

DATA
CENTER

NEXPAND



AISLE CONTAINMENT

OPTIMAL COOLING AND ENERGY EFFICIENCY THROUGH
THE SEPARATION OF HOT AND COLD AIRFLOWS

 **MINKELS**
A brand of  **legrand**

AISLE CONTAINMENT

Aisle containment is the solution to the challenges which data centers have been presented with since day one: the optimisation of cooling and energy-efficiency through the separation of hot and cold airflows.

With the **Nexpand Corridor**, Minkels offers data center managers and owners 'future-proof' solutions which offer the flexibility and modularity needed to be able to anticipate the dynamic of the modern day data center. Minkels offers the best solution for every situation with the Nexpand Corridor.

The Nexpand Corridor is the ultimate answer to the ever increasing demand for flexible and modular solutions. In the form of the Nexpand Corridor, Minkels lifts modular thinking and energy-efficient data center design to a higher level. Important features of the Nexpand Corridor are:

MODULARITY

Through the highly modular concept of the Nexpand Corridor, Minkels offers extensive possibilities to implement a Corridor solution in a phased and thus cost-efficient manner.

FLEXIBILITY

Because of its modular design, the Nexpand Corridor is flexible and thus can be adapted to fit the specific building environment.

EASE OF INSTALLATION

Modularity in the construction details ensure that the solution is easily and cost-efficiently installed.

ENERGY-EFFICIENCY

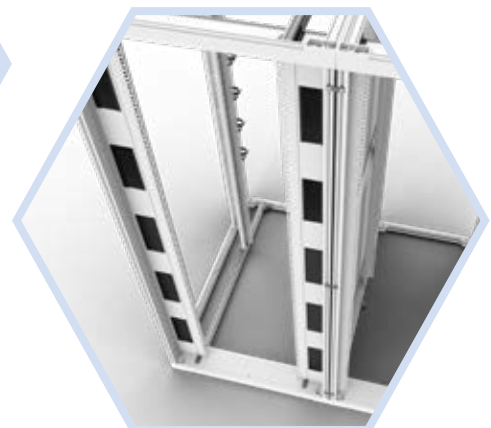
With the Nexpand Corridor, Minkels offers a solution which is more energy-efficient than other containment solutions on the market.

