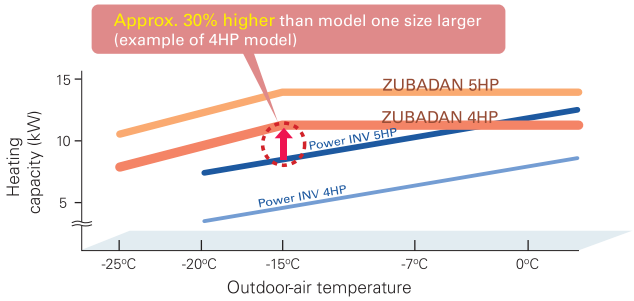
ZUBADAN SERIES

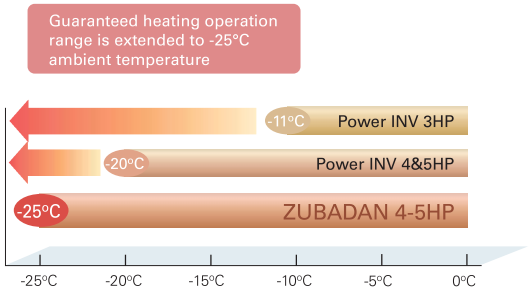
The ZUBADAN Series incorporates an original Flash Injection technology that improves the already high heating capacity of the system. This new member of the series line-up ensures comfortable heat pump-driven heating performance in cold regions.

✻Units in photo are Japanese models.
European model specifications are different.

Improved Heating Performance

Mitsubishi Electric's unique "Flash Injection" circuit achieves remarkably high heating performance. This technology has resulted in an excellent heating capacity rating in outdoor temperatures as low as -15°C, and the guaranteed heating operation range of the heating mode has been extended to -25°C. Accordingly, the heat-pump units of the ZUBADAN Series are perfect for warming homes in the coldest of regions.



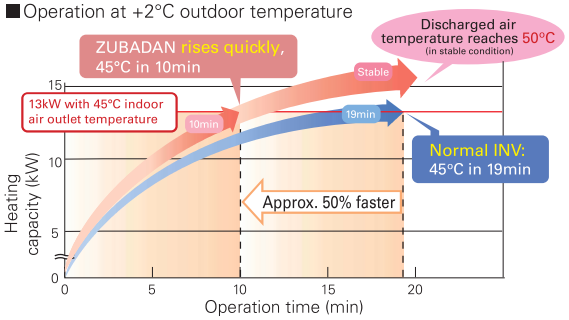


Enhanced Comfort

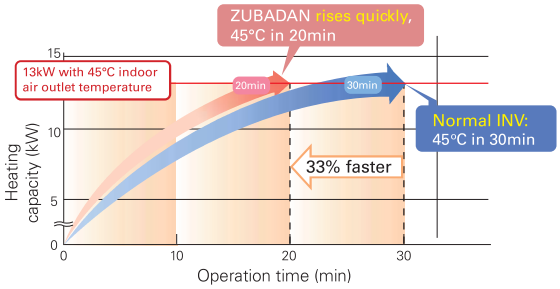
The Flash Injection circuit improves start-up and recover from the defrosting operation. A newly introduced defrost operation control also improves defrost frequency. These features enable the temperature to reach the set temperature more quickly, and contribute to maintaining it at the desired setting.

Quick Start-up

■Operation at +2°C outdoor temperature



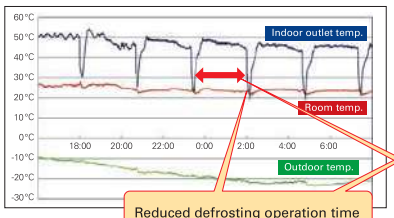
■Operation at -20°C outdoor temperature



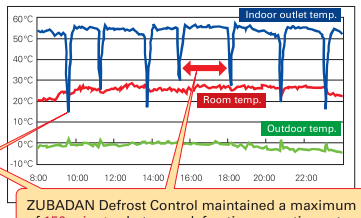
ZUBADAN Defrost Control and Faster Recovery from Defrost Operation

Field Test Results: Office building in Asahikawa, Hokkaido, Japan

■Operation data for 25 Jan. 2005



■Operation data for 2 Dec. 2004



Reduced defrosting operation time from 4 to 3 minutes.

