MITSUBISHI ELECTRIC

Changes for the Better

for a greener tomorrow

Mitsubishi Electric Quality

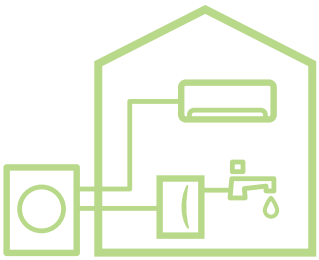
Ingenious Use of Waste Heat from Air Conditioners

Evolutionary air conditioning and hot-water supply system recycles previously discarded waste heat from air conditioners to heat water

COP 7.0*

Mr.SLIM+

Hybrid heat recovery system



*Conditions for Air-to-Air coolong: Indoor 27°C (dry bulb) / 19°C (wet bulb) ; Outdoor 35°C (dry bulb)
*Water temperrature: 45°C

Using waste heat from air conditioners to heat water

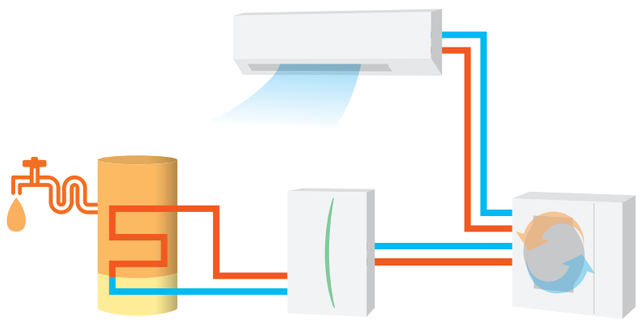
Mr. SLIM+ —The smart air conditioning and hot-water supply system conceived from eco-conscious ideas

More ecological | Heat recovery function recycles waste heat from air conditioners

COP 7.0*

Air conditioners normally exhaust hot air from the outdoor unit as waste heat in cooling operation. With Mr. SLIM+, however, the heat that is exhausted by conventional air conditioning systems is recycled and simultaneously transferred to the hot-water supply system, where it's used to heat water.

In conventional systems, the air-heat exchanger in the outdoor unit works as a condenser during air conditioning operation. The heat of the indoor-air is transferred to the outside-air and exhausted as waste heat.
The new circuit in Mr.SLIM+ uses a water-heat exchanger for supplying hot water as the condenser. When the air conditioning and hot-water systems are running at the same time, heat is recycled and used rather than being exhausted as waste heat.
"COP7.0* attained at water temperature of 45°C and standard air conditioning operation conditions"
Traditionally, when using a hot-water supply system where the air-heat exchanger is in the outdoor unit, operation may not be possible when the outside temperature is very high. However, since Mr.SLIM+ uses the Air-to-Air indoor unit for air conditioning operation and there's no heat exchange with outside-air, it's possible to use the hot-water supply system even if the ambient temperature is very high.
"Hot-water supply is possible (in heat recovery mode) even when the temperature outside is high (outside temperature = 46°C)"



*Conditions for Air-to-Air coolong: Indoor 27°C (dry bulb) / 19°C (wet bulb) ; Outdoor 35°C (dry bulb) *Water temperrature: 45°C

Space savings | Air conditioning and hot-water supply in one system – Installation space reduced

Mr.SLIM+ utilizes an evolutionary "2-in-1" design that combines two original Mitsubishi Electric system technologies (i.e., Air-to-Air and Air-to-Water) using a single outdoor unit.

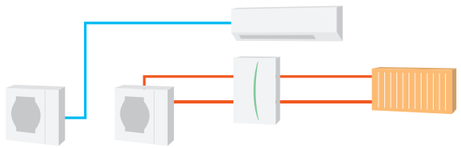
Save on installation

Mitsubishi Electric's legendary Air-to-Air and Air-to-Water systems have been integrated into a new configuration in which two systems share just one outdoor unit. The installation area required outside is cut in half, realizing a space savings of 50%.