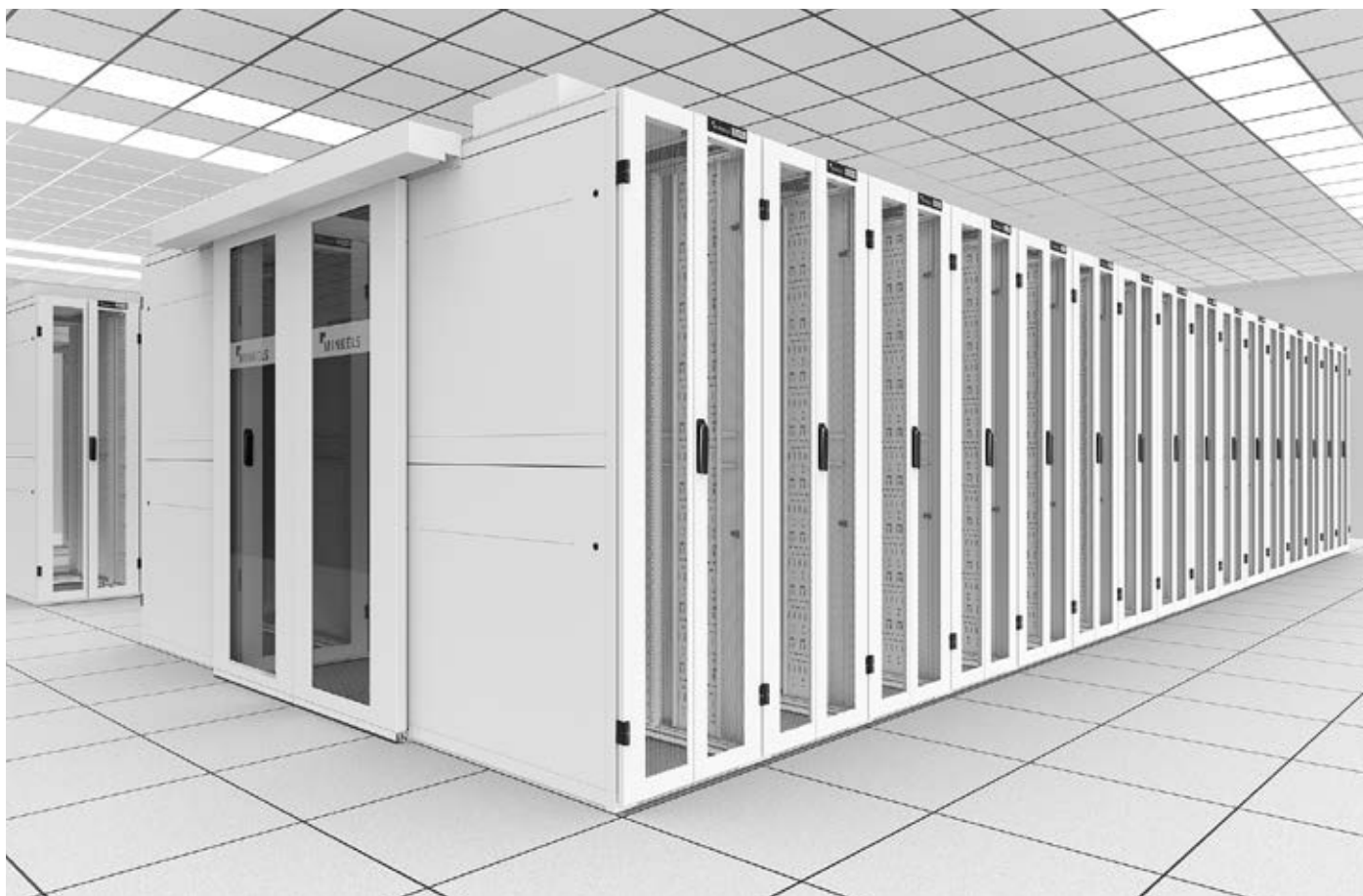
OPTIMAL INTEGRATION

The Nexpand Corridor can be integrated with row-based cooling systems which brings cooling close to the heat source, but also with more traditional forms of cooling which require a raised floor. In addition, this concept offers plug & play integration with e.g. fire detection and suppression systems, monitoring sensors and access control.



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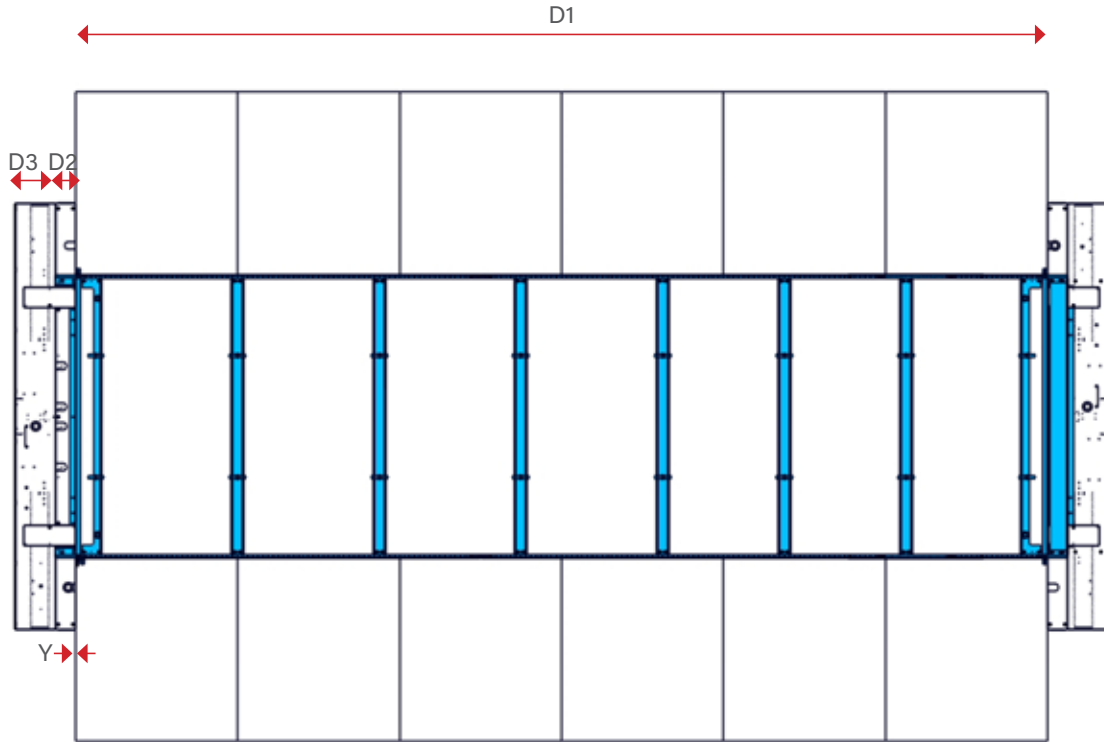
Corridor - Standard

Aisle width	mm	Variable between 1000-1800 Standard width: 1200 & 1800
Overall width	mm	Aisle width + 200
Standard row height	mm	1978/2200/2422
Overall height	mm	Row height + 55.5/135.5 (Hr)
Colours		RAL 9003 (white) / RAL 9005 (black)
Materials		Powder coated sheet metal
Working conditions		Max. 5 - 40°C / 20 - 80% RV
Standardisation		CE

Portal - optional

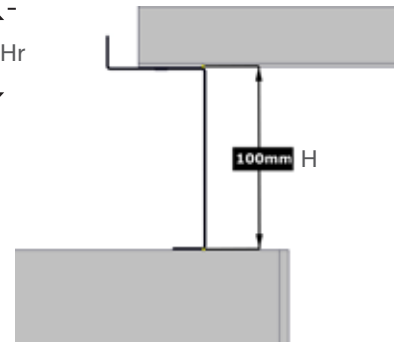
Depth	mm	100
Total width portal	mm	2100

TOP AND FRONT VIEW AISLE CONTAINMENT

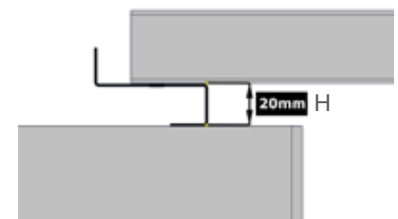


Dimension

- D1 = Corridor length
- D2 = Portal depth is 100mm
- D3 = Sliding door beam depth is 200mm
- Y = Flexible start/end panel (flexible in this case means extendable from 0-75 mm)



