



Do more with pallets:

- Double-deep stacking
- One sided loading
- Hydraulic extensions
- Dual load transport

Telescopic forks

Hydraulic lift truck forks
Save time, space and money



kooi Reachforks®

A trademark of MSE-FORKS B.V.



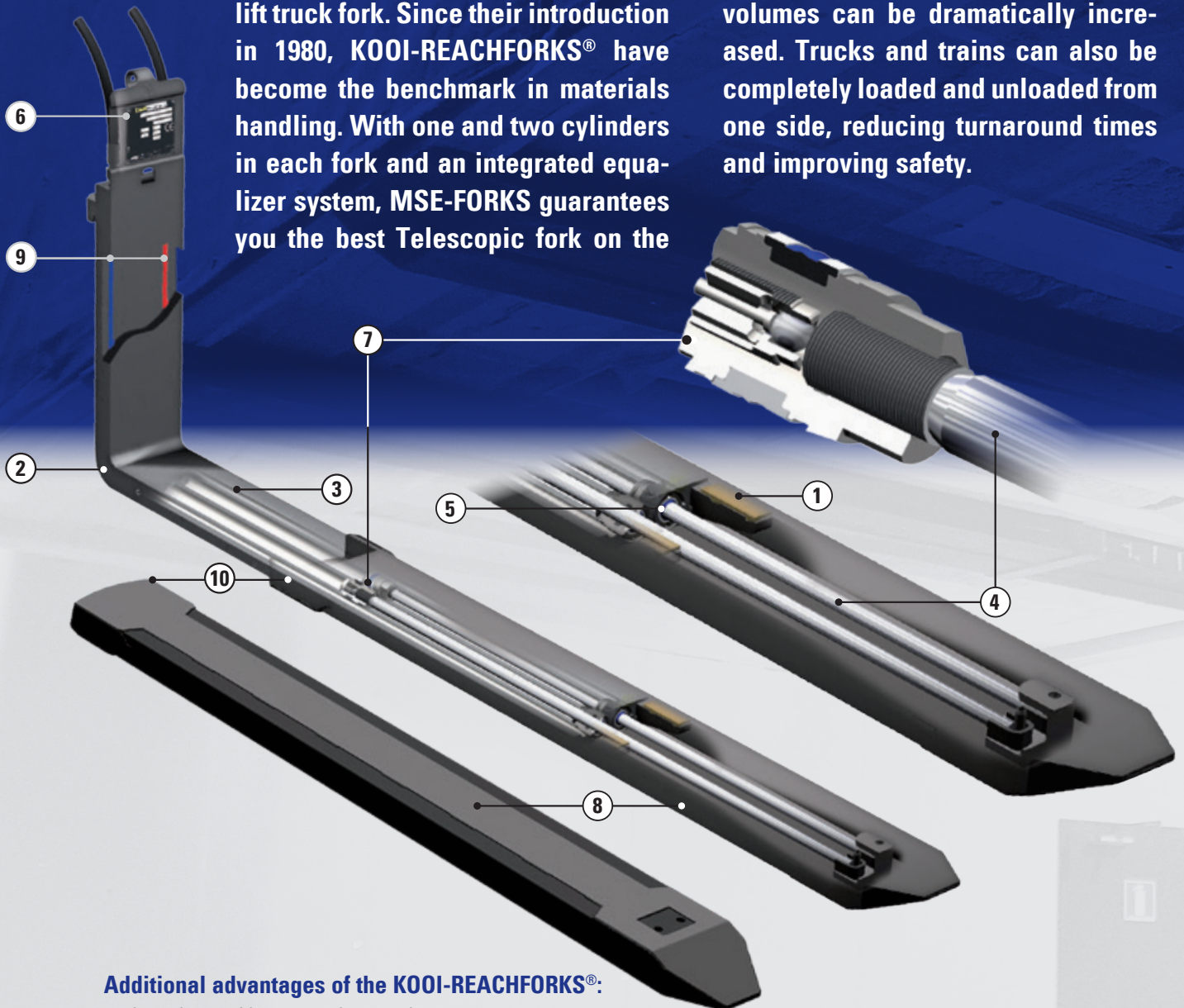
MSE-FORKS
Innovative Logistic Products

KOOI-REACHFORKS®

are attachments that can be used throughout industry to save time, space and money.

