

The Formwork Experts.

Doka Table Lifting System TLS

User Information

Instructions for assembly and use (Method statement)



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Introduction

Elementary safety warnings

User target groups

- This booklet is aimed at all persons who will be working with the Doka product or system that it describes. It contains information on the standard design for setting up this system, and on correct, compliant utilisation of the system.
- All persons working with the product described herein must be familiar with the contents of this booklet and with all the safety instructions it contains.
- Persons who are incapable of reading and understanding this booklet, or who can do so only with difficulty, must be instructed and trained by the customer.
- The customer is to ensure that the information materials provided by Doka (e.g. User Information booklets, Instructions for Assembly and Use, Operating Instruction manuals, plans etc.) are up to date and available to all users, and that they have been made aware of them and have easy access to them at the usage location.
- In the relevant technical documentation and formwork utilisation plans, Doka shows the workplace safety precautions that are necessary in order to use the Doka products safely in the usage situations shown.

In all cases, users are obliged to ensure compliance with national laws, standards and regulations throughout the entire project and to take appropriate additional or alternative workplace safety precautions where necessary.

Hazard assessment

The customer is responsible for drawing up, documenting, implementing and continually updating a hazard assessment at every job-site.

This booklet serves as the basis for the site-specific hazard assessment, and for the instructions given to users on how to prepare and utilise the system. It does not substitute for these, however.

Remarks on this booklet

- This document can be used as general Instructions for Assembly and Use (Method Statement) or be incorporated into site-specific Instructions for Assembly and Use (Method Statement).
- The graphics, animations and videos in this document or app sometimes depict partially assembled assemblies and may require additional safety equipment and/or measures to comply with safety regulations.

The customer must ensure all applicable regulations are complied with, even if they are not shown or implied in the graphics, animations and videos provided.

 Individual sections contain further safety instructions and/or special warnings as applicable.

Planning

- Provide safe workplaces for those using the formwork (e.g. for when it is being erected/dismantled, modified or repositioned etc). It must be possible to get to and from these workplaces via safe access routes!
- If you are considering any deviation from the details and instructions given in this booklet, or any application which goes beyond those described in the booklet, then revised static calculations must be produced for checking, as well as supplementary assembly instructions.

Regulations; industrial safety

- All laws, Standards, industrial safety regulations and other safety rules applying to the utilisation of our products in the country and/or region in which you are operating must be observed at all times.
- If a person or object falls against, or into, the sideguard component and/or any of its accessories, the component affected may only continue in use after it has been inspected and passed by an expert.

Rules applying during all phases of the assignment

- The customer must ensure that this product is erected and dismantled, reset and generally used for its intended purpose in accordance with the applicable laws, standards and rules, under the direction and supervision of suitably skilled persons.
 These persons' mental and physical capacity must not in any way be impaired by alcohol, medicines or drugs.
- Doka products are technical working appliances which are intended for industrial / commercial use only, always in accordance with the respective Doka User Information booklets or other technical documentation authored by Doka.
- The stability and load-bearing capacity of all components and units must be ensured during all phases of the construction work!
- Do not step on or apply strain to cantilevers, closures, etc. until suitable measures to ensure their stability have been correctly implemented (e.g. by tie-backs).
- Strict attention to and compliance with the functional instructions, safety instructions and load specifications are required. Non-compliance can cause accidents and severe injury (risk of fatality) and considerable damage to property.
- Sources of fire in the vicinity of the formwork are prohibited. Heaters are permissible only when used correctly and situated a correspondingly safe distance from the formwork.
- Customer must give due consideration to any and all effects of the weather on the equipment and regards both its use and storage (e.g. slippery surfaces, risk of slipping, effects of the wind, etc.) and implement appropriate precautionary measures to secure the equipment and surrounding areas and to protect workers.
- All connections must be checked at regular intervals to ensure that they are secure and in full working order.

In particular threaded connections and wedged connections have to be checked and retightened as necessary in accordance with activity on the jobsite and especially after out-of-the-ordinary occurrences (e.g. after a storm).

 It is strictly forbidden to weld Doka products – in particular anchoring/tying components, suspension components, connector components and castings etc. – or otherwise subject them to heating.

Welding causes serious change in the microstructure of the materials from which these components are made. This leads to a dramatic drop in the failure load, representing a very great risk to safety.