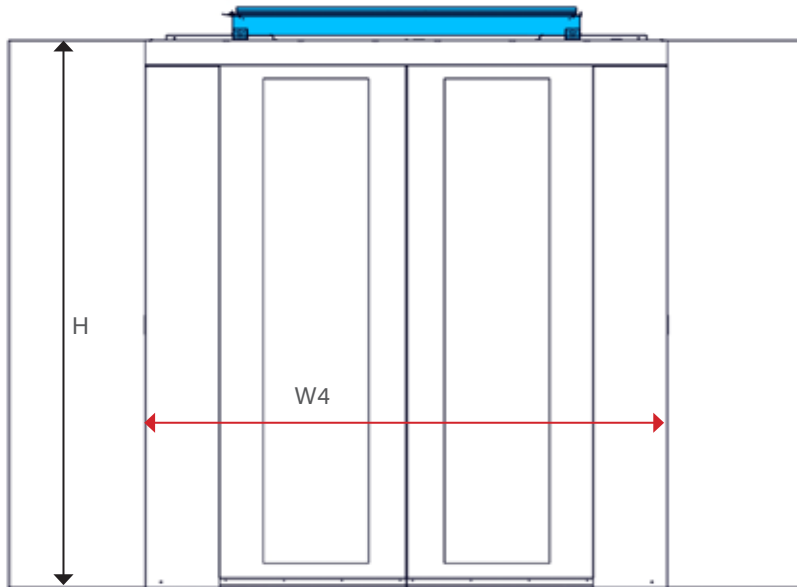
Internal space for mounting accessories



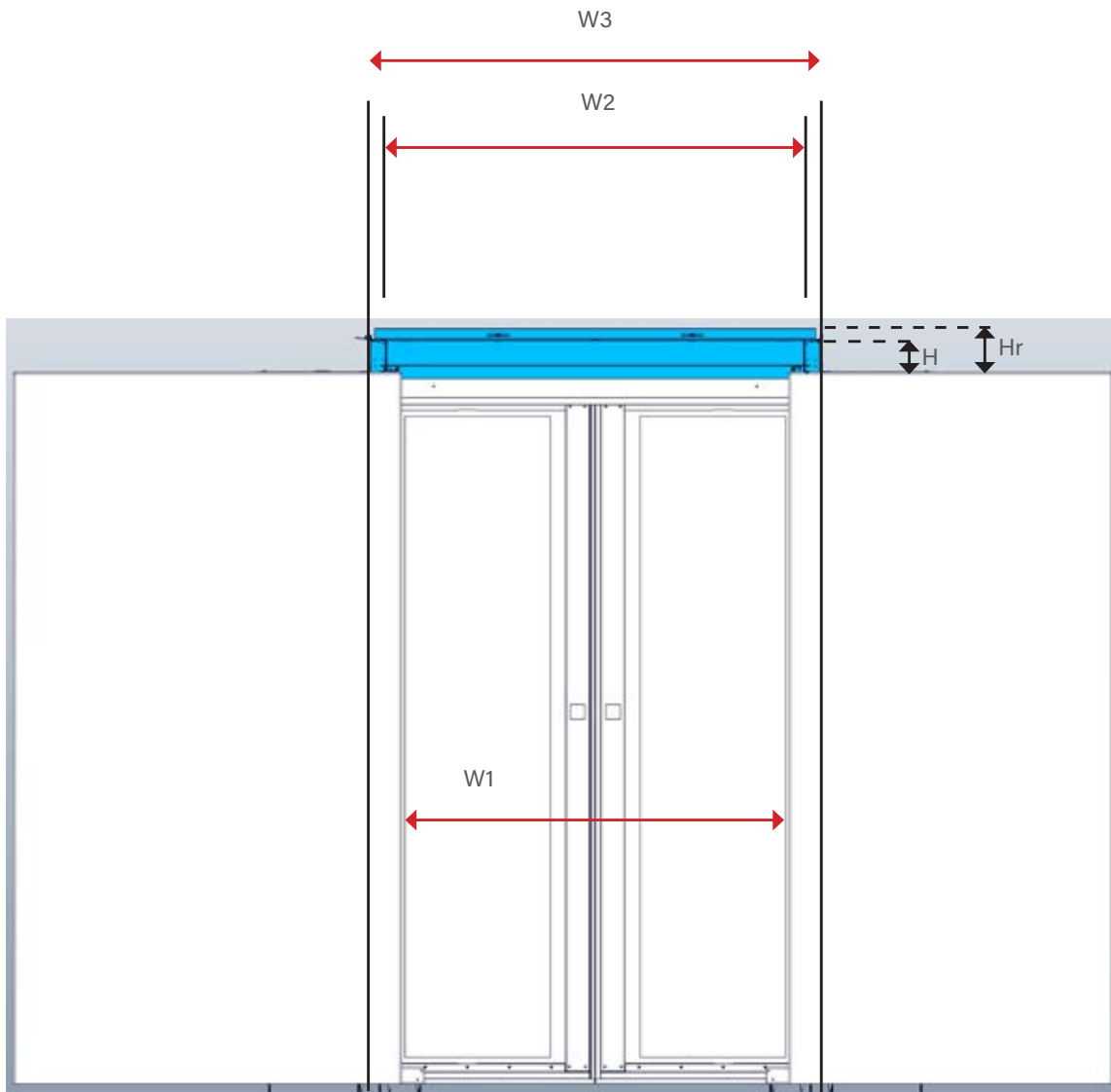
Internal space when no accessories are needed