MSE-FORKS was the first to develop a hydraulic extending and retracting lift truck fork. Since their introduction in 1980, KOOI-REACHFORKS® have become the benchmark in materials handling. With one and two cylinders in each fork and an integrated equalizer system, MSE-FORKS guarantees you the best Telescopic fork on the

market. By using KOOI-REACHFORKS® for double-deep stacking, storage volumes can be dramatically increased. Trucks and trains can also be completely loaded and unloaded from one side, reducing turnaround times and improving safety.



Additional advantages of the KOOI-REACHFORKS®:

1. Interchangeable wear resistant strips.
2. Reinforced heel giving less deflection.
3. Honed cylinder bores improve seal life.
4. Hard chromed piston rods protected by outer forks.
5. Specially designed wiper ring protects the forks even in dirty conditions.
6. Special design fitting guard for easier connection of the forks onto the fork carrier.
7. One or twin cylinders in each fork allow the forks to work in all kind of applications.
8. Unique design outerforks includes integrated wear plate (400HB) for longer fork life.
9. Fully integrated oil channels and hydraulic parts means working parts are protected reducing maintenance costs.
10. An ingenious combination of laser cutting and sheet metal work construction ensures that sleeves do not catch when withdrawing from pallets. The sleeves corners are fully rounded off along all edges.

Single Range

Mainly on reachtrucks for double-deep stacking

These single-cylinder telescopic forks are ideal for double-deep pallet storage and therefore are mostly used on warehouse trucks, reachtrucks etc.

Double Range

Mainly on counterbalance and side-loader lift trucks for one sided loading

These double-cylinder telescopic forks are ideal for one-sided loading and unloading of trucks, trains etc. and can perform under demanding circumstances.

Slim Range

Mainly included on multi-pallet handlers

These ultra-narrow telescopic forks use are ideal for inserting between bricks or blocks etc. Their width allows them to be used on multi-load handlers for lifting one, two or even four pallets at once.

Extension Range

Mainly on counterbalance and reachtrucks for variable lengths and dual pallet handling

These hydraulically adjustable forks can drastically reduce costs incurred as a result of damaged products and pallets.

Power Range

Mainly on mounted forklift trucks for one sided loading

These telescopic forks are specially designed for use on truck-mounted forklift trucks and are fitted with an external synchronization valve in order to cope with the higher power demands required for this type of usage.

Heavy Duty Range

Mainly on heavy counterbalance and side-loaders forklift trucks for one sided loading

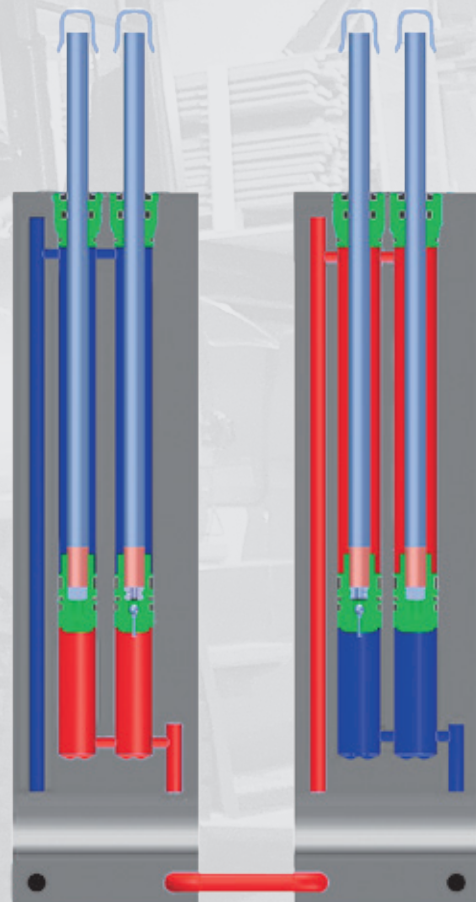
These telescopic forks are specially designed for use on heavy lift trucks with capacities of more than 10.5000 kg and are fitted with an external synchronization valve in order to cope with the higher power demands required for this type of usage