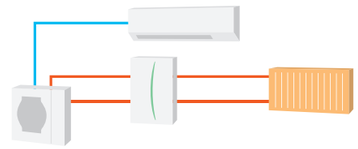
Save on construction

Previously, two systems including two separate outdoor units were required. But the all-new Mr.SLIM+ simplifies everything into a single system configuration, improving reliability and quality by reducing installation time. That results in savings in both time and money, which are passed on to our customers.

Conventional system



Hybrid heat recovery system



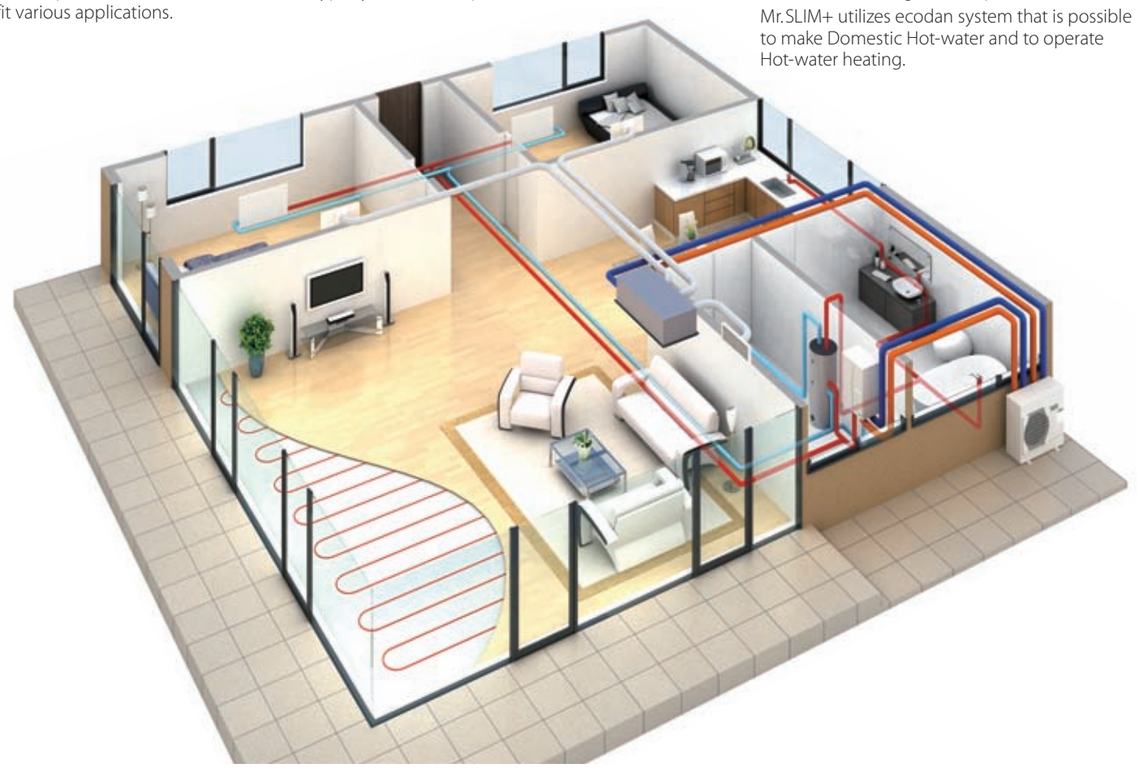
1 Unit, 2 Roles – Total Comfort Year-round

Air conditioning and hot-water supply matching the needs of each room

All-in-one outdoor unit
(air conditioning, hot-water supply and hot-water heating)

Mr.SLIM for Air-to-Air
Mr.SLIM+ utilizes a duct system that enables the air conditioning or heating of multiple rooms, and other indoor unit type systems that is possible to fit various applications.

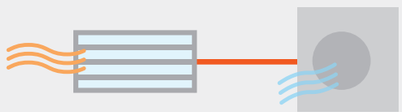
ecodan for Air-to-Water
✓Hot-water supply (Domestic Hot-water supply)
✓Hot-water heating for multiple rooms
Mr.SLIM+ utilizes ecodan system that is possible to make Domestic Hot-water and to operate Hot-water heating.



