



## ASSEMBLY INSTRUCTIONS

Pallet rack  
PR15000-M



Please read this manual before using the product and follow the instructions it contains!

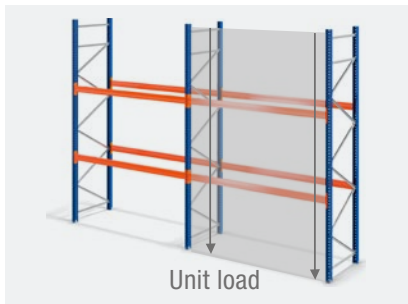
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Do not over-tighten screws!

## EXPLANATION OF TERMS

### UNIT LOAD



- Total load capacity between 2 horizontal bars
- Max. unit load capacity: 15000 kg

### COMPARTMENT LOAD



- Total load capacity per beam level
- Max. shelf load depends on beam length

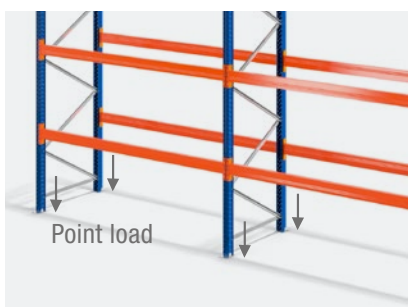
180 cm	→	max. 3000 kg
270 cm	→	max. 4500 kg
360 cm	→	max. 4000 kg



#### Maximum load per pallet

Due to the lower shelf load, four pallets may only be stored with a load of max. 1000 kg each with a cross beam length of 360 cm.

### POINT LOAD



- A load generated by the stand on the foundation
- Max. point load per foot plate: 3750 kg (outer uprights)
- Max. point load per foot plate: 7500 kg (inner uprights)



#### Load capacity

The information on load capacity refers to a shelf with at least 2 bays and at least 2 levels (4 cross members), which are evenly suspended in height to ensure the maximum shelf and bay load.

The operation of a shelf bay with only one level is prohibited! Suspending only one level in a bay reduces the shelf and bay load enormously due to the statics. Our load tests and all specifications therefore always refer to at least 2 levels.

## OVERVIEW

### DRUM SHELF

Painted steel shelf for 110 cm deep pallet racks. The drum shelf is simply placed between the beams and is suitable for drums up to a filling volume of 200 l.

### UPRIGHT

A complete upright consists of: 2 cold-rolled, blue upright rods as well as the galvanised diagonal and cross struts and the foot plates incl. bolt anchors. All required screw material is included.

Available upright depth 110 cm or 80 cm.

### BEAMS

Cross beams are the load carriers of a pallet rack. Individually height-adjustable in 50 mm increments.

Available in the lengths: 180 cm, 270 cm, 360 cm

### L-PROFILE RACK PROTECTOR

With yellow/black signal strips to protect the outer rack uprights. Each with four bolt anchors for floor mounting. Mandatory according to German DGUV rule 108-007 (previously BGR234).

### Complete upright

### STEEL SHELF

The floor is painted in signal orange RAL 2004. Steel shelves are placed directly onto the beams and are self-fixing.

### PUSH-THROUGH PROTECTION

Prevents unintentional movement of the pallet to the rear.

### SUPPORT BAR

Support bars are attached transversely to the beams, for example to increase the load capacity of the wooden shelves. Load capacity per support bar: 600 kg

### U-PROFILE RACK PROTECTOR

With yellow/black signal strips to protect the inner rack uprights. Each with four bolt anchors for floor mounting.



### WOODEN SHELF

Shelves (chipboard, 38 mm) are placed on the beams and fixed using four locking plates.

### SPACER

Spacer – 20 cm – for parallel positioning of racks. Spacers can also be used to fix the rack to the wall.

### MESH REAR WALL

Steel rack back panel painted in orange. It prevents stored goods from falling down.

### LOAD CAPACITY LABEL

Self-adhesive load capacity label with information on load capacity – complies with German DGUV specifications: 108-007 (formerly BGR 234).

Always supplied and must be attached to the rack in a clearly visible position.



### GALVANISED MESH DECK

Shelf made of galvanised mesh. The modules are placed on the beams and are self-fixing due to the special construction.

### CRASH PROTECTION RAIL

Protects the rack system from damage to the outer uprights and their struts caused by accidental collisions, e.g. with forklift trucks.

## GENERAL INFORMATION

### PREVENT DANGERS

The TOPREGAL product you have purchased is manufactured in accordance with the current state of the art and complies with the applicable regulations and rules. Nevertheless, it may pose a danger to people and property if:

- the rack is not properly assembled, improperly modified or converted.
- accessories used are not original ones.
- the safety regulations are not observed.

Therefore every person who carries out the installation must read and follow the safety regulations, if necessary have this confirmed by a signature.

### ACCIDENT PREVENTION REGULATIONS

All relevant accident prevention regulations apply:

- Generally accepted safety rules.
- Country-specific regulations.
- Guidelines for storage facilities and equipment of the respective country.

### PLEASE NOTE

Before assembly, commissioning or use, the information contained in these instructions must be observed. If you need technical support, please contact us.

