

MANUFACTURED FOR:
MITSUBISHI ELECTRIC US, INC.

MITSUBISHI ELECTRIC US, INC.
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Application Guidelines for using the Mitsubishi CITY MULTI® Low Ambient Kit

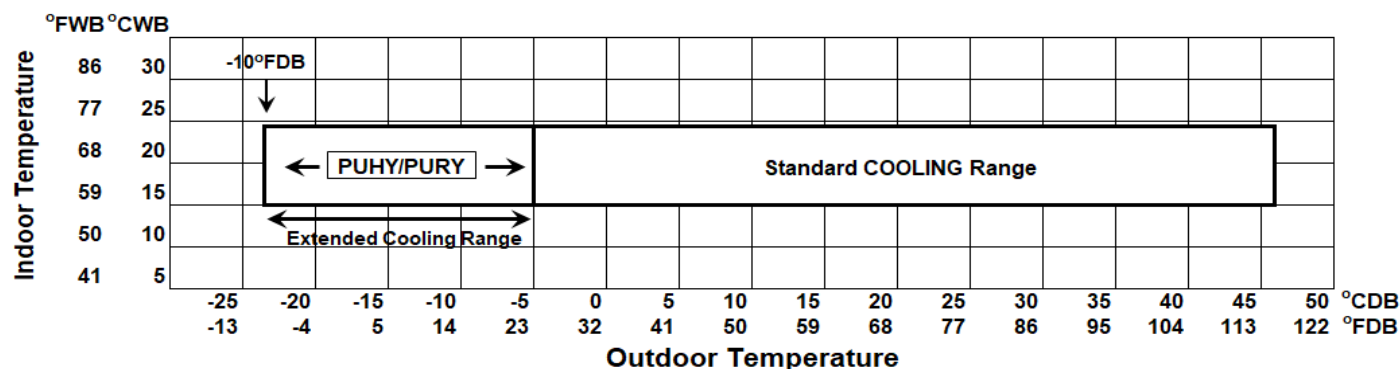
The Mitsubishi CITY MULTI low ambient kit is designed for use with the N-Generation Air Cooled Outdoor Units to provide full cooling capacity down to -10°F outdoor temperature (see chart below).

NOTE for R2 Systems:

*Full cooling capacity down to -10°F.

**In cooling mode or cooling main, to guarantee full cooling capacity, the system must operate with a constant heat load in the zones requiring cooling when ambient temperatures fall below 5°F.

IMPORTANT! The low ambient kit is only active when the outdoor unit is in cooling mode.



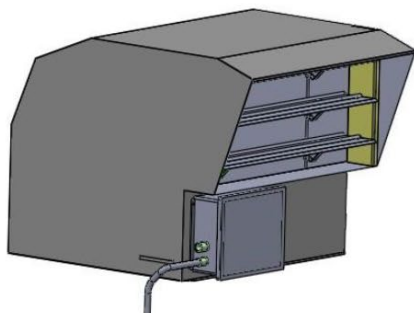
The complete kit consists of the following components, used in combination. The outdoor unit model determines the type and the number of components that are used. All components must be used as specified, to achieve the low temperature rating shown above.

Part Number	Description
LAHN-1	Low Ambient Hood Assembly (main) with damper control box For single fan modules ("S") Also combined with LAHN-2 for larger dual fan modules ("XL")
LAHN-2	Low Ambient Hood Assembly (sub) Combined with the LAHN-1 for dual fan ("XL") modules
LAHN-3	Low Ambient Hood Assembly (main) with damper control box For dual fan ("L") modules
LAHN-4	Low Ambient Hood Assembly (sub) Combined with LAHN-3 for dual fan ("L") modules
	**MESCA Provided Snow/Wind Guards Reference: Bulletin: CM_PAB_100_19_011_CM_LAHN_Low Ambient Hood_TNU Heat Pump_Release

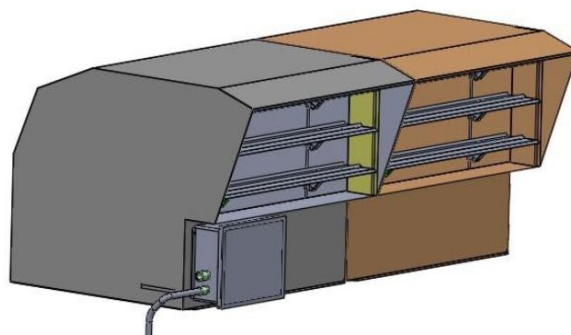
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LAHN-1 (LAHN-3)



LAHN-1 and LAHN-2 (LAHN-3 and LAHN-4) connected



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* The wind deflector is shipped as flat panels (not assembled). The above images are for representation purpose only.

