



CONNECT AND PROTECT

Loading and lifting capacity

Whitepaper


nvent

HOFFMAN



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General notes

This technical information and all technical descriptions regarding nVent HOFFMAN's enclosures do not represent warranted qualities and therefore nVent HOFFMAN is unable to accept liability with regards to deviations.

nVent HOFFMAN reserves the right to extend or modify this technical documentation at any time.

All the technical information contained within this technical information is applicable to nVent HOFFMAN's enclosures only.

For any questions or suggestions with regards to this technical information please do not hesitate to contact your local sales representative or partner.

1 Introduction

This technical information has been prepared and created by nVent HOFFMAN to support customers with information regarding the transport of enclosures and particular site installation operations, such as loads for the different parts of the enclosure. nVent HOFFMAN also wants to support customers in being able to make the best design based on their requirements.

nVent HOFFMAN's floor standing enclosures are ever changing, to meet demanding requirements customers and the engineering industry desire, which includes installation in a wide range of environments, accessory compatibility, ease of installation and damage limitations, where possible.

nVent HOFFMAN not only supplies high quality enclosures to meet stringent industrial requirements but also a wide range of supporting documentation, to provide the technical information needed for customers and to make their job as easy as possible.

nVent HOFFMAN ensures that its enclosures are tested to the strictest of standards, in DEKRA laboratories, following the standard EN 62208, the basic standard for empty enclosure manufactures, which governs enclosure requirements and the tests that should be carried out.

Certifications are published on nVent HOFFMAN's websites which provides necessary documentation to customers, when using enclosures, peripherals and accessories.

The internationally recognized IEC EN 62208 standard stipulates all the requirements that need to be met with regards to enclosures that are used in low-voltage switchgear and control gear assemblies. In compliance to the standard, nVent HOFFMAN has provided a series of white papers and technical documents to make all the necessary information easily available and interpretable by its direct and indirect customers.

Enclosure installations are deemed to be as difficult as the installation site permits. Due to the pressures of the industrial market, it is paramount that installations are carried out in an

efficient and effective way meaning the installation time is as low as possible while ensuring health and safety is always taken into consideration.

Measurements are displayed in millimeters (mm) and loads are given in Newton's (N) as a display of force. The formula to work out a force is shown below along with a conversion to the kilogram (Kg):

$$\text{Force (N)} = \text{mass (Kg)} \times \text{acceleration (m/s}^2\text{)}$$

Acceleration due to gravity is measured at 9.8m/s² and occurs when an object is falling to the earth.

1 N is a force of 1 with acceleration due to gravity with means from the above formula that the below applies when converting from Force (N) to mass (Kg):

$$1\text{N} = 1\text{Kg} \times 9.8(\text{m/s}^2) = 9.8\text{Kg}$$

Therefore, one newton equals 9.8 kilograms.