It is permissible to cut individual tie rods to length with metal cutting discs (introduction of heat at the end of the rod only), but it is important to ensure that flying sparks do not heat and thus damage other tie rods.

The only articles which are allowed to be welded are those for which the Doka literature expressly points out that welding is permitted.

Assembly

- The equipment/system must be inspected by the customer before use, to ensure that it is in an acceptable condition. Steps must be taken to exclude components that are damaged, deformed, or weakened due to wear, corrosion or rot (e.g. fungal decay).
- Using our safety and formwork systems together with those of other manufacturers can create risks that may lead to injury and damage to property. This requires separate verification by the user.
- The equipment/system must be assembled and erected in accordance with the applicable laws, standards and rules by trained customer personnel whilst maintaining any applicable safety inspections that may be required.
- It is not permitted to modify Doka products; such modifications constitute a safety risk.

Closing the formwork

• Doka products and systems must be set up so that all loads acting upon them are safely transferred!

Pouring

 Do not exceed the permitted fresh-concrete pressures. Over-high pouring rates overload the formwork, cause greater deflection and risk breakage.

Stripping the formwork

- Do not strip out the formwork until the concrete has reached sufficient strength and the person in charge has given the order for the formwork to be stripped out!
- When stripping out the formwork, never use the crane to break concrete cohesion. Use suitable tools such as timber wedges, special pry-bars or system features such as Framax stripping corners.
- When stripping out the formwork, do not endanger the stability of any part of the structure, or of any scaffolding, platforms or formwork that is still in place!

Transporting, stacking and storing

 Observe all country-specific regulations applying to the handling of formwork and scaffolding. For system formwork the Doka slinging means stated in this booklet must be used – this is a mandatory requirement.

If the type of sling is not specified in this document, the customer must use slinging means that are suitable for the application envisaged and that comply with the regulations.

- When lifting, always make sure that the unit to be lifted and its individual parts can absorb the forces that occur.
- Remove loose parts or secure them so that they cannot slip out of position and drop.
- When lifting formwork or formwork accessories with a crane, no persons must be carried along, e.g. on working platforms or in multi-trip packaging.
- All components must be stored safely, following all the special Doka instructions given in the relevant sections of this document!

Maintenance

 Only original Doka components may be used as spare parts. Repairs may only be carried out by the manufacturer or authorised facilities.

Miscellaneous

The weights as stated are averages for new material; actual weights can differ, depending on material tolerances. Dirt accretions, moisture saturation, etc. can also affect weight.

We reserve the right to make alterations in the interests of technical progress.

Eurocodes at Doka

The permissible values stated in Doka documents (e.g. F_{perm} = 70 kN) are not design values (e.g. F_{Rd} = 105 kN)!

- It is essential to avoid confusing permissible values with design values!
- Doka documents will continue to state the permissible values.

Allowance has been made for the following partial factors:

γ_F = 1.5

- γ_{M, timber} = 1.3
- γ_{M, steel} = 1.1
- k_{mod} = 0.9

Consequently, all the design values for an EC design calculation can be determined from the permissible values.

Symbols used

The following symbols are used in this document:

This is a notifier drawing attention to an extremely dangerous situation in which noncompliance with this notifier will lead to death or severe, irreversible injury.

WARNING

DANGER

This is a notifier drawing attention to a dangerous situation in which non-compliance with this notifier can lead to death or severe, irreversible injury.

CAUTION

This is a notifier drawing attention to a dangerous situation in which non-compliance with this notifier can lead to slight, reversible injury.



NOTICE

This is a notifier drawing attention to a situation in which non-compliance with this notifier can lead to malfunctions or damage to property.



Instruction Indicates that

Indicates that actions have to be performed by the user.



Sight-check

Indicates that you need to do a sight-check to make sure that necessary actions have been carried out.



Tip





Reference

Cross-references other documents.

Services

Support in every stage of the project

- Project success assured by products and services from a single source.
- Competent support from planning through to assembly directly on site.

Project assistance from start to finish

Every single project is unique and calls for individualised solutions. When it comes to the forming operations, the Doka team can help you with its consulting, planning and ancillary services in the field, enabling you to carry out your project effectively, safely and reliably. Doka assists you with individual consulting services and customised training courses.

Efficient planning for a safe project sequence

Efficient formwork solutions can only be developed economically if there is an understanding of project requirements and construction processes. This understanding is the basis of Doka engineering services.