Dimension	1200 mm width aisle	1800 mm width aisle
W1 = aisle width	1200 mm	1800 mm
W2 = Interior width roof system	1291 mm	1891 mm
W3 = Total width roof system	1400 mm	2000 mm
Hr = Height roof system (total height)	Hr = 135,5 mm to allow mounting accessories: sensors/cameras/LED lighting H = 100 mm	Hr = 135,5 mm to allow mounting accessories: sensors/cameras/LED lighting H = 100 mm
H = Height of the beam	Hr = 55,5 mm (when no accessories are needed) H = 20 mm	Hr = 55,5 mm (when no accessories are needed) H = 20 mm

Please note that the dimensions refer to an electric sliding door.
Page 11 shows the different dimensions for both mechanical and electric sliding doors.



Dimension	1200 mm width aisle	1800 mm width aisle
H = height of the cabinet	-	-
W4 = Total portal width	2100 mm	2100 mm



FREE STANDING

When the highest amount of flexibility is required, the **Free Standing Corridor** is the most optimal solution. The Free Standing Corridor is a fully self-supporting aisle containment system, with which closed off aisles can be created independent from the IT-racks –which is not usual in the data center market.

'PAY-AS-YOU-GROW' SOLUTION

Immediately after implementation, the Free Standing corridor reaches the same energy-efficiency as a regular aisle containment system with IT-racks would. The Free Standing Corridor can be used for both cold aisle containment and hot aisle containment. The system – a modular design consisting only of a carrying construction, wall panels, roof panels and sliding doors - offers corporate and commercial data centers a cost-efficient 'pay-as-you-grow' solution in order to create energy-efficiency at low initial investments (CAPEX).

MINIMAL INITIAL INVESTMENTS

The Free Standing Corridor can be used in combination with an existing infrastructure and already fitted racks, and drastically

improves the airtightness and with this the energy-efficiency. The Free Standing Corridor can also be used for a new room where the end user will fill the corridor themselves based on their own demands and requirements, or those of a customer. This allows for a start with a minimal initial investment. Depending on the length of the corridor, racks can be added stepwise while the required airtightness is maintained.

FREE STANDING FRAME

The free standing frame carries the sliding door systems, roof systems, corridor walls and vertical panels/chimneys, without any support other than the floor onto which the entire construction is installed. The frame consists of two sheet metal rigid door portals at the beginning and end of the construction and modular, plate steel beam sections. The minimum length of the free standing frame is 1800 mm and can be added onto with 600 mm sections. The maximum length of the free standing frame is 26400 mm. The standard walkways are enclosed by the containment system, and have a width of either 1200 or 1800 mm.

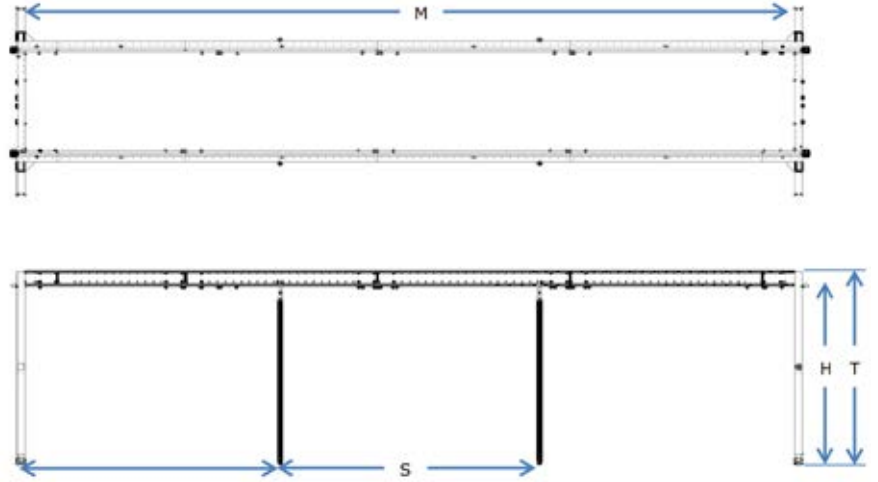


Features	Nexpand Corridor	Free Standing
Integration differing cabinet depths	● ● ●	● ● ●
Integration differing cabinet heights	● ● ○	● ● ●
Integration differing cabinet widths	● ● ○	● ● ●
Integration differing brands of cabinets	● ○ ○	● ● ●
Modularity	● ● ○	● ● ●
Integration sensors	● ● ●	● ● ●
Expansion with extra cabinets	● ● ○	● ● ●
Row-based cooling	● ● ●	● ● ○
Integration fire suppression systems	● ● ●	● ● ●
Initial investments*	● ● ○	● ● ●
Separation of hot and cold air	● ● ●	● ● ●
Cold corridor setup	● ● ●	● ● ●
Hot corridor setup	● ● ●	● ● ●
Avoidance of hotspots	● ● ●	● ● ●
Possibility for energy-efficiency	● ● ●	● ● ●
Power per m ²	● ● ●	● ● ●
Cable management on top of cabinet**	● ● ●	● ● ○
Busbar integration	● ● ●	● ● ○
Transverse wall	○ ○ ○	● ● ●
Adjustable side wall	● ● ○	● ● ●
Flexibility in adaptation or replacement of cabinet	● ○ ○	● ● ●

