

Pallet rack



DENIOS.

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1. General Instructions

1.1. Key and explanation of symbols

The following safety symbols are used in this user manual. These symbols warn the reader to take note of the associated safety advice.



This symbol indicates that there is a danger to health and risk of death.



This symbol indicates that there is a risk of damage to machinery, equipment or the environment.



This symbol identifies information which is useful for gaining a better understanding of the product and how to use it properly.



This symbol warns of dangerous electrical voltages in the working area.(eg electrical switchgear, terminal boxes etc.)



This symbol warns of the risks caused by explosive atmospheres.



This symbol warns of suspended loads and their associated dangers.



This symbol warns of a risk of possible crushing.



This symbol warns of a risk that body parts may be crushed (especially hands) by moving or closing parts of machinery.



**SEPARATE
GUIDE**

This symbol indicates that an additional user guide or guidelines for use or maintenance of accessories must be read and carefully followed. (Guide supplied with the equipment or delivered separately). (Any related safety instructions must be followed.)

2. Basic Safety Instructions

Keep this user manual in a safe place. It is intended to be used in a practical way and should be available to the user in the place where the equipment is used.

This user manual applies to pallet racks. It contains all the information needed regarding correct set-up, trouble-free operation, maintenance, removal from service and disposal. The instructions in this user manual must be carefully followed and adhered to.

All those involved in the installation, operation, maintenance and repair of the product must have read and understood this user manual and have been trained and instructed in its use.

These instructions for use do not absolve the operator from the duty to carry out special operational training in accordance with GefStoffV and BetrSichV. Operational training must be based on the safety datasheets for the substances to be stored and the risk assessment which must be carried out.

The following information should also be considered in the operational training:

- Type of storage (active/passive)
- Load capacity of storage system
- Guidelines for loading/unloading
- Stored materials
- Material properties
- Combined storage prohibition

Combined storage prohibition for certain substances must be observed.

No changes, extensions or modifications may be made to the product without the manufacturer's written authorisation.

National directives and safety regulations must be complied with.

3. Safety regulations

The following safety regulations are in part extracts from the BG regulations for storage equipment and equipment in BG 234 (previously ZH 1/428) from the professional association.

1. When planning a racking system the "Guidelines for storage systems and equipment BGR 234" from the German Federation of Institutions for Statutory Accident Insurance and Prevention (Hauptverband der gewerblichen Berufsgenossenschaften), as well as the relevant workshop regulations and the general accident prevention guidelines must be observed.
2. Racking must be installed vertically. Shelf deviation from the vertical in the longitudinal direction must not exceed 1/500 of the rack height and in the depth direction it must not exceed 1/400 of the rack height. Deviation from horizontal must not exceed 1/350 of the bay width.
3. Any unevenness in the floor must be compensated for with levelling plates.
4. For corrosively active industrial flooring (eg magnesite flooring) the support feet of the rack must be insulated. The instructions for use from the flooring manufacturer must be observed.
5. Roadways within racking areas must be laid out so they are a minimum of 1.25m wide and side routes must be at least 0.75 m wide. The safety distance to transport vehicles must be a minimum of 0.50 m on each side.
6. Racking may only be loaded in accordance with its basic dimensional limitations. Loading of shelves must be carried out evenly, as the static design requires an evenly distributed load. Pointed impact loads and sliding loads must therefore be avoided.
7. Shelving with a shelf load of over 200 kg or a bay load of over 1000 kg must be identified with an identification plate. Identification plate details: Manufacturer, year of manufacture or order number, permitted shelf and bay loads. The identification plate supplied must be placed in a clearly visible location.
8. The given maximum load capacity of shelves and bays must not be exceeded.
9. The maximum support loadings and bearing pressures on the floor are set by DENIOS AG. As the user, you must therefore ensure that this floor loading can be safely borne by the location where the racking is installed. If this information is not available, DENIOS AG may assume a permitted bearing pressure of 50 kg/cm² minimum.
10. The storage rack may only be set up or moved when it is unloaded.
11. Do not allow people to stand on racking framework or bays, especially shelving components.
12. Damaged or bent load-bearing components of a storage system must be immediately replaced, as DENIOS AG only guarantees the system's load capacity when in perfect condition.
13. In accordance with section 10 Testing of work equipment, the racking system must be inspected in accordance with equipment and product safety legislation.

4. Intended use of the equipment

The pallet rack is suitable for the safe storage of drums up to 205 litres on Euro or chemical pallets or directly on the grids (for version with spill pallet).



Only store substances to which the material of the spill pallet is resistant.
See General User Manual



The permitted total volume of the storage system must not be exceeded.



The load capacity for the storage system stated on the datasheet / identification plate must be observed.



Ensure that stored substances are only stored on the grids.



The permitted total storage volume and the maximum permitted storage volume of the largest stored container must be observed in relation to the useful volume of the spill pallet.



Drums must be loaded onto the storage system or removed or brought down from it with suitable equipment (eg drum grippers).



Separated storage of substances is required. Store materials so that all containers and the spill pallet are visible.



Substances may only be stored together when a risk assessment has shown that there is no risk of possible reactions or physical interference.



Packaging and containers must meet the transport regulations.

Note: When using the storage system in Ex zones, ensure the components are sufficiently earthed and check the conductivity of the components.