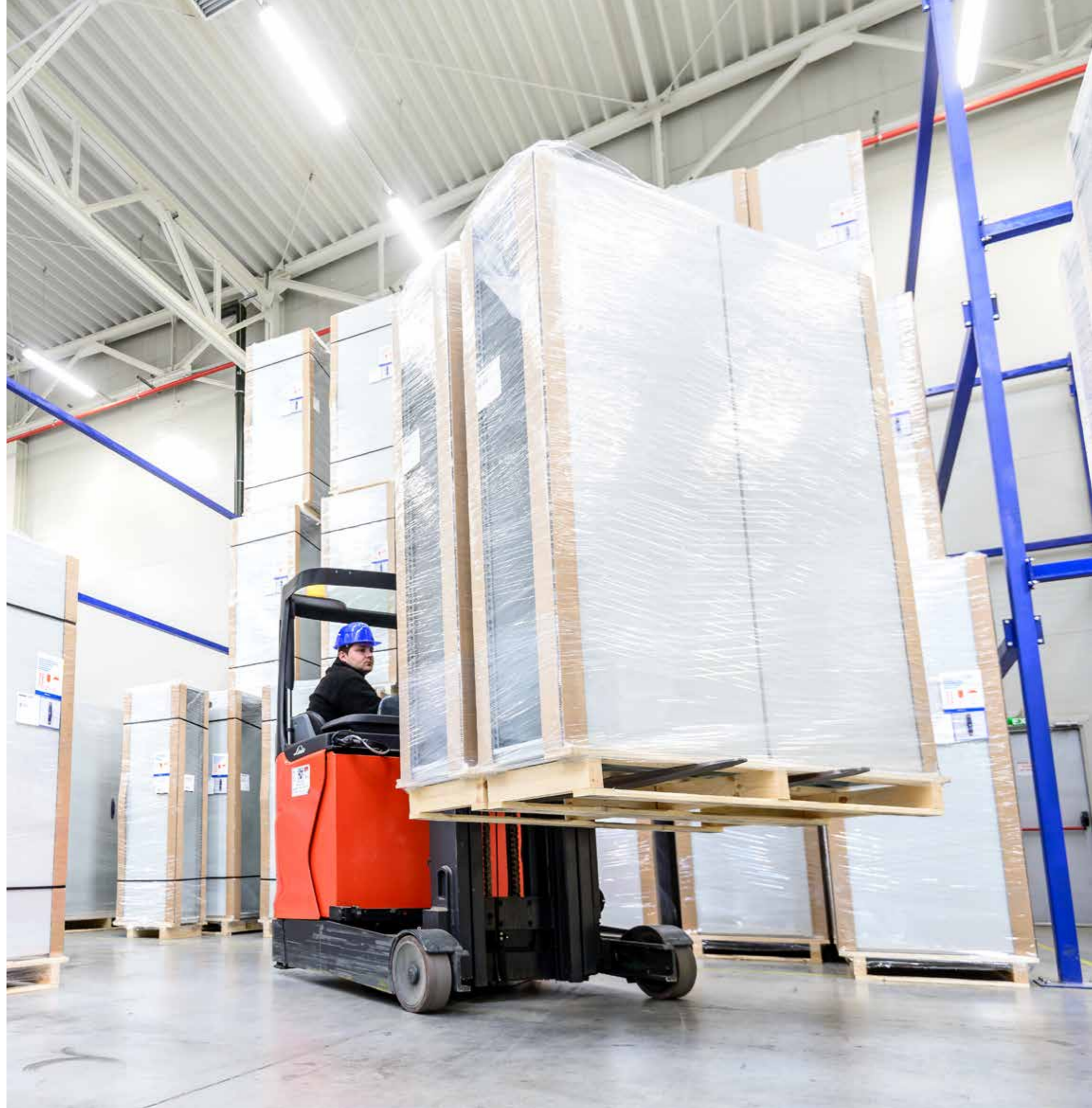
2 Enclosures transport

This section covers the various ways to transport an nVent HOFFMAN enclosure, which accessories should be used, the affects different enclosure configurations can have and the permissible loads allowed in nVent HOFFMAN's enclosures during these safety critical transport operations.

Following the standard IEC EN 62208, which states that "Where required, enclosures shall be provided with the appropriate lifting devices or transport means", nVent HOFFMAN offers different accessories to guarantee a safe transport.

The lifetime capacity of the enclosures with the available accessories has been tested according to the same standard, IEC EN 62208, which specifies clearly the test to be carried out in chapter 9.5. The tests have been carried out by DEKRA in the Netherlands.

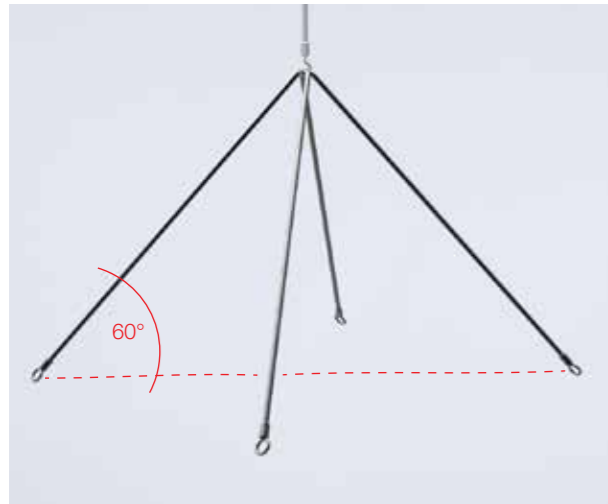
Ensuring the correct methods are followed when transporting enclosures is critical, to guarantee the enclosures integrity is maintained and that the components installed inside are safe, secure and protected from the installation environment.



2 Enclosures transport

2.1 Transport by crane

nVent HOFFMAN's floor standing enclosures are suitable to be transported using a crane if the correct accessories are installed and used appropriately. Enclosures can be craned either individually or as a bayed solution. Depending on the installation, the lifting angles can be different, therefore affecting the lifting capacity. nVent HOFFMAN offers standard accessories suitable for single and bayed enclosures.



Crane lifting angles

- 60° - A crane can lift floor standing enclosures by attaching to the lifting eye bolts, creating an angle of 60 degrees to the enclosures roof plate.
- 90° - A crane can lift floor standing enclosures by attaching to the lifting eye bolts, creating an angle of 90 degrees to the enclosures roof plate.
- Cable angles at 90 degrees to the enclosures roof plate will support the largest loads when lifted.

