The Renewable Solutions Provider

Making a World of Difference

Heat Pump Air Curtains

MITSUBISHI ELECTRIC

Air Conditioning | Heating
Ventilation | Controls

thermoscreens®

The need for Heat Pump Air Curtains

With more and more businesses operating an 'open door' policy, the need for an energy efficient way to maintain comfort levels is growing.

Whilst conventional air curtains will help to lower energy usage by reducing the amount of heating or cooling required by a building with an open door, adding a Heat Pump Air Curtain to the building will significantly improve the energy efficiency and save on annual running costs.

Leading heat pump manufacturers Mitsubishi Electric, have collaborated with air curtain specialists Thermoscreens, to develop a range of air curtains using advanced heat pump technology for optimum performance and energy efficient operation.

The name Mitsubishi is synonymous with excellence

Founded in 1921, Mitsubishi Electric is now a global, market leading environmental technologies manufacturer. In the UK, the Living Environmental Systems Division provides pioneering solutions that heat, cool, ventilate and control our buildings in some of the most energy efficient ways possible.

We believe that global climate challenges need local solutions. Our aim is to help individuals and businesses reduce the energy consumption of their buildings and their running costs.

At Mitsubishi Electric we have evolved and today we offer advanced environmental systems that really can **make a world of difference**.

Thermoscreens are pioneers in air curtains

Pioneers of air curtains across Europe, Thermoscreens are leading manufacturers of quality air solutions with a global reputation for excellence.

Their comprehensive range is ideal for use in applications across the retail, leisure and commercial sector. With products exported to over 50 countries worldwide, Thermoscreens manufacturer to the exacting standards of BS EN ISO 9001:2000 as well as the Environmental Management System BS EN ISO 14001:2004, to ensure quality, efficiency and reliability.

Our latest generation of **Heat Pump Air Curtains** maintain comfort levels whilst delivering the highest level of energy efficiency

Create the perfect environment

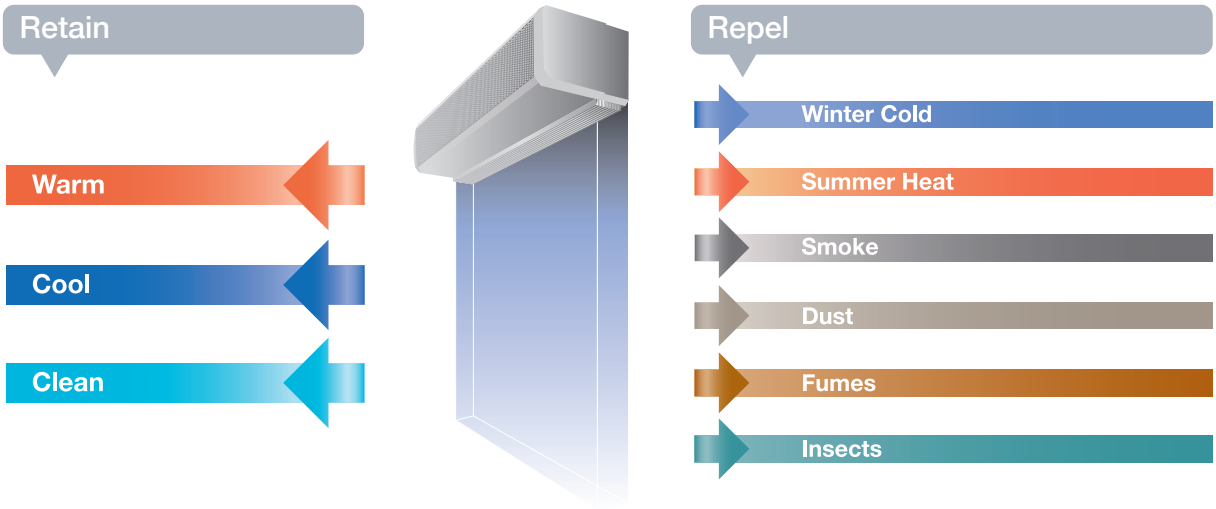
As rising energy costs and increasing legislation drive the demand for greater energy efficiency, much more intelligent solutions are needed and **Heat Pump Air Curtains** fit in line with this demand.

Air Curtains

An air curtain creates a clean, comfortable climate allowing for an open door policy which gives uninterrupted access for trade, protects against outdoor pollution and saves energy by preventing conditioned air from escaping.

