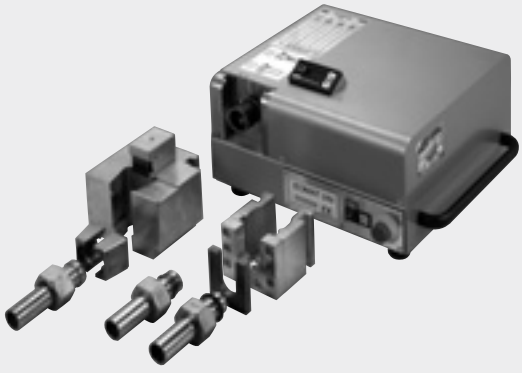
Assembly tooling



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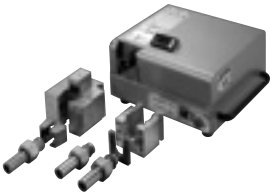
Assembly machines for EO/EO-2, Triple-Lok®	 **EOMAT ECO** p. H13	 **EOMAT UNI** p. H15	 **EOMAT PRO** p. H21
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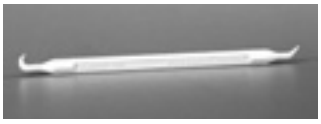
O-Ring assembly tools for O-Lok®	 **O-Lok® CORG** p. H56	 **O-Ring Pick** p. H56	
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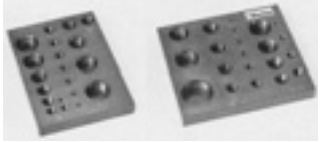
Thread identification	 **Thread ID kit** p. H59	 **Portboard** p. H59	

H

Parker tube fabricating equipment

Equipment described in this section is designed to make strong, accurate tubing systems easier and more dependable. Every time you make up a tubing circuit, you want to be sure you get strong dependable joints, accurate kink-free bends and a neat system that will stand up to years of hard service. You want to fabricate the system with the least effort and risk of errors.
Parker tube fabricating equipment is designed to help you get all these benefits. Parker has been leading the way in use of tubing and in fittings design for over 60 years. All this experience has shown Parker engineers a host of ways to make tube fabricating equipment more efficient and trouble free. You'll find them all in the equipment featured here – from improvements that help you make accurate concentric flares, to bender designs that make kink-free bending easier. They'll all help you get better tubing systems with less work and less risk of mistakes in fabrication.

Machine selection

Parker offers a variety of assembly devices and machines for different products and different applications.
Refer to overview in chapter E for machine recommendation.

Disposal of old equipment

The TFDE electrically driven assembly machines are large stationary industrial tools within the meaning of the Electrical and Electronic Equipment Act (EC Directive 2002/96/EC/"WEEE Directive"). This equipment is not usually used in private households but in industry. Within the scope of the Electrical Act, industrial users are responsible for the professional disposal of old equipment.

Service

Assembly machines and standard tooling for TFDE connectors are available from stock for immediate service.
Both purchasing and leasing are possible depending on machine type and volume of business. For limited projects, assembly equipment can be provided on a rental basis via our certified distributor network.
Special "demo"-equipment is available for sales presentations and fairs.

Technical support

TFDE machine service procedures ensure that reliable machine function and fitting performance is achieved when using genuine Parker assembly equipment.
All machines come with detailed operating manuals. Parker distributors and sales representatives are trained to give advice on operation and application. Experienced application engineers at TFDE are available when it comes to special application of TFDE assembly equipment.
In case of machine malfunction, spare machines can be provided on short notice so that production can continue. In the meantime, damaged machinery is checked and repaired at the TFDE machine repair facility. Well trained and experienced engineers take personal care that the machines return properly repaired and tested.

TFDE also offers a machine maintenance and calibration service. Standard spare parts like oil filters can be ordered from stock.

Repair procedure

Please contact your Parker Service Center for problem solving/repair. Your correspondent will organise the repair and arrange a spare machine if required. Please do not send in machines without notice to your sales correspondent. To assure optimum service, all machine shipments must include a documentation with information about: Machine type, serial number, purchase data, problem description, contact name, phone number and complete address for return.

Experienced engineers support proper operation of TFDE assembly machinery

Tool lifetime

Assembly tools are subject of wear and must be regularely (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerous assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:

- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant

Manual assembly tools for EO/EO-2

VOMO – Pre-assembly tools for EO/EO-2 tube connections

Simple but essential tool for the manual presetting of EO-fittings.

The use of a VOMO assures that the bite ring securely cuts into the tube without damage on the inner fitting cone.

Pre-assembly using VOMO or EOMAT must be done for all connections of:

– EO-2 with large tube dimensions (Tube O.D. 30 mm and above)

– EO-Progressive Stop Ring/Progressive Ring with stainless steel tube or standpipe fittings (E.g.: "BE"-type hose fitting).

For proper use, see EO assembly instructions. VOMO tools wear out and then may cause assembly failures. VOMO's must be checked regularly with "KONU" cone-templates (max. after 50 assemblies) and replaced when damaged or worn out.

Specifications:

Material: hardened tool steel
Sizes: 4 LL – 12 LL,
6 L – 42 L,
6 S – 38 S

Pre-assembly of: EO-2 and Progressive Stop Ring PSR/EO progressive Ring DPR
Economic production qty: Max. 10 assemblies per day.

Features, advantages and benefits of pre-assembly tools:

1. **Marking notch** – A special ridge engraves a circular mark onto the tube end to verify that it was properly bottomed at assembly. Failures caused by improper tube cutting or bottoming in VOMO can be recognised before final installation.
2. **Flexible** – A VOMO can be used anywhere to assure safe fitting assembly – even at assembly sites where EOMAT machines are not available.
3. **Safe** – Hazardous blowout of incorrect assembled standpipe hose fittings or stainless steel tube can be avoided by VOMO-assembly.

4. **Efficient** – There is no doubt that VOMO-presetting contributes to save time and effort in bite-type assembly. The small investment pays back immediately.
5. **Special** – VOMO tools are specifically designed and manufactured to match EO-fitting standards.
6. **Tool lifetime** – Assembly tools are subject of wear and must be regularely (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerous assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:

- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant

Series	Tube O.D. mm	Pre-assembly tools Order code	Cone-templates Order code
LL	04	VOMO04LLX	KONU04LL
	06	VOMO06LLX	KONU06LL
	08	VOMO08LLX	KONU08LL
	10	VOMO10LLX	KONU10LL
	12	VOMO12LLX	KONU12LL
L	06	VOMO06LX	KONU06L[1)]
	08	VOMO08LX	KONU08L[1)]
	10	VOMO10LX	KONU10L[1)]
	12	VOMO12LX	KONU12L[1)]
	15	VOMO15LX	KONU15L
	18	VOMO18LX	KONU18L
	22	VOMO22LX	KONU22L
	28	VOMO28LX	KONU28L
	35	VOMO35LX	KONU35L
	42	VOMO42LX	KONU42L
S	06	VOMO06SX	KONU06L[1)]
	08	VOMO08SX	KONU08L[1)]
	10	VOMO10SX	KONU10L[1)]
	12	VOMO12SX	KONU12L[1)]
	14	VOMO14SX	KONU14S
	16	VOMO16SX	KONU16S
	20	VOMO20SX	KONU20S
	25	VOMO25SX	KONU25S
	30	VOMO30SX	KONU30S
	38	VOMO38SX	KONU38S

1) Cone-templates for tube O.D.6 to 12 mm are identical in series L and S.

KONU – Cone-template for tools VOMO/MOK/MOSI

Cone-templates are essential for monitoring wear on pre-assembly tools like VOMO, MOK or MOS.

KONU must be regularly used to prevent fitting failures caused by worn out or damaged tools (DIN 3859-2: max. each 50th assembly).

For proper use see EO assembly instructions, Chapter E.

Specifications:

Material: hardened tool steel
Sizes: 4 LL – 12 LL,
6 L – 42 L,
6 S – 38 S
(Sizes 6 L – 12 L
are identical to 6 S – 12 S)

Features, advantages and benefits of cone-templates:

1. **Special** – KONU are high precision cone-templates specifically designed and manufactured to match EO standards.
2. **Maintenance tool** – A leaking fitting can be easily checked and replaced if worn-out.

Tube O.D. mm	Cone gauges Order code
04-LL	KONU04LL
06-LL	KONU06LL
08-LL	KONU08LL
10-LL	KONU10LL
12-LL	KONU12LL
06-L	KONU06L[1])
08-L	KONU08L[1])
10-L	KONU10L[1])
12-L	KONU12L[1])
15-L	KONU15L
18-L	KONU18L
22-L	KONU22L
28-L	KONU28L
35-L	KONU35L
42-L	KONU42L
06-S	KONU06L[1])
08-S	KONU08L[1])
10-S	KONU10L[1])
12-S	KONU12L[1])
14-S	KONU14S
16-S	KONU16S
20-S	KONU20S
25-S	KONU25S
30-S	KONU30S
38-S	KONU38S

[1]) Cone-templates for tube o.d. 6 to 12 are identical in series L and S.

Selection guide: Checking equipment for EO assembly

Performance of EO tube connections is depending on perfect condition of pre-assembly tools and proper assembly process.
Cone-templates KONU for monitoring MOK/VOMO tool wear and AKL gauges for checking result of PSR preassembly are available.

	KONU 	**AKL** 
Function	Checking of preassembly tools	Checking of PSR assemblies
Will detect: Deformed **MOK/VOMO**	Yes, compared to template	Yes, if relevant for PSR performance
Will detect: Visual damage and cracks of **MOK/VOMO**	No	Yes, if relevant for PSR performance
Will detect: Assembly failures like: tube end not bottomed, underassembly of PSR	No	Yes, if relevant for PSR performance
Will detect: Insufficient bite of **PSR**	No Visual check required	No Visual check required
Application	Expert template for trained and experienced engineers in workshop	Gauge for production of PSR assemblies

KONU – Cone-template for EO pre-assembly tools

Limitations
Cone-template KONU detect wear and deformation of pre-assembly tools like VOMO, MOK or MOS. But it does not indicate failures on completed assemblies.
Cone-template KONU will not detect all possible failures of pre-assembly tools. Pre-assembly tools must be scrapped when they show visual wear or cracks, even if KONU check is OK.

Application
KONU is expert tooling for trained and experienced engineers. For practical monitoring of assembly result in production, distance gauge AKL are recommended.

Distance Gauge for Assembly AKL

Distance Gauges AKL

Distance gauges AKL are suitable for checking the pre-assembly result of Progressive Rings PSR. They are used on pre-assembled tubes before final installation. The green LED lights up, when none of the following failures is detected:

- Excessive wear of preassembly tools MOK
- Excessive assembly force / pressure setting
- Tube end by far not bottomed in assembly tool MOK.

Therefore, assembly check by cone-template KONU can be void. Use of distance gauges AKL does not replace the check of the bite (visible collar in front of Progressive Ring).

Specification

Function:	Distance gauge with LED indication
For checking of:	Machine pre-assembly of Parker EO Progressive Ring PSR
Series:	LL/L/S
Tube-OD:	4–38/42 mm
Dimensions:	Length: approx. 130–160 mm
	Front diameter: approx. 30–52 mm
Power:	2 × Battery AA – Mignon – LR6 (included)
Scope of supply:	Distance gauge with LED indication, batteries, master piece and instructions in a plastic case

Features, Advantages & Benefits of distance gauge AKL

1. Clear – In contrast to the visual evaluation, the simple good/bad decision is obvious, even for less experienced operators.
2. Economical – The distance gauges AKL are fast in application. The production process is not slowed down noticeably compared with other testing methods.
3. Result-oriented – In the comparison to examining the tools with the AKL teachings the assembly result is examined. Thus also the failure opportunity "Tube by far not bottomed" is detected.
4. Practical – The gauges are light, handy, easy, and can be fastened with an eye. Standard batteries are used, so that a long life span is reached.
5. Safe – The measuring head consists of high-grade steel and is not adjustable or detachable. A master piece for regular functional testing is shipped with each AKL gauge.
6. Innovative – For customers of prefabricated hydraulic tubes, so far it was not easy to inspect the assembly quality of incoming goods.Thus incorrect assemblies, which are caused by use of worn pre-assembly tools, remained often undiscovered. With the distance gauges AKL an efficient and effective inspection of incoming goods can be accomplished, allowing pro-active quality management together with the tube supplier.

Limitations

- Distance gauges AKL are suitable only for the inspection of machine pre-assembly. After final tightening of the connection, a failure might be indicated, even if the Progressive Ring was properly assembled by the pre-assembly machine.
- Distance gauges AKL are designed for the use with Progressive Rings PSR. Parker does not take responsibility for the function with other bite type fittings. Distance gauges AKL are not suitable for checking EO-2 and EO2-FORM connections.
- Use of distance gauges AKL does not replace the check of the bite (visible collar in front of Progressive Ring).

Function

Distance gauges AKL are suitable for checking the effect of worn tools on pre-assembly result of Progressive Rings PSR. They are used on pre-assembled tubes before final installation. The distance gauges AKL particularly detects the position of the Progressive Ring PSR in relation to the tube end. Shining of the green LED indicates that the assembly cone can be further used. Flicker of the green LED is quite possible, since the installed tube in the gauge can have some clearance. If the wear of the assembly tool reaches 0,1 mm on the cone, the LED shines no longer and indicates that the tool is worn. These defective tube assemblies must not be installed and the worn assembly tool must be replaced. The inspection has to take place regularly, at the latest after 50 assemblies. Then, assembly tool check by cone-template KONU can be void.

Operation

- Shining of the green LED indicates that the assembly cone can be further used
- If the LED doesn't shine, the assembly must not be used

Applications

- Mass production of hydraulic tube assemblies for mobile hydraulics, automotive and agricultural vehicles
- Commercial tube manipulators for hydraulic tube assemblies
- Inspection of incoming tube assemblies at the final installation plant

Ordering

Size	Order code	Size	Order code	Size	Order code
04-LL	AKL04LL	10-L	AKL10L	10-S	AKL10S
06-LL	AKL06LL	12-L	AKL12L	12-S	AKL12S
08-LL	AKL08LL	15-L	AKL15L	14-S	AKL14S
10-LL	AKL10LL	18-L	AKL18L	16-S	AKL16S
12-LL	AKL12LL	22-L	AKL22L	20-S	AKL20S
06-L/S	AKL06LS	28-L	AKL28L	25-S	AKL25S
08-L/S	AKL08LS	35-L	AKL35L	30-S	AKL30S
		42-L	AKL42L	38-S	AKL38S

Manual assembly devices for EO/EO-2 tube connections

Machine selection guide

Manual assembly devices are available to reduce assembly time and effort. High assembly quality and consistency assures reliable fitting performance. EO assembly devices are manually operated and do not need any external power supply.

Due to the low weight, easy handling and simple but reliable design, the EO assembly devices are the ideal tool for tube preparation of small quantities.

For efficient mass production, manual devices are not suitable, therefore EOMAT machines are recommended.

Features, advantages and benefits

1. **Flexible** – Manual assembly devices are portable and do not need any power supply. Therefore they are ideal for on-site tube assembly, repair and plant maintenance.
2. **Economic** – Manual assembly devices close the gap in between manual fitting pre-assembly in a vice and the EOMAT technology. The devices contribute to save time and effort in bite type assembly. The little investment pays back immediately.
3. **Controlled assembly** – After pre-assembly, the tube joint can be easily inspected before final installation. Therefore, this mandatory step in fitting assembly is less likely to be forgotten.
4. **Special** – Each device has been especially developed for the efficient use in a certain application. The HVM-B is a handy tool for the quick pre-assembly of EO Progressive rings onto soft steel tube. The EO-KARRYMAT is a real problem solver when it comes to on-site assembly of medium to large EO-Progressive rings and EO-2 fittings onto steel and stainless steel tube.

How to select the ideal assembly device for your application:

	HVM-B 	**EO-KARRYMAT** 
Assembly method EO-2: PSR/DPR/D: Triple-Lok®:	 not suitable Stroke controlled not suitable	 Pressure controlled Pressure controlled not suitable
Tube specification Material: Outside diameter/mm: Min. U-bend: Wall thickness:	 Steel 4–15 mm 25 mm no limitation	 Steel, Stainless Steel 6–42 mm 66 mm no limitation
Tool specification	Special assembly cones MOSI and plates HL	Standard assembly cones MOK and plates GHP
Operation drive	Lever with eccentric cam	Handpump
Process control	Assembly stroke determined by tool geometry	Pressure control according to selection chart
Preassembly is equal to EO-2: PSR: D/DPR:	 – 1 turn 1 turn	 Gap closed 1½ turn 1¼ turn
Performance Overall cycle time: Economic production quantity:	 10 secs. max. 50 assemblies per day	 30–60 secs. max. 20 assemblies per day
Application	Simple tool for quick pre-assembly of small dimension EO-Progressive rings onto steel tubes	Most efficient for one-site assembly of medium to large DPR- and EO-2 connections onto any suitable tube material. Repair jobs and hydraulic services

HVM-B Pre-assembly tool

This pre-installation tool is a simple tool for a quick and safe pre-assembly of EO-Progressive Stop Ring/Progressive ring. The tool is very handy and can be used at any site provided a vice is available. Suitable for LL, L and S series and tube sizes from 4 to 15 mm O.D.

Attention:

- ⚠ **Not suitable for EO-2 assembly.**
- ⚠ **Not suitable for stainless steel progressive ring assembly.**
- ⚠ **Final assembly of ½ turn in fitting body required.**
- ⚠ **Not suitable for tube OD larger 15 mm**

Specifications:

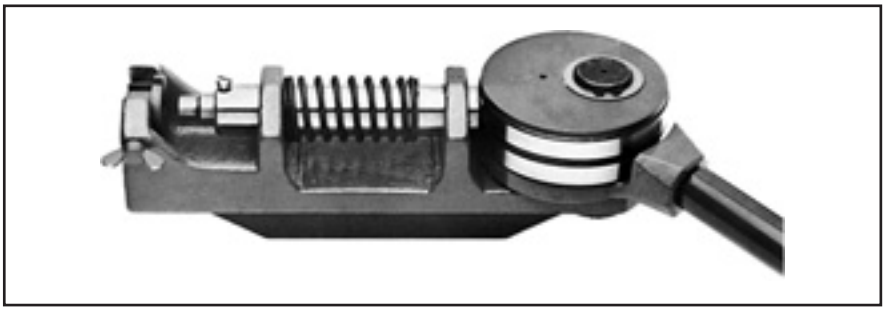
For pre-assembly of: EO Progressive Stop Ring (PSR)/Progressive Ring (DPR)
Pre-assembly equals: 1 turn of nut

For assembly check and fitting installation see assembly instructions chapter E.

Tube O.D.: 4 to 15 mm
Min. U-bend: 25 mm
Series: LL, L and S
Tube and fitting material: Steel
Weight: approx. 7.0 kg (without tools)

Features, advantages and benefits of pre-assembly tool:

1. **Special** – HVM-B is designed and manufactured to match EO-DPR standards.
2. **Vice mounted** – For easy workshop use, the HVM-B can be clamped into any vice.
3. **Flexible** – A HVM-B can be used anywhere to assure safe fitting assembly – even at assembly sites where EOMAT technology is not available.
4. **Efficient** – There is no doubt that HVM-B-presetting contributes to save time and effort in bite-type assembly. The small investment pays back immediately.



Type	Order code
HVM-B pre-assembly tool device for mount in vice, without tools	HVMBKPLX

Series	Tube O.D. mm	Tube location plate Order code	Assembly cone Order code	Cone-template Order code
LL	4	HL04X	MOSI04LLX	KONU04LL
	6	HL06X	MOSI06LLX	KONU06LL
	8	HL08X	MOSI08LLX	KONU08LL
	10	HL10X	MOSI10LLX	KONU10LL
	12	HL12X	MOSI12LLX	KONU12LL
L	6	HL06X	MOSI06LX	KONU06L[1])
	8	HL08X	MOSI08LX	KONU08L[1])
	10	HL10X	MOSI10LX	KONU10L[1])
	12	HL12X	MOSI12LX	KONU12L[1])
	15	HL15X	MOSI15LX	KONU15L
S	6	HL06X	MOSI06SX	KONU06L[1])
	8	HL08X	MOSI08SX	KONU08L[1])
	10	HL10X	MOSI10SX	KONU10L[1])
	12	HL12X	MOSI12SX	KONU12L[1])
	14	HL14X	MOSI14SX	KONU14S

1) Cone-templates for tube o.d. 6 to 12 are identical in series L and S.

HVM-B Pre-assembly tool

1

How to use

- Clamp HVM-B into vice.
- Select required assembly cone (MOSI) and insert.
- The assembly cones are marked with tube O.D. and series (e.g. 10-L).

2

- Insert the tube location plate – HL – of corresponding size and fasten with screw.
- The tube location plates are marked with tube O.D. (e.g. “10”).

3

- Slip nut “M” and Progressive Stop Ring PSR/Progressive ring “DPR” (or cutting ring “D”) over tube end and insert into pre-assembly tool.
- Nut position must be in front of tube location plate – HL – !

4

- Hold tube against stop in the assembly cone.

5

- Pull lever to turn the eccentric cam (Pre-assembly).