5. Product description

5.1 Design

- Stable shelving system available in 3 bay widths.
- Racking frame galvanized, rails powder coated, red-orange (RAL 2001)
- Rack rails can be height adjusted at 50 mm intervals to suit various sizes of pallet and container.
- Base plates for ground anchoring
- All racking components are tested to BGR 234, RAL-RG 614 and DIN 18800.
- Delivered flat-pack for self-assembly

5.2 Construction

The Pallet Rack is constructed as follows, depending on type:

Type PO

- Galvanized frame.
- Hook-in, powder coated rails, height adjustable in steps of 50 mm.
- Shelf guard on every storage level (optional).

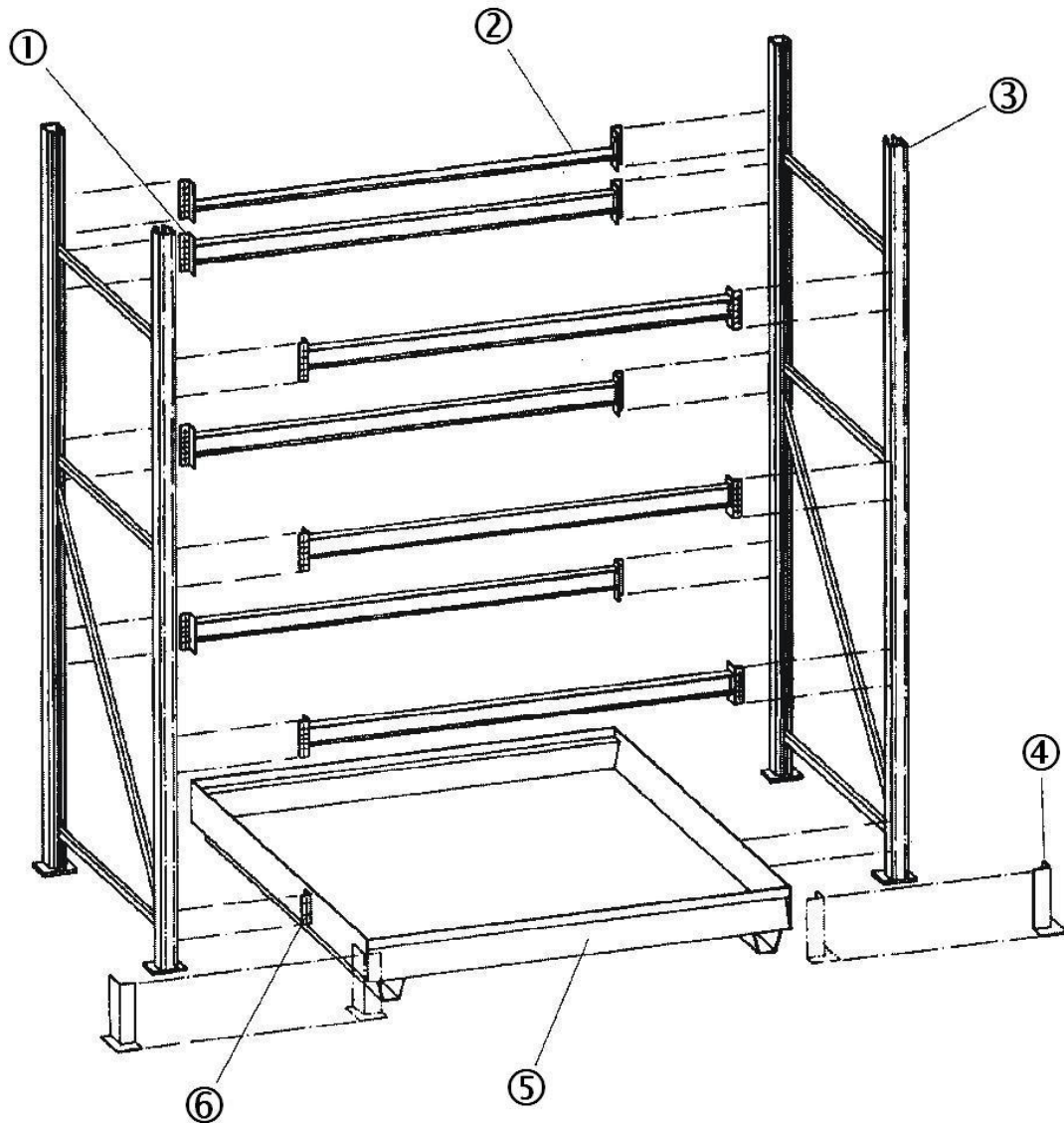
Type PR

- Galvanized frame.
- Hook-in, powder coated rails, height adjustable in steps of 50 mm.
- Shelf guard on every storage level.
- Special galvanised spill pallet.
- Optional spill pallet inlay in plastic (PE HD), not electrically conductive

Type PRP

- Galvanized frame.
- Hook-in, powder coated rails, height adjustable in steps of 50 mm.
- Shelf guard on every storage level
- Plastic spill pallet, not electrically conductive.