The need for equal movement (Equalizer system)

Uneven movement is the most significant problem encountered when using any telescopic forks. This can lead to twisting of pallets which can cause dangerous situations when loading or unloading and is particularly hazardous when working at height in double-deep racking systems. MSE-FORKS self-equalizer system guarantees 100% synchronization of movement.

Other advantages

- Visibility is considerably improved through a reduction in the number of hoses and the absence of an external flowdividing system.
- When the load is not centralized on the KOOI-REACHFORKS® the equalizer forks will compensate the force on the hydraulic forks automatically.
- Easy and quick connection onto the fork carrier.
- Lower fitting costs because of the absence of separate flowdivider.



Applications

Double-deep-stacking: The use of double-deep- stacking increases warehouse capacity by up to 30% compared to “single-deep” warehouse operations.

The fact that the KOOI-REACHFORKS® can reach twice as far as normal forks from one side means that the racking at each side of the aisle can be doubled.

Double deep storage has become a very popular choice in “high throughput” operations and is ideal for Cold stores,

Dry stores and the storage of multiple pallets of the same products, known as FILO (First In Last Out) principle. KOOI-REACHFORKS® are the best system for changing any type of forklift truck into a “double-deep” truck. The Double-deep-stacking application has already generated considerable cost savings.



Telescopic Forks vs. Pantograph system

Telescopic forks can also have some important benefits in single-deep and double-deep applications. Compared to reach trucks with a pantograph or moving mast, the relatively light Telescopic forks result in a reach truck with better stability, visibility and higher lifting capacity. Telescopic forks have some distinct advantages compared to a pantograph such as:

1. Reduced attachment weight (approx. 35%).
2. When using trucks with a fixed mast it is no longer necessary to have a bottom racking beam, increasing ware house capacity and reducing overall racking costs.
3. Virtually the same lost load thickness as standard forks and optimum visibility.
4. Shorter mast compared to the total lift truck height.
5. All parts are integrated inside the forks and cannot be damaged. Fewer items require maintenance, meaning reduced operating costs.
6. Easy to install on new or existing lift trucks.
7. Double pallet transport possible with same reach system.

Loading and unloading

Trucks as well as trains can be completely loaded and unloaded from one side. It is no longer necessary to turn the vehicle or approach the trailer from both sides. This way of pallet handling makes the operation safer than the traditional method because all the operations are carried out from one side. The time saving is $\pm 30\%$. The reduced amount of space required for turning means that extra space is created which can, for example, be used to store additional goods. Of course we cannot calculate the benefits for the truck driver but the fact that the trailer only has to be opened from one side and the fact that no extra manoeuvre is required should not be underestimated.



Double pallet transport

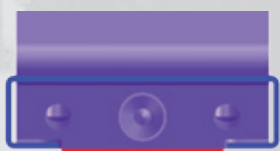
KOOI-REACHFORKS® can be extended to transport two pallets at a time. This can generate considerable benefits involving large volumes or long distances. Combinations with a fork positioner and spreader are possible as well, allowing you to handle 4 pallets at a time which improves the loading and unloading speed of trucks and trains enormously.



Hydraulic extensions

These telescopic forks allow a wide variety of different pallet sizes to be handled safely and quickly without damage to the pallets or goods. They also help to reduce the safety risks and wasted time often associated with the use of manual forks extensions.

These state of the art fork extensions have a special cross section so that the underside of the outerforks cannot catch pallet boards, preventing damage.