Features and Benefits include:

- Reduced CO_2 emissions
- Reduced running costs
- Energy efficient Inverter technology
- Available as free standing or recessed models
- A wide range of air curtain sizes are available in 1m, 1.5m and 2m lengths
- Allows open door policy in retail outlets
- Easy to install and maintain



Compatible Models

Mr Slim - one of Britain's best-selling air conditioning split-systems which combine efficiency and complete versatility.

City Multi - a multi and direct expansion type of air conditioning system which offers excellent seasonal energy efficiency, low running costs and reduced CO_2 emissions.

with Heat Pump Air Curtains

Heat Pumps

Heat pump technology offers high energy efficiency by upgrading naturally occurring low temperature heat into useful high temperature heat.

Benefits include:

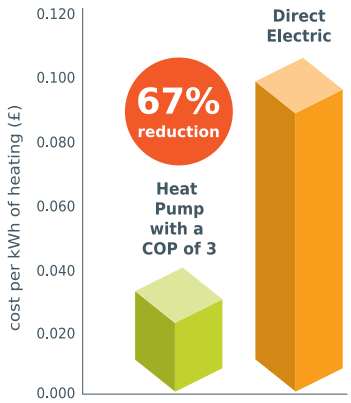
- Proven high efficiency
- Flexibility
- Improved energy efficiency
- CO_2 reduction

In comparison to a standard electric heater, one kilowatt of energy in gives just under one kilowatt of heat to the building. With a typical electrically driven heat pump, one kilowatt of energy gives a heat output of approximately three kilowatts, making it **300% more efficient**. This ratio is known as the Coefficient of Performance (COP).

Further Comparisons

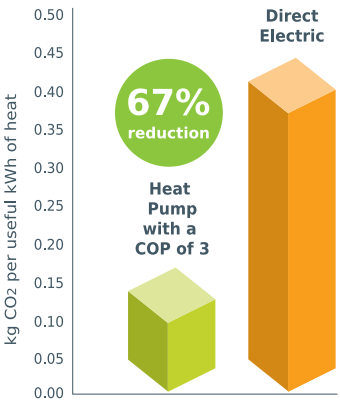
- When using a Heat Pump Air Curtain, the CO_2 emissions are far less than a conventional electrically heated air curtain
- The carbon emissions of a heat pump are approximately 67% less than when connected to a direct electric heaters due to its ability to upgrade the energy harvested from the outside air
- By calculating a payback period by adding the annual running cost of each system to the capital cost for every year of use, the result is a payback against the equivalent direct electric system of approximately 1.1 years*

Running cost
air curtain comparison



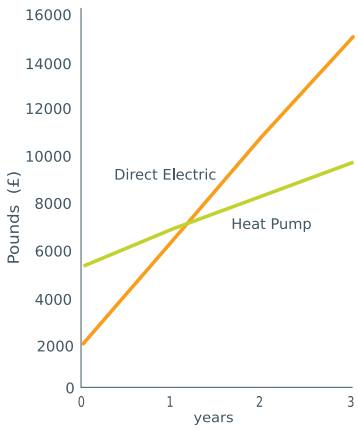
Established from independent BRE testing

CO_2 emissions
air curtain comparison



Established from independent BRE testing

***Payback period**



Fully compliant with Legislation

Part L of The Building Regulations

Through Part L, the Government aims to reduce CO_2 emissions from new commercial buildings by an average of 9% when compared against the 2010 standards.

This means that energy consumption has to be reduced as much as possible by reducing the heat lost from a building, thus making it more air tight and improving levels of insulation. This in turn places increasing importance on the way air conditioning systems are designed, selected, installed and maintained with the key requirement for energy efficiency to help meet carbon reduction targets. Mitsubishi Electric's advanced range of heat pump air conditioning units can transfer heat around a building to balance cooling and heating loads. Systems can also be added to reuse wasted heat for hot water supply, thereby removing the need for direct fossil fuel use on site that typically results in higher direct emission levels.

The Ecodesign Directive (ErP)

Air conditioning is regarded as a significant user of energy in buildings across the EU. Driving the visibility of seasonal efficiency, the Ecodesign Directive is focusing on air conditioning <12kW in a bid to reduce overall energy consumptions, and to accelerate market transformation to more energy efficient products.