5.3 Component overview



Item	Designation
1	Rail
2	Safety bar
3	Side frames
4	Impact protection corner (optional)
5	Spill pallet
6	Impact protection corner

5.4. Technical Data

Model	External dimensions	Capacity (205 litre drums)	Sump capacity	Load (kg per shelf)	Bay load (kg)	Bay height (mm)
	W x D x H (mm)					
PO 18.25	1970 x 1100 x 2700	-	-	2145	5496	1300
PO 18.37	1970 x 1100 x 3800	-	-	2145	5496	1200
PO 27.25	2870 x 1100 x 2700	-	-	3255	8377	1300
PO 27.37	2870 x 1100 x 3800	-	-	3255	8377	1200
PO 33.25	3470 x 1100 x 2700	-	-	3780	9435	1300
PO 33.37	3470 x 1100 x 3800	-	-	3780	9435	1300
PR 18.25	1970 x 1100 x 2700	8	430	2145	5496	1300
PR 18.37	1970 x 1100 x 3800	12	430	2145	8350	1200
PR 27.25	2870 x 1100 x 2700	12	660	3255	8377	1300
PR 27.37	2870 x 1100 x 3800	18	660	3545	10656	1200
PR 33.25	3470 x 1100 x 2700	16	1000	3780	9435	1300
PR 33.37	3470 x 1100 x 3800	24	1000	3439	10318	1200
PRP 18.25	1970 x 1100 x 2700	8	400	2145	5496	1300
PRP 18.37	1970 x 1100 x 3800	12	400	2145	8350	1200
PRP 27.25	2870 x 1100 x 2700	12	600	3255	8377	1300
PRP 27.37	2870 x 1100 x 3800	18	600	3545	10656	1200
PRP 27.27	2870 x 1100 x 2700	12	1100	3255	8377	1300
PRP 27.44	2870 x 1100 x 4400	18	1100	3000	9000	1300

6. Set-up / Commissioning

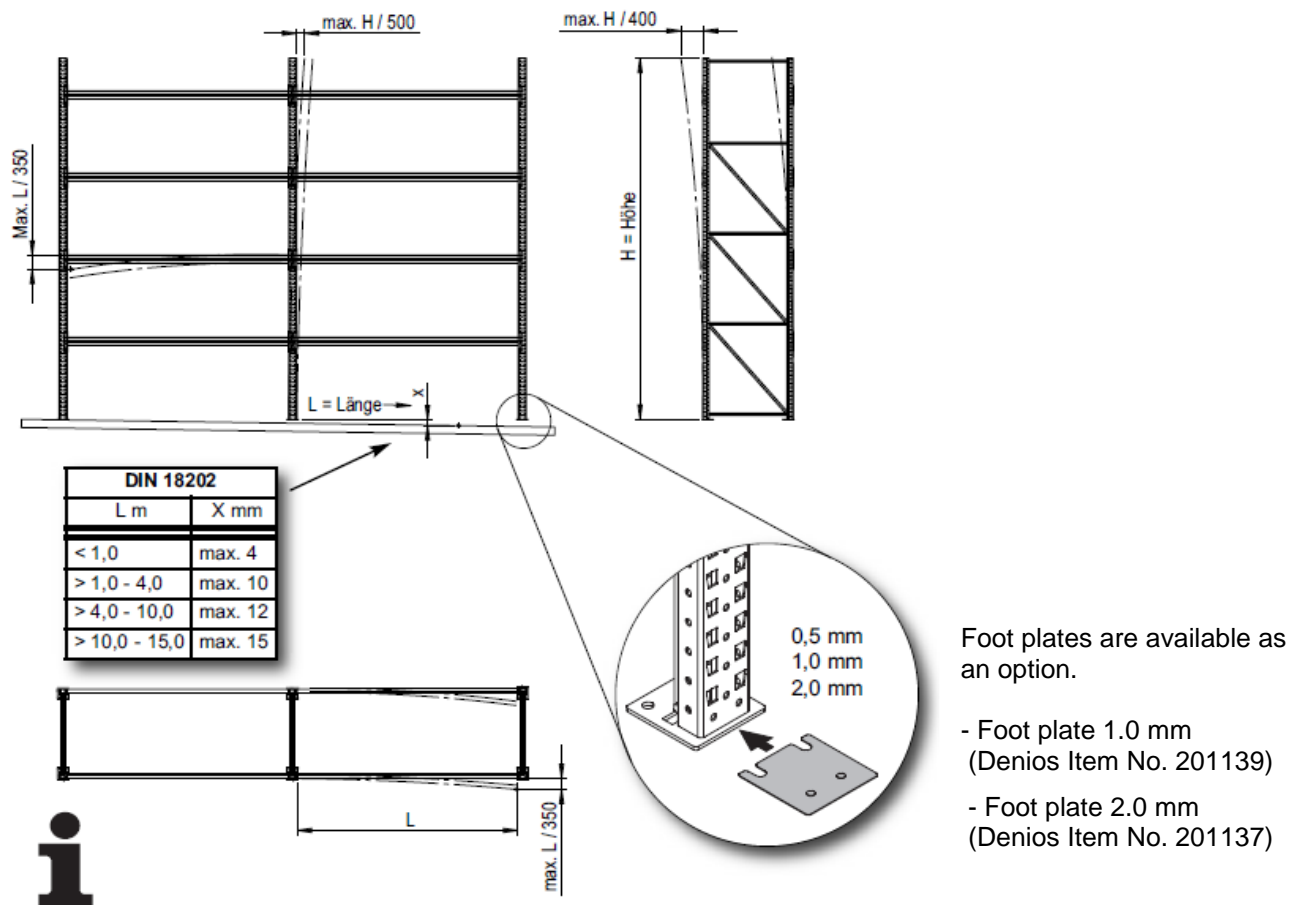
6.1 Conditions for placement

- Pallet Racks must only be assembled on even, firm surfaces.



All racking must be anchored to the ground.

Requirements for location / floor tolerances as per DIN 18202 Table 3: as per DIN EN 15620.



