

WS 2000 | WS 3000 | Z 1 | W 100

Art. No. 13033-EN

Wide-span shelving

Assembly and usage instructions



Dear customer,

Thank you for choosing a SCHULTE Lagertechnik product.

It is essential to observe the instructions in these assembly and usage instructions. According to legal regulations, you as the operator of the system are obliged to affix the type and load plates supplied, as well as these assembly and usage instructions, to clearly visible positions on the shelving!

The specified frame load capacity is valid for the specified buckling length. When changing the suspension heights of the beams (buckling length), the tables in these instructions apply.

Warranty and guarantee claims are only valid if the shelving is installed correctly according to the installation instructions.

Your team at
SCHULTE Lagertechnik

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Shelving overview



WS 2000 wide-span shelving

for light loads

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WS 3000 wide-span shelving

for diverse partitions

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Z 1 wide-span shelving

for medium loads

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Z 1 workbench

worktable

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Z1 workbench

workbench with shelving levels

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W 100 wide-span shelving

for heavy loads

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GENERAL INSTRUCTIONS

Information regarding legal regulations in these assembly and operating instructions is only valid for Germany.

For assembly outside Germany, the local, statutory and country-specific regulations and/or conditions apply. Please contact your local authorities for further information.

These assembly instructions have been produced with great care. Nevertheless, errors can still occur. For this reason, no legal or any other liability can be accepted for missing or incorrect information and its consequences.

Necessary changes to the assembly instructions can be made by us without prior notice. This document may only be reproduced by the manufacturer.

The following standards and guidelines must be observed: DGVU 108-007

Before starting assembly, please read through these assembly instructions and observe the instructions contained.

Before setting up your shelving system, please make sure you read the information and instructions contained in this document. Please adhere closely to the information in these instructions and the notes in our order documents when setting up the system and during subsequent use. Please contact Gebrüder Schulte GmbH & Co. KG for any queries.

Liability and warranty

The manufacturer is not responsible for any personal injury or damage to property resulting from improper use, rather the operator of the shelving system is responsible.

The shelving components we supply may only be used for their intended purpose. Our "General terms and Conditions" apply. Warranty and liability claims for personal injury and damage to property resulting from improper use, operation, dismantling or assembly, repairs or from external influences are excluded. All information in this document refers only to shelving units for indoor installation. In other cases, please contact us.

ASSEMBLY INSTRUCTIONS

Assembly must be carried out by qualified personnel (ideally at least 2 persons) with the appropriate tools. Brute force must not be used when assembling the components. Assembly must be carried out according to the following instructions. Exceptions are only permitted if in individual cases our accompanying documents require a different assembly. Any discrepancies must be agreed with our technical personnel.

The valid regulations of the German employers' liability insurance association must be observed. See DGVU 108-007.

The permissible loads of the shelving must not be exceeded. The load can be identified by the shelf embossing or the accompanying documents. The specifications apply for evenly distributed static load. For bay load, see tables (see technical appendix).

SAFETY INFORMATION

The following safety regulations are excerpts from the rules for storage facilities and equipment of DGVU 108-007 issued by the German employers' liability insurance association.

- The shelving is designed exclusively for loading and unloading by hand. The sides not intended for loading and unloading must be secured against load units falling down. The use of forklift trucks is not permitted.
- Shelving must be installed vertically. Any deviation of the shelving from the vertical in both longitudinal and depth directions must not exceed 1/200 of the shelving height. Any deviation from the horizontal must not exceed 1/200 of the bay width. Deviations should be corrected with base plates.
- Shelving must be adequately secured against tipping in certain cases.
 - Shelving with a height to depth ratio greater than 5:1 must be secured.

Example 1: Shelf height = 2,500 mm; depth = 400 mm; → 6.25:1.
The shelving is not stable.

Example 2: Shelf height = 2,500 mm; depth = 500 mm; → 5:1.
The shelf is stable.
 - Shelving with wing doors and a height to depth ratio greater than 4:1 must also be secured. Suitable measures to prevent tipping (p. 5-6) are: floor anchoring, wall anchoring or securing with cross bracing. If anchoring to the ground, the clamping base (with tab) must be bolted to the T-profile before anchoring.
 - The following must also be secured: shelving with pull-out elements (such as drawers, suspension file pull-outs) and shelving with ladder systems. Suitable measures to prevent tipping (p. 6) are: wall anchoring or securing with cross bracing.
- The shelves must be installed at evenly spaced intervals over the shelving height. The maximum distance is 600 mm. The lowest shelf may be mount-

ed max. 600 mm from the floor.

- Shelves with a maximum shelf load of 330 kg are available. The shelves must be provided with type plates. These must contain the following information: manufacturer, type, year of manufacture or picking number, permissible loads.
- The maximum permissible floor unevenness depends on DIN 18202, Table 3, Line 3. The floor must absorb a surface pressure of at least 50 kg/cm².
DIN 18202, Part 5, Line 3:

up to	1 m	distance:	4 mm
over	1 - 4 m	distance:	10 mm
over	4 - 15 m	distance:	12 mm
up to	15 m	distance:	15 mm
- If it is a corrosive floor (e.g. magnesite floor), the shelving must be separated by the use of special base plates, i.e. there must be no direct contact between floor and shelving. These base plates are available from SCHULTE Lagertechnik.
- Shelving may only be assembled or converted when unloaded.
- The shelving is not suitable for carrying dynamic loads (no sliding or impact loads).
- The shelving must not be stepped on by persons.
- Damaged shelving parts must be replaced immediately.
- Foodstuffs must not be stored directly on galvanised shelves.
- The shelving units may only be assembled in dry, well-ventilated rooms. The air humidity must not exceed 60 percent. For installation in a temperature range of - 20 degrees Celsius to + 50 degrees Celsius.
- All load specifications apply to construction in areas **NOT** at risk of earthquakes. Reduction factors apply for earthquake risk zones.

The assembly instructions only apply to shelving that is installed indoors. This means that influences from wind and snow are not considered. Earthquake influences must also be individually calculated by the manufacturer. The manufacturer must be consulted in the event of any necessary conversion work or discrepancies. These assembly instructions are only valid for installation at a location within Germany. For all other installation sites, the national accident prevention regulations for storage facilities and equipment must be observed.

SHELVING INSPECTIONS

The German Ordinance on Industrial Safety and Health (BetrSichV) regards storage equipment/shelving as work equipment. According to § 10 of the BetrSichV, these must be checked regularly by qualified persons. Any damage must be recorded, measured and documented. The controls are based on the new European standard DIN EN 15635 ("Guidelines for safe working"). This defines the procedure for inspections of storage facilities/shelving systems.

Visual inspections

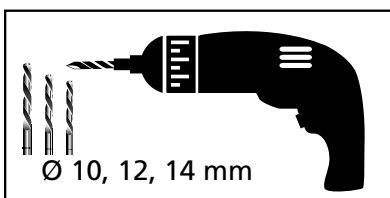
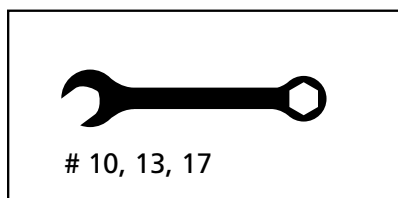
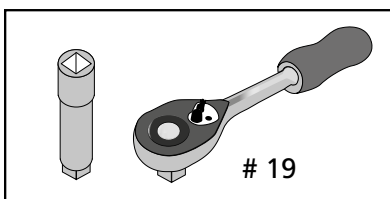
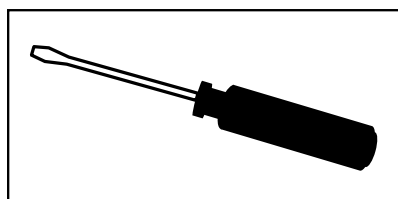
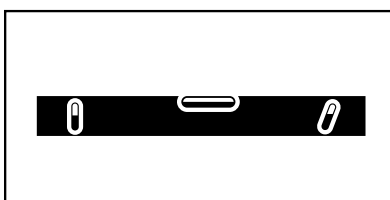
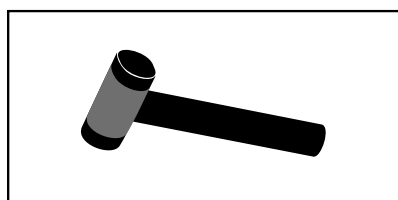
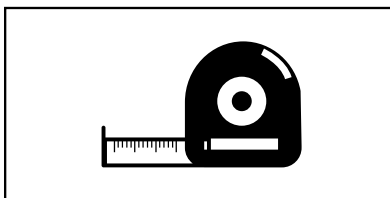
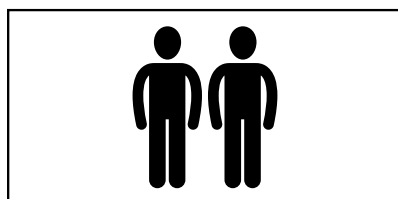
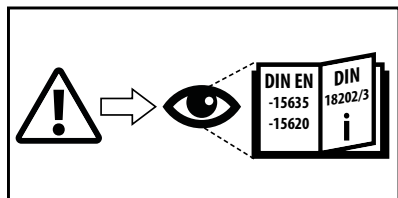
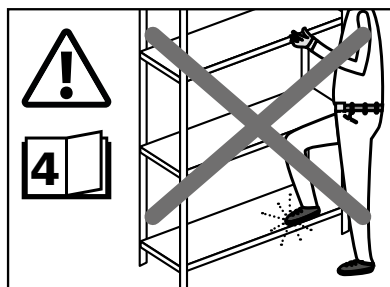
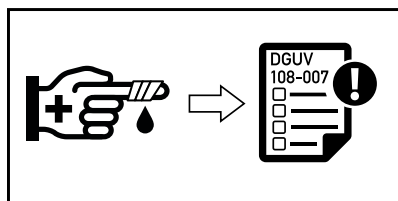
The safety officer must ensure that inspections are carried out at regular intervals, usually weekly, or at other intervals based on a risk analysis. A formal written report must be recorded and stored.

Expert inspections

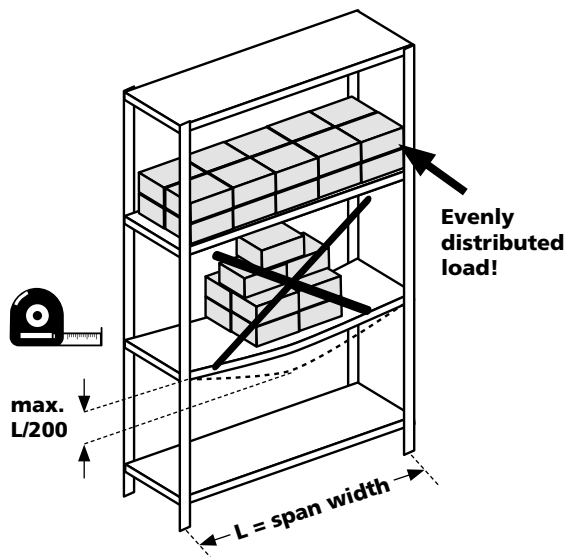
"Inspections must be carried out by a competent person at intervals of no more than 12 months. A written report must be submitted to the Safety Officer with observations and proposals for any necessary action."
(Extract from DIN EN 15635)

Expert inspection by a competent person

The expert inspection must be carried out by a competent person (e.g. a trained shelving inspector) who is familiar with the relevant laws and regulations, rules of professional associations and the corresponding standards and draft standards. Specialist knowledge of storage equipment and shelving is also required.



Loading the shelving

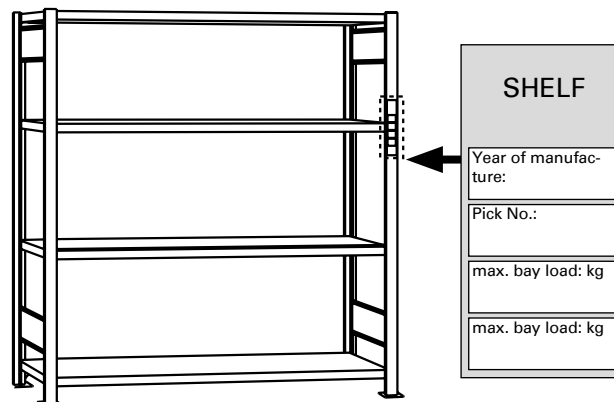


i When loading the shelving, the maximum load of the shelf must be observed. The shelves must be loaded evenly.

The **max. per. bowing** of the supporting shelves must not exceed $L/200$ mm of the support width!

EXAMPLE: Shelf length 1,000 mm, max. permissible bowing $L/200 = 1,000 \text{ mm} \div 200 = 5 \text{ mm}$

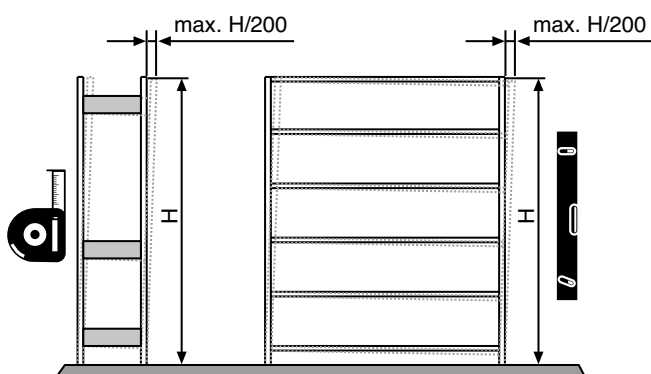
Labelling the shelving



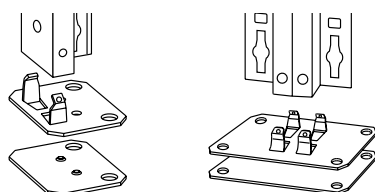
i For shelving units with a shelf load of more than 200 kg or a bay load of more than 1,000 kg, load plates must be filled in by the operator and attached in a clearly visible place.

Please refer to the tables of the respective shelves (page 10, 19, 26, 27) for the maximum bay load.

Vertical installation

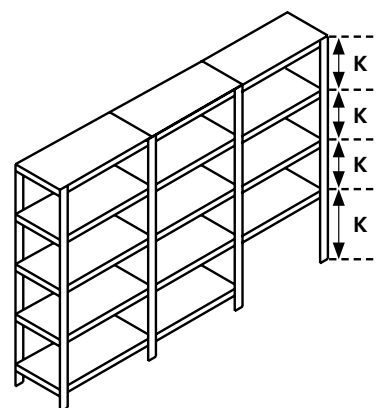


Make sure that the installation is plumb!



i If the floor is uneven, use **base plates** for the shelving bases.

