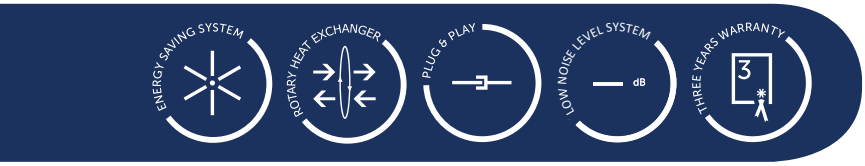
THERM-X | HR85

BARKELL
AIR HANDLING UNITS



BASIC FEATURES

Therm-X MVHR / HR85

Compact and packaged heat recovery solution for mechanical supply and extract ventilation equipped with high efficiency rotary heat exchanger.

With a wide and flexible range of sizes and connection options the Therm-X HR85 MVHR units are the ideal solution for indoor or outdoor installations in commercial applications such as shops, offices, coffee bars, restaurants, sport facilities and schools.

Also equipped with state-of-the-art plug and play integrated controls the Therm-X units offer the all-in-one heat recovery solution for local mechanical ventilation.

The units are fully compliant with the requirements for the UK Building Regulations and the European Eco-design directive.

The unit is designed to handle air that is free of heavy dust, grease, hazardous chemicals or other abrasive pollutants with temperature ranging from -15°C up to +60°C and a maximum relative humidity up to 90 %.

- 8 models covering airflows from 0.03 m3/s (120 m3/h) to 2.16 m3/s (7750 m3/h) @ 200 Pa ESP
- Compact in size with optional top or side connections for installation flexibility
- Easy access for maintenance
- Smooth, crevice free and easy to clean interior surfaces
- Condensation rotary heat exchanger
- Fully compliant with the requirements for Part L of the UK Building Regulations and the Eco-design directive
- Near silent operation
- Low leakage and solid 50mm thick galvanized frameless construction
- Painted finish for corrosion protection
- L1 (MB) casing leakage class according to BS EN 1886
- T3/TB4 (MB) casing thermal performance according to BS EN 1886
- Aluminium rotary heat exchanger with bypass facility and high heat recovery efficiency up to 85%, exceeding ErP 2018
- Energy-efficient EC fans with integrated electronic control and silent operation
- Low energy consumption M5 supply bag or panel filter as standard (F7 optional filter available)
- Intelligent integrated control system with touch screen controller (CAV, VAV, DCV, time scheduling, boost & trickle, free-cooling, supply and room temperature control, anti-frost, etc…)
- Optional integrated electric or LPHW coil for heating and water changeover (WCO) or direct expansion (DX) coils for heating/cooling
- Extensive range of complimentary ancillaries for installation and control
- Detailed and accurate software selections with the THERM-X CHOOSE&GO software

CONSTRUCTION AND COMPONENTS

Casing construction

The Therm-X HR85 unit casing is assembled from a self-supporting frameless construction, manufactured with double skinned, corrosion resistant, 50mm deep hot dip galvanized sandwich panels (0.8mm gauge).

The outstanding mechanical strength, thermal and acoustic performance of the casing is assured by packing the panels with high density rockwool (88kg/m3) with excellent thermal and acoustic performance (D=0.041 W/m.K, fire resistance class A1 to 13501-1 + A1: 2009 - non-combustible).

The panels are joined with internally enclosed self-drilling fixings resulting in a smooth internal surface, crevice free, which contributes to the cleanliness of the unit and the quality of the air supplied through it.

The panels are finished with an powder paint finish for optimum corrosion protection.

Installation

The unit is suitable for free standing internal installation as standard and can be equipped with an optional weatherproof roof for external installation (*except versions with top connections, ducted external installation is assumed, any unducted connections must be louvered by others*).

Connections can be positioned on the sides (vertical configuration) or on the top of the unit (upper configuration) except for unit sizes 550 and 750 which are available only in vertical configuration (side connections).

Unit sizes 070 and 100 are supplied with circular flanged connections.

Unit sizes 150 and 200 are supplied with both side and top circular connections allowing the arrangement of the unit to be modified on site. Circular flanges are also provided.

Unit sizes larger than size 200 are supplied with square connections and factory fitted nutserts to allow easy installation of square to round transitions (*transitions must be ordered separately*).

Small unit sizes (up to 200) are supplied as a single piece unit.

Larger units are supplied in a modular arrangement with each section individually packed and provided with quick-fit electrical and mechanical connections (*assembly and wiring on site by others*).

Both single piece and sectioned units are provided with a galvanized base frame to facilitate transport and handling.

Access and maintenance

Access to all the unit compartments is available through the tool operated access panels as standard.

All access panels are equipped with handles to facilitate handling during maintenance operations. The control panel is installed in an easily accessible enclosure inside of the unit.

Fans

The unit fan section comprises of high performance supply and extract, single inlet-backward curved plug fan. The fans are directly driven by low energy consumption IE4 electronically commutated (EC) motors.

The fan exceeds the 2015 efficiency requirements of regulation 327/211 of the Eco-design directive for fans.

The assembly is statically and dynamically balanced as per DIN / ISO 1940 to balancing grade G 6.3. The highly efficient aluminium impellers and aerodynamic design of the casing ensure low noise levels especially on the outlet of the fan.

The fan assembly is installed on a highly rigid galvanized support structure mounted with an aerodynamically designed galvanized inlet and an outlet casing designed to reduce swirl.

The EC motors offer intelligent integrated control electronics allowing soft start as well as over-temperature and short circuit protection. The motor insulation is Class 'B', rated IP 54 (acc. to EN 60529) and meets all relevant EMC directives and requirements.

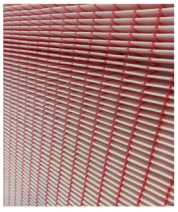
Filters

Filtration for protection of the finned heat exchanger and treatment of the supply air is provided by compact panel or bag synthetic media filters.

Grade of filtration according to BS EN779:2012 is class M5 on supply and M5 on extract.

The low pressure drop synthetic media makes for a low energy consumption filter, to help reduce the overall energy consumption of the unit. For stricter indoor air quality requirements an F7 supply air filter is optionally available.

The filters are mounted on slides for easy removal and tightly sealed against the rails to ensure reduced filter bypass leakage.



CONSTRUCTION AND COMPONENTS

Rotary heat exchanger

The heat recovery section is equipped with a highly efficient rotary air to air heat exchanger, exceeding the 2018 requirements of regulation 1253/2014 of the Eco-design directive for ventilation units, with operational efficiency up to 85%.

The heat exchanger finned area is manufactured from high thermal transmittance and corrosion resistant aluminium. The casing is manufactured from galvanized steel.

The exchanger is Eurovent certified and fully tested to EN308:1997.

The heat exchanger is equipped with its own motor and control system that adjusts the rotor speed according to the requirements for heat recovery to provide close control of the supply air temperature and enable free cooling operation when the conditions are favourable (e.g. summer night ventilation).

In extreme conditions, where the exhaust temperature drops to the point of frost risk the unit control logic provides a frost protection routine for the heat exchanger.

OPTIONAL FEATURES

Integrated electric post heating coil

The unit can be optionally fitted with an electric post heating coil manufactured with open coil heating elements and galvanized casing.

The heater is complete with fully modulating SCR (Silicon Controlled Rectifier) control (0-10V) and 2 stages of overheat protection (automatic and manual reset) all integrated on the unit's control logic.

The SCR control provides accurate, supply air temperature regulation.

The heat output is precisely controlled from 0 to 100% by using the unit in-built temperature sensors or a space temperature sensor.

The electric post heating coil is recommended where no hot water supply is available on site and there is need for top-up heating of the supply air.

Integrated LPHW post heating coil

The unit can be supplied with an integrated water heating coil operating with LPHW to provide supply air top up heating.

The coils are manufactured with aluminium fins, copper tubes and assembled on a corrosion resistant galvanized casing.

Maximum operating pressure 1.6 Mpa, 110°C.

The heating output is automatically regulated by the factory fitted temperature sensors and the integrated unit controls.

For unit size 070 the water post heating coil is supplied loose for fitting and wiring by others on site. It is not required to order the coil separately.

DX (direct expansion) or WCO (water changeover coil)

Where cooling is also required a changeover water coil (WCO) can be provided operating with either chilled/hot water (depending on the seasonal requirements) on a common water circuit. Alternatively a direct expansion (DX) coil can be offered. DX coils are tested to 4.6MPa.

Both DX and WCO coils are manufactured with aluminium fins with hydrophilic coating, copper tubes and assembled on a corrosion resistant galvanized casing. The cooling coil section is also equipped with a plastic droplet eliminator.

The cooling/heating output is automatically regulated by the factory fitted temperature sensors and the integrated unit controls.

A fully removable, epoxy coated, galvanized condensate tray fitted with a 40mm drain connection is provided for condensate collection and disposal.

For unit size 070 the WCO or DX coil is supplied loose for fitting and wiring by others on site. It is not required to order the coil separately.

Ancillaries

All Therm-X units have available a wide range of mechanical and control ancillaries compatible with the units to facilitate installation and enhance the unit's operation. The ancillaries available for the HR85 range:

Shut off dampers (circular)
Square to round transitions (unit size > 200)
Weatherproof roof
Spare filters
Duct mounted electrical and water heaters
Damper actuators
Duct and room mounted IAQ sensors (CO2, humidity)
PIR motion sensor
Valve and actuator kits

TESTING

All unit models undergo a stringent set of tests to the relevant European standards in an accredited laboratory to ensure accurate catalogue data.

Performance is tested to ISO 5801:2007 Industrial fans – Performance testing using standardized airways.

Casing radiated noise acoustically tested to BS EN 3744:2010 –Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane.

Published figures are for free field spherical propagation.

In duct noise acoustically tested to BS EN ISO 5136:2010 - Acoustics – Determination of sound power radiated into a duct by fans and other air-moving devices- In-duct method.

Heat recovery efficiency tested to EN 308:1997 - Heat exchangers - Test procedures for establishing performance of air to air and flue gases heat recovery devices.

Model box casing performance tested to EN1886:2007 - Ventilation for buildings - Air handling units:

Thermal transmittance of the casing - T3 (MB)
Thermal bridging of the casing - TB4 (MB)
Casing air leakage - L1 (MB)

BUILDING REGULATIONS AND ECO-DESIGN DIRECTIVE

All models are performance tested and measurements are made to obtain the power consumption of the units in several operating points.

These tests were conducted to evaluate the performance of the unit at standard configuration (M5/M5 filters).

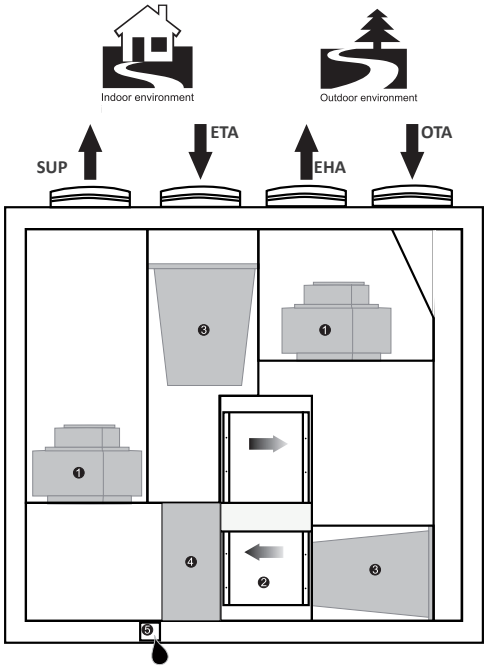
The units are able to operate within the limits of both of these regulations under most conditions. To get accurate performance data a detailed selection can be provided.

OPERATIONAL DIAGRAM

Version with top connections (upper configuration)

Key:

OTA - Outside air
SUP - Supply air
ETA - Extract air
EHA - Exhaust air

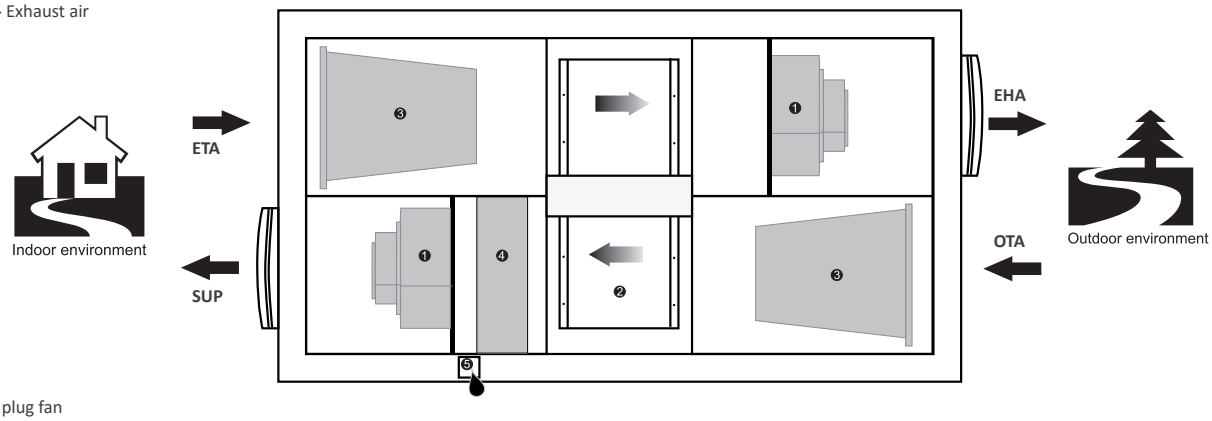


❶ EC plug fan
❷ Condensation rotary heat exchanger
❸ Panel or bag M5 filter
❹ Optional post heating/cooling coil - Electric, LPHW, water changeover or DX
❺ Condensate collection and disposal

Version with side connections (vertical configuration)

Key:

OTA - Outside air
SUP - Supply air
ETA - Extract air
EHA - Exhaust air



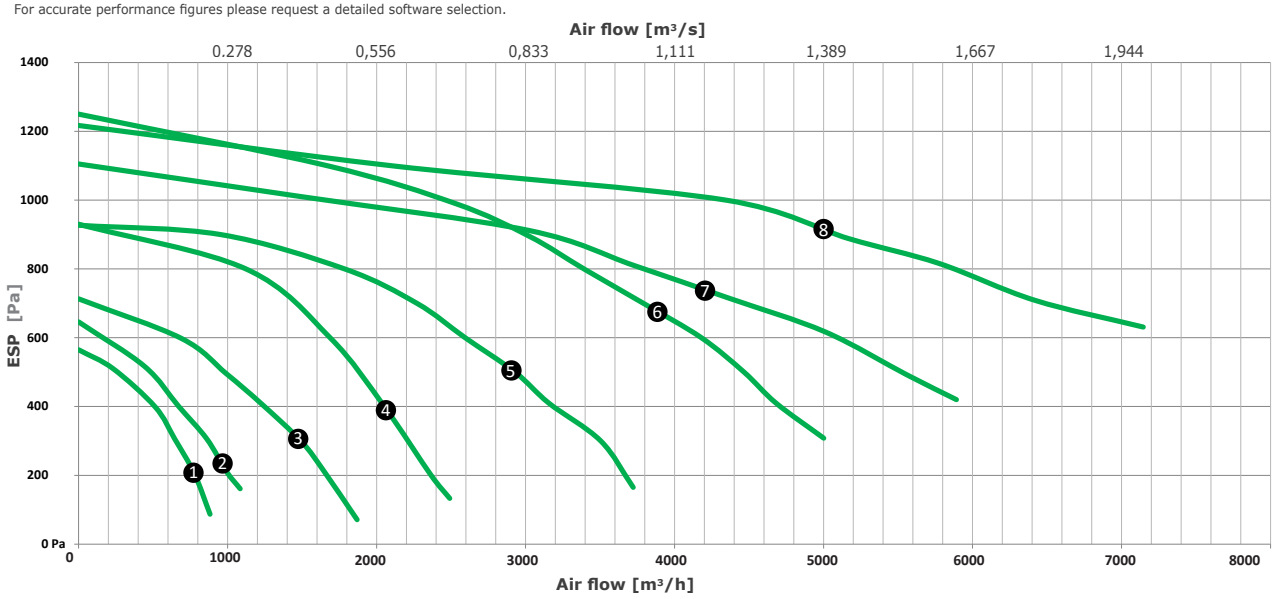
❶ EC plug fan
❷ Condensation rotary heat exchanger
❸ Panel or bag M5 filter
❹ Optional post heating/cooling coil - Electric, LPHW, water changeover or DX
❺ Condensate collection and disposal

PERFORMANCE CHARACTERISTICS

Performance is shown for standard configuration with M5 supply filter, M5 extract filter.