Attention

⚠ **For assembly check and final assembly see PSR/DPR instructions.**

Attention:

⚠ **At final assembly nut must be tightened by ½ turn.**

EO-KARRYMAT portable pre-assembly device for EO tube connections

Type	Order code
EO-KARRYMAT assembly device complete device including handpump and carrying case, including operation manual. Tools (assembly cone MOK and backing plate GHP) must be ordered separately.	EOKARRYMAT
Promotion leaflet UK/DE	4044-DE/UK
Separate operating manual UK/DE/FR/IT	4044-T
Spare parts	
Handpump	82C-2HP
Pressure gauge	EOKARRYMAT/MANO
Pressure chart sticker	EOKARRYMAT/CHART
Cover hinge	EOKARRYMAT/HINGE
Assembly head	EOKARRYMAT/BLOCK

The EO-KARRYMAT is a dependable device for safe and efficient bite-type presetting. It allows pre-assembly of even large dimension steel and stainless steel tube at assembly sites where EOMAT technology is not available.

The EO-KARRYMAT consists of a hydraulic drive and a handpump. The hydraulic assembly pressure can be read on a gauge. The EO-KARRYMAT comes as one unit with all components firmly attached to a practical carrying frame.

Specifications:

For pre-assembly of: EO PSR/DPR and EO-2

Pre-assembly equals:
EO Progressive Stop Ring (PSR): 1½ turns of nut

EO Progressive ring (DPR): 1¼ turns of nut

EO-2 "Gap closed"

⚠ **For assembly check and fitting installation see assembly instructions chapter E.**

Tube O.D.: 6 to 42 mm

Min. U-bend: 66 mm

Series: L and S

Tube and fitting material: Steel and stainless steel

Total cycle time: approx 30–60 sec.

Weight: approx. 28 kg

Economic production quantity: max. 20 assemblies per day

Oil: HLP23–1.22 (filled before delivery)

Features, advantages and benefits of EO-KARRYMAT:

1. **Ideal** – Weighing 28 kg, the EO-KARRYMAT is portable and does not need any power supply. Therefore the EO-KARRYMAT is the ideal tool for on-site tube assembly, repair and plant maintenance.
2. **Economic** – The EO-KARRYMAT closes the gap in between manual fitting pre-assembly in a vice and the EOMAT technology. EO-KARRYMAT assembly is far less hard work as manual assembly but it achieves the dependent assembly result of the EOMAT assembly machine.
3. **"Must" for stainless steel** – As direct assembly of stainless steel tubes in bite type fittings results in failure, a special pre-assembly process is mandatory according to ISO 8483 / DIN 3859 and all manufacturers instructions. The EO-KARRYMAT fulfils this requirement.
4. **Dependable** – The use of the EO-KARRYMAT is far less demanding than manual fitting assembly using wrenches. It helps to prevent failures caused by insufficiant fitting assembly which is most critical on large dimension steel and stainless steel tube.
5. **Controlled assembly** – After pre-assembly, the tube joint can be easily inspected before final assembly. Therefore, this mandatory step in fitting assembly is less likely to be forgotten.
6. **Special** – The EO-KARRYMAT has been especially developed for the efficient on-site assembly of EO Progressive ring and EO-2 fittings. The tools are designed to allow safe assembly of even large dimension steel and stainless steel tubes without excessive hard work.

The applications:

- Repair workshops
- Mobile repair service
- Plant maintenance in process engineering, paper production, power plants, offshore exploration, industrial production
- On-site assembly of tubing systems

Tube O.D. ∅ [mm]	EO-2 P [bar]	PSR/DPR P [bar]
6	45	30
8	55	40
10	65	50
12	75	60
14	95	70
15	95	70
16	110	90
18	110	90
20	160	120
22	120	110
25	210	160
28	160	140
30	300	200
35	250	180
38	350	280
42	300	230
Installation	min. 60° max. 90°	~ 30°

Assembly machines for EO/EO-2 and Triple-Lok®

Machine selection guide

EOMAT assembly is much more cost efficient than manual assembly of EO-fittings. Assembly time and effort are greatly reduced. Proper and consistant pre-assembly support safe and leakfree fitting performance.

EOMAT machines are specifically designed to match EO-2, EO PSR/DPR rings and Triple Lok® standards. Assembly is achieved with high precision and repeatability.

EOMAT machines are available in several versions to serve individual applications. All machines are designed for reliable workshop use even under severe construction site working conditions. Tool handling and machine operation are simple.

How to select the ideal EOMAT machine for your application:

Features, advantage and benefits:

1. **Universal** – Assembly of EO-2, EO PSR/DPR rings and 37° flaring for Triple-Lok® can be done with just 1 machine.
2. **Efficient** – With a cycle time of some 12 to 15 seconds the EOMAT machine greatly saves assembly time and effort. The investment pays back quickly.
3. **Safe** – Proper pre-assembly greatly reduces the danger of leaking fittings or even hazardous tube blow out.
4. **Strong** – Even 37° flaring of larger sized stainless steel tube is done within few seconds.
5. **Flexible** – All tube dimensions from 6 to 42 mm can be used. All common tube materials are covered, even plastic tube (EO-2 and PSR/DPR only).
6. **Marking notch** – A special ridge makes a circular mark onto the tube end to verify that it was properly bottomed at assembly. Failures caused by improper tube cutting or bottoming in MOK can be recognised before final installation.
7. **Reliable** – For more than 20 years, hundreds of EOMAT machines have operated under heavy duty workshop conditions.

Selection chart EOMAT Pre assembly and Flaring machines

	EOMAT ECO	EOMAT UNI	EOMAT PRO
Assembly method:			
EO-2	Pressure controlled	Pressure controlled	Pressure controlled
D/PSR/DPR	Pressure controlled	Pressure controlled	Stroke controlled
Triple-Lok®	–	Conventional 37° flaring	
Tube specification:			
Material	Steel, Stainless Steel	Steel, Stainless Steel	Steel, Stainless Steel, copper, nylon
Outside diameter	6–42 mm	6–42 mm	PRO22 / PRO42: 4–22/4–42 mm
Min. U-bend	75 mm	65 mm	PRO22 / PRO42: approx. 35/70 mm
Wall thickness:			
EO-2/PSR/DPR	No limitation	No limitation	No limitation
Triple Lok®	not applicable	6×1 to 38×4 or 42×3 mm (Tube O.D. × wall thickness)	–
Operation:			
Setting	Manual pressure adjustment according to selection chart Depending on: Assembly type; Tube dimension; Tube material	Manual pressure adjustment according to selection chart Depending on: Assembly type; Tube dimension; Tube material	Tool detection and automatic adjustment Manual adjustment of pressure is possible
Process control	Pressure gauge	Pressure gauge	PLC with display
Error detection:	No	No	Warning light and message displayed if deviations in assembly process occur
Memory function	No	No	Memory options for custom application on MOK transponderchip
Oil temperature control	No	No	Warning light and message displayed
Foot operating switch	Not available	Not available	Available
Performance	1 Phase/230 V	1 Phase/230 V	400 V, 50 Hz, 3-phase
Overall cycle time (sec.):			
EO-2 presetting	20	12	PRO22 / PRO42: approx. 8/10 seconds
PSR/DPR presetting	25	15	PRO22 / PRO42: approx. 10/12 seconds
37° flaring	–	15	–
Economic production quantity:	max. 50 assemblies per day	max. 300 assemblies per day	100 or more assemblies per day
Continuous operating:	80 %	80 %	100%
Weight	approx. 30 kg	approx. 66 kg	approx. 90 kg
Application	**Portable machine for repair and workshops**	**Universal assembly machine for workshop**	**Cost-effective commercial production**

EOMAT ECO Mobile assembly machine for EO-2 and PSR hydraulic fittings

The EOMAT ECO is a portable machine for the assembly of EO-2 and EO Progressive Ring fittings.
This electro-hydraulic unit is simple to operate; the assembly pressure is set on the digital display. The equipment is simple to use, robust and easy to move.
The EOMAT ECO is an ideal piece of equipment for hydraulic service engineers.

Technical data

Application:	assembly of Parker EO-2 and PSR Progressive Ring fittings assembly of cutting ring fittings to DIN EN ISO 8434-1
Process:	pressure-controlled press operation through assembly tools
Drive:	electro-hydraulic
Assembly corresponds to:	EO-2: gap closed PSR: 11/2 turns of the nut
Tube material:	steel and stainless steel
Tube diameters:	6 to 42 mm
Series:	L and S
Min. U-bend:	75 mm
Speed:	working stroke 15 to 20 secs, total cycle time approx. 20 to 25 secs
Dimensions:	750 × 360 × 300 mm
Weight:	30 kg
Electrical power rating:	230V 1-phase 50 Hz 700 W

Operation:

for detailed assembly instructions, see our fittings technology technical handbook, chapter E. For safety information, see machine operating manual.

1. Install assembly cone and backing plate
2. Set the setting pressure on the display in accordance with the chart
3. Insert tube complete with nut and ring
4. Operate START button and keep pressed
5. Hold the tube firmly during the assembly operation and press against the stop
6. The assembly operation is complete when the cylinder has travelled back to its starting position
7. Assembly inspection and final assembly should proceed in accordance with the operating manual.

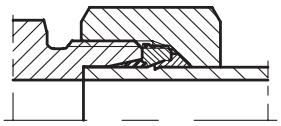
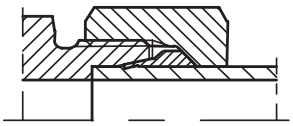
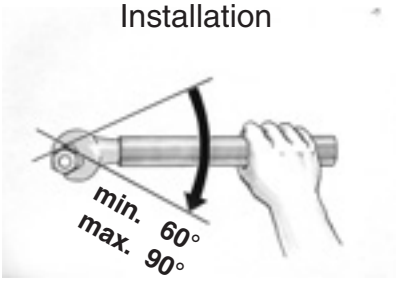
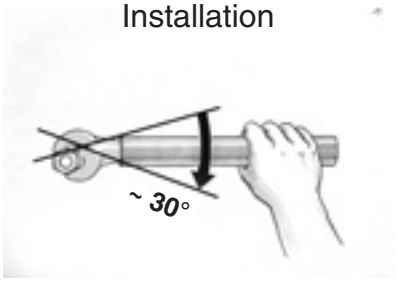
Performance:

Economic production quantity: max. 100 assemblies per day.

Type	Order code
EOMAT ECO basic machine Ready to operate, including operating manual Without tools, no separate assembly fixture required	EOMATECO230V
Bulletin	4046 via Parker catalogue service EMDC
Operating manual UK/DE/FR/IT/ES	EOMATECO/MANUAL
Pressure chart sticker	EOMATECO/CHART
Standard preventive maintenance	EOMATECO/INSPECTION

Setting pressures

EOMAT ECO

Tube-O.D.	EO-2	PSR/DPR
		
∅ (mm)	P (bar)	P (bar)
6	25	20
8	35	25
10	40	35
12	45	40
14	60	45
15	60	45
16	70	60
18	70	60
20	105	75
22	75	70
25	135	105
28	105	90
30	190	130
35	160	115
38	210	180
42	190	145
	Installation 	Installation 

The stated values are guidelines. The results of pre-assembly should therefore be thoroughly checked.

EOMAT UNI assembly and flaring machine

General

The EOMAT UNI is an electro-hydraulic machine for the assembly of:

EO-2
EO PSR/DPR and
Triple-Lok® 37° flared tube fittings.

Compared to manual assembly it greatly reduces assembly time, effort and cost and also guarantees leakfree performance of constant high-quality fitting assemblies.

Common tube materials such as steel (ST 37.4 NBK, ST 52.4 NBK), stainless steel (1.4571/1.4541/316Ti or similar) and copper can be pre-assembled.

The tool range covers all metric tube sizes from 4 to 42 mm outer diameter. The required operating pressure is variable and set at the LED-Display. The unit may therefore be used for a variety of different applications. The tooling for either EO-2/ PSR/DPR pre-assembly or tube flaring may be manually replaced, without the use of tools.

Technical data

Tube diameters: 6–42 mm

Min. U-bend: 65 mm

Series: L and S

Oil:
Esso Nuto H 32 or equal, 3.5L
(Reference oil change, see label on unit)
Operating pressure:
Variable from 15 to 200 bar
Dimensions:
Width 535 mm, height 285 mm, depth 515 mm

Performance:

Overall cycletime: 12–15 sec.
Economic production quantity:
max. 300 assemblies per day

Hydraulic pump:
1.2 kW – 3.7 l/min
Electrical connection:
220–240 V/ 1~ / 50 Hz / 9.5 A
Connection cable:
5 m – Earth plug
Weight: 66 kg

We reserve the right to make modifications in the course of further technical development.

Features, advantages and benefits:

1. **Universal** – Assembly of EO-2, EO-PSR/DPR and 37° flaring for Triple-Lok® can be done with just 1 machine.
2. **Efficient** – With a cycle time of some 15 seconds the EOMAT UNI greatly saves assembly time and effort. The investment pays back quickly.
3. **Safe** – Proper pre-assembly greatly reduces the danger of leaking fittings or even hazardous tube blow out.
4. **Strong** – Even 37° flaring of larger sized stainless steel tube is done within few seconds.
5. **Flexible** – All tube dimensions from 4 to 42 mm can be pre-assembled. All common tube materials are covered.
6. **Workshop tool** – At 66 kg, the EOMAT UNI can be brought to an assembly site.
7. **Marking ridge** – All MOK tools feature a special ridge in the bottom surface which is designed to make a circular groove into the tube-end at assembly. No mark indicates that the tube-end has not been properly bottomed at assembly.
8. **Reliable** – For more than 20 years, hundreds of machines are operated under heavy duty workshop conditions.

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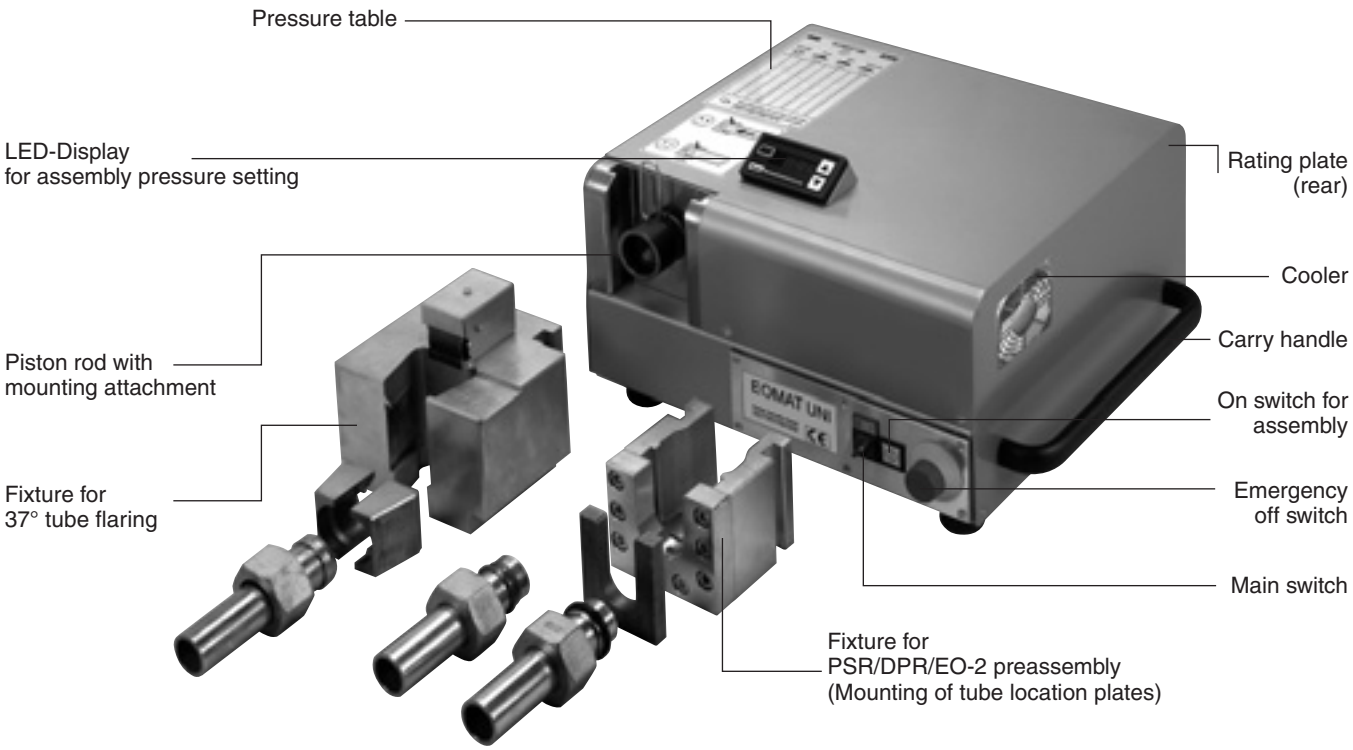
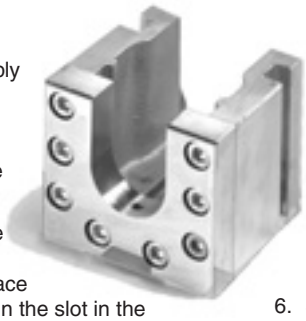


EOMAT UNI assembly and flaring machine

Basic operation for EO-2 Functional nuts

See EO-2 instructions for fitting assembly

1. Adjust EO-2 pressure according to chart (A)
2. Insert the pre-assembly fixture in the tool mounting (weight approx. 5.5 kg).
3. Select the assembly cone (MOK) and backing plate (GHP) in accordance with the tube size and type.
4. Place and lock the assembly cone in the tool holder. Place the backing plate in the slot in the fixture.



5. Slide the EO-2 functional nut onto the tube, which has been cut off square and deburred.
6. Place the tube with the EO-2 functional nut in the pre-assembly fixture between backing plate and assembly cone.
7. Press the tube against the stop in the assembly cone. Hold the tube in this position. Press and hold the start button until the pre-assembly process is complete.
8. Take the assembled tube connection out of the location plate. See EO-2 assembly instruction (chapter E) for assembly check and installation instructions.
9. Check assembly result before final installation.

Basic operation for EO PSR/DPR ferrules

See PSR/DPR instructions for fitting assembly

1. Adjust PSR/DPR pressure according to chart (A)
2. Insert the pre-assembly fixture in the tool mounting (weight approx. 5.5 kg).
3. Select the assembly cone (MOK) and backing plate (GHP) in accordance with the tube size and type. Check the assembly cone using a cone-template.
4. Place the assembly cone in the tool holder. Place the backing plate in the slot in the fixture.
5. Oil the ring, nut and assembly cone.
6. Slide the nut and ring onto the tube, which has been cut off square and deburred.
7. Place the tube with nut and progressive ring or cutting ring in the pre-assembly fixture between backing plate and assembly cone.
8. Press the tube against the stop in the assembly cone. Hold the tube in this position. Press and hold the start button until the pre-assembly process is completed.
9. Take the pre-assembled tube out of the backing plate. See EO PSR/DPR assembly instruction (chapter E) for assembly check and installation instructions.
10. Check assembly result before final installation.

Basic operation for 37˚ tube flaring

See Triple-Lok® instructions for fitting assembly

1. Adjust Triple-Lok® pressure according to chart (A)
2. Insert the tube flaring fixture in the toolmounting (weight approx. 19.5 kg).

3. Lubricate the flaring pin.
4. Insert the flaring die set corresponding to the tube size.
5. Push the nut and support sleeve onto the tube.
6. Push the tube through the flaring die hole to the stop plate. To prevent misalignment, longer tubes are to be supported during the flaring process.
7. Press and hold START button until flaring process is completed.
8. Lift the tube with the flaring die upwards out of the fixture.
9. To release the tube, place the flaring die set in the opening provided in the fixture and tilt the tube to one side.
10. Check assembly result before final installation.

Important!

Only proceed with pre-assembly when a tube with nut and cutting ring has been placed in the fixture (failure to observe this can result in damage to the tools). Longer tubes are to be suitably supported during pre-assembly.The assembly cones are to be regularly checked for correct dimensions using the cone-template and should be replaced when necessary.

Caution: do not reach into the working area of the pre-assembly fixture while it is operating!

Important!

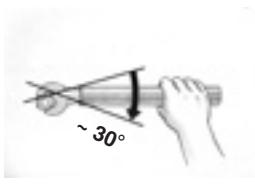
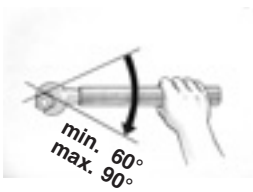
Do not drive the flaring pin into the flaring die without a tube in position. The roughened surface of the flaring die must be absolutely free of oil and grease to prevent the tube from slipping.

Caution: do not reach into the working area of the flaring fixture while it is operating!

EOMAT UNI assembly and flaring machine

Pressure setting chart A

EOMAT UNI

Tube-O.D.	EO-2	PSR/DPR	Triple-Lok®
∅ (mm)	P (bar)	P (bar)	P (bar)
6	30	25	20
8	35	30	25
10	45	35	35
12	50	40	35
14	60	50	45
15	60	50	60
16	70	55	60
18	70	55	70
20	100	80	95
22	80	75	95
25	130	100	105
28	100	90	125
30	180	125	135
35	150	110	155
38	200	170	165
42	180	140	185
Installation			

Steel (ST 37.4 NBK, ST 52.4 NBK, …)

Stainless Steel (ST 1.4571, 1.4541, 1.4301, 316 Ti, …)

The given values are a guide. The results of pre-assembly and/or tube flaring are therefore always to be checked.
For detailed instructions on tube preparation, tool selection, assembly check and final installation see chapter E.