Hardened wearstrip



Telescopic forks on fork positioners

Telescopic forks can be used with most fork positioners. This combination can save a lot of time when a variety of pallet types are being handled. One, two or even four pallets can be handled by special small telescopic forks mounted on a double fork positioner.



Telescopic forks on truck-mounted forklifts

A lot of 'piggyback' lift trucks are equipped with Telescopic forks. The fixed mast in combination with the Telescopic forks provide a stable, lightweight machine with a relatively high capacity.



Telescopic forks on side-loaders and heavy capacity trucks

Telescopic forks are frequently used on side-loaders for "double-deep" stacking operations and to help manoeuvre the load. They have the advantage over traditional pantograph attachments of not affecting platform width while adding little weight.

The advantage of KOOI-REACHFORKS® compared to other devices such as a pantograph is a greater residual capacity will be achieved through its lower attachment weight. The machine is easier to operate, has better performance, is more cost effective and the driver's view is not obstructed.



Specifications

Single Range - mainly on reachtrucks for double-deep stacking

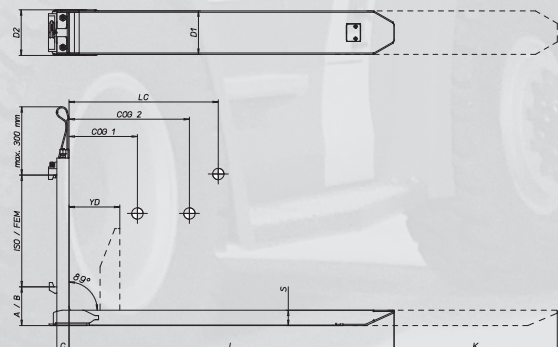
Model	Capacity on LC 600 mm (kg)	Section D1/D2xS (mm)	L / K (mm)	C (mm)	CoG1 (mm)	CoG2 (mm)	Weight (kg)	ISO/FEM
RG2 20 1100/0750	2000	131/139 x 57	1100/0750	45	370	530	147	2A
RG2 20 1200/0850			1200/0850		415	600	156	
RG2 20 1350/1000			1350/1000		480	710	170	
RG2 30 1100/0750	3000	131/139 x 57	1100/0750	45	350	508	157	3A
RG2 30 1200/0850			1200/0850		395	580	166	
RG2 30 1350/1000			1350/1000		460	680	180	
RGN2 35 1100/0750	3500	131/139 x 62	1100/0750	50	355	500	172	3A
RGN2 35 1200/0850			1200/0850		417	590	180	
RGN2 35 1350/1000			1350/1000		463	665	198	
TFG2 30 1050/0800	3000	131 / 139 x 62	1050/0800	50	350	505	168	3A
TFG2 30 1150/0900			1150/0900		390	575	178	
TFG2 30 1300/1050			1300/1050		455	680	193	
TRG2 30 0950/0900	3000	170/179 x 67	095/0900	50	267	412	182	3A
TRG2 30 1050/1000			1050/1000		356	553	213	
TRG2 30 1200/1150			1200/1150		448	698	243	

Double Range - mainly on counterbalance and side-loader lift trucks for one sided loading

