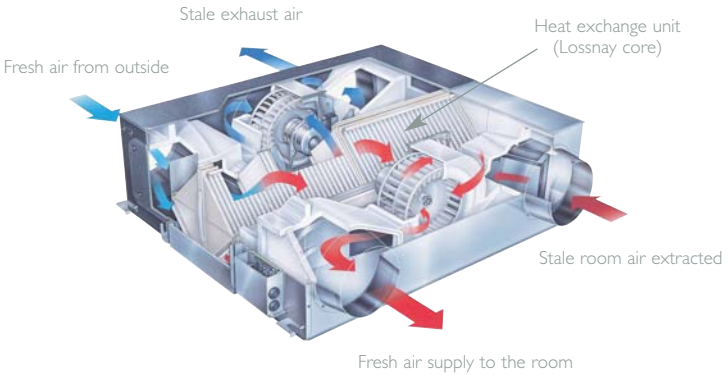
Lossnay

Total Heat Exchangers

M series | Mr.SLIM | CITY MULTI | Lossnay | CONTROLS | TECHNICAL

MITSUBISHI ELECTRIC
AIR CONDITIONING SYSTEMS



Simple and

Excellent air quality and unbeatable Heat Exchange Efficiency

Poor air quality can be attributed to many problems arising in the workplace or in the home. It is believed to contribute to a significant loss in productivity, low morale and higher rates of sickness amongst many employees. The object of providing good ventilation alongside air conditioning in residential and commercial buildings is to provide conditions under which people can live and work in comfort and safety.

Developed and refined over the past 30 years, the Lossnay system has perfected the recovery of waste energy. The units reduce overall energy costs by extracting stale air and then recovering the heating or cooling energy to either warm or cool incoming fresh air. By utilising this energy, the Lossnay system can save up to 30% on initial capital costs of heating and cooling plant.

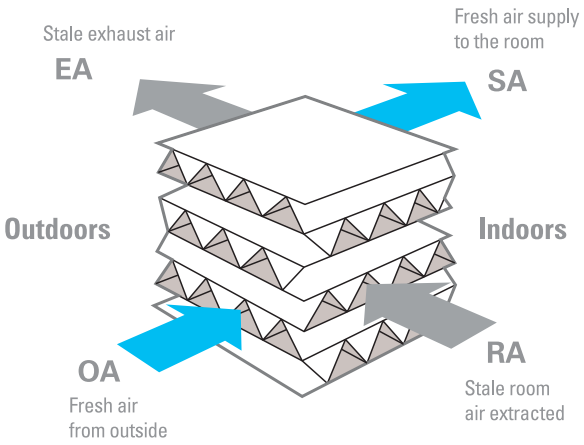
Effective

The Secret of the Lossnay System

The secret of the Lossnay system lies in the cross flow, plate fin structure of the heat exchange unit.

A diaphragm made of specially processed paper fully separates inlet and exhaust air supplies, ensuring that only fresh air is introduced to the indoor environment.

The superior heat-transfer and moisture permeability of the special paper ensures highly efficient total heat exchange (temperature and humidity) when inlet and exhaust air supplies cross in the Lossnay element.



Main features of Lossnay

Effective ventilation

Lossnay's simultaneous air exhaust/supply provides effective ventilation. Conventional ventilators (i.e. extract propeller fans) do not work effectively within air tight buildings because of the negative air pressures involved.

Good energy recovery

Total heat (sensible and latent) recovery provides a comfortable air temperature within the room. The energy saved by using Lossnay contributes towards lowering the heating or cooling requirement within the building, therefore reducing the energy requirement and running costs.

Free cooling function (LGH series)

When the outdoor temperature is lower than the indoor air conditioned temperature in the summer, Lossnay provides fresh outdoor cool air to reduce the indoor air temperature.

Good sound attenuation

As the Lossnay core is made of paper and the permeable holes are small, the Lossnay core provides outstanding soundproofing properties and is appropriate for sound proof rooms.

