



Certificate No. 890217
Quality Assurance Part 1

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RHX & PHX Platinum Range of Packaged Air Conditioning Equipment

General

Utilising the highest efficiency fans and motors currently available and incorporating heat-recovery as standard, the Dalair Platinum range offers a quiet, compact and cost effective solution for small to medium duty air handling equipment.

Platinum PL Plus units are supplied fully wired, factory pre-commissioned and ready to run, complete with an integrated controller, pre-programmed with universal control functions.

Optional, component sections, such as frost protection, heating coils & cooling coils can be added and are readily incorporated into the control strategy.

Installation and commissioning couldn't be simpler. After positioning the unit, connect the ductwork, services and electrical supply, select the appropriate control strategy and, using the in-built digital display and touch pad, enter the occupation times and set points.

Platinum units can be supplied without the integrated control system, if required.



The Platinum Range

Description

The Platinum range is a packaged, one-piece, supply and extract air handling unit, complete with shut-off dampers, fans, filters and heat exchanger, providing air volumes from 0.1m³/s to 5.5m³/s. Two methods of heat recovery are available as standard, namely rotary heat exchangers (RHX) or plate heat exchangers (PHX). In addition, all unit arrangements can be supplied with an optional recirculation damper, to provide early morning, fast space warm up.

We can also provide alternative heat recovery methods such as "run-around coils", albeit not catalogued as part of the Platinum standard range of equipment, due to the very low efficiency of these installations.

The electrical control system (PL Plus) is fully integrated with a microprocessor-based controller positioned inside the unit. The controller is pre-programmed with an in-built control strategy that monitors and regulates all temperatures, airflows and other control functions.

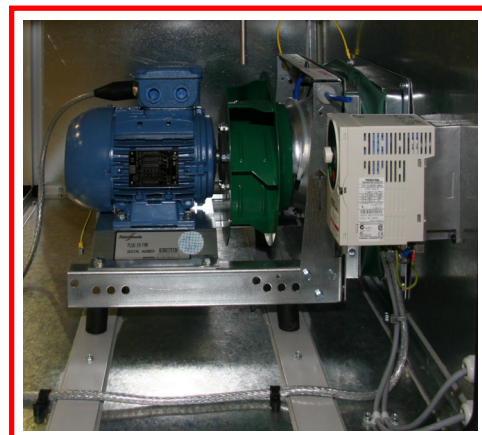
Optional and supplementary components, such as frost coils, heaters and coolers, can be added and easily incorporated into the control strategy.

The standard basic unit is supplied as a single one-piece section requiring no site assembly. When site access is restricted the basic unit can be manufactured as two separate sections to facilitate easy access into the building. Once in position the sections are bolted back together. "Quick Connectors" are used to join any inter-connecting electrical wiring or control cables.