RG4 25 1100/0750	2500	161/169x57	1100/0750	45	363	536	178	2A
RG4 25 1200/0850			1200/0850		406	607	189	
RG4 25 1350/1000			1350/1000		473	717	206	
RG4 35 1100/0750	3500	161/169x57	1100/0750	45	344	506	189	3A
RG4 35 1200/0850			1200/0850		386	576	200	
RG4 35 1350/1000			1350/1000		451	683	217	
RG4 45 1100/0750	4500	161/169x57	1100/0750	45	344	506	189	3A
RG4 45 1200/0850			1200/0850		386	576	200	
RG4 45 1350/1000			1350/1000		451	683	217	
RG4 58 1100/0750	5800	161/169x62	1100/0750	50	314	449	233	4A
RG4 58 1200/0850			1200/0850		354	512	245	
RG4 58 1350/1000			1350/1000		415	610	264	
RE4 32 1100/0750	3200	161/169x47	1100/0750	45	328	486	176	3A
RE4 32 1200/0850			1200/0850		369	554	185	
RE4 32 1350/1000			1350/1000		433	660	200	
RE4 25 1100/0750	2500	161/169 x 57	1100/0750	45	370	526	185	2A
RE4 25 1200/0850			1200/0850		414	596	197	
RE4 25 1350/1000			1350/1000		482	702	215	
RE4 35 1100/0750	3500	161/169 x 57	1100/0750	45	350	498	196	3A
RE4 35 1200/0850			1200/0850		394	566	208	
RE4 35 1350/1000			1350/1000		460	670	227	
RE4 45 1100/0750	4500	161/169 x 57	1100/0750	45	350	498	196	3A
RE4 45 1200/0850			1200/0850		394	566	208	
RE4 45 1350/1000			1350/1000		460	670	227	
RE4 58 1100/0750	5800	161/169 x 62	1100/0750	50	318	455	238	4A
RE4 58 1200/0850			1200/0850		359	519	250	
RE4 58 1350/1000			1350/1000		421	618	270	
RE4 32 1100/0750	3200	161/169 x 47	1100/0750	45	318	455	238	3A
RE4 32 1200/0850			1200/0850		359	519	250	
RE4 32 1350/1000			1350/1000		421	618	270	

Remarks

- Minimum operating pressure 10 MPa, maximum 25 MPa.
- All forks have a 6 mm thick integrated wear plate (400 HB) under the complete outer sleeves for longer life span.
- For optimal speed and minimum loss of pressure the recommended minimum hose diameter is 8 mm.
- In cold-storage applications KOOI-REACHFORKS® can be used down to -30 degrees Celcius, contact your dealer.
- The lift truck manufacturer must determine the combined KOOI-REACHFORKS® and lift truck capacity.
- Capacities shown are nominal and apply to the forks and not the lift truck. Other capacities and dimensions on request.
- MSE-FORKS B.V. reserves the right to modify and improve their products without prior notice being given.



Slim range - mainly included on multi-pallet handlers

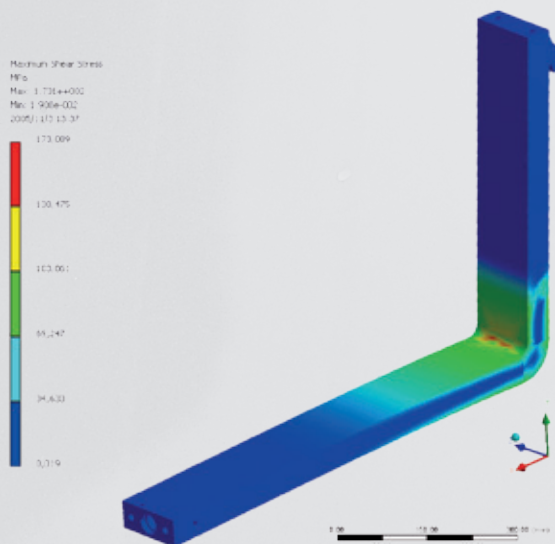
Model	Capacity on LC 600 mm (kg)	Section D1/D2xS (mm)	L / K (mm)	C (mm)	CoG1 (mm)	CoG2 (mm)	Weight (kg)	ISO/FEM
RE2 27 1150/0700	2700	89/81x63	1150/0700	60	445	630	106	2A
RE2 27 1250/0800			1250/0800		490	705	113	
RE2 27 1400/0950			1400/0950		565	825	122	
RE2 37 1150/0700	3700	89/81x73	1150/0700	60	415	575	132	3A
RE2 37 1250/0800			1250/0800		465	650	139	
RE2 37 1400/0950			1400/0950		535	755	151	

Extension range - mainly on counterbalance and reachtrucks for variable lengths an dual pallet handling