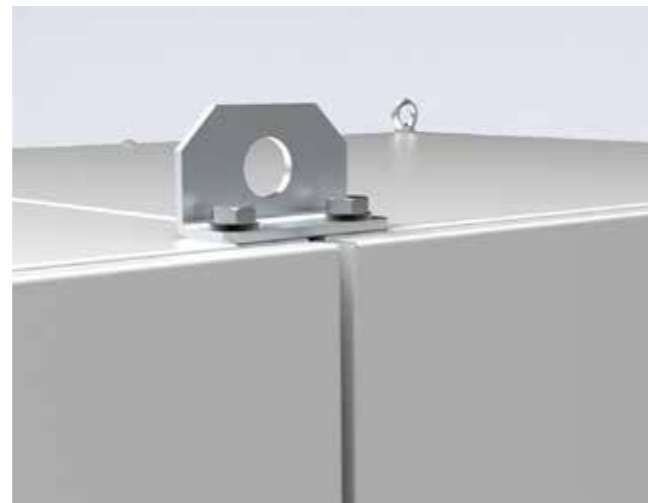
Lifting accessories



Lifting eye bolts

LE9304/LE9304SS

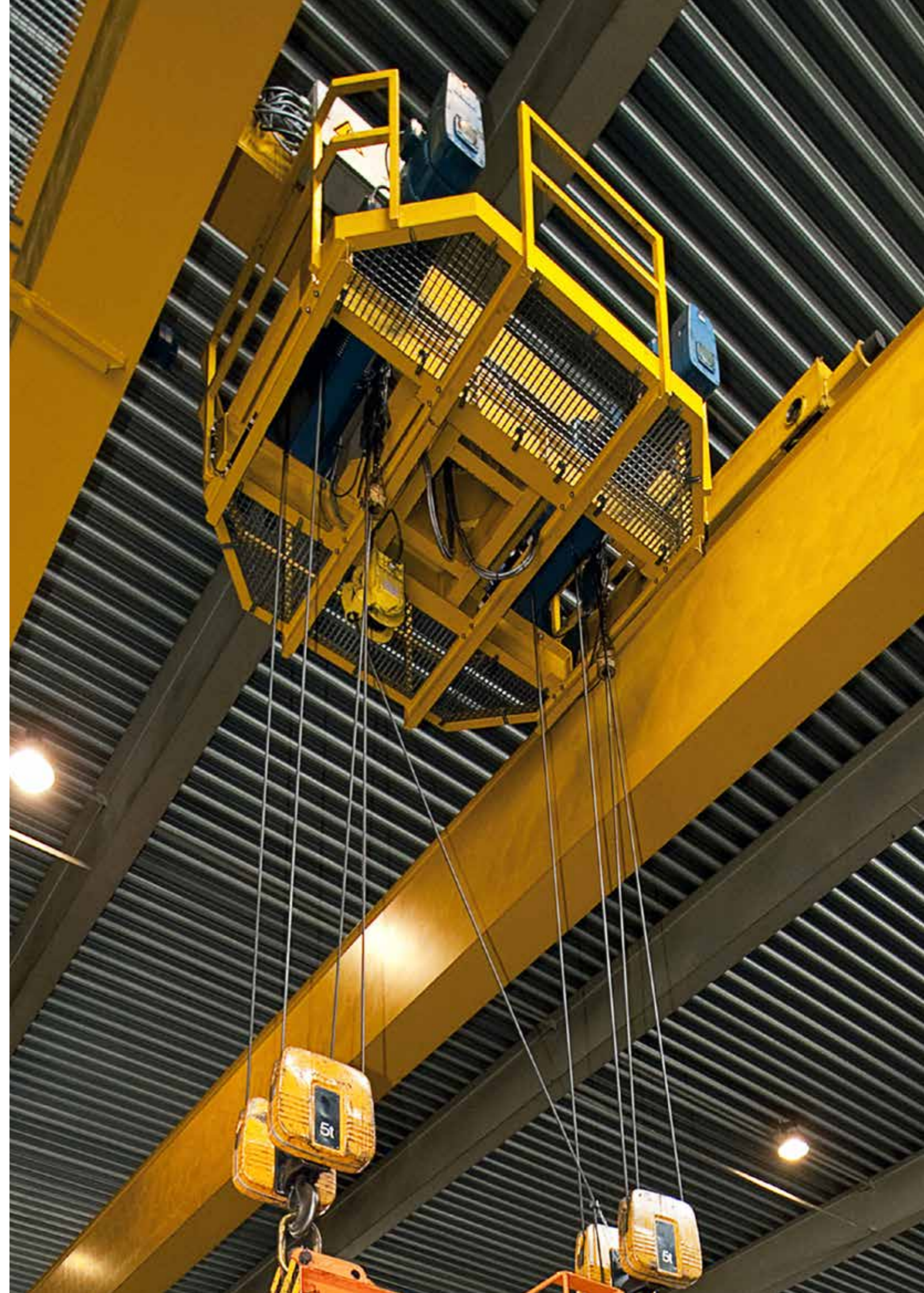
Install nVent HOFFMAN's lifting eyes on floor standing enclosures if crane transport is required. Individual transported enclosures will require four lifting eyes fitted in each corner. Bayed enclosures only require two lifting eyes to be fitted on the enclosures installed at the end of the bayed solution.