- The evenness of the hall floor must meet the tolerance limits of DIN 18202, Section 5 Line 3 or DIN EN 15620 Point 5.1.2 Table 1.
- Minimum concrete quality must be B25 (as per DIN 1045).
- The hall floor must be a minimum of 200 mm thick.
- The hall floor must not be made from a material (eg containing magnesite), which would cause chemical reactions with the racking (especially of the ground anchors and foot plates).
- The shelving operator must ensure that the flooring is able to withstand the loads on the racking pillars.
- The permitted bearing pressure for the flooring must not be less than the value given for the shelving unit.
- The construction of the flooring must be able to withstand tensile forces and shear forces to ensure correct anchoring of the racking.

Assembly for types PR and PO

- At least 2 people are needed to assemble the racking system. A waist high table or two free standing supports on which the components can be laid for pre-assembly would be of use.
 - When assembling the individual components, do not use brute force by striking with a metal hammer or using a levering rod. A rubber mallet or a soft wooden spacer should be used.
 - When assembling the frames take care not to overtighten the bolts. The bolts should be hand tightened first, then tightened using a spanner by 1 or 2 turns.
-
- Horizontal assembly of the side frames (see 6.3.1 / 6.3.2).
 - Set up two frames with a rail in between.
 - Slot in the lower pair of cross members at the required bay height and secure in place with the rubber mallet.
 - Fit two safety pins per rail (see 6.3.3).
 - The distance between the top storage level and the end of the side frame must be at least 500 mm.
 - Fit the shelf guards (see 6.3.4)
 - Side frame diagonal measurements must be the same.
 - If necessary, straighten and align side frames.
 - Secure the side frames (see 6.3.5).
 - Push the spill pallet (optional) in between the side frames until it stops then secure with bolts.
 - Apply the load sticker to the shelf.