REE2 17 0800/0400	1700	128/128x40	0800/0400	40	215	240	90	2A
REE2 17 1000/0200			1000/0200		290	310	105	
REE2 17 1200/0800			1200/0800		375	495	116	
REE2 24 0800/0400	2400	131/131x44	0800/0400	45	220	275	104	2A
REE2 24 1000/0200			1000/0200		300	325	121	
REE2 24 1200/0800			1200/0800		285	510	135	
RGE2 20 0800/0400	2000	131/131x57	0800/0400	45	233	293	113	2A
RGE2 20 1000/0200			1000/0200		316	340	133	
RGE2 20 1200/0800			1200/0800		397	520	145	
RGE2 30 0800/0400	3000	131/131x57	0800/0400	45	220	275	122	3A
RGE2 30 1000/0200			1000/0200		302	327	144	
RGE2 30 1200/0800			1200/0800		382	515	158	

Remarks

- The Extension Range needs a minimum overlap of 400 mm (retracted length-stroke).
- The Slim Range needs a minimum overlap of 400 mm (retracted length-stroke).
- For optimal speed and minimum loss of pressure the recommended minimum hose diameter is 8 mm.
- In cold-storage applications KOOI-REACHFORKS® can be used down to -30 degrees Celsius, contact your dealer.
- Capacities given are for normal circumstances. For extreme applications contact your dealer.
- MSE-FORKS reserves the right to modify and improve their products without prior notice.

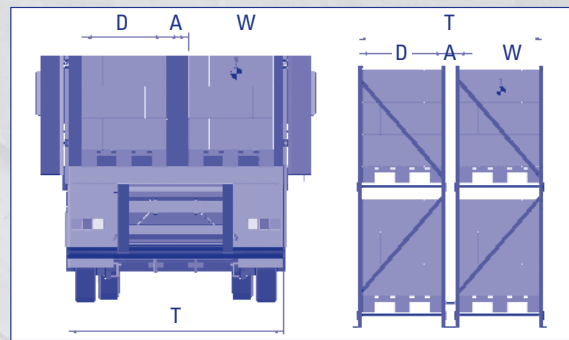
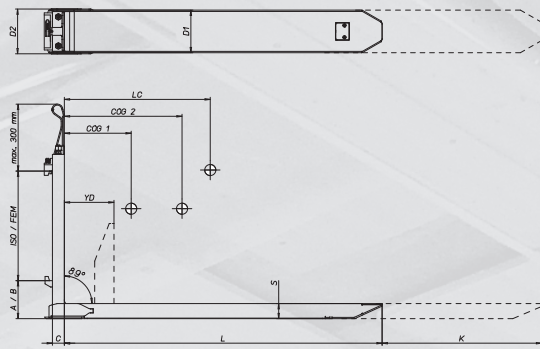


Extension Range Telescopic forks can be used as extension forks for handling 4-way pallets on the long or short side for example.



Special ISO standard for Telescopic forks

MSE-FORKS confirms that all their hydraulic telescopic forks comply fully with ISO 13284. This means that all inner sections of the Telescopic forks are tested to 3 times their rated capacity. In addition all outer forks are also tested to 3 times their rated capacity. Finally a random selection of forks are subjected to a dynamic endurance test of 1.000.000 cycles with an overload of 25% which complies to ISO 2330 (fork arms).



Formula to determine the measurements of the KOOI-REACHFORKS®

- T = total dept (mm)
- W = maximum weight of pallet (kg)
- D = dept of pallet (mm)
- A = space between the pallets (mm)
- O = standard overlap 350 mm
- LC1 = load center retracted 600 mm

- Formule retracted length mm (L): $(T-O) / 2 + O$
- Formule stroke mm (K): $L - O$
- Formule distance palletstops mm (YD): $L - D$
- Formule load center extended mm LC2: $T - (0,5 \times D)$
- Formule capacity Telescopic forks RG: $W \times LC2 / LC1$

Example:

- D = 1200 mm
- T = D+A+D = 2450 mm
- W = 800 kg
- A = 50 mm
- L = $(2450 - 350) / 2 + 350 = 1400$ mm
- K = $1400 - 350 = 1050$ mm
- YD = $1400 - 1200 = 200$ mm
- LC2 = $2450 - (0.5 \times 1200) = 1850$ mm
- Capacity = $800 \times 1850 / 600 = 2466$ kg