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Components Required Per Outdoor Unit

Component selections for models using multiple modules are based on the modules being placed 1-3/16" apart. If the modules are placed further than 15" apart, additional SWDN-1 wind deflectors may be required. Also, if multiple models are placed next to each other (1-3/16" apart), fewer SWDN-1 wind deflectors may be needed.

Y Standard Efficiency													
Unit Model	Module Size				Package Quantity								
	S	L	XL	EXL	LAHN-1	LAHN-2	LAHN-3	LAHN-4	SWDN-1	SWDN-2	WDN-1	WDN-2	WDN-3
PUHY-P72(T/Y)NU-A(-BS)	1				1				1		1		
PUHY-P96(T/Y)NU-A(-BS)		1					1	1	1			2	
PUHY-P120(T/Y)NU-A(-BS)		1					1	1	1			2	
PUHY-P144(T/Y)NU-A(-BS)		1					1	1	1			2	
PUHY-P168(T/Y)NU-A(-BS)			1		1	1			1		2		
PUHY-P192(T/Y)SNU-A(-BS)		2			2	2			1		**NOT APPLICABLE		
PUHY-P216(T/Y)SNU-A(-BS)		2			2	2			1				
PUHY-P240(T/Y)SNU-A(-BS)		2			2	2			1			4	
PUHY-P264(T/Y)SNU-A(-BS)	1	2			1		2	2	1		1	4	
PUHY-P288(T/Y)SNU-A(-BS)	1	2			1		2	2	1		1	4	
PUHY-P312(T/Y)SNU-A(-BS)	1	2			1		2	2	1		1	4	
PUHY-P336(T/Y)SNU-A(-BS)		3					3	3	1		6		
PUHY-P360(T/Y)SNU-A(-BS)		3					3	3	1		6		
PUHY-P384(T/Y)SNU-A(-BS)		3					3	3	1		6		
PUHY-P408(T/Y)SNU-A(-BS)		3					3	3	1		6		
PUHY-P432(T/Y)SNU-A(-BS)		3					3	3	1		6		

Y High Efficiency													
Unit Model	Module Size				Package Quantity								
	S	L	XL	EXL	LAHN-1	LAHN-2	LAHN-3	LAHN-4	SWDN-1	SWDN-2	WDN-1	WDN-2	WDN-3
PUHY-EP72(T/Y)NU-A(-BS)	1				1				1		1		
PUHY-EP96(T/Y)NU-A(-BS)		1					1	1	1			2	
PUHY-EP120(T/Y)NU-A(-BS)		1					1	1	1			2	
PUHY-EP144(T/Y)NU-A(-BS)		1					1	1	1			2	
PUHY-EP168(T/Y)NU-A(-BS)			1		1	1			1		2		
PUHY-EP192(T/Y)NU-A(-BS)			1		1	1			1		2		
PUHY-EP192(T/Y)SNU-A(-BS)		2			2	2			1			4	
PUHY-EP216(T/Y)NU-A(-BS)				1	1	1				1	1		1
PUHY-EP216(T/Y)SNU-A(-BS)		2			2	2			1		**NOT APPLICABLE		
PUHY-EP240(T/Y)NU-A(-BS)				1	1	1				1	1		1
PUHY-EP240(T/Y)SNU-A(-BS)		2			2	2			1			4	
PUHY-EP264(T/Y)SNU-A(-BS)	1	2			1		2	2	1		1	4	
PUHY-EP288(T/Y)SNU-A(-BS)	1	2			1		2	2	1		1	4	
PUHY-EP312(T/Y)SNU-A(-BS)	1	2			1		2	2	1		1	4	
PUHY-EP336(T/Y)SNU-A(-BS)		3					3	3	1		6		
PUHY-EP360(T/Y)SNU-A(-BS)		3					3	3	1		6		
PUHY-EP384(T/Y)SNU-A(-BS)		3					3	3	1		6		
PUHY-EP408(T/Y)SNU-A(-BS)		3					3	3	1		6		
PUHY-EP432(T/Y)SNU-A(-BS)		3					3	3	1		6		