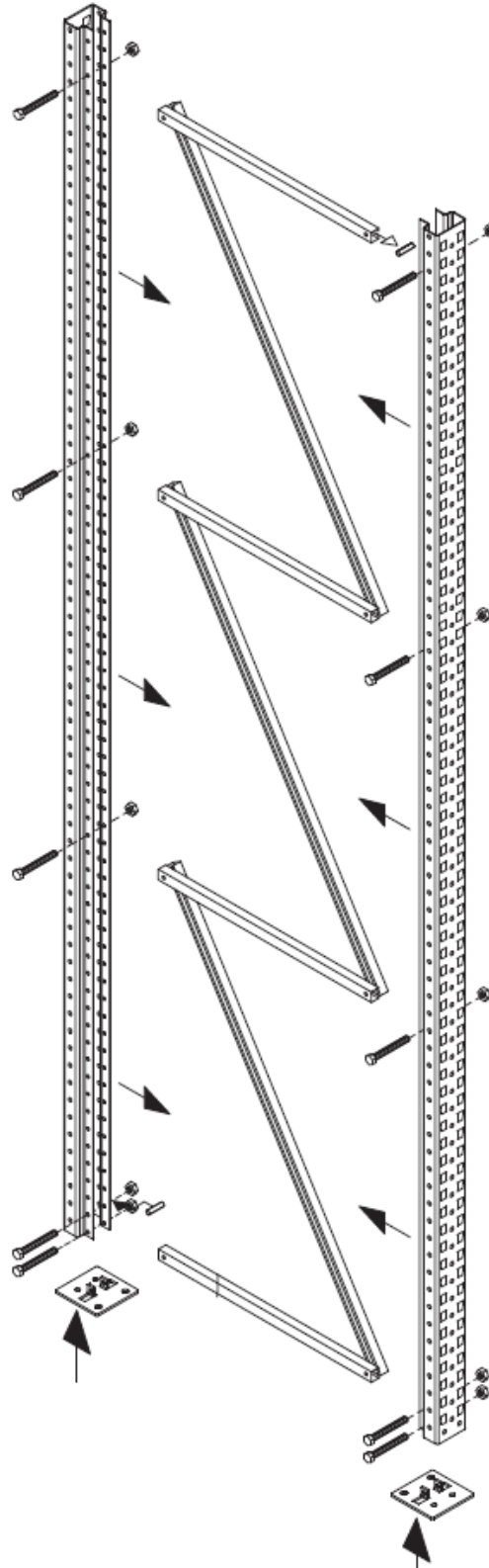
6.2 Tooling required



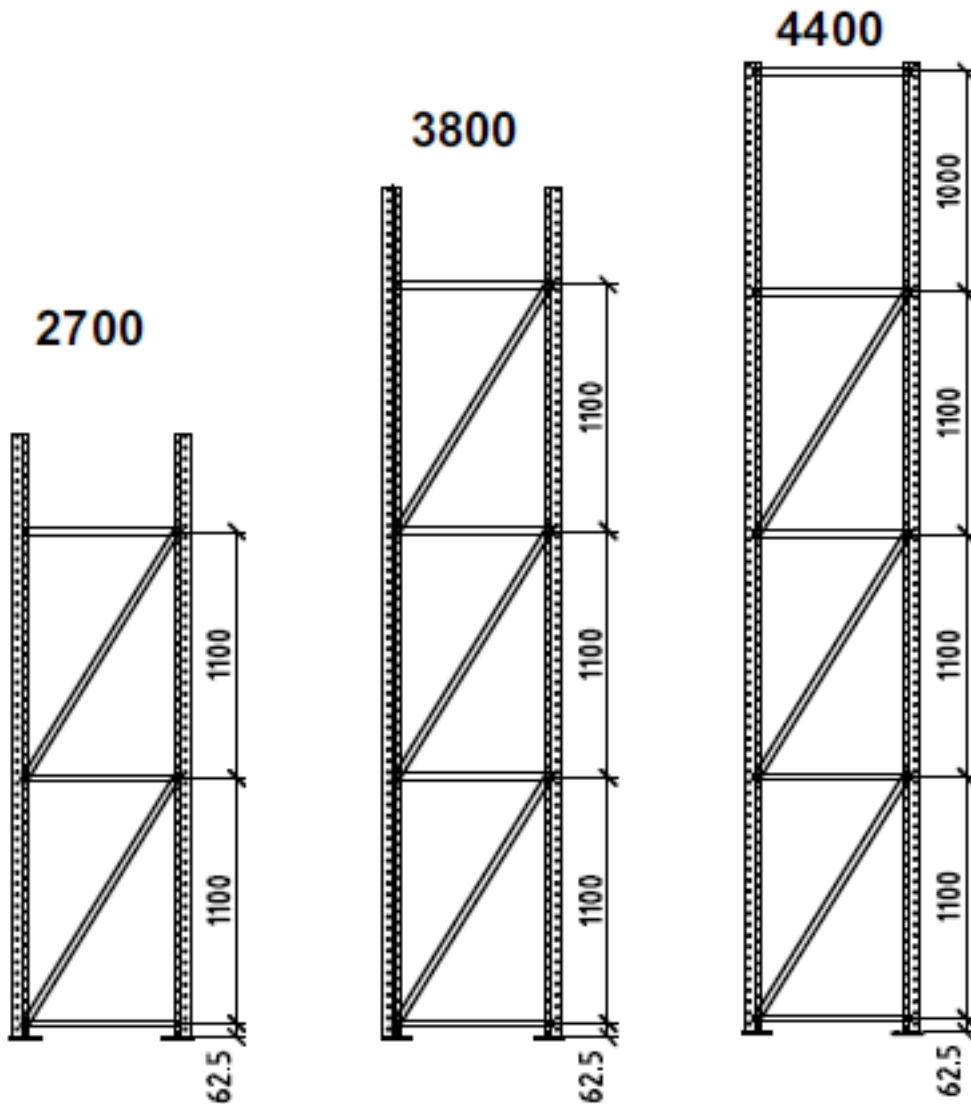
Measuring tape
String
Plumb line
Spirit level
Hammer drill
Percussion drill bit
Plastic or rubber mallet
Screwdriver
Combination wrench and socket wrench

6.3 Assembly

6.3.1 Screw assembly framework



Overview of the DENIOS rack design types



Rack height
H=2700 mm

Rack type:

PO 18.25
PO 27.25
PO 33.25
PR 18.25
PR 27.25
PR 33.25
PRP 18.25
PRP 27.25
PRP 27.27

Rack height
H=3800 mm

Rack type:

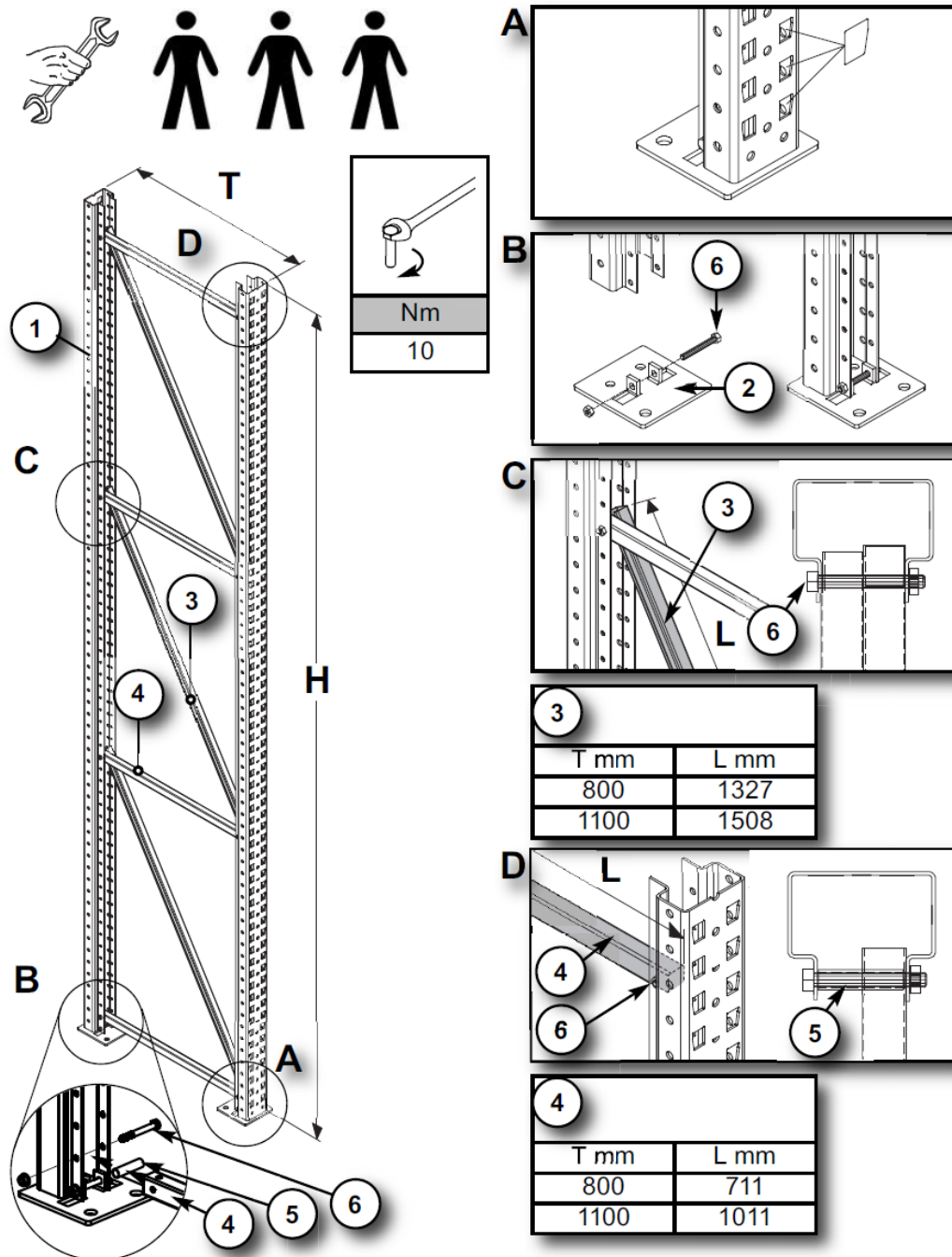
PO 18.37
PO 27.37
PO 33.37
PR 18.37
PR 27.37
PR 33.37
PRP 18.37
PRP 27.37