EOMAT UNI assembly and flaring machine

Ordering

Type	Order code
EOMAT UNI Basic machine Ready to use, including operation manual Filled with hydraulic oil Without EO assembly fixture/Flaring fixture Without tools for EO-assembly/37˚ flaring Basic machine 230 V, 1 Phase, 50 Hz	EOMATUNI230V
Fixture for PSR/DPR/EO-2 assembly	EOMATSCHNEIDRX
37° Flaring fixture for Triple-Lok® including flaring pin	EOMATBOERDELBX
EOMAT UNI promotion leaflet UK	4042/UK
EOMAT UNI promotion leaflet DE	4042/DE
EOMAT UNI operating manual UK/DE/FR/IT	EOMATUNI/MANUAL
Standard preventive maintenance	EOMATUNI/INSPECTION

Assembly fixtures, tools, cone-templates, and lubricant must be ordered separately

Assembly tools for PSR/DPR/EO-2 see page H19–H20.

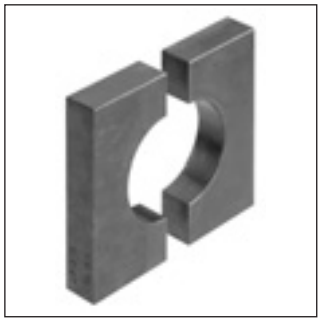
37° flaring tools for Triple-Lok® see page H30.

Spare parts

Type	Order code
Fixing clip for MOK	EOMAT/CLIP
37° flaring pin	EOMAT/FLAREPIN
O-ring for flaring pin	EOMAT/0212500
Tube stop assembly for flaring block	EOMAT/0213800
Pressure chart sticker	EOMATUNI/CHART
Spring for flaring block	EOMAT/0213500
LED Display for pressure adjustment	SCE-025-01

EO PSR/DPR and EO-2 assembly tools for EOMAT/EO-KARRYMAT

Assembly cone MOK



Tube locating plate GHP

Cone-template KONU for MOK

Assembly fixture must be installed on EOMAT UNI II/III

Size		Order code				
Series	Tube-O.D.	Assembly cones for EO PSR/DPR MOK	Assembly cones for EO-2[4]) MOK	Backing plates GHP	Distance control gauges AKL	Cone-templates KONU
LL[3])	4 6 8 10 12	MOK04LLX MOK06LLX MOK08LLX MOK10LLX MOK12LLX	as MOK for PSR/DPR	GHP04X GHP06X GHP08X GHP10X GHP12X		KONU04LL KONU06LL KONU08LL KONU10LL KONU12LL
L	6 8 10 12 15 18 22 28 35 42	MOK06LX MOK08LX MOK10LX MOK12LX MOK15LX MOK18LX MOK22LX MOK28LX MOK35LX MOK42LX	MOKEO206L MOKEO208L MOKEO210L MOKEO212L MOKEO215L MOKEO218L MOKEO222L MOKEO228L MOKEO235L MOKEO242L	GHP06X[1]) GHP08X[1]) GHP10X[1]) GHP12X[1]) GHP15X GHP18X GHP22X GHP28X GHP35X[2]) GHP42X[2])	AKL06LS AKL08LS AKL10L AKL12L AKL15L AKL18L AKL22L AKL28L AKL35L AKL42L	KONU06L[1]) KONU08L[1]) KONU10L[1]) KONU12L[1]) KONU15L KONU18L KONU22L KONU28L KONU35L KONU42L
S	6 8 10 12 14 16 20 25 30 38	MOK06SX MOK08SX MOK10SX MOK12SX MOK14SX MOK16SX MOK20SX MOK25SX MOK30SX MOK38SX	MOKEO206S MOKEO208S MOKEO210S MOKEO212S MOKEO214S MOKEO216S MOKEO220S MOKEO225S MOKEO230S MOKEO238S	GHP06X[1]) GHP08X[1]) GHP10X[1]) GHP12X[1]) GHP14X GHP16X GHP20X GHP25X GHP30X GHP38X	AKL06LS AKL08LS AKL10S AKL12S AKL14S AKL16S AKL20S AKL25S AKL30S AKL38S	KONU06L[1]) KONU08L[1]) KONU10L[1]) KONU12L[1]) KONU14S KONU16S KONU20S KONU25S KONU30S KONU38S

Flaring tools see KARRYFLARE

1) Backing plates, cone-templates and flaring die sets for series L and S for tube outer diameter 6, 8, 10 and 12 are the same.
2) **Note:** Two-part backing plates for tube OD 35 and 42.
3) Assembly tools for LL-series for EOMAT UNI on request.
4) Special MOK for easy tube insertion. MOK for EO-2 are marked with groove.

Tool mounting rack

Practical rack for storing 10 pieces each assembly cone MOK and backing plate GHP.

Type	Order code
Tool mounting rack for GHP and MOK	EOMATWERKZGAUFN.X

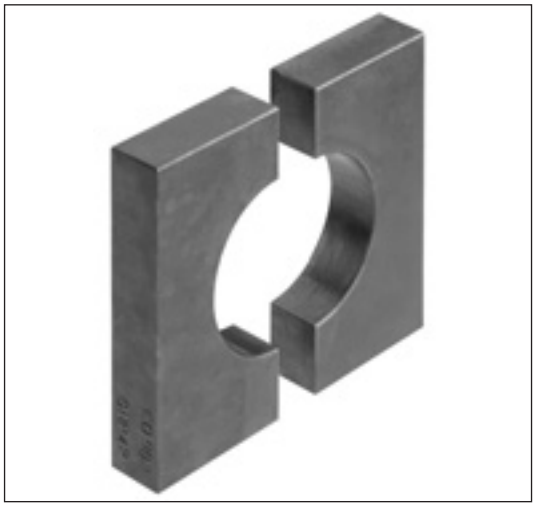
Tool lifetime

Assembly tools are subject of wear and must be regularely (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerous assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:

- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant
- MOK EO-2 don't wear out

Ferulok assembly tools for EOMAT/EO-KARRYMAT

Assembly cone



Back-up plate

Size		Order code	
Dash size	Tube-O.D. inch	Back-up plate	Assembly cone
4	1/4	975867-4	976521-4
6	3/8	975867-6	976521-6
8	1/2	975867-8	976521-8
10	5/8	975867-10	976521-10
12	3/4	975867-12	976521-12
14	7/8	975867-14	976521-14
16	1	975867-16	976521-16
20	1 1/4	975867-20	976521-20
24	1 1/2	975867-24	976521-24
32	2	975867-32	976521-32

Assembly tools for inch tube bite type FERULOK.
FERULOK fittings see TFD US-Catalogue 4300.
Machine setting according to correspondant size EO DPR.

EOMAT PRO – Economic assembly machine for EO-2 and progressive ring fittings

The EOMAT PRO is a powerful machine for economical and safe tube installations. The device is designed for installation of Parker EO-2 and progressive ring fittings to DIN EN ISO 8483-1 (DIN 2352) with common tube materials (steel, stainless steel, copper, nylon). The EOMAT PRO is fast and quiet. It permits the assembly of very tight and complex tube bends. Automatic tool detection guarantees short set-up times and prevents errors due to setting the device incorrectly. Unlike conventional cutting ring assembly devices, the EOMAT PRO is stroke-controlled and produces accurate and reproducible assembly results.

The EOMAT PRO can be used in automatic or manual mode.

In automatic mode, the settings are read from a transponder chip in the tool. The operator cannot change the device settings in automatic mode.

In the display the tube diameter and the type of installation (EO-2 or progressive ring) will be shown.

There is also a useful piece counter which can be reset by the operator.

Other messages can appear about the assembly cones – for example, notifications about routine checks and tool lifetime.

If there is a significant, implausible variation, the display will show an error message. If universal MOK tools are used with universal parameters, this means that only implausible gross deviations will be displayed.

Adaptive assembly cones (MOK-RW) permit the operator to control and set the installation parameters and limits in a few simple steps. In this way the tool is optimized for the specific installation. These individual parameters deliver the best results for the tube material, wall thickness and lubricant used. The device will show slight deviations from the nominal values with a red warning light and a prompt in the display to check the installation. It is therefore possible to detect connections that have been incorrectly installed, check them and remove from the process if needed (e.g. the ring was mounted the wrong way around).

Automatic tool detection, the stored installation values and the display of error messages (red warning light and display) cannot be deactivated in automatic mode by the operator.

In manual mode, different installation values can be set. Manual mode is activated using a key switch. The key is supplied with every device.

The device comes in two versions:

- The quick EOMAT PRO22 for tube sizes up to 20-S/22-L. It has a compact assembly head for tight tube bends.
- The powerful EOMAT PRO42 with a robust assembly head for all sizes up to 38-S/42-L.

Technical data

Application:	Economical mass production of Parker EO tube connections Installation of Parker EO-2 and progressive stop ring (PSR) fittings Installation of cutting ring fittings in accordance with DIN EN ISO 8434-1
Process:	Automatic mode PSR: Stroke-controlled assembly with plausibility check Manual mode and EO-2: Pressure-controlled assembly without error detection
Installation requires:	EO-2: Gap to be closed PSR: 1½ turns of the union nut Other products: See the manufacturer's documentation
Tube material:	Steel, stainless steel, copper, nylon
Tube specification:	All permitted tubes for use with Parker EO couplings
Tube diameter:	EOMAT PRO22: 4 to 22 mm (except for EO-2 – 20-S) EOMAT PRO42: 4 to 42 mm
Range:	LL, L and S
Min. U-bend:	EOMAT PRO22: approx. 35 mm EOMAT PRO42: approx. 70 mm
Tool Identification:	Uses RFID technology, the transponder is in the MOK assembly cone
Error detection:	Plausibility check of the installation parameters after installation
Display:	Text messages and warning light
Available languages:	German, English, French, Spanish, Italian
Display:	Automatic mode: Type of fitting, tube diameter and range Manual mode: Pressure set Piece counter (resettable)
Error messages:	"Check installation result" in the case of non-plausible installation parameters. Reminder to check the tool after every 50 uses. Reminder to change the tool when the end of its lifetime is reached. Warnings about critical hydraulic oil level and temperature.

H

Speed:	EOMAT PRO 22: ca 1.0 s stroke distance, ca 8–10 s total cycle time EOMAT PRO 42: ca 2.0 s stroke distance, ca 10–12 s total cycle time
Economic production quantity:	around 100 assemblies per day
Operating duration:	100%
Noise:	Less than 75 dB (A)
Ambient temperature:	0 °C to +40 °C
Storage temperature:	–25 °C to +60 °C
Parameters:	No condensing humidity
Dimensions:	L 620 mm×W 735 mm×H 340 mm
Weight:	approx. 90 kg
Operational resources:	Esso Hydraulic Oil Nuto H32 or equivalent (filled for delivery)
Electrical power:	400 V 3-phase 50 Hz 1100 W
Cable:	5 m cable with CEE 16 A phase-inverter plug
Tools:	EOMAT PRO 22: MOK PRO assembly cones and MOS compact rear supports EOMAT PRO 42: MOK PRO assembly cones and GHP standard backing plates
Lubricant:	EO-NIROMONT
Test equipment:	AKL distance gauges

EOMAT PRO – features, advantages and benefits

- Low unit costs due to its fast and efficient hydraulic drive
- Compact assembly head for tight and complex bends
- Long lifespan of the assembly tools
- Settings are automatically read from the tool
- Stroke-control achieves a consistently good fitting result
- In automatic mode the operator cannot adjust the installation parameters
- A display showing the number of pieces processed and any error messages
- Adaptive tools for optimal installation parameters and the best possible error detection
- Oil volume and the heat capacity is designed to cope with mass assembly under continuous or shift working patterns
- The foot switch allows the operator a high degree of flexibility

Operation

Detailed installation instructions and safety information can be found in the operation manual

1. Insert the assembly cone and backing plate
2. In automatic mode, the display shows the mounting type and dimensions
3. Fit the tube with the union nut and ring
4. Press and hold the START button
5. Hold the tube securely through the whole assembly process and push it into the limit stop
6. The assembly process is finished when the cylinder moves back to the starting position
7. Assembly inspection and final assembly is done according to the assembly instructions (see chapter E)

Tool lifetime

Assembly tools are subject to wear, and must be periodically (at least every 50 assemblies) cleaned and inspected (inspection instructions, see chapter E) Worn tools can cause dangerous assembly failures, and need to be replaced in good time. High tool life can be achieved by:

- Regular cleaning and lubrication
- Store protected from dirt and corrosion
- Careful trimming and cleaning of the tube ends
- Proper tool selection and operation
- Use of the recommended lubricant

The MOK PRO assembly cones are made from wear-resistant tool steel, and are therefore suited to mass production. If used properly, they should have an average lifespan of approximately 10,000 assemblies. After this lifespan is reached, the display will show that a tool change is needed. The worn tool should be **replaced,** it will no longer work in automatic mode. Worn assembly cones can be used after the end of their expected lifespan in manual mode with care.

Machine/Item	Order code
EOMAT PRO machine, ready to use, with key for selection switch Auto/Manual, with operation manual, filled with hydraulic oil, without tooling and accessories	
EOMAT PRO22 Tube-OD 4–22 mm 400 V, 50 Hz, 3 Phase Renting (monthly rate) Leasing (2 year hire purchase)	EOMATPRO22400V EOMATPRO/RENTFEE EOMATPRO/LEASEFEE
EOMAT PRO42 Tube-OD 4–42 mm 400 V, 50 Hz, 3 Phase Renting (monthly hire rate) Leasing (2 year hire purchase)	EOMATPRO42400V EOMATPRO/RENTFEE EOMATPRO/LEASEFEE
Accessoires/Item	
lubricant for assembly cone 250 ccm bottle	EONIROMONTFLUESSX
Foot switch	FOOTSWITCHSAFETYKIT
Fixing clamp for MOK	EOMATPRO/CLIP
Spare key for selection switch	EOMATPRO/KEY
EOMAT PRO promotion leaflet UK	4043 via Parker Catalogueservice EMDC
Operation manual UK/DE/FR/IT/ES	EOMATPRO/MANUAL
Standard preventive maintenance	EOMATPRO/INSPECTION

Assembly tools for EO fittings

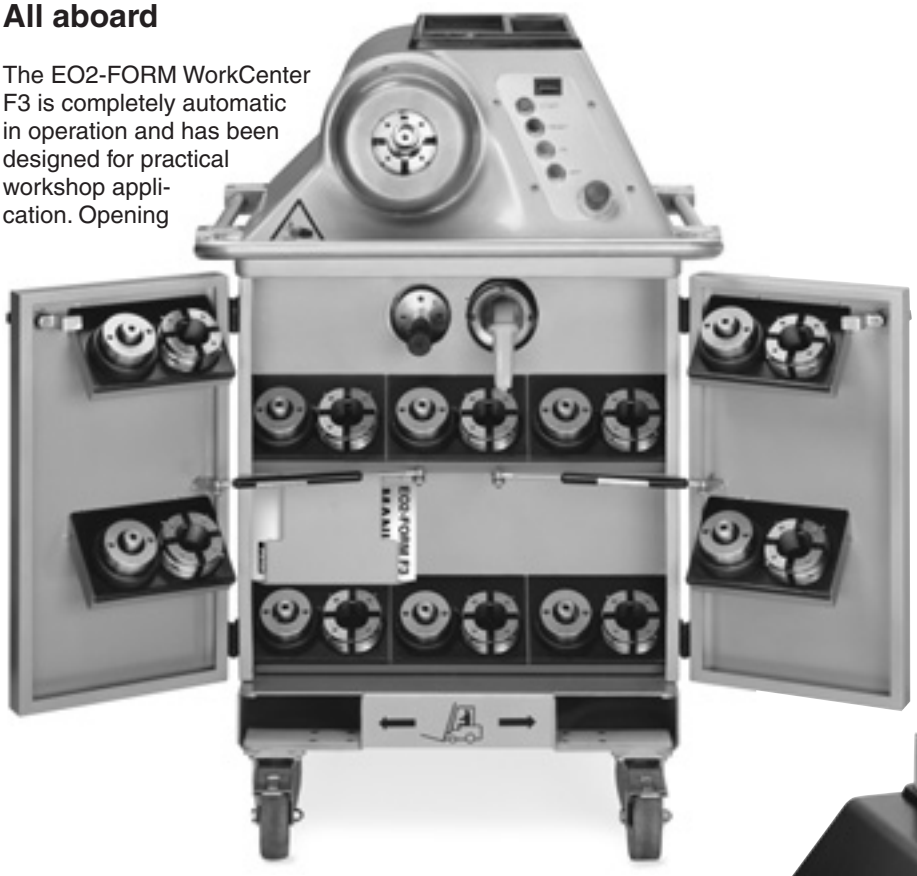
								
Size		Tool order code						
Series	Pipe OD (mm)	Adaptive assembly cone for progressive ring	Standard assembly cone for progressive ring	Standard assembly cone for EO-2	Backing plate for EOMAT PRO42	Compact backing plate for EOMAT PRO22	Distance gauge only for pro-gressive ring	Cone template for assembly cone
LL	04	MOK04LLPRORW	MOK04LLPRO	–	GHP04X	GHP04PRO	AKL04LL	KONU04LL
	06	MOK06LLPRORW	MOK06LLPRO	–	GHP06X	GHP06PRO	AKL06LL	KONU06LL
	08	MOK08LLPRORW	MOK08LLPRO	–	GHP08X	GHP08PRO	AKL08LL	KONU08LL
	10	MOK10LLPRORW	MOK10LLPRO	–	GHP10X	GHP10PRO	AKL10LL	KONU10LL
	12	MOK12LLPRORW	MOK12LLPRO	–	GHP12X	GHP12PRO	AKL12LL	KONU12LL
L	06	MOK06LPRORW	MOK06LPRO	MOKEO206LPRO	GHO06X	GHP06PRO	AKL06LS	KONU06L
	08	MOK08LPRORW	MOK08LPRO	MOKEO208LPRO	GHP08X	GHP08PRO	AKL08LS	KONU08L
	10	MOK10LPRORW	MOK10LPRO	MOKEO210LPRO	GHP10X	GHP10PRO	AKL10LL	KONU10L
	12	MOK12LPRORW	MOK12LPRO	MOKEO212LPRO	GHP12X	GHP12PRO	AKL12LL	KONU12L
	15	MOK15LPRORW	MOK15LPRO	MOKEO215LPRO	GHP15X	GHP15PRO	AKL15L	KONU15L
	18	MOK18LPRORW	MOK18LPRO	MOKEO218LPRO	GHP18X	GHP18PRO	AKL18L	KONU18L
	22	MOK22LPRORW	MOK22LPRO	MOKEO222LPRO	GHP22X	GHP22PRO	AKL22L	KONU22L
	28	MOK28LPRORW	MOK28LPRO	MOKEO228LPRO	GHP28X	–	AKL28L	KONU28L
	35	MOK35LPRORW	MOK35LPRO	MOKEO235LPRO	GHP35X	–	AKL35L	KONU35L
	42	MOK42LPRORW	MOK42LPRO	MOKEO242LPRO	GHP42X	–	AKL42L	KONU42L
S	06	MOK06SPRORW	MOK06SPRO	MOKEO206SPRO	GHP06X	GHP06PRO	AKL06LS	KONU06L
	08	MOK08SPRORW	MOK08SPRO	MOKEO208SPRO	GHP08X	GHP08PRO	AKL08LS	KONU08L
	10	MOK10SPRORW	MOK10SPRO	MOKEO210SPRO	GHP10X	GHP10PRO	AKL10S	KONU10L
	12	MOK12SPRORW	MOK12SPRO	MOKEO212SPRO	GHP12X	GHP12PRO	AKL12S	KONU12L
	14	MOK14SPRORW	MOK14SPRO	MOKEO214SPRO	GHP14X	GHP14PRO	AKL14S	KONU14S
	16	MOK16SPRORW	MOK16SPRO	MOKEO216SPRO	GHP16X	GHP16PRO	AKL16S	KONU16S
	20	MOK20SPRORW	MOK20SPRO	MOKEO220SPRO	GHP20X	GHP20PRO	AKL20S	KONU20S
	25	MOK25SPRORW	MOK25SPRO	MOKEO225SPRO	GHP25X	–	AKL25S	KONU25S
	30	MOK30SPRORW	MOK30SPRO	MOKEO230SPRO	GHP30X	–	AKL30S	KONU30S
	38	MOK38SPRORW	MOK38SPRO	MOKEO238SPRO	GHP38X	–	AKL38S	KONU38S
		Programmable with individual parameters for plausibility checks	Programmed with universal parameters without effective error detection	Programmed with universal parameters without effective error detection	Also suitable for EO-KARRYMAT and all EOMAT devices from Parker	Only suitable for the EOMAT PRO 22 device from Parker	To check the assembly result of Parker EO Progressive rings (not for EO-2)	To check wear of MOK assembly cones for progressive rings (not MOK EO-2)

H

The EO2-FORM WorkCenter F3

All aboard

The EO2-FORM WorkCenter F3 is completely automatic in operation and has been designed for practical workshop application. Opening the doors turns the machine into a totally equipped WorkCenter. The tool storage area is located in the front – the tools are neatly laid out and easily viewed. No other workbenches or tool racks are required. Special convenient-to-handle tools make the machine setups and tool changes easier. Thanks to automatic tool recognition, the operator has only to press the start button, whereupon the tube is formed into the correct shape in one pass. This means that EO2-FORM connections are extremely simple to manufacture. The EO2-FORM F3 is so reliable because of its powerful hydraulic drive and robust forming tools.