In order to avoid personal injury and damage to property, please note the following:

- the guidelines of the storage facilities and equipment ZH 1/428 of the German Federation of Institutions for Statutory Accident Insurance and Prevention – in the current issue.
- the relevant workplace directives and regulations.
- the information from your safety officer.
- the structural conditions and regulations, in particular the condition and load-bearing capacity of the floor.
- that the facilities are in good order and condition.  
Damaged or deformed components must be replaced immediately. If in doubt, stop installation or use, secure the installation area and inform your safety officer.
- that loading may only be carried out after all assembly work has been completed.
- that the persons carrying out the assembly and conversion work are to be secured against falling in accordance with the German UVV rules for construction work (VBG 37 §12).
- that protective clothing such as helmets, gloves, safety shoes etc. must be worn during assembly and conversion.
- that the racks must be effectively protected against impact from forklifts or other vehicles.
- that if you install our shelving system yourself, a subsequent acceptance test by a certified shelving inspector in accordance with DIN EN 15635 is mandatory.

## ASSEMBLY PREPARATION

All original TOPREGAL components used to stabilise the warehouse equipment must be attached without restriction. These include in particular frame components, unit assemblies, diagonal struts, beams, floor anchors, screws/fastening elements and safety clamps. During assembly one should ensure that the screws are not over-tightened. The screws must be pre-fastened by hand and later tightened using suitable tools such as a cordless drill or a wrench.

### PLANNING

Before the shelves are set up, the area provided for them is measured and the position of the shelf rows is recorded. Tape measure and chalk line are best suited for this. When setting up the racking, please note that the intended racking row spacing is not equal to the working aisle width and that pallets, containers or empties may protrude into the aisle. The required working aisle width can be obtained from the manufacturer of the operating device or from your safety officer. Transport routes for power-driven or track-bound conveyors must be wide enough to ensure a safety clearance of at least 0.5 m on both sides of the conveyors. The space required for manoeuvring operations must also be taken into account when dimensioning. The safety clearance can be dispensed with if access by persons is prevented by structural measures.

### TESTING OF FLOOR AND FLOOR TOLERANCES

Before installing racking equipment, check:

- whether the load-bearing capacity of the floor is suitable to safely absorb the intended loads.  
If in doubt, ask a specialist and have the load-bearing capacity determined.  
The responsibility for the correctness of the information given lies with the builder-owner.
- the surface of the floor: a reinforced concrete slab, min. 200 mm thick, concrete quality C20/25 is required.  
If the surface is provided with a magnesite screed, insulating plates must be used to avoid of corrosion and special ground anchors are required.



#### Assembly

Racks may only be used in accordance with the assembly and installation instructions supplied by us. operating instructions can be set up and modified. The conversion of racks may only be carried out in an unloaded condition.

## TECHNICAL REGULATIONS

### BASIC STRUCTURE

A shelf row consists of at least 2 fields. At least 2 compartments (4 crossbars) must be hooked into each compartment will be. The shelf heights are to be kept approximately the same for all compartments. If the height of the compartments varies from compartment to compartment 10 %, the maximum field load is reduced.

The uprights are connected to the base plates by screw connections and then fixed in the load-bearing floor. The trusses are attached by simple plug-in construction with safety clamps.

### UPRIGHT HEIGHT

The compartments of the first and last bay of a shelf row must be hooked in at least 50 cm below the upright height to prevent the load from falling. For all other bays, the highest bay must be hooked at least 10 cm below the upright height.

### PASSAGEWAYS

Passages for industrial trucks and forklift trucks must be secured against falling stored goods. This can be achieved, for example, by ensures the insertion of a wooden shelf. The clear height must be 25 cm higher than the vehicle height, but at least 200 cm.

### COLLISION PROTECTION

Corner areas and passages must be protected by a collision guard with yellow-black hazard marking that is not connected to the rack. (see German DGUV: 108-007)

### SAFETY DISTANCES

When assembling, the exact location of the rack must be marked on the floor beforehand. The necessary safety distance to structural parts (e.g. wall, column) and aisles must be observed. (see German DGUV: 108-007)

In addition to the wall distance of 100 mm, the possible pallet overhang must be taken into account. If the pallet protrudes 60 mm, a total safety distance of 160 mm applies.

However, if pedestrian traffic is possible between the wall and the row of shelves, there must be no overhang apart from the pallet.

### CONDITION OF THE SOIL

The minimum component thickness of the soil is 20 cm, the minimum borehole depth is 12 cm. The evenness of the ground is to be measured according to FEM 9.831 and DIN 18202. The minimum concrete quality is C 20/25.

### IDENTIFICATION

Marking by a load plate is mandatory. These are included in the delivery.



## VERTICAL INSTALLATION / DEFLECTION

The shelf must be aligned vertically. Deviations of the shelf supports from the vertical in the length and depth of the shelves must not exceed 1/200 of the shelf support heights. To compensate for uneven floors, height compensation plates can be used - but only up to a maximum of 2 cm. The individual uprights must be aligned within a row of shelves.

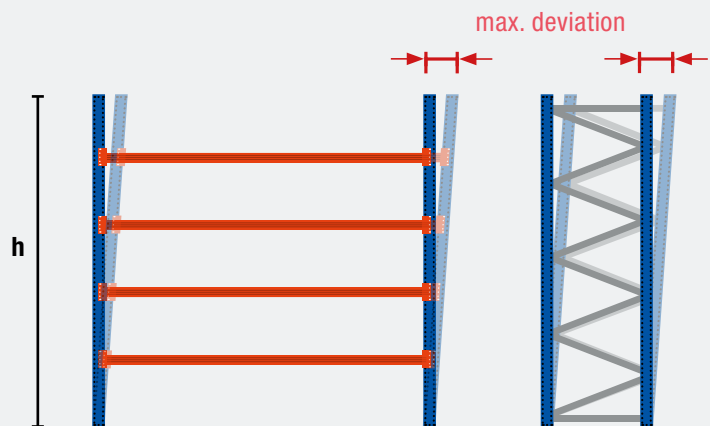
There is a general obligation to anchor the floor! Suitable bolt anchors are included in the delivery. The shelves may only be loaded after assembly is complete.