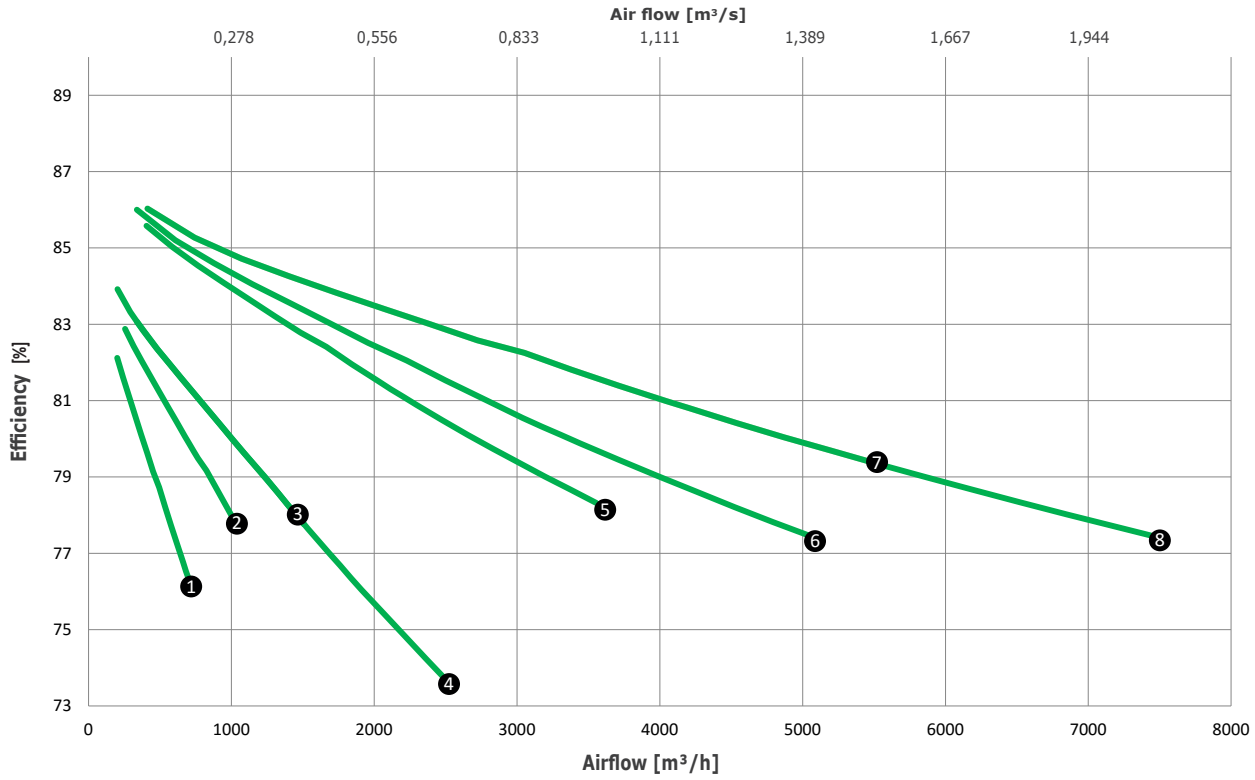
Performance tested to ISO 5801:2007 - Installation category D.

For accurate performance figures please request a detailed software selection.



1 HR85-070EC-RS-V/U
2 HR85-100EC-RS-V/U
3 HR85-150EC-RS-V/U
4 HR85-200EC-RS-V/U
5 HR85-300EC-RS-V/U
6 HR85-450EC-RS-V/U
7 HR85-550EC-RS-V
8 HR85-750EC-RS-V

HEAT RECOVERY EFFICIENCY



1 HR85-070EC-RS-V/U
2 HR85-100EC-RS-V/U
3 HR85-150EC-RS-V/U
4 HR85-200EC-RS-V/U
5 HR85-300EC-RS-V/U
6 HR85-450EC-RS-V/U
7 HR85-550EC-RS-V
8 HR85-750EC-RS-V

Heat recovery performance was measured under the following conditions:

Outdoor air temperature -5°C, relative humidity 90%, Indoor air temperature 20°C, relative humidity 65%

The graphic shows the heat recovery efficiency for wet conditions. A maximum 5% deviation can be expected when comparing with the equivalent efficiency under dry conditions.

ACOUSTIC CHARACTERISTICS

THERM-X / HR85

Unit type/ model			Sound power level per frequency band (dB)								Casing breakout @3m dB (A)
			63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
HR85-070	Supply	Duct inlet noise	72,7 dB	69,3 dB	70,4 dB	58,0 dB	55,4 dB	47,7 dB	47,1 dB	42,3 dB	**38,1 dB (A)**
		Duct outlet noise	74,6 dB	70,9 dB	83,4 dB	67,8 dB	64,5 dB	62,1 dB	57,3 dB	54,5 dB	
	Exhaust	Duct inlet noise	73,6 dB	70,2 dB	71,3 dB	58,9 dB	56,3 dB	48,5 dB	47,9 dB	43,2 dB	
		Duct outlet noise	75,5 dB	71,8 dB	84,2 dB	68,7 dB	65,3 dB	63,0 dB	58,2 dB	55,3 dB	
HR85-100	Supply	Duct inlet noise	79,2 dB	78,4 dB	70,7 dB	60,1 dB	55,9 dB	47,8 dB	43,5 dB	41,9 dB	**43,1 dB (A)**
		Duct outlet noise	87,5 dB	84,5 dB	83,6 dB	76,5 dB	72,9 dB	69,2 dB	63,0 dB	58,6 dB	
	Exhaust	Duct inlet noise	80,0 dB	79,3 dB	71,6 dB	60,9 dB	56,8 dB	48,7 dB	44,4 dB	42,8 dB	
		Duct outlet noise	88,4 dB	85,4 dB	84,5 dB	77,4 dB	73,8 dB	70,1 dB	63,9 dB	59,5 dB	
HR85-150	Supply	Duct inlet noise	81,0 dB	74,9 dB	64,2 dB	58,5 dB	55,5 dB	51,1 dB	44,9 dB	38,5 dB	**40,4 dB (A)**
		Duct outlet noise	83,2 dB	78,2 dB	78,3 dB	74,9 dB	71,9 dB	68,6 dB	63,3 dB	58,8 dB	
	Exhaust	Duct inlet noise	81,9 dB	75,7 dB	65,1 dB	59,3 dB	56,4 dB	52,0 dB	45,7 dB	39,3 dB	
		Duct outlet noise	84,1 dB	79,1 dB	79,2 dB	75,7 dB	72,8 dB	69,4 dB	64,1 dB	59,7 dB	
HR85-200	Supply	Duct inlet noise	78,2 dB	70,8 dB	66,9 dB	62,2 dB	60,8 dB	56,6 dB	52,2 dB	47,4 dB	**42,5 dB (A)**
		Duct outlet noise	81,1 dB	79,3 dB	82,5 dB	78,6 dB	77,1 dB	73,6 dB	69,1 dB	67,9 dB	
	Exhaust	Duct inlet noise	79,1 dB	71,7 dB	67,7 dB	63,0 dB	61,7 dB	57,5 dB	53,0 dB	48,3 dB	
		Duct outlet noise	82,0 dB	80,1 dB	83,4 dB	79,5 dB	78,0 dB	74,4 dB	70,0 dB	68,7 dB	
HR85-300	Supply	Duct inlet noise	77,7 dB	72,2 dB	80,1 dB	67,1 dB	60,7 dB	53,9 dB	48,3 dB	46,9 dB	**45,3 dB (A)**
		Duct outlet noise	79,3 dB	76,4 dB	82,3 dB	76,4 dB	75,8 dB	70,9 dB	63,2 dB	64,5 dB	
	Exhaust	Duct inlet noise	76,7 dB	71,2 dB	79,2 dB	66,1 dB	59,7 dB	53,0 dB	47,3 dB	46,0 dB	
		Duct outlet noise	78,3 dB	75,5 dB	81,4 dB	75,4 dB	74,8 dB	70,0 dB	62,2 dB	63,5 dB	
HR85-450	Supply	Duct inlet noise	82,0 dB	74,1 dB	81,3 dB	68,4 dB	63,4 dB	57,9 dB	54,2 dB	50,9 dB	**47,6 dB (A)**
		Duct outlet noise	88,1 dB	85,4 dB	87,6 dB	82,5 dB	82,3 dB	78,7 dB	74,2 dB	76,2 dB	
	Exhaust	Duct inlet noise	81,0 dB	73,1 dB	80,4 dB	67,5 dB	62,4 dB	57,0 dB	53,2 dB	50,0 dB	
		Duct outlet noise	87,2 dB	84,5 dB	86,7 dB	81,5 dB	81,4 dB	77,7 dB	73,3 dB	75,3 dB	
HR85-550	Supply	Duct inlet noise	77,8 dB	73,8 dB	74,1 dB	63,5 dB	57,4 dB	56,5 dB	50,2 dB	44,1 dB	**38,3 dB (A)**
		Duct outlet noise	87,3 dB	85,8 dB	84,1 dB	79,9 dB	76,2 dB	72,4 dB	67,3 dB	65,3 dB	
	Exhaust	Duct inlet noise	76,9 dB	72,9 dB	73,1 dB	62,6 dB	56,4 dB	55,6 dB	49,3 dB	43,2 dB	
		Duct outlet noise	86,4 dB	84,8 dB	83,2 dB	79,0 dB	75,3 dB	71,4 dB	66,3 dB	64,3 dB	
HR85-750	Supply	Duct inlet noise	80,0 dB	76,9 dB	78,0 dB	68,8 dB	64,7 dB	60,5 dB	54,9 dB	50,1 dB	**40,3 dB (A)**
		Duct outlet noise	89,0 dB	87,3 dB	90,0 dB	86,7 dB	83,8 dB	78,7 dB	71,5 dB	70,9 dB	
	Exhaust	Duct inlet noise	79,0 dB	75,9 dB	77,1 dB	67,8 dB	63,7 dB	59,5 dB	53,9 dB	49,2 dB	
		Duct outlet noise	88,0 dB	86,4 dB	89,1 dB	85,8 dB	82,9 dB	77,8 dB	70,6 dB	70,0 dB	

All stated sound power levels are for maximum operating air flow for the stated fan velocity at an external static pressure of approximately 100Pa.

Sound pressure levels calculated at 3 meters for Q1 – free space - spherical propagation.

Casing radiated noise acoustically tested to BS EN 3744:2010.

In duct noise acoustically tested to BS EN ISO 5136:2010. Noises stated are for the fresh air/supply air branch, noise for the extract/exhaust air branch is the same.

ELECTRIC CHARACTERISTICS

Model... without coils / with water heating coil/ with direct expansion coil/ with water changeover coil

Unit type/model	Phase [pcs]	Voltage [V]	Frequency [Hz]	Rated input [kW]	Full load current [A]
HR85-070	1	230	50	0,4	3
HR85-100	1	230	50	0,95	5,8
HR85-150	1	230	50	1	6,2
HR85-200	1	230	50	1,5	6,8
HR85-300	3	400	50	2	3,5
HR85-450	3	400	50	3,5	5,8
HR85-550	3	400	50	3,5	5,8
HR85-750	3	400	50	5,7	9

Model with electric post heating coil

Unit type/model	Phase [pcs]	Voltage [V]	Frequency [Hz]	Rated input [kW]	Full load current [A]
HR85-070	1	230	50	2,4	11,7
HR85-100	3	400	50	4	10,2
HR85-150	3	400	50	5,5	12,3
HR85-200	3	400	50	9	17,3
HR85-300	3	400	50	11	16,5
HR85-450	3	400	50	18,5	27,1
HR85-550	3	400	50	27,6	40,7
HR85-750	3	400	50	35,5	52

Characteristics of fan electric motor (per fan)

Unit type/model	Phase [pcs]	Voltage [V]	Frequency [Hz]	Rated input [W]	Full load current [A]	Speed [r/min]	Maximum tempe-rature [°C]	Protection IP	Inulation class
HR85-070	1	230	50	200	1,2	2650	50	44	B
HR85-100	1	230	50	455	2,8	2600	40	54	B
HR85-150	1	230	50	455	2,8	2600	40	54	B
HR85-200	1	230	50	715	3,1	2800	40	54	B
HR85-300	3	400	50	1000	1,63	2580	55	54	B
HR85-450	3	400	50	1700	2,6	2600	40	54	B
HR85-550	3	400	50	1850	2,9	2180	50	54	F
HR85-750	3	400	50	2040	4,2	2730	65	54	F

Characteristics of electric post heating coil

Unit type/model	Phase [pcs]	Voltage [V]	Frequency [Hz]	Rated input [kW]	Full load current [A]	Airflow [m3/h]
HR85-070	1	230	50	2	8,7	700
HR85-100	3	400	50	3	4,4	900
HR85-150	3	400	50	4,5	6,5	1600
HR85-200	3	400	50	7,5	10,9	2500
HR85-300	3	400	50	9	13	3000
HR85-450	3	400	50	15	21,7	4500
HR85-550	3	400	50	24	34,7	5500
HR85-750	3	400	50	30	43,4	7000

COIL CHARACTERISTICS

Please note all performance data is displayed for reference only. Coil performance is based on the nominal conditions stated and should be checked for the actual operational conditions of the equipment at the time of selection.

Characteristics of LPHW heating coil

Unit type/ model	Rated capacity* [kW]	Outlet air temperature [°C]	Water pressure loss [kPa]	Water flow [m³/h]	Air pressure loss [Pa]	Air flow [m³/h]	Connection diameter
**HR85-070	5,59	33	9,52	0,25	15,11	700	1/2
HR85-100	7,92	35,4	6,47	0,35	9,42	900	1/2
HR85-150	13,71	34,7	18,74	0,6	12,16	1600	3/4
HR85-200	17,77	30,5	30,02	0,78	26,39	2500	3/4
HR85-300	24,17	33,2	12,16	1,07	14,13	3000	3/4
HR85-450	30,51	29,6	18,74	1,34	28,55	4500	3/4
HR85-550	42,16	32,1	10,1	1,86	14,91	5500	3/4
HR85-750	48,39	29,9	13,05	2,13	22,66	7000	3/4

* For water temperature gradient 90/70 and inlet air temperature 10°C.
** External coil

Correction coefficients of the capacities of the LPHW coil*						
Air inlet temperature [°C]	Water temperature gradient					
	90/70	85/65	80/60	75/55	70/50	65/45
0	1,18	1,10	1,01	0,93	0,85	0,76
5	1,09	1,01	0,93	0,84	0,76	0,68
10	1,00	0,92	0,84	0,76	0,68	0,60
15	0,91	0,83	1,18	0,67	0,59	0,51
20	0,83	0,75	0,67	0,59	0,51	0,43

* To apply to the rated capacity in the characteristics of the hot water coil.

Characteristics of water changeover cooling / heating coil (WCO) - Heating

Unit type/ model	Rated capacity* [kW]	Outlet air temperature [°C]	Water pressure loss [kPa]	Water flow [m³/h]	Air pressure loss [Pa]	Air flow [m³/h]	Connection diameter
**HR85-070	6,68	37,5	2,5	0,29	46	700	3/4"
HR85-100	9,04	39	1,3	0,39	28	900	3/4"
HR85-150	14,74	36,6	1,0	0,64	36	1600	1"
HR85-200	20,03	33,1	1,8	0,87	80	2500	1"
HR85-300	28,52	37,4	1,9	1,24	43	3000	1"
HR85-450	37,84	34,3	3,1	1,65	86	4500	1"
HR85-550	54,22	38,4	3,6	2,36	45	5500	1 1/2"
HR85-750	118,91	59	14,3	5,24	71	7000	1 1/2"

* For water temperature gradient 60/40 and inlet air temperature 10°C.
**External coil

Correction coefficients of the capacities of the water changeover heating/cooling coil (WCO) - Heating *				
Air inlet temperature [°C]	Water flow/return temperature			
	60/40	55/50	45/40	35/30
0	1,31	1,47	1,18	0,89
5	1,16	1,31	1,02	0,74
10	1,00	1,15	0,87	0,59
15	0,85	1,00	0,72	0,44
20	0,70	0,85	0,58	0,30

* To apply to the rated capacity in the characteristics of the water changeover coil.

COIL CHARACTERISTICS

Please note all performance data is displayed for reference only. Coil performance is based on the nominal conditions stated and should be checked for the actual operational conditions of the equipment at the time of selection.