- Workshop machine for universal use
- 6 to 38/42 mm tube OD
- Cycle time approx. 20 seconds
- Especially advantageous for: Hydraulic presses, cranes and lifts, heavy machinery, shipbuilding, offshore and hydraulic steelworks

The EO2-FORM WorkCenter PRO22

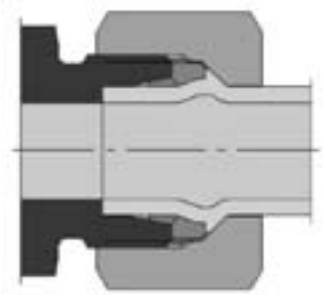
Mass production without tears

The EO2-FORM WorkCenter PRO22 is based on proven EO2-FORM technology and was specially designed for the economic production of EO2-FORM tube fittings. Compared with the EO2-FORM F3 WorkCenter, the PRO22 production machine works considerably more efficiently and can machine tighter tube bends. Because of its powerful drive and efficient cooling, continuous mass production on a shift-work basis is provided for. In addition, the machine is especially quiet and vibration-free in operation. Small to medium tubes from 6 to 22 mm can be accommodated on the new machine. The compact assembly head enables even tight tube bends to be machined.

- Production machine for economical and fail-safe manufacturing
- 6 to 22 mm tube OD
- Cycle time approx. 6 seconds
- Advantageous for applications such as: manufacturers of agricultural machinery, construction machines, trucks, fork lift trucks and other mass-produced hydraulic equipment

Technical Data	
Machine	**EO2-FORM F3 and PRO22**
Designated use	Cold forming of tube ends for tube connections
Method	Axial swaging
Suitable for	EO tube fittings to DIN EN ISO 8434-1
	Hose Connections to DIN 71550
Tube specification	
Steel tubing	E235 / ST37.4; E355 / ST52.4
Stainless steel tubing	1.4571
Other materials	CuNiFe, duplex and others on request
Boiler tube	Tubes for turbine construction on request
Tools	Interchangeable
Forming die sets	“MF3” single part forming die sets, one type for each tube OD
Forming pin	“BF3” forming pin with inner mandrel, one type each per tube OD, wall thickness and material
Function	
Tool change	Manual
Setting	Automatic tool recognition and pressure setting
Tube clamping	Hydraulic
Forming	Hydraulic
Controls	Automatic sequence: after pressing START button: Clamp – form – withdraw – unclamp
Environmental conditions	
Working temperature	+10 … +50°C
Relative humidity	Msc. 90%, non-condensing

EO2-FORM F3 WorkCenter



Type	EO2-FORM F3	EO2-FORM PRO22
Specifications		
Type	Universal workshop machine	Powerful production machine
Design	WorkCenter	WorkCenter
Application	Alternative to welding	Efficient mass production
Weight	Approx. 330 kg	Approx. 375 kg
Dimensions (B×L×H)	800 (open: 1,300)×660×1,150	800 (open: 1,300)×1,130×1,200
Electrical supply	400 V, 50 Hz, 3 phase 230 V, 50 Hz, 3 phase 440 V, 60 Hz, 3 phase	400 V, 50 Hz, 3 phase
Electric motor drive rating	4 kW	4 kW
Oil cooler	Optional	Standard
Performance data		
Steel tube	6×1 ... 38×7/42×4	6×1 … 20×2/22×2
Stainless steel tube	6×1 … 38×5/42×3	6×1 … 20×2/22×2
Minimum width U-bend	Approx. 135 mm	Approx. 100 mm
Cycle time	15–20 sec.	Ca. 6 sec.
Economic production quantitiy	Max. 100 formings/hour Max. 200 forming/hour (with oil cooler)	Max. 600 formings/hour
Applications	Ideal for project and workshop tasks, small batches and on-site installations. Tubes of all sizes.	Economic mass production of small to medium tube dimensions

Features, advantages and benefits

1. **Process / Product concept** – The EO2-FORM technology is not a stand-alone machine or a new fitting system. It is a product extension of the EO-2 range which has existed since 1993. Exactly the same, proven seal elements are used.

2. **Workcenter concept** – All tools, handling devices, lubricants and the operator manual are well organised inside the machine. Once the doors are opened, the machine turns into a stand-alone workcenter for tube preparation. On the top shelf, there are practical compartments for rules, pens, lubricant and standard EO-boxes with nuts and sealing rings. No additional workbenches or shelves for tooling are required.

3. **Easy operation** – One single START-button is all that needs to be operated to run a forming cycle completely. No “zero position” or “reset” activities have to be performed in-between two forming cycles. For efficient mass production, a foot switch is available. A label on the machine head shows all operation steps in pictograms and all important dimensions in charts.

4. **Easy tool change** – An ergonomic, pistol-like device allows quick and easy change of the one-piece clamping die set without opening the forming head or even touching the tools. Another handle speeds up the setup process of the forming pin in the bayonet mechanism.

5. **Easy handling** – Standard tools and one set of EO-2 sealing rings are suitable for all common hydraulic tube dimensions. No special sleeves are required for thin wall or small diameter tube.

6. **Well organised** – All tools and accessories are well organised in a practical compartment inside the machine housing. Nothing gets dirty, lost or confused.

7. **Easy transport** – The machine is equipped with heavy duty wheels so that it can be moved around by one person without hard work or additional equipment. Special attachments for crane and forklift truck transport are standard. A reeling serves as handle, protection and attachment for fixing belts when transported by truck. Tools and all accessories are safely and cleanly stored inside.

8. **Easy logistics** – EO2-FORM uses the same components as EO-2. Special sets of nuts and sealing rings can be ordered with one part number (FORM …). This reduces ordering effort and contributes to achieve availability with optimum inventory.

9. **Stainless steel capabilities** – Forming pins for stainless steel tubes are specially designed for optimum forming results and surface coated for maximum lifetime. All forming pins for stainless steel tube are marked with a blue dot. Clamping dies can be used for both, steel and stainless steel tube.

10. **Approved functional system** – EO2-FORM has been on market for years. It is approved for use in shipbuilding, offshore industry, hydraulic water lock systems, press and crane manufacturing, heavy mobile equipment and general machine building. EO2-FORM is tested and approved from authorities like German Lloyd, DNV or from end-users like Daimler-Chrysler.

11. **Cost saving** – Compared to welding or brazing, EO2-FORM is much less time consuming. Special tube preparation and finishing are not necessary. Cold forming uses only a fraction of the energy needed for brazing or welding.

12. **Superior vibration resistance** – The EO2-FORM process achieves a smooth structural transformation of the tube wall. There are no sharp edges or notches to reduce the vibration resistance.

13. **Superior mechanical strength** – The working contact area of the EO2-FORM connection is the flat front surface of the metal support ring which is made of heat-treated, high-strength steel or stainless steel. This provides superior mechanical strength without settling, loosening or need for re-tightening.

14. **Universal** – The EO2-FORM machine can cold-form all common steel and stainless steel tube materials for hydraulic pipework. Even exotic materials such as Cu-NiFe or Duplex can be formed. EO2-FORM tools cover metric tube sizes from 6 to 42 mm OD.

15. **Short tube ends** – The compact clamping device and special dies are suitable for machining complex tube bends.

16. **Noise/energy loss reduction** – The EO2-FORM process results in a smooth inner contour of the tube. Minimum pressure drop, heat and noise is created. No hidden corners allow the accumulation of air, dirt or other sources of trouble.

17. **Clean** – The EO2-FORM process is environmental clean and safe. As no heat is used, hazards from fumes or heat do not occur.

18. **Zinc plated tubing** – The EO2-FORM process allows the use of zinc-plated tubing. The costs of cleaning or painting are saved.

19. **Quality** – Tube clamping and tool functions are fully automated. Proper joint geometry and seal dimensions are achieved by using standard EO-2 sealing rings. Therefore high and consistent quality is achieved without manual adjustment.

20. **Proven Technology** – Since 1993, millions of EO-2 fittings have operated worldwide under heavy duty conditions, providing leak-free hydraulic systems.

21. **No restrictions** – The process allows to use EO-2 elastomeric sealing technology even for applications where bite-type connectors are not permitted by safety standards, for example hydraulic presses, cranes, lifts or ship canal systems locks.

F3 Forming machine for EO2-FORM high pressure tube connections

Machine Type	Order code F3	Order code PRO22
EO2-FORM basic unit for forming tube ends, ready to operate with magnetic gripper, holder and operator's handbook, but without tools, packed in a special transportation box		
Universal EO2-FORM F3 machine Tube OD 6-38/42 mm 400 V, 50 Hz, 3 phase 230 V, 50 Hz, 3 phase 440 V, 60 Hz, 3 phase Rental (monthly usage) Leasing (24 leasing rate)	 EO2FORMF3400V EO2FORMF3230V EO2FORMF3440V EO2FORMF3RENTFEE EO2FORMF3LEASEFEE	
Production machine EO2-FORM PRO22 Tube OD 6-20/22 mm 400 V, 50 Hz, 3 phase Rental (monthly usage) Leasing (24 leasing rate)		 EO2FORM400VPRO EO2FORMPRORENTFEE EO2FORMPROLEASEFEE

Accessories Type	Order code F3	Order code PRO22
Lubrication for forming pin: 0.25 L bottle EO-NIROMONT 1L re-fill pack EO-NIROMONT	 EONIROMONTFLUESSX LUBSS	 EONIROMONTFLUESSX LUBSS
Oil cooler kit	F3/COOLERKIT	included
Foot switch	F3/FOOTSWITCH	F3/FOOTSWITCH
Magnetic gripper for forming pin	F3/PINHOLDER	F3/PINHOLDER
Holder for forming die set	F3/DIEHOLDER	F3/DIEHOLDER
Clamping segments for die set	F3/DIECLAMP	F3/DIECLAMP
Clamping segment spring ∅ 8 mm	F3/DIECLAMPSPRING8	F3/DIECLAMPSPRING8
Clamping segment spring ∅ 12 mm	F3/DIECLAMPSPRING12	F3/DIECLAMPSPRING12
Operation manual: UK, DE, FR, IT, SWE	4033	EO2FORMPRO/MANUAL
Standard preventive maintenance	EO2FORMF3/INSPECTION	EO2FORMF3/INSPECTION

EO2-FORM F3 machines are shipped in special containers which should be kept for future transports to avoid damage. Please don't dispose the transport boxes!

Machine housing Type	Order code F3	Order code PRO22
Top machine cover	F3/HEADCOVER	F3PRO/08836014
Top tray	F3/TOPTRAY	F3/TOPTRAY
Door lock for tool compartment	F3/DOORLOCK	F3/DOORLOCK
Door hinge	F3/DOORHINGE	F3/DOORHINGE
Shock absorber for doors	F3/DOORSPRING	F3/DOORSPRING
Tool tray for inner tool compartment (top), 6×	F3/TOOLTRAYIN	F3/TOOLTRAYIN
Tool tray for inner tool compartment (bottom), 6×	F3/0883611	F3/0883611
Tool tray for tool compartment in doors, 2×	F3/TOOLTRAYDOOR	F3/TOOLTRAYDOOR
Die insert for tool tray (use screw M6)	F3/TOOLTRAYDIE	F3/TOOLTRAYDIE
Holder for magnetic gripper	F3/PINHOLDERTRAY	F3/PINHOLDERTRAY
Holder for holder	F3/DIEHOLDERTRAY	F3/DIEHOLDERTRAY
Plastic guide for forklift (use screw M6)	F3/FORKGUIDE	F3/FORKGUIDE
Front wheel with lock	F3/FRONTWHEEL	F3/FRONTWHEEL
Rear wheel	F3/BACKWHEEL	F3/BACKWHEEL

Foot switch

Magnetic gripper for forming pin

Holder for forming die set

Oil cooler kit

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Sticker Type	Order code F3	Order code PRO22
EO2-FORM door label	F3/STICKERPARKER	F3PRO/STICKERPARKER
Short instructions on side	F3/STICKERINSTRUC	F3PRO/STICKERINSTRUC
Lubrication on front	F3/STICKERLUB	F3/STICKERLUB
Crane attachment (1 piece)	F3/STICKERCRANE	F3/STICKERCRANE
Forklift on front	F3/STICKERFORK	F3/STICKERFORK

Operation panel Type	Order code F3	Order code PRO22
Front panel counter	F3/FRONTCOUNTER	F3/FRONTCOUNTER
“START” switch (black with symbol)	F3/STARTSWITCH	F3/STARTSWITCH
“RESET” switch (blue)	F3/RESETSWITCH	F3/RESETSWITCH
“ON” switch (green)	F3/ONSWITCH	F3/ONSWITCH
“OFF” switch (red)	F3/OFFSWITCH	F3/OFFSWITCH
Emergency stop switch (red)	F3/STOPSWITCH	F3/STOPSWITCH

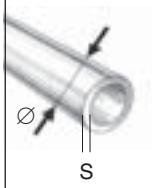
Tool Components Type	Order code F3	Order code PRO22
Bayonet bolt for forming pin	F2/PINBOLT	F2/PINBOLT
Screw for clamping die segments	F3/DIESCREW	F3/DIESCREW
Spare part kit for clamping die set (4× Pin ∅4, 4× Spring ∅8, 4× Spring ∅12, 4× Screws)	F3/DIEKIT	F3/DIEKIT

Pin for forming pin

Pin for clamping die set

F3 Forming machine for EO2-FORM high pressure tube connections

Clamping die set MF3EO-2



Forming pin BF3EO-2

Tube O.D. ∅	Clamping dies for steel and stainless steel tubes Order code	∅ × s	Forming pin for steel tubes Order code	Forming pin for stainless steel tubes Order code[1)][2)]
06-L/S	MF3EO206	06×1.0 06×1.5 06×2.0	BF3EO206X1S BF3EO206X1.5S BF3EO206X2S	BF3EO206X1SS BF3EO206X1.5SS
08-L/S	MF3EO208	08×1.0 08×1.5 08×2.0 *08×2.5*	BF3EO208X1S BF3EO208X1.5S BF3EO208X2S *BF3EO208X2.5S*	BF3EO208X1SS BF3EO208X1.5SS
10-L	MF3EO210	10×1.0 10×1.5 10×2.0	BF3EO210LX1S BF3EO210LX1.5S BF3EO210LX2S	BF3EO210LX1SS BF3EO120LX1.5SS BF3EO210LX2SS
10-S	MF3EO210	10×1.5 10×2.0 *10×3.0*	BF3EO210SX1.5S BF3EO210SX2S *BF3EO210SX3S*	BF3EO210SX1.5SS BF3EO210SX2SS
12-L	MF3EO212	12×1.5 12×2.0	BF3EO212LX1.5S BF3EO212LX2S	BF3EO212LX1.5SS BF3EO212LX2SS
12-S	MF3EO212	12×1.5 12×2.0 *12×3.0*	BF3EO212SX1.5S BF3EO212SX2S *BF3EO212SX3S*	BF3EO212SX1.5SS BF3EO212SX2SS
15-L	MF3EO215	15×1.0 15×1.5 15×2.0	BF3EO215X1S BF3EO215X1.5S BF3EO215X2S	 BF3EO215X1.5SS BF3EO215X2SS
16-S	MF3EO216	16×2.0 *16×2.5* *16×3.0*	BF3EO216X2S *BF3EO216X2.5S* *BF3EO216X3S*	BF3EO216X2SS *BF3EO216X2.5SS* *BF3EO216X3SS*

F3 Forming machine for EO2-FORM high pressure tube connections

Tube O.D. ∅	Clamping dies for steel and stainless steel tubes Order code	∅ × s	Forming pin for steel tubes Order code	Forming pin for stainless steel tubes Order code[1)2)]
18-L	MF3EO218	18×1.5	BF3EO218X1.5S	BF3EO218X1.5SS
		18×2.0	BF3EO218X2S	BF3EO218X2SS
20-S	MF3EO220	20×2.0	BF3EO220X2S	BF3EO220X2SS
		20×2.5	*BF3EO220X2.5S*	*BF3EO220X2.5SS*
		20×3.0	*BF3EO220X3S*	*BF3EO220X3SS*
		20×3.5	*BF3EO220X3.5S*	
22-L	MF3EO222	22×1.5	BF3EO222X1.5S	BF3EO222X1.5SS
		22×2.0	BF3EO222X2S	BF3EO222X2SS
25-S	MF3EO225	*25×2.0*	*BF3EO225X2S*	*BF3EO225X2SS*
		25×2.5	*BF3EO225X2.5S*	*BF3EO225X2.5SS*
		25×3.0	*BF3EO225X3S*	*BF3EO225X3SS*
		25×4.0	*BF3EO225X4S*	
28-L	MF3EO228	*28×2.0*	*BF3EO228X2S*	*BF3EO228X2SS*
30-S	MF3EO230	*30×3.0*	*BF3EO230X3S*	*BF3EO230X3SS*
		30×4.0	*BF3EO230X4S*	*BF3EO230X4SS*
		30×5.0	*BF3EO230X5S*	
35-L	MF3EO238	*35×2.0*	*BF3EO235X2S*	*BF3EO235X2SS*
		35×3.0	*BF3EO235X3S*	*BF3EO235X3SS*
38-S	MF3EO242	*38×3.0*	*BF3EO238X3S*	*BF3EO238X3SS*
		38×4.0	*BF3EO238X4S*	*BF3EO238X4SS*
		38×5.0	*BF3EO238X5S*	*BF3EO238X5SS*
		38×6/7	*BF3EO238X6+7S*	
42-L		*42×2.0*	*BF3EO242X2S*	*BF3EO242X2SS*
		42×3.0	*BF3EO242X3S*	*BF3EO242X3SS*

Tools for hose connection DIN 71550

Clamping die set MF3EO-2

Forming pin BF3EO-2

Tube O.D. ∅	Clamping dies for steel and stainless steel tubes Order code	∅ × s	Forming pin for steel tubes Order code	Forming pin for stainless steel tubes Order code[1)2)]
10	MF3EO210	10x1.5	BF3DIN7155010X1.5S	
12	MF3EO212	12x1.5	BF3DIN7155012X1.5S	BF3DIN7155012X1.5SS
15	MF3EO215	15x2.0	BF3DIN7155015X2S	
18	MF3EO218	18x1.5	BF3DIN7155018X1.5S	
20	MF3EO220	20x2.5	BF3DIN7155020X2.5S	
22	MF3EO222	22x1.5	BF3DIN7155022X1.5S	BF3DIN7155022X1.5SS
25	MF3EO225	25x2.0	BF3DIN7155025X2S	BF3DIN7155025X2SS
28	MF3EO228	28x1.5	BF3DIN7155028X1.5S	BF3DIN7155028X1.5SS
		28x2.0		BF3DIN7155028X2SS
30	MF3EO230	30x1.5		BF3DIN7155030X1.5SS
32	MF3EO232	32x1.5	BF3DIN7155032X1.5S	
35	MF3EO235	35x2.0		BF3DIN7155035X2SS

Tool compatibility: Italic = Tools for EO2-FORM F3 WorkCenter
Regular = Tools for EO2-FORM F3 and PRO22 WorkCenter

Please select clamping die and forming pin according to tube dimension and material.
1) All forming pins for stainless steel tubing are marked with a blue dot on front surface.
2) Stainless steel tools are TiN coated.
Clamping die sets which are only used for stainless steel tubes should be marked with the blue dot sticker to avoid use with steel tube.

Tool lifetime
Assembly tools are subject of wear and must be regularely (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerous assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:

- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant

Flaring tools for Triple-Lok® tubes

Flaring tool selection guide

Manual flaring devices are available for on-site assembly and field repair of Triple-Lok® tube connections.
Manual flaring tools range from simple impact flarers to handpump-operated workshop devices. Flaring result and fitting performance depends strongly on the skill and effort of operator. Hand flaring tools are not recommended for efficient industrial production.

Features, advantages and benefits of hand flaring tools

1. **Flexible –** Manual flaring tools are portable and do not need any power supply. Therefore they are ideal for on-site assembly and field repair.
2. **Special –** Each device has been especially developed to match Parker Triple-Lok® standards. The tube connections will fit properly without rework.

How to select the ideal flaring device for your application:

	Hand flaring tools 1004/210A	Impact flaring tool	EO-KARRYFLARE	Parflare ECO
				
Assembly method				
Triple-Lok®	impact flaring	impact flaring	conventional flaring	conventional flaring
O-Lok®	not suitable	not suitable	not suitable	not suitable
Tube specification				
Material	copper, steel	copper, steel, stainless steel	steel, stainless steel	steel, stainless steel
Dimension metric tube	6 to 16 mm (1004)	6 to 38 mm	6 to 38/42 mm	6 to 38/42 mm
Dimension inch tube	1/8″ to 5/8″ (210A)	1/4″ to 1 1/2″	1/4″ to 1 1/2″	1/4″ to 1 1/2″
Min. U-bend	depending on vice	depending on vice	65 mm	70 mm
Tools				
Clamping dies	one device	vice block	Flaring die M15 … (same dies used EOMAT)	Flaring die M15 … (same dies used EOMAT)
Flaring pin	integral part of device	pin plus hammer	integral part of device	integral part of device
Operation				
Flaring	hammer impact	hammer impact	handpump	electro-hydraulic
Process control	manual	manual	pressure according to chart	pressure according to chart
Tube clamping	manual clamping	manual	automatic clamping	automatic clamping
Specifications				
Design	flaring device for use in vice	Hand tools for use in vice	portable desktop	portable desktop
Weight	approx. 1.5 kg	–	approx. 29 kg	approx. 30 kg
Dimension (W×L×H)	–	–	750×360×260 mm	750×360×300 mm
Performance				
Overall cycle time	approx. 1–3 min	approx. 1–3 min	approx. 30–60 sec.	approx. 15–20 sec.
Economic production quantity:	10 flarings per week	10 flarings per week	max. 50 flarings per day	max. 100 flarings per day
Quality	dependant on operator	dependant on operator	controlled process	controlled process
Application	on-site repair jobs only; Limited to small dimensions. Limited to single assemblies, not for industrial production, emergency repairs until industrial flared tube is available for replacement.		Efficient for on-site flaring of small quantities not for mass production	portable machine for repair and workshop

Manual flaring tools for Triple-Lok® tubes

These 37˚ flaring tools are for use with copper, aluminum alloy, and thin wall steel or stainless steel tubes. A vice block is clamped together with the tube end into a vicener. Flaring pin is used with a hammer. Separate tooling sets for each tube size in metric and inch dimensions are available.