Optimise construction workflows with Doka

Doka offers special tools that help you in designing transparent processes. This is the way to speed up pouring processes, optimise inventories and create more efficient formwork planning processes.

Custom formwork and on-site assembly

To complement its system formwork range, Doka offers customised formwork units. And specially trained personnel assemble load-bearing towers and formwork on site.

Just-in-time availability

Formwork availability is a crucial factor in realising your project on time and on budget. The worldwide logistics network puts the necessary formwork quantities on site at the agreed time.

Rental and reconditioning service

The formwork material needed for any particular project can be rented from Doka's high-performing rental park. Doka Reconditioning cleans and overhauls both client-owned equipment and Doka rental equipment.



Digital Services

for higher productivity in construction From planning to completion of construction with our digital services we want to set the pace for boosting productivity in construction. Our digital portfolio includes solutions for planning, procuring and managing to performing on site. Learn more about our digital offer at doka.com/digital.

System description

Doka Table Lifting System TLS - for vertical lifting of Doka tableforms with no need for a crane

The Doka Table Lifting System TLS is used for moving Doka tableforms up to the next floor.

It is also suitable for transporting Doka equipment between floors, in suitable multi-trip packaging containers (always comply with the loading data and loading rules for the Table Lifting System).

NOTICE

'Passenger transportation' with the Table Lifting System TLS is forbidden. (Exception: for carrying out site-assembly and maintenance work)

A comprehensive system of safety features makes for fast, safe working, both when operating the Table Lifting System itself and when cycling tables.

With the Doka Table Lifting System TLS you can even carry on cycling tables safely during strong winds (up to max. 72 km/h).

NOTICE

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All work in connection with assembly, disassembly and dismantling, and the first time of putting into service, must be supervised by certified Doka specialists.

- The crew who are going to operate the Doka Table Lifting System TLS need special skills and knowledge which can only be passed on by certified Doka specialists.
- As proof that they have received such special instruction, a certificate is issued to persons who have undergone this training.
- Persons who do not have this certificate are not allowed to start up or use the Doka Table Lifting System TLS.

Follow the directions in the 'Doka Table Lifting System TLS' Operating Instructions!



Product description



- A Basic unit TLS
- B Lifting platform TLS centre 3.00x1.60m
- C Lifting platform TLS back 3.00x1.60m
- D Protective grating TLS 1.80m
- E Protecting metal sheet TLS
- F Lifting mast TLS 1.50m
- G Supporting profile TLS 5.15m
- H Pressure strut TLS 3.70m
- I Floor support TLS 0.40m
- ${\bf J}~$ Adjusting device TLS
- K Beam for landing level safety gate TLS 0.40m
- L Landing level safety gate TLS with handle
- ${\bf M}\,$ Landing level safety gate TLS w. limit switch
- N Switch box TLS ground control
- O Switch box TLS landing level safety gate
- P Lifting cross-bar TLS
- **Q** Lifting beam TLS 67kN (in 'parked' position)

Bottom to top-floor height

- standing on ground and working from ground level: max. 100 m
- when suspended from floor-slab: max. 15 m

Lifting platform TLS

Max. load:

when lifting: 1650 kg during loading: 2650 kg

- Loading area:
 - Entrance width: 2.70 m
 - (3.20 m between lifting masts)
 - Length: 4.93 m



- Integral railings
- Integral loading gates
- Integral loading ramp
- Protective grating TLS 1.80m may also be mounted if desired

Landing level safety gates

- For safeguarding the loading and offloading points
- Landing level safety gates for every floor
- Integral control for every floor

Drive mechanism

The Table Lifting System is driven electromechanically.

 Required supply voltage: 400V/50Hz (fuse protection min. 3 x 32A, slow-blow)

Lifting speed

- Starting speed: 5 m/min.
- Lifting speed: 10 m/min.