Lifting device

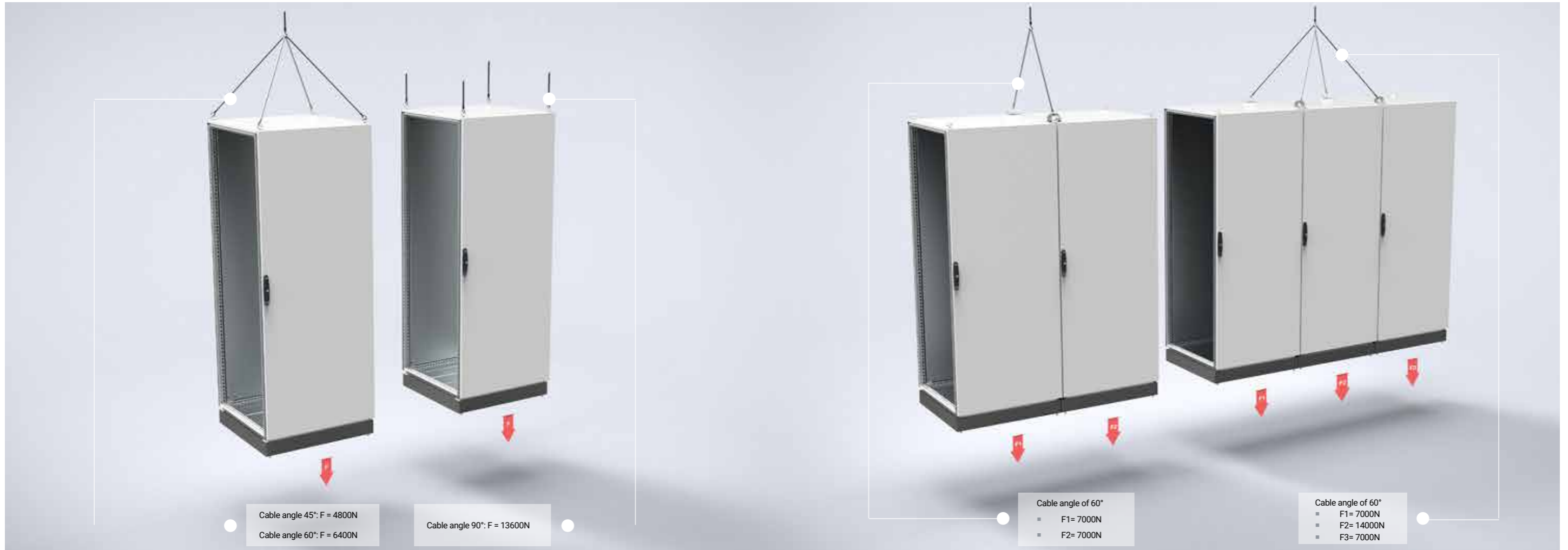
LC02

Install nVent HOFFMAN's lifting device on floor standing enclosures for optimal weight distribution when lifting bayed enclosures. The lifting device only needs to be installed on the sides where the enclosures are bayed.



2 Enclosures transport

Lifting capacity



Individual enclosure

Individual floor standing enclosures can be transported by crane safely using the lifting eye bolts, LE. The load that is installed inside the enclosure is systematically distributed allowing for a smooth transit.

Permissible loads are dependent upon the lifting angle.

Two bayed enclosures

Two floor standing enclosures bayed side by side can be transported by crane safely using the lifting devices, LC. The load that is installed inside the enclosure is systematically distributed allowing for a smooth transit. The lifting accessories required will depend upon the enclosure as well as its configuration, but using the baying brackets CCI and CCM is a must.

Permissible load is specified for a cable angle of 60°.

- F1= 7000N
- F2= 7000N

Three bayed enclosures

Three floor standing enclosures bayed side by side can be transported by crane safely using the lifting devices, LC. The load that is installed inside the enclosure is systematically distributed allowing for a smooth transit. The lifting accessories required will depend upon the enclosure as well as its configuration, but using the baying brackets CCI and CCM is a must.

Permissible load is specified for a cable angle of 60°

- F1= 7000N
- F2= 14000N
- F3= 7000N

Lifting capacity for enclosures

2.2 Transport by fork-lift



nVent HOFFMAN's floor standing enclosures are suitable for transit by forklift truck either individually or as a bayed solution. In either case it is important that the applicable plinths are fitted to ensure that the forks of the forklift truck can be moved underneath the enclosure(s) in order to safely transport them. For a bayed floor standing enclosure solution, nVent HOFFMAN's combining plinths should be used and fitted between each enclosure for strength and rigidity.