### EXAMPLE OF PLUMB SET UP: RACK UPRIGHT HEIGHT 4 M

$$\frac{\text{Shelf height } h}{200} = \text{max. deviation}$$

$$\frac{400 \text{ cm}}{200} = 2 \text{ cm}$$

In this example, the maximum deviation in the longitudinal and transverse directions must therefore not exceed 2 cm.

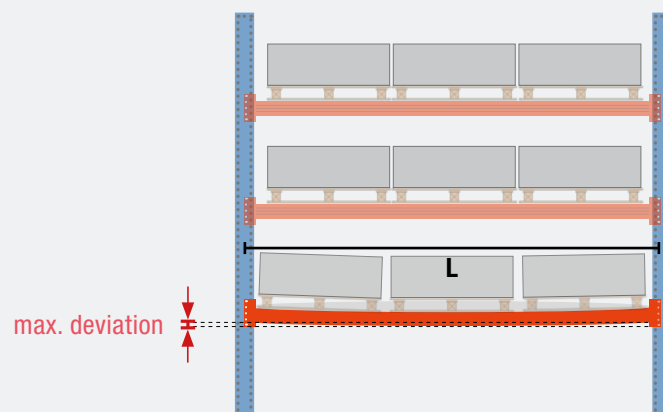


### EXAMPLE OF DEFLECTION: BEAM LENGTH 2,7 M

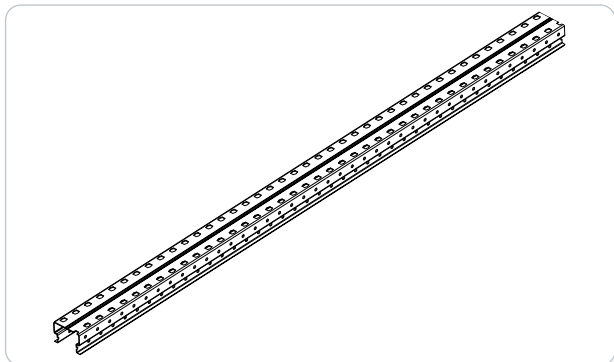
$$\frac{\text{Beam length } L}{200} = \text{max. deviation}$$

$$\frac{270 \text{ cm}}{200} = 1.35 \text{ cm}$$

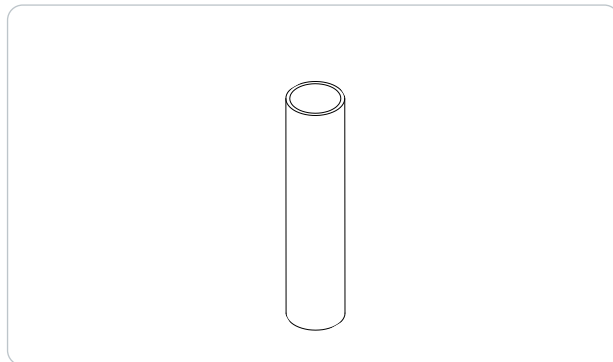
The maximum deflection in this example must therefore not exceed 1.35 cm.



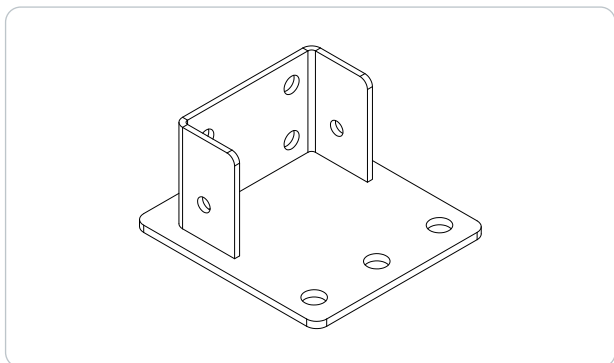
**A** Upright profile



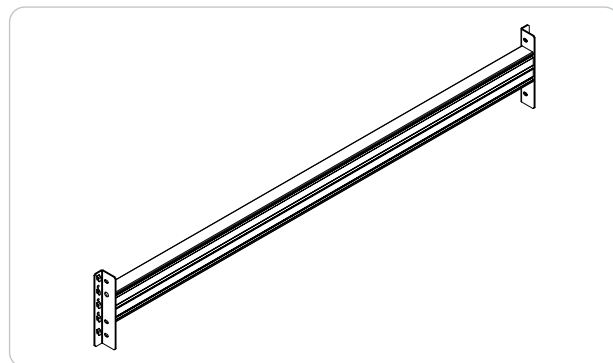
**E** Spacer sleeve 1 (length 47 mm)