These hand tools are suitable for small on-site repair jobs. They are not suitable for thick-wall tubing and industrial production. A rigid vice must be available at the assembly site.

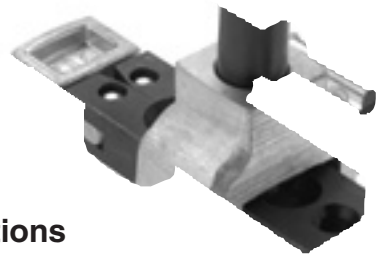
Features, advantages and benefits

1. **Light** – Hand flaring tools can be used at any assembly site where a proper workshop is not available
2. **Quick** – Hand flaring tools can be used for temporary repair until a proper spare tube has been made by machine

Applications

- Field repair of agricultural and construction vehicles
- Small, local repair workshops
- Mobile repair service

Combination impact flarer 1004 for small dimension metric tube



Specifications

Design:	**Hand flaring tool for small on-site repair jobs**
Operation:	**Flaring pin Impact**
37° Flaring:	Triple-Lok® connection – ISO 8434-2/ SAE J514
Tube material:	copper, aluminum and low carbon steel
Tube diameter:	6 to 16 mm metric tube
Wall thickness:	max 15% of tube O.D.
Requirements:	Rigid vice and hammer
Performance:	Overall cycle time 1–3 min

Economic production quantity: 10 flarings per week

Operation

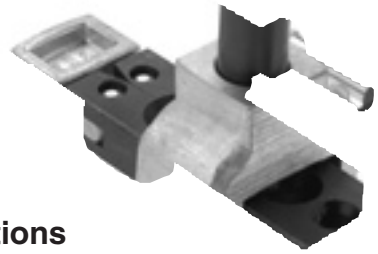
1. Clamp tube end flush in block halves
2. Clean and lubricate tube end and flaring pin
3. Form the flare by a few sharp hammer blows
4. Release vice and unclamp tube

See chapter E for detailed instructions on Triple-Lok® assembly

Ordering

Type	Order code
Combination impact flarer Complete device including Combination dies and pin	1004-74M
Tool lubricant 0.25L bottle	EONIROMONTFLUESSX

Combination impact flarer 210A for small dimension inch tube



Specifications

Design:	**Hand flaring tools for small on-site repair jobs**
Operation:	**Flaring pin Impact**
37° Flaring:	Triple-Lok® connection – ISO 8434-2/ SAE J514
Tube material:	copper, aluminum and low carbon steel
Tube diameter:	1/8˝ to 5/8˝ inch
Wall thickness:	max 15 % of tube-O.D.
Requirements:	Rigid vice and hammer
Performance:	Overall cycle time 1–3 min

Economic production quantity: 10 flarings per week

Operation

1. Clamp tube end flush in block halves
2. Clean and lubricate tube end and flaring pin
3. Form the flare by a few sharp hammer blows
4. Release vice and unclamp tube

See chapter E for detailed instructions on Triple-Lok® assembly

Ordering

Type	Order code
Combination impact flarer Complete device including Combination dies and pin	210A
Tool lubricant 0.25L bottle	EONIROMONTFLUESSX

Impact flaring tools for metric and inch tube

Specifications

Design: **Hand flaring tools for small on-site repair jobs**
Operation: **Impact flaring pin**
37° Flaring: Triple-Lok® connection – ISO 8434-2/ SAE J514
Tube material: copper, aluminum, steel and stainless steel tube
Tube diameter: 6 to 38 mm/1/4″ to 1 1/2″
Wall thickness: max 15% of tube-O.D., max 10% of tube O.D. for tubes larger 20 mm tube O.D.
Requirements: Rigid vice and hammer
Performance: Overall cycle time 1–3 min
Economic production quantity: 10 flarings per week

Operation

1. Clamp tube end flush in block halves
2. Clean and lubricate tube end and flaring pin
3. Form the flare by a few sharp hammer blows
4. Use pre-flaring pin for tube O.D. 20 mm/3/4″ and larger
5. Release vice and unclamp tube

See chapter E for detailed instructions on Triple-Lok® assembly

Tools for metric tube			
Tube-O.D. mm	Pre-flaring pin Order code	Flaring Order code	Vice block Order code
06		P17408	M27406
08		P17408	M05742
10		P17408	M27410
12		P17414	M27412
14		P17414	M27414
15		P17414	M27415
16		P17414	M27416
18		P17418	M27418
20	P1E	P17418	M27420
22	P1E	P17422	M14742
25	P1E	P17422	M27425
30	P1E	P17432	M27430
32	P1E	P17432	M27432
38	P1E	P17438	M24742

Tools for inch tube			
Tube-O.D. inch	Pre-flaring pin Order code	Flaring Order code	Vice block Order code
1/4″		P17408	M04742
5/16″		P17408	M05742
3/8″		P17408	M06742
1/2″		P17414	M08742
5/8″		P17414	M10742
3/4″	P1E	P17418	M12742
7/8″	P1E	P17422	M14742
1″	P1E	P17422	M16742
	P1E		
1 1/4″	P1E	P17432	M20742
1 1/2″	P1E	P17438	M24742

Type	Order code
Tool lubricant 0.25L bottle	EONIROMONTFLUESSX

KARRYFLARE Portable flaring device for Triple-Lok®

The KARRYFLARE is a portable device for easy and workmanlike 37° tube flaring. It allows the flaring of even large dimension steel and stainless steel hydraulic tube at assembly sites where Parflange® technology is not available.

The KARRYFLARE consists of a hydraulic flaring unit and a hand pump. The hydraulic assembly pressure can be read on a gauge which is ergonomically located. The KARRYFLARE is ideal for tube flaring of small quantities and on-site tube installation.

It is practical, simple to operate, reliable and easy to transport. The KARRYFLARE comes as one unit with all components firmly attached to a practical carrying frame.

Technical data

37° flaring of hydraulic tube
Flare dimensions and geometry according to ISO 8434 / SAE J514
For Parker Triple-Lok® hydraulic fittings
Tube outer diameter 6 to 38 mm / ¼ to 1 ½˝
Maximum capacity: 38 × 4 mm / 1 ½ × 0.120˝
With special flaring pin up to 42 mm tube O.D.
Tube material: steel and stainless steel
Weight: approx. 29 kg
Dimensions: approx. L 750 mm × W 360 mm × H 260 mm
Hydraulic oil: H-LP32-1.2 liter

Ordering

KARRYFLARE device and accessories

Description	Order code
KARRYFLARE Manual flaring device KarryFlare including handpump, carrying case and manual tank filled with hydraulic oil, 37° flaring pin installed. Flaring dies "M15" must be ordered separately.	KARRYFLARE
Accessoires	
Tool lubricant 0.25L bottle	EONIROMONTFLUESSX
Tool lubricant 1 L refill	LUBSS
Promotion leaflet	LEAF/4049-D1/UK/DE
Spare parts	
Flaring bloc, complete	KARRYFLARE/BLOC
Standard Flaring pin 6–38 mm, with O-ring	KARRYFLARE/FPIN
Special Flaring pin 42 mm, with O-ring	KARRYFLARE/FPIN42
Tube stop with guide	KARRYFLARE/TSTOPKPL
Pressure chart sticker	KARRYFLARE/CHART
Operating manual	OM/4047-T1

Performance

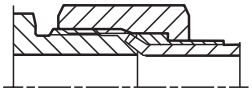
Cycle time: 30–60 sec.
Economic production quantity: max 50 flarings per day

Features, advantages and benefits

1. Flexible on-site tube flaring
2. Simple operation
3. KARRYFLARE is portable and does not require any power supply
4. Flaring quality is comparable to EOMAT
5. Saves time and effort compared to manual impact flaring
6. Safe and consistent result
7. All elements are ergonomically located
8. Robust, light metal transport box
9. Telescopic handle and wheels for convenient trolley transport
10. Uses "M15" flaring dies (EOMAT/1015)

Applications

- Assembly of 37° flare fittings in small quantities
- On-site repair of agricultural vehicles and mobile construction equipment
- Repair workshops and plant maintenance
- Mobile repair service

KARRYFLARE		
 Tube-O.D. ∅ [mm]	– ∅ [Inch]	 Triple-Lok®, P [bar]
6	1/4	35
8	5/16	45
10	3/8	60
12	1/2	60
14		80
15		100
16	5/8	100
18		120
20	3/4	160
22		160
25	1	180
28		215
30	1 1/4	230
35		270
38	1 1/2	280
42		320

Parflare ECO

Mobile flaring machine for Triple-Lok® hydraulic fittings

Parflare ECO
Economical – Simple – Safe

A full fledged Triple-Lok® fitting flaring machine at an economical price. The Parflare ECO is a mobile machine that flares tubes to 37° for Parker Triple-Lok® hydraulic fittings. This electro-hydraulic machine is simple to operate, with the flaring pressure being set via a digital display. The machine is simple to use, rugged and easy to transport. Because of these features, the Parflare ECO is the ideal machine for hydraulic service technicians.

Application areas:
For the repair and maintenance of hydraulic tubing systems in both workshop and field operations.

Advantages for the service technician:
- professional flaring
- energy and time savings due to the electric drive
- simple operation
- portable and light
- rugged and mobile

Purchasing advantages:
- inexpensive
- economical mode of operation
- existing tooling can be used
- unbeatable price-to-performance ratio

The machine is perfectly suited to regular use, but not to high volume production.

Technical Data	
Application:	Flaring tubes for Parker Triple-Lok® hydraulic connectors
Procedure:	Axial forming with flaring pin
Flaring:	37° to DIN EN ISO 8434-2
Tube material:	Steel and stainless steel tubing
Tube diameter:	6 to 42 mm / ¼˝ to 1 ½˝
Minimum width U-bend:	70 mm
Speed:	15 to 20 sec. cycle time/approx. 20 to 30 sec. total cycle time
Economical production quantity:	max. 100 assemblies per day
Dimensions:	750×360×300 mm
Weight:	30 kg
Electrical power rating:	EU Version: 230 V single phase 50 Hz 700 W US Version: 110 V single phase 60 Hz 700 W

Type	Order code
Parflare ECO basic machine, ready to operate, including operator's handbook, without tools	EU Version: PARFLAREECO230V US Version: PARFLAREECO110V
Brochure	BUL/4048/DE via Parker catalogue Service EMDC
Operator's handbook UK/DE/FR/IT/ES	PARFLAREECO/MANUAL
Standard preventive maintenance	PARFLAREECO/INSP
Pressure chart sticker	PARFLAREECO/CHART
Standard flaring pin 6–38 mm, with O-ring	KARRYFLARE/FPIN
Special flaring pin 42 mm, with O-ring	KARRYFLARE/FPIN42

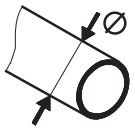
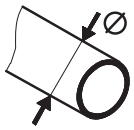
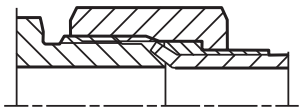
Operation:
For detailed assembly instructions, see our fittings technology handbook, chapter E. For safety information, see machine operating manual.
1. Insert die valves and close cover
2. Set the recommended flaring pressure in accordance with the chart on the display
3. Insert tube with retaining nut and sleeve
4. Push START button and keep depressed
5. Keep a firm hold of the tube throughout the complete flaring procedure
6. The flaring procedure is finished when the cylinder has returned back to its start position
7. Flaring inspection and final assembly should be in accordance with the assembly handbook

Tool lifetime
Assembly tools are subject to wear and must be regularly (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerours assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:
- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant

Parflare ECO mobile flaring machine for Triple-Lok® hydraulic fittings

Pressure chart

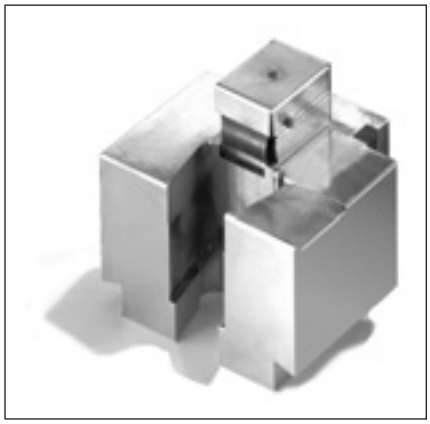
Parflare ECO

Tube-O.D.  ∅ (mm)	Tube-O.D.  ∅ (inch)	Triple-Lok®  P (bar)
6	1/4	20
8	5/16	25
10	3/8	35
12	1/2	35
14		45
15		60
16	5/8	60
18	3/4	70
20		95
22	1	95
25	1 1/4	110
28		130
30	1 1/2	140
35		165
38		180
42		200

H

37° flaring tools for KARRYFLARE device and PARFLARE ECO, EOMAT UNI, II and III

Flaring die set M1574



Flaring fixture must be installed on EOMAT UNI II/III

Flaring dies for metric tube	
Tube O.D. mm	Order code
6	M157406-1
8	M157408-1
10	M157410-1
12	M157412
14	M157414
15	M157415
16	M157416
18	M157418
20	M157420
22	M157422
25	M157425
28	M157428
30	M157430
32	M157432
35	M157435
38	M157438
42	M157442

Flaring dies for inch tube	
Tube O.D. inch	Order code
3/16″	M037415-1
1/4″	M047415-1
5/16″	M157408-1
3/8″	M067415-1
1/2″	M087415
5/8″	M107415
3/4″	M127415
7/8″	M147415
1″	M167415
1 1/4″	M207415
1 1/2″	M157438

Flaring diameters acc. to ISO 8434-2/SAE J514 for Triple-Lok®. Not suitable for metric flare adapters.
The flaring pin for the KARRYFLARE and Parflare ECO is integrated in the device. For the EOMAT UNI the flaring pins are in the EOMAT flaring fixture (EOMATBOERDELBX).
Flaring dies are **not** interchangeable with Parflange® tools for 1025/1040/50-machines.

Tool lifetime
Assembly tools are subject of wear and must be regularely (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerous assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:

- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant

Assembly machines for O-Lok® and Triple-Lok®

Parflange® machine selection guide

Parflange® 1025 and Parflange® 50 are orbital flaring machines designed to cold-form high pressure tube connections. The unique feature of the Parflange® process is that the deformation of the tube end is achieved by rolling rather than by just pushing a tool into the tube end. The Parflange® machine smoothly compresses the tube material and achieves a high strength joint with a polished surface of the tube end. O-Lok® sleeves are firmly fixed onto the tube end, resulting in a very rigid high-pressure tube connection.

Features, advantages and benefits

1. **Superior sealing performance –** The Parflange® process achieves a sealing surface of unique surface quality and mechanical strength.
2. **Superior vibration resistance –** Unlike conventional flaring, the Parflange® process results in a rigid connection of the O-Lok® sleeve on the tube-end. Parflange®/O-Lok® connections perform much better under reversed bending stress conditions.
3. **Easy to use** – No programming or adjustments necessary. High quality results are consistently achieved without manual adjustments.
4. **Cost saving** – Compared to brazing or welding, orbital flanging is much less time consuming. Special tube preparation and finishing are not necessary. Flanging uses only a fraction of the energy needed for brazing or welding.
5. **Clean** – The Parflange® process is environmental clean and safe. As no heat or chemicals are used, hazards from fumes or heat do not occur.
6. **Zinc plated tubing.** The Parflange® process allows the use of zinc-plated tubing. The cost for cleaning, post process plating or painting is saved.
7. **Process/Product concept** – Parflange® machines are especially designed to match Parker O-Lok® and Triple-Lok® standards. Machine, tools and products are fine-tuned for reliable performance.
8. **Proven technology** – For more than 10 years, hundreds of Parflange® machines have operated worldwide under heavy duty workshop conditions.

H

How to select the ideal Parflange® Machine for your application:

Machine selection chart	**Parflange® 1025** 		**Parflange® 50** 	
Assembly method Triple-Lok® O-Lok®	Orbital flaring 37° Orbital flanging 180°		Orbital flaring 37° Orbital flanging 180°	
Tube specification Material Dimension metric tube Dimension inch tube Min. U-bend	Steel, Stainless Steel 6 to 25 mm 1/4″ to 1″ 140 mm		Steel, Stainless Steel 6 to 50 mm 1/4″ to 2″ 120 mm	
Tools Clamping dies Flaring/flanging pin	special Parflange® tools M40 … (old: M30 …) B30 …		special Parflange® tools M40 … B30 …	
Operation Setting Standard sleeve feeding Optional sleeve feeding Tube clamping Flanging/Flaring Process control	automatic adjustment manual loading not available manual clamping automatic drive semi automatic		automatic adjustment manual loading O-Lok® sleeve feeder hydraulic clamping automatic drive fully automatic	
			BASIC	**PRO**
Specifications Design Weight Dimension (W × L × H)	desktop approx. 85 kg 390×670×460 mm		stand-alone approx. 380 kg 700×840×1035 mm	stand-alone approx. 410 kg 700×840×2030 mm
Performance Version Voltage Overall cycle time Economic production quantity	1.5 kW 400 V 3 Phase approx. 50 secs. max. 100 per day	1.1 kW 230 V 1 Phase approx. 60 secs. max. 50 per day	4.5 kW 400 V 3 Phase approx. 15 secs. max. 500 per day	4.5 kW 400 V 3 Phase approx. 15 secs. max. 1200 per day
Application	Ideal for projects and workshop use and maintenance High quality result No mass production	on-site repair jobs where 3phase power supply is not available	Efficient production machine for low-cost and high-quality assembly	Efficient mass production machine for low-cost and high-quality assembly

Parflange® 1025 workshop machine for O-Lok® and Triple-Lok®

The Parflange® 1025 machine is designed to cold-form high pressure tube connections for O-Lok® and Triple-Lok® connection. It uses the Parflange® orbital flaring process. The Parflange® 1025 machine smoothly compresses the tube material and achieves a high strength joint with a polished surface of the tube end. O-Lok® and SAE flange sleeves are firmly fixed onto the tube end, resulting in a very rigid high-pressure tube connection.

The 1025 is the smallest machine of the Parflange® machine programme. It is recommended for low-volume assembly jobs of small to medium tube dimensions. Maximum tube capacity is 25 × 4 mm/1″ (steel tube) and 25 × 2.5 mm/1″ stainless steel tube (3 Phase version). Its advantage is the quick and easy change of tooling and the simple operation without manual adjustments or programming. The machine is transportable so that it can be moved to any assembly site with electrical power supply.

The Parflange® 1025 comes ready to be used. Parflange® tools are purchased separately. For each tube dimension, special clamping dies and Parflange® pins are required.

Specifications

Purpose:	180° flanging for O-Lok® and 37° flaring for Triple-Lok®
Process:	Orbital flaring and flanging according to Parflange® process
Design:	Desktop machine for workshop use
Tube material:	steel and stainless steel tube
Tube diameter:	metric: 6 to 25 mm Inch: ¼ to 1″
Maximum capacity:	Steel tube 25×4/1″×0.120 (tube O.D. × wall thickness) Stainless steel tube 25×2/1″×0.095
Min. U-bend:	140 mm
Tube specification:	fully annealed seamless cold drawn or welded precision tube
Performance:	
Overall cycle time	1.5 kW: 50 sec; 1.1 kW: 60 sec
Economic production quantity	1.5 kW: max. 100; 1.1 kW: max. 50
Operation:	Manual clamping, automatic flanging/flaring
Cycle time:	approx. 15 to 20 secs.
Tools:	Flaring pin B30 … and clamping dies M40 …
Tool clamping:	Manual, by eccentric lever
Tool lubrication:	Automatic lubrication device
Lubricant:	EO-NIROMONT LUBSS (filled when delivered)
Hydraulic oil:	HLP 23 0.5L (filled when delivered)
Installation:	rigid workbench and electrical power supply required
Dimensions:	390×670×460 mm
Weight:	85 kg

Features, advantages and benefits

1. **Superior sealing performance –** The Parflange® process achieves a sealing surface of unique surface quality and mechanical strength.
2. **Superior vibration resistance –** Unlike conventional flaring, the Parflange® process results in a rigid connection of the O-Lok® sleeve on the tube-end. Parflange®/ O-Lok® connections perform much better under reversed bending stress conditions.
3. **Easy to use** – No programming or adjustments necessary. High quality results are consistently achieved without manual adjustments.
4. **Quality –** Machine setting, tool control and even lubrication are fully automated so that high and consistent quality results are achieved without manual adjustments.
5. **Small bending radii** – The compact clamping device and special dies are suitable for flanging short tube ends.
6. **Cost saving** – Compared to brazing or welding, orbital flanging is much less time consuming. Special tube preparation and finishing are not necessary. Flanging uses only a fraction of the energy needed for brazing or welding.
7. **Clean** – The Parflange® process is environmental clean and safe. As no heat or chemicals are used, hazards from fumes or heat do not occur.
8. **Zinc plated tubing** – The Parflange® process allows the use of zinc-plated tubing. The cost for cleaning or painting can be saved.
9. **High tool lifetime** – The Parflange® 1025 machine is equipped with an automatic lubrication device. The tools will not wear rapidely if the operator does not lubricate regularly.
10. **Process/Product concept** – Parflange® machines are especially designed to match Parker O-Lok® and Triple-Lok® standards. Machine, tools and products are fine-tuned for reliable performance.
11. **Proven technology** – Since more than 10 years, hundreds of Parflange® machines have operated worldwide under heavy duty workshop conditions.