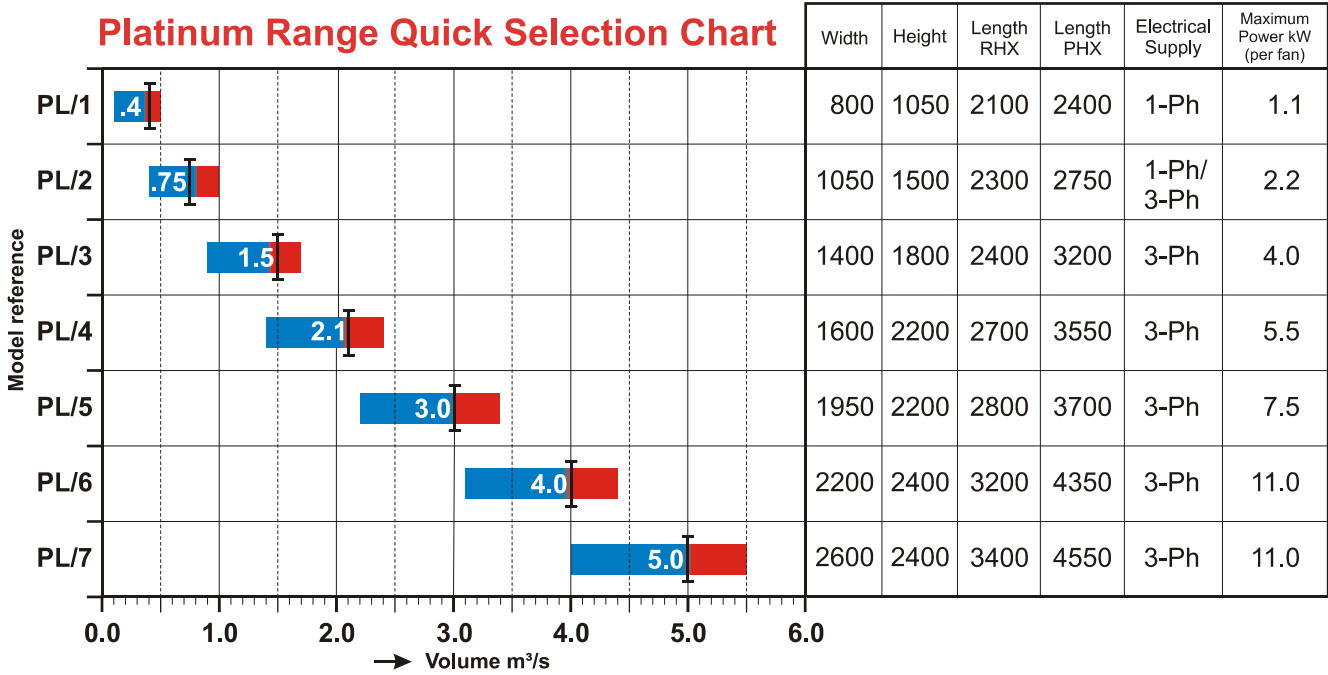
Applications

Platinum units are designed for use in comfort ventilation applications. Depending upon the type of heat exchanger selected, Rotary (RHX) or Plate (PHX), the units can be utilised in offices, schools, day nurseries, shops, public and residential buildings.

Plate heat exchanger (PHX) units may be used for moderately humid applications, although they are not recommended for high humidity applications, such as swimming pools, where a rotary heat exchanger unit (RHX) would be more suitable. When located externally the units are made fully weatherproof with the addition of a sloped roof together with a top deck louvre and bottom deck cowl to prevent short-circuiting of the return air.



Quick Selection Chart



Using the quick selection chart

Unit model references are shown on the vertical axis with volume along the horizontal axis. The bars indicate the range of volumes served by each unit size, with the I-beam and value shown in white indicating the nominal unit volume.

If cooling is required, the selection point must lie within the blue area of the bar.

To comply with building regulations, specific fan power requirements (L2), ensure the selection point is within the blue area and limit the external static pressure to a maximum of 200Pa. Contact your local Dalair Sales Office for an accurate selection when compliance is required and the external static pressure exceeds 200Pa.

Quick selection example

Volume required 3.5m³/s. The unit reference would be PL/6, nominal volume 4.0m³/s with a range from 3.1m³/s to 4.4m³/s. 400V, 3-Phase electrical supply with a maximum, total power requirement 22kW (11kW per fan).