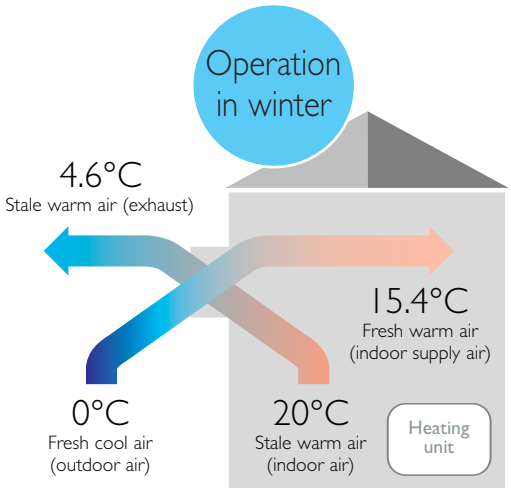
Part L2 Building Regulations

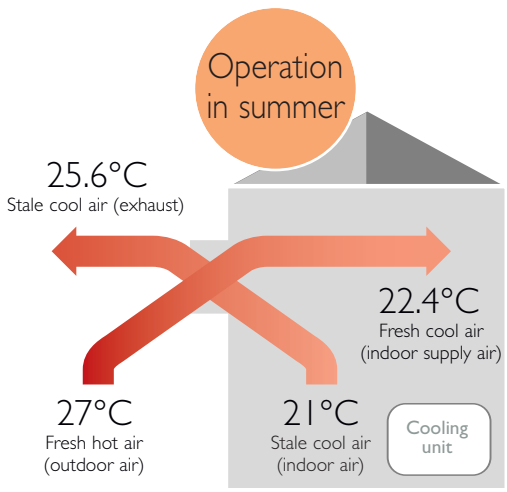
With the introduction of Part L2 (Part J in Scotland), new building design is changing to become more airtight, as well as energy efficient. The need for fresh air has remained the same however and thus poses new challenges for modern design. Lossnay fully meets these challenges due to its basic principal and its efficient heat recovery. See the **Technical Information Section** for CIBSE recommended fresh air rates.

Enhanced Capital Allowance (ECA)

LGH-RX4 now qualifies for Enhanced Capital Allowances.

Total heat recovery concept





Using a Lossnay LGH-100RX4 in the winter example above, 8.9kW of heat is recovered per hour from the extracted air.

Lossnay working in conjunction with air conditioning

Lossnay units can work either on their own to provide fresh air into a room, or in combination with Mr Slim or City Multi ceiling cassettes and ducted units.

When working together with air conditioning, Lossnay units can provide significant energy savings by automatically utilising free cooling as well as heat recovery. As the Lossnay and the air conditioning unit are connected by a two core communication cable, they can work together to optimise both comfort and energy efficiency. This is done by the Lossnay reading the mode and set temperature the air conditioning wants, then utilising the outside temperature to help achieve the required temperature either by free cooling or heat recovery.

When using Lossnay in conjunction with air conditioning the heating and cooling loads can be reduced significantly, reducing the running costs by up to 30% compared with air conditioning systems without heat recovery systems.

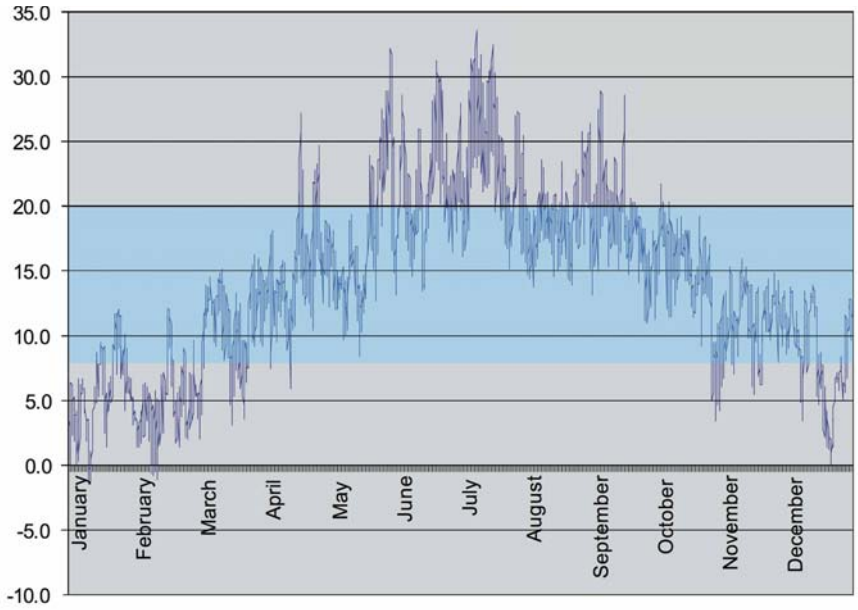
Above example: One LGH25RX4 serving one PLA-RP71BA. Room size 7m x 7m, 140w/m² heat load. 7 people per room, 10litres/per/person of fresh to meet Part F requirements. Maximum amount of fresh air to be introduced is 30% of the fan coil volume. Ceiling cassettes may require fresh air casements. Free cooling is not available below 8°C when interlocked with Mr Slim or City Multi units.