The Ecodesign Directive is now working on air conditioning >12kW, which will use minimum seasonal performance, maximum standby power and maximum sound levels for measuring and rating units. Current plans are to introduce this from 2017 with a view to improve seasonal efficiency.

Heat Pump Air Curtains meet these regulations due to their high energy efficiency and low carbon emissions, also with the addition of controls, energy consumption can be monitored and subsequently reduced further.

Mitsubishi Electric's Green Gateway

Green Gateway is Mitsubishi Electric Living Environmental System's commitment to the environment.

It strives to instill positive changes in Mitsubishi Electric's own operations as well as seeking to influence those of its customers. For further information visit the following website: **greengateway.mitsubishielectric.co.uk**

The Importance of Control

Our latest range of Heat Pump Air Curtains offer the highest level of control to ensure maximum comfort and energy efficiency wherever the application.

Available either as a standalone remote controller or fully integrated with any leading Building Energy Management System (BEMS) our comprehensive range offers:

- A choice of 50% or 100% heat output
- Full integration with BEMS, including BACnet, Modbus, Lonworks, etc
- Set point function
- Remote control
- Ambient/Heat switch
- Auto mode to match heat to the demand

To further reduce energy use, the range also offers enhanced control options, including **weather compensation** as standard on Mr Slim models. **This achieves significant energy and carbon savings**. Weather compensation automatically adjusts the heat pump compressor in accordance with the outside air temperature.

MelcoRetail

MelcoRetail is a dedicated retail interface

MelcoRetail provides connection of up to 50 M Series, Mr Slim and City Multi indoor units to be communicated via either optional MelcoBEMS Mini RS485 adapters or M-NET centralised controllers AE-200E/EW-50A. It is ideal for commercial premises where a Heat Pump Air Curtain would be fitted.

- Monitor and control up to 6 split indoor units
- Dedicated retail interface
- Control third party equipment
- Advanced energy saving and energy metering
- Ideal for commercial M2M applications
- Ethernet or GPRS remote connectivity

Air curtain helps increase energy efficiency and customer comfort

As a world famous brand, McDonald's Restaurants faces the challenge of delivering high standards of service and comfort for customers whilst maximising operational and energy efficiency across a diverse range of premises.

This is where a comparison at two High Street sites is paying real dividends for the corporation after it looked for ways of delivering complete customer comfort in the most energy efficient way possible. Sites in Stoke-on-Trent and Milton Keynes were chosen because they were almost identical in terms of footfall, sales and opening hours.

Both sites with similar weather conditions are situated on exposed High Streets and suffered from problems with unused seats by the door due to cold drafts.

"It's going to be cold in there no matter what you do with your heating", explains McDonald's UK Equipment & Capital Investment Consultant Dave Holden. So we decided that we needed to target this cold, incoming air at source rather than trying to heat the whole room".

For an accurate comparison, the restaurant in Milton Keynes was fitted with a Heat Pump Air Curtain connected to a Mr Slim air conditioning unit above its sliding door, while in Stoke-on-Trent the outlet was left to operate without the installation.

The heat pump-driven unit blows a 'curtain' of air across the doorway protecting the inside environment from outside drafts and debris whilst helping to maintain a stable and comfortable temperature inside the restaurant - and also preventing leakage and wasted energy costs.

The figures proved to be fairly staggering with the Milton Keynes store showing a saving of 59kW per day in energy consumed compared to the Stoke location - equating to a direct saving in energy of £6.20 per day.

After installation of the air curtain, conditions in Milton Keynes improved significantly meaning that all of the seats were now full, including the ones by the door. It eliminated cold spots and drafts and created a much more comfortable environment due to this protective barrier.

The test led to an initial roll-out to a further 50 stores and is now a standard specification item on all restaurants with sliding doors.

Dave says: **"We estimate that even if we have them set on heating only, they will have paid for themselves within two winters".**

"I spoke to one manager who, before he had it installed, had 20 seats near the entrance door that no one ever sat in because it was too cold. Now, without spending money on extra seats, he has effectively regained 20 spaces which has got to be good business for any restaurant".

Dave Holden has overseen a programme of energy improvements that has helped maximise customer comfort and increase the number of useful seats in each restaurant

Installation Summary

Mr Slim PHV DXE Heat Pump with **Thermoscreens wall-mounted air curtain**.

The restaurants had electronic doors which improve accessibility for customers but also increases exposure to the outside air.