Applications

Workshop use, project work, plant maintenance, on-site assembly.
Not for efficient mass production

Ordering

Type	Order code
Parflange® 1025 Basic machine Ready to use, Including operating manual, Filled with hydraulic oil and lubricant Without Parflange® tools	
Basic machine 400 V, 3 Phase, 50 Hz	1025-380VTRI50
Basic machine 230 V, 1 Phase, 50 Hz	1025-220VMONO50
1025 promotion leaflet UK	4390/UK
1025 promotion leaflet DE	4390/DE
1025 operating manual UK/DE/FR/IT	1025/MANUAL
Standard preventive maintenance	1025/INSPECTION

Parflange® machines are shipped in a special container which should be kept for all transports to avoid damage.

Spare parts

Type	Order code
Tool lubricant qty: 1L EO-NIROMONT	LUBSS
Drive belt	1025/028Polyv
Came guide and with screw	1025/0281031
Hydraulic tank seal kit	1025/0281042
Lubrication kit	1025/0281200

Parflange® 50 WorkCenter

Bins can be stored on top platforms

Easy refill of tool lubricant

The Parflange® 50 WorkCenter is the top-of-the-range machine for orbital flaring & flanging of O-Lok® and Triple-Lok® tube assemblies. It combines the practical EO2-FORM F3 WorkCenter concept with the proven Parflange® technology.
Due to the robust design and the precise process control, the Parflange® 50 WorkCenter achieves consistent high quality results and high productivity. Machine housing, cycle programming and all operating elements are designed for good ergonomics, optimum workflow and highest security. The compact Parflange unit and the compact housing allow the forming of small and complex tube bends. Maximum tool lifetime is achieved by the automatic lubrication system as well as easy visibility and accessability of the tooling area. The integrated tool compartments and designated space for bins for nuts and sleeves make it comfortable and efficient to work with the Parflange® 50.

Parflange® advantages over brazing or welding

Faster and lower cost – 9 to 12 times the speed of comparable induction brazing.
Flexibility – Small batch quantities are practical due to short tool change times.
Simple tube preparation – The Parflange® process does not require any special pre- or post-flange cleaning of the tube and sleeve.
Safety – Unlike brazing, the Parflange® process does not require any flux, braze alloy, post braze cleaner or rust inhibitor. An environmentally safe lubricant applied to the flanging pin is the only additive associated with the Parflange®.
Environment – The Parflange® process is environmentally clean and safe. It does not require open flame or any form of heating. Additionally, there is no emission of hazardous fumes, as is typical with welding and brazing.
Energy – The Parflange® process uses only a fraction of the energy needed for welding or brazing.
Corrosion resistance – The Parflange® process accommodates the use of plated or unplated components (i.e. tube and sleeve). Thus, the high costs of electro-plating assemblies after fabrication is eliminated by using pre-plated tube.
Excellent surface quality – The Parflange® process eliminates the potential leak path present at the braze or weld joint.

Features and benefits

1. **Cost saving** – Compared to welding or brazing, orbital flanging is much less time consuming. Special tube preparation and finishing are not necessary. Flanging uses only a fraction of the energy needed for brazing or welding.
2. **Zinc plated tubing** – The Parflange® process allows the use of zinc-plated tubing. The cost for cleaning post process plating, or painting can be saved.
3. **High tool lifetime** – The Parflange® 50 machine is equipped with an automatic lubrication device. The operator does not have to lubricate the tools ensure long pin life.
4. **Use of existing tools** – All existing Parflange® tools (M40 dies and B30/B40 pins) fit into the new machine generation.
5. **WorkCenter concept** – When the doors are opened, the machine body turns into a WorkCenter for production of O-Lok® and Triple-Lok® tube assemblies. All tools are available for rapid and convenient machine setup and tool change.
6. **Low-cost mass production** – The machine can be ordered with an automated sleeve feeder. The Parflange® 50 then is the perfect solution for low-cost mass production.
7. **Universal** – The Parflange® 50 can do 37° flaring for Triple-Lok® connectors and flange tubes for O-Lok® fittings (ORFS). Parflange® tools cover metric tube from 6 to 50 mm O.D. and inch tube from 1/4 to 2˝ O.D.
8. **Flange Seal** – The Parflange® 50 is also capable for the innovative Flange Seal connection, which contributes to reduce component cost and assembly time.
9. **Heavy duty** – The rigid machine design allows use for mass production of even large stainless steel tube connections.
10. **Process/Product concept** – Parflange® machines are especially designed to match O-Lok®, Triple-Lok® and SAE-flange standards. Machine, tools and products are fine-tuned for reliable performance.
11. **Superior sealing performance** – The Parflange® process achieves a sealing surface of unique surface quality and mechanical strength.
12. **Superior vibration resistance –** Unlike conventional flaring, the Parflange® process results in a rigid connection of the O-Lok® sleeve on the tube-end. Parflange®/O-Lok® connections perform much better under reversed bending stress conditions.
13. **Efficient** – The short cycle time and the automatic process allow efficient mass production.
14. **Quality** – Tube clamping, tool control and even lubrication is fully automated so that high and consistent quality results are achieved without manual adjustments.
15. **Easy to use** – The clamping and flanging process is fully automated. Manual tool manipulation is not required. The process is initiated by pushing the tube end into the tooling.
16. **Bin holder** – The top surface is designed to store two standard bins for fitting nuts and Parflange® sleeves. Everything is easy to reach for the operator.
17. **Illuminated tooling area** – Insertion of Parflange® sleeves and condition monitoring of tools is easy.
18. **Practical lubricant refill** – The container for tool lubricant is easily accessible by a hatch on the machine side.
19. **Side drawer** – Chips, dirt and dropped components like Parflange® sleeves can be removed by a small drawer. This allows to keep the working area clear and avoid jamming of moving parts.
20. **Clean** – The Parflange® process is environmentally clean and safe. As no heat or chemicals are used, hazards from fumes or heat do not occur.
21. **Perfect for project work** – After finishing a piping project, the machine can be put aside. Tools don't get lost and dirty. For the next project, the machine just needs to be transported to the new side and unfolded into the WorkCenter. This is particularly useful for piping projects in shipyards, paper mills, offshore platforms or steel mills.
22. **Ready to go** – The Parflange® WorkCenter is delivered including all necessary details like electrical plug, operator manual, short instruction pictograms on machine housing and dimensional charts for tube preparation.
23. **New Generation** – The Parflange® 50 WorkCenter replaces the Parflange® 1040 machine, which has been successful in the market for more than 12 years.

Parflange® 50 BASIC WorkCenter

Technical description 50 BASIC WorkCenter:

The Parflange® 50 is a production WorkCenter for orbital flaring and flanging of high pressure tube connections. The unique feature of the Parflange® process is that the deformation of the tube end is achieved by rolling rather than by just pushing a tool into the tube end.

The Parflange® machine smoothly compresses the tube material and achieves a high strength joint with a polished surface of the tube end.

O-Lok® sleeves are firmly fixed onto the tube end, resulting in a robust and vibration-resistant tube connection.

The Parflange® 50 is the heavy-duty, mass production WorkCenter of the Parflange® machine programme.

It is recommended for industrial production of all sizes Triple-Lok® and O-Lok® tube connections.

Maximum tube capacity is 50 mm/2˝ tube O.D.

The powerful drive and the fast, automatic process allow short cycle times for efficient production. Its advantage is the quick and easy change of tooling and the simple operation without manual adjustments or programming. Tube clamping and tool lubrication are done automatically.

The Parflange® 50 comes ready to be used. Parflange® tools have to be purchased separately. For each tube dimension, special clamping dies and Parflange® pins are required. The machine can be moved on wheels, by forklift truck and crane. For basic use, just an electrical power supply is required.

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Machine specification 50 BASIC WorkCenter:

Purpose:	180° Flanging for O-Lok® and 37° Flaring for Triple-Lok®
Process:	Orbital flaring and flanging according to Parflange® process
Design:	WorkCenter for industrial production
Tube material:	Steel and stainless steel tube
Tube diameter:	Metric: 6 to 50 mm Inch: 1/4˝ to 2˝
Min. U-bend:	120 mm
Maximum capacity:	Steel tube (ST 37, ST 52, …) Metric: 38×5/50×3 mm (tube O.D. × wall thickness) Inch: 2˝×0.120 Stainless steel tube (1.4571, 316, …) Metric: 38×4 mm Inch: 1 1/2˝×0.156
Tube specification:	Fully annealed seamless cold drawn or welded and redrawn precision tube
Operation:	Automatic clamping, automatic flanging/flaring
Speed:	5–8 sec. flanging time/15–20 sec. total cycle time
Economic production quantity:	max. 500 flarings per day
Tools:	Flaring pin B30 … or B40 … Clamping dies M40 …
Tool compartments:	10 die sets, 10 pins
Tool clamping:	Automatic
Tool lubrication:	Automatic lubrication device
Lubricant:	EO-NIROMONT (filled when delivered)
Hydraulic oil:	HLP 46 (filled when delivered)
Installation:	Electrical power
Dimensions:	700×840×1035 mm
Platform for bins:	2 platforms, 300×500 mm, max. 5 kg each
Weight:	380 kg
Electrical power:	400 V, 3 Phase, 50 Hz, 4.5 kW
Transport options:	On wheels, by forklift truck, lifting attachments

Parflange® 50 PRO WorkCenter

Technical description 50 Pro WorkCenter:

For industrial mass production of O-Lok® connections, special machines Parflange® 50 PRO with O-Lok® sleeve feeder are available. This sleeve feeding device increases the productivity, particularly of high volume – single tube dimension jobs.

In “Feeder ON – mode”, O-Lok® sleeves just need to be inserted into feeder rails. First cycle start is initiated by manually closing the safety cover. Then, all following cycles are started by pushing the tube into the pre-clamped dies. All other machine activities, like tube clamping, flanging, tube release, insertion of O-Lok® sleeves into dies, pre-clamping of dies and the operation of safety cover run fully automatic. The operator just is handling the tubes and refilling the sleeve-feeder from times to times with O-Lok® sleeves.

In “Feeder OFF – mode”, the Parflange® 50 PRO operates like the Parflange® 50 BASIC without O-Lok® sleeve feeder. This mode is useful for maximum size flexibility and Triple-Lok® assembly. For quick changeover and safety reasons, the O-Lok® sleeve feeder is just switched OFF but not be removed from the Parflange® 50 PRO WorkCenter.

For operation of O-Lok® PRO machines, compressed air supply is required, even when sleeve feeder is not used.

Machine specification 50 PRO WorkCenter:

Specific differences of Parflange® 50 Pro versus Parflange® 50 Basic

Design:	Parflange® 50 with additional O-Lok® sleeve feeder
Normal Operation:	Same as Parflange® 50 Basic when feeder is switched off
Feeder Operation:	Work-cycle is initiated by inserting tube end Automatic clamping, automatic flanging/flaring Automatic insertion of O-Lok® sleeves into dies Automatic operation of safety cover Automatic pre-clamping of dies
Manual operation:	like Parflange® 50 Basic
Cycle time:	5–8 sec. flanging time/approx. 15 to 20 sec. total cycle time
Economic production quantity:	max. 1200 flarings per day
Tools:	Same tools as Parflange® 50 BASIC
Feeder:	Feeder is delivered in separate box and must be firmly attached to machine. Feeder can be switched ON and OFF but must not be removed.
Feeder rails:	Feeder rail kits must be ordered separately for each O-Lok® sleeve size.
Feeder setup:	Installation of matching rail kit by knurled nuts and adjustment of scale wheel according to chart
Installation:	Electrical power, for feeder type machines: compressed air supply (6 bar)
Dimensions:	700×840×2030 mm
Weight:	410 kg

Parflange® 50 Ordering

Type	Order code
Parflange® 50 Basic machine Ready to use, including operation manual, filled with hydraulic oil and lubricant Without Parflange® tools Basis machine Europe version (not prepared for O-Lok® sleeve feeder)	
Purchase: EU-Version US-Version	1050EU400VBASIC 1050US440V60HZBASIC
Leasing (2 year hire purchase)	1050BASICLEASEFEE
Rent (monthly)	1050BASICRENTFEE

Parflange® 50 BASIC

Type	Order code
Parflange® 50 Pro machine Europe version including O-Lok® sleeve feeder without feeder rails	
Purchase: EU-Version US-Version	1050EU400VPRO 1050US440V60HZPRO
Leasing (2 year hire purchase)	1050PROLEASEFEE
Rent (monthly)	not available

Parflange® 50 PRO for mass production of O-Lok® assemblies

Sleeve feeder rails for Parflange® 50 Pro	Tube O.D.	Order code
O-Lok® sleeve feeding rail	6 mm/¼″	1050/RAIL04
O-Lok® sleeve feeding rail	8, 10 mm/$^{3}/_{8}$″	1050/RAIL06
O-Lok® sleeve feeding rail	12 mm/½″	1050/RAIL08
O-Lok® sleeve feeding rail	14, 15, 16 mm/$^{5}/_{8}$″	1050/RAIL10
O-Lok® sleeve feeding rail	18, 20 mm/¾″	1050/RAIL12
O-Lok® sleeve feeding rail	22, 25 mm/1″	1050/RAIL16
O-Lok® sleeve feeding rail	28, 30, 32 mm/1¼″	1050/RAIL20
O-Lok® sleeve feeding rail	35, 38 mm/1½″	1050/RAIL24

Feeder rail kits are available for each O-Lok® size

50 promotion leaflet	4391-1 via Parker catalogue service EMDC
50 operating manual UK/DE/FR/IT/ES	1050/MANUAL
Standard preventive maintenance	1050/INSPECTION

Tool lubricant refill qty: 1L EO-NIROMONT	LUBSS
Replacement cartridge for spindle lubrication	1050/22900001801

High-Performance lubricant for Parflange®

Parflange® machines and feeders are shipped in special containers which should be kept for future transports to avoid damage. Please don't dispose the transport boxes!!!

Tooling for Parflange® machines

Machine and tool selection

Parflange® 1025

Parflange® 50

Parflange® 1025 machines flanging capacity for O-Lok®

Tube material	220 V 1.1 kW	380 V 1.5 kW
	Max. tube size mm (inch)	
Steel ST37	25×4 (1″×0.120)	25×4 (1″×0.120)
Stainless steel 304L/316L*	25×2.5 (1″×0.95)	25×2.5 (1″×0.95)
Steel ST52	25×4 (1″×0.120)	25×4 (1″×0.120)

Parflange® 50 machines flanging capacity for O-Lok®

Tube material	Max. tube size mm (inch)
Steel ST37	38×5/50×3 (2×0.120)
Steel ST52	38×4 (1 1/2×0.156)
Stainless steel 304L/316L*	38×4 (1 1/2×0.156)

Parflange® 1025 machines flaring capacity for Triple-Lok®

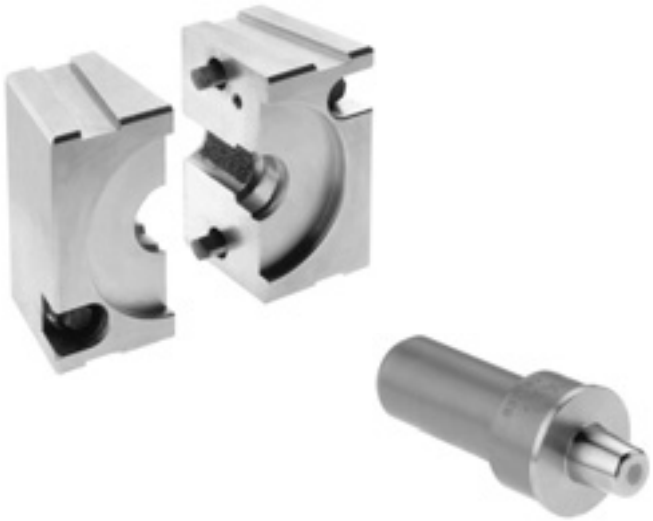
Tube material	Elect. power of machine	
	220 V 1.1 kW	380 V 1.5 kW
	Max. tube size mm (inch)	
Steel ST37	25×3 (1″×0.120)	25×3 (1″×0.120)
Stainless steel 304L/316L* Steel TU 52 B	25×3 (1″×0.120)	25×3 (1″×0.120)
Stainless steel Duplex (or PW 400)	Not recommended	25×2.5 (1×.095)

Parflange® 50 machines flaring capacity for Triple-Lok®

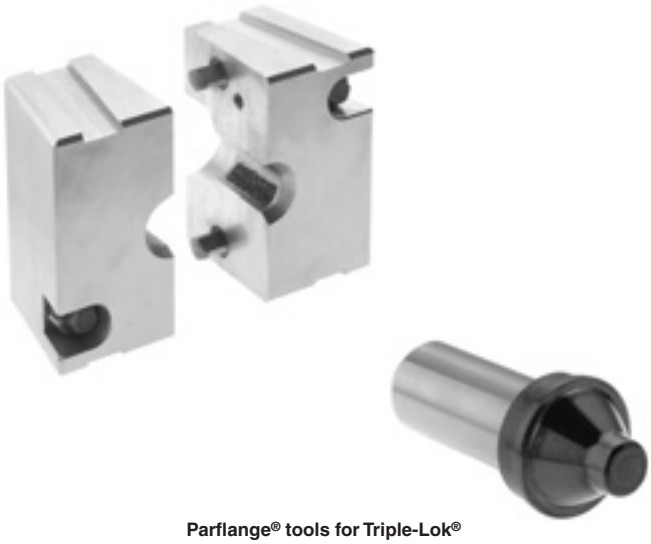
Tube material	Elect. power of machine
	220/380 V 4.5 kW Max. tube size mm (inch)
Steel TU 37 B	38×4/42×3 (1 1/2×0.120)
Steel TU 52 B	38×4/42×3 (1 1/2×0.120)
Stainless steel 304L/316L*	38×4/42×3 (1 1/2×0.120)
Stainless steel Duplex (or PW 400)	38×3.6

* Parflange® tools for stainless steel tubes have different dimensions and are specially coated. These tools are marked with suffix “SS”.

Parflange® tool identification



Parflange® tools for O-Lok®



Parflange® tools for Triple-Lok®

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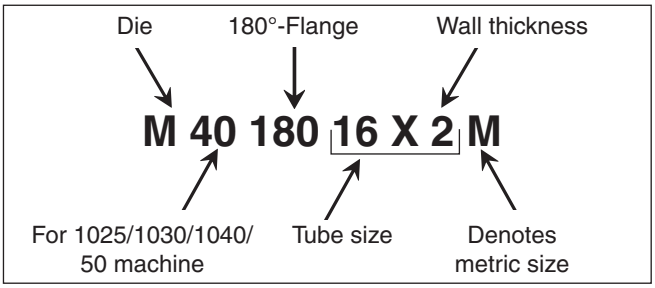
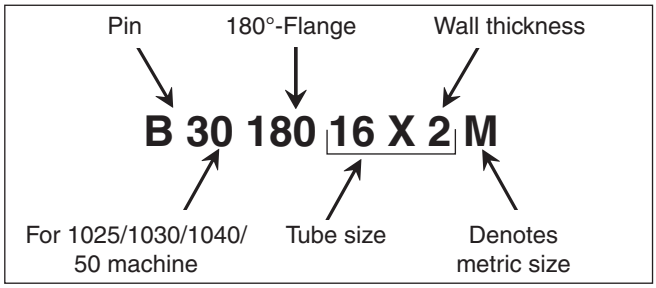
Tooling for metric tubing

Metric die numbering system

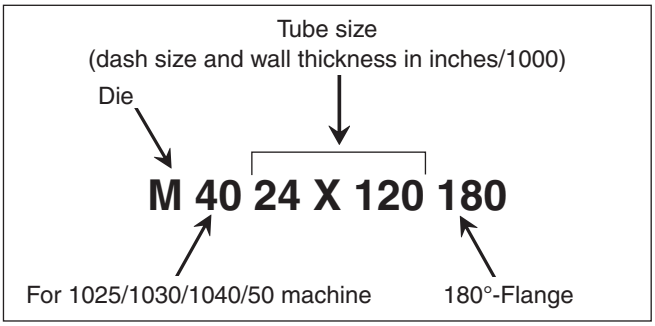


Metric pin numbering system

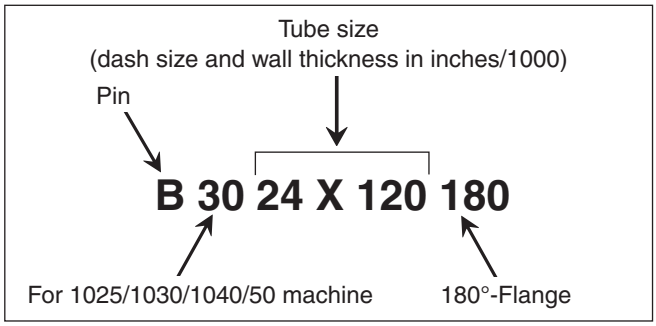


Tooling for inch tubing

Die numbering system



Pin numbering system



Parflange® tools for stainless steel tubes have different dimensions and are specially coated. These tools are marked with suffix “SS”.