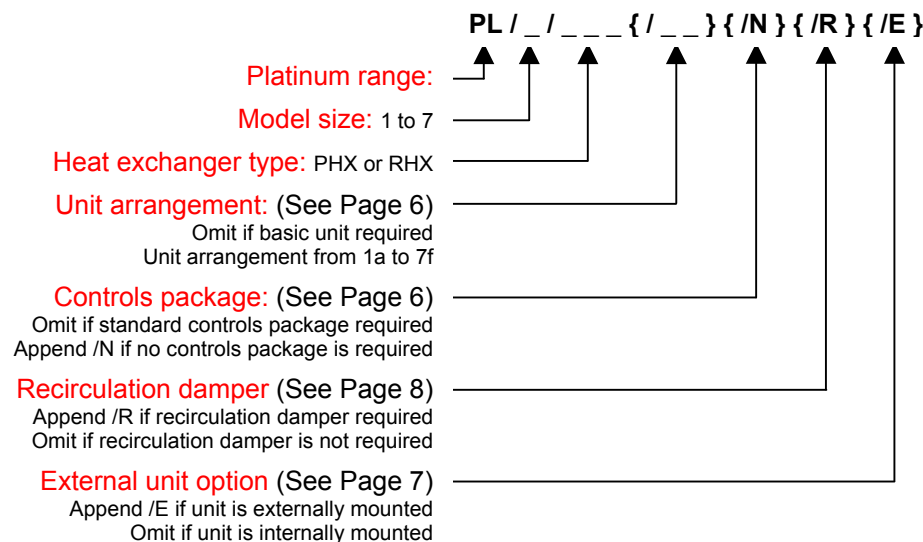
Power requirements

The maximum power requirement, per fan, shown above is for guidance only. An accurate selection, based on the volume and external static pressure, may result in a power requirement lower than that indicated in the quick selection chart.

Quotations

The quick selection chart should only be used as a guide for initial sizing. Please contact your local Dalair Sales Office for an accurate selection, together with a full quotation including all relevant technical data, L2 calculations and predicted noise levels.

Platinum Range Ordering Code



Examples: -

PL/4/RHX

Model size 4 with rotary heat exchanger. Basic unit. Internally mounted.

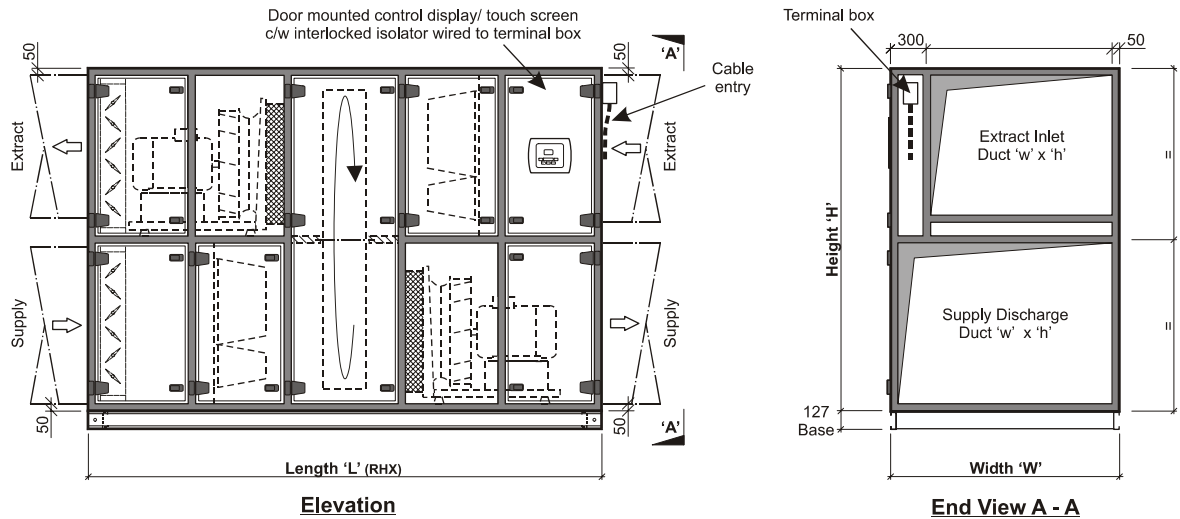
PL/3/PHX/4b/R

Model size 3 with plate heat exchanger. Electric frost coil and LPHW re-heater. Recirculation damper. Internally mounted.