Characteristics of water changeover cooling / heating coil (WCO) - Cooling

Unit type/ model	Rated capacity* [kW]	Outlet air temperature [°C]	Water pressure loss [kPa]	Water flow [m³/h]	Air pressure loss [Pa]	Air flow [m³/h]	Connection diameter
**HR85-070	4,53	15,2	17,3	0,78	50	700	3/4"
HR85-100	6,05	14,8	8,5	1,04	31	900	3/4"
HR85-150	9,57	15,7	6,3	1,64	40	1600	1"
HR85-200	12,91	16,8	11,1	2,21	88	2500	1"
HR85-300	19,17	15,3	12,9	3,29	47	3000	1"
HR85-450	25,28	16,3	21,4	4,34	96	4500	1"
HR85-550	37,35	14,8	26,3	6,41	50	5500	1 1/2"
HR85-750	44,29	15,5	35,8	7,6	76	7000	1 1/2"

* For water temperature gradient 7/12 and inlet air temperature 25°C with 70% of relative humidity.
**External coil

Correction coefficients of the powers of the water changeover heating/cooling coil (WCO) - Cooling *			
Air inlet temperature [°C]	Water flow/return temperature		
	7/12	6/11	5/10
20	0,44	0,53	0,62
25	1,00	1,09	1,18
30	1,65	1,74	1,83

* To apply to the rated capacity in the characteristics of the water changeover coil

Characteristics of direct expasion coil (DX)

Unit type/model	Rated capacity [kW]*	Outlet air temperature [°C]	RH after coil [%]	Refrigerant pressure loss [kPa]	Air pressure loss [Pa]	Air flow [m³/h]	Connection diameter of gas connection	Connection diameter of liquid connection
**HR85-070	4,98	14,6	90,7	17,9	47	700	5/8"	5/8"
HR85-100	7,17	13,5	91,8	22,8	29	900	5/8"	5/8"
HR85-150	12,12	14	91,2	12,5	37	1600	int 28,2"	7/8"
HR85-200	16,33	15,5	89,5	21,0	80	2500	int 28,2"	7/8"
HR85-300	22,68	14,1	90,9	31,9	42	3000	1 3/8"	1 1/8"
HR85-450	29,28	15,5	89,3	50,0	87	4500	1 3/8"	1 1/8"
HR85-550	41,38	14,1	90,7	26,0	45	5500	1 5/8"	1 1/8"
HR85-750	48,47	15	89,8	34,3	68	7000	1 5/8"	1 1/8"

* For inlet air temperature 25°C with 70% of relative humidity and evaporation temperature 5°C , refrigerant R410A.
**External coil

COIL CHARACTERISTICS

Please note all performance data is displayed for reference only. Coil performance is based on the nominal conditions stated and should be checked for the actual operational conditions of the equipment at the time of selection.

Recommended valve K_{vs} for different temperature gradients

LPHW heating coil

Unit type/model	K_{vs} [flow / kPa]						Recommended pump pressure [kPa]
	90/70 [°C]	85/65 [°C]	80/60 [°C]	75/55 [°C]	70/50 [°C]	65/45 [°C]	
HR85-070	0,6	0,6	0,6	0,6	0,6	0,6	60
HR85-100	1,6	1,6	1,6	0,6	0,6	0,6	60
HR85-150	2,5	2,5	2,5	1,6	1,6	1,6	60
HR85-200	4,0	2,5	2,5	2,5	2,5	1,6	60
HR85-300	4,0	4,0	4,0	4,0	2,5	2,5	60
HR85-450	6,3	6,3	4,0	4,0	4,0	4,0	60
HR85-550	6,3	6,3	6,3	6,3	6,3	4,0	60
HR85-750	6,3	6,3	6,3	6,3	6,3	6,3	60

Water changeover cooling / heating coil (WCO)

Unit type/ model	Heating - flow/return temperature of water [°C]	K_{vs} [flow / kPa]	Cooling - flow/return temperature of water [°C]		
			7/12	6/11	5/10
			Recommended pump pressure [kPa]		
HR85-070	60/40	1,6	60	60	60
	55/50	2,5	70	70	70
	45/40	2,5	60	60	60
	35/30	2,5	60	60	60
HR85-100	60/40	1,6	60	60	60
	55/50	4,0	60	60	60
	45/40	4,0	60	60	60
	35/30	4,0	60	60	60
HR85-150	60/40	2,5	60	60	60
	55/50	4,0	100	100	100
	45/40	4,0	70	70	70
	35/30	4,0	60	60	60
HR85-200	60/40	4,0	60	60	60
	55/50	6,3	100	100	100
	45/40	6,3	70	70	70
	35/30	6,3	60	60	60
HR85-300	60/40	6,3	60	70	70
	55/50	12,0	100	100	100
	45/40	12,0	70	70	70
	35/30	12,0	60	60	60
HR85-450	60/40	6,3	70	70	70
	55/50	12,0	120	120	120
	45/40	12,0	100	100	100
	35/30	12,0	70	70	70
HR85-550	60/40	12,0	70	70	100
	55/50	24,0	120	120	120
	45/40	24,0	120	120	120
	35/30	24,0	70	70	70
HR85-750	60/40	12,0	100	100	120
	55/50	24,0	120	120	120
	45/40	24,0	120	120	120
	35/30	24,0	100	100	100

WEIGHTS

Unit type/model Vertical (Side connec.)	without heater / with electric heater [kg]	with LPHW /DX /WCO coil [kg]
HR85-070	115	120
HR85-100	165	175
HR85-150	205	215
HR85-200	220	230
HR85-300	335	350
HR85-450	350	365
HR85-550	550	580
HR85-750	570	600

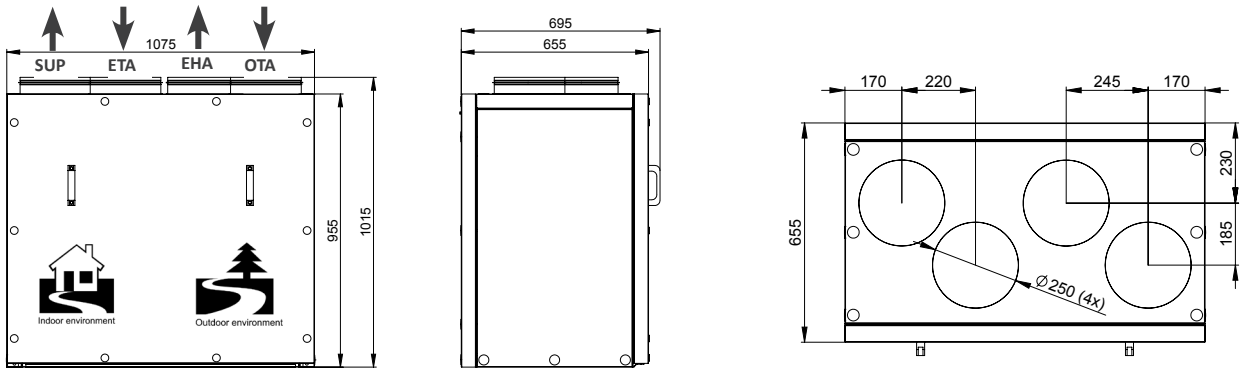
Unit type/model Upper (Top connec.)	without heater / with electric heater [kg]	with LPHW /DX /WCO coil [kg]
HR85-070	140	145
HR85-100	190	200
HR85-150	205	215
HR85-200	220	230
HR85-300	335	350
HR85-450	350	365

DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

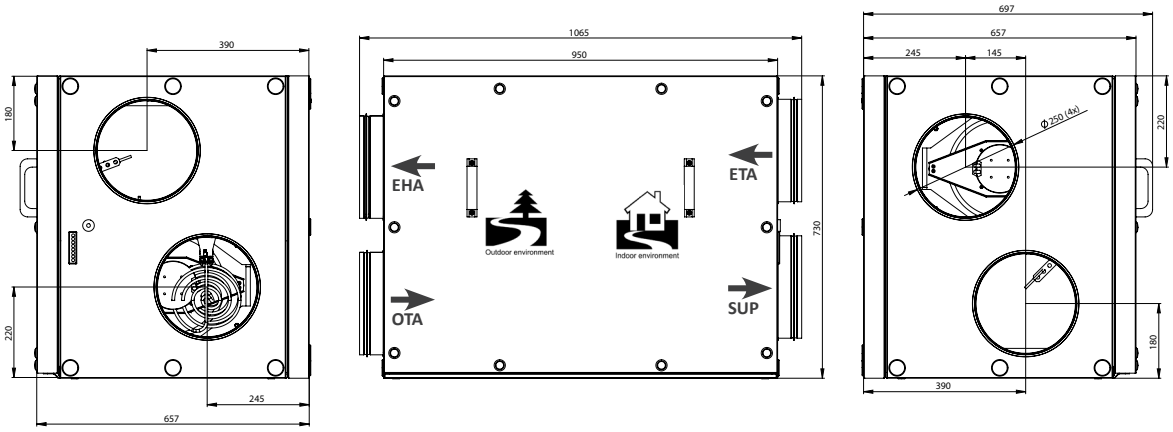
HR 85 070 U

- Left supply version with duct connections from the top

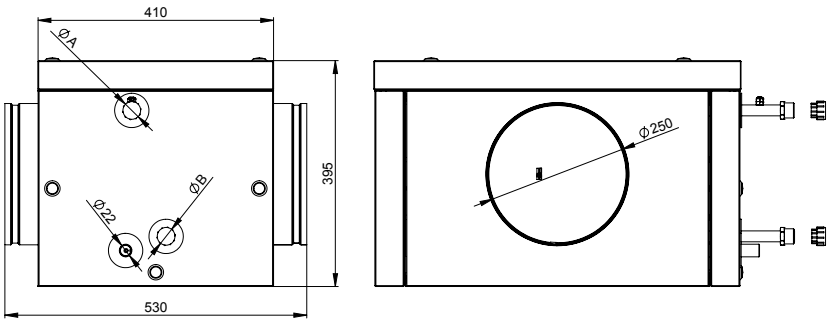


HR 85 070 V

- Right supply version with duct connections from the side



HR 85 070 V/U external coil



HR 85 070	A	B
LPHW	G 1/2"	G 1/2"
water changeover(WCO)	G 3/4"	G 3/4"
direct expansion (DX)	5/8"	5/8"

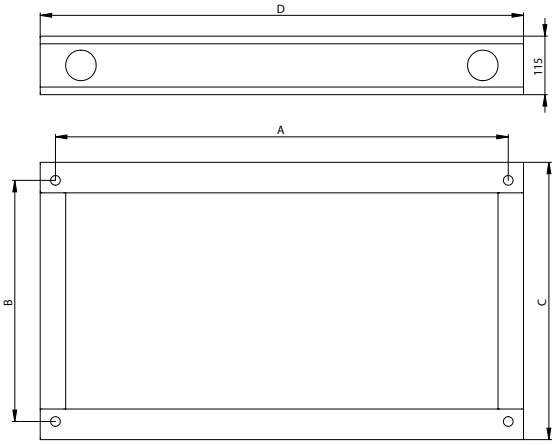
Note: It is not necessary to order the coil separately.

DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

Base frame for HR 85 070 V/U

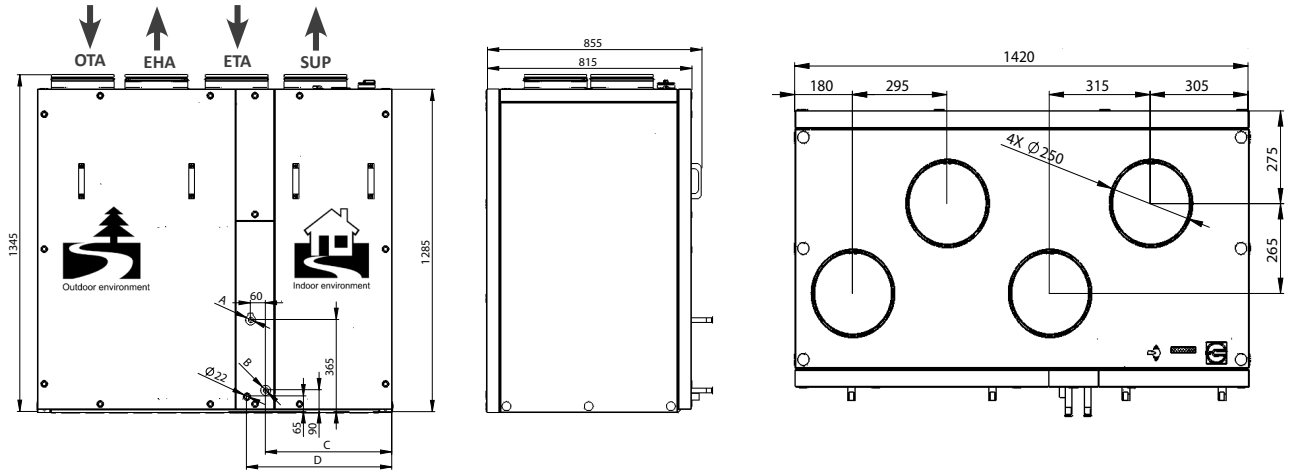
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.



Unit type/model	A	B	C	D
HR 85 070 V	890	475	545	950
HR 85 070 U	890	475	545	1075

HR 85 100 U

- Right supply version with duct connections from the top



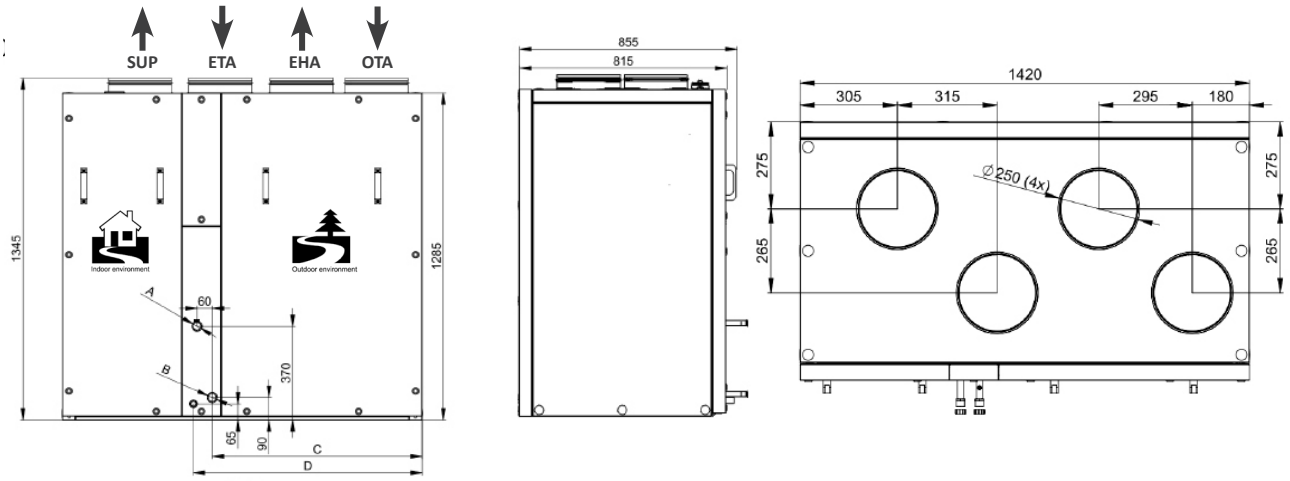
HR 85 100 U	Ø A	Ø B	C	D
LPHW	G 1/2"	G 1/2"	505	580
water changeover (WCO)	G 3/4"	G 3/4"	505	580
direct expansion (DX)	5/8"	5/8"	505	580

DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

HR 85 100 U

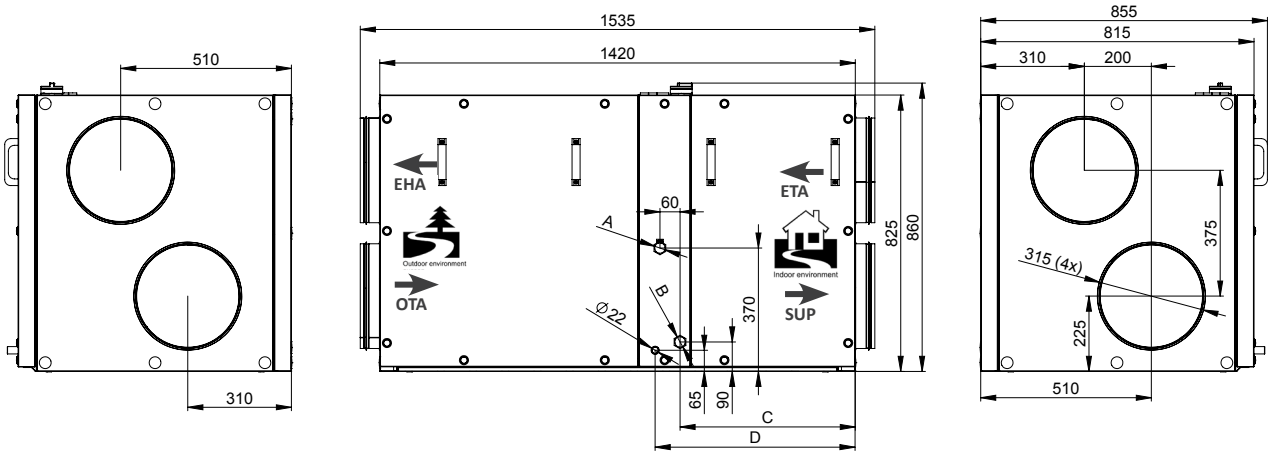
- Left supply version with duct connections from the top