Rack height
H=4400 mm

Rack type:

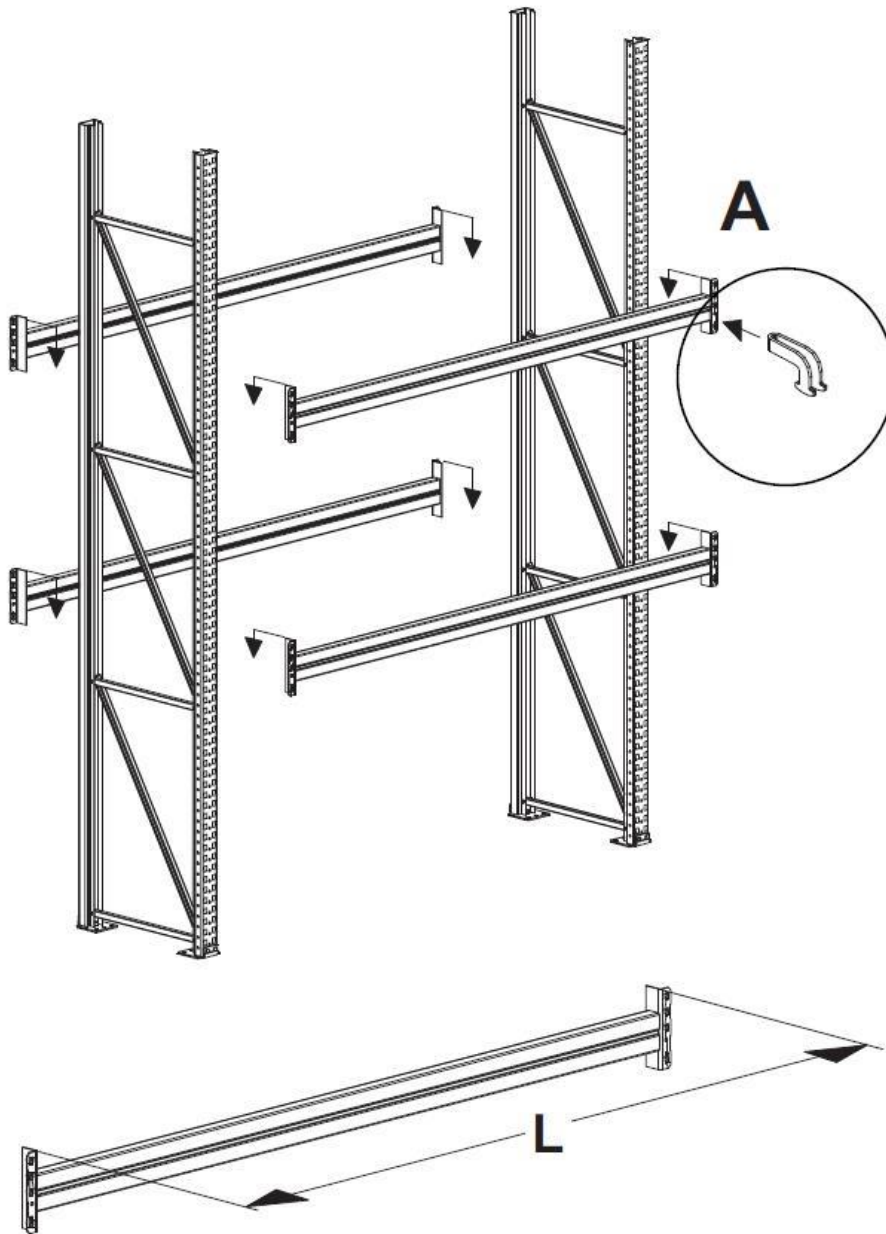
PRP 27.44

6.3.2 Rack construction

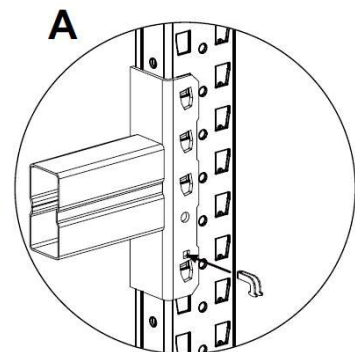


Uprights (1), bracers (3+4), and footplates (2) are bolted to a frame. The sturdy uprights have a stiffened C profile. By adding the bracers (horizontal (4) and diagonal (3)) at regular intervals (1100 mm) along with the stiffening lip of the upright (1) a solid and sturdy rack framework is created. Stable footplates channel the supporting forces into the ground. Hexagonal bolts M8 x 65 and M8 locking nuts are used when bolting the bracers to the uprights. The footplates are bolted to the uprights using one M8 x 65 hexagonal bolt and one M8 safety lock nut (bolts included in parts kit supplied).