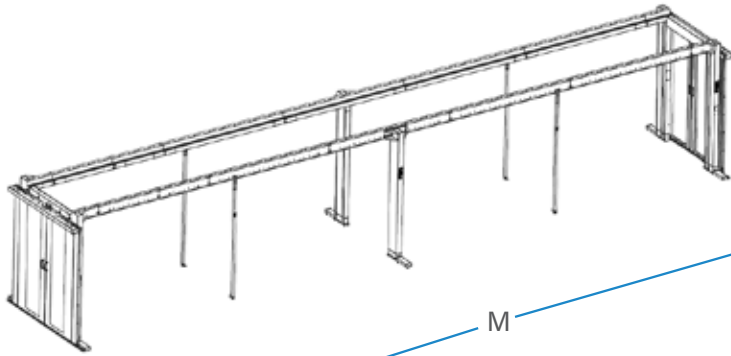
* including supporting cabinets (necessary)

** Minkels-development

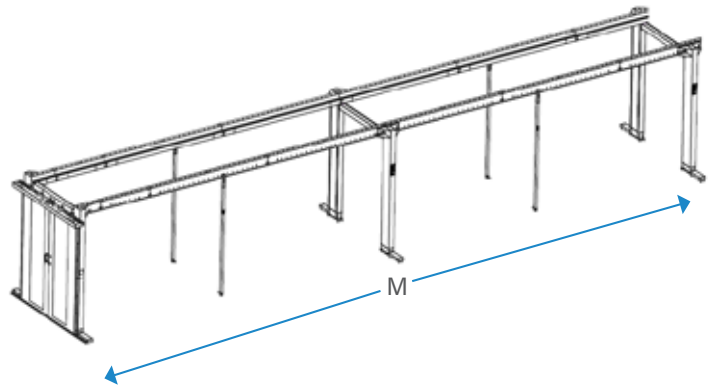
FREE STANDING



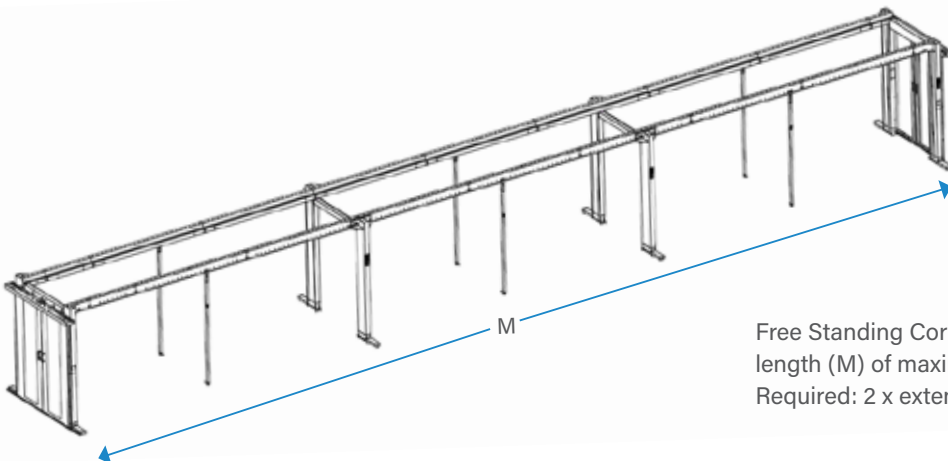
Free Standing Corridor structure for a module length (M) of maximum 9.60 metres.



Free Standing Corridor structure for a module length (M) of maximum 12.60 metres.
Required: 1 x extension portal.



Free Standing Corridor structure for a module length (M) of maximum 18.60 metres.
Required: 1 x extension portal + 1 x crossbeam.



Free Standing Corridor structure for a module length (M) of maximum 24.60 metres.
Required: 2 x extension portals + 2 x crossbeams.

Free Standing			
General			
Aisle width	mm	1200 / 1800 ¹	
Net aisle width	mm	1370 / 1970 ²	
Free height available for use (H)	mm	2220	
Overall height (T)	mm	2385	
Module length (M)	mm	1800 – 26400 in 600 ³ increments	
Colours		RAL 9005	
Materials		Sheet steel, powder coating	
Operating conditions		Max. 5 to 40°C / 20 to 80% RH	
Air flow optimisation		Yes	
Standards		Not applicable	
Portal			
Portal type		Double	
Portal depth	mm	100	
Sliding door system		Fully compatible with Nexpan Corridor sliding door portfolio	
Extension Portal			
Usage	mm	With a module length (M) of > 9600	
Portal depth	mm	100	
Distance	mm	between portal and extension portal is max < 9300	
Assembly method		Fully free-standing. Portals must be screwed into the floor	
Lengthwise beams			
Segment lengths	mm	1000, 1200, 1600, 2400 (400mm length wise beam is included per portal)	
Maximum length that can be bridged without support (S)	mm	3700. Distance between vertical supports	
Roof system			
		Fully compatible with Nexpan Corridor portfolio ⁴	
Crossbeam		If module length (m) >12,6m	
Vertical support of lengthwise beams			
Dimensions	mm	Height (H) x 50 x50	
Adjustment		Continuously adjustable	
Adjustment range	mm	3300 +/- 350 with respect to the assembly position ⁵	
Attachment to the length wise beam		Using a knob	