HR 85 100 U	Ø A	Ø B	C	D
LPHW	G 1/2"	G 1/2"	825	900
water changeover (WCO)	G 3/4"	G 3/4"	825	900
direct expansion (DX)	5/8"	5/8"	825	900

HR 85 100 V

– Right supply version with duct connections from the side



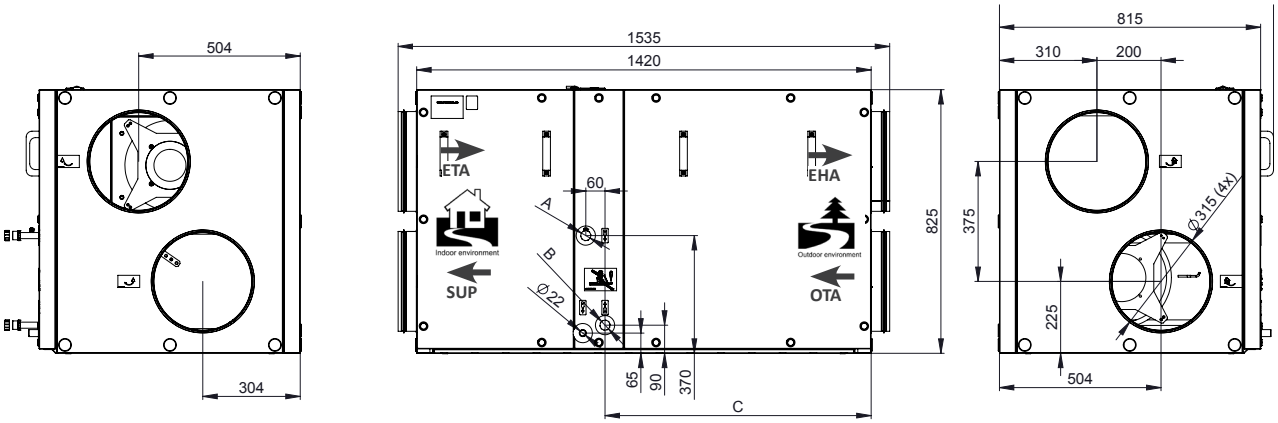
HR 85 100 V	Ø A	Ø B	C	D
LPHW	G 1/2"	G 1/2"	825	900
water changeover (WCO)	G 3/4"	G 3/4"	825	900
direct expansion (DX)	5/8"	5/8"	825	900

DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

HR 85 100 V

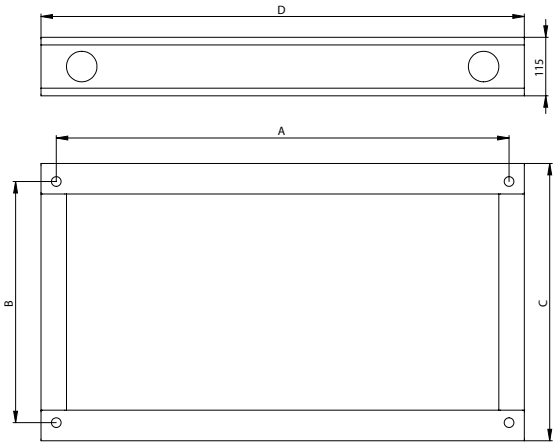
- Left supply version with duct connections from the side



HR 85 100	Ø A	Ø B	C
LPHW	G 1/2"	G 1/2"	830
water changeover (WCO)	G 3/4"	G 3/4"	830
direct expansion (DX)	5/8"	5/8"	830

Base frame for HR 85 100 V/U

HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.



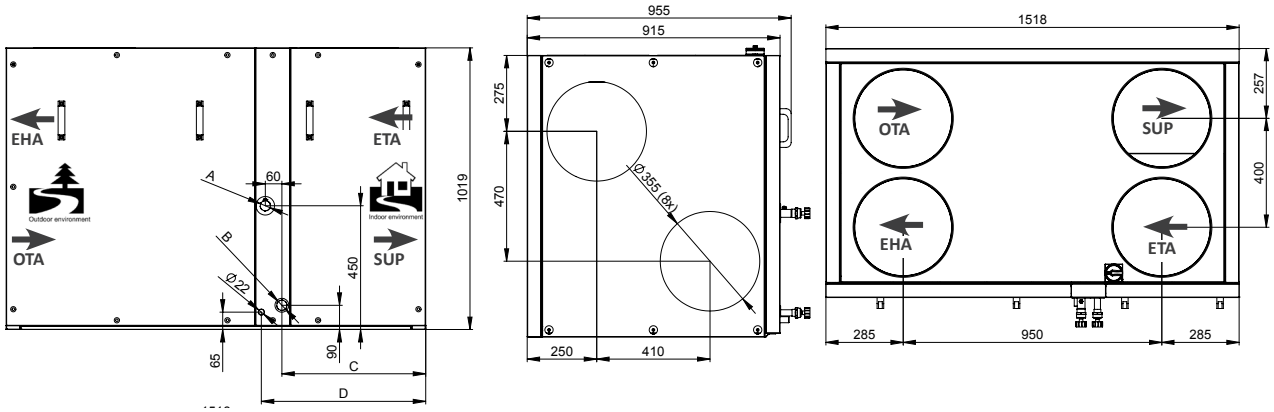
Unit type/model	A	B	C	D
HR 85 100 V	1240	635	705	1415
HR 85 100 U	1240	635	705	1415

DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

HR 85 150, 200 U/V

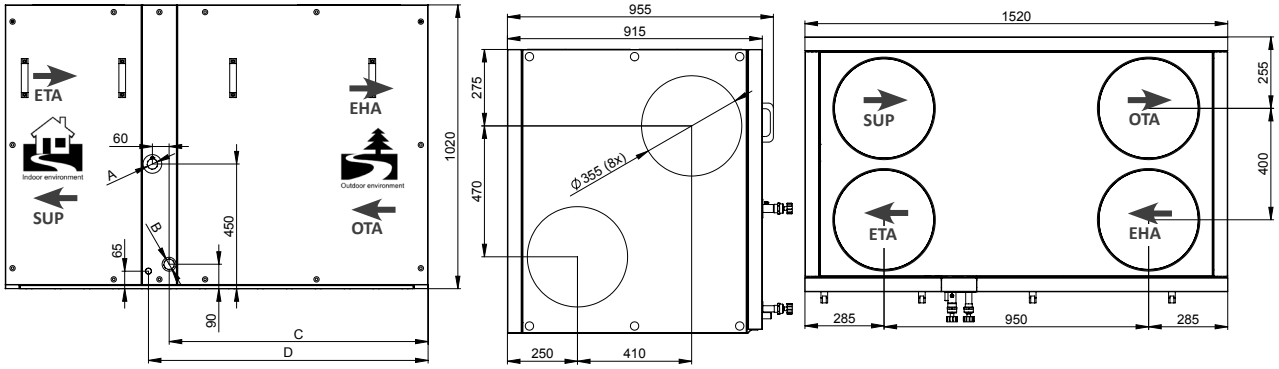
– Right supply version with duct connections from the top and side



HR 85 150, 200 V/U	Ø A	Ø B	C	D
LPHW	G 3/4"	G 3/4"	520	595
water changeover (WCO)	G 1"	G 1"	520	595
direct expansion (DX)	1 1/8"	7/8"	520	595

HR 85 150, 200 U/V

- Left supply version with duct connections from the top and side



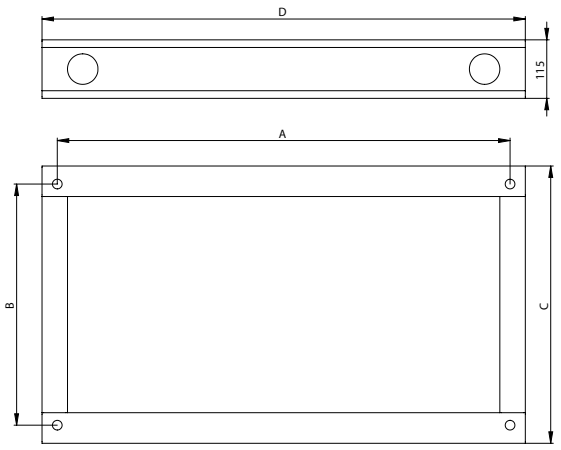
HR 85 150, 200 V/U	Ø A	Ø B	C	D
LPHW	G 3/4"	G 3/4"	930	1005
water changeover (WCO)	G 1"	G 1"	930	1005
direct expansion (DX)	1 1/8"	7/8"	930	1005

DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

Base frame for HR 85 150/200 V/U

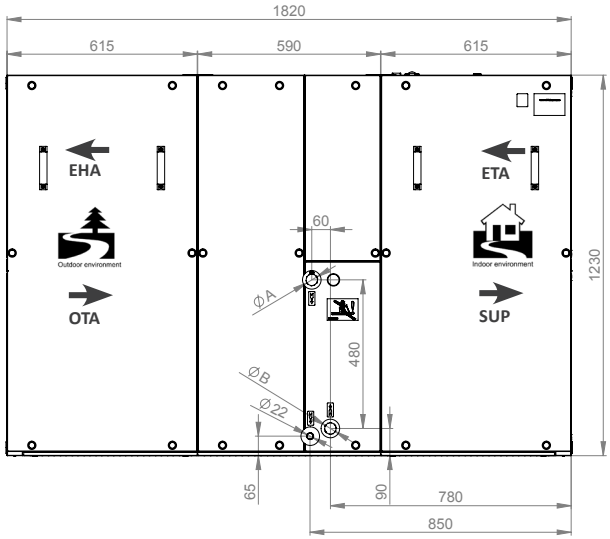
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

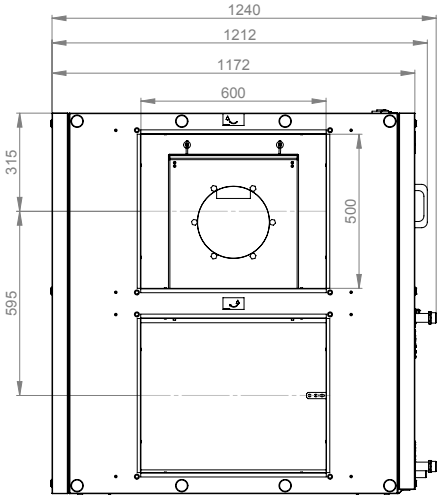


Unit type/model	A	B	C	D
HR 85 150/200 V	1340	735	810	1520
HR 85 150/200 U	1340	735	810	1520

HR 85 300, 450 V

– Right supply version with duct connections from the side





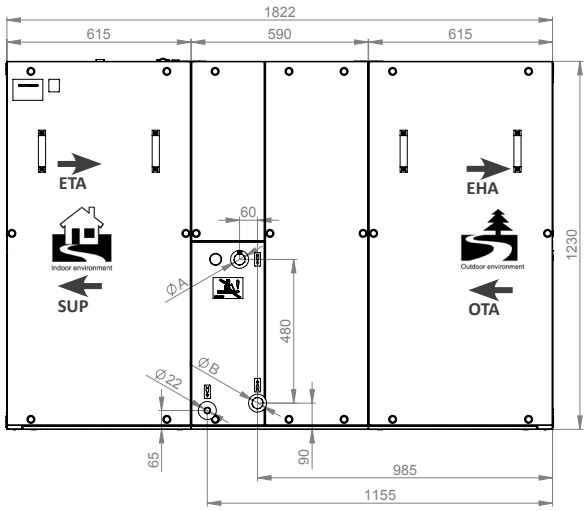
HR 85 300, 450 V	Ø A	Ø B
LPHW	G 3/4"	G 1"
water changeover (WCO)	G 1"	G 3/4"
direct expansion (DX)	1 3/8"	1 1/8"

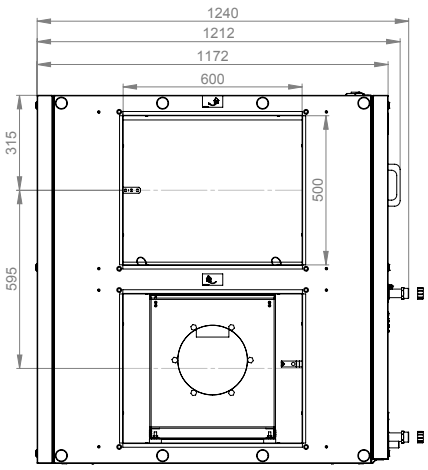
DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

HR 85 300, 450 V

– Left supply version with duct connections from the side





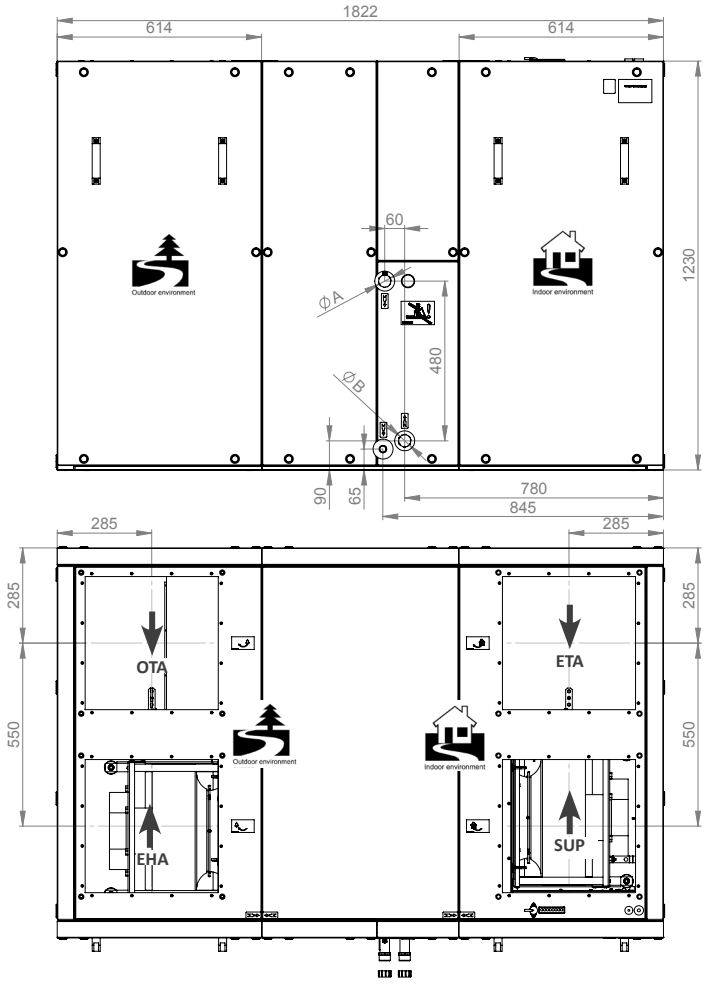
HR 85 300, 450 V	Ø A	Ø B
LPHW	G 3/4"	G 1"
water changeover (WCO)	G 1"	G 3/4"
direct expansion (DX)	1 3/8"	1 1/8"

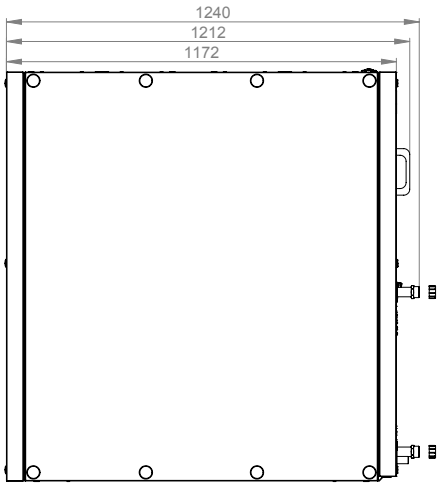
DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