Loading data

Anchoring forces per suspension point





A Temporary reshore (locate as statically required)

Floor support TLS 0.40m for max. 7 lifting mast sections (max. bottom to top-floor height 10.5 m)

Inter-floor dis-	Vertical reac- tion force	Tension	Forces on dowel	ır	Horizontal shoring force
	F _{Z(1)B,k}	F _{Z(1)A,k}	F _{Y(1),k} (90° to Fx)	F _{X(1),k}	F _{X(0),k}
2.65 m	73 kN	26 kN	4 kN	32 kN	37 kN
3.00 m	73 kN	26 kN	4 kN	28 kN	33 kN
4.50 m	73 kN	26 kN	4 kN	18 kN	22 kN

Floor support TLS 0.40m for max. 10 lifting mast sections (max. bottom to top-floor height 15 m)

Inter-floor dis-	Vertical reac- tion force	Tension	Horizontal shoring force		
lance	F _{Z(1)B,k}	F _{Z(1)A,k}	F _{Y(1),k} (90° to Fx)	F _{X(1),k}	F _{X(0),k}
2.65 m	79 kN	28 kN	5 kN	34 kN	39 kN
3.00 m	79 kN	28 kN	5 kN	30 kN	35 kN
4.50 m	79 kN	28 kN	5 kN	20 kN	25 kN

Lifting mast anchoring TLS cross bar 0.40m

Inter-floor dis-	Vertical reac- tion force	Forces on dowel Shear			
tanoo	F _{Z(2),k}	F _{Y(2),k} (90° to Fx)	F _{X(2),k}		
2.65 m	2 kN	16 kN	16 kN		
3.00 m	2 kN	16 kN	14 kN		
4.50 m	2 kN	16 kN	11 kN		
7.00 m	2 kN	8 kN	10 kN		

Lifting mast anchoring TLS wall

Inter-floor dis-	Vertical reac- tion force	Forces on dowel Shear			
tance	F _{Z(2),k}	F _{Y(2),k} (90° to Fx)	F _{X(2),k}		
2.65 m	2 kN	4 kN	20 kN		
3.00 m	2 kN	4 kN	20 kN		
4.50 m	2 kN	4 kN	20 kN		
7.00 m	2 kN	3 kN	17 kN		

Subgrade reaction when stood on ground

Bottom to top-floor height	10 m	20 m	30 m	40 m	50 m	60 m	70 m	80 m	90 m	100 m
Total weight per mast- side	3551 kg	4166 kg	4701 kg	5316 kg	5956 kg	6491 kg	7106 kg	7721 kg	8281 kg	8896 kg
Subgrade reaction	143 kN/m ²	167 kN/m ²	189 kN/m ²	213 kN/m ²	239 kN/m ²	260 kN/m ²	285 kN/m²	309 kN/m ²	332 kN/m ²	356 kN/m ²

doka

Areas of use, possible configurations



Follow the directions in the 'Doka Table Lifting System TLS' Operating Instructions!

Note:

Check the Doka Table Lifting System TLS after assembly and every time before start-up, as described in the Operating Instructions.

Standing on ground and working from ground level

System dimensions:



a ... 1.35 m (landing level safety gates mounted to the floor supports) a ... 1.60 m (landing level safety gates mounted to the Beam for landing level safety gate)

- b ... max. 7.00 m (spacing between the anchorages)
- c ... max. 4.50 m (lifting height above the top lifting mast anchoring)
- d ... max. 100 m
- e ... min. 0.30 m
- A Switch box TLS landing level safety gate
- **B** Switch box TLS ground control
- C Cable reel

- D Safety barrier at edge of slab
- **E** Lifting mast anchoring TLS

Space required:



- f ... 4.60 m
- g ... 5.80 m
- й... 1.90 m
- E Lifting mast anchoring TLS

 ${\bf K}~$ Landing level safety gate TLS

Note:

If the bottom to top-floor height is between 40 m and 100 m, then the Cable-reel set TLS 100.00m must be used instead of the Cable reel TLS 40.0m (mounted to the Basic unit TLS).

Note:

The Switch box TLS ground control and the Switch box TLS landing level safety gate each come with a 10 m control cable permanently attached.

If these switch boxes are too far (> 10 m) away from the Switch box for cable-reel, then Control cables TLS 20.0m will be needed as extension cables.

Suspended from the floor-slab

System dimensions:



a ... min. 2.65 - 4.50 m

b ... max. 7.00 m (spacing between the anchorages) c ... max. 4.50 m $\,$

- (lifting height above the top lifting mast anchoring)
- d ... max. 14.80 m
- e ... min. 0.30 m
- f ... 4.95 m
- D Safety barrier at edge of slab
- E Lifting mast anchoring TLS
- F Floor support TLS 0.40m
- **G** Adjusting device TLS
- H Lifting cross-bar TLS
- I Supporting profile TLS 5.15m
- J Pressure strut TLS 3.70m



F Floor support TLS

K Landing level safety gate TLS

Note:

If the total lifting height does not exceed 4.50 m (1 storey), then no lifting mast anchoring is needed.