All of nVent HOFFMAN's floor standing enclosures are delivered fixed to a wooden pallet to ensure local transport operations can be performed easily for when plinths are not installed.

The forks of the forklift truck need to be positioned under the enclosure(s) as far too each side as possible to ensure the full

loading capacity is achievable. Plinth combining profiles (PCP/PCPK) must be used when transporting bayed floor standing enclosures to ensure the load ratings stated can be reached.

Care must be taken when using a manual hand pallet truck to not prise the top and bottom wooden members apart. This can break the pallet and result in the floor standing enclosure falling due to an unstable platform. Ensure the manual hand pallet truck is fully underneath the load before jacking the forks up to take the load.

A. Single enclosures

To ensure proper transport for a floor standing enclosure.

B. Bayed enclosures

To ensure proper transport for bayed floor standing enclosures, with the plinths already assembled, the plinth combining profiles must be used to ensure rigid joining between the plinths.

The transport can be made using the modern pallet supplied as standard, or using the applicable plinth.



3 Loading capacity for accessories

This section covers the different loading capacity of the enclosure parts and accessories to make easier and safer the design work.

Following the standard EC EN 62208, which states in chapter 8.2 that "Compliance of the permissible load that the enclosure and its doors are able to carry is checked according to the test of chapter 9.4", nVent HOFFMAN has carried out the tests not only to the enclosure and the doors but to all the relevant parts and accessories.

The tests have been carried out by DEKRA in the Netherlands.

3 Loading capacity for accessories

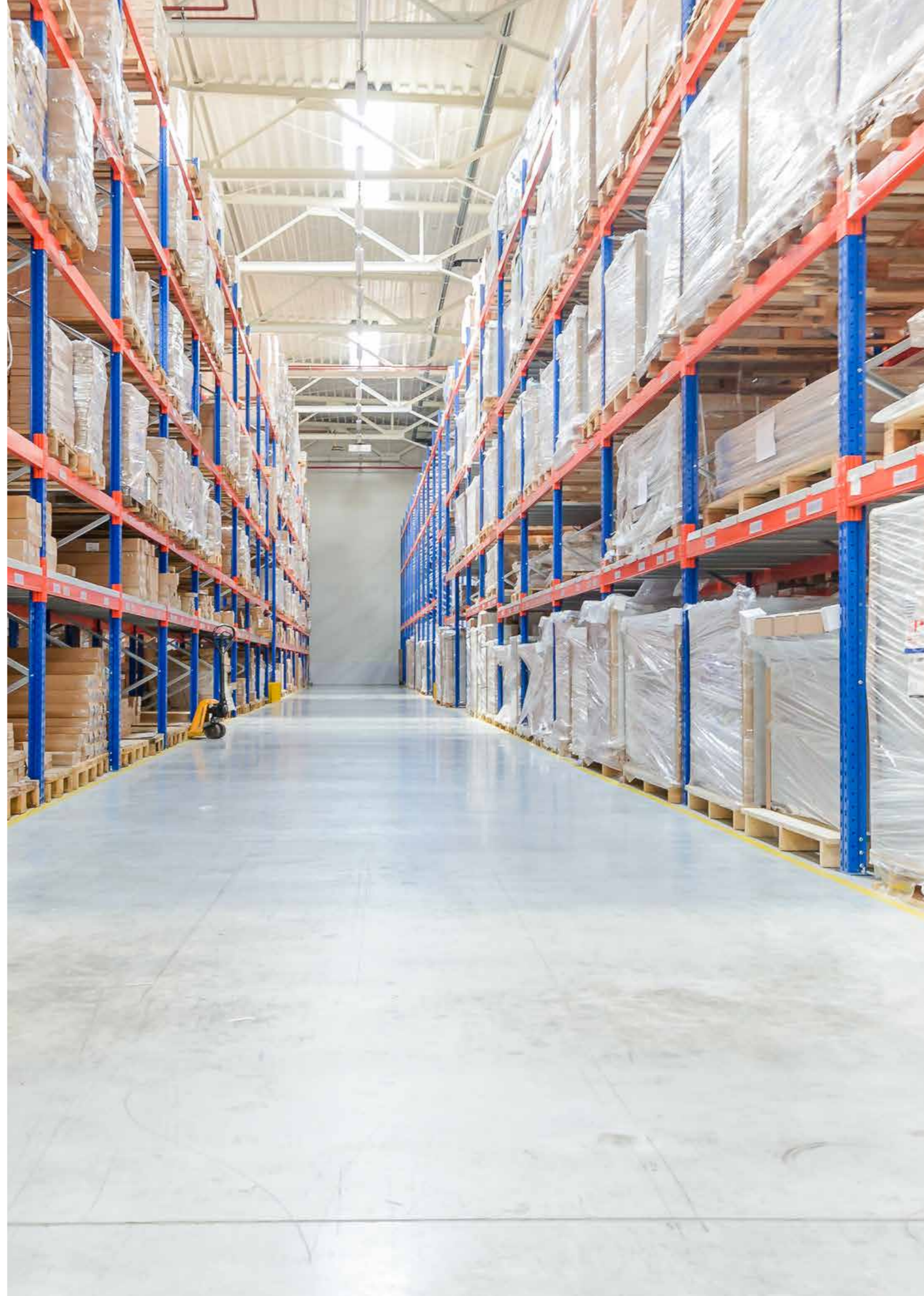
3.1 Leveling feet, LF



Enclosures on leveling feet

With static load the permissible overall load capacity is $F = 3000 \text{ N/feet}$