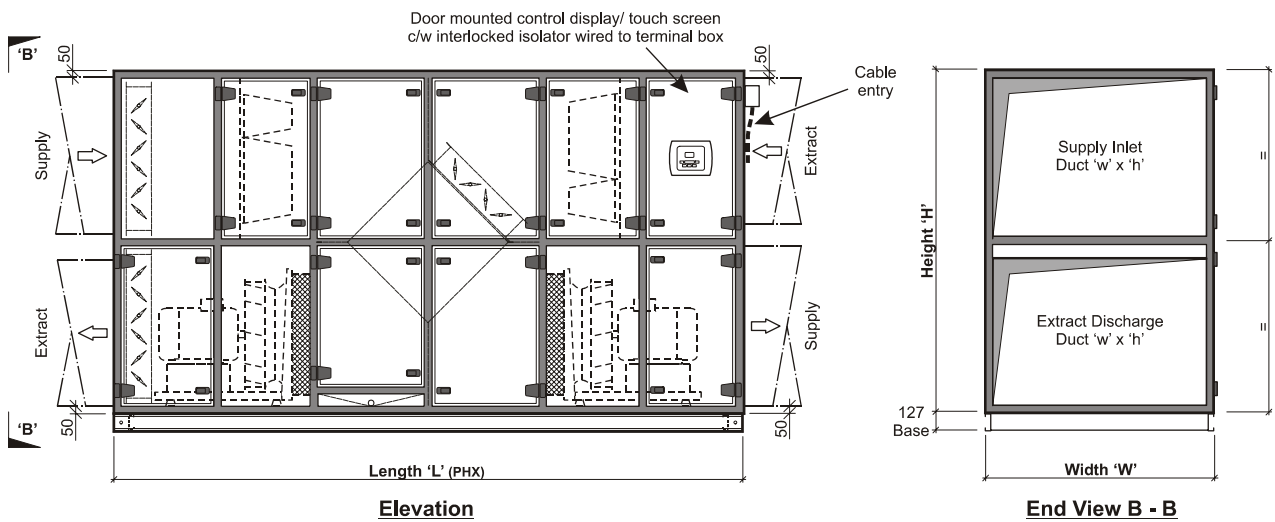
PL/7/RHX/6b/N/E

Model size 7 with rotary heat exchanger. Electric frost coil, LPHW re-heater and CW cooling coil. No controls package required. Externally mounted, outdoor unit with sloped roof, top deck louvre and bottom deck cowl fitted.

Dimensions



RHX Rotary Heat Exchanger - Basic unit



PHX Plate Heat Exchanger - Basic unit

Unit Ref.	Volume m ³ /s	'W'	'H'	'L' RHX	'L' PHX	Supply	w	x	h	Extract	w	x	h
PL/1	0.4	800	1050	2100	2400	Inlet	700	x	450	Inlet	700	x	350
						Discharge	700	x	450	Discharge	700	x	350
PL/2	0.75	1050	1500	2300	2750	Inlet	950	x	650	Inlet	700	x	550
						Discharge	950	x	650	Discharge	950	x	550
PL/3	1.5	1400	1800	2400	3200	Inlet	1300	x	800	Inlet	1050	x	700
						Discharge	1300	x	800	Discharge	1300	x	700
PL/4	2.1	1600	2200	2700	3550	Inlet	1500	x	1000	Inlet	1250	x	900
						Discharge	1500	x	1000	Discharge	1500	x	900
PL/5	3.0	1950	2200	2800	3700	Inlet	1850	x	1000	Inlet	1600	x	900
						Discharge	1850	x	1000	Discharge	1850	x	900
PL/6	4.0	2200	2400	3200	4350	Inlet	2100	x	1100	Inlet	1850	x	1000
						Discharge	2100	x	1100	Discharge	2100	x	1000
PL/7	5.0	2600	2400	3400	4550	Inlet	2500	x	1100	Inlet	2250	x	1000
						Discharge	2500	x	1100	Discharge	2500	x	1000

Construction

Casings

Framework

The unit framework is fabricated from 50mm anodised aluminium extruded section with rivet fitted nylon corners.