HR 85 300, 450 U

– Right supply version with duct connections from the top





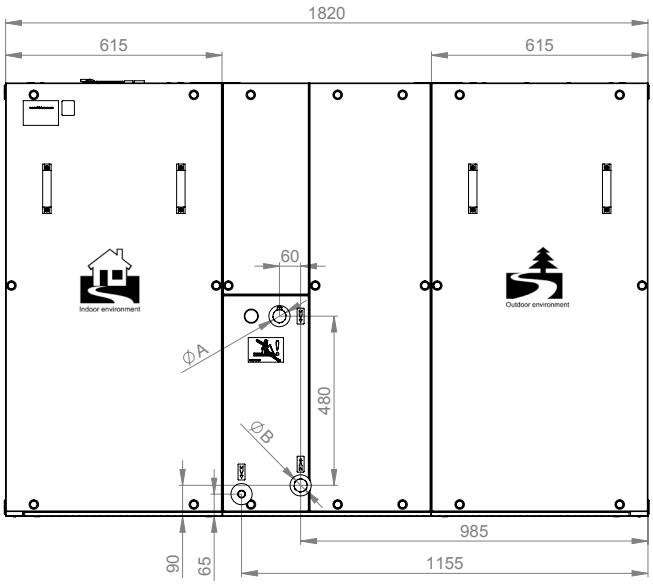
HR 85 300, 450 U	Ø A	Ø B
LPHW	G 3/4"	G 1"
water changeover (WCO)	G 1"	G 3/4"
direct expansion (DX)	1 3/8"	1 1/8"

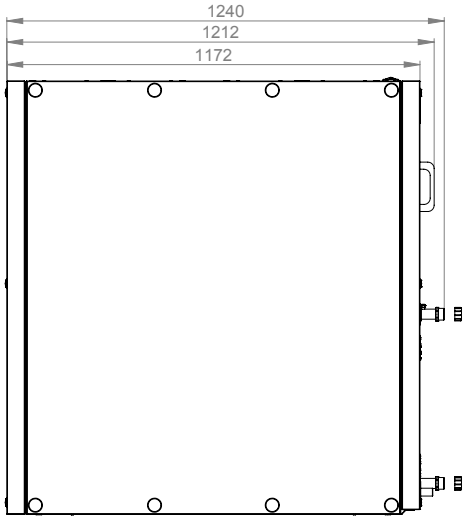
DIMENSIONS

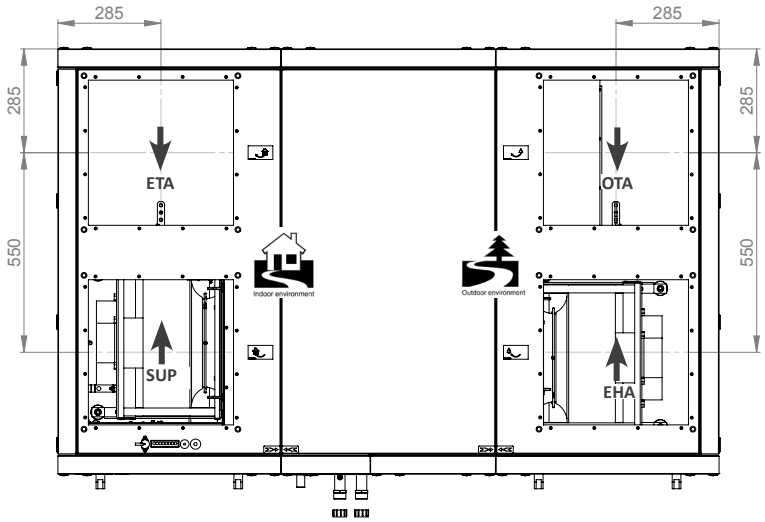
Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

HR 85 300, 450 U

– Left supply version with duct connections from the top







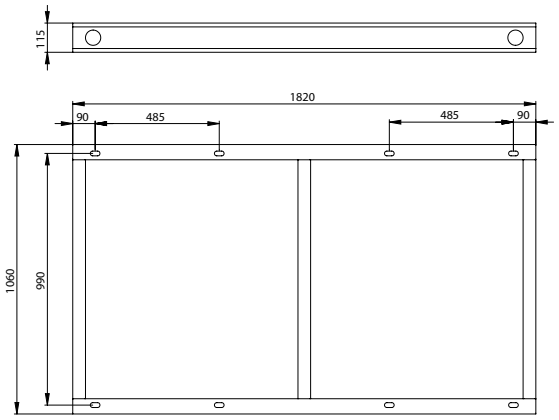
HR 85 300, 450 U	Ø A	Ø B
LPHW	G 3/4"	G 1"
water changeover (WCO)	G 1"	G 3/4"
direct expansion (DX)	1 3/8"	1 1/8"

DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

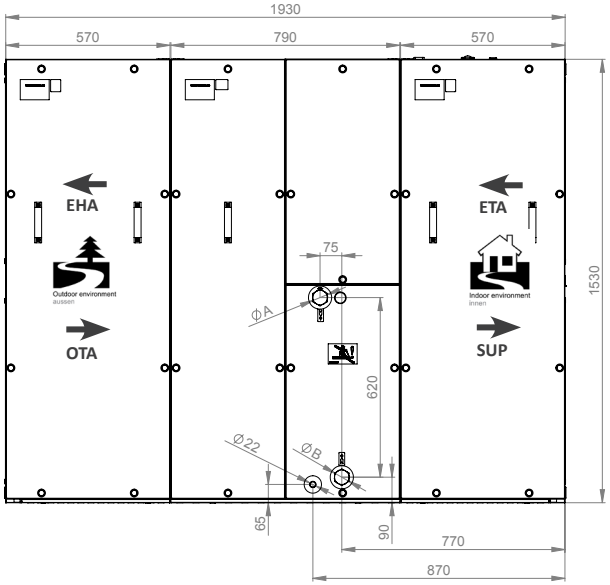
Base frame for HR 85 300/450 V/U

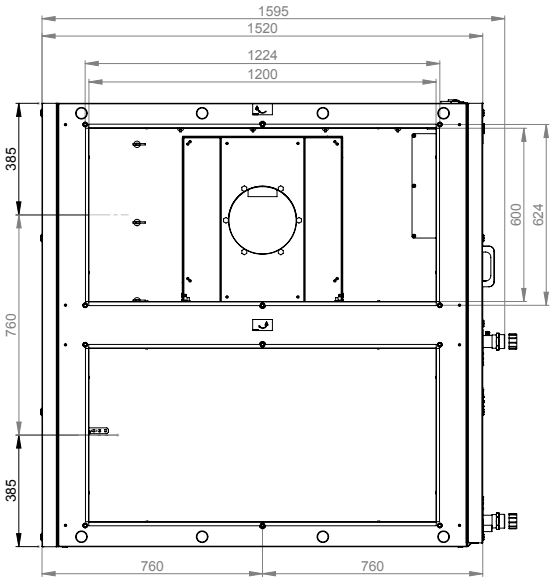
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.



HR 85 550/750 V

– Right supply version with duct connections from the side





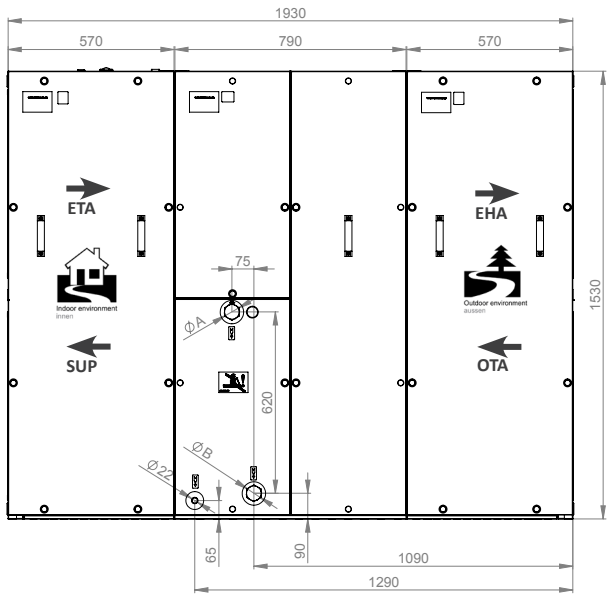
HR 85 550, 750 V	Ø A	Ø B
LPHW	3/4"	1 1/2"
water changeover (WCO)	1 1/2"	3/4"
direct expansion (DX)	1 5/8"	1 1/8"

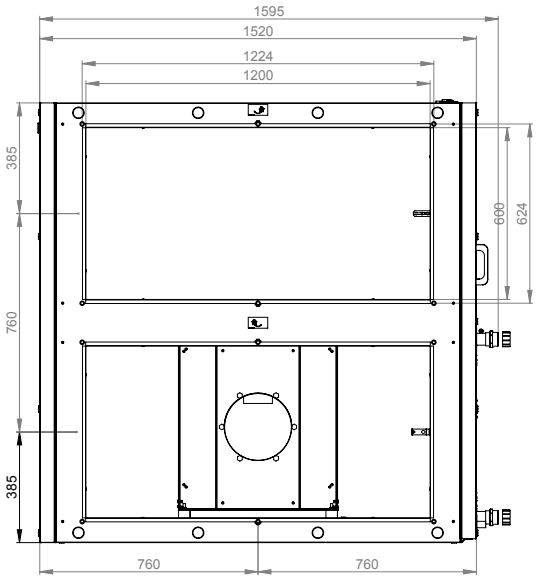
DIMENSIONS

Dimensional data and details shall be checked and confirmed at the time of order.
HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.

HR 85 550/750 V

– Left supply version with duct connections from the side

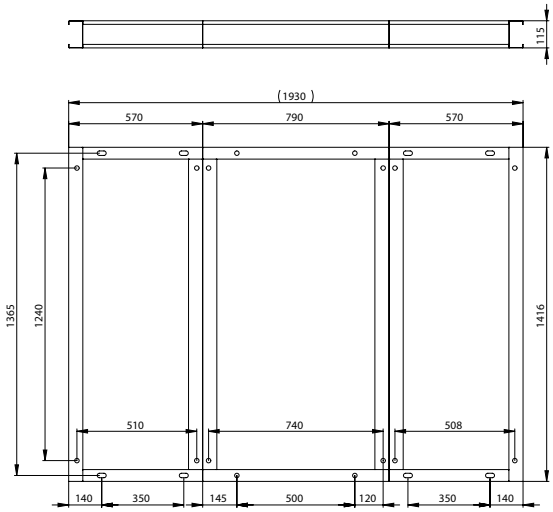




ALFA 85 550, 750 V	Ø A	Ø B
LPHW	3/4"	1 1/2"
water changeover (WCO)	1 1/2"	3/4"
direct expansion (DX)	1 5/8"	1 1/8"

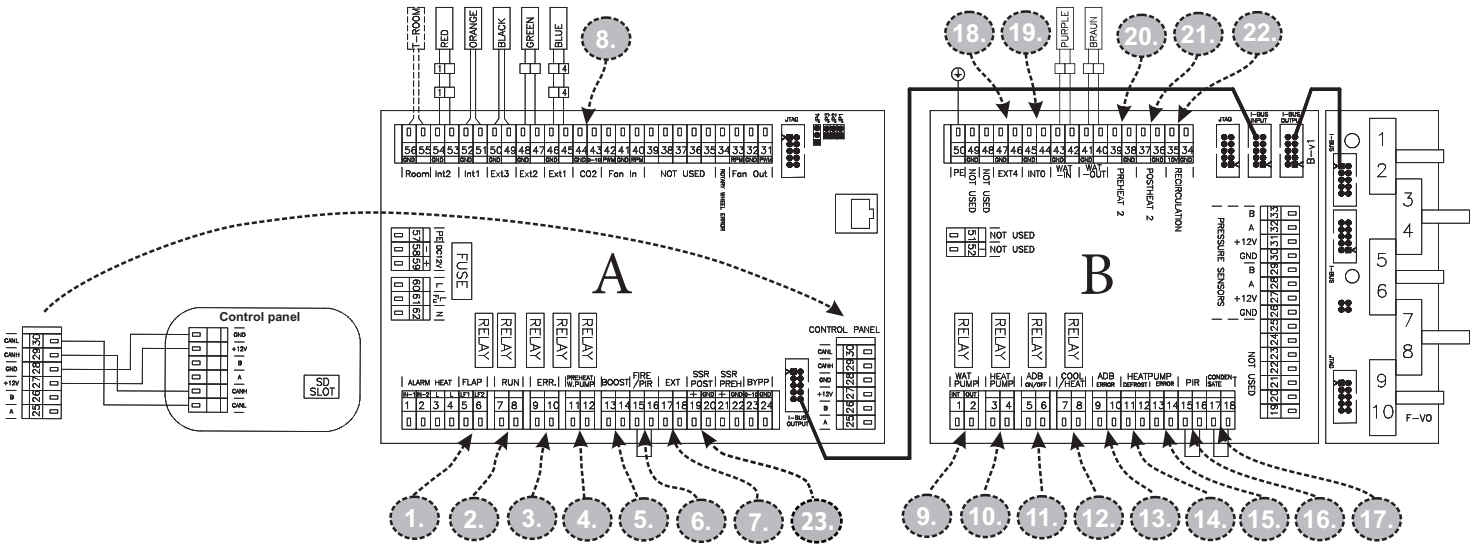
Base frame for HR 85 550/750 V

HR85 units are supplied with integrated base frames for ease of transport and handling. The base frame dimensions shall be added to the height of the unit to obtain the overall installed height.



WIRING DIAGRAMS

The diagram below is a generic illustration and it's presented for reference only. The actual wiring diagram for each unit will be provided at the time of order.



1.	**A** (5-6)	LF1 - FRESH AIR DAMPER (output L-open), LF2 - EXHAUST DAMPER (output L-open)
2.	**A** (7-8)	RUN CONTACT (output -NO/NC settable)
3.	**A** (9-10)	ERROR CONTACT (output NO)
4.	**A** (11-12)	EXTERNAL PRE HEATING COIL WATER PUMP (11 - Lint, 12 - Lout)
5.	**A** (13-14)	BOOST (input NO)
6.	**A** (15-16)	FIRE (input NC)
7.	**A** (17-18)	EXTERNAL CONTROL ON/OFF (input NC)
8.	**A** (43-44)	AQS SENSOR 0-10V (input) - RH, CO2, VOC, ETC..
9.	**B** (1-2)	WATER PUMP (1 - Lint, 2 - Lout)
10.	**B** (3-4)	HEAT PUMP CONTROL settable (output - ON/OFF)
11.	**B** (5-6)	ADIABATIC MODULE (output - ON/OFF)
12.	**B** (7-8)	COOL / HEAT settable (WCO = NC/NO - DX = output settable)
13.	**B** (9-10)	ADIABATIC MODULE ERROR (input NO)
14.	**B** (11-12)	HEAT PUMP DEFROST settable (input NC/NO)
15.	**B** (13-14)	HEAT PUMP ERROR settable (input NC/NO)
16.	**B** (15-16)	PIR SENSOR (input NC)
17.	**B** (17-18)	CONDENSATE OVERFLOW (input NC)
18.	**B** (46-47)	EXTERNAL TEMPERATURE SENSOR (external post heating coil - input)
19.	**B** (44-45)	EXTERNAL TEMPERATURE SENSOR (adiabatic module / recirc. chamber - input)
20.	**B** (38-39)	EXTERNAL PRE HEATING COIL (output 0-10V)
21	**B** (36-37)	EXTERNAL POST HEATING COIL (output 0-10V)
22	**B** (34-35)	RECIRCULATION CHAMBER (MIXING BOX) (output 0-10V)
23	**A** (19-20)	INTEGRAL POST HEATING COIL CONTROL (output 0-10V or PWM)

THERM-X CONTROLS

All Therm-X MVHR units are factory fitted with a Plug&Play fully integrated intelligent control package.

The factory fitted controls include:

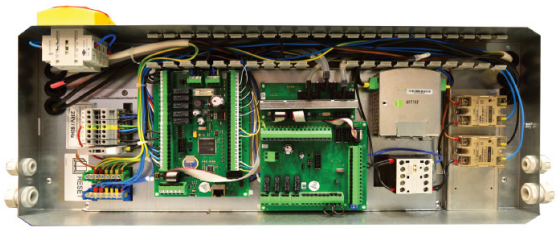
- Sealed controls enclosure with unit PCB and all electrics
- Mains switch isolator
- Rotary heat exchanger controller
- 3 temperature sensors (fresh air, supply air, return air)
- 1 sensor for antifreeze protection (exhaust air)
- 2 digital pressure sensors for filters
- 3 digital pressure sensors for airflow measurement and constant pressure operation
- 2 water temperature sensors (*only versions with water coil*)
- 1 condensate level sensor (*only versions with WCO or DX cooling coil*)
- Automatic and manual thermal re-set for electric heaters (only versions with electric heater

All units are also provided with the following loose items (*installation and wiring by others*):

- 1 room temperature sensor
- RGB handheld wired touchscreen controller (*cable not supplied, UTP cable recommended*)

The in-built controls are pre-configured and offer several alternatives to operate your Therm-X unit.