- 1 Optimum aisle widths between the racks. Non-standard aisle widths can be achieved by placing the racks used at a different position under the length wise beams
- 2 Aisle width between the wall panels (if applicable)
- 3 Module length > 9.6 metres requires an extension portal; module length > 12.6 metres requires an extension portal with crossbeam; module length > 18.6 metres requires 2 extension portals with crossbeams. Please contact Minkels Sales if you require a module that exceeds 26.4 metres in length.
- 4 The complete roofing portfolio of Nexpan Corridor can be applied in the Nexpan Free Standing Corridor concept. The function of the roof rails is however integrated into the length wise beams.
- 5 The position of the vertical supports should be determined using the information given in the user manual and/or installation manual. The vertical supports may only be moved if the maximum width that can be bridged unsupported (3.7m) is not exceeded.

DOOR SYSTEMS FOR AISLE CONTAINMENT



Minkels offers self-closing sliding doors, with which you can close off your aisle containment in an airtight seal. The self-closing sliding door system is available in two different colours: RAL 9003 (white) / RAL 9005 (black). During the closing of the doors, a soft closing mechanism prevents the doors from unexpectedly

striking against each other. The door panels have been fitted with safety glass panels to ensure the safety of persons and to allow light to enter the containment, as well as to provide the possibility of viewing the walkways from outside the containment.



Sliding door system

Door type		Single, double
For aisle widths	mm	1200 + 1800
Clear door opening	mm	1000
Height door opening	mm	Height door system -70
Depth of beam	mm	170
Height of beam	mm	70
Width door system	mm	1950
Door closing		Soft close
Door synchronization		No
Opening - outside		Manual
Opening - inside		Manual

Options

Self closing		Door synchronisation incl. automatic closing of doors
Electronic door system		Door synchronisation incl. motorized opening and closing of doors

Security options

Door position indicator		Magnetic contacts
Electronic lock*		Electronic locking of the sliding door system
Power consumption Electronic lock		17 W
Operation - inside		Push button Motion sensor
Operation - outside		Push button (Standard) Key Switch Motion sensor Key Pad RFID - Card reader

Electronic door system*

Standardization		NEN-EN 16005
Clear door opening	mm	1000 mm
Height door opening	mm	Height door system -100
Depth of beam	mm	200
Height of beam	mm	100
Width door system	mm	2100
Electrical supply		230V - 50Hz/60Hz
Power consumption		180 W
Power connection		SCHUKO, C13, Cee-form, BS, No cable - Standard 5 m cable length
Safety		Electrical sliding system is equipped with anti-oppression system In the event of a power failure, the doors can be opened manually (fail-safe)

*Portal necessary

ROOF SYSTEMS FOR AISLE CONTAINMENT

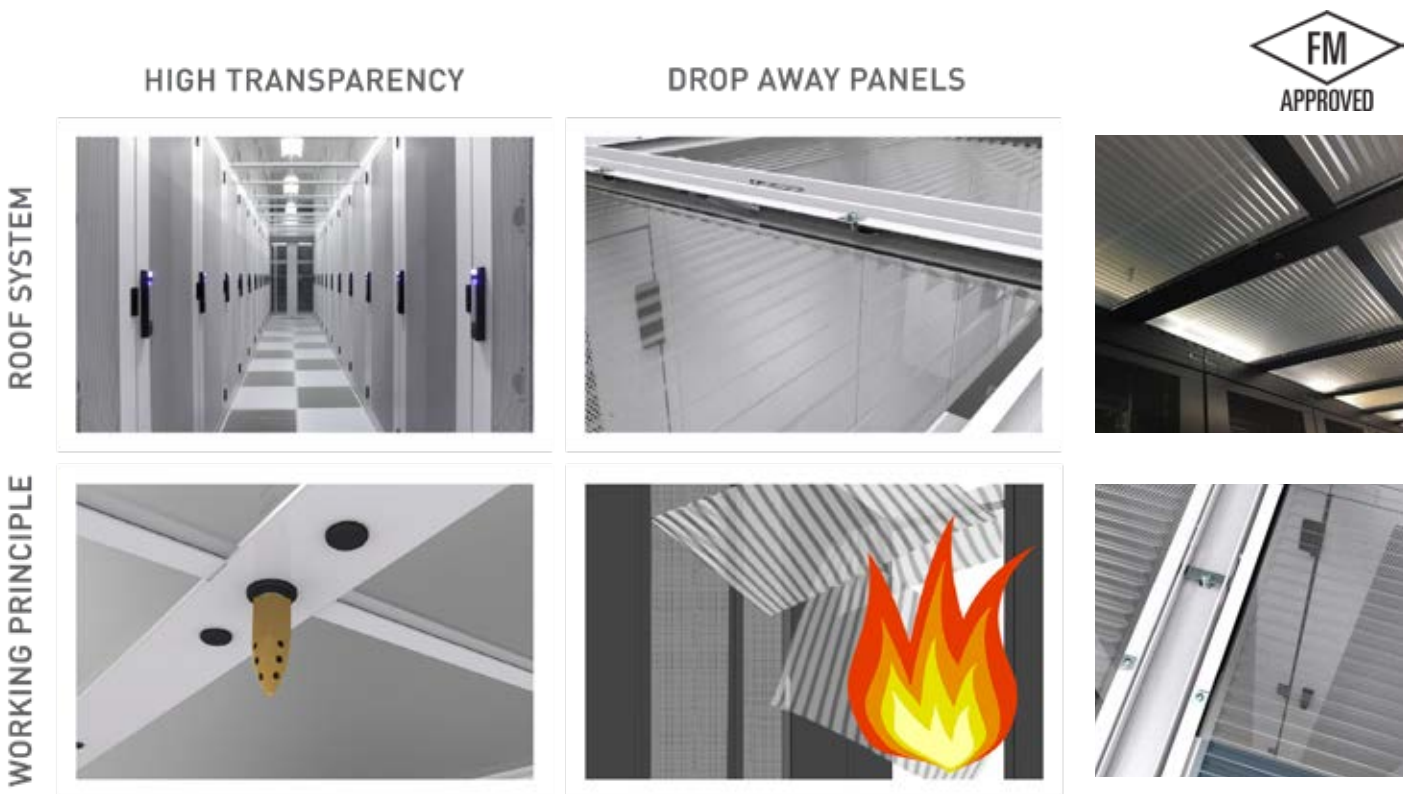
For your Nexpan Corridor a choice can be made between a high transparency roof and Drop Away Panels.