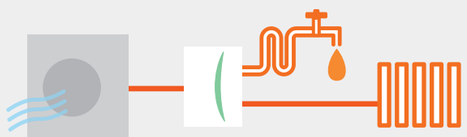
Various operations

Mr.SLIM / Air to Air (Air Cooling)
Air-to-Air cooling using Air-to-Air indoor unit

Mr.SLIM / Air to Air (Air Heating)
Air-to-Air heating using Air-to-Air indoor unit



ecodan / Air to Water (Hot-water heating + DHW)
Air-to-Water operation using Air-to-Water indoor unit

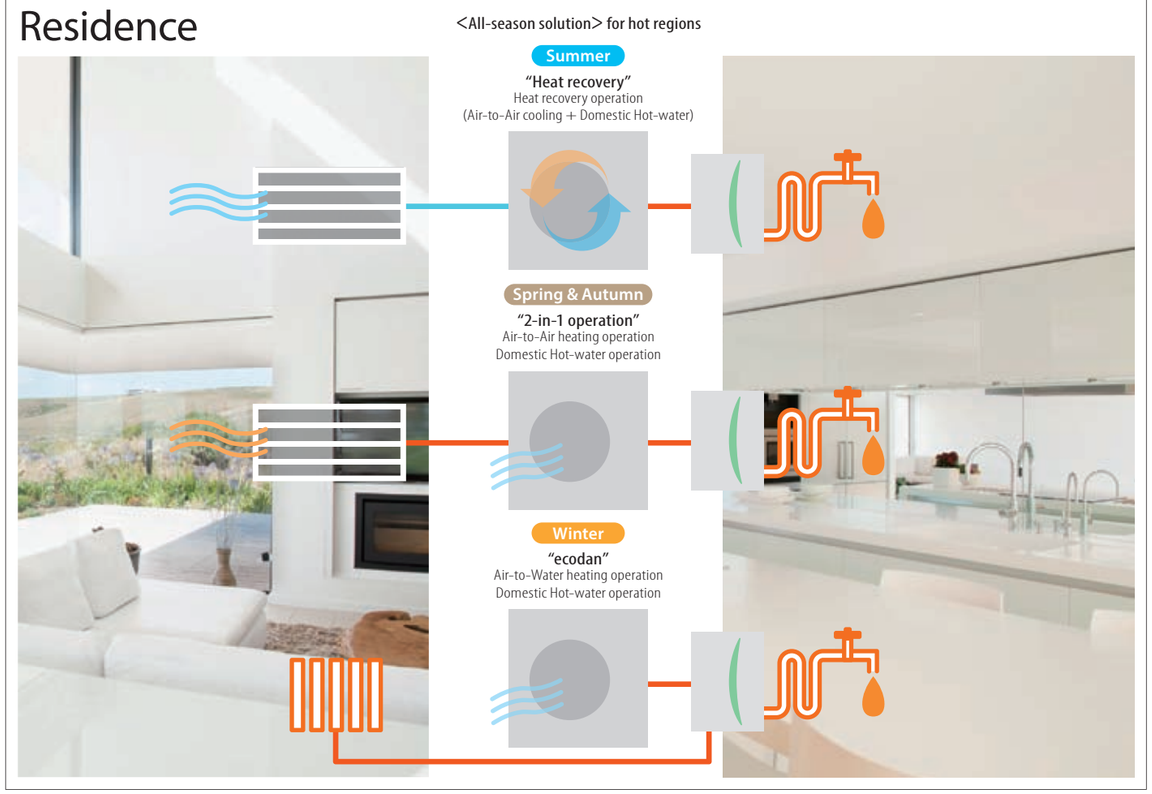


Mr.SLIM + ecodan / Air to Air (Air Cooling) + DHW
Heat recovery using both Air-to-Air and Air-to-Water indoor units