Loading platform

The Doka Table Lifting System TLS can also be used as a loading platform.

Usage situation:

 After the top floor has been completed, the Doka tableforms are craned off the building using Dokamatic lifting straps 13.00m or Transport forks.

Repositioning and aligning the Table Lifting System



Follow the directions in the 'Doka Table Lifting System TLS' Operating Instructions!

Note:

Only position the Table Lifting System in slab-edge zones that have no projecting parts.

A Lifting cross-bar TLS must be mounted to each of the Lifting masts TLS (with the lugs on the side nearest the motor) before the Table Lifting System can itself be lifted and repositioned).



A Lifting cross-bar TLS 10.50m

B Lifting cross-bar TLS 15.00m

Later, the Lifting beam TLS 67kN (which is guided by the crane hook) will be attached to these Lifting cross-bars TLS.



A Lifting cross-bar TLS

B Lifting beam TLS 67kN

After the crane-lifting operation, the Lifting beam TLS 67kN is replaced in the holding fixture on the Lifting platform TLS.



B Lifting beam TLS 67kN

C Lifting platform TLS back 3.00x1.60m

In order to shorten the distances travelled when setting up and striking the formwork, it may be helpful to reposition the Table Lifting System several times on one floor.

Follow the directions in the 'Lifting beam TLS 67kN' Operating Instructions!

Aligning the Table Lifting System

Depending on how far the slab-edges are out of true in the vertical, there are two possible alignment methods:

- Spindles in the Floor supports TLS
- Fitting wedges between the Supporting profiles and the floor-slab, or setting the distance with the Adjusting device TLS



A Adjusting device TLS

B Doka Express anchor 16x125mm

Repositioning Doka tableforms

With the DoKart plus, only one person is needed on each storey to manoeuvre the Doka tableforms. During the automatic lifting operation, the next Doka tableform is readied for lifting, while on the floor above, the previous tableform is moved to its proper location.



Follow the directions in the 'DoKart plus' Operating Instructions and in the User Information booklet of the tableform used.

General instructions on repositioning

NOTICE

- Tables must be stood stably, and able to withstand wind loads, in every phase of the construction work.
- Max. wind speed during resetting: 72 km/h.
- No persons or unsecured objects are allowed to be on the table or the Table Lifting System TLS during lifting and travelling.

Repositioning operation

Floor below

- > Send the Lifting platform TLS to the floor in question.
- > Open the landing level safety gates.
- Lower the loading ramp and open the gates of the lifting platform.



- Set down the table on the lifting platform. The person operating the DoKart plus must always be on the building side.
- Move out the DoKart plus from under the table.
- Secure and tie down the table if necessary (required for edge tables with an integral downstand beam, platforms, ...).

There are crane eyes on the lifting platform for tying back the Doka tables if necessary.

 Close the gates of the Lifting platform and tilt up the loading ramp. Close the landing level safety gates.



Raise the table to the next floor on the lifting platform.

Floor above:

- > Open the landing level safety gates.
- Lower the loading ramp and open the gates of the lifting platform.
- > Wheel the table off the platform.



- Close the gates of the Lifting platform and tilt up the loading ramp.
- Close the landing level safety gates.
- Send the Lifting platform TLS back down to the floor below.



After the last table has been repositioned, the DoKart plus can then be moved up to the next floor by the Table Lifting System.

Anchoring on the structure

NOTICE

The system is typically anchored to the structure using the **Tie rod system 15.0**.



Risk of confusion!

When the system is combined with Doka automatic climbing systems, the **Tie rod system 20.0** must be used throughout the entire project.

This also applies to combinations with guided climbing systems (e.g. Guided climbing form-work Xclimb 60).

Positioning point and suspension point



- A Universal climbing cone 15.0
- **B** Sealing sleeve K 15.0 (expendable anchoring component)
- C Cone screw B 7cm
- D Stop anchor 15.0 (expendable anchoring component)
- F Depth mark

• Universal climbing cone 15.0

- The positioning point and the suspension point are both prepared using this one single type of cone
- Stop anchor 15.0
 - Expendable anchoring component for anchoring the universal climbing cone (and thus the climbing unit) in the concrete from one side.
- Cone screw B 7cm
 - On the positioning point for fastening the universal climbing cone.
 - On the suspension point for safe fastening of the floor support, of the beam for landing level safety gate, and of the lifting mast anchoring.