nVent HOFFMAN offers leveling feet as a standard accessory, specially suitable for installations in which the floor is uneven to guarantee the stability and perfect door closing. It is mounted directly in the enclosure frame.



Lifting capacity for enclosures

3.2 Transport caster for individual or bayed enclosures



For easy transportation of an (equipped) enclosure, nVent HOFFMAN offers the LCR casters. The casters can be mounted directly on the enclosure's frame or underneath the plinths (PF/PV) with the provided mounting brackets. The use of LCR casters raises the enclosure by 70 mm.

The LCR casters are available with or without the brackets.

A. Single enclosures

nVent HOFFMAN's single enclosures can easily be moved by using the LCR casters. The LCR kit contains 4 casters and the corresponding mounting accessories.

B. Bayed enclosures

nVent HOFFMAN's bayed enclosures can easily be moved by using two casters at the beginning, two in the end, and two on each joining.

Loading capacity for accessories

3.3 Doors



3.3.1 Complete door, DN

3.3.2 Partial door, DP

Item number	Dimension H x W	F [N]	Item number	Dimension H x W	F [N]
DP01504R5	150 x 400	10	DP04008R5	400 x 800	10
DP01506R5	150 x 600	10	DP05004R5	500 x 400	50
DP01508R5	150 x 800	10	DP05006R5	500 x 600	50
DP02004R5	200 x 400	10	DP05008R5	500 x 800	50
DP02006R5	200 x 600	10	DP06004R5	600 x 400	50
DP02008R5	200 x 800	10	DP06006R5	600 x 600	50
DP02504R5	250 x 400	10	DP06008R5	600 x 800	50
DP02506R5	250 x 600	10	DP08006R5	800 x 600	50
DP02508R5	250 x 800	10	DP08008R5	800 x 800	50
DP03004R5	300 x 400	10	DP10006R5	1000 x 600	50
DP03006R5	300 x 600	10	DP10008R5	1000 x 800	50
DP03008R5	300 x 800	10	DP12006R5	1200 x 600	50
DP04004R5	400 x 400	10	DP12008R5	1200 x 800	50
DP04006R5	400 x 600	10			