Enclosure Panels

All panels are 50mm thick double skin, tray form, insulated with 45kg/m³ foam. Outer panel skins are plastisol coated galvanised mild steel. Inner skins are galvanised mild steel. The standard outer colour is Goosewing Grey (BS10A05).

Access Panels

Access panels are manufactured to the same specification as the enclosure panels and are fitted with cam action, quick release, lift and turn latches. Access doors close onto compression rubber seals to provide an airtight enclosure.

Leakage standards

These units are suitable for leakage testing in accordance with BS EN 1886, Class L3, 400 Pa negative and 700 Pa positive.

Standard Components

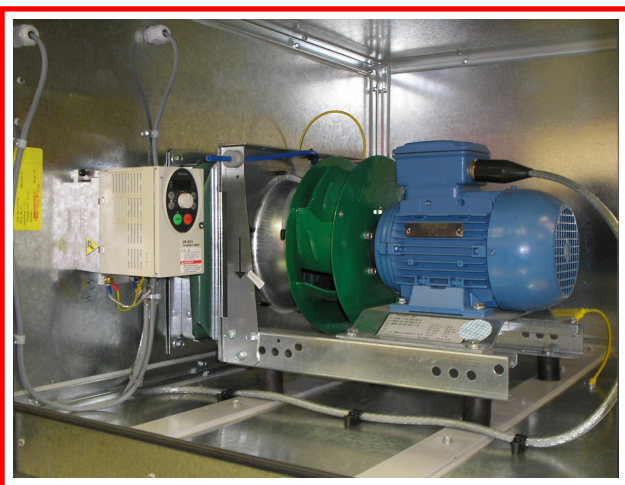
Fans

The Platinum range utilises direct driven plug-fans with backward curved blades. These axial-centrifugal fans offer excellent power efficiency, uniform airflow and low levels of both motor and flow generated noise.

Measurement tappings can be used to constantly monitor the airflow and provide variable speed control via frequency inverters.

Flow characteristics of plug-fans allow duct bends to be directly connected to the Platinum unit, without any significant pressure loss, thereby saving space.

For ease of commissioning and to facilitate volume checks an externally mounted digital display airflow-monitoring device is available as an optional extra.



Motors

Platinum range motors are high-performance, class EFF1-rated, offering the highest efficiency rating as classified by the EU Committee of Manufacturers of Electrical Machines and Power Electronics.

Building Control Regulations

Platinum units are fully compliant with current L2 regulations. (Subject to external unit pressures.)

Filters

Side withdrawal class F7 bag filters are fitted on both the supply and extract sides as standard. Differential pressure switches, measuring the pressure drop across the filters, are incorporated into the control system.

Rotary Heat Exchanger (RHX)

Rotary heat exchangers can provide up to 85% temperature efficiency. The amount of heat recovery is controlled by automatically regulating the speed of the rotor.

To eliminate cross contamination of airflows, rotary heat exchangers are equipped with a purging sector and adjustable pressure balancing plates as standard.



Rotary Heat Exchanger (RHX) Options

- ❖ Hygroscopically treated rotor, where recovery of moisture or cooling energy is a requirement.
- ❖ Epoxy treated rotor.

Plate Heat Exchanger (PHX)

As standard, plate heat exchangers are equipped with by-pass and shut off dampers to enable automatic control of heat recovery.

Plate heat exchangers can be utilised to provide summer pre-cooling where conditions allow.

Plate Heat Exchanger (PHX) Options

- ❖ Epoxy-treated plate heat exchanger.
- ❖ Recirculation dampers can be incorporated for early morning start-ups.

Shut-off Dampers

Internally mounted supply air inlet and exhaust discharge dampers are fitted as standard, complete with on/off actuators.