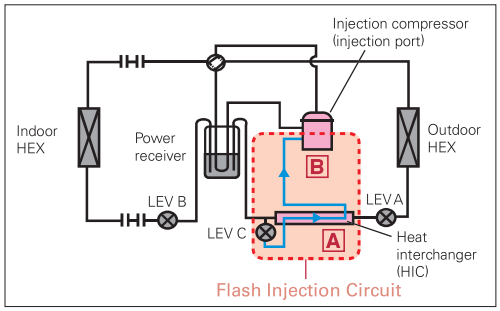
ZUBADAN Defrost Control maintained a maximum interval of 150 minutes between defrosting operations at outdoor temperatures of approximately -20°C and 0°C.

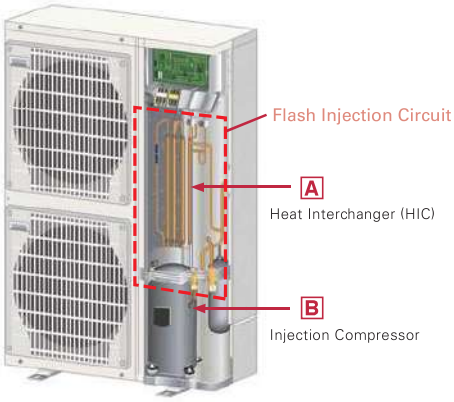
Installation example

Mitsubishi Electric's Flash Injection Technology
The Key to High Heating Performance at Low Outdoor Temperatures

Flash Injection Circuit

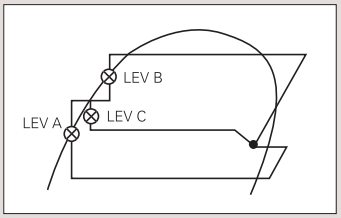
ZUBADAN





The ZUBADAN Series is equipped with Mitsubishi Electric's original Flash Injection Circuit, which is comprised of a bypass circuit and heat interchanger (HIC). The HIC transforms rerouted liquid refrigerant into a gas-liquid state to lower compression load. This process ensures excellent heating performance even when the outdoor temperature drops very low.
In traditional units, when the outdoor temperature is low, the volume of refrigerant circulating in the compressor decreases due to the drop in refrigerant pressure and the protection from overheating caused by high compression, thereby reducing heating capacity. The Flash Injection Circuit injects refrigerant to maintain the refrigerant circulation volume and compressor operation load, thereby maintaining heating capacity.

Mollier Chart Image Representing Flash Injection Circuit Operation



A Heat Interchanger (HIC)

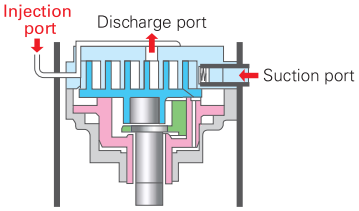
HIC cross-sectional view

Purpose: Transform liquid refrigerant into liquid-gas state

Effect: Injection circuit increases energy efficiency

The compressor is subjected to a heavy load when compressing liquid refrigerant, and the result is lower operation efficiency. The addition of HIC supports refrigerant heat exchange at two different pressure levels. The heat-exchange process transforms the injected liquid refrigerant into a gas liquid state, thereby decreasing the load on the compressor during the compression process.

B Injection Compressor



Purpose: To increase the volume of refrigerant being circulated

Effect: Improves heating capacity at low outdoor temperatures, and enables higher indoor-air outlet temperature adjustment and higher defrost operation speed

Refrigerant passes from the HIC into the compressor through the injection port. Having two refrigerant inlets makes it possible to raise the volume of refrigerant being circulated when the outdoor temperature is low and at the start of heating operation.

To ensure full capacity in cold and snowy regions...

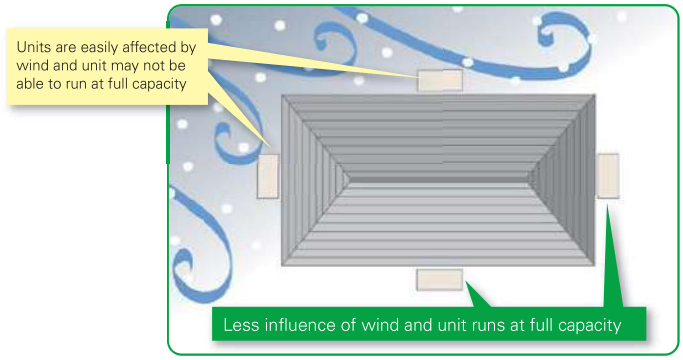
3 Important Points to Remember When Installing the Outdoor Unit

✻RAC/PAC (inc. Air to Water) /MXZ

Wind and snow can significantly reduce capacity.
Be sure to check the infomation below and install the outdoor unit correctly.