Buckling length



K = WS 2000 & WS 3000: The buckling length must not exceed max. 600 mm!

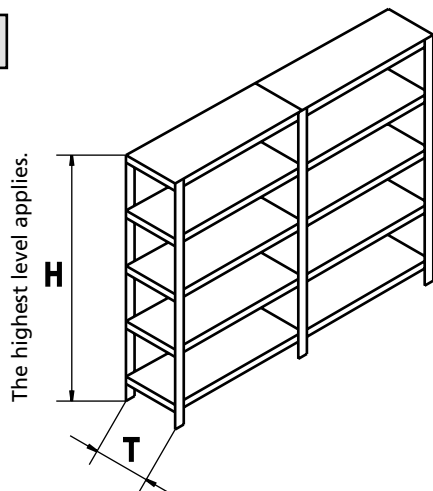
K = Z1: The buckling length must not exceed max. 100 mm!

K = W100: The buckling length may not exceed 1,200 mm, whereby the bay load is reduced! (see page 26)

i The buckling length is the distance from the ground to the top edge of the shelf or from the top edge of the shelf to the top edge of the shelf. The bay load may be reduced if the distances are large.

Shelving tilt protection

A



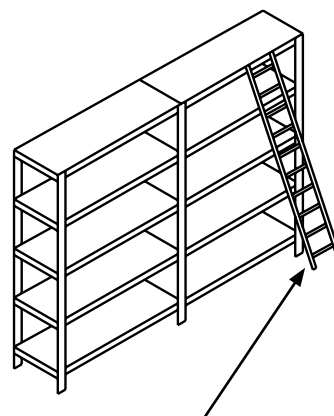
If the ratio of height (H) to depth (D) is greater than 5:1, measures must be taken to prevent tipping!

If forklift trucks operate in the immediate vicinity of the shelving units, measures must be taken to prevent tipping if the height (H) to depth (T) ratio exceeds 4:1.

See **page 8** for recommended measures to prevent tipping, such as floor anchoring, wall anchoring and cross bracing.

Shelving tilt protection

B



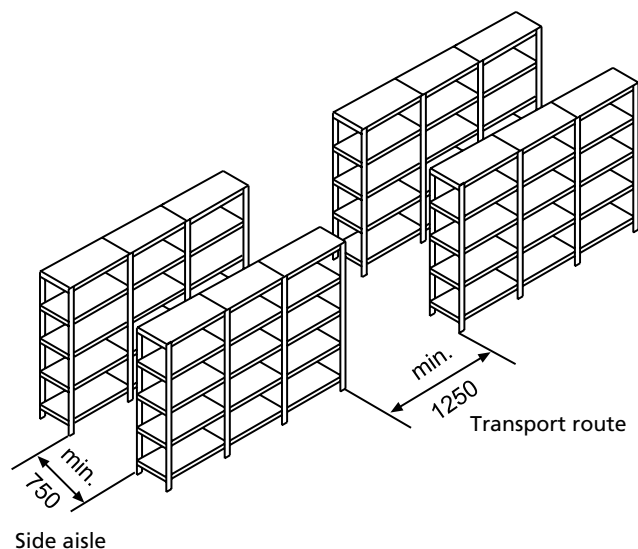
e.g. use of ladders
When using ladders, TRBS 2121 Part 2



Shelving with ladder systems must be secured with wall anchors or cross bracing!

See **page 8** for recommended measures to prevent tipping, such as wall anchoring and cross bracing.

Minimum spacing of shelving rows



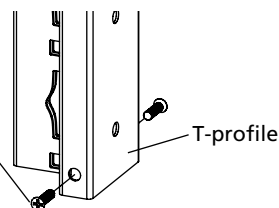
The distances between the shelving rows must be at least 1,250 mm for a traffic route (see DGUV).

For a side aisle (see DGUV) the minimum distance is 750 mm.

Ground anchoring WS2000

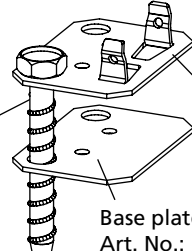
Suitable measures for **A** and **B**

Self-tapping bolt
4.8 x 13 mm
Art. No.: 12710



single clamping base
Art. No.: 15280

Bolt anchor
Art. No.: 19956



Base plate
Art. No.: 12694

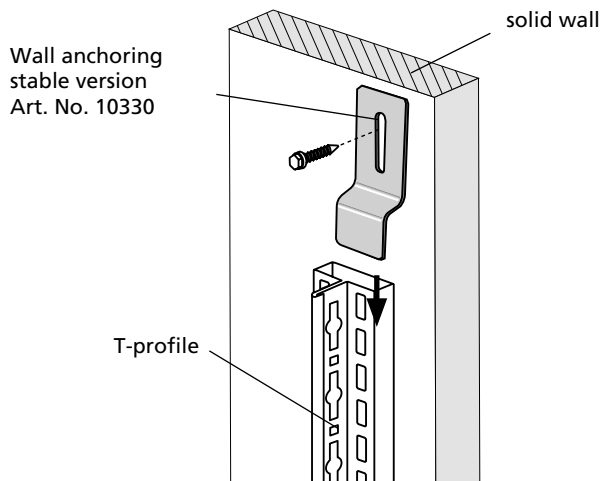


To anchor the unit to the ground, bolt the single clamping base to the T-profile and fix this unit to the ground with the bolt anchor.

The self-tapping bolts, the bolt anchors and the base plates are **NOT** included in the standard delivery.

WS2000 wall anchoring

Suitable measures for **A** and **B**

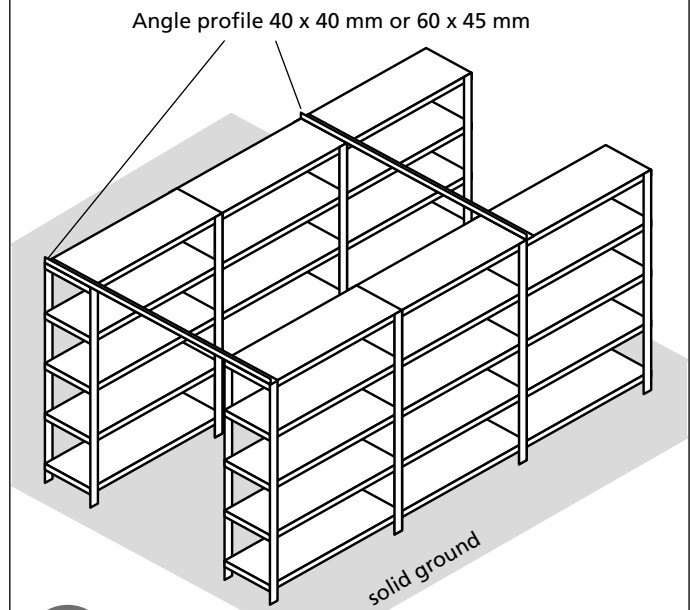


The wall anchoring is bolted to the T-profile and wall.

Anchors suitable for the wall type are not included and must be procured by the customer.

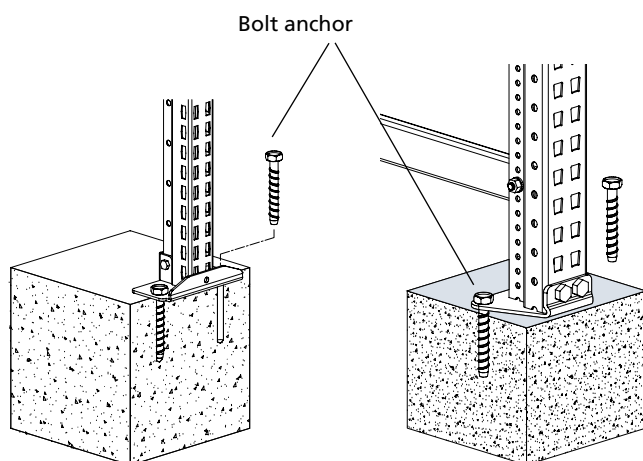
Cross bracing

Suitable measures for **A** and **B**



Angle profiles (40 x 40 mm or 60 x 45 mm) are required to connect and stabilise several rows of shelving.

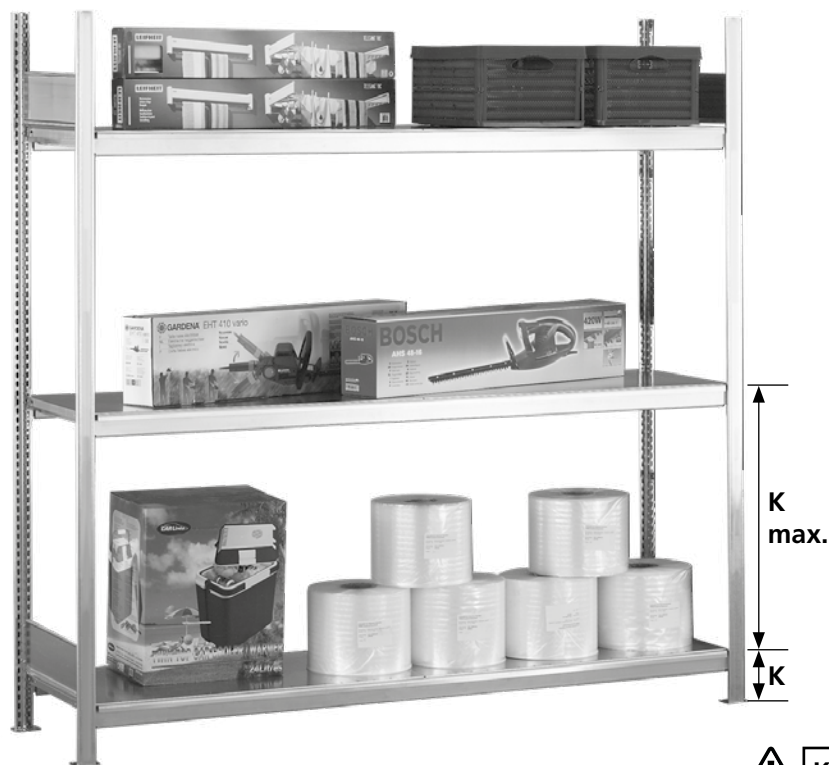
Ground anchoring WS 3000 / W 100



To anchor the unit to the ground, bolt the base plate to the upright frame and fix this unit to the ground with bolt anchors.

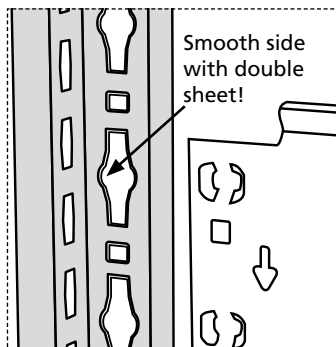
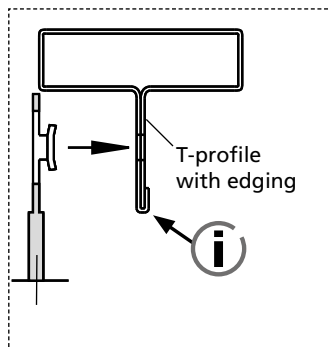
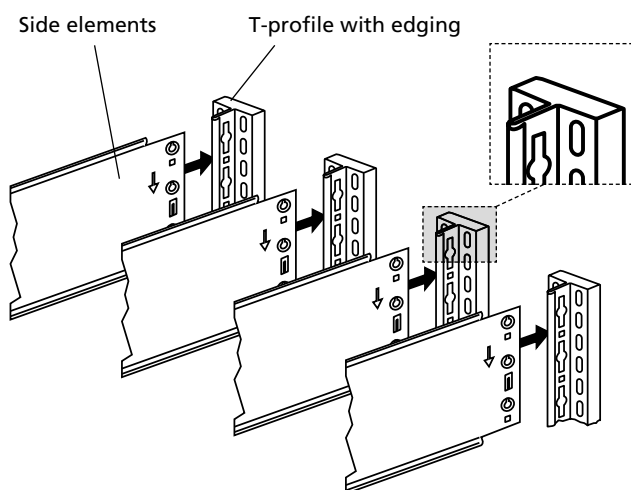
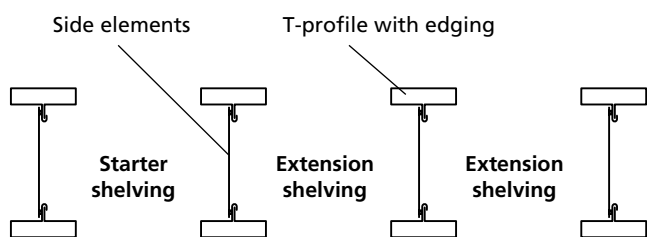
Bolt anchors for ground anchoring are **NOT** included in the standard delivery.

Assembly of WS 2000



! K = max. 600 mm

Assembly of T-profile frames

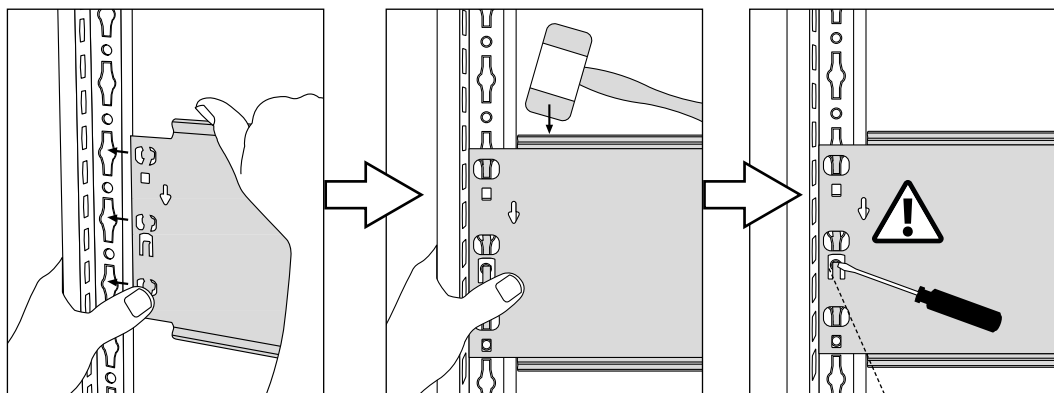


The T-profiles must always be assembled with the **edging** in the same direction!

The side elements are inserted in the smooth side without edging. On this side the panel is doubled with a small offset.