Stop anchor



	Stop anchor 15.0						
	11.5cm	16cm	40cm				
а	11.5 cm	16.0 cm	40.0 cm				
b	17.0 cm	22.0 cm	46.0 cm				
	Where the concrete cover 'd' = 2 cm						
<u> </u>	19.0 cm	24.0 cm	48.0 cm				
C	Where the	concrete cover 'd'	= 3 cm				
	20.0 cm	25.0 cm	49.0 cm				

a ... tie-rod length

b ... installation depth

c ... minimum slab thickness

d ... concrete cover

Note:

Stop anchors of different lengths should not be mixed in the same project.

WARNING

- The short **Stop anchor 15.0 11.5cm 90** has a much lower load-bearing capacity than the Stop anchor 15.0 16cm 55.
 - For this reason, the short stop anchor is only allowed to be used on systems with low tensile loads at the anchoring location, such as on climbing systems inside shafts.
 - If the geometry means that it is only possible to install the short stop anchor, then revised static calculation, with extra reinforcement steel, is required in cases where larger tensile loads may occur.
 - The Stop anchor 15.0 11.5cm is only permitted for slab thicknesses < 24 cm. For slab thicknesses ≥ 24 cm, the Stop anchor 15.0 16cm (or larger) must be used.</p>



WARNING

- The **Stop anchor 15.0 11.5cm 90** may accidentally come unscrewed from the universal climbing cone while low-viscosity concrete is being poured.
 - Take additional precautions to prevent the Stop anchor 15.0 11.5cm 90 from being turned.

The following components are fastened to the Universal climbing cone by means of the Cone screw B 7cm.

- Floor support TLS 0.40m
 - For safe suspension of the table lifting system in all phases of the work.



Beam for landing level safety gate 0.40m - For fixing the landing level safety gates.



Lifting mast anchoring TLS cross bar 0.40m - For back-staying the Lifting masts TLS to the structure.



- Lifting mast anchoring TLS wall
 - As an alternative to the Lifting mast anchoring TLS cross bar 0.40m, for back-staying the Lifting masts TLS to the structure.



Dimensioning the suspension point

The required cube compressive strength of the concrete at the time of loading must be specified separately for each project by the structural designer. It will depend on the following factors:

- Ioad actually occurring
- In length of the stop anchor
- reinforcement / extra reinforcement steel
- distance from edge

The introduction of the forces, the transfer of these forces into the structure, and the stability of the overall construction, must all be verified by the structural designer.

The required cube compressive strength fck,cube,current must be at least 10 N/mm², however.

Preparing the positioning point

The instructions given below for preparing the positioning point apply, analogously, to all components that are fastened to the Universal climbing cone using the Cone screw B 7cm.



WARNING

> Always screw the stop anchor into the universal climbing cone until it fully engages (up to the depth mark).

Not screwing the stop anchor fully into the cone may lead to reduced load-bearing capacity and failure of the suspension point - resulting in possible injury and/or damage.

► Use only the Cone screw B 7cm for the positioning point and suspension point (head of screw is red)!

WARNING

Sensitive anchoring, suspension and connector components!

- > Never weld or heat these components.
- > Any components that are damaged or weakened by corrosion or wear must be withdrawn from use.

NOTICE

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- The axis of the universal climbing cone must be at right-angles to the surface of the concrete - maximum angle of deviation: 2°.
- The universal climbing cone must be embedded so that it is flush with the concrete surface.
- Do not exceed the tolerances for the locations of the positioning point and suspension point.
- Protect the thread from soiling.
- Universal climbing cones are supplied with sealing sleeves K. Fit new sealing sleeves every time the cones are re-used.

Tools needed:

- Reversible ratchet 3/4"
- Universal cone spanner 15.0/20.0 (for universal climbing cone)
- Extension 20cm 3/4"
- Box nut 50 3/4" (for Cone screw B 7cm)

These tools are all included in the Tool box TLS.

- Push the sealing sleeve all the way onto the universal climbing cone.
- Screw the stop anchor into the universal climbing cone, until it engages (up to the depth mark).
- Fasten the universal climbing cone to the installation template with a Cone screw B 7cm.