1 Installation Location

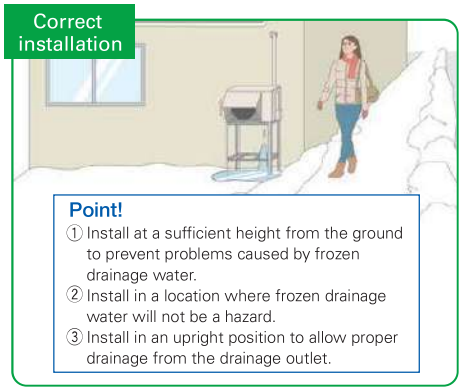
Be aware of the prevailing wind direction in winter and install the outdoor unit where it is as sheltered as possible.

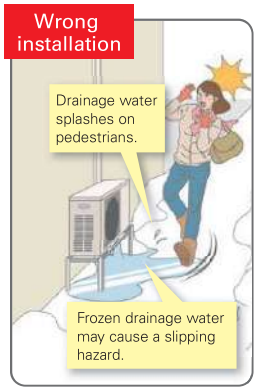


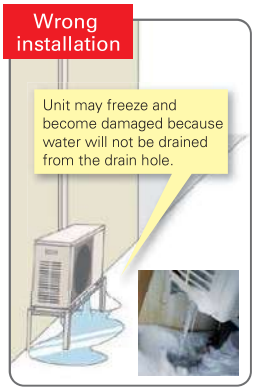
2 Measures for Drainage of Water

Case 1: Unit is installed close to passage (walkway)

Do not install the unit close to passage as drainage water from the unit may freeze and cause a slipping hazard.

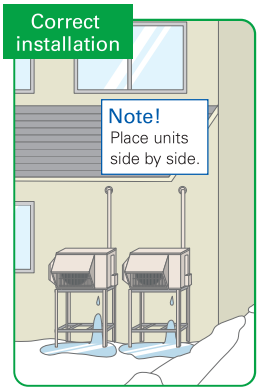


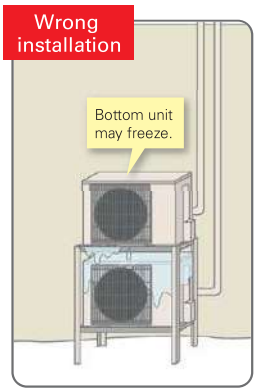




Case 2: Multiple units are installed

Do not install units on top of one another as it may cause frozen drainage water on the bottom unit.





3 Measures for Snow

Unit is installed on the ground

To avoid the adverse effects of snow and frozen drainage water, install the unit on a stand to ensure a sufficient height from the ground.

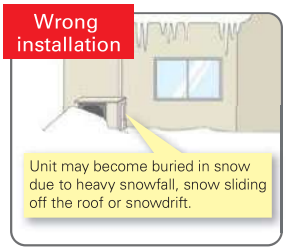
Correct installation

Point!

① Install at a position/height to prevent the unit being buried in snow *1 and the adverse effects of frozen drainage water.*2
② Install so as to avoid the effects of snow or snowdrift.
③ Install so as to avoid the damage from falling snow or icicles.

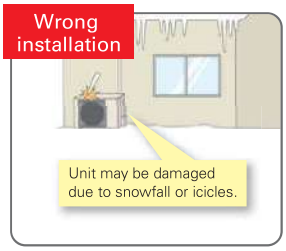
*1 Install at a height above the highest snowfall depth.
*2 Even for correct installations, dripping drainage water may form an icicle which needs to be cleared away regularly to prevent a blocked drainage outlet.

Wrong installation



Unit may become buried in snow due to heavy snowfall, snow sliding off the roof or snowdrift.

Wrong installation

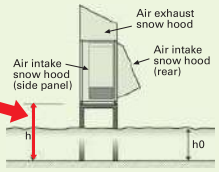


Unit may be damaged due to snowfall or icicles.