Lossnay fan speed button is incorporated within the standard PAR-21MAA and PAR-F27MEA controllers

The graph opposite shows the hourly temperature for 2006 in London between 8.00am - 6.00p.m. The point to note is the amount of free cooling available during these hours, as well as the heat recovery below (22% of the time) and cooling recovery above (20% of the time). Lossnay is a year round solution for providing fresh air.

Free cooling provided by **Lossnay** was available in London over **58%** of the time in 2006

Ambient Temperature - London 2006, 8am - 6pm



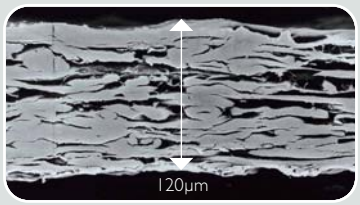
Over 58% of the time between 8am-6pm, the temperature in London was between 8°C and 20°C, allowing free cooling when the air conditioning setpoint was 21°C in cooling mode. If the setpoint is higher, free cooling is increased.

Hyper Lossnay Core

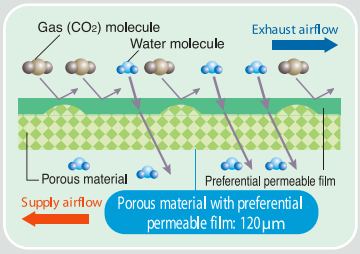
LGH-RX4 Lossnay units feature the newly developed "Hyper Lossnay Core", which uses non-porous, ultra-thin film to achieve high enthalpy exchange efficiency. With a thickness of only 25µm, these are the thinnest in the world and are approximately one fifth the thickness of previous Mitsubishi Electric products. Moisture permeability is dramatically increased and enthalpy heat exchange greatly improved.

Comparison of new and old Lossnay Core cross-sections

Previous Lossnay Core

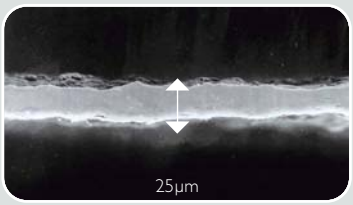


Porous partition plate

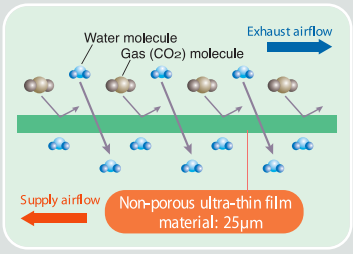


Consists of a two-layer construction using a specially processed material made of a preferential permeable film on a porous base material. This provides moisture permeability and air barrier properties, but the two-layer construction makes a certain thickness unavoidable.

New Hyper Lossnay Core



Non-porous film partition plate



Consists of a specially processed structure based on a single-layer, non-porous, ultra-thin film material. Moisture exchange (water vapour transmission) is promoted by the special film, which increases the affinity for moisture (the thinner the film, the higher the permeability). The non-porous ultra-thin film material acts as a barrier against air leakage.

Comparison of material used in Hyper Lossnay Core (25µm ultra-thin film) with regular paper

The thinnest paper used in regular printing is 51µm thick (used in dictionaries) and the material of the Hyper Lossnay Core is approximately half the thickness of this.

Use	Thickness
Hyper Lossnay Core material	25µm
Previous Mitsubishi Electric material	120µm
Photocopier paper	100µm
Dictionary paper	51µm

Connect ducts in two different directions (Outdoor vents)

Ducts can be connected in two different directions to the outdoor vents thanks to collars and aperture plates that can be interchangeably placed in two different positions. This flexibility allows for installations close to the surface of a wall and helps avoid cases where the stale air exhaust vent would be blocked by an obstruction of some kind. This makes both the planning and installation of Lossnay units that much simpler.

Standard installation	Installation with duct direction changed
A space is necessary to prevent the influx of rainwater.	Can be installed close to the surface of the wall.
EA OA	EA OA
	Changing the duct direction
Collar / Aperture Plate	Exchangeable

Interface simply

Because an adaptor now comes as standard equipment, networking LGH RX4 systems connected with Mitsubishi Electric's line of air conditioners has never been easier. There is no need to purchase any extra parts, creating the possibility of very simple systems and keeping initial costs as well as construction time and trouble to an affordable minimum.

Multi-Ventilation Mode

Enables the appropriate supply/exhaust balance to be selected to suit usage, environment and location.

All LGH models feature the "Multi-ventilation Mode," which allows the air supply/exhaust balance to be varied dynamically to suit the usage environment and location. Modes can be selected easily by setting the connectors on the circuit board.

Ventilation Mode	Supply Airflow	Exhaust Airflow
Power air supply/exhaust mode	High	High
Power air supply mode	High	Low
Power air exhaust mode	Low	High
Energy-saving ventilation mode	Low	Low

* "High" can be further set to "Extra high" using the dip switch.