The air curtain minimises the amount of cold air entering the seating area, whilst keeping warm air inside to maximise efficiency.

The use of a Mr Slim inverter-driven, outdoor heat pump significantly minimises the energy used and helps maximise comfort in the restaurant.

Mr.SLIM™

HP DXE - Recessed

MODEL		HP1000R DXE	HP1500R DXE	HP1500R DXE	HP2000R DXE	HP2000R DXE	HP2000R DXE
CAPACITY (kW)	Heating (nominal)	8.3	13.2	13.2	15.7	15.7	21
	Cooling (nominal)	7.4	11.8	11.8	14	14	16.8
AIRFLOW MAX (l/s)		364	575	575	720	720	720
SOUND PRESSURE LEVEL AT 3m (dBA)	Lo-Mi1-Hi	47-54-57	45-52-56	45-52-56	47-54-57	47-54-57	45-54-57
WEIGHT (kg)		52	75	75	93	93	93
DIMENSIONS (mm)	Width x Depth x Height	1250 x 348 x 539	1750 x 348 x 539	1750 x 348 x 539	2340 x 348 x 539	2340 x 348 x 539	2340 x 348 x 539
ELECTRICAL SUPPLY*1		220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz
PHASE*1		Single	Single	Single	Single	Single	Single
RUNNING CURRENT (A)*1		0.8	1.2	1.2	1.4	1.4	1.4
MAINS CABLE No. Cores*1		3	3	3	3	3	3
UNIFORMITY AT OUTLET (%)*2		90	92	92	90	90	90
MAX MOUNTING HEIGHT (m)		3.2	3.2	3.2	3.2	3.2	3.2

Notes: *1 For indoor units with electric heaters enabled, 380-415V 3ph power supply (7.3A HP1000, 12.1A HP1500, 14.4A HP2000). *2 Tested to ISO 27327.

HP DXE - Free Standing

MODEL		HP1000 DXE	HP1500 DXE	HP1500 DXE	HP2000 DXE	HP2000 DXE
CAPACITY (kW)	Heating (nominal)	8.3	13.2	13.2	15.7	15.7
	Cooling (nominal)	7.4	11.8	11.8	14.0	14.0
AIRFLOW MAX (l/s)		364	575	575	720	720
SOUND PRESSURE LEVEL AT 3m (dBA)	Lo-Mi1-Hi	47-54-57	45-52-56	45-52-56	47-54-57	47-54-57
WEIGHT (kg)		46	67	67	84	84
DIMENSIONS (mm)	Width x Depth x Height	1300 x 468 x 306	1825 x 468 x 306	1825 x 468 x 306	2350 x 468 x 306	2350 x 468 x 306
ELECTRICAL SUPPLY*1		220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz
PHASE*1		Single	Single	Single	Single	Single
RUNNING CURRENT (A)*1		0.8	1.2	1.2	1.4	1.4
MAINS CABLE No. Cores*1		3	3	3	3	3
UNIFORMITY AT OUTLET (%)*2		90	92	92	90	90
MAX MOUNTING HEIGHT (m)		3.2	3.2	3.2	3.2	3.2

Notes: *1 For indoor units with electric heaters enabled, 380-415V 3ph power supply (7.3A HP1000, 12.1A HP1500, 14.4A HP2000). *21 Tested to ISO 27327.

PUHZ-ZRP - Outdoor Units

MODEL		PUHZ-ZRP71VHA	PUHZ-ZRP125VKA2	PUHZ-ZRP125YKA2 Three Phase	PUHZ-ZRP140VKA2	PUHZ-ZRP140YKA2 Three Phase	PUHZ-ZRP200YKA Three Phase
SOUND PRESSURE LEVEL (dBA)	Heating/Cooling	48 / 47	52 / 50	52 / 50	52 / 50	52 / 50	62 / 59
SOUND POWER LEVEL (dBA)	Cooling	67	70	70	70	70	-
WEIGHT (kg)		67	116	125	118	131	135
DIMENSIONS (mm)	Width x Depth x Height	950 x 330 +30 x 943	1050 x 330 +40 x 1338	1050 x 330 +40 x 1338	1050 x 330 +40 x 1338	1050 x 330 +40 x 1338	1050 x 330 +40 x 1338
ELECTRICAL SUPPLY		220-240V, 50Hz	220-240V, 50Hz	380-415V, 50Hz	220-240V, 50Hz	380-415V, 50Hz	380-415V, 50Hz
PHASE		Single	Single	Three	Single	Three	Three
STARTING CURRENT (A)		5	5	5	5	5	5
FUSE RATING (BS88) - HRC (A)		25	32	16	40	16	20
INTERCONNECTING CABLE		2 Core	2 Core	2 Core	2 Core	2 Core	2 Core
MAX PIPE LENGTH (m)		50	75	75	75	75	100
MAX HEIGHT DIFFERENCE (m)		30	30	30	30	30	30
CHARGE R410A (kg) - 30m		3.5	5.0	5.0	5.0	5.0	5.0