6.3.3 Inserting the rails

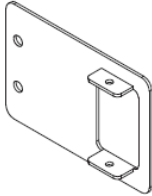


Sicherungsstift
Safty pin
Goupilles de sécurité



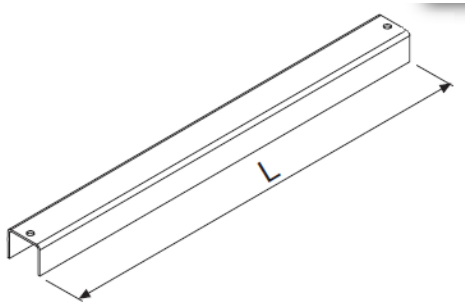
6.3.4 Fitting the shelf guards (Type PR)

Shelf guard retainer

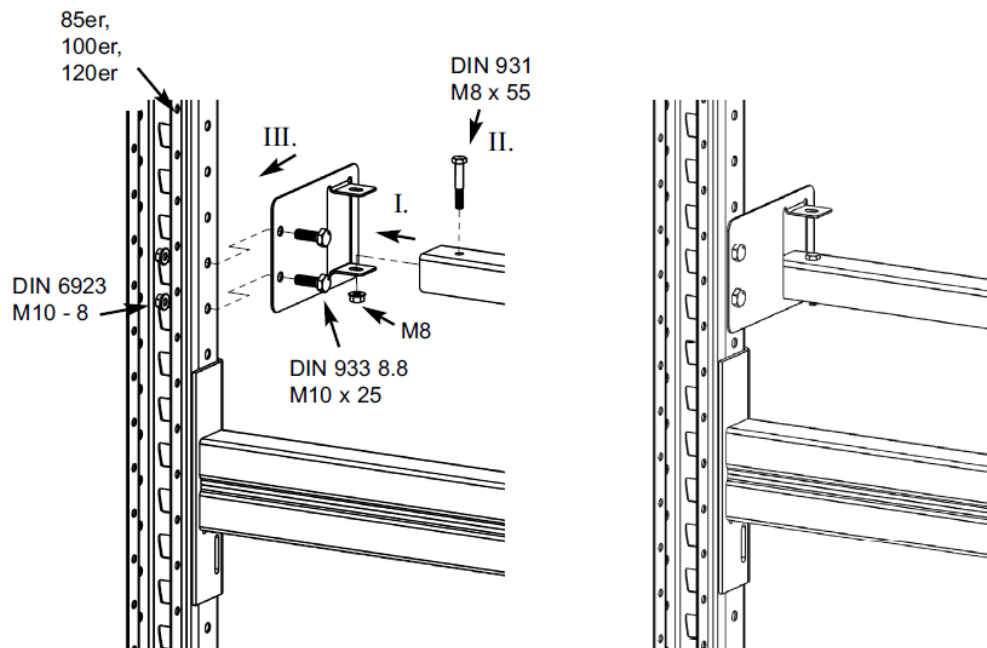
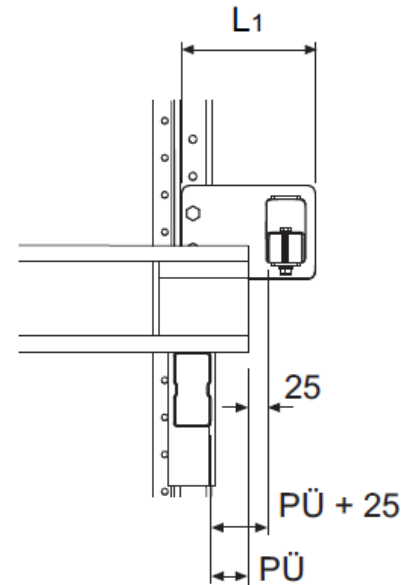


PÜ	L1
PÜ 25	155
PÜ 50	180

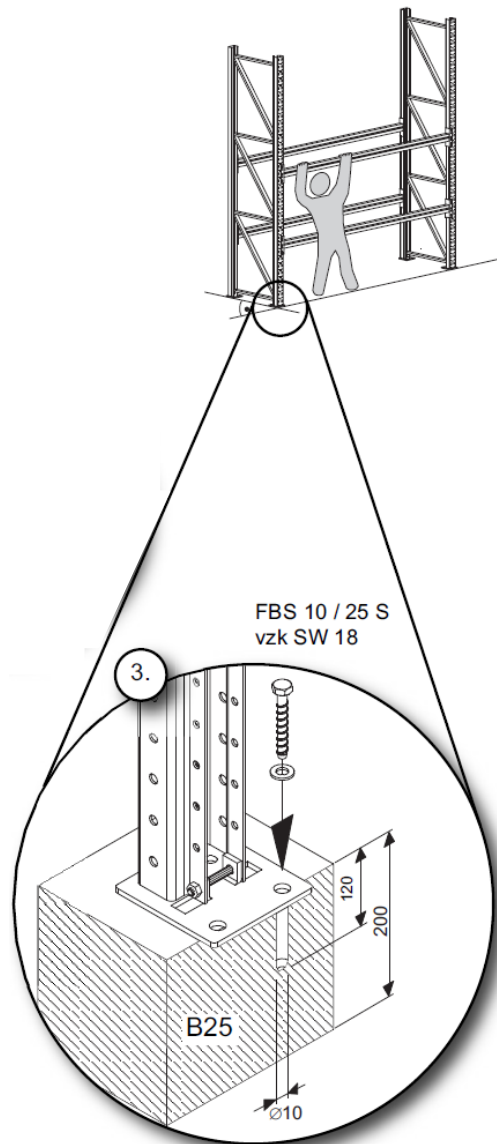
Shelf guard / simple design



L mm
1800
2700
3300



6.3.5 Ground anchoring



The bolted anchor for ground anchoring is supplied as standard.