Normal Office

Providing efficient ventilation while maintaining air supply/exhaust balance...

Power air supply & air exhaust

Most widely-used pattern forming the basis for traditional ventilation design. This allows the most efficient ventilation while maintaining the air supply/exhaust balance. The optimum ventilation rate can be maintained by selecting the Power air supply/exhaust mode with both the air supply & air exhaust switched to "High" (or "Extra high") on the main unit. For example in an office, the control switches can be set to "High" to run in Power air supply/exhaust mode when a large number of people are in the office, then switched to "Low" to run in Energy-saving ventilation mode late at night or on holidays when there are few people present.

Small Office or Building

Using Lossnay compensates for using extractor fans...

Power air supply

In smaller offices or buildings, there may be insufficient air supply to the main rooms or offices due to the excessive exhaust via extractor fans located in toilets or kitchen areas. Setting to Power air supply mode with the air supply switch on "High" (or "Extra high") and the air exhaust switch on "Low" on the main unit, allows efficient ventilation while making up for the insufficient air supply.

Smoking Areas

Priority on air exhaust...

Power air exhaust

In locations such as smoking areas, dirty air must be exhausted swiftly. Setting the Power air exhaust mode with the air supply switch on "Low" and the air exhaust switch on "High" (or "Extra high") on the main unit allows efficient extraction of cigarette smoke and odours. Maintaining the area at a negative air pressure also prevents dirty air from spreading to surrounding areas.

Enhanced Capital Allowance & Part L2

The need for energy efficiency is paramount and is determined by legislation and regulation. To encourage efficient use of energy, the UK Government introduced the Enhanced Capital Allowance Scheme (ECA). The number of qualifying products on the Energy Technology Product List has recently been expanded and includes 'air to air energy recovery'. The Lossnay heat recovery units (LGH-RX4) have been designed to ensure businesses qualify for ECA and benefit from the utmost efficiency, both financially and environmentally.

Qualified for Energy Technology List www.eca.gov.uk

How Enhanced Capital Allowances Work

Enhanced Capital Allowances are used to encourage businesses to invest in particular types of equipment by providing up-front tax relief, as 100% of the allowances can be reclaimed in the first year. So, using the below example of a £1000 investment in equipment that qualifies for ECA's, the company could reclaim £300 in the first year.

	Enhanced Capital Allowance
Tax Rate	30%
% of expenditure to which allowance applies	100%
Equipment plus installation costs	£1000
Taxable amount reduced by	100% OF £1000 = £1000
FIRST YEAR SAVING	30% of £1000 = £300

Part L2

Part L2 of the Building Regulations is undergoing a major change. With building regulations tightened up from April 2006, new commercial buildings have to be pressure tested to show they are airtight and energy efficient. Proof will also be needed to show that the new buildings will not overheat and the occupants will be able to work comfortably. This means that the fresh air requirements are even more important than ever before. Lossnay offers many features that will help the building designer as well as the occupants and with Lossnay's high efficiency, unique controllability and its modular design approach, Lossnay will assist greatly in Part L2 compliance.

Enhanced Capital Allowance Scheme (ECA)

The **key features** of the ECA scheme:

- Under the scheme, all businesses liable for UK corporation tax, are able to claim an enhanced capital allowance on any qualifying expenditure (regardless of size and location of business or whether in the industrial or commercial sector)
- Businesses can offset the full cost of specific technologies (such as Lossnay) against taxable profits of the period of the investment
- In order to qualify for this scheme, technology has to meet the energy saving criteria as published in the Energy Technology Criteria List. Our LGH-RX4 Lossnay systems fully meet this criteria in their drive for energy efficiency
- Only investment in new and unused plant and machinery qualify

For further instructions go to **www.eca.gov.uk** and click on Mitsubishi Electric Air Conditioning under the air to air energy recovery category.

Restaurants

A restaurant can never be too clean and its air never too fresh

The atmosphere of a restaurant is crucial to securing and retaining customers. Cleanliness is the key to an attractive atmosphere and restaurants devote significant effort to ensuring their premises are sanitary. Sanitation and cleanliness, however, are not enough. No matter how clean a restaurant may look, if there are bothersome odours lingering in the air, all those efforts go to waste and the restaurant's clean image is tarnished. For these reasons, Lossnay's superior ventilation capabilities ensure that every breath is a fresh one and a pleasant environment is maintained for guests at all times. Lossnay also keeps owners happy with its remarkable heat recovery technology that supplies fresh outdoor air with minimal change to indoor temperature, saving on energy costs.