Hot regions

All-in-one system solution for cooling market

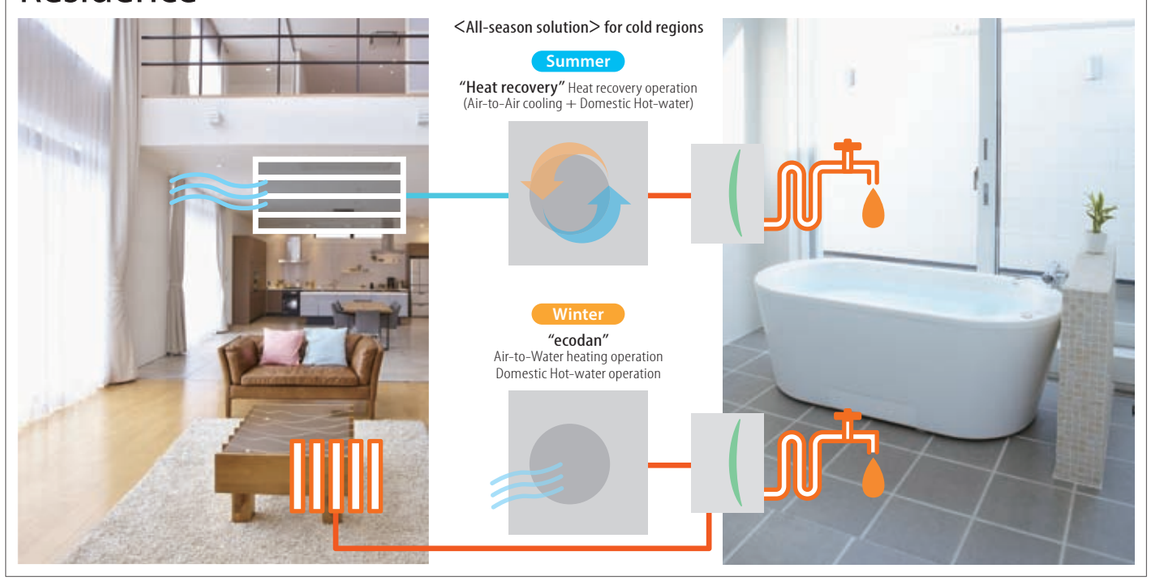
Residence



Cold regions

All-in-one system solution for heating market

Residence



Commercial-use

Heat recovery achieves impressive operation efficiency – Mr.SLIM+ simultaneously offers highly efficient air conditioning and hot-water supply wherever needed (e.g. beauty salons, petrol stations, banks)

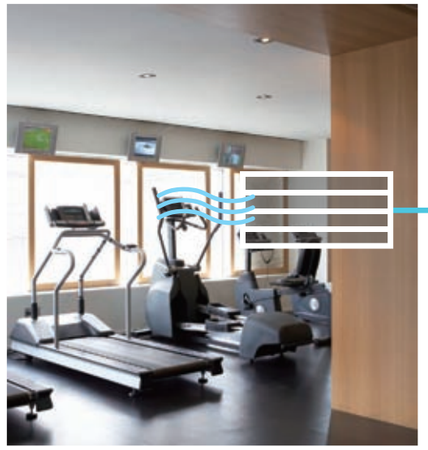
Bar/Night club

Summer Winter

"Heat recovery" Heat recovery operation
(Air-to-Air cooling + Hot-water system)

Application: Bar/Night club (e.g. off-gas grid areas)
Existing cooling system: Air-to-Air system
Existing hot-water system: Electric or Combination boilers
Air-to-Air cooling space: Hall space
Hot water: For kitchen

Sports club



Summer Winter

"Heat recovery" Heat recovery operation
(Air-to-Air cooling + Hot-water system)

Application: Sports club (e.g. off-gas grid areas)
Existing cooling system: Air-to-Air system
Existing hot-water system: Electric or Combination boilers
Air-to-Air cooling space: Training room
Hot water: For shower room

Small office

Summer Winter

"Heat recovery" Heat recovery operation
(Air-to-Air cooling + Hot-water system)

Application: Small office (e.g. off-gas grid areas)
Existing cooling system: Air-to-Air system
Existing hot-water system: Electric or Combination boilers
Air-to-Air cooling space: Machine room
Hot water: For kitchen

Lineup

Mr.SLIM+ offers a diverse lineup to select from, ensuring maximum flexibility in home/office design. Choose from a variety of models seven indoor units and ecodan indoor units.