Use a stand to add sufficient height to protect the unit heat exchanger from snow and prevent icicles forming during defrost operation.

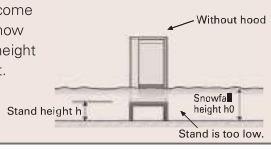
Correct installation

Minimum height (h) should be higher than the highest snowfall depth (h0) +20cm



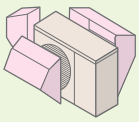
Wrong installation

Unit may become covered in snow if the stand height is insufficient.



Install snow protection hood as necessary

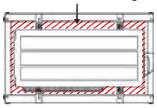
Correct installation



Point!

Install the snow protection hood or other cover in snowy regions.

Necessity of accessories (drain socket & centralised drain pan, stand, snow protection hood, base heater)

	Snowy region	Cold region	Remarks
	Countermeasures for snow	Countermeasures for freezing	
Drain socket, Centralised drain pan	Not used	Not used	Prevents freezing
Stand	Needed	Needed	1. Install so as to prevent the unit being buried in snow (at a height greater than the highest snowfall depth). Be sure that the stand does not obstruct drainage. 2. Install so as to prevent damage to the unit due to frozen drainage water (icicles). <Correct> Clearance to prevent snow accumulating. 
Snow protection hood	Needed *When the installation position is subject to snowfall.	—	1. Prevents heat exchanger from being covered in snow. 2. Prevents snow accumulating inside the air duct.
Base heater	—	Needed	Outdoor units equipped with a heater for cold regions are those with an "H" in the model name. For the cold-climate zone, use of a unit with a heater is strongly recommended. Even for the moderate-climate zone use of a unit with a heater is recommended for regions subject to high humidity in winter.

⚠ CAUTION About disposal of drainage water

When the unit is installed in cold or snowy regions :

Drainage water may freeze in the drain socket/hose and prevent the fan from rotating.

Do not attach a drain socket packaged as an accessory to the unit.

✻ In the case that fitting a drain socket is absolutely necessary, steps must be taken so that the drainage water does not freeze. For more information, please consult Mitsubishi Electric or one of its dealers/resellers.

R32

Split Type Specifications

				NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW
				Power Inverter				ZUBADAN			
Model name				PUZ-SWM80V/YAA	PUZ-SWM100V/YAA	PUZ-SWM120V/YAA	PUZ-SWM140V/YAA	PUZ-SHWM80V/YAA	PUZ-SHWM100V/YAA	PUZ-SHWM120V/YAA	PUZ-SHWM140V/YAA
Refrigerant			mm	R32*1							
Dimensions		HxWxD	kg	1040x1050x480							
Weight				104.5/113.5	105.5/113.5	112/124.5	113.5/124.5	106/115	106.5/115	113.5/125.5	114.5/126
Power supply (V / Phase / Hz)			kW	VAA: 230 / 1-ph / 50, YAA: 400 / 3-ph / 50							
Heating	A7W35*2	Nominal		6.00	8.00	10.00	12.00	6.00	8.00	10.00	12.00
		COP	kW	5.00	5.00	4.85	4.75	5.05	5.00	4.85	4.80
	A2W35*2	Nominal		8.00	10.00	12.00	14.00	8.00	10.00	12.00	14.00
		COP		3.65	3.45	3.25	3.24	3.75	3.50	3.30	3.24
Average climate water outlet 35°C*3		Class		A+++	A+++	A+++	A+++	A+++	A+++	A+++	A+++
		ηs		184%/183%	180%/180%	178%/178%	177%/177%	187%/187%	185%/185%	181%/181%	184%/184%
Average climate water outlet 55°C*3		Class		A++	A++	A++	A++	A++	A++	A++	A++
		ηs		130%/130%	134%/133%	132%/132%	135%/135%	133%/133%	138%/137%	138%/137%	142%/142%
DHW 200(L) Load Profile (Average climate)*4		Class		A+	A+	A+	A+	A+	A+	A+	A+
		ηwh		134%	134%	134%	123%	134%	134%	134%	123%
Max outlet water temperature			°C	60				60			
Cooling	A35W7*2	Nominal	kW	7.10	9.00	10.00	12.50	7.10	9.00	10.00	12.50
		EER		3.20	2.95	2.85	2.60	3.20	2.95	2.85	2.60
	A35W18*2	Nominal	kW	8.00	10.00	12.00	14.00	8.00	10.00	12.00	14.00
		EER		4.90	4.55	4.30	3.62	4.90	4.55	4.30	3.62
PWL (Heating)*5			dB(A)	54	58	58	58	54	58	58	58
Max operating current			A	17/8	22/9	28/12	28/12	19/8	27/9	28/12	35/12
Breaker size			A	20/16	25/16	32/16	32/16	25/16	30/16	32/16	40/16
Piping	Diameter	Gas	mm	ø12.7 (15.88)*6				ø12.7 (15.88)*6			
		Liquid	mm	6.35				6.35			
	Length	Out-In	m	50	50	30*7	30*7	50	50	30*7	30*7
	Height	Out-In	m	30				30			
Guaranteed operation range	Cooling		°C	10°C~52°C				10°C~52°C			
	Heating		°C	-25°C ~24°C				-30°C~24°C			
	DHW		°C	-25°C ~42°C				-30°C ~42°C			