If it's Lossnay

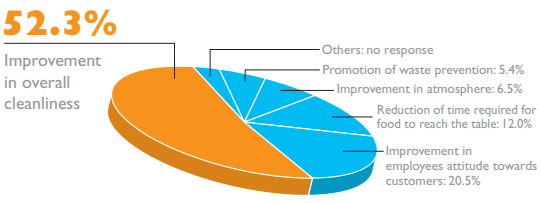
Lossnay works to remove stale air and supply fresh, clean air free of the odours associated with cooking, cigarettes and the people working and dining.

Change in room temperature is kept to a minimum during ventilation thanks to the heat-recovery function.

The Lossnay operate very quietly, so those in the midst of enjoying their meals will not be bothered by any excess noise.

A large array of Lossnay sizes are available to match the layout of just about any restaurant.

What would you most like to see improved in restaurants?



1996 Foodstuffs Consumption Monitor, Second Periodic Survey
(Ministry of Agriculture, Forestry and Fisheries, Japan)

Schools

Creating the best possible environment for our children to succeed

Children deserve all the help we can give them to grow up healthy, happy and prosperous. No matter how good a school's curriculum, no matter how positive and enthusiastic the teacher, a child who does not feel well will have a hard time learning. A constant flow of fresh air is nowhere as important as it is in our schools. In classrooms where large numbers of students are gathered for long periods of time, carbonic gases have the tendency to accumulate, decreasing the levels of oxygen that are vital for alertness and concentration. This is especially true during the winter months when windows tend to remain closed. Lossnay ventilates fresh outdoor air into classrooms to replenish the supply of oxygen and expels not only carbon dioxide, but also other pollutants and odours that inevitably sully the air.

If it's Lossnay

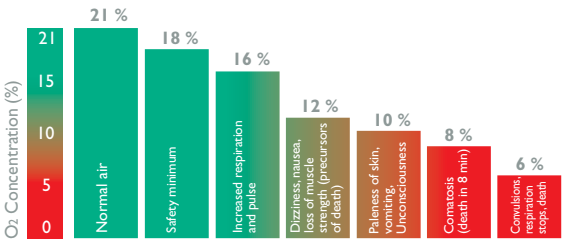
The continuous influx of fresh, outdoor air and the exhaust of stale, indoor air ensure that the indoor oxygen level is maintained at just the right balance for comfort and health.

Occupants have the luxury of breathing fresh air at all times even in highly air-tight buildings.

Lossnay's sound attenuation qualities prevent outside noise from penetrating into the room, helping to maintain a quiet environment for productive study.

Heat-exchange technology prevents fluctuations in temperature creating significant energy savings when either heating or cooling a room.

O_2 Concentration and Deficiency



Lossnay Selection / Payback Software and Quick Reference Guide available to order from your local sales office

Offices

Fresh air - improving the overall quality of working life

Many office buildings today are heavily insulated, air-tight structures with little or no natural ventilation. The unnatural environment created by air conditioners without added ventilation is a breeding ground for bacteria. Factor this in with the accumulation of pollutants and odours in the form of cigarette smoke, formaldehyde, pollen, dust, carbon dioxide and the necessity of ventilation becomes ever more apparent. In fact, poorly ventilated buildings can give rise to Sick Building Syndrome, a malady that is known to cause headaches, sore eyes, itching and loss of concentration. This results not only in discomfort at best and sickness at worst for the building's occupants, but also the reduced productivity of the workforce. Fresh air, effectively ventilated throughout the building is therefore essential to the overall quality of working life.

If it's Lossnay

Simultaneous forced-air supply and exhaust introduces fresh, outdoor air into the building, effectively ventilating even fully airtight structures.

Multiple split-type units operate independently of one another, simplifying system set up and ensuring a layout that optimally matches nearly any office design.

Lossnay operation can be interlocked with air-conditioning system operation.

Heat that is commonly lost due to ventilation is collected and reused thanks to the Lossnay Core, reducing an air conditioners energy load and cutting operating costs.

The unbeatable

Lossnay

The Lossnay allows the extraction of stale air and efficient recovery of heating or cooling energy to treat incoming fresh air. Whatever your environment, it's simple to improve it with Lossnay.

Simple technology at its best

Systems marked with the ECA logo are registered on the Energy Technology List and hence qualify for 100% first year enhanced capital allowances (whole system cost and 'reasonable' cost of installation). For further information please go to **www.eca.gov.uk**

Nominal conditions cooling: indoor 27°C DB, 19°C WB; outdoor 35°C DB, 24°C WB.
Nominal conditions heating: indoor 20°C DB; outdoor 7°C DB, 6°C WB.
UK Conditions: Summer; indoor 21°C DB, 15°C WB; outdoor 27°C DB. Winter; indoor 21°C DB; outdoor -1°C WB.