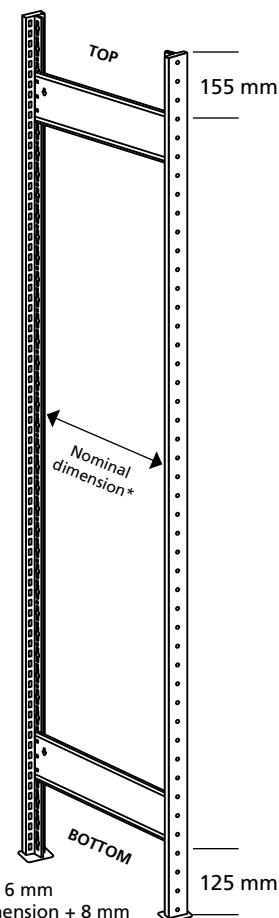
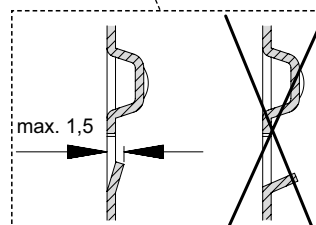
Starter shelving - assembly

Assembly of T-profile frames with side elements



- Assembly in the assembled state, so that the T-profile cannot spring.
- Make sure you use the correct T-profile side (without edging) and place far up in the perforation!
- **IMPORTANT: The side elements must ONLY BE HAMMERED IN WITH A SOFT Mallet !**
- Press the locking tabs into the T-profile with a screwdriver (max. 1.5 mm).

Refer to Table 1 below for the number and position of the side elements.



- * - for side elements: nominal dimension + 6 mm
- for face beam / rear panel: Nominal dimension + 8 mm

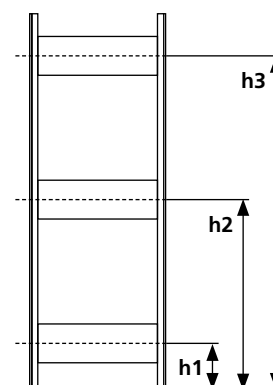
Table 1: T-profile frames - maximum bay load and position of side elements

If you require larger bay loads than those specified below, please contact us. These can be achieved with more reinforcement elements.

Max. bay load with only 2 levels: 800 kg

Position of the side elements

Frame height H mm	Number of side elements	Height position of side elements in mm		
		h1	h2	h3
2,000 - 2,299	2	206	1,756	---
2,300 - 2,499	2	206	2,056	---
2,500 - 3,000	3	206	1,006	2,256

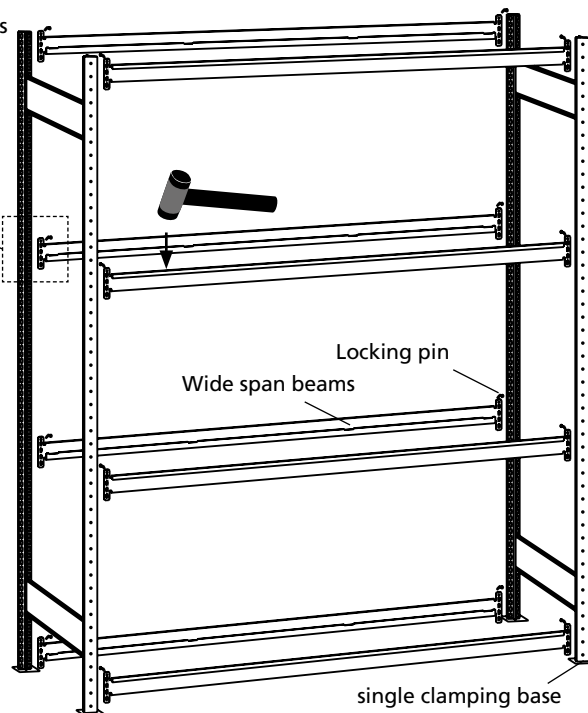
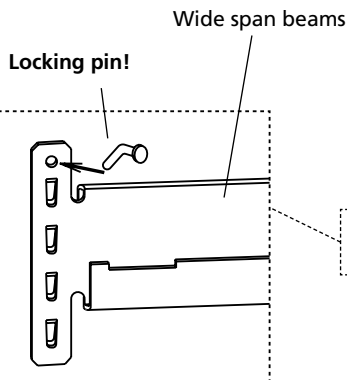


Bay loads and number of side elements

Shelving height:	2,000 mm	2,500 mm	3,000 m
Number of side elements:	2 pieces	3 pieces	3 pieces
Number of levels:	3 levels	4 levels	5 levels
maximum bay load	1,250 kg	1,800 kg	2,100 kg

Assembly of wide span beams

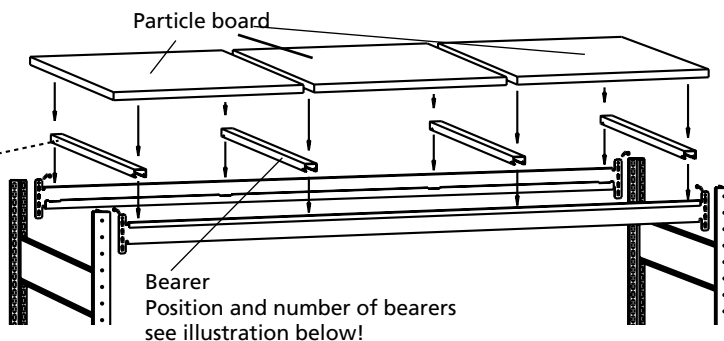
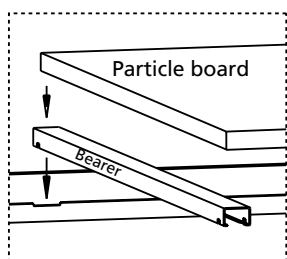
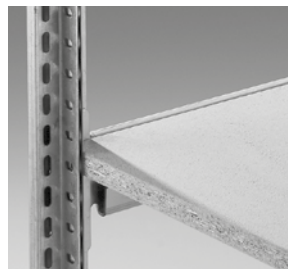
If the ratio of shelf height to shelf depth is greater than 5:1, the shelving must be secured against tipping!



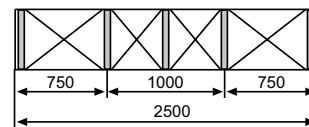
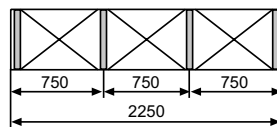
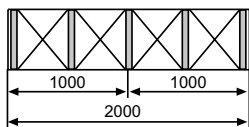
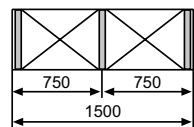
The locking pins must be attached. If the locking pin is difficult to insert, lock the face beam into the guide with a suitable rubber hammer until the locking pin fits!

Assembly of particle boards and bearers

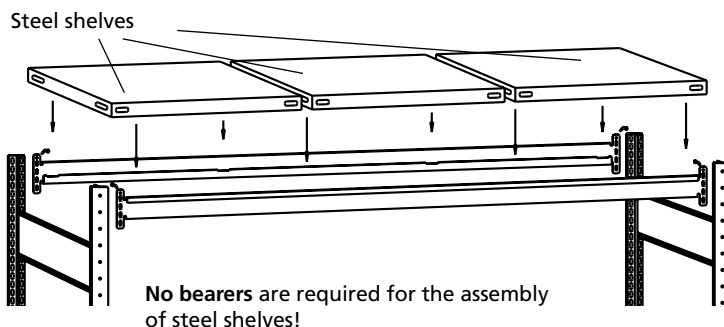
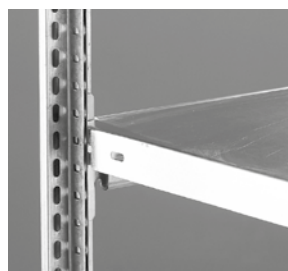
Particle board



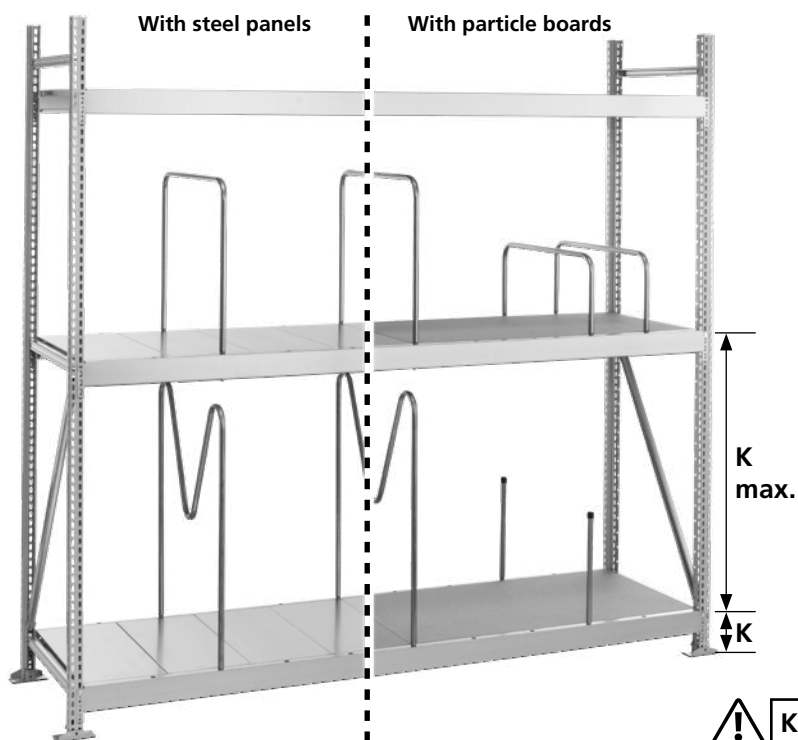
Position of the shelves and position of the beams for particle boards



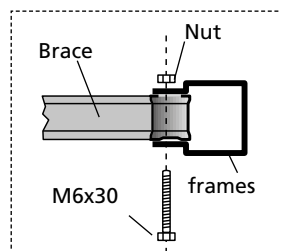
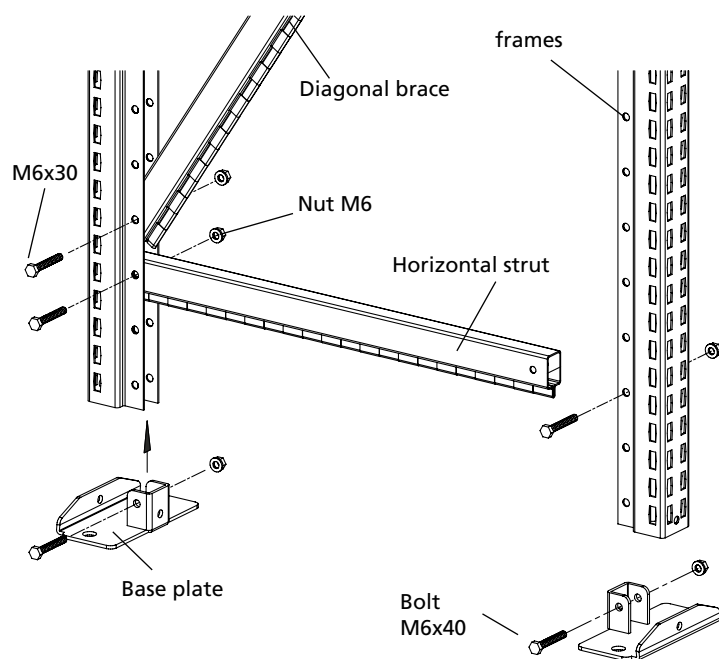
Steel shelves



Assembly of WS 3000



Assembly of frame multifunctional supports



Assembly instruction:
Tighten the M6x30 bolts with 10 Nm. Use a torque spanner.

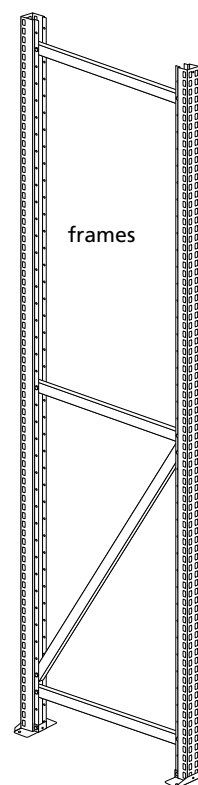
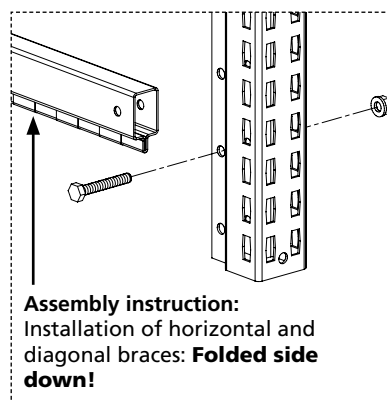
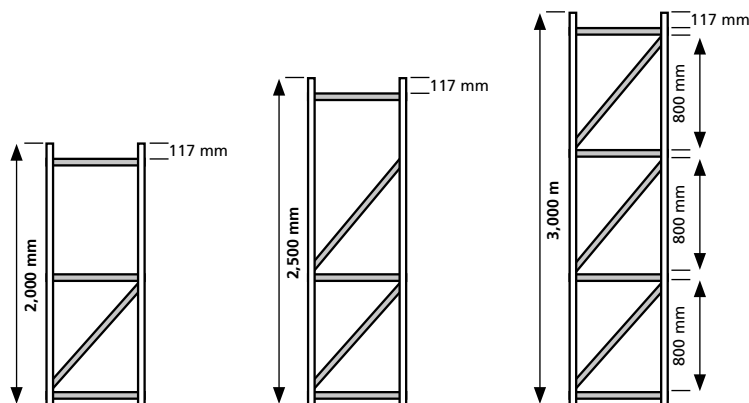


Table 1: Position and number of braces



Number of horizontal and diagonal braces

Frame height	2,000 mm	2,500 mm	3,000 mm
Number of horizontal braces:	3	3	4
Number of diagonal braces:	1	2	3

Horizontal and diagonal brace dimensions

Frame depth	500 mm	600 mm	800 mm	1,000 mm
Horizontal brace length mm	453 mm	553 mm	753 mm	953 mm
Diagonal brace length mm	940 mm	990 mm	1,112 mm	1,254 mm

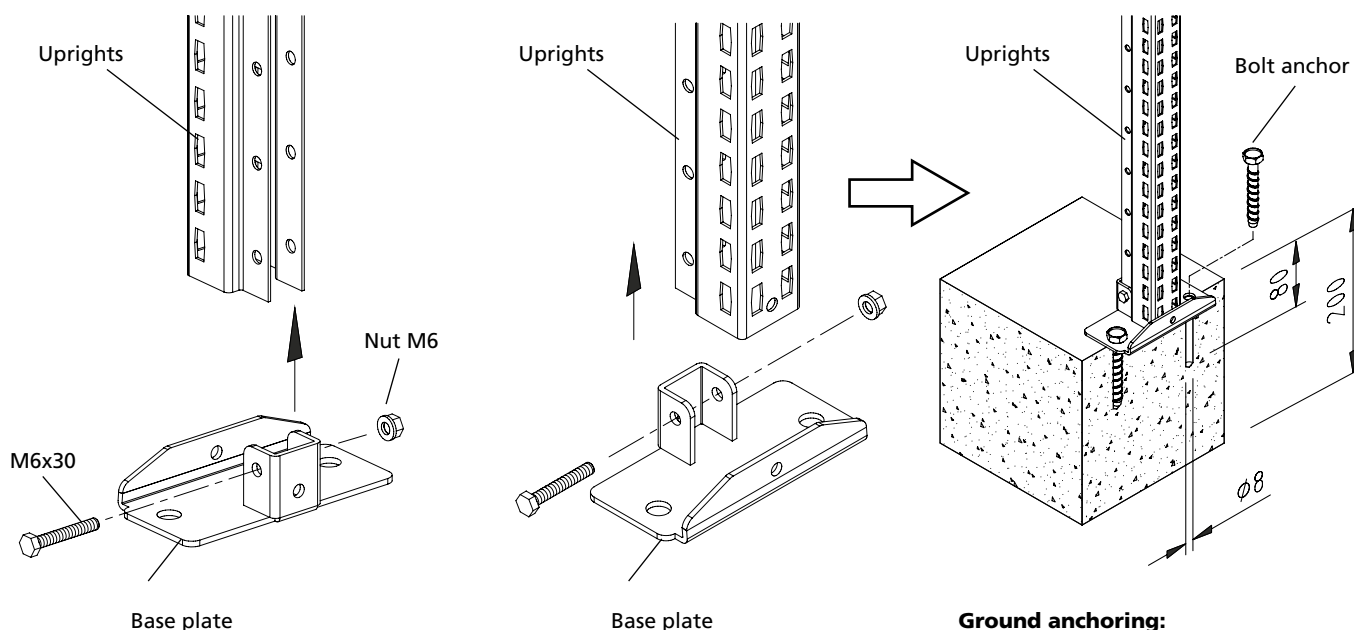
Assembly tolerances:

The permissible tolerance of the support length is ± 1 mm / metre.