For an online calculation tool, visit: www.mse-tools.com

Table 1 Load center of Telescopic forks (mm)

	1150	1250	1350	1450	1550	1650	1750	1850
100	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
200	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
300	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
400	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
500	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
600	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
700	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG4 25	RG4 25	RG4 25
800	RG2 20	RG2 20	RG2 20	RG2 20	RG4 25	RG4 25	RG4 25	RG4 25
900	RG2 20	RG2 20	RG4 25	RG4 25	RG4 25	RG4 25	RG2 30	RG2 30
1000	RG2 20	RG4 25	RG4 25	RG4 25	RG2 30	RG2 30	RG2 30	RG4 35
1100	RG4 25	RG4 25	RG4 25	RG2 30	RG2 30	RG4 35	RG4 35	RG4 35
1200	RG4 25	RG4 25	RG2 30	RG2 30	RG4 35	RG4 35	RG4 35	RG4 45
1300	RG4 25	RG2 30	RG2 30	RG4 35	RG4 35	RG4 45	RG4 45	RG4 45
1400	RG2 30	RG2 30	RG4 35	RG4 35	RG4 45	RG4 45	RG4 45	RG4 45
1500	RG2 30	RG4 35	RG4 35	RG4 45	RG4 45	RG4 45	RG4 45	RG4 45

Always round the capacity required up to the next model in the range. In the example above you would need the RG4-25-1400/1050. You can also use Table 1 to determine the Telescopic fork model you require.

Table 2

Indication of residual capacity for the most common Telescopic forks. Lift truck manufacturer needs always to confirm measurements.

Model:	RG2 20	RG2 20	RG2 20	RG4 25	RG4 25	RG4 25	RG4 25	RG2 30	RG2 30	RG4 35	RG4 35	RG4 45	RG4 45
Lift truck cap. (kg)	1200	1600	1800	1200	1600	1800	2000	2000	2500	2000	2500	3000	3500
Lift truck x (mm)	350	350	350	350	350	350	500	500	500	500	500	500	500
LC 600 mm	950	1310	1485	935	1290	1470	1670	1650	2110	1670	2100	2180	3030
LC 1350 mm	515	715	815	505	700	800	975	995	1230	975	1245	1515	1780
LC 1450 mm	475	665	750	460	650	740	915	905	1150	910	1170	1425	1680
LC 1750 mm	395	550	635	375	535	620	770	765	975	790	1015	1215	1435
LC 1850 mm	375	530	605	360	515	590	740	735	945	730	950	1160	1370

Table 2 gives a rough indication of the residual capacity of your lift truck in combination with our KOOI-REACHFORKS®. Please be aware that the lift truck manufacturer always needs to confirm the measurements of residual capacity.

Standard options

Over many years MSE-FORKS has acquired a great deal of knowledge enabling to offer KOOI-REACHFORKS® with specific customer options.

Palletstops

- Y1 palletstops are intended to stop the forks protruding too far through the pallet, thus preventing damage to goods and pallets standing behind.
- Y2 palletstops serve the same purpose and can also be used to support a separate load back rest.
- Y3 palletstops support the load and allow frequent repositioning of the forks on the carriage.



Extra wear protection

Extra protection can be added to the forks. High-grade steel sections can be welded under the complete length of the forks or incorporated into the nose.

Load back rest

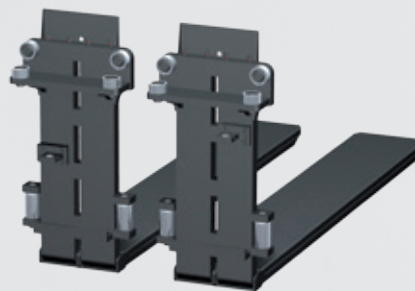
The load back rest supports the load and moves forward with the outer fork. It is bolted onto the Y2 palletstops but still allows the distance between the forks to be changed. MSE-FORKS supplies two types of load back rests, namely a standard design and a load back rest for reach lift-trucks. When the load back rest is used, the effective length of the telescopic forks is reduced by 25 mm. Where possible the pallet stops should be moved back 25 mm to prevent this.