Contents

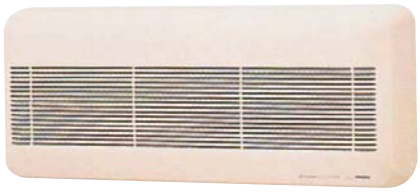
Lossnay

Total Heat Exchangers

Residential Model

Particularly suitable for modern homes with high insulation afforded by double glazing and cavity insulation, which require ventilation to remove stale air without major heat loss.

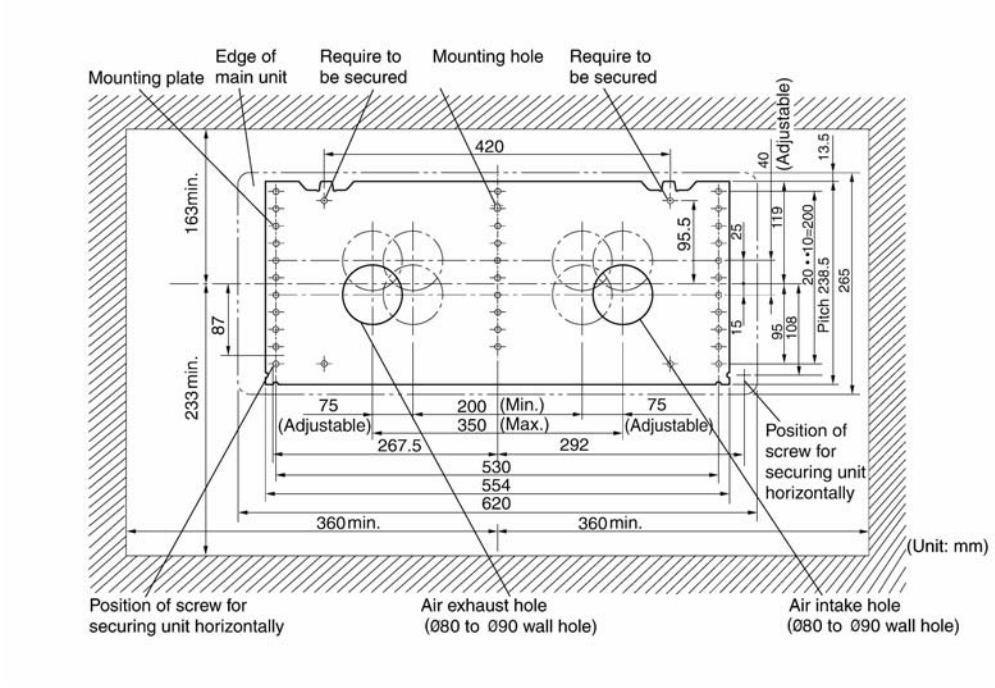
- Effective fresh air ventilation
- Efficient recovery of heating/cooling energy
- Good sound attenuation
- Reduces heating costs

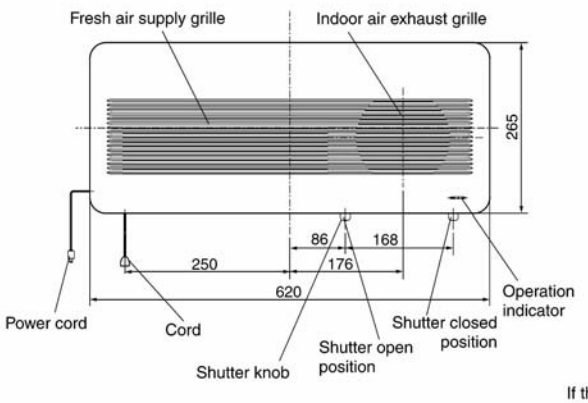


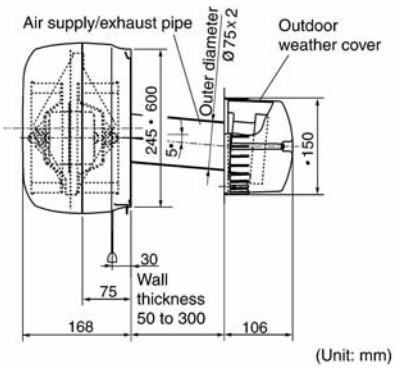
Technical Information

LOSSNAY		
MODEL REFERENCE		RESIDENTIAL WALL- MOUNTED VL 100U
ELECTRICAL POWER SUPPLY		220 - 240V, 50Hz
PHASE		Single
POWER CONSUMPTION (W)	Low	23
	High	26
AIRFLOW (m^3/h)	Low	65
	High	105
NOISE (dBA)	Low	29.5
	High	39
TEMPERATURE EXCHANGE EFFICIENCY (%)	Low	77
	High	70
WEIGHT (kg)		6.5
DIMENSIONS (mm)	Width	620
	Depth	168
	Height	265
DUCT SIZE (mm)		2x075
FUSE RATING (BS88) - HRC (A)		6
MAINS CABLE No. Cores		3