*1 Refrigerant leakage contribute to climate change. Refrigerant with lower global warming potential (GWP) would contribute less to global warming than a refrigerant with higher GWP, if leaked to the atmosphere. This appliance contains a refrigerant fluid with a GWP equal to 550. This means that if 1 kg of this refrigerant fluid would be leaked to the atmosphere, the impact on global warming would be 550 times higher than 1 kg of CO_2, over a period of 100 years. Never try to interfere with the refrigerant circuit yourself or disassemble the product yourself and always ask a professional. The GWP of R32 is 675 in the IPCC 4th Assessment Report.
*2 Air-to-Water values are measured based on EN14511 (Circulation pump input is not included.).
*3 ηs values are measured based on EN14825.
*4 ηwh values are measured based on EN16147.
*5 Sound power levels are measured based on EN12102.
*6 A diameter of 15.88 is necessary for cooling operation. Please refer to our installation manual for details.
*7 Maximum piping length can be up to 50m for heating only operation.

R410A

Split Type Specifications

Outdoor unit

					Power Inverter				
Model name					PUHZ-SW75V/YAA(-BS)	PUHZ-SW100V/YAA(-BS)	PUHZ-SW120V/YHA(-BS)	PUHZ-SW160YKA(-BS)	PUHZ-SW200YKA(-BS)
Refrigerant					R410A*1				
Dimensions		HxWxD		mm	1020×1050×480	1020×1050×480	1350×950×330	1338×1050×330	1338×1050×330
Weight				kg	92/104	114/126	118/130	136	136
Power supply (V / Phase / Hz)					VAA, VHA: 230 / 1-ph / 50, YAA, YHA, YKA: 400 / 3-ph / 50				
Heating	A7W35*2	Nominal		kW	8.0	11.2	16.0	22.0	25.0
		COP			4.40	4.46	4.10	4.20	4.00
	A2W35*2	Nominal		kW	7.5	10.0	12.0	16.0	20.0
		COP			3.40	3.32	3.24	3.11	2.80
Average climate water outlet 35°C*3		Class			A^{++}	A^{++}	A^{++}	A^{++}	A^{++}
		η_s			162/160	167/165	162/162	161	163
Average climate water outlet 55°C*3		Class			A^{++}	A^{++}	A^{++}	A^{++}	A^{++}
		η_s			129/128	130/129	125/125	125	127
DHW 200L(L)/300L(XL) Load Profile (Average climate)*4		Class			A^{+} / A	A^{+} / A	A^{+} / A	–	–
		η_{wh}			145/120	145/120	138/118	–	–
Max outlet water temperature (°C)					60	60	60	–	–
Cooling	A35W7*2	Nominal		kW	7.1	10.0	12.5	16.0	20.0
		EER			2.70	2.83	2.32	2.76	2.25
	A35W18*2	Nominal		kW	7.1	10.0	14.0	18.0	22.0
		EER			4.43	4.47	4.08	4.56	4.1
PWL (Heating)*5				dB(A)	58	60	72	78	78
Max operating current				A	22.0/11.5	28.0/12.0	29.5/13.0	19.0	21.0
Breaker size				A	25/16	32/16	32/16	25	32
Piping	Diameter	Liquid/Gas		mm	9.52/15.88	9.52/15.88	9.52/15.88	9.52/25.4	12.7/25.4
	Length	Out-In		m	40	75	75	80	80
	Height	Out-In		m	10	10	30	30	30
Guaranteed Operating Range	Heating			°C	–20°C~21°C	–20°C~21°C	–20°C~21°C	–20°C~21°C	–20°C~21°C
	DHW			°C	–20°C~35°C	–20°C~35°C	–20°C~35°C	–20°C~35°C	–20°C~35°C
	Cooling			°C	–15°C~46°C	–15°C~46°C	–15°C~46°C	–15°C~46°C	–15°C~46°C