The installation template ensures that the positioning point is correctly located.



 Fix the installation template to the stop-end formwork.



NOTICE

The positioning point must align with the suspension point beneath it (± 10 mm in the horizontal).

Tie the stop anchor tightly to the reinforcements with binding wire.



a ... 3270 mm (± 20 mm) b ... 400 mm (± 10 mm)

Pouring

- Before pouring, check all positioning points and suspension points once again.
 - The axis of the universal climbing cone must be at right-angles to the surface of the concrete – maximum angle of deviation: 2°.
 - The universal climbing cone must be embedded so that it is flush with the concrete surface.
 - Do not exceed the tolerances for the locations of the positioning point and suspension point.
 - The sealing sleeve must be completely pushed onto the Universal climbing cone.
 - The depth mark on the stop anchor must be right up against the Universal climbing cone = must be screwed in to the full depth.
 - Protect the thread from soiling.
- > Do not touch positioning points with the vibrator.
- Do not place concrete directly above the positioning points.

Preparing the suspension point

The instructions given below for preparing the suspension point apply, analogously, to all components that are fastened to the Universal climbing cone using the Cone screw B 7cm.

Fix the Floor support TLS in the Universal climbing cone 15.0 with a Cone screw B 7cm. A tightening torque of 100 Nm (20 kg, assuming a ratchet-length of approx. 50 cm) is sufficient.



- A Universal climbing cone
- C Cone screw B 7cm
- D Floor support TLS

Forcibly tightening the Cone screw B 7cm any more than this may cause damage and even cause the form tie to break!

The Reversible ratchet 3/4" must be used for screwing in and fixing the Cone screw B 7cm into the universal climbing cone.



Possible ways of connecting the landing level safety gates



- A Landing level safety gate TLS with handle
- B Landing level safety gate TLS with limit switch
- C Switchbox TLS
- D Floor support TLS 0.40m

Push the corner post of the landing level safety gate down onto the mounting fixture (E) and secure with the eyebolt (F).



Computation of quantities for Lifting masts TLS 1.50m

Standing on ground and working from ground level



a ... Operational height b ... 2.40 m

c ... min. 1.30 m

Operational height(a) - 2.40 m(b) + 1.30 m (c) n ... number 1) = 1.50 m

¹⁾ Round up the result to a whole number.

Total number of Lifting masts TLS 1.50m = 2 x n

Suspended from the floor-slab



d Lifting height	Total number of Lifting masts TLS 1.50m
Up to 2.80m	4
Up to 4.30m	6
Up to 5.80m	8
Up to 7.30m	10
Up to 8.80m	12
Up to 10.30m	14
Up to 11.80m	16
Up to 13.30m	18
Up to 14.80m	20

Automatic climbing unit TLS

The Automatic climbing unit TLS is a lifting appliance that is used for automatic, fast and safe raising of the Table Lifting System TLS in construction operations, without crane assistance.



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Follow the directions in the 'Automatic climbing unit TLS' Operating Instructions!

	[kg]	Article N°		[kg]	Article N°
Basic unit TLS Basiseinheit TLS	2336.0 Length: 431 cm Width: 242 cm Height: 274 cm Follow the directions in the "Opera- ting Instructions"!	586301000	Supporting profile TLS 5.15m Abstützprofil TLS 5,15m Galvanised	210.0	586317000
Lifting platform TLS centre Hubbühne TLS mitte 3,00x1,60m	3.00x1.60m 310.0	586307000	Pressure strut TLS 3.70m	70.0	586318000
Lifting platform TLS back 3 Hubbühne TLS hinten 3,00x1,60m	.00x1.60m 376.0 n Height: 139 cm	586308000	Galvanised		
Protective grating TLS 1.80	m 22.0	586334000	Floor support TLS 0.40m Deckenauflager TLS 0,40m Galvanised Length: 72.5 cm Width: 32.1 cm Height: 22.3 cm	39.0	586315000
Schutzgitter TLS 1,80m	Galvanised		Height. 22.3 Gill		
	Length: 141 cm Height: 121 cm		Adjusting device TLS Justiereinheit TLS Galvanised Length: 42 cm Width: 16 cm Height: 16 cm	2.0	586336000 586333000
			Kabelführung TLS Galvanised Length: 35 cm		
Protecting metal sheet TLS Protecting metal sheet TLS Schutzblech TLS	right left12.0 12.0Painted yellow Length: 85 cm Width: 32 cm Height: 73 cm	586309000 586310000	Lifting mast anchoring TLS cross bar 0.40m Hubmastverankerung TLS Traverse 0,40m Galvanised Length: 450 cm	92.0	586329000
Lifting mast TLS 1.50m Hubmast TLS 1,50m	82.0 Galvanised	586328000	Lifting mast anchoring TLS wall Hubmastverankerung TLS Wand Galvanised Length: 52 cm	15.5	586372000
			Lifting mast anchoring TLS strut Hubmastverankerung TLS Strebe Galvanised Length: 153.5 cm Width: 50 cm	22.0	586331000