Loading capacity for accessories

3.4 Panels

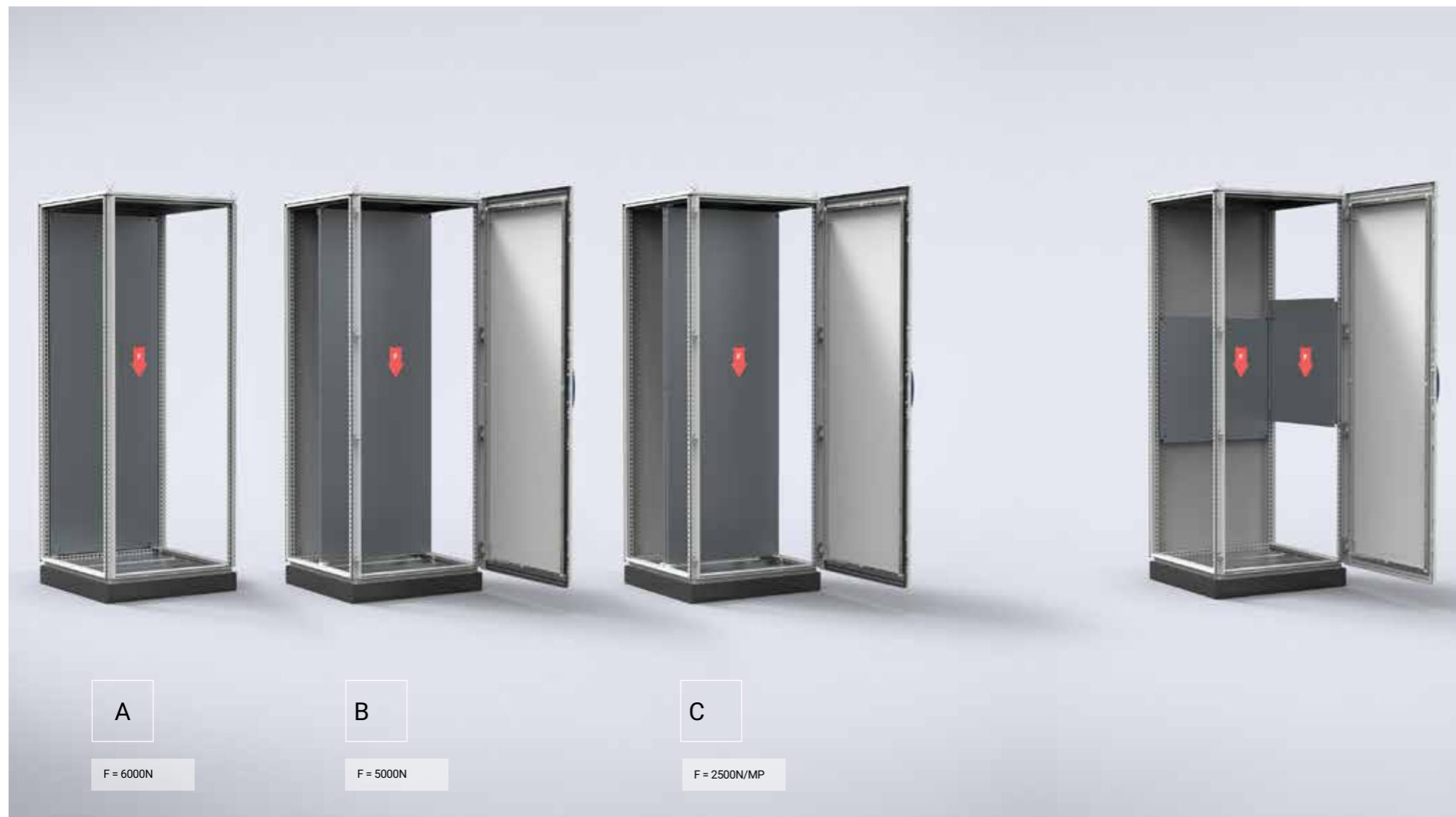


3.4.1 Rear panel, CRP

3.4.2 Side panels, SPM

Loading capacity for accessories

3.5 Mounting plates



3.5.2 Partial mounting plate

nVent HOFFMAN partial mounting plates, MPP, can be installed in the rear flush with the frame, in the side flush with the frame or adjusted in depth with CLPK profile in depth.

Item number	F [N]
MPP0404	1500
MPP0405	1700
MPP0604	1700
MPP0605	1700
MPP0606	1700
MPP0608	1700
MPP0610	1700
MPP0804	1200
MPP0805	1500
MPP0808	1700
MPP1004	900
MPP1008	1500
MPP1204	1700
MPP1206	1700

3.5.1 Complete mounting plate

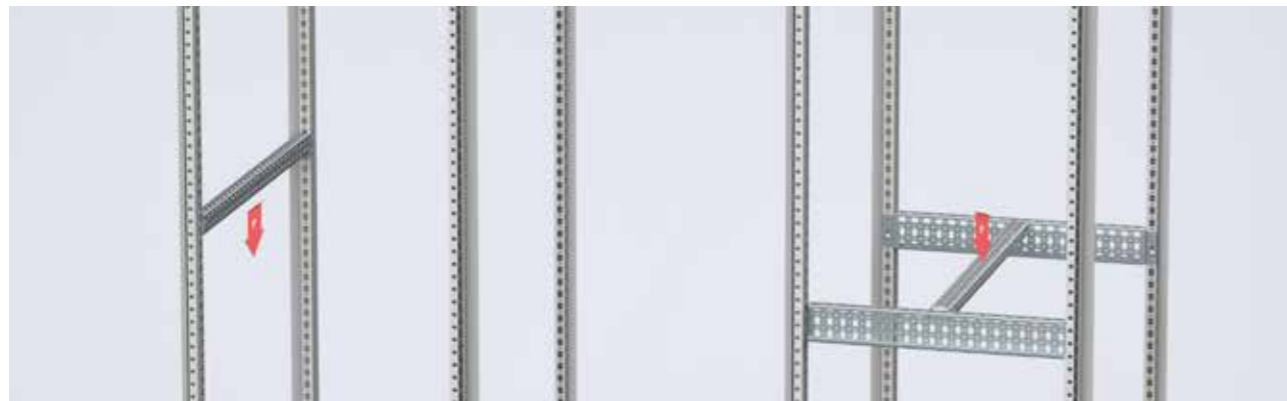
nVent HOFFMAN complete mounting plate can be installed in three different ways:

- A: Mounting plate in the most rear position, without any additional accessory because brackets are included in the standard delivery.
- B: Mounting plate adjusted in depth, adding MPD accessory.
- C: Mounting plate mounted back to back, adding MPBB accessory.