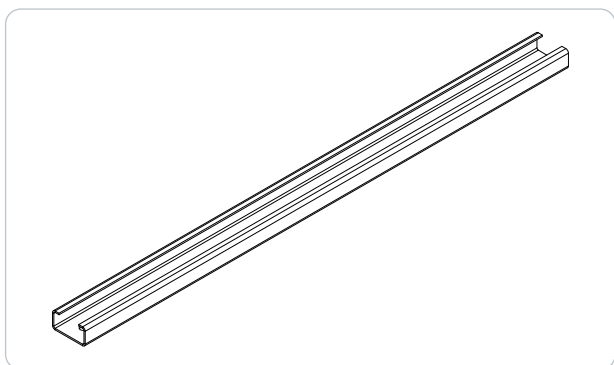
**B** Foot part



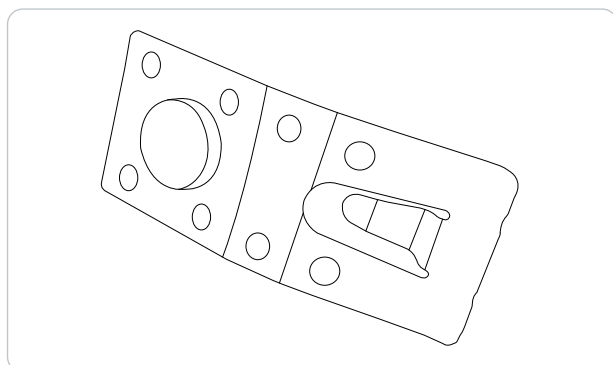
**F** Beam



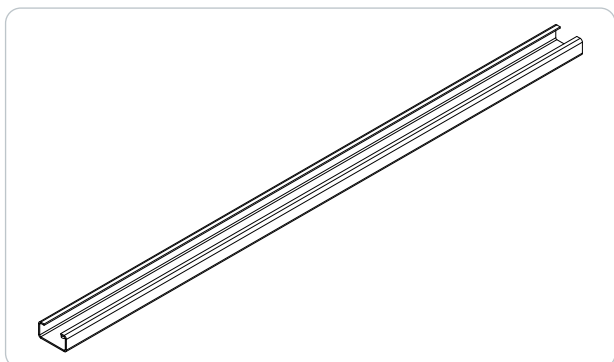
**C** Cross strut



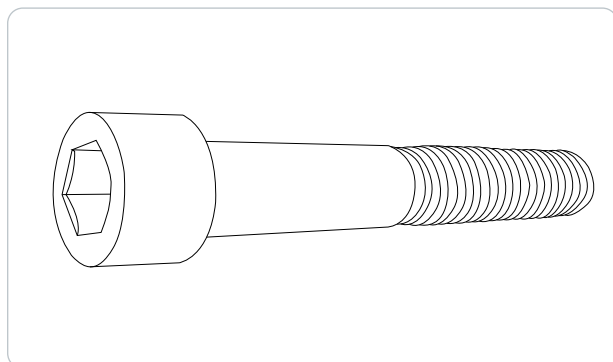
**G** Safety clamp

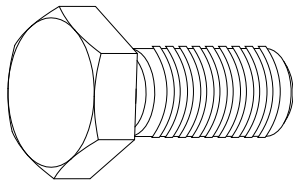
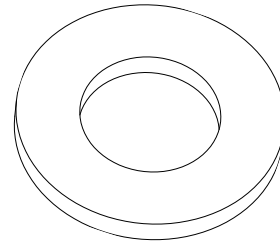
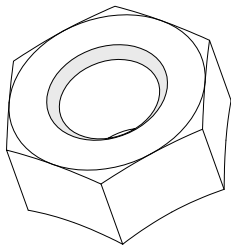
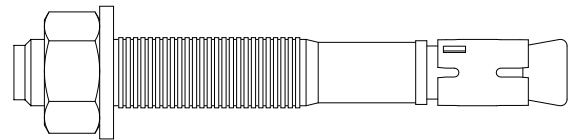
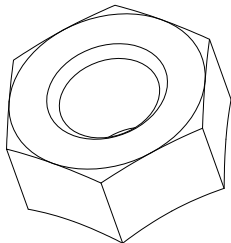
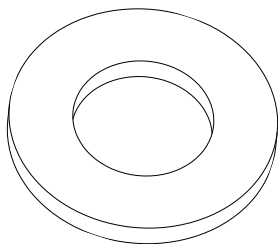


**D** Diagonal strut



**H** M10 x 65 hexagon screw



**I** M10 x 25 mm hexagon screw**M** M10 washer**J** M10 nut**N** M12 x 100 mm bolt anchor**K** M10 self-locking nut**L** M10 washer

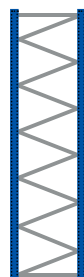
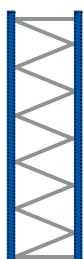
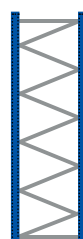
## OVERVIEW RACK UPRIGHTS



Height (incl. foot plates)	200 cm	250 cm	300 cm	350 cm
Depth	80 cm / 110 cm	80 cm / 110 cm	80 cm / 110 cm	80 cm / 110 cm
Unit load	15000 kg	15000 kg	15000 kg	15000 kg
Upright	anchored to the floor using 4 bolt anchors	anchored to the floor using 4 bolt anchors	anchored to the floor using 4 bolt anchors	anchored to the floor using 4 bolt anchors
No. cross struts	3	3	2	2
No. diagonal struts	2	3	4	5
Colour	RAL 5005	RAL 5005	RAL 5005	RAL 5005