For ease of frame assembly, the supports should be assembled with similar tolerances.

The permissible assembly tolerances of the frame depth are $+ 2$ mm / $- 1$ mm.

Assembly of base plate and ground anchoring

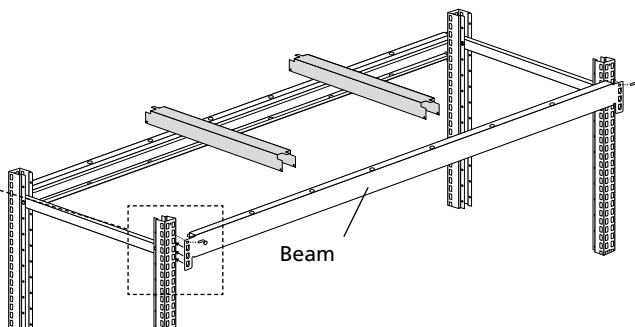
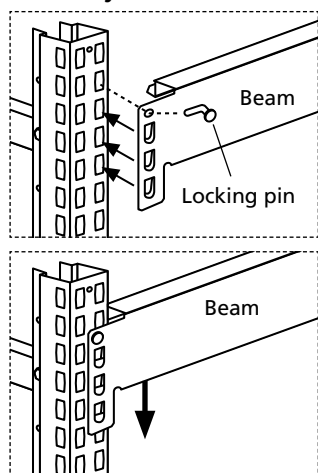


Ground anchoring:

Per base plate 1 pc. bolt anchor
d = 8 x 75 mm
(Art. 19956, please order separately)

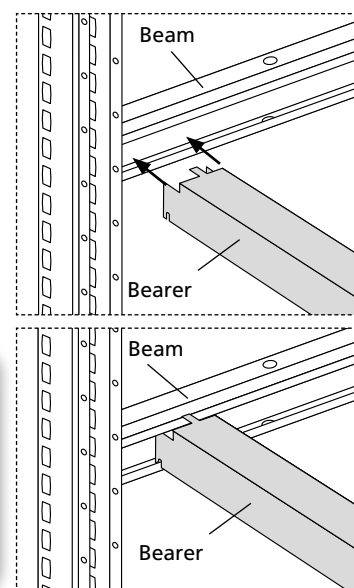
Assembly of beams and bearers

Assembly of beams



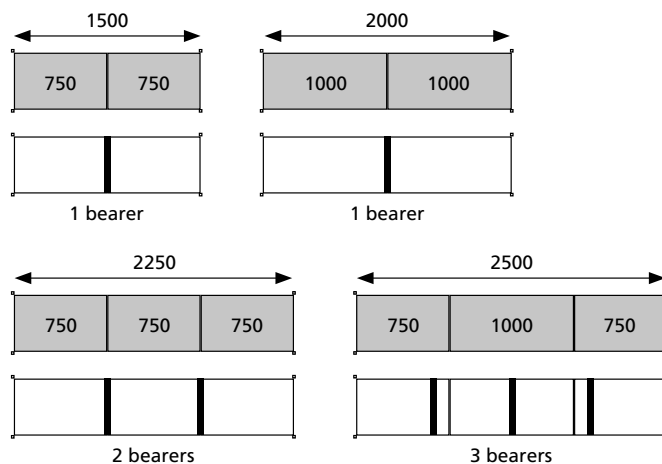
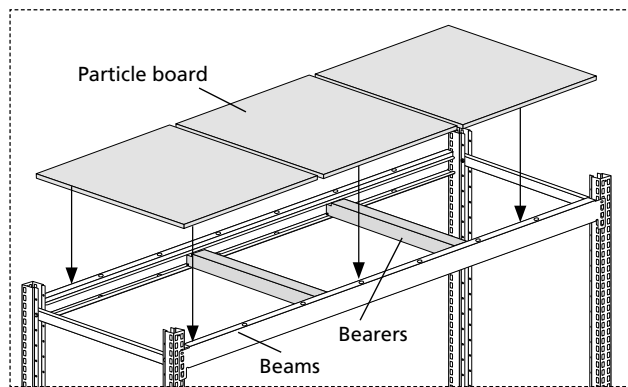
The **locking pins must be attached**. If the locking pin is difficult to insert, lock the face beam into the guide with a suitable rubber hammer until the locking pin fits!
Bearers are always required for beams with particle boards and panels!

Assembly of bearers



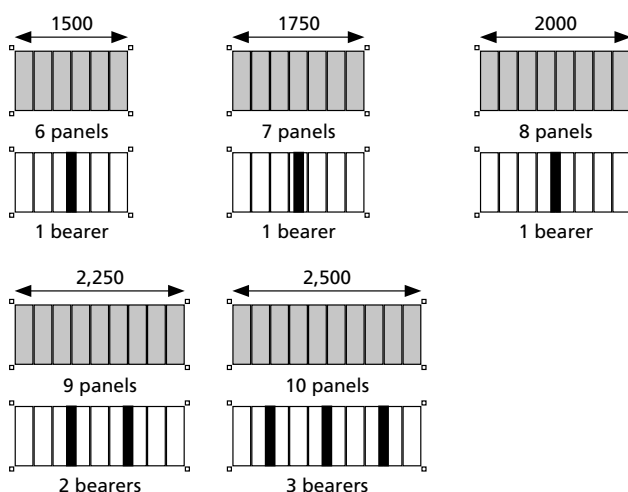
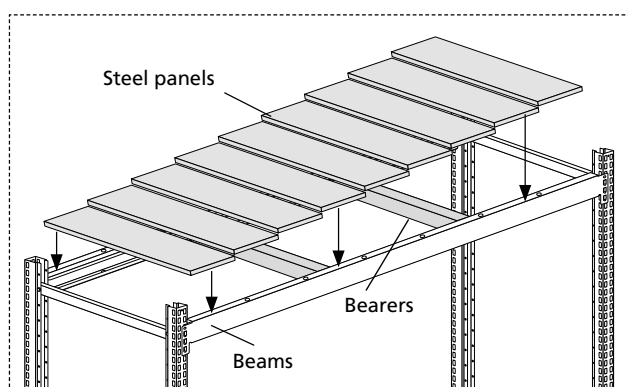
Assembly & position of bearers and particle boards

Number and position of the particle board and bearers per shelf width

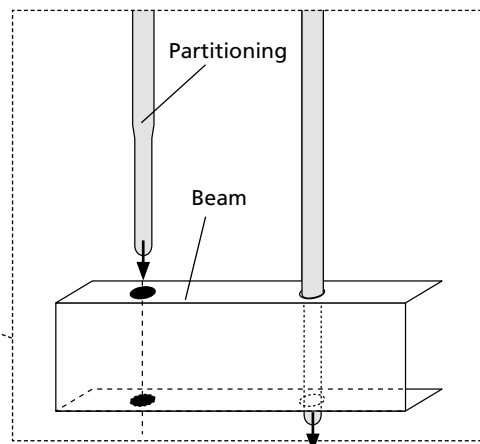
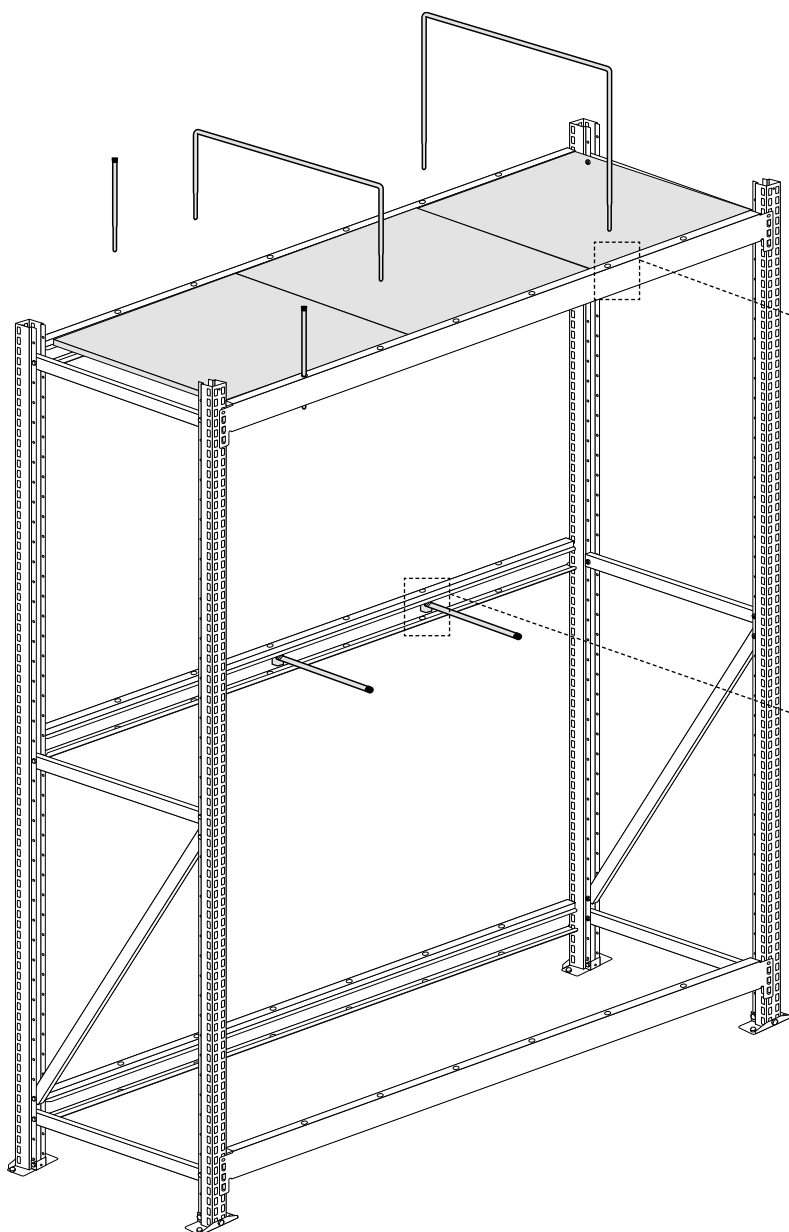


Assembly & position of bearers and steel panels

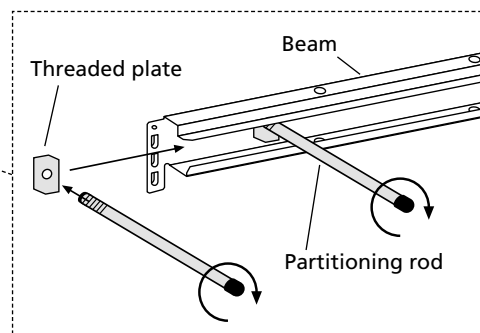
Number and position of the steel panels and bearers per shelf width



Assembly of partitioning elements

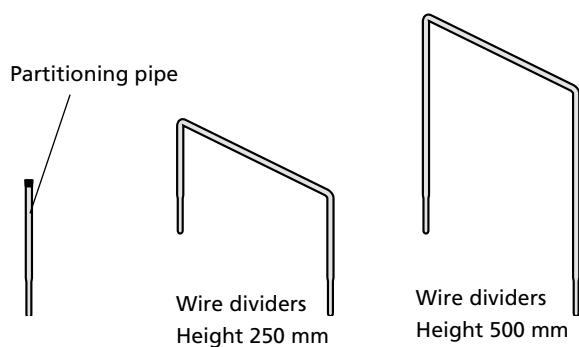


Insert the partitioning elements through both openings in the beams.

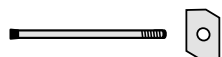


Slide the partitioning rod with the threaded plate into the beam and turn the rod until the plate is firmly tightened.