The controls are ready to go from the moment the unit is turned ON (*except externally mounted sensors which require installation and wiring by others*), and can be easily configured with the help of the handheld controller provided.



Some of the features offered by the controller are listed below:

AIRFLOW CONTROL

The controls offer continuous flow rate modulation of the airflow range of the unit in 10% steps.

The ratio of airflows for supply and exhaust can be adjusted according to the requirements of the project.

The unit can be set to operate in distinct ventilation modes to control the supply of outside air for ventilation purposes.

CAV (Constant Air Volume) MODE

The unit is programmed to supply a constant amount of air to the ventilated space.

The unit will adjust the output of the fans according to the internal or external pressure changes in order to maintain the amount of air being supplied to the rooms constant.

VAV (Variable Air Volume) MODE

The unit is programmed to adjust the fans output to maintain a constant pressure in the supply duct while varying the air volume according to the demand of the ventilated space.

The unit adjusts the supply flow rate according to the overall opening of the supply VAV terminal units in the system.

DCV (Demand Controlled Ventilation) MODE

The unit is programmed to adjust the supplied airflow according to the occupancy on the ventilated space matching the outdoor air supply to the ventilation demand.

The fan output is determined by a 0-10V input from an air quality sensor (*CO2, RH, VOC, etc., can be ordered from Barkell, installation and wiring by others*).

The flow rate is controlled according to the 0-10V signal.

"Breathing"

The unit can be set to turn OFF when the IAQ requirements on the ventilated space are satisfied to save energy. The unit then turns ON regularly to "breathe" and check the concentration of pollutants, returning to normal operation if required.

THERM-X CONTROLS

TRICKLE MODE

If a PIR motion sensor is installed (*can be ordered from Barkell, installation and wiring by others*), in the event of no occupancy the unit provides only background ventilation to save energy.

BOOST MODE

When there is a high demand for ventilation or a swift heating or cooling of the space is necessary (e.g. unit start up) the boost mode overrides the operation of the unit and runs the fans at the maximum defined airflow for the time period determined by the user.

The boost mode can be enabled with the supplied handheld controller or an external switch (*by others*).

TIME SCHEDULLING

The unit can be set to operate on a timed operation on weekly and/or yearly schedules with individual settings for up to six time blocks per day/year.

TEMPERATURE CONTROL

The unit is able to control the conditioned space temperature based on the temperature of the supply or return air.

Temperature control based on room temperature is also possible given the room temperature sensor is installed.

The unit automatically and continuously controls the output of the heat recovery device and the integrated heat exchangers (if installed) in order to achieve the set-point temperature defined by the user.

The supply air temperature is kept in between the limits defined during comissioning to avoid overcooled or overheated air being supplied to the room

AUTOMATIC FREECOOLING

The unit automatically detects favourable conditions for free-cooling and ventilates using the cold outside air to achieve space cooling savings.

OTHER CONTROL FEATURES

In addition to the basic ventilation and temperature control the Therm-X controller offers a range of features to extend the functionality as well as to facilitate commissioning operation and maintenance of the equipment.

Heat pump

Control of heat pump via ON/OFF or 0-10V
Enable, error and defrost signal

Safety

FIRE MODE interlock with BMS
Soft start up
Frost protection of the water heat exchangers
Overheat protection of the electric heaters
Condensate tray overflow protection
Fault and emergency alarms on the handheld controller
Memory of last operational state in event of power outage

Commissioning

Automatic calibration of filters and fans on commissioning
Component test mode
PID tuning

Maintenance

Continuous monitoring of the filter status
Dirty filter alarm

External

Control of external mixing box based on CO2 or temperature (*not sold by Barkell*)

Control of external adiabatic module (*not sold by Barkell, ON/OFF control only, not suitable for modulating control*)

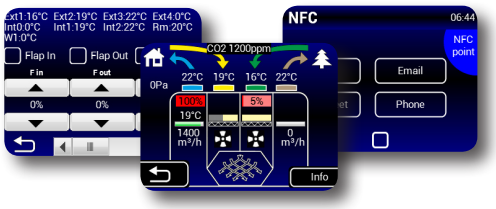
Control of external shut-off dampers (*can be ordered from Barkell, installation and wiring by others*)

Control of 2nd external pre-heating coil – water or electric (*can be ordered from Barkell, installation and wiring by others*)

Control of 2nd external post-heating coil – water, electric or direct expansion (*can be ordered from Barkell, installation and wiring by others*)

For further information about the external control functions of the Therm-X controls please contact our offices.

THERM-X CONTROLS



COMMUNICATION

The unit can be set-up and controlled via the handheld touchscreen controller supplied or via the BMS.

HANDHELD CONTROLLER

The handheld control panel is a powerful tool for setting up and operating the Therm-X units.

End user level functions:

- Adjusting operational parameters – set point temperature, airflow
- Activate BOOST MODE
- Set TIME SCHEDULLING
- Display alarms and faults in detail
- Monitor the unit operation
- Near Field Communication (NFC)

Commissioning level functions:

- Full set-up and calibration of the unit
- Select and set up ventilation modes
- Set-up secondary ventilation modes – BOOST, TRICKCLE,FREECOOLING
- Set airflow offset, temperature limits, etc.
- Test individual components
- Set end-user level access protection

The hand-held controller has a fully touchscreen based interface with full RGB color scheme and supports NFC communication.

The controller must be wired to the unit with a suitable communication cable (*not supplied by Barkell, unshielded twisted pair (UTP) recommended*) not exceeding a length of 50m.

BMS INTEGRATION

BMS integration is provided by connecting the unit control panel through a MODBUS RTU or TCP protocol allowing full control and monitoring of the unit.

Other protocols can be enabled with the use of an gateway converter (*not sold by Barkell, must be programmed by a BMS or controls specialist*).

CONTROLS SET-UP

The set-up of the controls on the Therm-X unit can be performed by one of our experienced commissioning teams.

We offer the following options to commission your Therm-X units:

Site attendance for demonstration of controls set-up

With this option one of our experienced engineers will attend to site and demonstrate how to calibrate and set the controls for the Therm-X unit using the provided handheld controller.

Site attendance for controls set-up

With this option one of our experienced engineers will attend to site and check the installation and wiring of every unit as well as calibrate and set up the controls to the required project design conditions.

For additional information about our comissioning options please contact our offices.

Please note:

Any mechanical or electrical works must be completed before our engineers attend to site to set-up the controls.

Barkell will not perform the integration of the the units into the BMS.

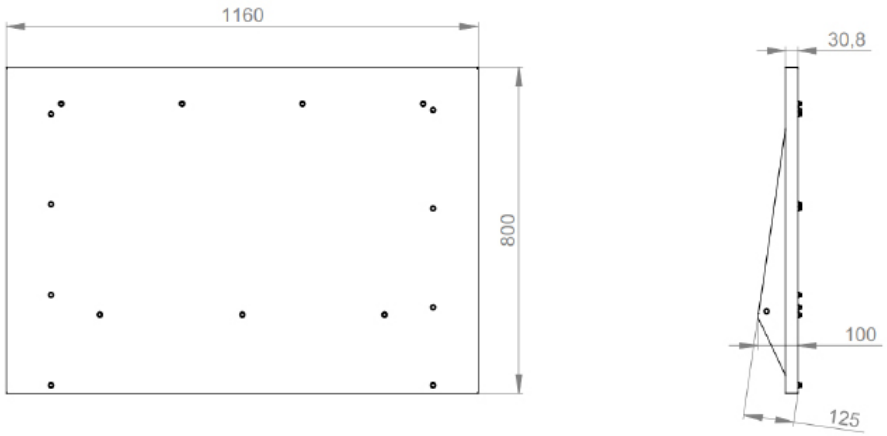
Demonstration of the controls and witnessing must be required separately.

ACCESSORIES

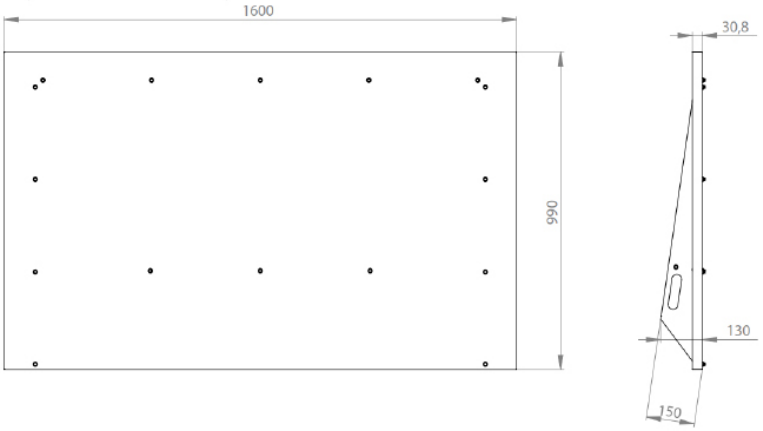
Weatherproof roofs

Weatherproof roofs for outdoor instalation of vertical type (side connections) Therm-X HR85 units

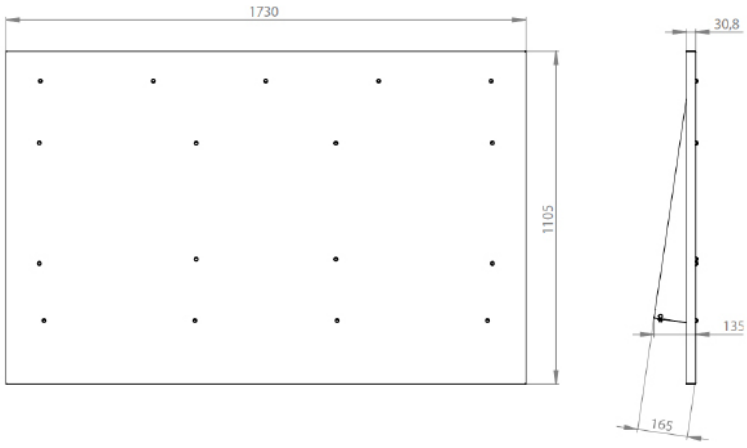
Unit type/model	Roof
HR85-070EC-RS-V	ROOF-HR85-070



Unit type/model	Roof
HR85-100EC-RS-V	ROOF-HR85-100



Unit type/model	Roof
HR85-150/200EC-RS-V	ROOF-HR85-150-200



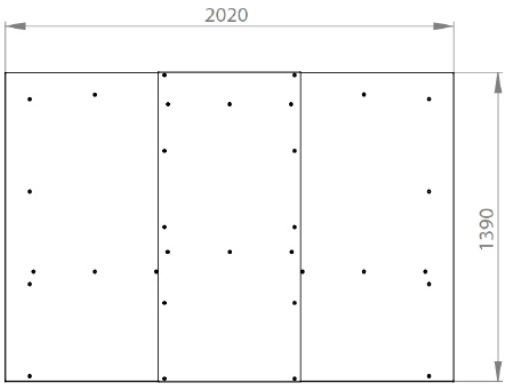
Notes:
Roofs are supplied loose for fitting on site by others. Fittings are included.
The dimensions of the roof shall be added to the overall dimensions of the unit.

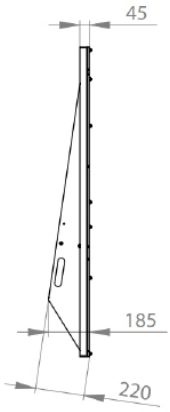
ACCESSORIES

Weatherproof roofs

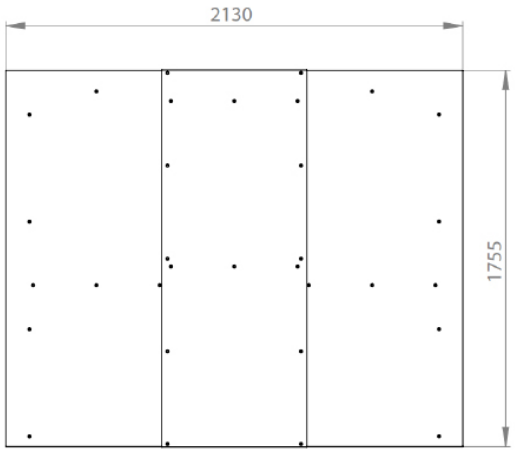
Weatherproof roofs for outdoor instalation of vertical type (side connections) Therm-X HR85 units

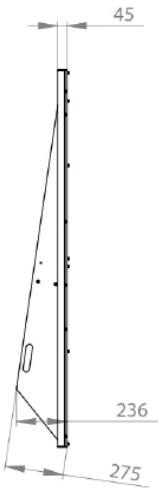
Unit type/model	Roof
HR85-300/450EC-RS-V	ROOF-HR85-300-450





Unit type/model	Roof
HR85-550/750EC-RS-V	ROOF-HR85-550-750





Notes:

Roofs are supplied loose for fitting on site by others. Fittings are included.

The dimensions of the roof shall be added to the overall dimensions of the unit.

ACCESSORIES

Rectangular shut off damper - MLKR/S

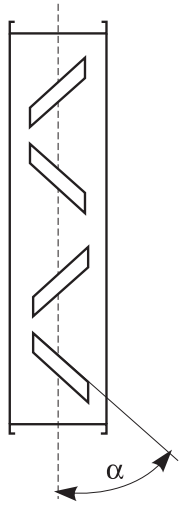
The MLKR/S rectangular damper can be unit mounted to allow automatic shutting off the unit inlets/outlets and prevent drafts when the unit is not in operation. The flanged damper frame is manufactured of galvanized steel. The blades are made of aluminum.

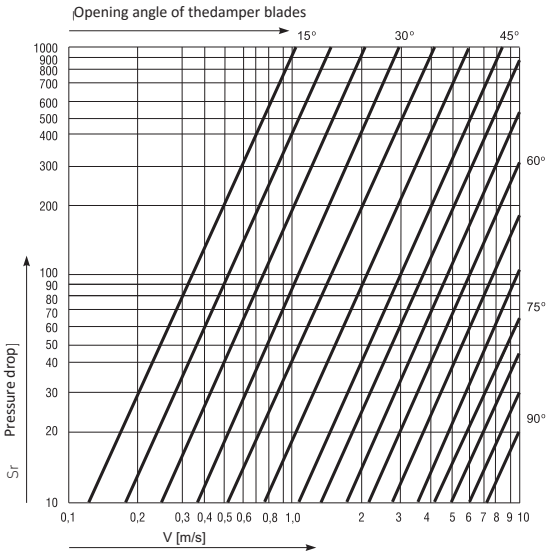
Notes:
Actuator must be ordered separately. Power and control for the damper actuator can be provided by the unit control panel. The unit can power and control up to 2 dampers. Damper and actuator are supplied loose for fitting and wiring on site by others.

Recommended combinations

Unit type/model	Rectangular damper	Recommended actuator
HR85-300EC-RS-V	MLKR/S-600X505	SERVO-TD-04-230-1
HR85-450EC-RS-V		
HR85-300EC-RS-U	MLKR/S-400X405	
HR85-450EC-RS-U		
HR85-550EC-RS-U (V)	MLKR/S-1200X605	
HR85-750EC-RS-U (V)		

Pressure drop



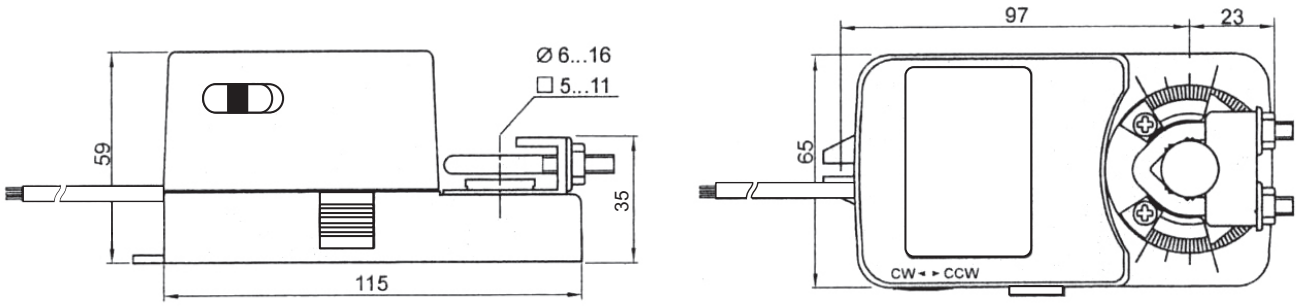


ACCESSORIES

Damper actuator - SERVO-TD-04-230-1

Actuator for MLKR and KTRK dampers, ON/OFF, no spring return.
The actuator drive comprises of a steel base and a plastic housing. The cable length is 1 m.
The drive shall be installed in sheltered dry indoor areas with the ambient temperature of -10 °C up to +55 °C.