Loading capacity for accessories

3.6 Mounting profiles

3.6.1. Mounting profile CLPF



Item number	F [N] horizontal C	F [N] horizontal П
CLPF400	800	1000
CLPF500	800	1000
CLPF600	800	1000
CLPF800	800	1000
CLPF1000	800	1000
CLPF1200	800	1000
CLPF1400	Only vertical loads allowed	Only vertical loads allowed
CLPF1600	Only vertical loads allowed	Only vertical loads allowed
CLPF1800	Only vertical loads allowed	Only vertical loads allowed
CLPF2000	Only vertical loads allowed	Only vertical loads allowed
CLPF2200	Only vertical loads allowed	Only vertical loads allowed

3.6.2 Click-in profiles, CLPK



Item number	F [N]
CLPK400	2000
CLPK500	2000
CLPK600	1600
CLPK800	1600
CLPK1000	1200
CLPK1200	1200

3.6.3 Side mounting profiles, CMB



Item number	F [N]
CMB402	1500
CMB502	1500
CMB602	1500
CMB802	1300

3.6.4 Door profiles, DCP



Item number	F [N]
DCP402	600
DCP502	600
DCP602	600
DCP802	600
DCP1002	500

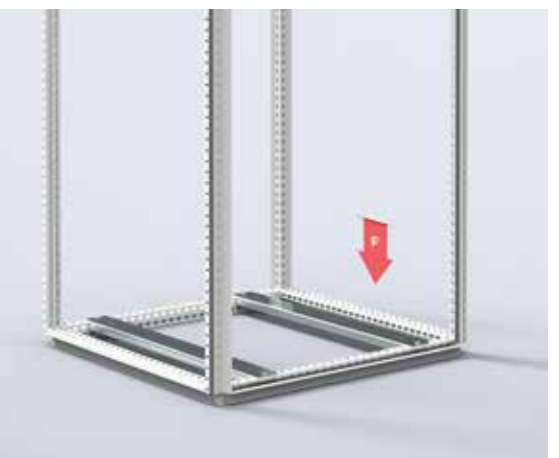
3.7 Bottom carrier bars

3.7.1 Heavy duty carrier bars, CBU



Item number	F [N]
CBU400	3000
CBU500	3000
CBU600	3000
CBU800	2250
CBU1000	1800
CBU1200	1500

3.7.2. Carriers bars, CB



Item number	F [N]
CB400	2500 per pcs
CB500	2100 per pcs
CB600	1800 per pcs
CB800	1300 per pcs

Loading capacity for accessories

3.8 Wall mounted single door enclosures, MAS/ASR/AFS/MAP

3.8.1. Mounting plate loading in single door enclosure



Product range	F [N]
MAS	1600
ASR	1600
AFS	1600
MAP	1600

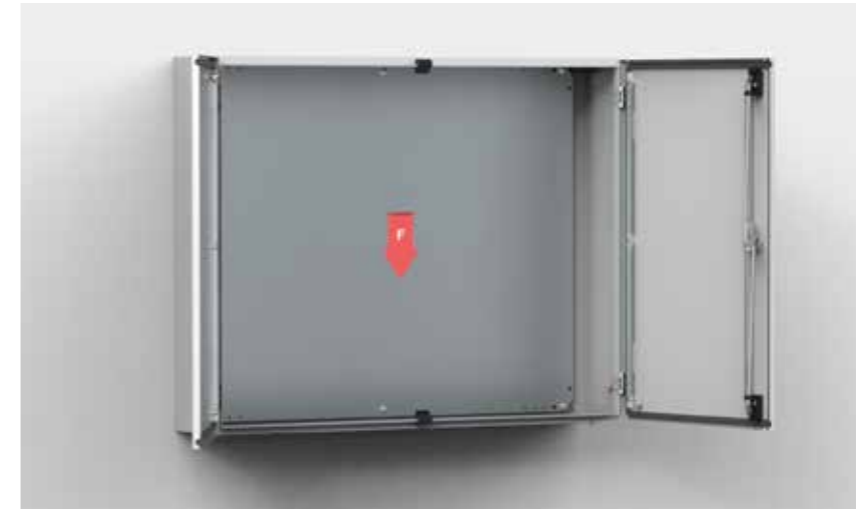
3.8.2. Door loading in single door enclosure



Product range	F [N]
MAS	280
ASR	280
AFS	280
MAP	280

3.9 Wall mounted double door enclosures, MAD/ADR

3.9.1. Mounting plate loading in double door enclosure



Product range	F [N]
MAD	3800
ADR	3800

3.9.2. Door loading in double door enclosure



Product range	F [N]
MAD	400
ADR	400

Loading capacity for accessories

3.10 Door loading with MMH/MMHS 180-degree hinges

3.10.1 Door loading with 2 hinges



Product range	F [N]
MMH02 / MMHS02	200

3.10.2 Door loading with 3 hinges



Product range	F [N]
MMH03 / MMHS03	300

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