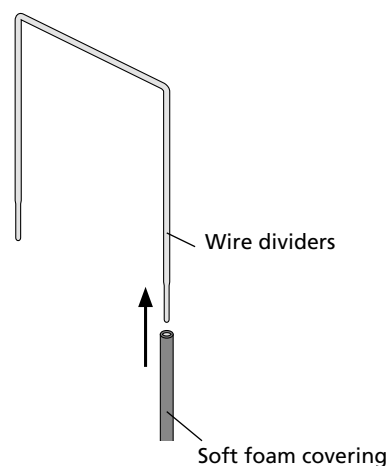
Partitioning pipe and wire dividers



Partitioning rod with threaded plate



Soft foam covering (optional) for partitioning pipe and wire dividers

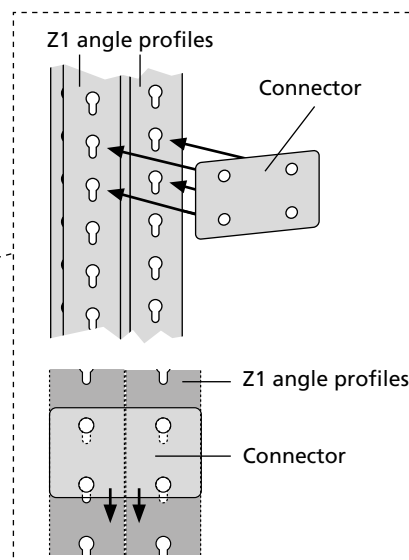
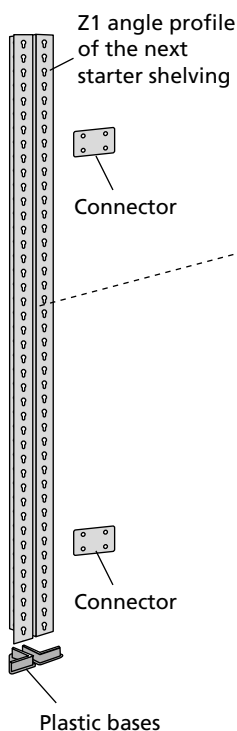
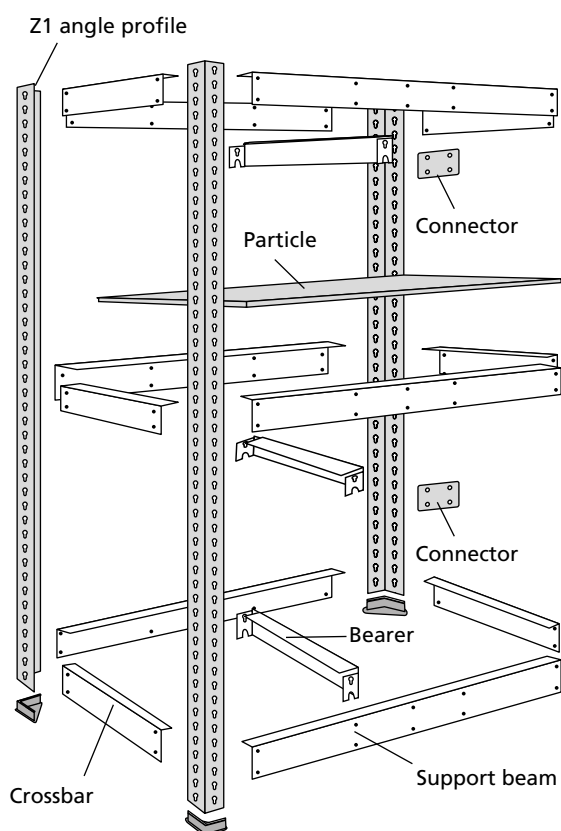


Assembly of Z 1



K1 = 110 mm
K max. = 975 mm
H max. 3,048 mm
and max. bay load = 2,500 kg!

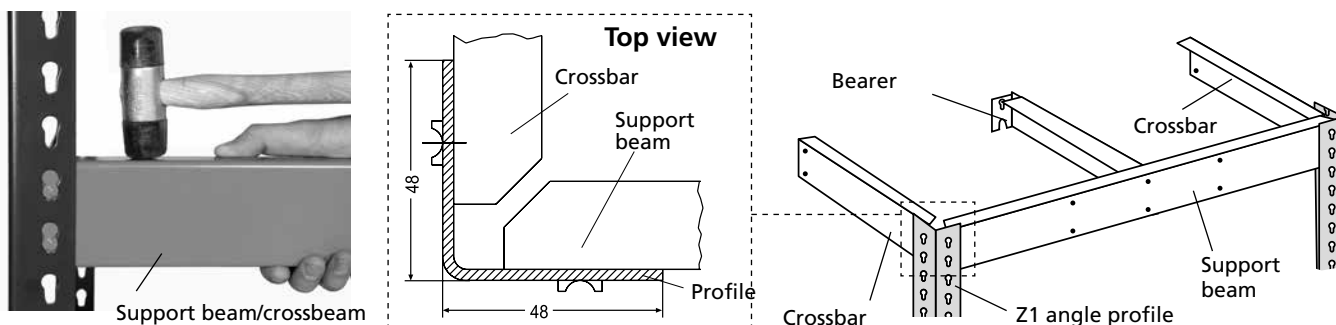
Assembly of starter elements



To connect further starter shelving bays, 2 connectors must be inserted in the upper and lower area of each upright side!

Place the connectors with the pronounced lugs in the openings of the two angle profiles and push them downwards. Use light hammer blows to drive the connectors into place.

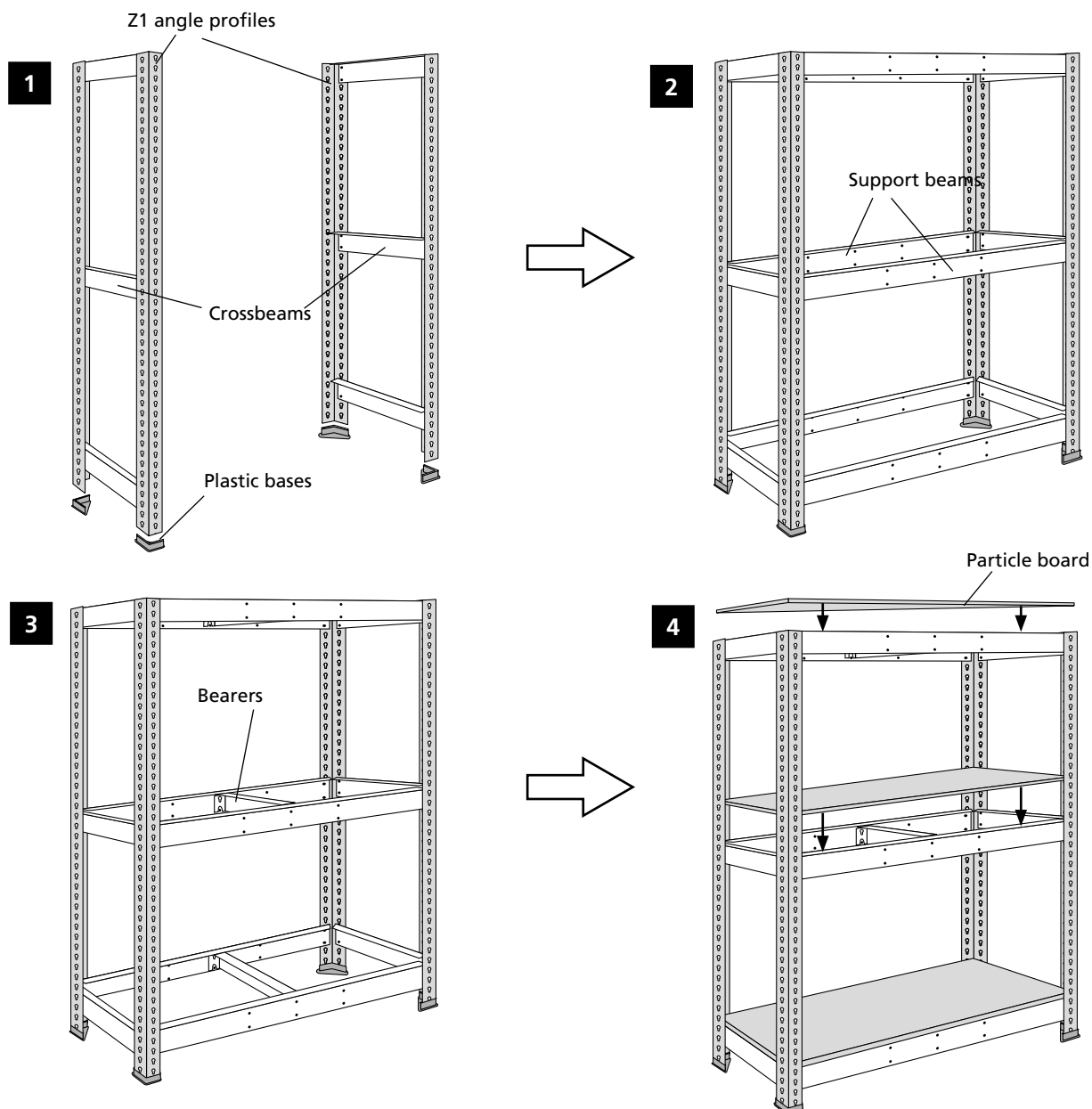
Inserting the crossbeams and support beams



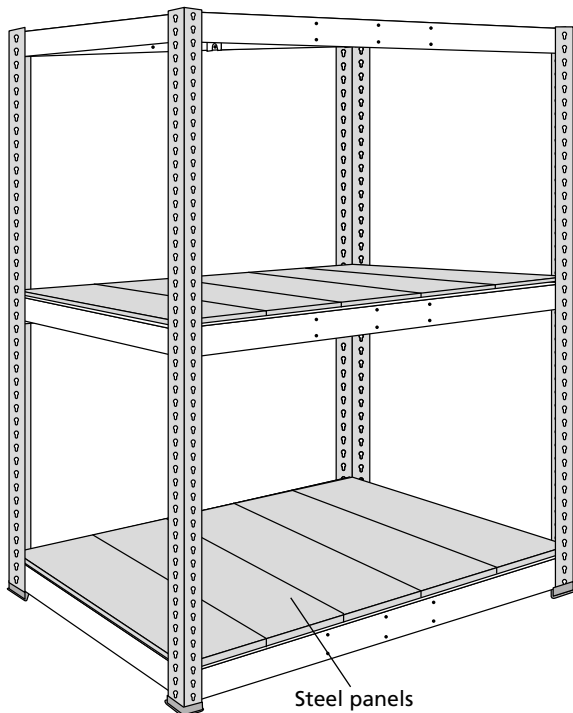
Insert the crossbeams and supports beams with the agraffes into the angle profiles.

Lock the crossbeams and supports in place with a rubber mallet so they are properly secured.

Assembly of starter elements



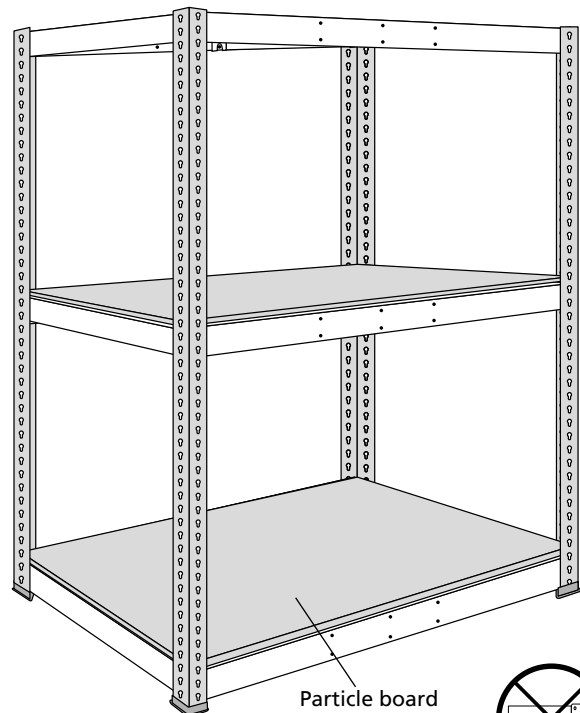
Steel panels



Number and sizes of steel panels

Shelving width	Number Steel panels 305 mm	Number Steel panels 260 mm	Number Steel panels 24 mm
1,536 mm	4	1	2
1,841 mm	5	1	2
2,146 mm	6	1	2
2,450 mm	7	1	2

Particle board



Number and sizes of particle boards

Only the supplied genuine particle boards may be used!
Always use one continuous particle board per level!

Load capacity tables und maximum shelf and bay loads



Load capacity table Z1 wide-span shelving Max. bay load per storage level

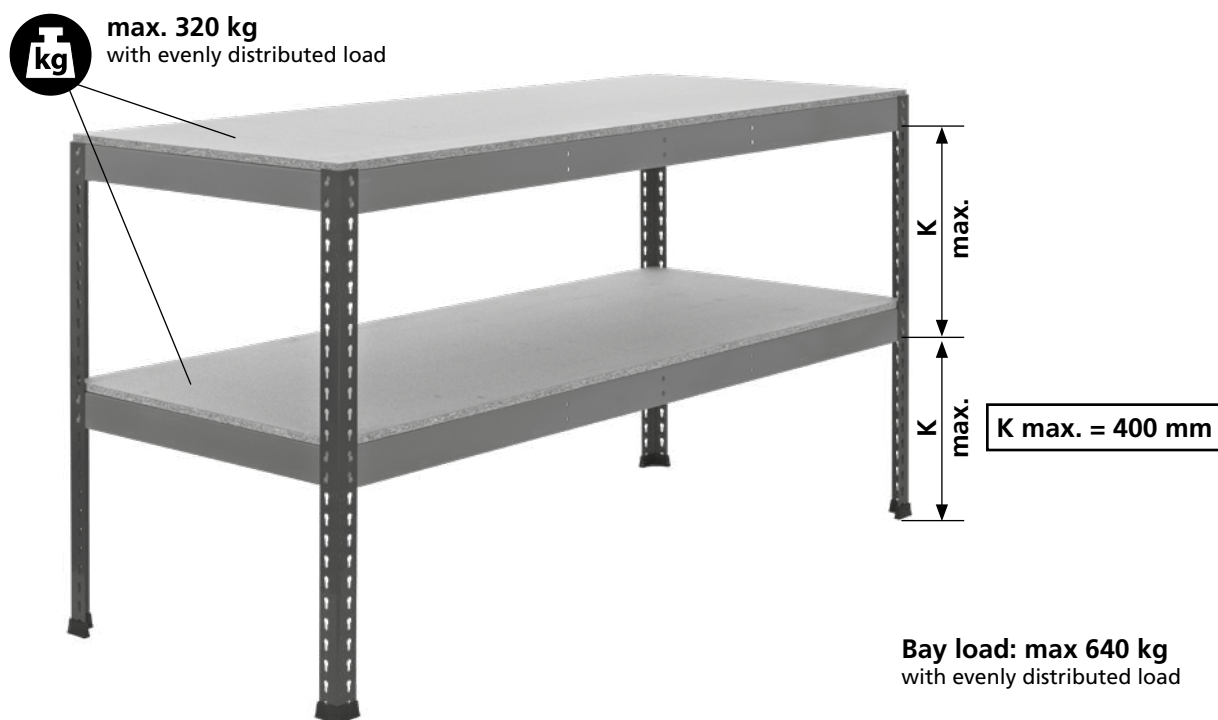
Shelving width	1,536 mm	1,841 mm	2,146 mm	2,450 mm
Depth 469 + 621 mm	640 kg	610 kg	577 kg	545 kg
Depth 773 + 925 mm	640 kg	720 kg	620 kg	500 kg

The total load (bay load) of the shelving depends on the distance between the individual levels.