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Y Hyper-Heat														
Unit Model	Module Size				Package Quantity									
	S	L	XL	EXL	LAHN-1	LAHN-2	LAHN-3	LAHN-4	SWDN-1	SWDN-2	WDN-1	WDN-2	WDN-3	
PUHY-HP72(T/Y)NU-A		1					1	1	1			2		
PUHY-HP96(T/Y)NU-A		1					1	1	1			2		
PUHY-HP120(T/Y)NU-A		1					1	1	1	**NOT APPLICABLE				
PUHY-HP144(T/Y)SNU-A		2					2	2	1			4		
PUHY-HP192(T/Y)SNU-A		2					2	2	1			4		
PUHY-HP240(T/Y)SNU-A		2					2	2	1			4		

****NOT APPLICABLE**

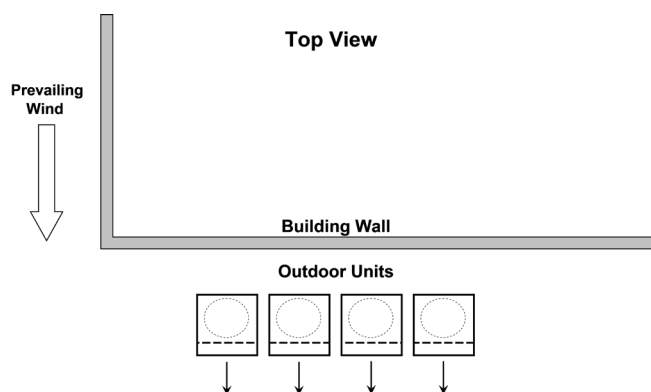
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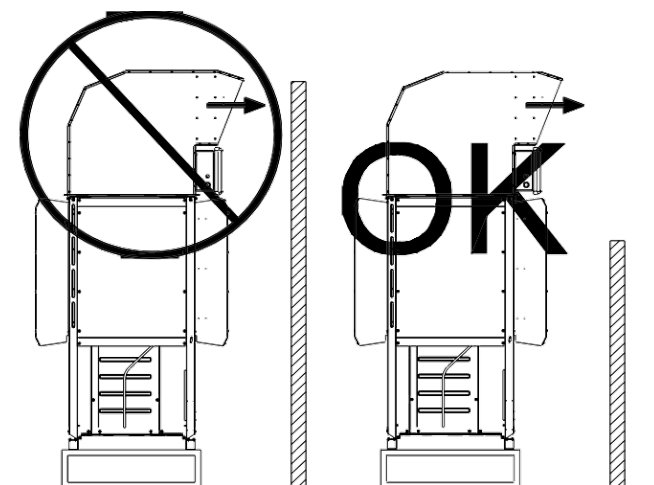
Unit Placement and Clearances

Outdoor units should be located in an area protected from prevailing winds. (Shown below)
In high wind locations, it may be advisable to locate the units within a walled area.

Hood discharge should be directed away from or perpendicular to the prevailing winds. Never toward.
When using the low ambient components, add an additional 8" to the standard mounting clearances.





If the units are surrounded by an enclosure, the discharge of the hood must direct the air out and over the enclosure walls to prevent air recirculation.



IMPORTANT!

If the unit is located in an area with continuous high winds, the unit may require additional bracing. Contact your local distributor for assistance.

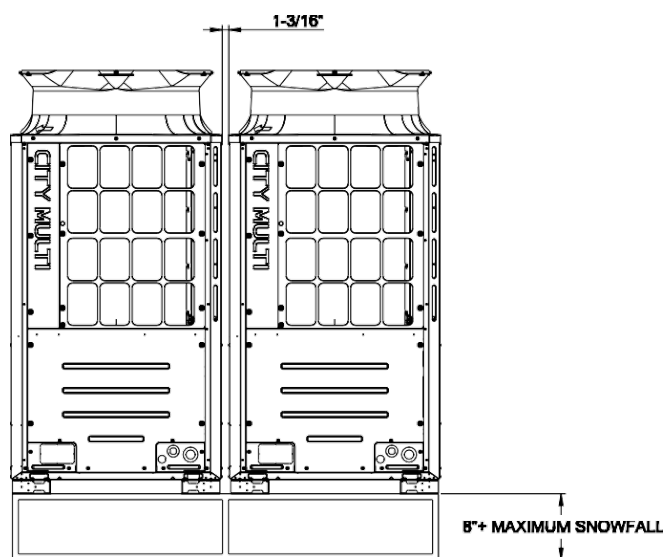
	NOTE When multiple ODUs are placed in close proximity, do not place ODUs such that discharge from one LAK hood will be directed toward another ODU.
	CAUTION If the unit is located in an area with continuous high winds, the unit may require additional bracing. Contact your local dealer for assistance.