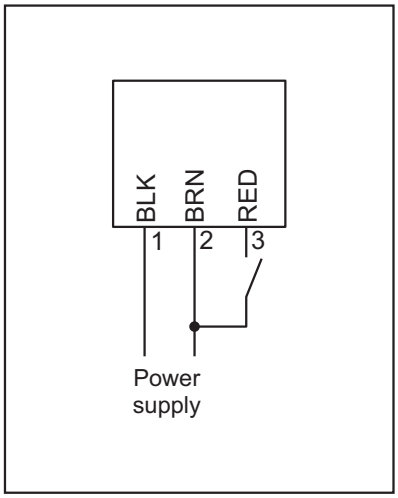
Dimensions



Damper shaft	Length [mm]	○ [mm]	◇ [mm]
	min. 40	8 up to 16	5 up to 12

Type	Voltage [V]	Power consumption		Torque [Nm]	Displacement time [s]	Working angle max.	Weight [kg]
		Standby [W]	Operation [VA]				
SERVO-TD-04-230-1-M	230	2	12	4	90	95°	0,5

Wiring diagram



Transition rectangular to circular - *PR-O*

Galvanized transition piece from rectangular to circular ducting. Can be easily installed in the unit through the use of factory fitted nut inserts on the unit connections.

Recommended combinations

Unit type/model	Transition
Vertical config. (side connnections)	
HR85-300EC-RS-V	PR-VO-0600X500-D560-L300
HR85-450EC-RS-V	PR-VO-0600X500-D560-L300
HR85-550EC-RS-V	PR-O-1200X600-D630-L600
HR85-750EC-RS-V	PR-O-1200X600-D630-L600

Unit type/model	Transition
Upper config (top connnections)	
HR85-300EC-RS-U	PR-VO-0400X400-D500-L300
HR85-450EC-RS-U	PR-VO-0400X400-D500-L300

ACCESSORIES

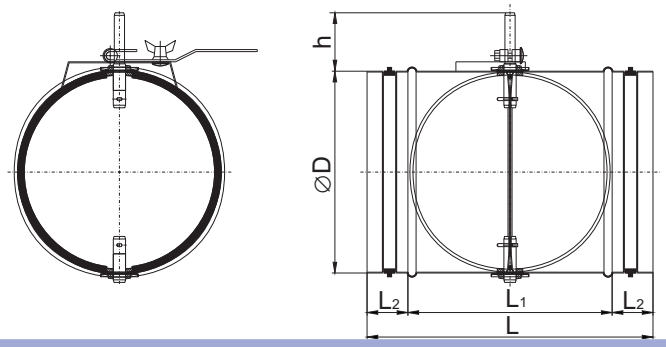
Circular shut off damper

The KRTK circular damper can be duct mounted to allow automatic shutting off the ventilation system and prevent drafts when the unit is not in operation.The damper housing is manufactured of galvanized steel. The damper may be fitted with a actuator after removing the manual control lever.

Notes:

Actuator must be ordered separately. Power and control for the damper actuator ican be provided by the unit control panel.

The control panel can power and control up to 2 dampers. Damper and actuator are supplied loose for fitting and wiring on site by others.



Circular damper	Dimensions [mm]					Sheet thickness [mm]	Weight [kg]
	D	L	L_1	L_2	h		
KRTK-A-250	250	320	200	60	65	0,80	2,1
KRTK-A-315	315	320	200	60	64	0,80	3,6
KRTK-A-355	355	420	300	60	63	0,80	5,1

Duct mounted electric heater - EOKO2

The EOKO2 electric duct mounted heater for heating or re-heating the supply air in HVAC systems.

It can be used for pre-heating or re-heating air from the THERM-X / HR85 unit's recuperative exchanger were the optional in-built heater capacity is not sufficient to achieve the required temperature or when closer temperature control of the room is required.

The heater is manufactured of galvanized steel and open coil electric heating elements.

The electric IP rating of the control housing of the heater is IP 20.

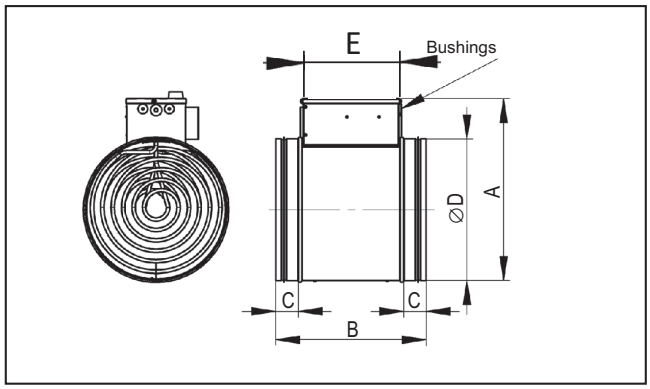
Recommended combinations

Unit type/model Vertical config. (side connnections)	Type of electric heater
HR85-070EC-RS-V	EOKO2-250-XX-X-D
HR85-100EC-RS-V	EOKO2-250-XX-X-D
HR85-150EC-RS-V	EOKO2-355-XX-X-D
HR85-200EC-RS-V	EOKO2-355-XX-X-D
HR85-300EC-RS-V	EOKO2-560-XX-X-D
HR85-450EC-RS-V	EOKO2-560-XX-X-D
HR85-550EC-RS-V	EOKO2-630-XX-X-D
HR85-750EC-RS-V	EOKO2-630-XX-X-D

Unit type/model Upper config (top connnections)	Type of electric heater
HR85-070EC-RS-U	EOKO2-250-XX-X-D
HR85-100EC-RS-U	EOKO2-250-XX-X-D
HR85-150EC-RS-U	EOKO2-355-XX-X-D
HR85-200EC-RS-U	EOKO2-355-XX-X-D
HR85-300EC-RS-U	EOKO2-500-XX-X-D
HR85-450EC-RS-U	EOKO2-500-XX-X-D

ACCESSORIES

Dimensions



Coil characteristics

Type	Nominal diameter [mm]	Output [kW]	Voltage [V]		Connection [type]	FLC [A]	Airflow Min. [m³/h]	Dimensions [mm]					Weight [kg]
			Coils only	Heater				A	B	C	D	E	
EOKO2-250-4,5-3	250	4,5	3x230	3x400	star	6,7	265	350	380	40	250	150	3,8
EOKO2-315-9-3	315	9,0	3x400	3x400	delta	13	530	430	380	60	315	150	8,2
EOKO2-355-9-3	355	9,0	3x400	3x400	delta	13	530	470	380	60	355	150	8,5
EOKO2-400-9-3	400	9,0	3x400	3x400	delta	13	530	500	380	60	400	150	8,9
EOKO2-500-18-3	500	18,0	3x400	3x400	delta	26,2	1059	600	460	50	500	150	10,4
EOKO2-560-18-3	560	18,0	3x400	3x400	delta	26,2	1059	660	460	50	560	150	11,6
EOKO2-630-18-3	630	18,0	3x400	3x400	delta	26,2	1059	730	460	50	630	150	13,2

Determination of air temperature rise

P[W] **= V** [m³/h] **x 0,34 x Δt** [°C]

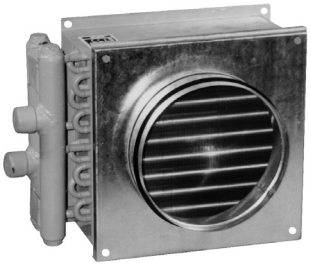
EOKO2 internal control system

The heater is supplied with fully integrated control panel with 7 digit display to adjust the desired set temperature.
To detect the temperature of the air an temperature sensor for duct installation is provided with the heater.

Notes:
The heater is supplied as a standalone product. Power and control to the heater must be provided by an external source. The Therm-X unit controls can be used for controlling this heater.
The Therm-X controller regulates the heater output only. All other emergency and safety functions (cooldown, minimum airflow, etc...) shall be ensured by an external control system.
Duct temperature sensor installation by others.
Heater supplied loose for fitting and wiring on site by others.

ACCESSORIES

Duct mounted water heater - VOK-01

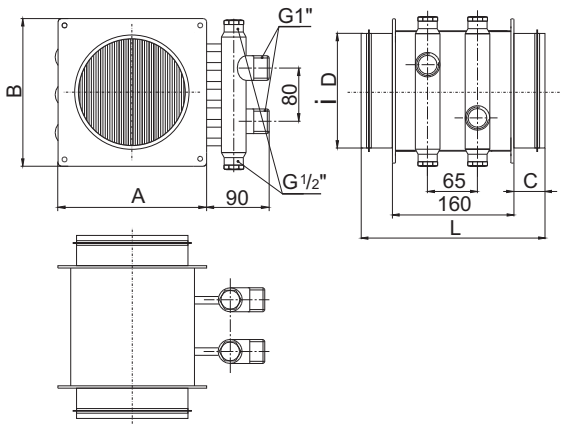


The VOK-01 water heater for heating or re-heating the supply air in HVAC systems.
It can be used for pre-heating or re-heating air from the Therm-X unit's recuperative exchanger were the optional in-built heater capacity is not sufficient to achieve the required temperature or when closer temperature control of the room is required.
The heater shall be installed indoor in a dry area with ambient temperatures ranging from 5 °C up to 60 °C and relative humidity of up to 80 %.
The heater frame is made of galvanized steel with copper tubes and aluminium fins.

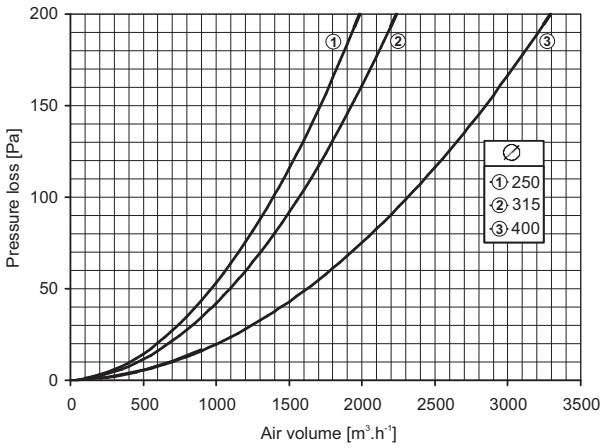
Coil characteristics

Type	Air flow [m³/h]	80/60 Water temperature gradient				60/40 Water temperature gradient				Dimensions [mm]					Weight [kg]**
		Rated capacity* [kW]	Outlet tempera-ture* [°C]	Water pressure loss [kPa]	Water flow [l/s]	Rated capacity* [kW]	Outlet tempera-ture* [°C]	Water pressure loss [kPa]	Water flow [l/s]	ØD	A	B	C	L	
VOK-01-T-250	1500	28,86	50,16	14,89	0,34	18,33	26,7	8,69	0,22	250	390	390	60	280	9,0
VOK-01-T-315	1500	28,86	50,16	14,89	0,34	18,33	26,7	8,69	0,22	315	390	390	60	280	9,0
VOK-01-T-355	2000	40,11	52,72	12,9	0,48	25,48	28,27	5,26	0,3	355	460	460	60	280	11,2

Dimensions

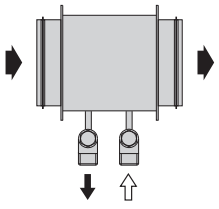


Pressure drop

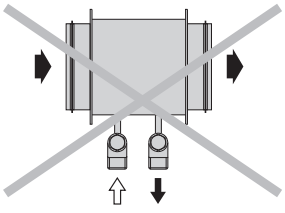


Installation

Counter flow installation



Parallel flow connection



Note:
The water coil is designed for the maximum operating water temperature of +100 °C and maximum operating pressure of 1.6 MPa.
The heater is supplied as a standalone product. Control to the heater must be provided by an external source. The Therm-X unit controls can be used for controlling this heater. A duct sensor (must be ordered separately) downstream of the heater is required.
Heater is supplied loose for fitting and wiring on site by others.
Valve and actuator kits not included.

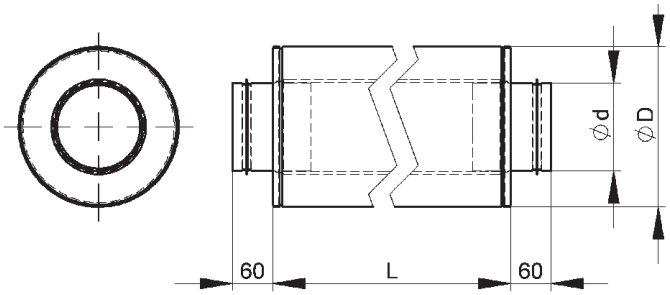
ACCESSORIES

Circular sound attenuator - SPTGLX

The ***SPTGLX*** circular sound attenuator is designed for reducing noise propagated through the HVAC ducting. The sound attenuator housing is manufactured of galvanized steel and rockwoll infill.

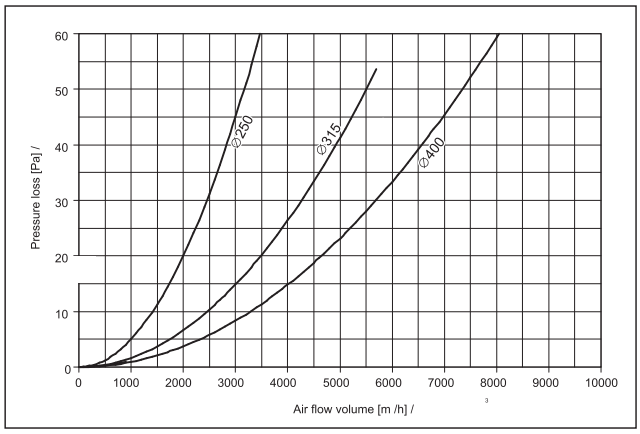
Note:
Attenuators supplied loose for installation on site by others.

Dimensions

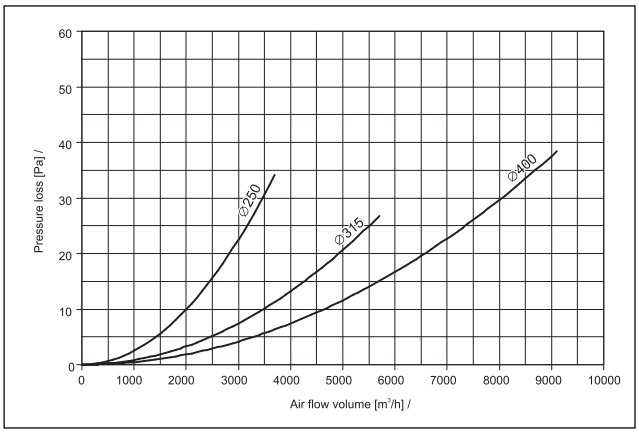


Type	Dimensions [mm]			Insertion losses [dB] by frequency band [Hz]						Weight [kg]
	L	d	D	250	500	1000	2000	4000	8000	
SPTGLX-0,5-250	500	250	350	4	9	19	8	5	4	8,6
SPTGLX-1,0-250	1000	250	350	6	14	27	15	9	7	12,6
SPTGLX-0,5-315	500	315	415	3	9	14	6	4	3	10,3
SPTGLX-1,0-315	1000	315	415	7	15	27	11	8	6	15,2
SPTGLX-0,5-400	500	400	500	4	8	13	5	5	3	12,6
SPTGLX-1,0-400	1000	400	500	5	13	21	9	8	5	18,5

Pressure loss for *SPTGLX*, length 1 m.



Pressure loss for *SPTGLX*, length 0.5 m.



ACCESSORIES

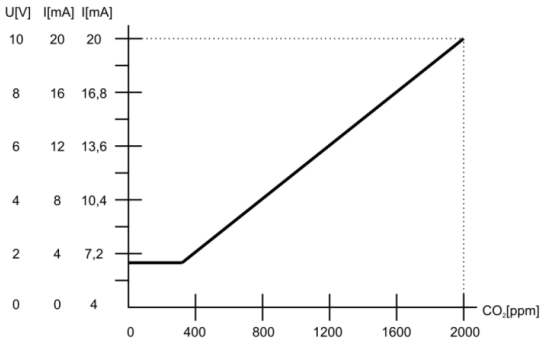
Room CO2 sensor - CI-CO2-M

Room sensor for measurement of the CO2 concentration on ventilated spaces. The 0-10V output signal can be connected to the Therm-X unit control panel for control in the DCV mode. The operation is based on the infrared principle. Auto-calibration procedure compensates for the aging of the infrared source and ensures outstanding long term stability. It is also possible to get the measured values via Modbus RTU.