Tool lifetime

Assembly tools are subject of wear and must be regularely (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerous assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:

- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant

Parflange® tools for O-Lok®

Parflange® tooling – Order codes for Parflange® 50/1040/1030/1025

90°-Flange-tool-selection (Metric tube)

Tube size mm	Steel tube		Stainless steel tube	
	Flange pin Order code	Flange die Order code	Flange pin Order code	Flange die Order code
06×1.0	**B3018006X1M**	**M4018006X1M**		
06×1.5	B3018006X1.5M	M4018006X1.5M		
08×1.0	**B3018008X1M**	**M4018008X1M**	B3018008X1MSS	M4018008X1MSS
08×1.5	**B3018008X1.5M**	M4018008X1.5M	B3018008X1.5MSS	M4018008X1.5MSS
10×1.0	**B3018010X1M**	**M4018010X1M**	B3018010X1MSS	M4018010X1MSS
10×1.5	**B3018010X1.5M**	**M4018010X1.5M**	B3018010X1.5MSS	M4018010X1.5MSS
10×2.0	**B3018010X2M**	M4018010X2M		
12×1.0	**B3018012X1M**	**M4018012X1M**	B3018012X1MSS	M4018012X1MSS
12×1.5	**B3018012X1.5M**	**M4018012X1.5M**	B3018012X1.5MSS	M4018012X1.5MSS
12×2.0	**B3018012X2M**	**M4018012X2M**		
15×1.0			B3018015X1MSS	M4018015X1MSS
15×1.5	**B3018015X1.5M**	**M4018015X1.5M**		
15×2.0	B3018015X2M	M4018015X2M		
16×1.5	**B3018016X1.5M**	**M4018016X1.5M**	B3018016X1.5MSS	M4018016X1.5MSS
16×2.0	**B3018016X2M**	**M4018016X2M**	B3018016X2MSS	M4018016X2MSS
16×2.5	B3018016X2.5M	M4018016X2.5M		
18×1.5	**B3018018X1.5M**	**M4018018X1.5M**		
18×2.0	**B3018018X2M**	**M4018018X2M**		
20×2.0	**B3018020X2M**	**M4018020X2M**	B3018020X2MSS	M4018020X2MSS
20×2.5	**B3018020X2.5M**	**M4018020X2.5M**		
20×3.0	B3018020X3M	M4018020X3M		
22×2.0	B3018022X2M	M4018022X2M		
22×2.5	B3018022X2.5M	M4018022X2.5M		
25×2.5	**B3018025X2.5M**	**M4018025X2.5M**	B3018025X2.5MSS	M4018025X2.5MSS
25×3.0	**B3018025X3M**	**M4018025X3M**		
28×2.0	B3018028X2M	M4018028X2M		
28×2.5	B3018028X2.5M	M4018028X2.5M		
30×2.0	B3018030X2M	M4018030X2M		
30×3.0	**B3018030X3M**	**M4018030X3M**	B3018030X3MSS	M4018030X3MSS
30×4.0	**B3018030X4M**	**M4018030X4M**		
32×3.0	B3018032X3M	M4018032X3M		
32×4.0	B3018032X4M	M4018032X4M		
35×3.0	B3018035X3M	M4018035X3M		
38×3.0	**B3018038X3M**	**M4018038X3M**		
38×4.0	**B3018038X4M**	**M4018038X4M**		

Tools for tube dimensions which are not listed must be inquired at Parker.

Bold = Standard dimensions
Regular = Non standard dimensions

90°-Flange-tool-selection (Inch tube)

Tube size inch	Steel tube	
	Flange pin Order code	Flange die Order code
1/4×0.035	B3004X035180	M4004X035180
1/4×0.049	B3004X049180	M4004X049180
3/8×0.035	B3006X035180	M4006X035180
3/8×0.049	B3006X049180	M4006X049180
3/8×0.065	B3006X065180	M4006X065180
1/2×0.035	B3008X035180	M4008X035180
1/2×0.049	B3008X049180	M4008X049180
1/2×0.065	B3008X065180	M4008X065180
5/8×0.065	B3010X065180	M4010X065180
5/8×0.083	B3010X083180	M4010X083180
3/4×0.065	B3012X065180	M4012X065180
3/4×0.083	B3012X083180	M4012X083180
3/4×0.095	B3012X095180	M4012X095180
3/4×0.120	B3012X120180	M4012X120180
1×0.065	B3016X065180	M4016X065180
1×0.095	B3016X095180	M4016X095180
1 1/4×0.120	B3020X120180	M4020X120180

Further tools for Inch tubing are available from Parker TFD Columbus!

Tool lifetime

Assembly tools are subject of wear and must be regularely (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerous assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:

- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant

Parflange® tools for Triple-Lok®

Metric tube

Tube size mm	Steel tube		Stainless steel tube	
	Flare pin Order code	Flare die Order code	Flare pin Order code	Flare die Order code
06×1.0 06×1.5	**B3007406X1M** **B3007406X1.5M**	**M4007406M** **M4007406M**	B3007406X1MSS	**M4007406M**
08×1.0 08×1.5	**B3007408X1M** **B3007408X1.5M**	**M4007408M** **M4007408M**	B3007408X1MSS B3007408X1.5MSS	**M4007408M** **M4007408M**
10×1.0 10×1.5	**B3007410X1M** **B3007410X1.5M**	**M4007410M** **M4007410M**	B3007410X1MSS B3007410X1.5MSS	**M4007410M** **M4007410M**
12×1.0 12×1.5 12×2.0	**B3007412X1M** **B3007412X1.5M** **B3007412X2M**	**M4007412M** **M4007412M** **M4007412M**	B3007412X1.5MSS	**M4007412M**
15×1.5 15×2.0	**B3007415X1.5M** B3007415X2M1	**M4007415M** **M4007415M**	B3007415X1.5MSS	**M4007415M**
16×1.5 16×2.0	**B3007416X1.5M** **B3007416X2M**	**M4007416M** **M4007416M**	B3007416X2MSS	**M4007416M**
18×1.5 18×2.0	**B3007418X1.5M** B3007418X2M	**M4007418M** **M4007418M**	B3007418X1.5MSS	**M4007418M**
20×2.0 20×2.5	**B3007420X2M** **B3007420X2.5M**	**M4007420M** **M4007420M**	B3007420X2MSS B3007420X2.5MSS	**M4007420M** **M4007420M**
22×1.5 22×2.0 22×2.5	B3007422X1.5M B3007422X2M B3007422X2.5M	**M4007422M** **M4007422M** **M4007422M**	B3007422X1.5MSS	M4007422M
25×2.0 25×3.0	B3007425X2M **B3007425X3M**	**M4007425M** **M4007425M**	B3007425X2.5MSS	**M4007425M**
28×2.0 28×2.5	B3007428X2M B3007428X2.5M	M4007428M M4007428M		
30×3.0	**B3007430X3M**	**M4007430M**	B3007430X3MSS	**M4007430M**
32×3.0	B3007432X3M	**M4007432M**		
35×3.0	B3007435X3M	M4007435M		
38×3.0 38×4.0	**B3007438X3M** **B3007438X4M**	**M4007438M** **M4007438M**	B3007438X4MSS	**M4007438M**
42×3.0 42×4.0	B3007442X3M B3007442X4M	M4007442M M4007442M		

Tools for tube dimensions which are not listed must be inquired at Parker.

Bold = Standard dimensions
Regular = Non standard dimensions

Inch tube

Tube size inch	Steel tube	
	Flange pin Order code	Flange die Order code
1/4×0.049	B3004X049074	M4004074
3/8×0.049 3/8×0.065	B3006X049074 B3006X065074	M4006074 M4006074
1/2×0.065	B3008X065074	M4008074
5/8×0.065 5/8×0.095	B3010X065074 B3010X095074	M4010074 M4010074
3/4×0.095	B3012X095074	M4012074
1×0.109	B3016X109074	M4016074
1 1/4×0.120	B3020X120074	M4020074

Further tools for Inch tubing are available from Parker TFD Columbus!

Tool lifetime

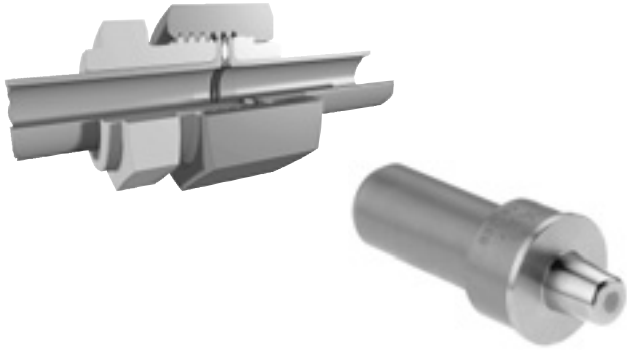
Assembly tools are subject of wear and must be regularely (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerous assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:

- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant

Parflange® tools for Flange Seal

Flange dies and Parflange® pins for machines 50/1040/1030/1025 steel tube

Clamping die set M ... 180



Parflange® pin B ... 180

Metric tube

Tube size (O.D. × wall thickness) mm	Flange pin Order code	Flange die Order code
06×1.0	B3018006X1M	M4018006X1MLHP
08×1.0 08×1.5	B3018008X1M B3018008X1.5M	M4018008X1MLHP M4018008X1.5MLHP
10×1.0 10×1.5 10×2.0	B3018010X1M B3018010X1.5M B3018010X2M	M4018010X1MLHP M4018010X1.5MLHP M4018010X2MLHP
12×1.0 12×1.5	B3018012X1M B3018012X1.5M	M4018012X1MLHP M4018012X1.5MLHP
16×2.0	B3018016X2M	M4018016X2MLHP
20×2.5	B3018020X2.5M	M4018020X2.5MLHP
25×2.5 25×3.0	B3018025X2.5M B3018025X3M	M4018025X2.5MLHP M4018025X3MLHP

Tools for tube dimensions which are not listed must be inquired at Parker.

Inch tube

Tube size (O.D. × wall thickness) Inch	Flange pin Order code	Flange die Order code
1/4×0.035 1/4×0.049	B3004X035180 B3004X049180	M4004X035180LHP M4004X049180LHP
3/8×0.049 3/8×0.065	B3006X049180 B3006X065180	M4006X049180LHP M4006X065180LHP
1/2×0.049 1/2×0.065 1/2×0.083	B3008X049180 B3008X065180 B300810X083180	M4008X049180LHP M4008X065180LHP M4008X083180LHP
5/8×0.065	B301010X065180	M4010X065180LHP
5/8×0.083	B301010X083180	M4010X083180LHP
3/4×0.065 3/4×0.083	B3012X065180 B3012X083180	M4012X065180LHP M4012X083180LHP
1×0.095	B3016X095180	M4016X095180LHP

Tool lifetime

Assembly tools are subject of wear and must be regularely (max. 50 assemblies) cleaned and checked (Checking instructions see chapter E). Worn out tools can cause dangerous assembly failures and must be replaced in time. Average tool lifetime is approx. 5000 cycles when properly used. Maximum lifetime can be achieved by following factors:

- Regular cleaning and checking
- Clean and corrosion-protected storage
- Proper de-burring and cleaning of tube end
- Proper tool selection and operation
- Use of specified lubricant

Lubricants

EO-NIROMONT lubricant for fitting assembly

EO-NIROMONT lubricant for flaring and forming tools

EO-NIROMONT are high performance lubricants specifically designed for the assembly of tube connections. They facilitate tightening using a low-torque when assembling joints by hand. In machine assembly, the use of EO-NIROMONT ensures that maximum tool-life is achieved. In forming processes, such as Parflange® or EO2-FORM, smooth and error-free sealing surfaces can be produced. Special additives prevent cold welding when working with stainless steel.

As opposed to when using Parker high performance lubricants, experience shows that the use of standard commercially available lubricants tend to lead to problems such as cold welding of forming tools, particularly when processing stainless steel tube.

Parker high performance lubricants – EO-NIROMONT – are offered in different containers and viscosities so that you can purchase the appropriate product in a suitable container to meet your needs:

Liquid lubricant, plastic bottle (item: EONIROMONTFLUESSX)
Parker high performance lubricant for the lubrication of threads, progressive rings and for all cold forming processes like Parflange® or EO2-FORM. The handy plastic bottle means that it can be applied directly where the lubrication is needed. EO-NIROMONT liquid should always be available at every assembly point where hydraulic connections are being made.

Liquid lubricant, refill package (Item: LUBSS)
Parker high performance lubricant for all cold forming processes like Parflange® or EO2-FORM. Its viscosity means that it is for use in automatic lubrication devices installed in Parflange machines. Absolutely essential for mechanical cold forming of stainless steel tubes.

Paste lubricant, tin (Item: EONIROMONTPASTX)
Parker high performance lubricant for the lubrication of the threads of the pre-assembly tool VOMO. The paste is economical and provides durable thread lubrication. Not suited for use with forming tools, as dust and swarf will stick to it.

Features, advantages and benefits of NIROMONT lubricant:

1. **Highly effective** – EO-NIROMONT dramatically reduces assembly effort. This helps to prevent fitting failure resulting from insufficient assembly.
2. **Cost saving –** Tools in assembly machines will last much longer, resulting in high-quality tube forming with excellent sealing surface.
3. **No cold welding** – Cold welding of stainless steel threads is impossible when EO-Niromont is properly applied.
4. **Liquid** – Penetrates even small gaps.
5. **Paste** – Stays in place for a while. Ideal for application on pre-assembly tools.
6. **Compatible** – EO-NIROMONT and LUBSS do not effect fitting surfaces or seal materials.

EO-NIROMONT

LUBSS

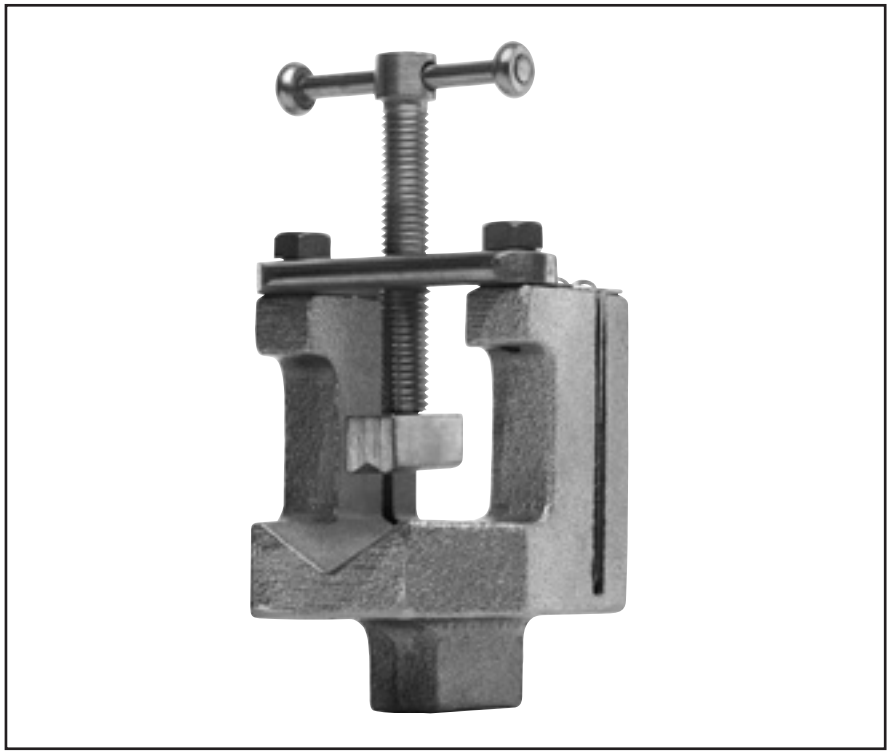
Ordering

Type	Order code
EO-NIROMONT Assembly lubricant paste (130 g)	EONIROMONTPASTX
EO-NIROMONT Assembly lubricant liquid (250 cc)	EONIROMONTFLUESSX
EO-NIROMONT Forming tool lubricant refill (1 L)	LUBSS

Cutting and bending tools

AV 6/42 – Tube saw square

Provides a neat and quick method of cutting tube at right angles. The exact cut is achieved by hardened guides. We recommend using deeper-section sawblades that cut in both directions for best results. The AV 6/42 can be used in a vice or just be clamped onto the tube for cutting.



Specifications:

Tube. O.D.: 6–42 mm
Weight: approx. 0.7 kg

Type	Order code
Tube cutting tool without saw	AV06/42KPLX
Spare hardened guides	AV06/4208X

Features, advantages and benefits of tube saw square:

1. **Square cut** – Exact tube preparation greatly reduces leakage caused by assembly failures.
2. **Contour clamping** – Tube is not distorted by clamping.
3. **No vice required** – For workshop application AV 6/42 can simply be clamped onto the tube without using a vice or other attachment.
4. **Replaceable guides** – Worn out guides can easily be replaced to maintain neat cutting result.
5. **Light** – At only 0.7 kg, the AV 6/42 should be carried in the toolbox of every hydraulic tube fitter.

Cutting and bending tools

BAV 6/12 – Combined tube bending and cutting tool

The BAV 6/12 is a workshop device for neat tube cutting and simple but exact bending of small dimension EO-tube. Relatively small bending radii can be achieved.

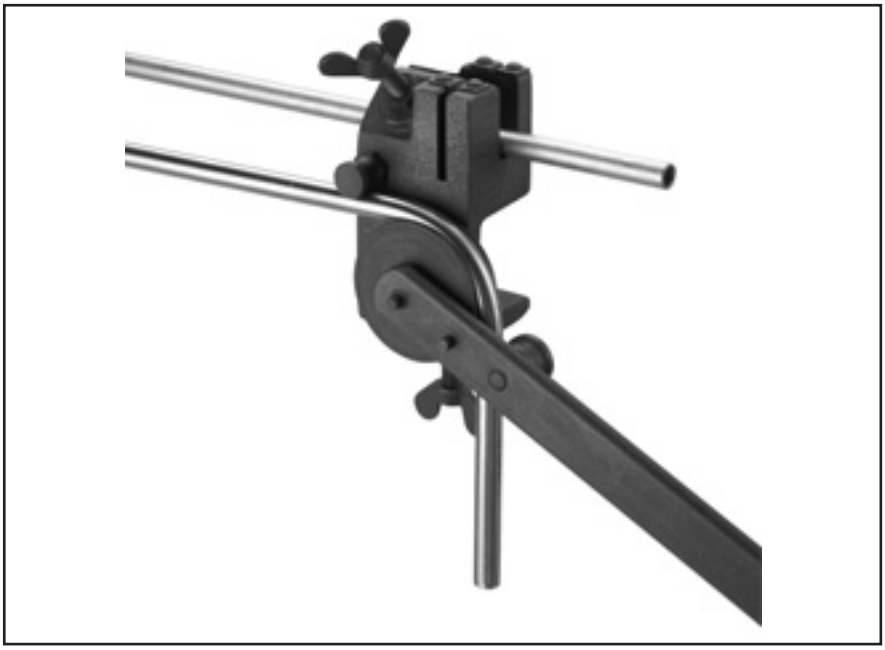
The exact cut is achieved with hardened guides and using sawblades which are notched on both sides. The BAV 6/12 can be used in a vice or just be clamped onto a workbench.

Specifications:

Tube. OD: 6–12 mm
Weight: approx. 2 kg

Type	Order code
Combined tube bending and cutting tool including 3 bending rolls for 6 to 12 mm tube and bending lever	BAV06/12KPLX
Spare Parts	
Spare hardened guide	BAV06/1206X
Bending roll 6/8 mm	BAV06/1209X
Bending roll 10 mm	BAV06/1210X
Bending roll 12 mm	BAV06/1211X
Bending pin	BAV06/1207X
Lever complete	BAV06/1220KPLX

Bending dimensions in mm			
Rolls for tube O.D.	6/8	10	12
Bending radius	19/20	25	26



Features, advantages and benefits of combined tube bending and cutting tool:

1. **Bending and cutting** – The BAV 6/12 is a light multi-purpose tool for all small dimension tube assemblies.
2. **Square cut** – Exact tube preparation greatly reduces leakage caused by assembly failures.
3. **No vice required** – For workshop application BAV 6/12 can simply be clamped onto a workbench.
4. **Small bending radii** – Compact tube bends allow tight assemblies.
5. **Light** – At only 2 kg, the BAV 6/12 can be easily brought to the assembly site.
6. **Optimised bending roller contour** – Special shape of bending roller allows small bends without tube flattening.

In-Ex tube deburring tool 226

Material: Aluminum with hardened steel blades
Tube-O.D.: 4 to 42 mm
Weight: 0.12 kg

Type	Order code
Tube deburrer	226A
Replacement blades	226A Blades

Features, advantages and benefits of In-Ex tube deburring tool 226:

1. **Proper deburring** – Exact tube preparation greatly reduces leakage caused by assembly failures.
2. **Replaceable blades** – Worn out blades can easily be replaced to maintain neat deburring result.
3. **Light** – At only 0.12 kg, the In-Ex tube deburring tool should be carried in the toolbox of every hydraulic tube fitter.