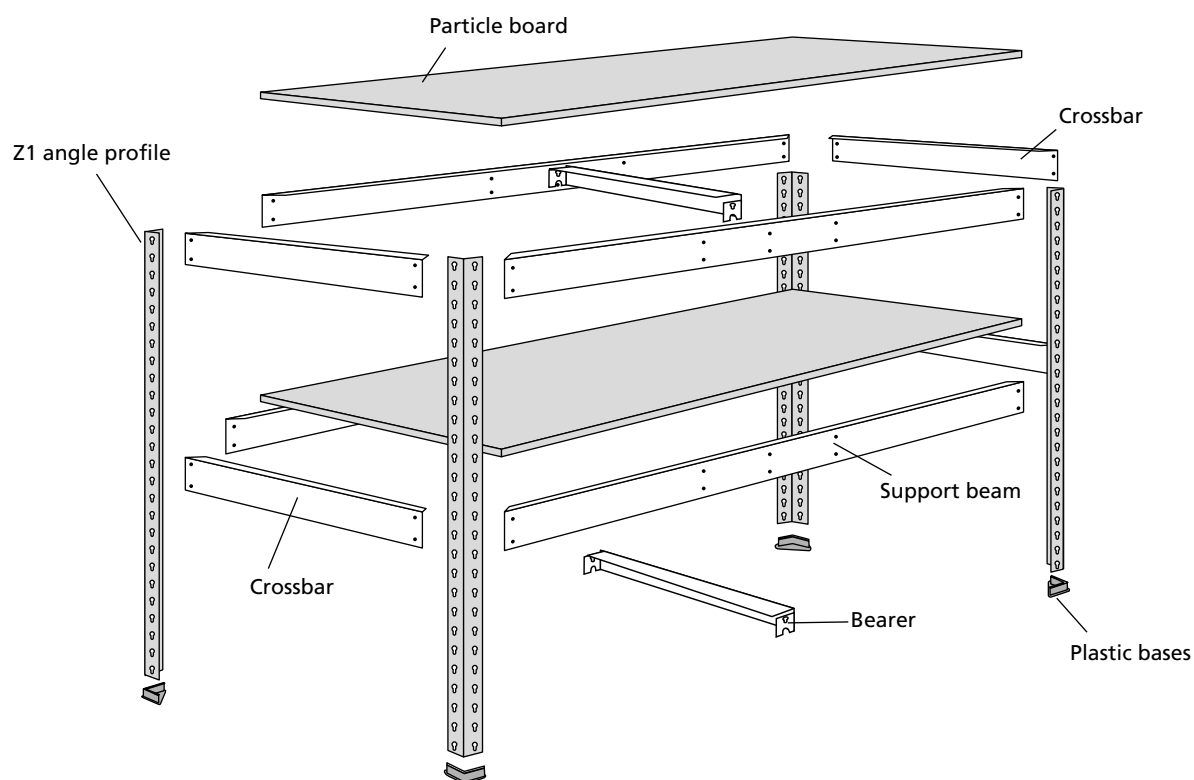
Load capacity table Z1 wide-span shelving Max. bay load per shelving bay

Shelving height	1,981 mm	2,438 mm	3,048 mm
Max. bay load with 3 levels	2,445 kg	2,175 kg	---
Max. bay load with 4 levels	3,200 kg	2,800 kg	2,500 kg
Max. bay load with 5 levels	3,500 kg	3,250 kg	3,000 kg
Max. bay load with 6 levels	3,900 kg	3,600 kg	3,300 kg
Max. bay load with 7 levels	---	3,850 kg	3,675 kg

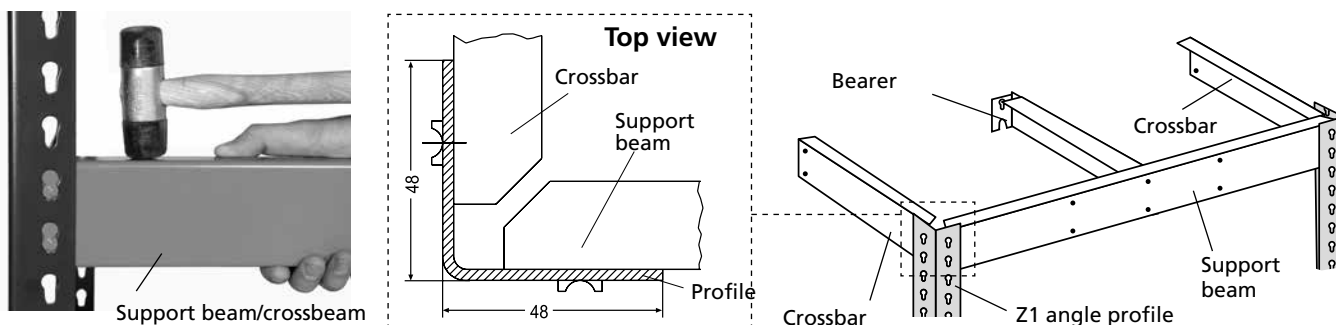
Assembly of Z 1 workbench as a worktable



Overview of starter elements



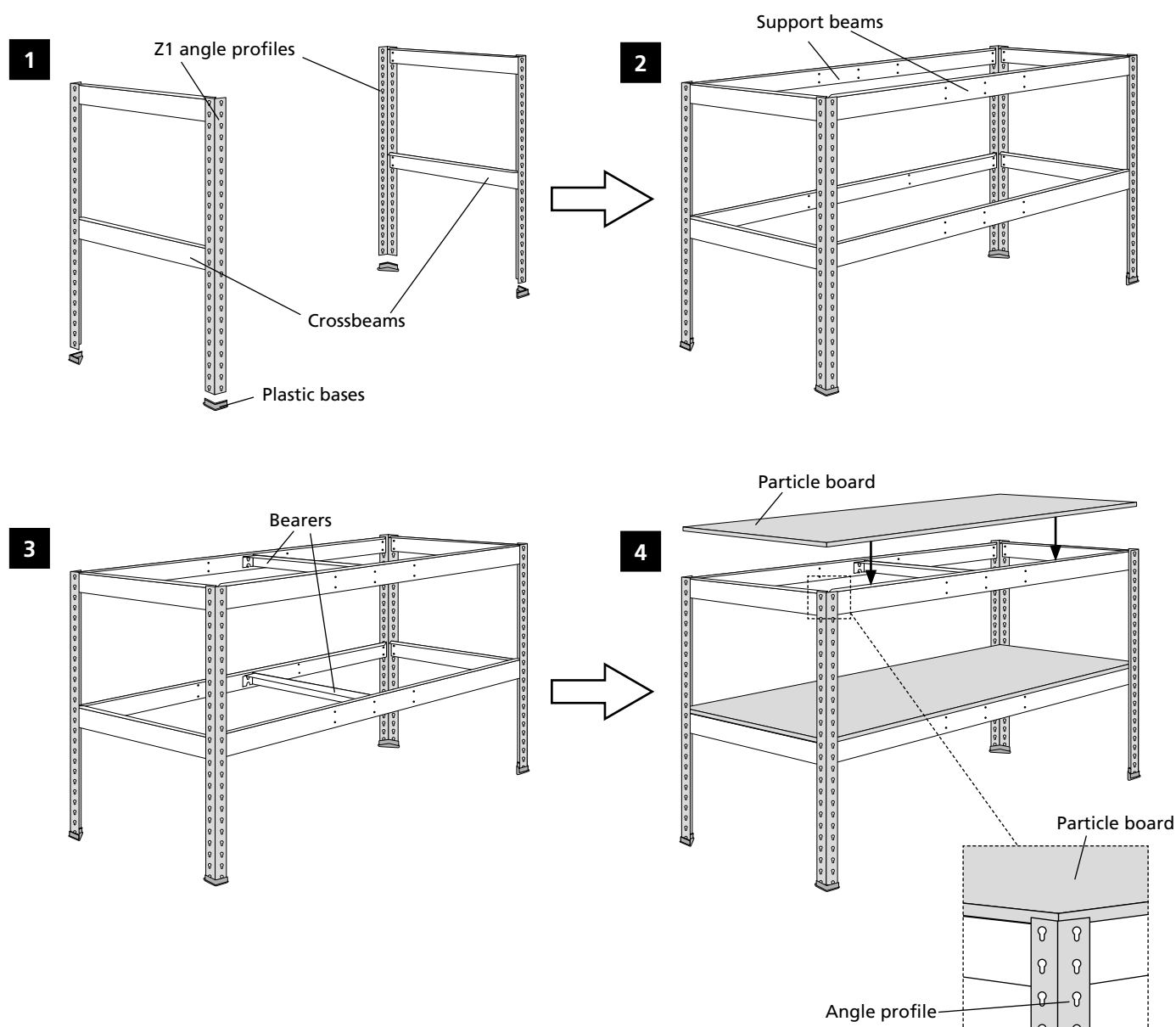
Inserting the crossbeams and support beams



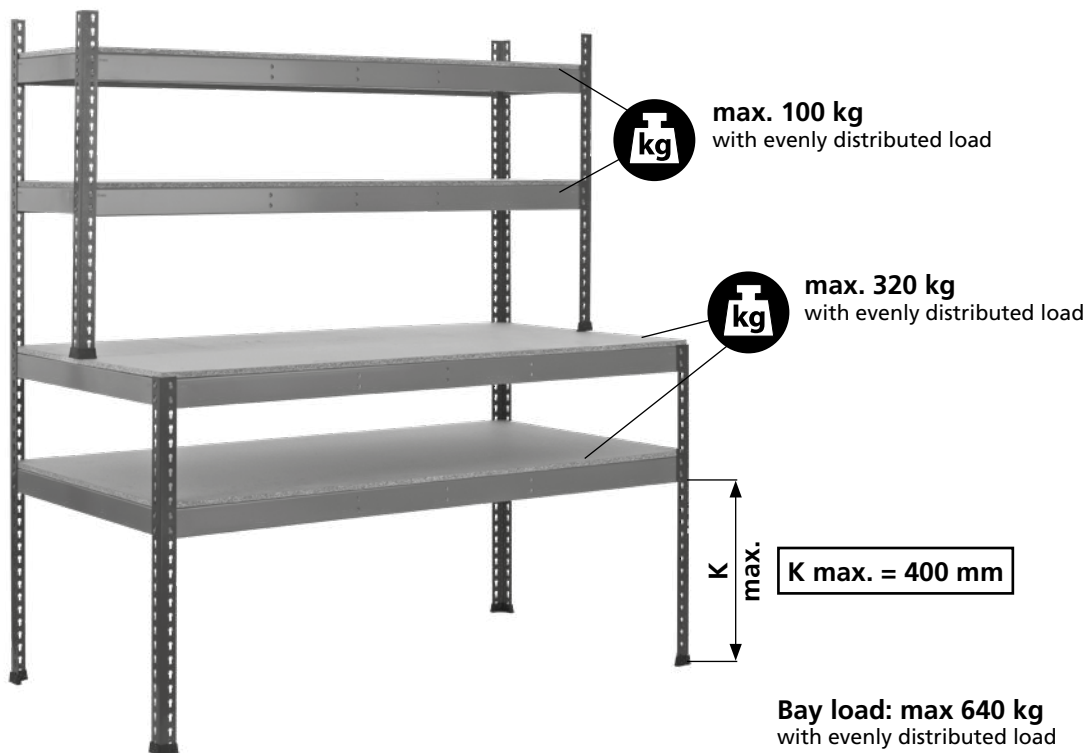
Insert the crossbeams and supports beams with the agraffes into the angle profiles.

Lock the crossbeams and supports in place with a rubber mallet so they are properly secured.

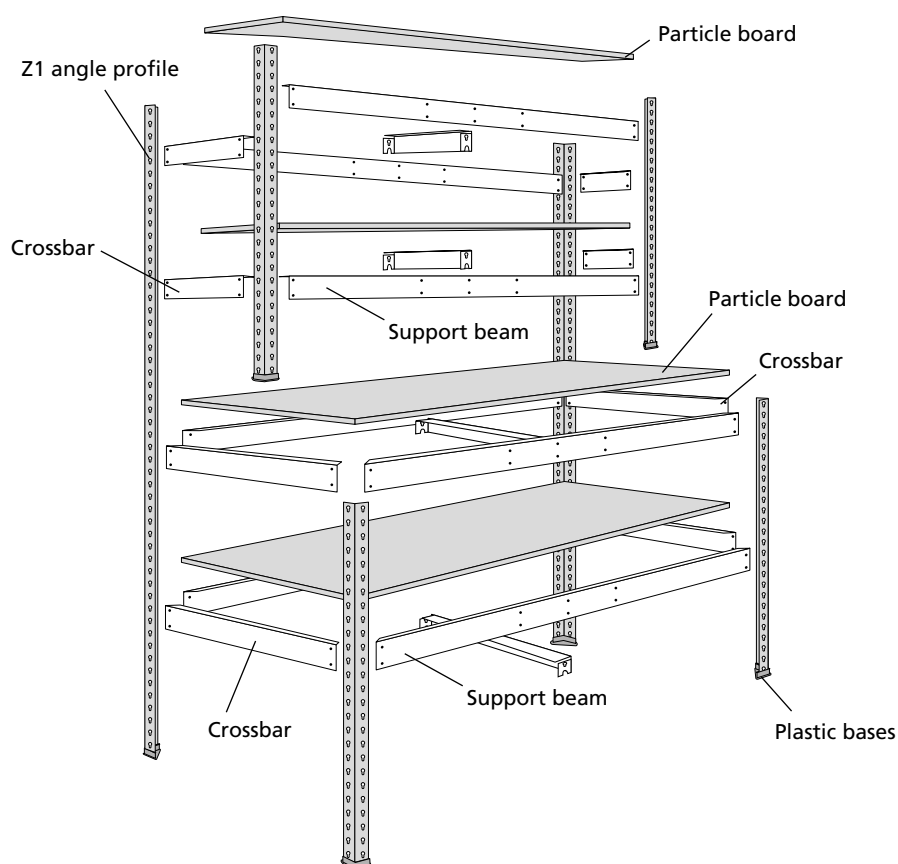
Assembly of starter elements



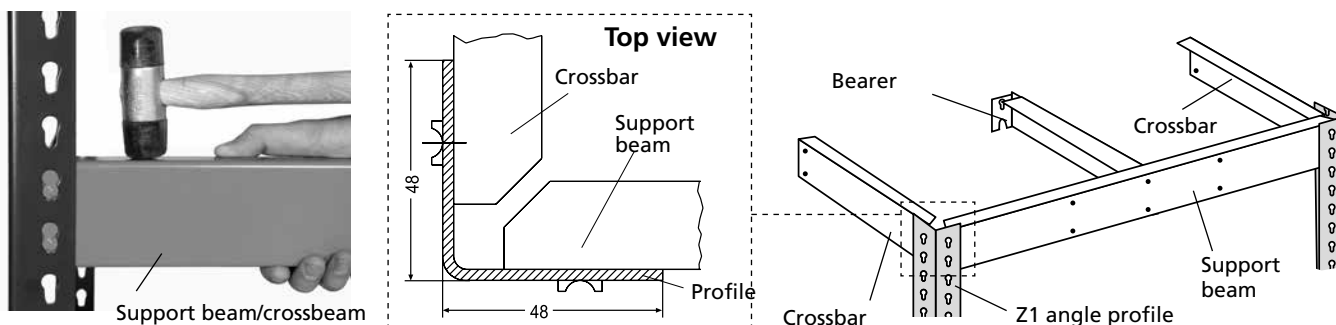
Assembly of Z 1 workbench with shelving levels