Controls

PL Plus Microprocessor control

The heart of the Platinum range control system is based around a very powerful, proven microprocessor. The control unit is supplied complete with a digital display and touch pad. The controller has a number of in-built pre-programmed control strategies, which can be selected by adjusting the setting of a four-way inline switch within the unit. This enables the unit's control strategy to be changed virtually "at the flick of a switch" and without the need to download alternative software, as with other systems. Control functions are denoted by the position of the four switches, with 1 indicating the switch is on and 0 indicating that the switch is off. For example, the four-way switch is set to "1000" for the standard arrangement of supply and extract fans with a plate or rotary heat exchanger. If a frost heater was required, all that would be necessary to enable automatic control of the frost heater, would be to change the four-way switch setting to "0100" and then select the type of frost heater (LPHW or electric) via the in-built touch pad and digital display. This feature makes the control unit a truly flexible system, which can be adapted to suit any environment.

Easy Operation

The system is user friendly with its clear two-line digital display and simple menu driven instructions. Three levels of user access are provided, each being password protected.

- Level 3** "commissioning" mode, gives full access to all points and adjustment of all settings.
- Level 2** "operator" mode, allows sensor readings to be viewed and set points to be adjusted.
- Level 1** "user" mode, limits user access to viewing sensor and set point information.

Any programmed alarm functions initiate an audible alarm and show details of the problem on the digital display. Alarms can also be relayed out to a set of volt-free contacts if required.

Commissioning

All units leave the factory pre-commissioned, however, final adjustments need to be made once the unit has been installed on site.

Pre-programmed factory settings

- ❖ Initial inverter settings.
- ❖ Temperature set points.
- ❖ Filter differential pressure switch settings.
- ❖ Damper motor settings.

Items not pre-programmed

- ❖ Control valves.
- ❖ Final inverter settings.
- ❖ Occupation times.

To assist set-up and commissioning a separate fully comprehensive controller manual is available. (Ref: Vero-Vent DPVV-01)

NOTE: -

Units can be supplied without the standard integrated control package to suit customers who wish to utilise their own systems.

Multiple Units and Connectivity

For installations with more than one Platinum unit a remotely mounted graphical display touch screen can be provided. This is connected to the units via a 2 or 4-wire network.

This enables the data and settings from all of the units on the network to be viewed and adjusted from this single point of reference, in either text or full graphics.

The touch screen also acts as a master time programmer and scheduler, which can monitor and control up to 30 Platinum units on one network. With the addition of a communications controller card and the appropriate protocol, the networked system is able to connect directly into other BMS systems such as **BACnet**, **LonWorks** or **Modbus**.

The system can also be configured to enable direct dial-up communication, allowing remote control and interrogation of the system and all units connected to it.

Pre-programmed unit arrangements

Arrangement	Ref.	Frost		Re-heat		Cooling		
		LPHW	Elec.	LPHW	Elec.	CW	DX	DXHP
0 Basic unit	-							
1 Frost	1a	X						
	1b		X					
2 Re-heater	2a			X				
	2b				X			
3 Cooler	3a					X		
	3b						X	
	3c							X
4 Frost & re-heater	4a	X		X				
	4b		X	X				
	4c		X		X			
5 Cooler & re-heater	5a			X		X		
	5b				X	X		
	5c			X			X	
	5d				X		X	
6 Frost, re-heater & cooler	6a	X		X		X		
	6b		X	X		X		
	6c		X		X	X		
	6d	X		X			X	
	6e		X	X			X	
	6f		X		X		X	
7 Frost & cooler	7a	X				X		
	7b		X			X		
	7c	X					X	
	7d		X				X	
	7e	X						X
	7f		X					X

Key

- Ref. Unit arrangement reference
- LPHW Low pressure hot water with 3-port valve
- Elec. Electric with thyristor & isolator
- CW Chilled water with control valve
- DX Direct expansion
- DXHP Direct expansion reverse cycle heat pump

Supplementary Components

Heating and Cooling Coils

Low pressure hot water (LPHW) heating coils, chilled water (CW) cooling coils, direct expansion cooling coils (DX) and reverse cycle heat pump cooling/heating coils (DXHP) are constructed from seamless copper tubes expanded onto aluminium plate type fins (CU/AL) to provide a good mechanical and thermal bond, and are housed within a galvanised sheet steel casing. For coastal applications, coils with polyester coated fins (CU/AL/POLY) are available as an optional extra.