HIGH TRANSPARENCY ROOF

Your Nexpan Corridor can be fitted with a high transparency roof. These roof panels provide a high light permeability/light transmission, up to 83%. The roof panels are installed onto rails, separate from the server cabinets.

DROP AWAY PANELS FM APPROVED

Drop Away Panels ensure the seamless integration of aisle containment solutions with sprinkler or water mist systems. In the case of a fire in the data center, the plastic Drop Away Panels automatically soften and fall down so that they do not form an obstruction when sprinklers are activated. The system is specifically designed for use with sprinkler installations which activate at 57.2 degrees Celsius and upwards.



Roof rail system

Rail lengths	mm	250 / 500 / 1000 / 1500 / 2000
Rails interconnected		Yes
Height adjustment	mm	10
Sealing		Finished with air tight seal

Roof system - options

Integration panel - sensors

Supporting sensors		Minkels Varicontrol-S
Mounting sensors		Toolless
Cable entries	mm	2x ø13,5 - rubber grommet
Integration panel - Fire extinguisher*		
Pipe throughput	mm	1x ø35 - rubber grommet



*Only i.c.w. high transparency roof system

Roof system - 'High Transparency'

Aisle width	mm	1200 / 1800
Start panel - range	mm	Flexible start/end panel, 100-175
Available pitch	mm	600 & 700 mm
Transparency		83%
Panel material		Double layered safety glass
Roof panel fixation		square key lock
1200 mm aisle width		
Segments		1
weight / segment	kg	600 --> 7,6 kg 700 --> 9,2 kg
Roof width	mm	1350
1800 mm aisle width		
Segments		2
weight / segment	kg	600 --> 10,4 kg 700 --> 12,6 kg
Roof width	mm	1950



BENEFITS OF THE DROP AWAY PANELS

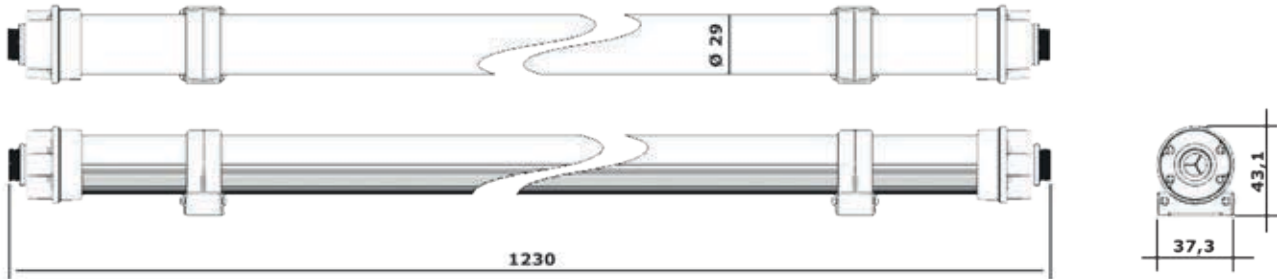
- Lightweight material: the panels do not cause any danger to people and equipment.
- The panels are suitable for Nexpan Corridor, and can also be used for retrofit.
- No height restriction: suitable for 2000 & 2200 mm high corridors.
- Drop Away Panels are available in standard width of 1200 mm.
- Extra safety-feature: the grounding of the metal framework construction.
- FM Approved

Roof system - 'Drop Away Panels'

Aisle width	mm	1200 / 1800
Start panel - range	mm	Flexible start/end panel 100-175
Available pitch	mm	700
Roof panel material		PVC - vinyl
Drop Away Panel weight	kg	0,16 kg
Roof panel fixation		square key lock
Optimal static differential air pressure	Pa	< 10
Max. static differential air pressure	Pa	45
1200 mm aisle width Segments		1 panel with 2 Drop Away Panels
weight / panel	kg	3,0
Roof width	mm	1350
Transparency *		81 %
1800 mm aisle width Segments		1 panel with 3 Drop Away Panels
weight / panel	kg	4,5
Roof width	mm	1950
Transparency *		83,5 %
Mounting method		Fixation on independent roof rails
Certified		UL Ceiling Panels for use Beneath Sprinklers BLME.R4036
Approval		FM Approval Class Number: 4651