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Equipment Supports

When modules are combined, they should be placed minimum 1-3/16" apart. By doing so, only one set of side wind deflectors (SWDN-1) is required per group of modules.

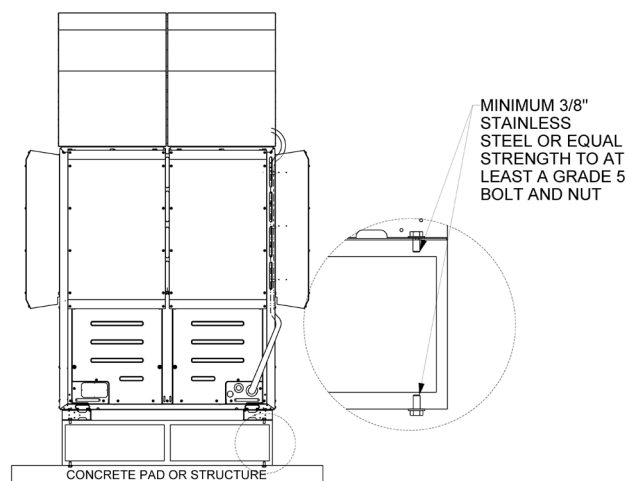


IMPORTANT!

The equipment supports must elevate the unit at least above the expected maximum snowfall level plus 8" (200 mm).

The equipment supports must be an open construction to minimize snow drifting and/or ice formation during defrost.

The equipment support must be firmly attached to the ground or structure. The outdoor unit must be properly attached to this equipment support with 3/8" stainless steel or equal strength to at least a grade 5 bolt



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Additional Rooftop Mounting Guidelines

The preferred mounting location for the outdoor units with a low ambient kit is on the ground. However, if this is not possible, follow all additional installation guidelines when rooftop mounting.

If you have any questions, please consult your distributor.

IMPORTANT!

The low ambient hood(s) increase the overall height of the units and therefore make them more susceptible to wind stresses. Follow all guidelines when using these on rooftop applications.

Outdoor units should be located in an area protected from prevailing winds.

Hood discharge should be directed away from or perpendicular to the prevailing winds. Never toward prevailing winds.

When using the low ambient components, add an additional 8" to the standard mounting clearances.

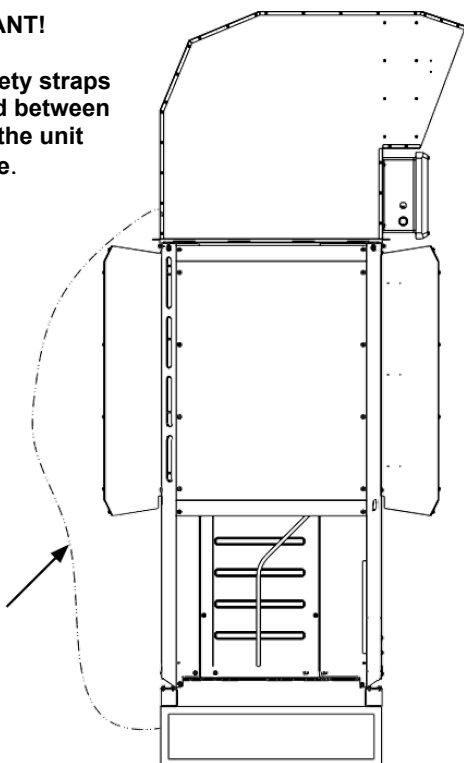
IMPORTANT!

For all roof top installations, safety straps must be attached between the hood(s) and the equipment support structure. Straps should be a minimum 3/16" vinyl coated cable.

IMPORTANT!

For all roof top installations, safety straps must be attached between the hood(s) and the unit support structure.

Safety strap provided by others.