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	[kg]	Article N°		[kg]	Article N°
Doka 4-part chain 3.20m Doka-Vierstrangkette 3,20m	15.0	588620000	Tool box TLS Werkzeugbox TLS	19.6	586337000
	Follow the directions in the "Opera- ting Instructions"!	CE	 (A) Combination wrench 8 (B) Combination wrench 10 (C) Combination wrench 13 (D) Combination wrench 16 (E) Combination wrench 17 (F) Combination wrench 18 (G) Combination wrench 19 (H) Combination wrench 22 (I) Combination wrench 30 	0.03 0.04 0.06 0.18 0.16 0.17 0.14 0.20 0.25 0 43	586343000 586342000 586341000 580645000 586340000 580646000 582837000 582837000 582839000 582839000
Cone screw M30 SW50 7cm Konusschraube M30 SW50 7cm	0.88	581444500	(K) Reversible ratchet 3/4" Galvanised	1.5	580894000
(J)	Green Length: 10 cm Diameter: 7 cm Width-across: 50 mm		 (L) Universal cone spanner 15.0/20.0 Galvanised Width-across: 50 mm (M) Safety Ruler SK Length: 18 cm 	0.90 0.02	581448000 581439000
Cone screw B 7cm Konusschraube B 7cm	0.86 Red Length: 10 cm Diameter: 7 cm Width-across: 50 mm	581444000	 (N) Extension 20cm 3/4" (O) Slot-screw screwdriver 0.6x3.5 (P) Slot-screw screwdriver 1x5.5 (Q) Set of ball-head hexagon-socket screw keys (R) Box spanners 1/2" set of 29 (S) Box nut 18 3/4" (T) Box nut 18 3/4" 	0.68 0.20 0.20 0.60 5.6 0.22	580683000 586344000 586366000 586346000 586345000 580643000 586643000
Universal climbing cone 15. Universal-Kletterkonus 15,0	.0 1.3 Galvanised Orange Length: 12.8 cm Diameter: 5.3 cm	581977000	(1) Box nut 24 3/4" (V) Box nut 24 1/2" L (W) Box nut 27 3/4" (X) Box nut 30 3/4" (Y) Box nut 50 3/4"	0.20 0.21 0.30 0.27 0.33 0.81	500679030 586364000 586376000 586377000 581449000
Sealing sleeve K 15.0 Dichtungshülse K 15,0	0.03 Orange Length: 12 cm Diameter: 6 cm	581976000			
Stop anchor 15.0 B11 Stop anchor 15.0 A16 Stop anchor 15.0 A40 Sperranker 15,0	0.55 0.38 0.71 Non-treated	581868000 581997000 581999000			
			Maintenance toolbox TLS Wartungs-Werkzeugbox TLS consisting of: (A) Grease cartridge TLS (B) Filling press TLS (C) Thickness gauge set 0.05-1.00mm (D) Pliers for external circlins 40-100mm	6.1 0.46 0.93 0.09 0.32	586369000 586368000 586367000 586350000 586348000
Torque wrench 3/4" 75-400M Drehmomentschlüssel 3/4" 75-400	Nm 2.3 ONm Galvanised Length: 69 cm	586374000	 (E) Water pump nut pliers 250mm (F) Screw dr. f. recessed-head scr. PZ 2 (G) Combination wrench 14 (H) Digital multimeter TLS (I) Dummy plug TLS 4 poles 	0.32 0.15 0.09 0.22 0.04	586347000 586351000 586349000 586353000 586352000
Brake-disc pull-off tool TLS Scheibenabzieher TLS D200	B D200 4.3 Height: 27 cm Width-across: 22 mm	586370000			



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