

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 regularly (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. 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 – 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.

	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

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-tem-plate 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 x Battery AA – Mignon – LR6 (included)
Scope of supply:	Distance gauge with LED indication, batteries, master piece and instructions in a plastic case

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

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-tem-plate 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



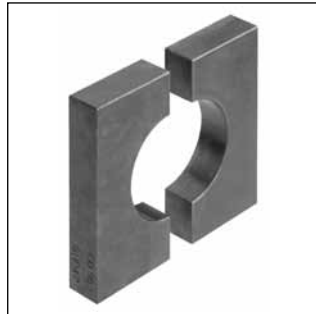
Applications

- 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

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



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
LL³⁾	4	MOK04LLX	as MOK for PSR/DPR	GHP04X		KONU04LL
	6	MOK06LLX		GHP06X		KONU06LL
	8	MOK08LLX		GHP08X		KONU08LL
	10	MOK10LLX		GHP10X		KONU10LL
	12	MOK12LLX		GHP12X		KONU12LL
L	6	MOK06LX	MOKEO206L	GHP06X ¹⁾	AKL06LS	KONU06L ¹⁾
	8	MOK08LX	MOKEO208L	GHP08X ¹⁾	AKL08LS	KONU08L ¹⁾
	10	MOK10LX	MOKEO210L	GHP10X ¹⁾	AKL10L	KONU10L ¹⁾
	12	MOK12LX	MOKEO212L	GHP12X ¹⁾	AKL12L	KONU12L ¹⁾
	15	MOK15LX	MOKEO215L	GHP15X	AKL15L	KONU15L
	18	MOK18LX	MOKEO218L	GHP18X	AKL18L	KONU18L
	22	MOK22LX	MOKEO222L	GHP22X	AKL22L	KONU22L
	28	MOK28LX	MOKEO228L	GHP28X	AKL28L	KONU28L
	35	MOK35LX	MOKEO235L	GHP35X ²⁾	AKL35L	KONU35L
	42	MOK42LX	MOKEO242L	GHP42X ²⁾	AKL42L	KONU42L
S	6	MOK06SX	MOKEO206S	GHP06X ¹⁾	AKL06LS	KONU06L ¹⁾
	8	MOK08SX	MOKEO208S	GHP08X ¹⁾	AKL08LS	KONU08L ¹⁾
	10	MOK10SX	MOKEO210S	GHP10X ¹⁾	AKL10S	KONU10L ¹⁾
	12	MOK12SX	MOKEO212S	GHP12X ¹⁾	AKL12S	KONU12L ¹⁾
	14	MOK14SX	MOKEO214S	GHP14X	AKL14S	KONU14S
	16	MOK16SX	MOKEO216S	GHP16X	AKL16S	KONU16S
	20	MOK20SX	MOKEO220S	GHP20X	AKL20S	KONU20S
	25	MOK25SX	MOKEO225S	GHP25X	AKL25S	KONU25S
	30	MOK30SX	MOKEO230S	GHP30X	AKL30S	KONU30S
38	MOK38SX	MOKEO238S	GHP38X	AKL38S	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 regularly (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. 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

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 progressive 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)