All coils are mounted on slide rails for ease of removal. Return bends and headers are fully enclosed within the unit section with top and side blanking plates fitted to prevent air bypass. Neoprene seals and capping plates are fitted where coil connections penetrate the unit casing. Cooling coils are fitted with a fixed drain tray, which is extended under the return bends, and terminated with a BSP screwed connection for trapping and piping by others.

A motorised control valve together with any additional external sensors required, are supplied loose for fitting and wiring on site (by others).

A matched condensing unit can be provided for DX and DXHP coils. However, installation, field wiring and pipework of the condensing unit would be by others.

Electric Heaters

Electric heaters are either “stab-in” or “slide in cassette” type. They are supplied with sheathed incoloy elements and are arranged for thyristor or stepped control as a part of the controls package.

NOTE: -

Electric and LPHW frost heaters are internally mounted directly in front of the supply filters. Additional heating and/or summer cooling coils are housed in additional bolt-on sections.

Reasons for using supplementary components

CW Cooling Coil

- ❖ Where summer cooling is required.

LPHW Heating Coil (Low pressure hot water)

- ❖ Where frost protection and/or additional heating is required.

DX Cooling Coil

- ❖ Where no chilled water system is available and summer cooling is required.

DXHP Cooling/Heating Coil (Heat pump)

- ❖ Where there is limited electrical power or there are no chilled water, gas boiler or LPHW systems and both summer cooling and additional heating are required.

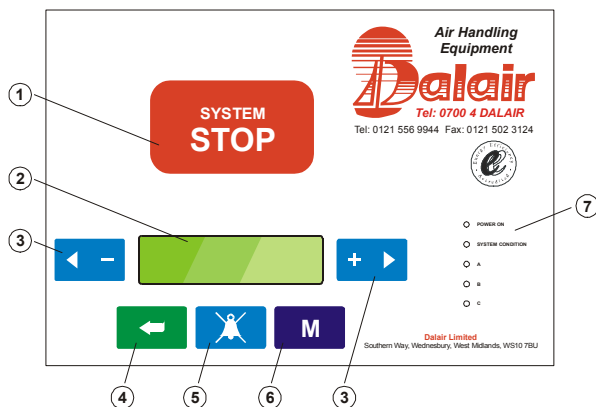
Electric Heater

- ❖ Where no gas boiler or LPHW system is available and frost protection and/or additional heating is required.

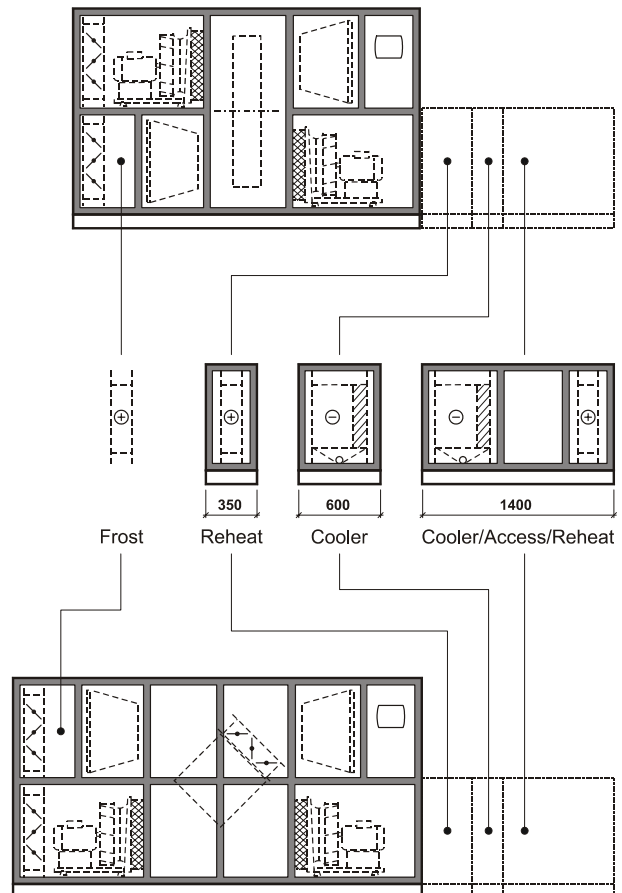
Recirculation Damper (See page 8)

- ❖ Where rapid warm up is required for plant that is not continuously operational.