* Transparency in % depending on total length Nexpan Corridor by the use of the filling panels

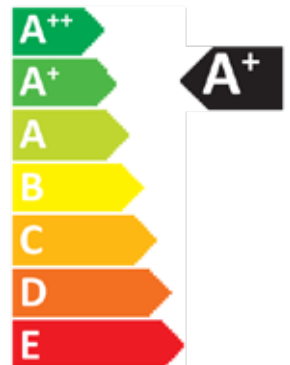
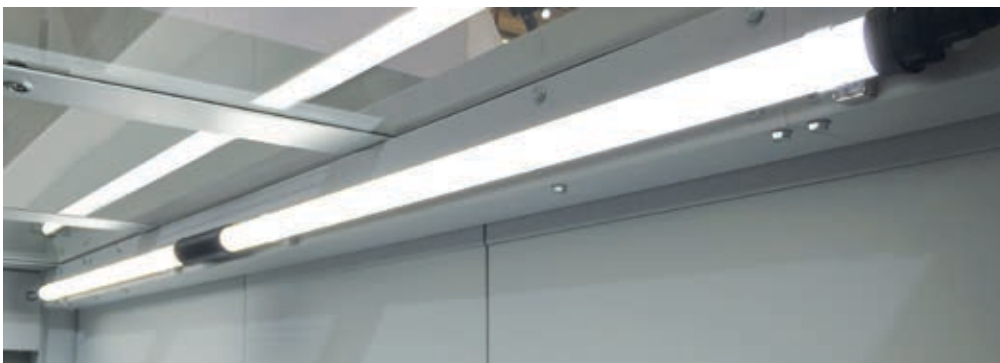
LED LIGHTING FOR AISLE CONTAINMENT



Energy-efficient LED Tubes deliver improved visibility in data centers, providing a safer and healthier working environment. Safety certification to the highest level, IEC 62471:2006, offers the user a guarantee of exceptional eye protection. These LED Tubes are optimised for the Nexpan Corridors.

The LED Tubes are exceptionally easy to install. With highly adjustable suspension points a Corridor can be fitted out with LED lighting in no time. And once fitted the LED Tube continues to offer outstanding flexibility. The option to rotate the tubes means that the illumination can be directed towards specific items of equipment. The high light intensity and energy efficiency

of the LED Tubes makes them just the thing for Nexpan Corridors. These LED Tubes provide greatly improved visibility. The LED Tubes can easily be expanded using extension cables: these are then concealed with neat cover caps so that the unit forms an attractive whole. Each LED Tube can be fitted with a motion sensor, allowing the lamps to switch off automatically if no movement has been detected for a specified period, a functionality that further underlines the energy-efficiency of this lighting solution for data centers.



MAIN FEATURES

- **Energy efficiency** – LEDs (Light Emitting Diodes) are small, solid lamps, highly energy-efficient and with an extremely long service life.
- **Safety guarantee** - Official IEC 62471:2006 certification means that this product complies with the most stringent safety requirements in the area of eye protection.
- **Powerful illumination** – 335 lux, delivering optimal working conditions in accordance with standard EN12464-1.
- **Simple installation** - Installing a LED Tube is simplicity itself thanks to the clever magnetic attachment system.
- **Flexibility** - Suitable for a wide range of rack formats and Corridor layouts, with options to rotate the installation position.
- **Integrated lighting** - The recesses for the LEDs, the connection cables and the small cover caps to conceal the cables give these units the appearance of a unified whole.

LED lighting – Nexpan Corridor			
Length	mm	1200	
Height	mm	43,1	
Width	mm	37,3	
Diameter	mm	37	
LED tube diameter	mm	29	
Lamp material		Polycarbonate PC-ABS	
Mounting clamp material		Anodised aluminium	
Weight of LED tube		505 g	
Variants		With PIR sensor Without PIR sensor	
Lux		Average 335 Lux	
Energy class		A+	
Colour temperature in Kelvin		5000°K	
Colour rendering (CRI)		80	
Dimmable		No	
Angle of illumination		130°	
Adjustable angle of illumination		Yes, with rotating LED Tube	
Operating conditions for LED tube		Max. -20°C - 40°C	
Storage temperature		Max. -40°C - 60°C	
IP value of fitting		IP21	
Impact resistance of fitting		IK08	
Expected life time of LED lamp		35,000 hours	
Input voltage		230 VAC/single phase/50 Hz	
Current consumption in Watts		20 W	
Circuit board (PCB)		FR 4	
Connectable LED Tubes		Yes, using 10cm Male/Female LED Tube connector power cable + cover	
Maximal length of serially connected LED Tubes		50 metres in series from a single power supply	
Location of LED Tubes in Corridors		Left and right side of corridor. Each side is fed separately	
Connection		C14/LED Tube connector – standard 4.0m cable length	
Installation method		Attachment to joists using flexible, sliding N50 magnets	
Corridor roof configuration		Compatible with Nexpan roof structure	
Quality mark		CE	
In accordance with Directives		Directive 2004/108/CE Directive 2006/95/CE Directive RoHs 2011/65/EU Directive WEEE 2012/19/EU Directive 2012/874/EU	
Standards		EN62471 EN12464-1	



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