Indoor unit

PLA-ZRP71BA

PKA-RP71KAL

PSA-RP71KA

PCA-RP71KA

PCA-RP71HA

PEAD-RP71JAQ

PEAD-RP71JALQ

ecodan
Air-to-Water indoor unit

Hydro box

EHSC-VM2B
EHSC-VM6B
EHSC-YM9B
EHSC-TM9B
EHSC-VM6EB
EHSC-YM9EB

Cylinder unit

EHST20C-VM2B
EHST20C-VM6B
EHST20C-YM9B
EHST20C-VM6EB
EHST20C-YM9EB
EHST20C-VM6SB
EHST20C-VM6HB
EHST20C-YM9HB
EHST20C-TM9HB

*2012 B generation split type models
*Reversible model cannot be connected

Outdoor unit

PUHZ-FRP71VHA

Specifications

Indoor unit						PLA-ZRP71BA	PKA-RP71KAL	PCA-RP71KA	PCA-RP71HA	PSA-RP71KA	PEAD-RP71JAQ	PEAD-RP71JALQ
Outdoor unit						PUHZ-FRP71VHA	PUHZ-FRP71VHA	PUHZ-FRP71VHA	PUHZ-FRP71VHA	PUHZ-FRP71VHA	PUHZ-FRP71VHA	PUHZ-FRP71VHA
Refrigerant						R410A *1	R410A *1	R410A *1	R410A *1	R410A *1	R410A *1	R410A *1
Power supply		Outdoor (V/Phase/Hz)				230/Single/50	230/Single/50	230/Single/50	230/Single/50	230/Single/50	230/Single/50	230/Single/50
Air-to-Air (ATA)	Cooling	Capacity	Rated		kW	7.1	7.1	7.1	7.1	7.1	7.1	7.1
			Min-Max		kW	3.3-8.1	3.3-8.1	3.3-8.1	3.3-8.1	3.3-8.1	3.3-8.1	3.3-8.1
		Total input	Rated		kW	1.85	1.88	1.90	2.26	1.97	2.10	2.08
		EER				3.84	3.78	3.74	3.14	3.60	3.38	3.41
		Design load			kW	7.1	7.1	7.1	7.1	7.1	7.1	7.1
		Annual electricity consumption *2			kWh/a	382	393	387	462	408	459	441
		SEER *4				6.5	6.3	6.4	5.4	6.1	5.4	5.6
			Energy-efficiency class			A++	A++	A++	A	A++	A	A+
	Heating (average season)	Capacity	Rated		kW	8.0	8.0	8.0	8.0	8.0	8.0	8.0
			Min-Max		kW	3.5-10.2	3.5-10.2	3.5-10.2	3.5-10.2	3.5-10.2	3.5-10.2	3.5-10.2
		Total input	Rated		kW	2.05	2.26	2.26	2.42	2.28	2.09	2.09
		COP				3.90	3.54	3.54	3.14	3.33	3.83	3.83
		Design load			kW	4.7	4.7	4.7	4.7	4.7	4.9	4.9
		Declared capacity	at reference design temperature		kW	4.7 (-10°C)	4.7 (-10°C)	4.7 (-10°C)	4.7 (-10°C)	4.7 (-10°C)	4.9 (-10°C)	4.9 (-10°C)
			at bivalent temperature		kW	4.7 (-10°C)	4.7 (-10°C)	4.7 (-10°C)	4.7 (-10°C)	4.7 (-10°C)	4.9 (-10°C)	4.9 (-10°C)
			at operation limit temperature		kW	3.5 (-20°C)	3.5 (-20°C)	3.5 (-20°C)	3.5 (-20°C)	3.5 (-20°C)	3.7 (-20°C)	3.7 (-20°C)
		Back-up heating capacity			kW	0	0	0	0	0	0	0
		Annual electricity consumption *2			kWh/a	1,510	1,569	1,555	1,787	1,709	1,799	1,799
		SCOP *4				4.4	4.2	4.2	3.7	3.9	3.8	3.8
			Energy-efficiency class			A+	A+	A+	A	A	A	A
Air-to-Water (ATW)	Nominal flow rate (for heating)				L/min	22.90						
	Heating *5	A7W35	Capacity		kW	8.00						
			Input		kW	1.96						
			COP			4.08						
		A2W35	Capacity		kW	7.50						
			Input		kW	2.65						
			COP			2.83						
	Heat recovery (ATA cooling & ATW) *6	W45	Capacity (ATA cooling + ATW)		kW	7.1+8.0	7.1+8.0	7.1+8.0	7.1+8.0	7.1+8.0	7.1+8.0	7.1+8.0
			Input		kW	1.90	1.93	1.95	2.31	2.02	2.15	2.13
			COP			7.95	7.82	7.74	6.54	7.48	7.02	7.09