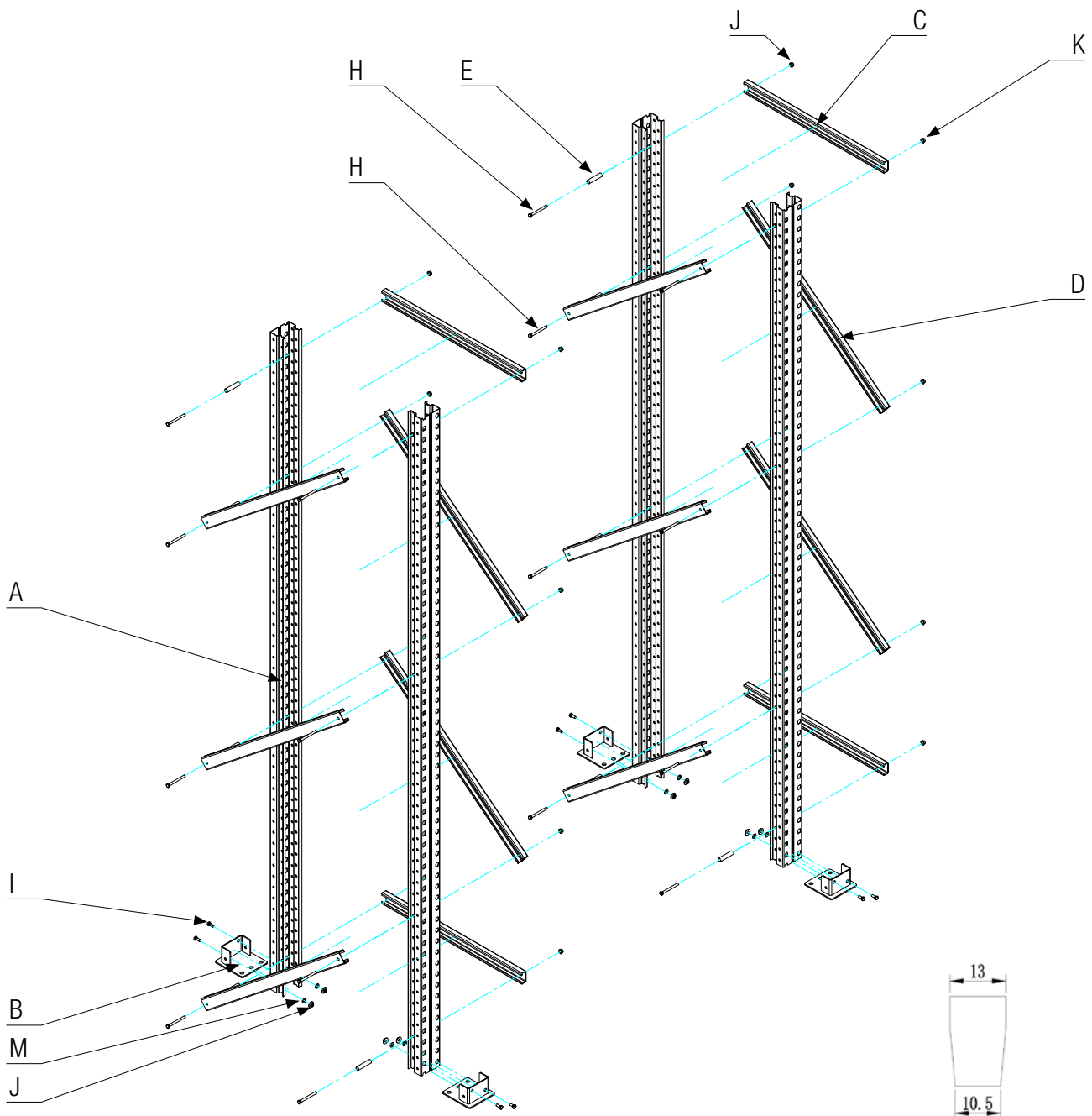


Height (incl. foot plates)	400 cm	450 cm	500 cm	550 cm
Depth	80 cm / 110 cm	80 cm / 110 cm	80 cm / 110 cm	80 cm / 110 cm
Unit load	15000 kg	15000 kg	15000 kg	15000 kg
Upright	anchored to the floor using 4 bolt anchors	anchored to the floor using 4 bolt anchors	anchored to the floor using 4 bolt anchors	anchored to the floor using 4 bolt anchors
No. cross struts	2	2	3	3
No. diagonal struts	6	7	7	8
Colour	RAL 5005	RAL 5005	RAL 5005	RAL 5005



Height (incl. foot plates)	600 cm	650 cm	700 cm	750 cm
Depth	80 cm / 110 cm	80 cm / 110 cm	80 cm / 110 cm	80 cm / 110 cm
Unit load	15000 kg	15000 kg	15000 kg	15000 kg
Upright	anchored to the floor using 4 bolt anchors	anchored to the floor using 4 bolt anchors	anchored to the floor using 4 bolt anchors	anchored to the floor using 4 bolt anchors
No. cross struts	2	2	2	2
No. diagonal struts	9	10	11	12
Colour	RAL 5005	RAL 5005	RAL 5005	RAL 5005