6.4 Parts list

Model	Uprights Height: 2700 mm	Uprights Height: 3800 mm	Cross member L= 1800 mm	Cross member L= 2700 mm	Cross member L= 3300 mm	Containment racking PRW 43	Containment racking PRW 65	TC Pallet Type TC-3F	PE rack floor spill pallet	Safety bar. L= 1800	Safety bar. L= 2700 mm	Safety bar. L= 3300 mm	Safety pin
PO 18.25 Basic shelf	2x		4x										8x
PO 18.25 Extension shelf	1x		4x										8x
PO 18.37 Basic shelf		2x	4x										8x
PO 18.37 Extension shelf		1x	4x										8x
PO 27.25 Basic shelf	2x			4x									8x
PO 27.25 Extension shelf	1x			4x									8x
PO 27.37 Basic shelf		2x		4x									8x
PO 27.37 Extension shelf		1x		4x									8x
PO 33.25 Basic shelf	2x				4x								8x
PO 33.25 Extension shelf	1x				4x								8x
PO 33.37 Basic shelf		2x			4x								8x
PO 33.37 Extension shelf		1x			4x								8x
PR 18.25 Basic shelf	2x		4x			1x				2x			8x
PR 18.25 Extension shelf	1x		4x			1x				2x			8x
PR 18.37 Basic shelf		2x	6x			1x				3x			12x
PR 18.37 Extension shelf		1x	6x			1x				3x			12x
PR 27.25 Basic shelf	2x			4x			1x				2x		8x
PR 27.25 Extension shelf	1x			4x			1x				2x		8x
PR 27.37 Basic shelf		2x		6x			1x				3x		12x
PR 27.37 Extension shelf		1x		6x			1x				3x		12x
PR 33.25 Basic shelf	2x				4x			1x				2x	8x
PR 33.25 Extension shelf	1x				4x			1x				2x	8x
PR 33.37 Basic shelf		2x			6x			1x				3x	12x
PR 33.37 Extension shelf		1x			6x			1x				3x	12x
PRP 18.25 Basic shelf	2x		4x						1x	2x			8x
PRP 18.25 Extension shelf	1x		4x						1x	2x			8x

Model	Uprights Height: 2700 mm	Uprights Height: 3800 mm	Cross member L= 1800 mm	Cross member L= 2700 mm	Cross member L= 3300 mm	Containment racking PRW 43	Containment racking PRW 65	TC Pallet Type TC-3F	PE rack floor spill pallet	Safety bar. L= 1800	Safety bar. L= 2700 mm	Safety bar. L= 3300 mm	Safety pin
PRP 18.37 Basic shelf		2x	6x						1x	3x			12x
PRP 18.37 Extension shelf		1x	6x						1x	3x			12x
PRP 27.25 Basic shelf	2x			4x					1x		2x		8x
PRP 27.25 Extension shelf	1x			4x					1x		2x		8x
PRP 27.37 Basic shelf		2x		6x					1x		3x		12x
PRP 27.37 Extension shelf		1x		6x					1x		3x		12x
PRP 27.27 Basic shelf	2x			4x					1x		2x		8x
PRP 27.27 Extension shelf	1x			4x					1x		2x		8x
PRP 27.44 Basic shelf		2x		6x					1x		3x		12x
PRP 27.44 Extension shelf		1x		6x					1x		3x		12x

6.5 Earthing

Pallet Racks must be earthed if flammable substances are being stored.

7. Operation



Using a suitable lifting device (eg forklift with drum tongs) carefully place or remove the containers on the grids.



When storing metallic containers place these carefully on the grid (speed \leq 1m/s) to prevent any possible sparks.



Take note of the bay depth when loading or unloading containers.



No unauthorised access to the Pallet Rack is permitted.



Do not use without safety pins.



Containers must be stored so that the spill pallet remains visible from one position at all times.



Note safety regulations!

8. Maintenance and repair



When replacing parts use only original replacement parts from the manufacturer!



The following table contains information on maintenance.

Part	Action	inspection
Spill pallet	inspect for any leaked liquids	once per week
Spill pallet	check, record	every 2 years
Grid	check	once per year
Grid mounting	check	once per year
Shelving system	check, especially hooked connections, bolted connections and safety pins	once per year
Shelving system	refinish surface protection	once per year



Repair any faults immediately (screws, damage to paintwork, deformation and general damage)

9. Removal from service



In the case of damage, decommission the storage system and label accordingly.

10. Disposal

The Pallet Rack comprises different components and parts which must be disposed of or recycled according to local and legal regulations.



Clean the rack components thoroughly before disposal to remove any hazardous material residue.

Dismantle or disassemble the individual components of the rack and arrange the components into the following groups:

- Steel
- Light metals
- Non-ferrous metals
- Plastic

Process the separated components through approved disposal and recycling channels.