		W55	Capacity (ATA cooling + ATW)		kW	7.1+9.0	7.1+9.0	7.1+9.0	6.4+9.0	7.1+9.0	7.1+9.0	7.1+9.0
			Input		kW	2.97	3.00	3.02	3.25	3.09	3.22	3.20
			COP			5.42	5.37	5.33	4.74	5.21	5.00	5.03
	ATW indoor unit					Cylinder unit or Hydro box (see previous page)						
Outdoor unit		Dimensions	HxWxD		mm	943-950-330 (+30)	943-950-330 (+30)	943-950-330 (+30)	943-950-330 (+30)	943-950-330 (+30)	943-950-330 (+30)	943-950-330 (+30)
		Weight			kg	73	73	73	73	73	73	73
		Air volume	Cooling		m^3/min	55	55	55	55	55	55	55
			Heating		m^3/min	55	55	55	55	55	55	55
		Sound level (SPL)	Cooling		dB(A)	47	47	47	47	47	47	47
			Heat recovery		dB(A)	47	47	47	47	47	47	47
			ATA Heating		dB(A)	48	48	48	48	48	48	48
			ATW Heating		dB(A)	48	48	48	48	48	48	48
		Sound level (PWL)	Cooling		dB(A)	67	67	67	67	67	67	67
			Heat recovery		dB(A)	67	67	67	67	67	67	67
			ATA Heating		dB(A)	68	68	68	68	68	68	68
			ATW Heating		dB(A)	68	68	68	68	68	68	68
		Operating current (max)			A	19.0	19.0	19.0	19.0	19.0	19.0	19.0
		Breaker size			A	25	25	25	25	25	25	25
Ext.piping		Diameter	Liquid/Gas		mm	9.52/15.88	9.52/15.88	9.52/15.88	9.52/15.88	9.52/15.88	9.52/15.88	9.52/15.88
		Max.length	Out-In		m	30 (for ATA) + 30 (for ATW)	30 (for ATA) + 30 (for ATW)	30 (for ATA) + 30 (for ATW)	30 (for ATA) + 30 (for ATW)	30 (for ATA) + 30 (for ATW)	30 (for ATA) + 30 (for ATW)	30 (for ATA) + 30 (for ATW)
		Max.height	Out-In		m	20	20	20	20	20	20	20
Guaranteed operating range (outdoor)			Cooling *3		°C	-15~+46	-15~+46	-15~+46	-15~+46	-15~+46	-15~+46	-15~+46
			Heating		°C	-20~+21	-20~+21	-20~+21	-20~+21	-20~+21	-20~+21	-20~+21
			ATW		°C	-20~+35	-20~+35	-20~+35	-20~+35	-20~+35	-20~+35	-20~+35
			Heat recovery		°C	+15~+46	+15~+46	+15~+46	+15~+46	+15~+46	+15~+46	+15~+46

*1 Refrigerant leakage contributes to climate change. Refrigerant with lower global warming potential (GWP) contributes 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 1,975. This means that if 1 kg of this refrigerant fluid leaked to the atmosphere, the impact on global warming would be 1,975 times higher than that of 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; always ask a professional.

*2 Energy consumption based on standard test results. Actual energy consumption will depend on how the appliance is used and where it is located.

*3 Optional air protection guide is required where ambient temperature is lower than -5°C.

*4 SEER/SCOP values are measured based on EN14825.

*5 Ait-to-Water values are measured based on EN14511 (Circulation pump input is not included.).

*6 Conditions for Air-to-Air cooling: Indoor 27°C (dry bulb) /19°C (wet bulb); Outdoor 35°C (dry bulb).

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