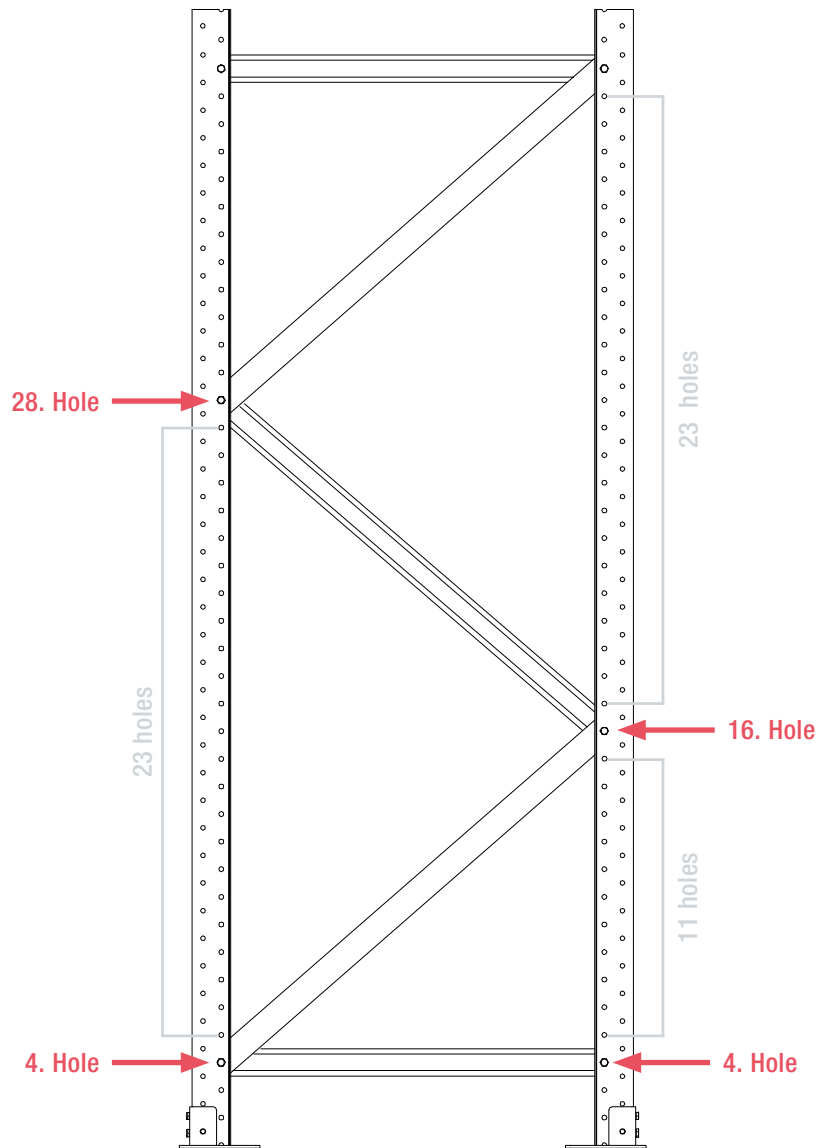
## UPRIGHT ASSEMBLY



Make sure that you mount the profiles the right way round. The holes must taper downwards (see fig. above).

1. Assemble upright profile **A** and foot part **B** and fasten with hexagon head screws **I**, nuts **J** and screw on washers **M**.
2. Cross struts **C** and diagonal struts **D** as shown in the picture with the distance sleeve **E**, the hexagon head screws **H** and fasten the self-locking nuts **K** to the stand.