Control Panel PL Plus



- | | |
|--|-----------------------|
| 1. System stop | 4. Enter / select |
| 2. Two line digital display | 5. Audible alarm mute |
| 3. Next / previous / Increase / decrease | 6. Mode select |
| | 7. Status indicators |



Sketches of RHX and PHX units showing the positions of supplementary components

Recirculation Damper

Recirculation Damper

Where rapid warm up is required for plant that is not continuously operational the addition of a recirculation damper enables an “early morning start-up mode” of operation.

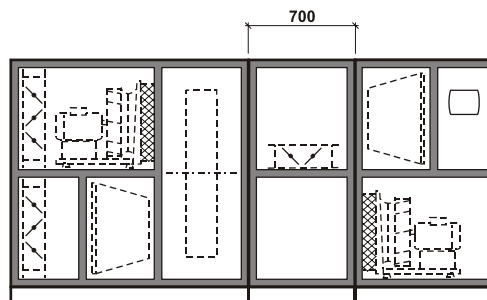
In this mode of operation the shut-off dampers remain closed on start-up and the recirculation damper is opened allowing full recirculation of the return air.

Only the supply fan is started and supplementary heating is provided until the desired temperature set point is attained.

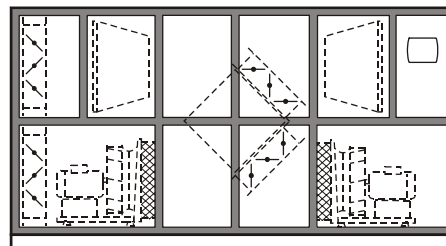
Once this has been achieved, the shut-off dampers are opened, the recirculation damper is closed and the extract fan is started. Control reverts to the normal mode of operation, with heat recovery being supplied via the rotary or plate heat exchanger.

To facilitate this “early morning start-up” mode, a supplementary section including an internal recirculation damper, is available for rotary heat exchanger (RHX) units.

The supplementary section is not required for PHX units, as the recirculation damper would be incorporated in the plate heat exchanger section.



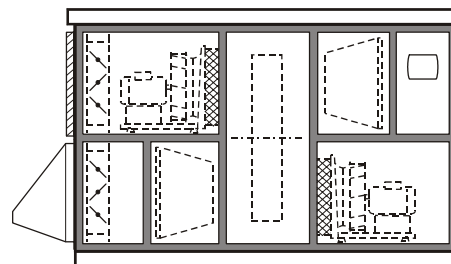
RHX unit shown with a supplementary section housing the recirculation damper



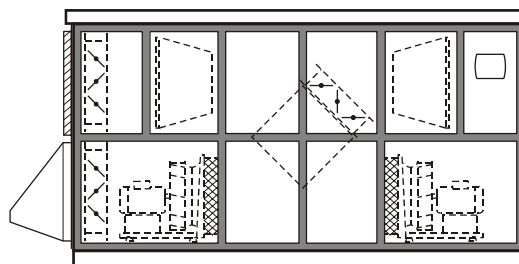
PHX unit shown with the recirculation damper incorporated in the heat exchanger section

Weatherproof Units

When located out doors, the units are made fully weatherproof with the addition of a sloped roof, together with a top deck louvre and bottom deck cowl, (to prevent short-circuiting of the return air), as shown in the unit sketches.



Externally mounted RHX unit



Externally mounted PHX unit

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