					ZUBADAN			
Model name					PUHZ-SHW80V/YAA(-BS)	PUHZ-SHW112V/YAA	PUHZ SHW140YHA	PUHZ-SHW230YKA2
Refrigerant					R410A*1			
Dimensions		HxWxD		mm	1020×1050×480	1020×1050×480	1350×950×330	1338×1050×330
Weight				kg	116/128	116/128	134	143
Power supply (V / Phase / Hz)					VAA, VHA: 230 / 1-ph / 50, YAA, YHA, YKA: 400 / 3-ph / 50			
Heating	A7W35*2	Nominal		kW	8.0	11.2	14.0	23.0
		COP			4.65	4.40	4.22	3.65
	A2W35*2	Nominal		kW	8.0	11.2	14.0	23.0
		COP			3.55	3.22	2.96	2.37
Average climate water outlet 35°C*3		Class			A^{++}	A^{++}	A^{++}	A^{++}
		η_s			169/167	171/169	163	164
Average climate water outlet 55°C*3		Class			A^{++}	A^{++}	A^{++}	A^{++}
		η_s			133/132	135/135	127	127
DHW 200L(L)/300L(XL) Load Profile (Average climate)*4		Class			A^{+} / A	A^{+} / A	A^{+} / A	–
		η_{wh}			145/120	145/120	138/118	–
Max outlet water temperature (°C)					60	60	60	60
Cooling	A35W7*2	Nominal		kW	7.1	10.0	12.5	20.0
		EER			3.31	2.83	2.17	2.22
	A35W18*2	Nominal		kW	7.1	10	12.5	20.0
		EER			4.52	4.74	4.26	3.55
PWL (Heating)*5				dB(A)	59	60	70	75
Max operating current				A	22/13	28/13	13	20
Breaker size				A	25/16	32/16	16	25
Piping	Diameter	Liquid/Gas		mm	9.52/15.88	9.52/15.88	9.52/15.88	12.7/25.4
	Length	Out-In		m	75	75	75	80
	Height	Out-In		m	30	30	30	30
Guaranteed Operating Range	Heating			°C	–28°C~21°C	–28°C~21°C	–28°C~21°C	–25°C~21°C
	DHW			°C	–28°C~35°C	–28°C~35°C	–28°C~35°C	–25°C~35°C
	Cooling			°C	–15°C~46°C	–15°C~46°C	–15°C~46°C	–15°C~46°C

*1 Refrigerant leakage contribute to climate change. Refrigerant with lower global warming potential (GWP) would contribute less to global warming than a refrigerant with higher GWP, if leaked to the atomosphere. This appliance contains a refrigerant fluid with a GWP equal to 550. This means that if 1 kg of this refrigerant fluid would be leaked to the atmosphere, the impact on global warming would be 550 times higher than 1 kg of CO_2, over a period of 100 years. Never try to interfere with the refrigerant circuit yourself or disassemble the product yourself and always ask a professional. The GWP of R410A is 2088 in the IPCC 4th Assessment Report.
*2 Air-to-Water values are measured based on EN14511 (Circulation pump input is not included.).
*3 η_s values are measured based on EN14825. *4 η_{wh} values are measured based on EN16147. *5 Sound power levels are measured based on EN12102.

R410A

Split type	Medium capacity (7.5kW–14kW)		Large capacity (≧16kW)
ZUBADAN New Generation	 PUHZ-SHW80/112AA	 PUHZ-SHW140	 PUHZ-SHW230
POWER INVERTER	 PUHZ-SW75/100AA	 PUHZ-SW120	 PUHZ-SW160/200