Notes: *1 For indoor units with electric heaters enabled, 380-415V 3ph power supply (7.3A HP1000, 12.1A HP1500, 14.4A HP2000). *2 Tested to ISO 27327.

CITY MULTI

VRF - Recessed

MODEL		VRF HP1000R DXE	VRF HP1500R DXE	VRF HP2000R DXE	VRF HP2000R DXE HO*3
CAPACITY (KW)	HEATING (NOMINAL)	8.3	13.2	15.7	21.0
	COOLING (NOMINAL)	7.4	11.8	14.0	16.8
AIRFLOW MAX (L/S)		364	575	720	720
SOUND PRESSURE LEVEL AT 3M (DBA) LO-MI1-HI		50-55-58	49-54-58	50-55-58	50-55-58
WEIGHT (KG)		52	75	93	93
DIMENSIONS (MM)	WIDTH	1250	1750	2340	2340
	DEPTH	348	348	348	348
	HEIGHT	539	539	539	539
ELECTRICAL SUPPLY*1		220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz
PHASE*1		Single	Single	Single	Single
RUNNING CURRENT (A)*1		0.8	1.2	1.4	1.4
MAINS CABLE NO. CORES*1		3	3	3	3
UNIFORMITY AT OUTLET (%)*2		90	92	90	90
UNIT SIZE (INDEX)		P71	P125	P140	P200
MAX MOUNTING HEIGHT (M)		3.3	3.3	3.3	3.3
COMPATIBLE OUTDOOR UNITS		PUHY / PURY / PQHY / PQRY	PUHY / PURY / PQHY / PQRY	PUHY / PURY / PQHY / PQRY	PUHY / PURY / PQHY / PQRY

Notes: *1 For indoor units with electric defrost heaters enabled, 3ph, 380-415V power supply (7.3A HP1000, 12.1A HP1500, 14.4A HP2000). *2 Tested to ISO27327. *3 Includes twin LEV kit for installation with the air curtain.

VRF - Free Standing

MODEL		VRF HP1000 DXE	VRF HP1500 DXE	VRF HP2000 DXE	VRF HP2000 DXE HO*3
CAPACITY (KW)	HEATING (NOMINAL)	8.3	13.2	15.7	21.0
	COOLING (NOMINAL)	7.4	11.8	14	16.8
AIRFLOW MAX (L/S)		364	575	720	720
SOUND PRESSURE LEVEL AT 3M (DBA) LO-MI1-HI		50-55-58	49-54-58	50-55-58	50-55-58
WEIGHT (KG)		46	67	84	84
DIMENSIONS (MM)	WIDTH	1300	1825	2350	2350
	DEPTH	468	468	468	468
	HEIGHT	306	306	306	306
ELECTRICAL SUPPLY*1		220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz
PHASE*1		Single	Single	Single	Single
RUNNING CURRENT (A)*1		0.8	1.2	1.4	1.4
MAINS CABLE NO. CORES*1		3	3	3	3
UNIFORMITY AT OUTLET (%)*2		90	92	90	90
UNIT SIZE (INDEX)		P71	P125	P140	P250
MAX MOUNTING HEIGHT (M)		3.3	3.3	3.3	3.3
COMPATIBLE OUTDOOR UNITS		PUHY / PURY / PQHY / PQRY	PUHY / PURY / PQHY / PQRY	PUHY / PURY / PQHY / PQRY	PUHY / PURY / PQHY / PQRY

Notes: *1 For indoor units with electric defrost heaters enabled, 3ph, 380-415V power supply (7.3A HP1000, 12.1A HP1500, 14.4A HP2000). *2 Tested to ISO27327. *3 Includes twin LEV kit for installation with the air curtain.

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Changes for the Better

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