Note:
Power can be provided by the unit to a single air quality sensor.
The Therm-X unit is able to operate based on the input from a single air quality sensor. Additional sensors can be connected with the use of an external system (contact Barkell for details).
Sensor supplied loose for fitting and wiring on site by others.
Cabling not included. Use of shielded cable for wiring is recommended.

Sensor characteristics

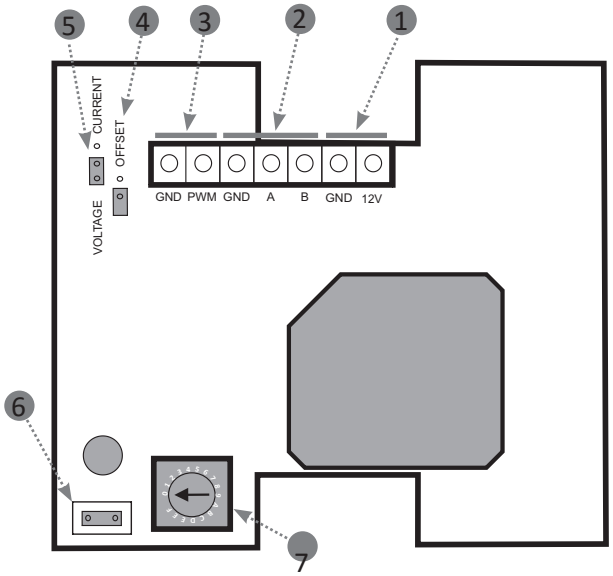
Power source	12V – 40V DC , 15V – 30V AC
Output voltage	0-10V DC / 2V - 10V
Output current	0-20mA / 4mA - 20mA
Operating range	370-2.000 ppm
Operational temperature	+0 to +40°C



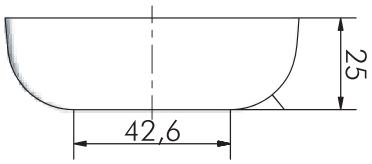
Wiring diagram

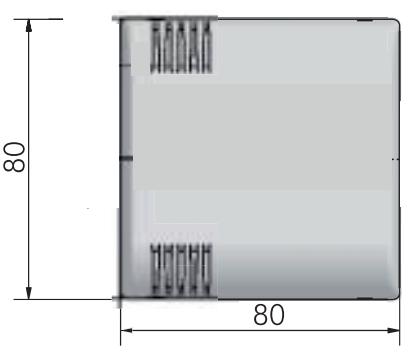
1	12V – 40V DC , 15V – 30V AC (Input)
2	Modbus RTU communication (Output)*
3	Output (0-10V / 4-20mA)
4	Output offset (+2V / +4mA)
5	Output selection - voltage / current
6	LED signalization (enable/disable)
7	Modbus adress (0=120... F=135)

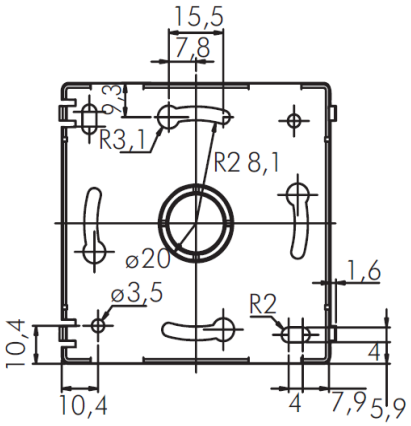
* INPUT REGISTER: Adress 100 = average value PPM,
Adress 101 = actual value PPM



Dimensions







ACCESSORIES

Duct CO2 sensor - CI-EE850-C3XXFP-002

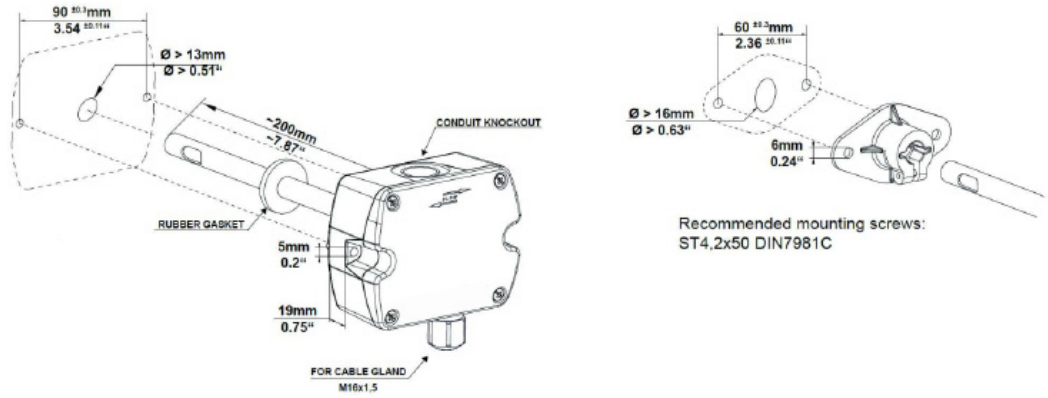
Duct CO2 sensor for measurement of the CO2 concentration on the return ductwork. The 0-10V output signal can be connected to the Therm-X unit control panel for control in the DCV mode. The elegant, compact housing enables easy installation directly at the ventilation duct using a mounting flange.

Note:
Power can be provided by the unit to a single air quality sensor.
The Therm-X unit is able to operate based on the input from a single air quality sensor. Additional sensors can be connected with the use of an external system (contact Barkell for details).
Sensor supplied loose for fitting and wiring on site by others.
Cabling not included. Use of shielded cable for wiring is recommended.

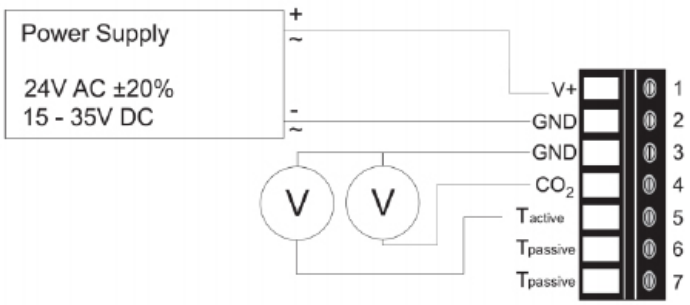
Sensor characteristics

Power source	24V AC ±20% or 15–35V DC
Output voltage	0–5/10V 4–20mA
Measuring range	0...2000 ppm: < ± (50 ppm < ± (50 ppm+2% of mv)
Operational temperature	0...+50 °C (32...122 °F)
Electrical protection	IP65

Assembly diagram



Wiring diagram



ACCESSORIES

Relative humidity duct sensor - CI-LCN-FTK140VV

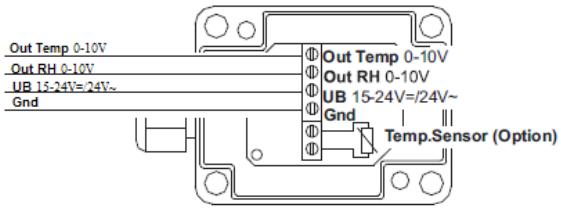
Duct relative humidity sensor for measurement of humidity on the return ductwork. The 0-10V output signal can be connected to the Therm-X unit control panel for control in the DCV mode.
The sensor has an analogue voltage output 0-10V, corresponding to the range of relative air humidity 0-100%.

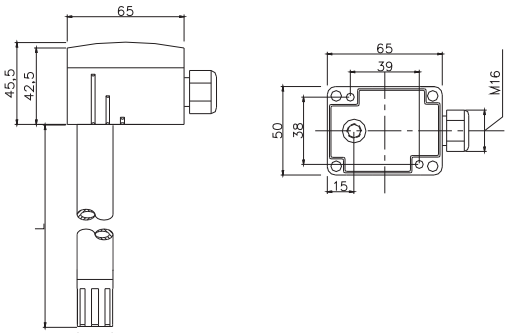
Note:
Power can be provided by the unit to a single air quality sensor.
The Therm-X unit is able to operate based on the input from a single air quality sensor. Additional sensors can be connected with the use of an external system (contact Barkell for details).
Sensor supplied loose for fitting and wiring on site by others.
Cabling not included. Use of shielded cable for wiring is recommended.

Sensor characteristics

Power source	15-24VDC/24AC +/-10%
Output voltage	0-10V DC
Measuring range	-20...+80°C
Operational temperature	-20...+70°C
Electrical protection	IP65

Assembly diagram





Motion PIR Room Sensor - CI-PS 1003

Passive infrared motion sensor for occupancy detection. When something enters into controlled space, this sensor detects heat emission from bodies and switches its contacts on or off.
The signal can be connected to the Therm-X unit turning the unit on or off accordingly.
The sensor has a detection range of 12 meters at an 90° angle and can be mounted on walls or installed in corners. It's possible to switch the light emission diodes (LED) on/off.Lower boundary mass sensing is 25 kilos.

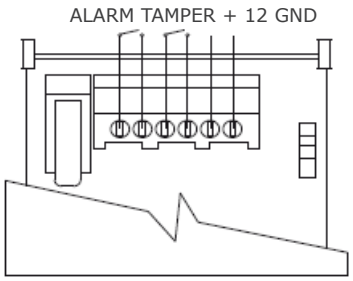
Note:
Power provided by the unit control panel.
Sensor supplied loose for fitting and wiring on site by others.
Cabling not included. Use of shielded cable for wiring is recommended.

Sensor characteristics

Power source	15-24 VDC
Detection area	12m
Detection angle	90°
Pulse scaler	1 or 2
Installation method	Installation on walls
Height of installation	1,8 up to 2,2m
Operating temperature range	-10°C up to +50°C
Signalisation output	1NC/1C 60V DC, 300mA
Operational contacts capacity	1NC, 28V DC, 100mA
Dimensions	106 mm x 54 mm x 36 mm

Wiring diagram

+ 12 V: DC
GND ANODE:DC
ALARM CATHODE: relay output
TAMPER: Anti tamper switch

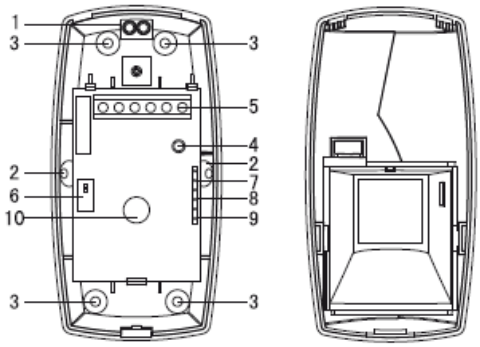


ACCESSORIES

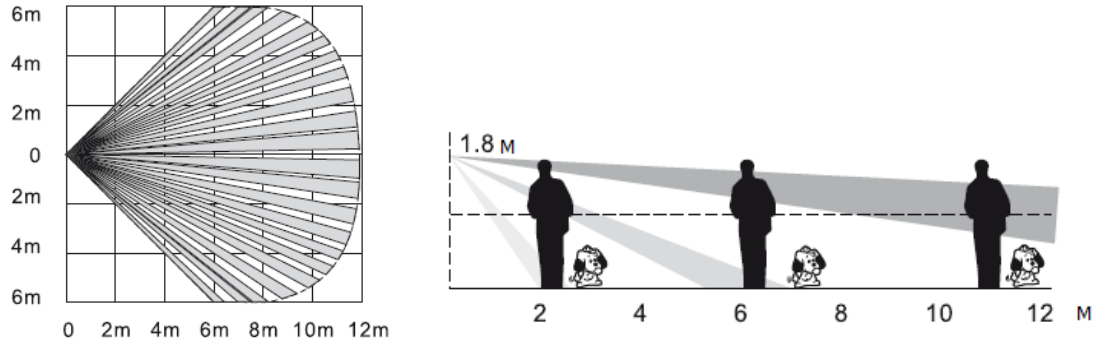
Motion PIR Room Sensor - CI-PS 1003

Main parts

1.	Output connection
2.	Corner bores
3.	Wall bores
4.	Light-emission diode (LED)
5.	Terminal block
6.	Anti tamper switch
7.	LED strap
8.	Jumper JP1
9.	Jumper JP2
10.	Sensor

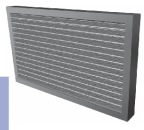


Sensor range



Spare filters

Spare or optional filters with the same design and manufacturing as the ones supplied with the units.



Unit type/model vertical config. (side connec.)	Supply/Exhaust filter, class M5 (standard)	bag / frame
HR85-070EC-RS-V	FILTR-HR85-V070 M5	frame
HR85-100EC-RS-V	FILTR-HR85-V100 M5	bag
HR85-150EC-RS-V	FILTR-HR85-VU150-VU200 M5	frame
HR85-200EC-RS-V	FILTR-HR85-VU150-VU200 M5	frame
HR85-300EC-RS-V	FILTR-HR85-VU300-VU450 M5	bag
HR85-450EC-RS-V	FILTR-HR85-VU300-VU450 M5	bag
HR85-550EC-RS-V	FILTR-HR85-V550-V750 M5	bag
HR85-750EC-RS-V	FILTR-HR85-V550-V750 M5	bag

Unit type/model upper config. (top connec.)	Supply/Exhaust filter, class M5 (standard)	bag / frame
HR85-070EC-RS-U	FILTR-HR85-U070 M5	frame
HR85-100EC-RS-U	FILTR-HR85-U100 M5	bag
HR85-150EC-RS-U	FILTR-HR85-VU150-VU200 M5	frame
HR85-200EC-RS-U	FILTR-HR85-VU150-VU200 M5	frame
HR85-300EC-RS-U	FILTR-HR85-VU300-VU450 M5	bag
HR85-450EC-RS-U	FILTR-HR85-VU300-VU450 M5	bag

Unit type/model vertical config. (side connec.)	Supply/Exhaust filter, class F7 (option)	bag / frame
HR85-070EC-RS-V	FILTR-HR85-V070 F7	frame
HR85-100EC-RS-V	FILTR-HR85-V100 F7	bag
HR85-150EC-RS-V	FILTR-HR85-VU150-VU200 F7	frame
HR85-200EC-RS-V	FILTR-HR85-VU150-VU200 F7	frame
HR85-300EC-RS-V	FILTR-HR85-VU300-VU450 F7	bag
HR85-450EC-RS-V	FILTR-HR85-VU300-VU450 F7	bag
HR85-550EC-RS-V	FILTR-HR85-V550-V750 F7	bag
HR85-750EC-RS-V	FILTR-HR85-V550-V750 F7	bag

Unit type/model upper config. (top connec.)	Supply/Exhaust filter, class F7 (option)	bag / frame
HR85-070EC-RS-U	FILTR-HR85-U070 F7	frame
HR85-100EC-RS-U	FILTR-HR85-U100 F7	bag
HR85-150EC-RS-U	FILTR-HR85-VU150-VU200 F7	frame
HR85-200EC-RS-U	FILTR-HR85-VU150-VU200 F7	frame
HR85-300EC-RS-U	FILTR-HR85-VU300-VU450 F7	bag
HR85-450EC-RS-U	FILTR-HR85-VU300-VU450 F7	bag

KEY TO CODING

HR85-070 EC-RS-U X X E-55 R P 3

P Version**
P Right side supply air connection
L Left side supply air connection

R Controls
R Superior

55 Filtration (supply / exhaust)
55 supply M5 / exhaust M5

E Post heating coil
X None
E Electric
W LPHW
C Water changeover (WCO)l
D Direct expansion (DX)

X Pre heating coil (frost coil)
X Without preheater

X Bypass
X Without bypass

U Installation
U Upper config. (top connections)
V Vertical config. (side connnections)

RS Heat exchanger
RS Rotary standart

EC Type of fan
EC EC motors

070 Nominal airflow*
070 Nominal flow rate 700 m³/h
100 Nominal flow rate 1000 m³/h
150 Nominal flow rate 1500 m³/h
200 Nominal flow rate 2500 m³/h
300 Nominal flow rate 3000 m³/h
450 Nominal flow rate 4500 m³/h
550 Nominal flow rate 5500 m³/h
750 Nominal flow rate 7500 m³/h

HR85 Unit Type
Commercial MVHRU Therm-X HR85

* Actual airflow is dependent on the unit size, type and the installation external static pressure.

** Always confirm unit handing and the positioning of the connections before ordering.