Overview of starter elements

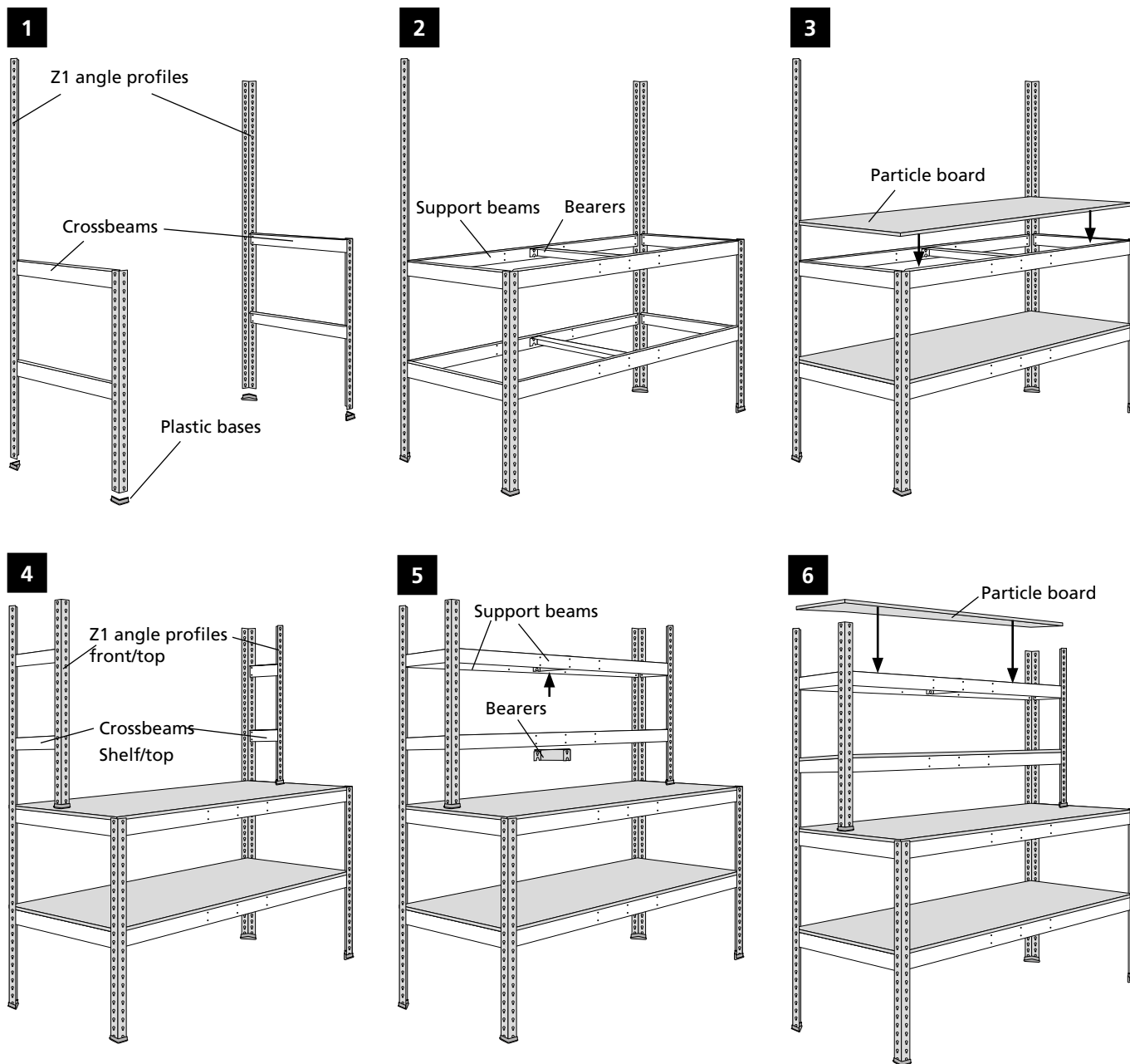


Inserting the crossbeams and support beams



Insert the crossbeams and supports beams with the agraffes into the angle profiles.
Lock the crossbeams and supports in place with a rubber mallet so they are properly secured.

Assembly of starter elements



Assembly of W 100



K = See page 26

Assembly of upright frames

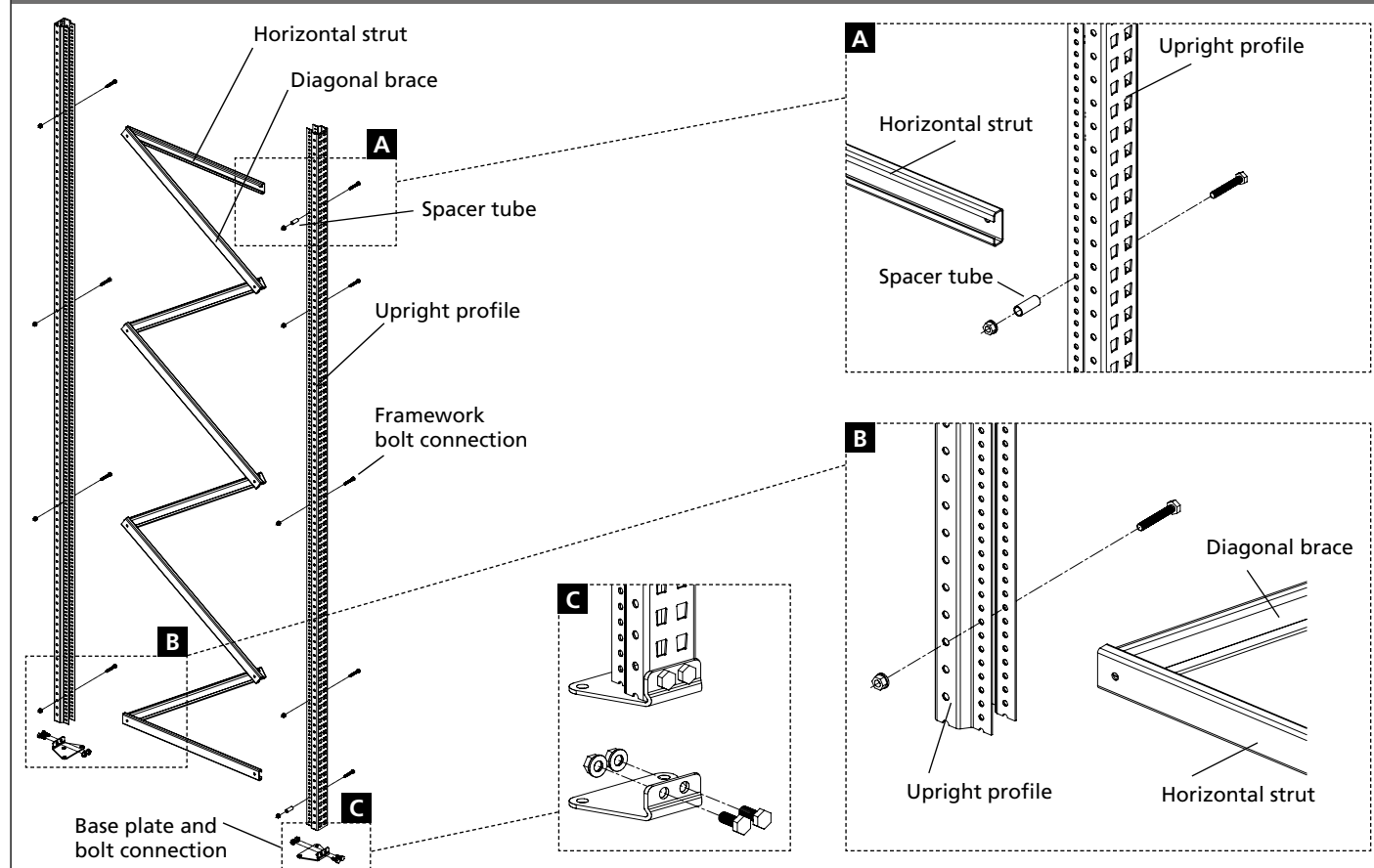
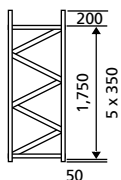


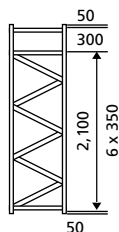
Table: Upright frames with diagonal/horizontal braces

2,000 mm

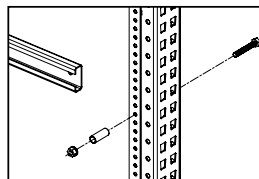


5 diagonals
2 horizontals
2 single connections
6 double connections

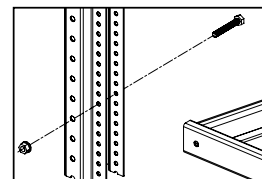
2,500 mm



6 diagonals
3 horizontals
4 single connections
7 double connections

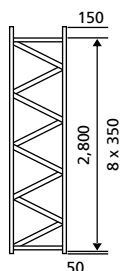


Single connections:
Bolt with nut
incl. spacer tube



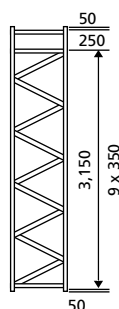
Double connections:
Bolt with nut

3,000 mm



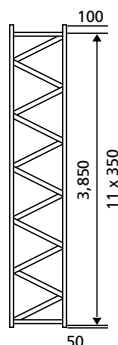
8 diagonals
2 horizontals
2 single connections
9 double connections

3,500 mm



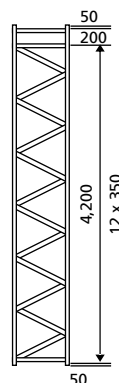
9 diagonals
3 horizontals
4 single connections
10 double connections

4,000 mm



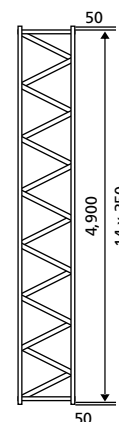
11 diagonals
2 horizontals
2 single connections
12 double connections

4,500 mm



12 diagonals
3 horizontals
4 single connections
13 double connections

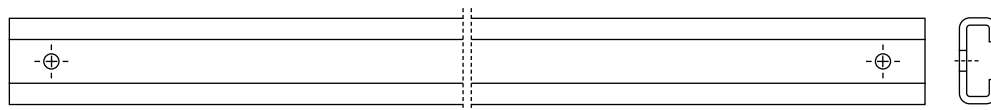
5,000 mm



14 diagonals
2 horizontals
2 single connections
15 double connections

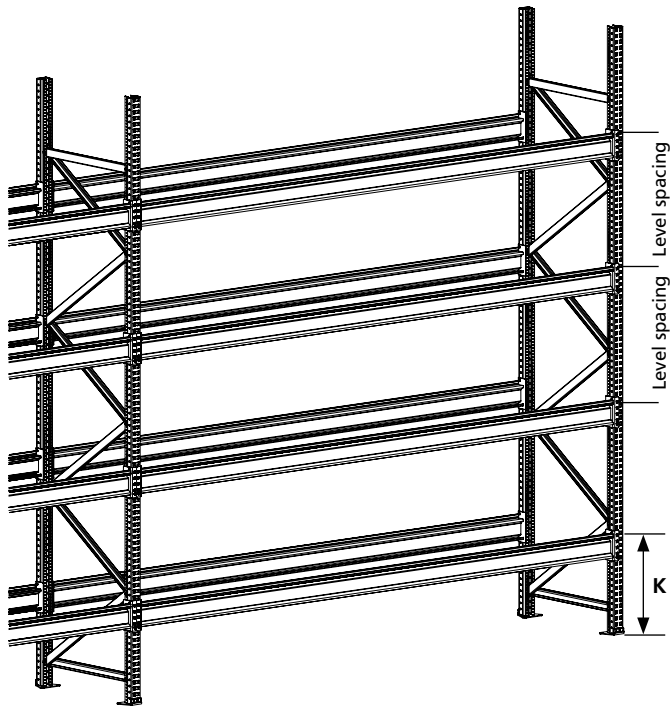
Dimensions of diagonal/horizontal braces

C-Profile Type CZ 36



Frame depth mm	Horizontal length mm	Diagonal length mm
600	553	660
800	753	834
1,000	953	1,018
1,200	1,153	1,208

Table 1: Maximum upright load

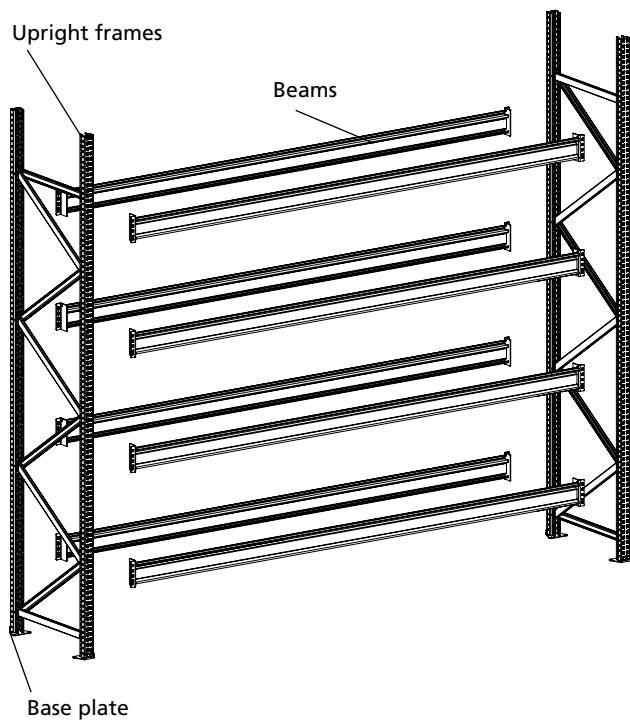


Maximum upright load

with different level spacing (buckling length)

K = level spacing	max. load capacity
500 mm	3,500 kg
600 mm	3,430 kg
700 mm	3,350 kg
800 mm	3,200 kg
900 mm	3,080 kg
1,000 mm	3,000 kg
1,100 mm	2,800 kg
1,200 mm	2,600 kg

Assembly of beams

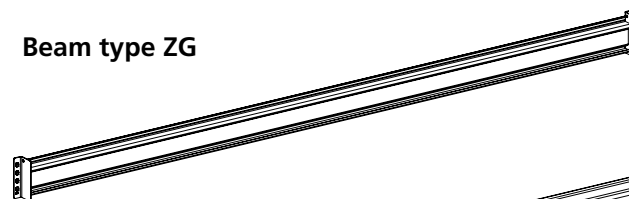


Beam type	Beam length	Load capacity
ZG 55/18	1,785 mm	670 kg
ZG 85/20	2,410 mm	950 kg
ZG 85/20	2,500 mm	1,050 kg
CO	1,250 mm	538 kg
CO	1,605 mm	419 kg

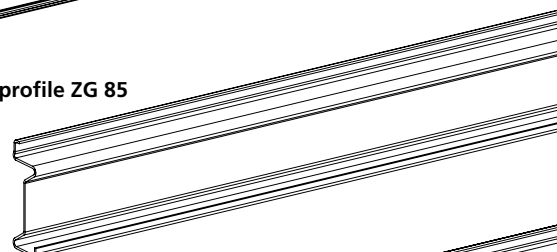


Important notice: The loads caused by beam pairs must not exceed the total permissible frame loads (page 26) in total.