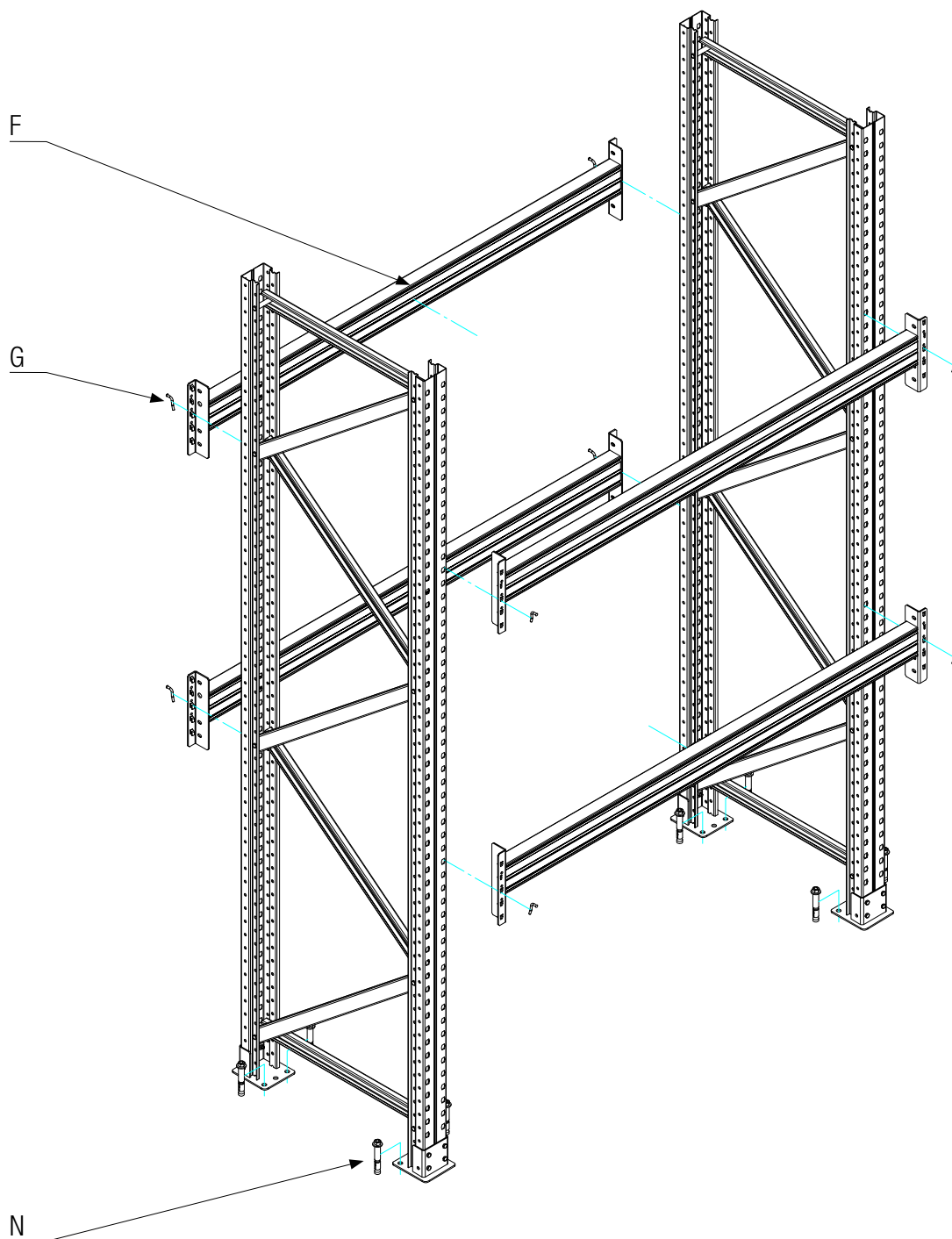
### Bracing



The 1st cross strut is to be mounted in the 4th hole. Between cross brace and the following diagonal brace there are 11 holes free – i.e. the screw of the next strut goes into the 16th hole.

Between further diagonal braces there are always 23 holes free for the next diagonal brace. For stud heights with 3 cross braces, the top cross brace would be placed in the 3rd hole from the top.

## BEAMS



1. Hook crossbar **F** in the desired position and secure with safety clamp **G**.
2. Drill holes and use bolt anchor **N** for ground anchoring.

## MOUNTING TRUSSES



Set up the pre-assembled stands and insert the Hook the crossbars into the upright profile at the desired height. Insert safety clamp into the hole provided in the crossbar. The trusses are hooked in a 50 mm grid.

**Please note:** Mount the last truss at least 50 cm before the end of the stand! A lateral fall protection of at least 50 cm, measured from the upper edge of the last level, is legally required on the outer upright frames!

## SHELF ASSEMBLY



**Wooden floor:** Place four Z-sheets on the crossbars and lay the floor on the Z-sheets.

Max. load 1500 kg

**Grating:** Place on crossbars - fixes itself.

Max. load 800 kg

**Steel floor:** Place on crossbars - fixes itself.

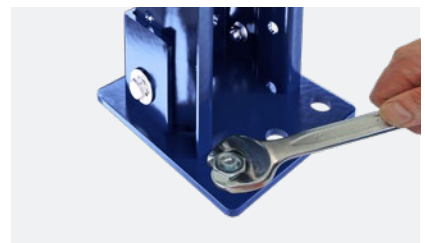
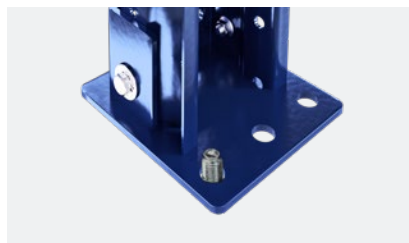
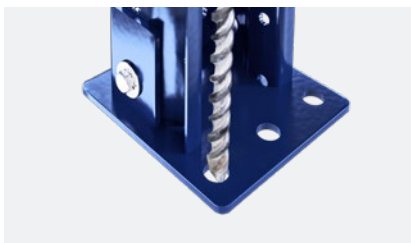
Max. load 1000 kg

**Wire mesh:** Place on crossbars - fixes itself.

Max. load 1500 kg

## FLOOR ANCHORING BASE PLATE

- Drill holes in the bottom: 12 mm Ø, 120 mm deep
- Blow out holes cleanly
- Drive in bolt anchor - the nut should be flush with the thread
- Tighten anchor with max. 46 Nm
- After tightening, the marking in the thread must not be visible!



### Fixing the foot plate

It is sufficient to fit one bolt anchor per foot plate to prevent the shelves from moving. However, we recommend at least two bolt anchors per foot plate to ensure better stability and prevent hazards. The third hole serves as an alternative to provide additional stability in case of obstacles such as pipes, steel reinforcements, etc. when drilling a hole.

## RACK INSPECTION

The European guideline DIN EN 15635 refers to the responsibility of the operator to keep the racks in proper condition. For this purpose, visual inspections as well as expert inspections must be carried out on the racks at regular intervals to ensure safety. Among other things, the following aspects must be checked:

- Are the shelf supports vertical?
- Are there cracks in the welding seams or in the base material?
- What is the condition and effectiveness of the safety devices?
- What is the condition of the building floor?
- What is the position of the loading unit on the shelf?
- Are loading and information notes available and up-to-date?
- Is the stability of the loading units given?

The performed tests, defects and their elimination must be documented in writing. This documentation must be kept at least until the next regular inspection. However, it is recommended to keep the documentation for the whole life of the rack. (see BGI/GUV-I 5166)

## PERSONS QUALIFIED FOR INSPECTION

A person is qualified if he/she can demonstrate specialist knowledge from his/her professional activities in the environment of the test object and appropriate further training. These are e.g. fitters of the manufacturer or appropriately qualified personnel of the operator.