Cutting and bending tools

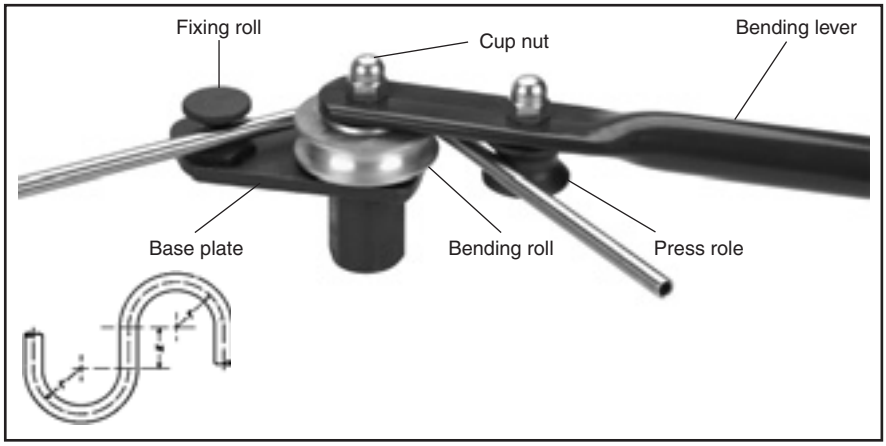
BV 6/18 – Tube bending tool

The BV 6/18 is a flexible bending device for simple but exact bending of EO-tube up to 18 mm tube O.D. The high quality bending results are achieved by 6 interchangeable bending rollers.

The fixing roller can be individually adjusted to produce a precise bend transition.

Specifications:
Tube-O.D.: 6–18 mm
Weight: approx. 4 kg

Type	Order code
Tube bending tool complete device including 6 bending rolls for 6 to 18 mm tube and bending lever	BV06/18KPLX
Spare Parts	
Bending roll 6/8 mm	BV06/1812X
Bending roll 10/12 mm	BV06/1803X
Bending roll 14 mm	BV06/1804X
Bending roll 15 mm	BV06/1805X
Bending roll 16 mm	BV06/1806X
Bending roll 18 mm	BV06/1807X
Fixing roll	BV06/1802X
Lever complete	BV06/1808KPLX



Bending dimensions in mm		
Rolls for tube O.D.	r	≈ X
6	33.0	35
8	34.0	35
10	35.5	35
12	36.5	35
14	36.5	35
15	44.0	38
16	44.0	38
18	51.5	42

Features, advantages and benefits of tube-bending tool:

1. **Vice mounted** – For easy workshop use, the BV can be clamped into a vice.
2. **Small bending radii** – Compact tube bends allow tight assemblies.
3. **Light** – At only 4 kg, the BV 6/18 can be easily brought to each assembly site.
4. **Optimised bending roller contour** – Special shape of bending roller allows small bends without tube flattening.

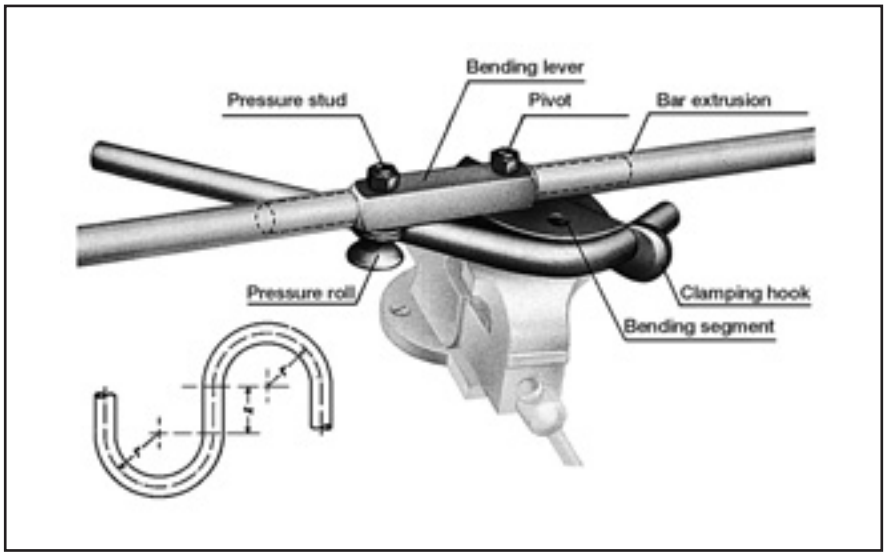
BV 20/25 – Tube bending tool

The BV 20/25 allows bending of medium size tube at the assembly site. The bending lever shows two universal studs. A bar extension can either be ordered or locally made.

Specifications:

Tube-O.D.: 20–25 mm
3 bending segments: 20, 22, 25 mm
Bending radius: r = 86,5 mm
x = 52 mm
Weight: approx. 15 kg (without bar extension)

Type	Order code
BV 20/25 Tube bending tool bending device including 3 bending segments for tube O.D. 20 to 25 mm including bending lever without bar extension tube	BV20/25KPLX
Spare Parts	
Bending segment 20 mm	BV20/2501X
Bending segment 22 mm	BV20/2502X
Bending segment 25 mm	BV20/2503X
Fixing arm	BV20/2505X
Lever complete	BV20/2506KPLX
Bar extension tube	BV20/2510X



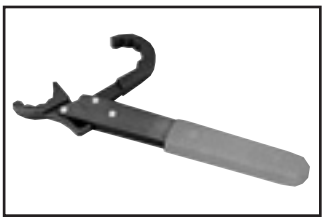
Features, advantages and benefits of tube-bending tool:

1. **Rigid design** – The solid design and the bar extension allow manual bending without heating the tube.
2. **Optimised bending roller contour** – Special shape of bending roller allows small bends without tube flattening.
3. **Shaped clamping** – Tube is not distorted by clamping.
4. **Small bending radii** – Compact tube bends allow for compact assemblies.
5. **Vice mounted** – For easy workshop use, the BV can be clamped into a vice.

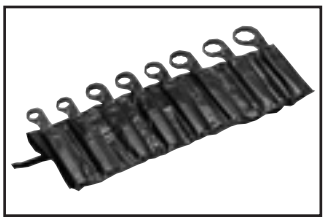
H

Hand-tools

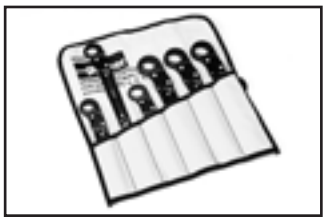
Par-Lok wrench



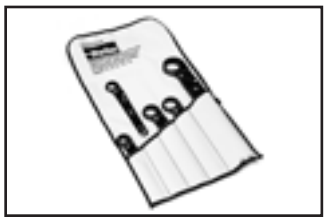
Par-Lok wrench



Par-Lok wrench kit



O-Lok® wrench kit



Triple-Lok® & Ferulok wrench kit

360° Snap-action ratchet wrench for hex sizes from 10 mm to 41 mm and inch sizes from $^{3}/_{8}$″ to $2^{1}/_{4}$″ accross flats. Inch sizes meet US government specifications and are listed as NSN-5120-00-474-7227.

Easy fitting assembly
Easy access ratchet wrench speeds fittings installation in tight locations. Rugged, snap-action jaws can be opened over tube lines, locked onto fitting hex and ratcheted within $^{1}/_{8}$ turn. Full six point contact prevents fitting distortion common with wrench slippage. Ideal for tube line installations where compact runs required multiple fittings make-up, disassembly and remakes.

Specifications
Par-Lok wrenches are available individually or in different kit combinations. Par-Lok jaws are constructed from drop-forged, high carbon steel material with a black conversion coat finish. Par-Lok handles are made from heavy gauge steel material, heat treated and with a corrosion resistant black finish. Solid stainless steel rivets and tempered jaw springs are designed into every wrench for maximum strength.

O-Lok® wrench kit
Six piece wrench set for use with O-Lok® body and nut sizes -4, -6, -8. Kit contains wrenches for hex sizes $^{5}/_{8}$″, $^{11}/_{16}$″, $^{3}/_{4}$″, $^{13}/_{16}$″, $^{7}/_{8}$″ and $^{15}/_{16}$″.

Triple-Lok® & Ferulok wrench kit
Five piece wrench set for use with Triple-Lok® and Ferulok body and nut sizes -4, -6, -8, -10, -12. Kit contains wrenches for hex sizes $^{9}/_{16}$″, $^{11}/_{16}$″, $^{7}/_{8}$″, and 1″ and $^{1}/_{4}$″.

Features, advantages and benefits of Par-Lok wrench:

1. **360**° – No slipping and hexagon damage.
2. **Snap-mechanism** – Ideal for tube fitting assembly.
3. **Light** – Par-Lok wrenches belong in the standard toolbox of each fitting engineer.

Inch Sizes					Metric Sizes	
Hex Size	Order code	Hex Size	Order code	Hex Size	Max. torque Nm	Order code
3/8	860062-6	1 1/8	860062-18	10 mm	35	860063-10
7/16	860062-7	1 1/4	860062-20	11 mm	37	860063-11
1/2	860062-8	1 3/8	860062-22	12 mm	42	860063-12
9/16	860062-9	1 1/2	860062-24	13 mm	45	860063-13
5/8	860062-10	1 5/8	860062-26	14 mm	57	860063-14
1 1/16	860062-11	1 7/8	860062-30	16 mm	88	860063-16
3/4	860062-12	2	860062-32	17 mm	107	860063-17
1 3/16	860062-13	2 1/4	860062-36	19 mm	125	860063-19
7/8	860062-14	Full kit of all	860062-KIT2	21 mm	149	860063-21
1 5/16	860062-15	eight wrenches		22 mm	178	860063-22
1	860062-16	O-Lok® kit	860062-LKIT	24 mm	209	860063-24
Full kit	860062-KIT	(six wrenches)		27 mm	100	860063-27
of all eleven sizes		Triple-Lok®/Ferulok kit	860062-XUKIT	30 mm	100	860063-30
		(five wrenches)		32 mm	170	860063-32
				36 mm	170	860063-36
				41 mm	310	860063-41
				Full kit		860063-KIT
				of all ten sizes		
				10 to 22 mm		

WZK – Tool boxes

Tools which are regularly used for tube preparation and bending are available in organized tool boxes. Two sets are available:

Features, advantages and benefits:

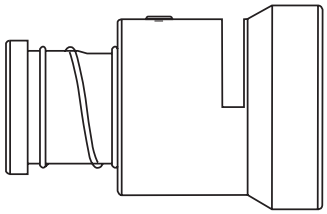
1. **Well organised** – Nothing gets dirty, damaged, lost or forgotten.
2. **Practical** – In one box you take everything to the assembly site.
3. **Rigid** – The solid metal box is suitable for daily workshop use.

Type	Content	Order code
Toolbox WZK1	BV6/18 tube bending tool	WZK1KOMPLX
Toolbox WZK2	BV6/18 tube Bending tool, AV6/42 tube saw square, Hacksaw, Flat file, Deburring tool, fixture for assembly cones VOMO and cone-template KONU	WZK2KOMPLX

H

O-ring assembly tools

CORG O-ring installation tool for O-Lok®



Parker's CORG Assembly Tools are designed to facilitate the installation of the O-ring into the half-dovetail groove of the O-ring face seal fitting. They are available in sizes –4 to –32 (6 mm to 50 mm/1/4˝ to 2˝ tube).

Ordering

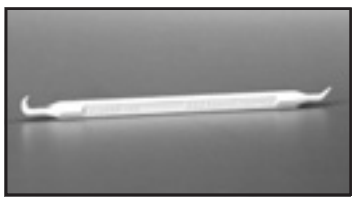
CORG tool Order code	Fitting size	O-ring size
CORG-4	– 4	2-011
CORG-6	– 6	2-012
CORG-8	– 8	2-014
CORG-10	–10	2-016
CORG-12	–12	2-018
CORG-16	–16	2-021
CORG-20	–20	2-025
CORG-24	–24	2-029
CORG-32	–32	2-135

Operation
See chapter F "Fitting assembly" for detailed instructions

The CORG assembly tool is easy to use and can be operated in just a few steps:

1. Insert the O-ring into the slot located on the side of the tool.
2. Position the open end of the tool over the ORFS end of the fitting.
3. With the fitting end bottomed inside the tool, push the piston of the tool until the O-ring is released into the fitting groove.

O-ring pick for O-Lok®



O-ring pick

A plastic O-ring pick to allow easy removal of O-rings without causing damage to the fitting.

Ordering

Type	Order code
Plastic O-ring pick device	O-RINGPICK

Features, advantages and benefits of O-Ring installation tools

1. **Special** – O-ring installation tools are especially designed for O-Lok® fittings with CORG groove. O-rings are not torn or damaged at assembly.

2. **Cost saving** – O-ring installation tools are easy to use and save time and cost when O-rings need to be assembled.

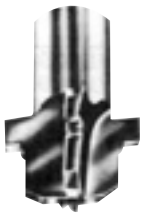
Port cutting tools

Counterbore tools and thread taps for metric ports

For manufacturing metric ports to ISO 6149 (Details see chapter D).

These tools allow correct manufacturing of metric port connections. Counterbore tools and thread taps are made of high speed tool steel (HSS).

Ordering counterbore tools



ISO 6149 Port size	Order code	
	Large Spot face[1])	Small Spot face[2])
M 08×1.0	R1449A	R1449B
M 10×1.0	R1450A	R1450B
M 12×1.5	R1451A	R1451B
M 14×1.5	R1452A	R1452B
M 16×1.5	R1453A	R1453B
M 18×1.5	R1454A	R1454B
M 22×1.5	R1455A	R1455B
M 27×2.0	R1456A	R1456B
M 33×2.0	R1457A	R1457B
M 42×2.0	R1458A	R1458B
M 48×2.0	R1459A	R1459B

1) with ID-groove
2) without ID-groove

Ordering thread taps

ISO 6149 Port size	Order code
M08	M08×1-6H-TAP
M10	M10×1-6H-TAP
M12	M12×1.5-6H-TAP
M14	M14×1.5-6H-TAP
M16	M16×1.5-6H-TAP
M18	M18×1.5-6H-TAP
M22	M22×1.5-6H-TAP
M27	M27×2-6H-TAP
M33	M33×2-6H-TAP
M42	M42×2-6H-TAP
M48	M48×2-6H-TAP

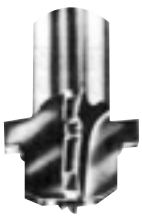
H

Counterbore tools and thread taps for straight SAE thread ports

For manufacturing UNF ports to SAE J 1926-1 (details see chapter D)

These tools allow correct manufacturing of UNF port connections. Counterbore tools and thread taps are made of high speed tool steel (HSS).

counterbore tools

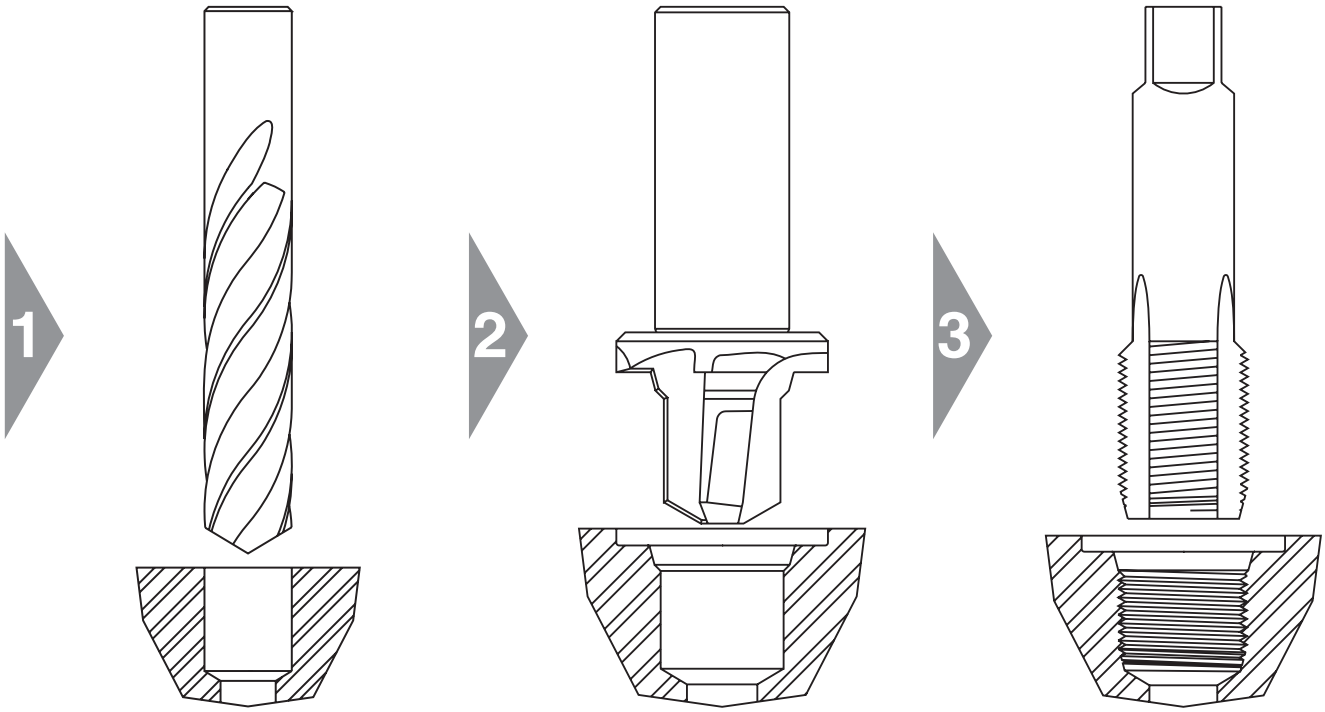


Use with UNF thread size	SAE dash size	Order code
5/16-24	2	Y-34730
3/8-24	3	Y-34731
7/16-20	4	Y-34732
1/2-20	5	Y-34733
9/16-18	6	Y-34734
3/4-16	8	Y-34735
7/8-14	10	Y-34736
1 1/16-12	12	Y-34737
1 3/16-12	14	Y-34738
1 5/16-12	16	Y-34739
1 5/8-12	29	Y-34740
1 7/8-12	24	Y-34741
2 1/2-12	32	Y-34743

thread taps

Use with UNF thread size	SAE dash size	Order code
5/16-24	2	5/16X24 UNF-2B
3/8-24	3	3/8X24 UNF-2B
7/16-20	4	7/16X20 UNF-2B
1/2-20	5	1/2X20 UNF-2B
9/16-18	6	9/16X18 UNF-2B
3/4-16	8	3/4X16 UNF-2B
7/8-14	10	7/8X14 UNF-2B
1 1/16-12	12	1 1/16X12 UNF-2B
1 3/16-12	14	1 3/16X12 UNF-2B
1 5/16-12	16	1 5/16X12 UNF-2B
1 5/8-12	29	1 5/8X12 UNF-2B
1 7/8-12	24	1 7/8X12 UNF-2B
2 1/2-12	32	2 1/2X12 UNF-2B

Operation of port cutting tools



1. Pilot hole drilling **2. Port counterboring** **3. Thread tapping**

Note:
All dimensions must be according to relevant standards. See chapter D for details.
It is necessary to create a spotface surface which is flat and perpendicular to the port. Smooth finish to prevent leakage or O-ring extrusion.

Parker counterbore tools are made from high speed tool steel (HSS). Regular HSS port tapping tools are intented for workshop use and repair.
Maximum lifetime of Parker counterbores can be achieved by:

- use for cutting mild steel or aluminium only
- staying within recommended cutting speed for HSS / port material
- sufficiant lubrication and cooling
- workshop use and repair only

For serial production of hydraulic ports, these Parker workshop tools are not suitable.
For production, Parker generally recommends to use hard carbide alloy.

Thread identification

Thread identification kit

The thread identification tools are beneficial in the assistance of the identification of international threads such as:

- European threads
  (Metric, BSPP, BSPT threads) and
- U.S. threads
  (NPT and SAE straight threads UNF)

The Thread Identification Kit is equipped with a set of callipers, thread profiles, and an instruction booklet.

The components of the thread ID Kit are no high precision gauges but simple instruments for workshop use.

Ordering

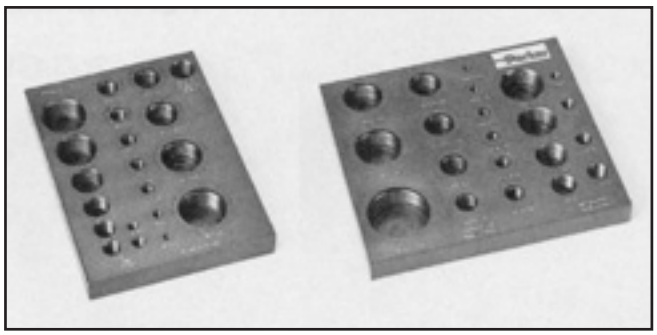
Type	Order code
Thread identification kit	MIK-1

Attention: The kit is only available in english!

Portboard

Portboards are suitable for thread identification of male stud connectors. The two portboards are machined with female threads for quick and easy identification by simply screwing the appropriate male port end.

- European
  (Metric, BSPP/BSPT threads)
- U.S.
  (NPT and SAE straight threads UNF)



Ordering

Type	Order code
Portboard for NPT and SAE straight threads	PORTBOARD A
Portboard for Metric and BSPP/BSPT threads	Portboard B