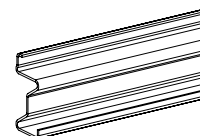
Beam type ZG



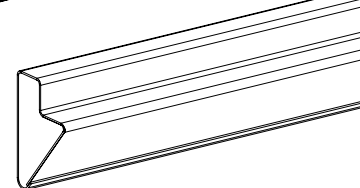
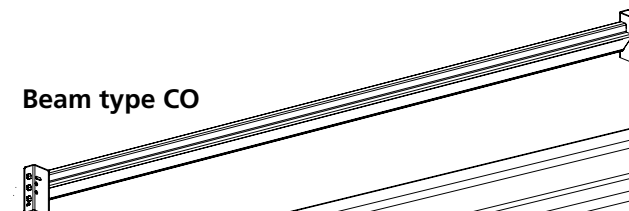
Beam profile ZG 85



Beam profile ZG 55

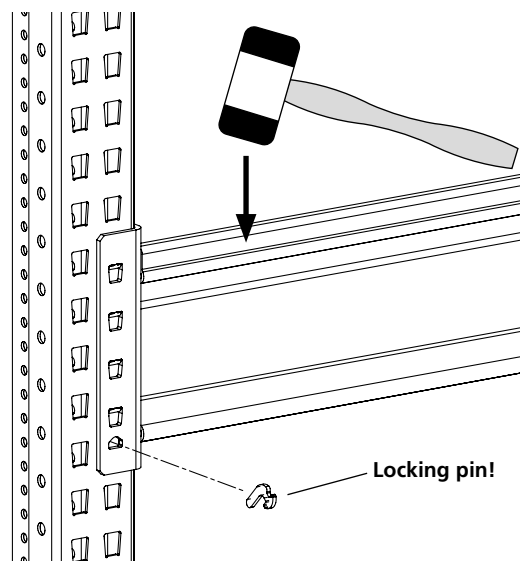
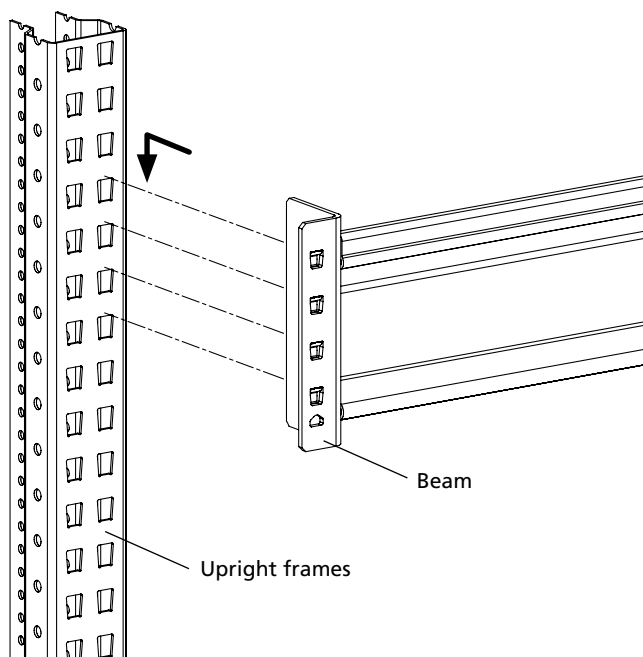


Beam type CO



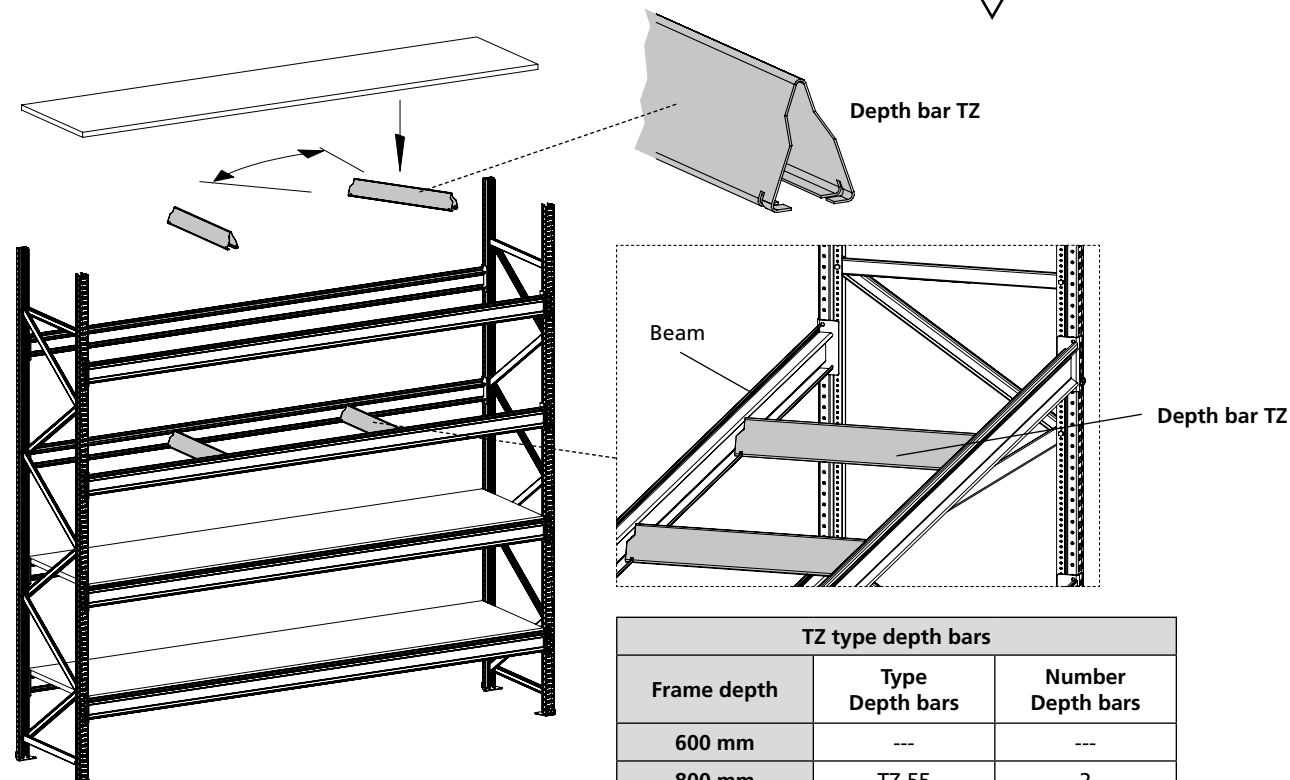
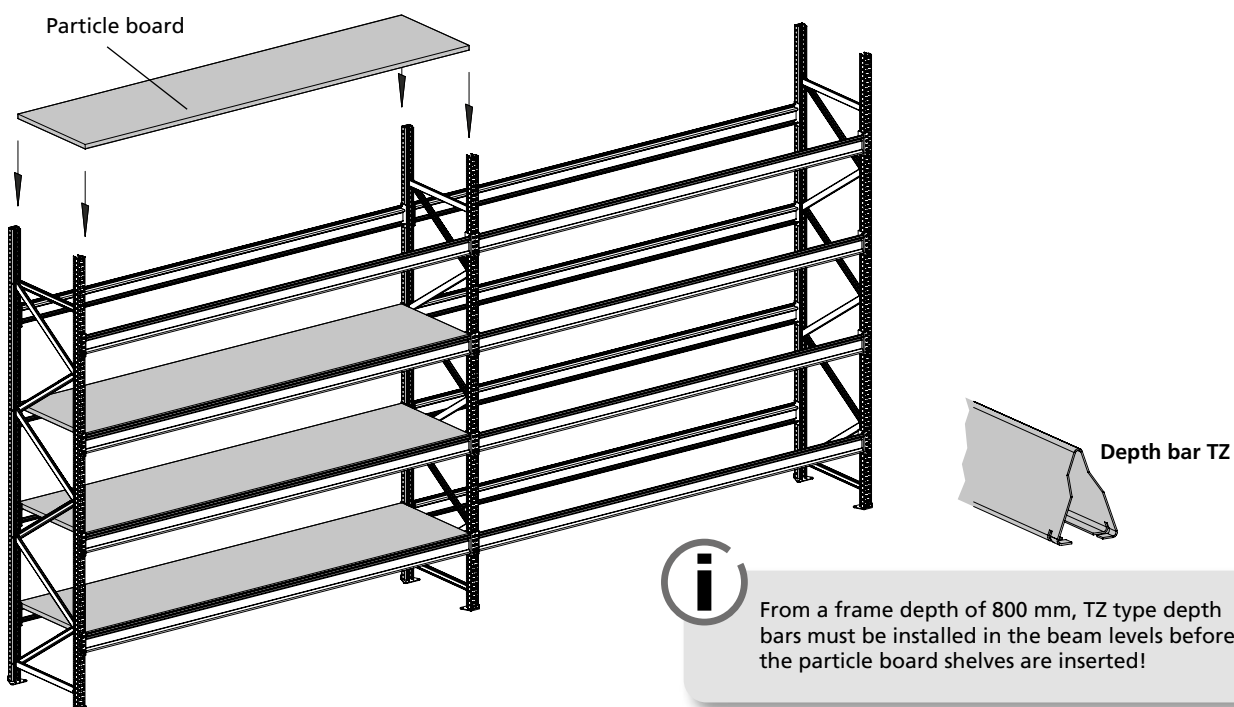
Beam profile CO

Inserting the beams and locking pins



It is essential to attach the locking pins to lock the beams!

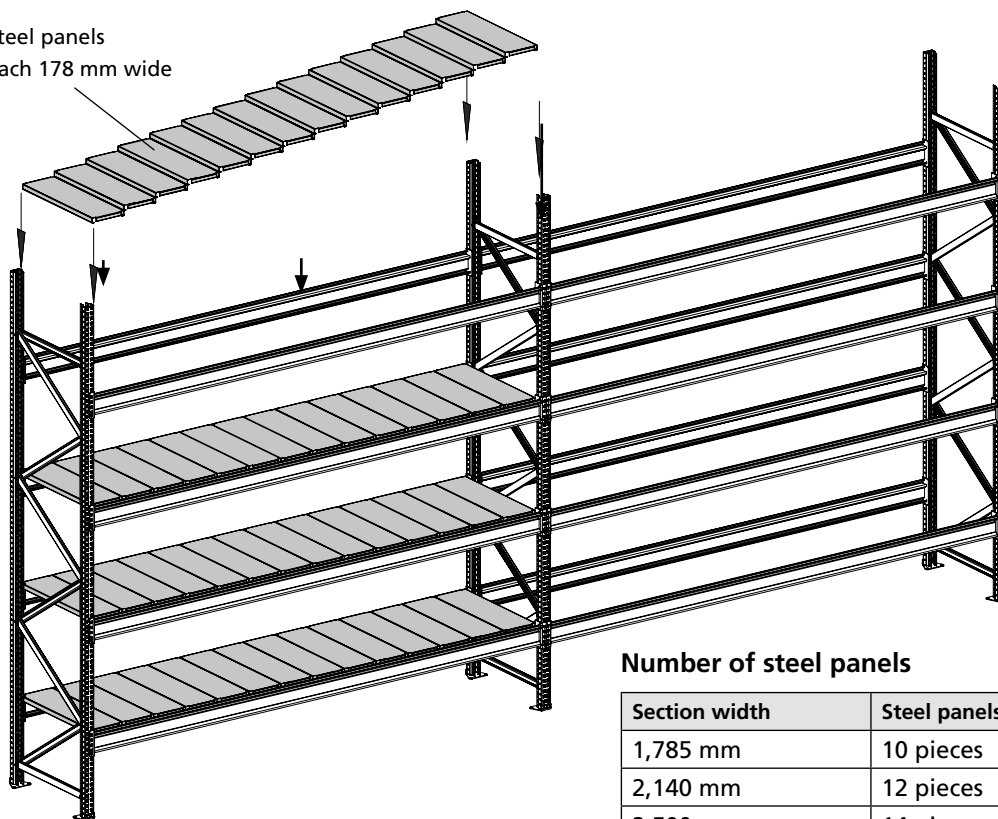
Assembly of the particle board shelves and TZ depth bars for beam type ZG



TZ type depth bars		
Frame depth	Type Depth bars	Number Depth bars
600 mm	---	---
800 mm	TZ 55	2
800 mm	TZ 85	2
1,000 mm	TZ 55	2
1,000 mm	TZ 85	3
1,200 mm	TZ 55	3
1,200 mm	TZ 85	3

Assembly of steel panels with beam type ZG

Steel panels
each 178 mm wide



Number of steel panels

Section width	Steel panels
1,785 mm	10 pieces
2,140 mm	12 pieces
2,500 mm	14 pieces

Notes

Notes

Notes

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.

