube lengths



Tube line fabrication guide for leak free systems

● Support against actuating forces:



Recommended tools for tube line fabrication:

Cutting:

EO Tube cutting tool AV

EO Combined tube bending and cutting tool BAV

Tube cutters:
Steel: Type Kloskut;
Stainless Steel: Type 635 B-EX,
Type 218 B-SS Tru-Kut Sawing Vice

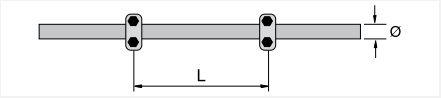
Deburring:

Parker deburring tool no. 226 DEBURR

Bending:
EO Combined tube bending and cutting tool BAV
EO Tube bending tool BV 6/18, BV 20/25
EO Tube bending tool BVP (programmable)

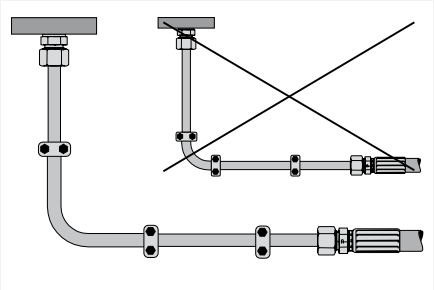
Tube lines have to be supported in certain distances:

Use sufficient tube clamps to support weight
Use sufficient tube clamps to protect joints from vibration



Ø [mm]	L [m]
6.0 – 12.7	1.0
12.7 – 22.0	1.2
22.0 – 32.0	1.5
32.0 – 38.0	2.0
38.0 – 57.0	2.7
57.0 – 75.0	3.0
75.0 – 76.1	3.5
76.1 – 88.9	3.7
88.9 – 102.0	4.0
102.0 – 114.0	4.5
114.0 – 168.0	5.0
168.0 – 219.0	6.0

Vibration has to be eliminated near by the connectors:



Allow expansion and contraction. Do not hamper expansion and contraction near by tube bends.