VL 100U







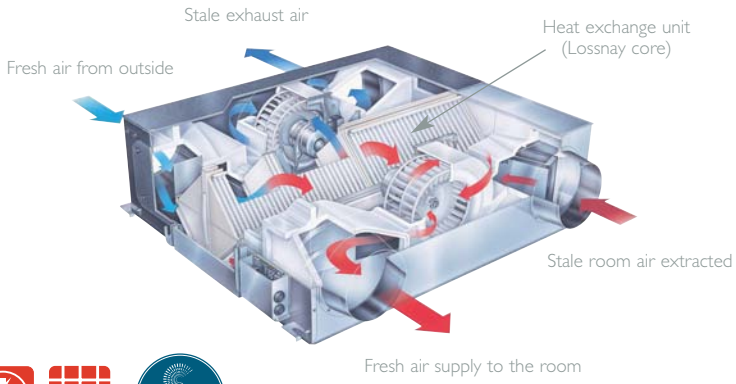
If the wall is thicker than 300 mm, use the extension pipes and the pipe extension joints (separately sold parts).

LGH-RX4

Commercial Series

This commercially orientated system can be utilised virtually anywhere.

- Effective fresh air ventilation
- High heat recovery
- Free cooling function
- Good sound attenuation
- New "Hyper Lossnay Core". At only 25µm (approx 1/5 the thickness of LGH-RX3) the Lossnay core uses the thinnest paper in the world to achieve high enthalpy exchange efficiency



Technical Information

LOSSNAY

MODEL REFERENCE			COMMERCIAL LGH-15RX4	COMMERCIAL LGH-25RX4	COMMERCIAL LGH-35RX4	COMMERCIAL LGH-50RX4	COMMERCIAL LGH-80RX4	COMMERCIAL LGH-100RX4	COMMERCIAL LGH-150RX4	COMMERCIAL LGH-200RX4
ELECTRICAL POWER SUPPLY			220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz
STARTING CURRENT (A)			0.7	0.8	1.7	1.9	3.6	5.4	7.2	10.8
RUNNING CURRENT (A)		Low	0.22	0.25	0.48	0.60	1.40	1.70	2.70	3.50
		High	0.31	0.40	0.71	0.90	1.60	2.00	3.10	4.20
		Extra High	0.45	0.49	0.79	0.95	1.70	2.10	3.30	4.30
INPUT POWER (W)		Low	51	59	110	142	315	400	625	820
		High	73	96	167	214	370	475	730	980
		Extra High	107	117	187	225	385	490	770	1010
AIRFLOW (m^3/h)		Low	110	165	230	350	670	870	1250	1650
		High / Extra High	150	250	350	500	800	1000	1500	2000
AIRFLOW (l/s)		Low	31	46	64	97	186	242	347	458
		High / Extra High	42	69	97	139	222	278	417	556
EXTERNAL STATIC PRESSURE (PA)		Low	35	25	25	30	70	80	70	65
		High	60	50	70	60	100	100	100	90
		Extra High	95	80	150	150	140	160	140	150
NOISE (dBA)	Lossnay	Low	23	23	24	24.5	31	32.5	33.5	36
		High	25	26	30	31.5	33	35	36.5	38
		Extra High	27	27.5	32	34	34.5	37	37.5	40
	Bypass	Low	23	23	24	25.5	31.5	34	36.5	37
		High	25	26.5	30	33	34	36.5	38.5	39.5
		Extra High	27	28	32.5	35.5	35.5	38	40	41
TEMPERATURE EXCHANGE EFFICIENCY (%)		Low	81	83.5	84	82	80.5	81	81.5	81.5
		High	77	78	79	77	78	79	79	79
		Extra High	77	78	79	77	78	79	79	79
ENTHALPY EXCHANGE EFFICIENCY (%)	Heating	Low	74	77	77	73.5	73.5	74	74.5	75
		High / Extra High	70	70	70	67.5	71	71	72	71
	Cooling	Low	70	71	74.5	71.5	70.5	69.5	72	71
		High / Extra High	64.5	65	68	64.5	67	67	68	67
WEIGHT (kg)			17	21	30	33	61	69	124	140
DIMENSIONS (mm)		Width	610	735	874	1016	1004	1231	1004	1231
		Depth	780	780	888	888	1164	1164	1164	1164
		Height	275	275	317	317	398	398	800	800
DUCT SIZE (mm)			100	150	150	200	250	250	(SA,RA)250 (OA,EA)270x700	(SA,RA)250 (OA,EA)270x700
STANDARD FILTER*1			EU3	EU3	EU3	EU3	EU3	EU3	EU3	EU3
FUSE RATING (BS88) – HRC (A)			6	6	6	6	6	10	16	16
MAINS CABLE NO. CORES			3	3	3	3	3	3	3	3