## VISUAL INSPECTION

- Visual inspections must be carried out weekly.
- Visual inspections can be carried out by an internal, competent person.
- The scope of inspection can be reduced to those parts of the rack where defects have been present since of the last test are to be expected.

## EXPERT INSPECTION

- Expert inspections must be carried out at least every 12 months.
- The comprehensive expert inspection should be carried out by a competent, usually external person and a comprehensive test protocol is created.



You have questions about shelf testing or would like our certified shelf testers to do the inspection for you?

**Talk to us about it! Phone 01495 707222**

## L / U-PROFILE COLLISION PROTECTION

ARTICLE NO. L-SHAPE = 4749, 9870

U-SHAPE = 4748, 9668

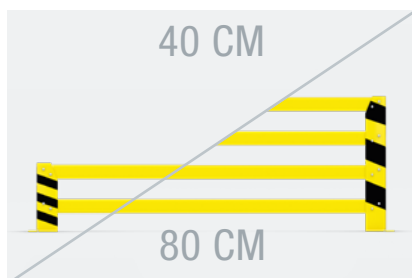


- Heights: 40 cm / 80 cm incl. 4 bolt anchors
- Painted in yellow with black signal stripes
- Corner rack protection to protect the outer uprights from accidental impact by lifting equipment such as forklift trucks, ants, etc
- According to German DGUV 108-007

## CRASH PROTECTION RAIL

ARTICLE NO. 40 cm = 11757, 11758, 11759, 5434, 11760

80 cm = 11761, 11762, 11763, 11764, 11765



- Material thickness: 4 mm
- Height: 40 cm / 80 cm
- Lengths: 93 cm / 123 cm / 193 cm / 253 cm / 360 cm
- Painted in yellow with black signal stripes
- Protection against accidental collision, e.g. with industrial trucks
- According to German DGUV 108-007

## SUPPORT BAR

ARTICLE NO. 1223



- Support bar / depth support for pallet racks with 80 cm or 110 cm depth
- Load capacity: 600 kg
- Colour: TOPREGAL orange (corresponds roughly to RAL 2004)
- Support bars are used, for example, to increase the load-bearing capacity of the shelves
- According to German DGUV 108-007

## DRUM SHELF

ARTICLE NO. 20808



- Depth: 111.5 cm (for 110 cm deep pallet racks)
- Material: steel, powder-coated
- Colour TOPREGAL orange (corresponds approximately to RAL 2004)
- Is placed between the beams without additional fastening
- Welded push-through protection prevents the drums from slipping through
- Max. load per level: 1000 kg
- Suitable for drums up to a filling quantity of 200 L

## SHELVES



- **Wire mesh:** Material thickness: 5 mm / mesh size: 50 x 100 mm / self-fixing due to welded-on depth bars / max. load: 1500 kg
- **Galvanised mesh shelf:** Material thickness: 1.5 mm / galvanised / mesh size: 99.9 x 99.9 mm / self-fixing due to welded angles / max. load: 800 kg
- **Wooden shelf:** Material thickness: 38 mm / P2 chipboard / assembly using galvanised Z-plates / max. load: 1500 kg
- **Steel shelf:** Material thickness: 1.5 mm / height of the steel shelf: 40 mm / Colour: similar to RAL2004 pure orange / Self-fixing due to welded angles max. load: 1000 kg



## SPACER

ARTICLE NO. 87772



- Spacer for parallel positioning of rows of pallet racks
- Can also be used to fix the rack to the wall
- Length: 20 cm
- Colour: TOPREGAL blue (corresponds roughly to RAL 5003)
- For upright height < 3 m we recommend 2 spacers per upright
- For upright height > 3 m we recommend 3 spacers per upright

## PUSH-THROUGH PROTECTION

ARTICLE NO. 1333, 1334, 1335



- Width: 180 cm, 270 cm and 360 cm
- Push-through protection prevents unintentional movement of the pallets to the rear
- Colour: TOPREGAL orange (corresponds roughly to RAL 2004)
- According to German DGUV 108-007

## MESH BACK PANEL

ARTICLE NO. 7100, 7101



- Available at a length of 180 cm and 270 cm
- Height: 100 cm
- Colour: TOPREGAL orange (corresponds roughly to RAL 2004)
- The sides of pallet racks not intended for loading and unloading (individual rows of racks!) must be secured against any falling of loading units and pallets

## LOAD DISTRIBUTOR

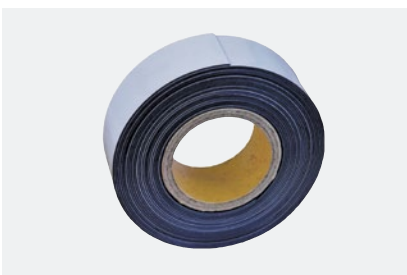
ARTICLE NO. 87441



- Load distributor for upright with 110 cm depth
- Length: 120 cm
- Protects the floor and reduces the point load

## MAGNETIC TAPE

ARTICLE NO. 9590, 9591



- Magnetic tape for labelling racks or e.g. on car bodies, machines, beams, metal cabinets, etc.
- Dimensions: L 10 m / B 5 cm or 10 cm / T 0.15 cm
- Reusable
- Easy cutting to size with standard scissors

# TOPREGAL

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