Width under side	Width upper side	Height
750	750	1200
700	1000	1200
725	1000	1200

Special mountings

Special mountings such as fork positioners and fork spreaders are the result of the considerable experience we have acquired over the last 20 years. Our engineering department can change all your 2D drawings into 3D models. 3D modelling enables measurements to be adapted for use with other specifications.



Camera system

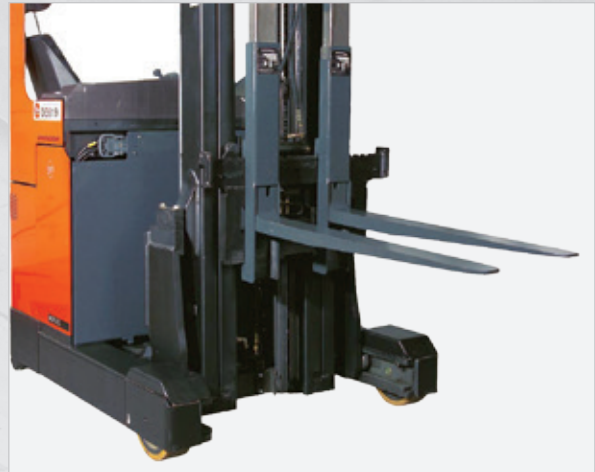
MSE-FORKS is working together with the Dutch manufacturer of industrial camera-systems Orlaco Products b.v. The miniature camera is completely integrated on side of one of the telescopic forks. The advantage of this system is that the driver of the lift-truck is able to see how the ReachForks are positioned in all circumstances. This is particularly helpful to the driver in double-deep stacking application making the operation safer and more efficient.



Other Products

Mast height extension

This unique mast extension range is designed to adjust the height of a standard lift-truck mast. This is especially useful if the existing mast does not comply with the requested height. The mast extensions enable lift-trucks to be enhanced with an additional telescopic boom. The same lift-truck can then handle extra pallets at a higher level without a larger load centre being required.



Load positioning systems

If the side-loader lift truck is operating on rough ground, one of the forks can compensate for the difference in height ensuring the safe loading and unloading of goods. Damage is reduced and the risk of load slipping off the forks is decreased. This powerful attachment is sold under the name Single Height Shift. Also possible in combination with KOOI-REACHFORKS®.



Manually extendible slide-on fork extensions

Using special sheet metalworking techniques, a slide-on extension has been created that is partially open along its lower surface, but has the characteristics of a closed sleeve.



Mountable telescopic Jib cranes

The Jib crane is provided with a loading hook. By using the deep bore technology, the portable arm can move in and out hydraulically from the driver's seat. All hydraulic parts are integrated cannot be damaged. Jib cranes can be delivered with fork pockets and mounting hooks.





Production and safety standards

MSE-FORKS requires its KOOI-REACHFORKS® to be of the highest quality and we can only guarantee this by complying with all applicable international standards:

ISO 9001-2008

Model for quality assurance in design/development, production, installation and servicing.

ISO 13284

Fork arm extensions and Telescopic fork arms. Technical characteristics and strength requirements. (Safety factor of 3 at all times).

ISO 2328

Hook on type fork arms and fork carrier. Mounting dimensions.

ISO 4406

Hydraulic fluid power - Fluids Method for coding level of contaminations by solid particles.

ISO 3834-2

Quality requirements for welding. Fusion welding of metallic materials.

CE

European Machinery Directives 2006/42/EC



Palletless handling?

Since 2003 MSE-FORKS has introduced a new patented system the so-called RollerForks® which can be used for palletless container handling. For more information please visit our website www.slip-sheet-attachments.com



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