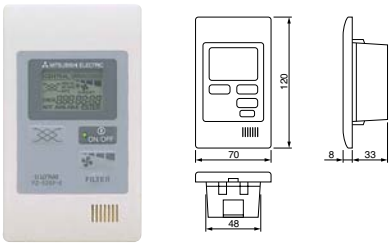
Notes: Running Current, Input Power and Recovery Efficiency are based on the above airflow rate, power supply 240v, 50Hz. Extra High mode available via dip switch setting. Noise measured at 1.5m under the centre of panel.

*1: Eu7 filter available as optional parts.

LGH-15RX4 to LGH-200RX4

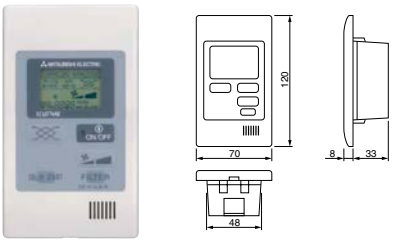
M-NET Controller
PZ-52SF-E (M-NET)

Control 16 Lossnay units from sizes
15 -100 or up to 8, sizes 150 - 200

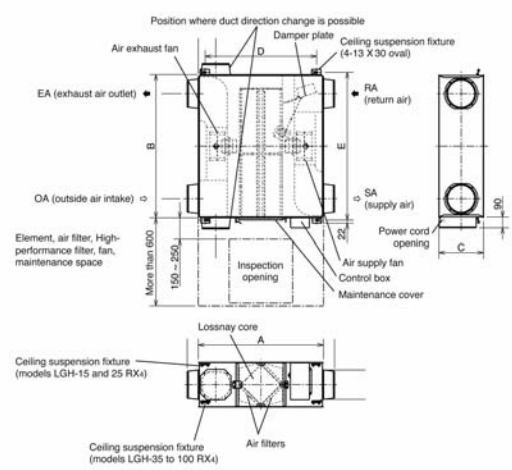


Lossnay Controller
PZ-41SLB-E

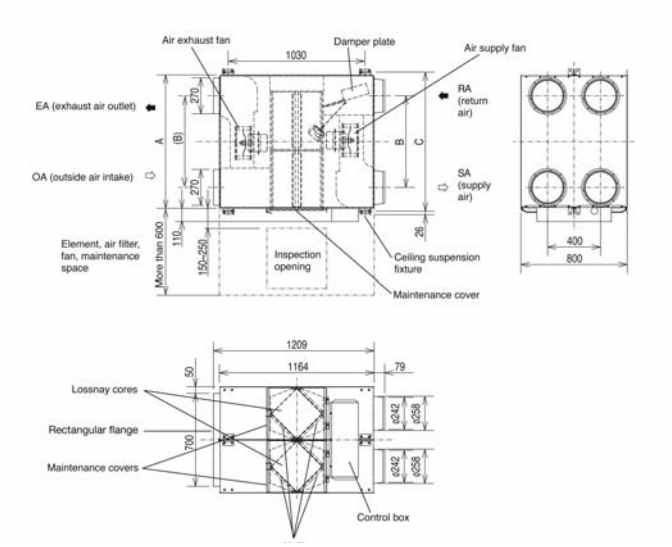
Control 15 Lossnay units from sizes
15 -100 or up to 7, sizes 150 - 200



LGH-15-100RX4 >



LGH-150-200RX4 >



MODEL REFERENCE	DIMENSIONS A	B	C	CEILING SUSPENSION FIXTURE PITCH D	E	NOMINAL DIAMETER
LGH-15RX4	780	610	275	700	641	ø100
LGH-25RX4	780	735	275	700	765	ø150
LGH-35RX4	888	874	317	790	906	ø150
LGH-50RX4	888	1016	317	790	1048	ø200
LGH-80RX4	1164	1004	398	1030	1036	ø250
LGH-100RX4	1164	1231	398	1030	1263	ø250

MODEL REFERENCE	A	B	C
LGH-150RX4	1004	690	1046
LGH-200RX4	1231	920	1273