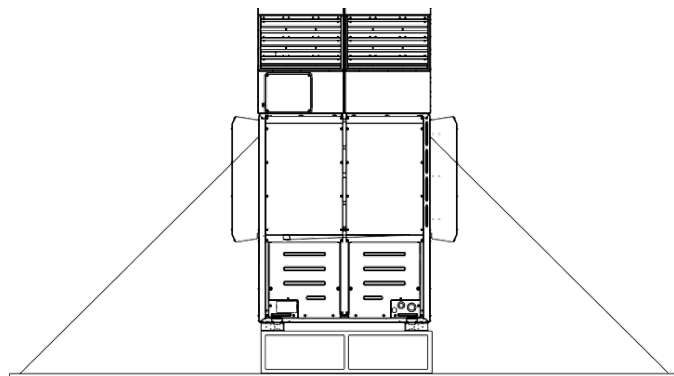


Straps must be attached to the hood where they will not interfere with the movement of the dampers. Attachment to both the hood and mounting structure is to be with a bolt through connection using a bolt 1/4" or larger in diameter.

The outdoor unit and equipment support should be firmly attached to the structure.

Or, if the equipment support is the type that does not attach to the structure, refer to the equipment support manufacturer's guidelines for proper size and construction.

Depending on location, exposure and other factors influencing the wind, additional support (or cables) may be required such as shown below. Contact your distributor for assistance.



Best Practices for Applying CITY MULTI systems in Server Rooms

With the introduction of the low ambient kit and the ability to extend the cooling operating range from 23°F to -10°F, CITY MULTI systems are being used for more server room applications. While the low ambient kit will help to prevent the system from going into freeze protection mode due to an ambient temperature below 23°F, there are still several other factors that could cause the system to go into freeze protection mode and lose cooling capacity even above 23°F.

NOTE for R2 Systems:

*Full cooling capacity down to -10°F.

**In cooling mode or cooling main, to guarantee full cooling capacity, the system must operate with a constant heat load in the zones requiring cooling when ambient temperatures fall below 5°F.

Here are some recommended best practices to limit the likelihood of the system going into freeze protection mode:

- CITY MULTI systems that will operate in outdoor ambient temperatures below 23°F require a low ambient kit.
- Follow all installation instructions for the low ambient kit and outdoor units, including outdoor unit placement and mounting, closely.
- Always have a 100% backup system installed for critical server room applications that require precise temperature control or where an alarm is activated. It is up to the designer to determine which applications are critical. Depending on system size, P-Series units may be a good choice. *Never use M-Series products for critical server room applications*
- Do not combine server room applications and comfort cooling on the same system
- The best way to lay out a server room is to use fewer larger indoor units (one when possible) as opposed to many small indoor units. If multiple indoor units are used, it is best to connect them to one controller and sense from the controller. If no controller is located in the space, mount a remote sensor in place of the return sensor. Ensure even distribution of airflow throughout the space for even loading of all indoor units. In most cases, ducted-style units are preferred because air distribution can be easily customized for the room.
- When using ducted models, whenever possible, system design should target a higher than nominal airflow as shown in the fan curves.
- The system should be sized to have a 50% minimum guaranteed capacity demand year-round. If multiple server rooms are connected, the 50% minimum applies to each room. This means that indoor units should have a minimum 50% demand year-round.
- Run the indoor unit at maximum airflow at all times. If necessary, lock the system on high speed (see chart below for switch settings).

Indoor Unit Model	Switch Setting
PEFY-P15-96NMHU-E(2)	SW7-1 ON
PFFY- P06-24NE(R)MU-E	SW7-1 ON
PVFY-P12-54NAMU-E1	SW7-1 ON
PEFY- P06-54NMAU-E(2/3)	SW4-6 ON
PEFY- P06-24NMSU-E/ER2	SWB in #3 position
PEFY- P72/96NMHSU-E	SW4-6 ON

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- On the PLFY and the PCFY indoor units, the high ceiling setting and the high efficiency filter setting can also be used to maximize airflow.

Indoor Unit Model	Switch Setting
PLFY-EP06-48NEMU-E(1)	* SW21-1 ON/SW21-2 OFF/SW21-3 OFF/SW21-4 ON
PCFY-P15-36NKMU-ER1	SWA #3 position

* Settings are for 4-way airflow. For 2-way or 3-way airflow, refer to the Technical and Service manual.

- 68°F is the lowest temperature set point that is allowed.
- Enable the self-recovery function in case of power failure by turning on DipSW1-9 of indoor units.
- Use remote thermal sensor if air inlet of indoor units is located near the exhaust heat from servers.
- Manage humidifying locally if humidity control is required.
- When restarted or when coming out of a thermal off mode, the CITY MULTI system may take several minutes to begin cooling again.