Comfort air conditioning unit with cross-counterflow-cross heat exchanger

Trisolair 59 26 01 - simplified illustration

Automatically selects the most economical operating mode!

Trisolair 52 and Trisolair 59

AIR VOLUME FLOW: 1,200 – 5,000 m³/h

At a glance:

- **Over 80% temperature efficiency through three-stage recuperative heat recovery**
- **Energy efficiency class H1 according to EN 13053:2012**
- **Energy-saving EC fans**
- **Integrated compressor refrigeration system (59 series)**
- **Compact design**
- **Integrated defrosting function**
- **Integrated control and regulation system, compatible with all conventional building management systems**
- **Fulfils the requirements of VDI 6022**

Units in the Trisolair 52 and 59 series achieve the highest heat recovery efficiency at low to medium air volume and can be used in a wide range of comfort air conditioning applications. Thanks to their compact design, the systems are particularly good for refurbishment projects. The combination of first-class components with precise control and regulation systems guarantees economical operation at all times, while ensuring the highest degree of comfort air conditioning. A compressor refrigeration system integrated into the 59 series increases the cooling capacity of the overall system at high temperatures and additionally allows the dehumidification of outside air.

Further performance parameters and options:

- Filtering the air in any operating mode
- Corrosion-free heat exchanger made from polypropylene
- Pumped hot water heating coil
- Bypass damper
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for comfort air conditioning, including all control and regulation fittings
- Intensive quality inspection with factory test run

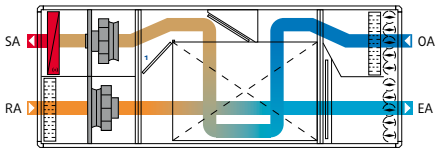
Options

- Recirculation air heating damper
- Pumped chilled water cooling coil
- Reversible compressor refrigeration system (series 59)
- Attenuator
- Outdoor installation
- Thermal bridge factor TB1
- Remote maintenance
- And many more

Functional description

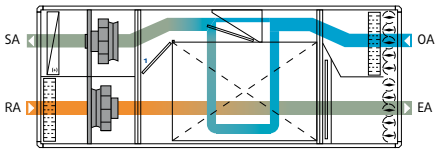
Heat recovery

In case of low outside temperatures the system operates completely in heat recovery mode. The cross-counterflow-cross plate heat exchanger enables the recovery of up to 80% of the heat contained in the return air. The standard integrated heating coil compensates for ventilation and transmission heat losses of the building as required.



Reduced heat recovery

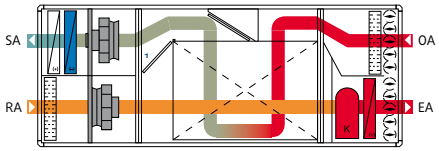
If the outside air temperatures rise, the heat recovery requirement is reduced. The bypass dampers, which run along the entire depth of the device, are continuously regulated in order to achieve the desired supply air temperature. If the outside temperatures continue to rise, the heat recovery is completely bypassed. The design of the bypass reduces the internal pressure drop on the OA-SA path and hence also significantly reduces the power consumption of the fan motor as it is effective over the entire depth of the unit.



Summertime conditions

If the outside temperature rises above the return temperature, the highly efficient heat exchanger is used as a "cooling recovery system". The warm outside air is cooled by the return air.

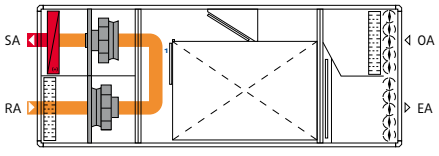
Cooling operation type 59:
Where outside air temperatures are sufficiently high, the heat exchanger is used for precooling the outside air (cold recovery). This minimises the electrical capacity required by the integrated compressor refrigeration system, which cools the supply air to the desired temperature and dehumidifies it if required. If unfavourable temperature conditions mean that precooling is not practical, the heat exchanger is bypassed.



Recirculation Air Heating Operation*

In recirculation air mode, the outdoor and exhaust air dampers are closed. The air is heated via the heating coil. Rooms which are not used all of the time, such as lecture halls or sports halls, can therefore be quickly heated before being used.

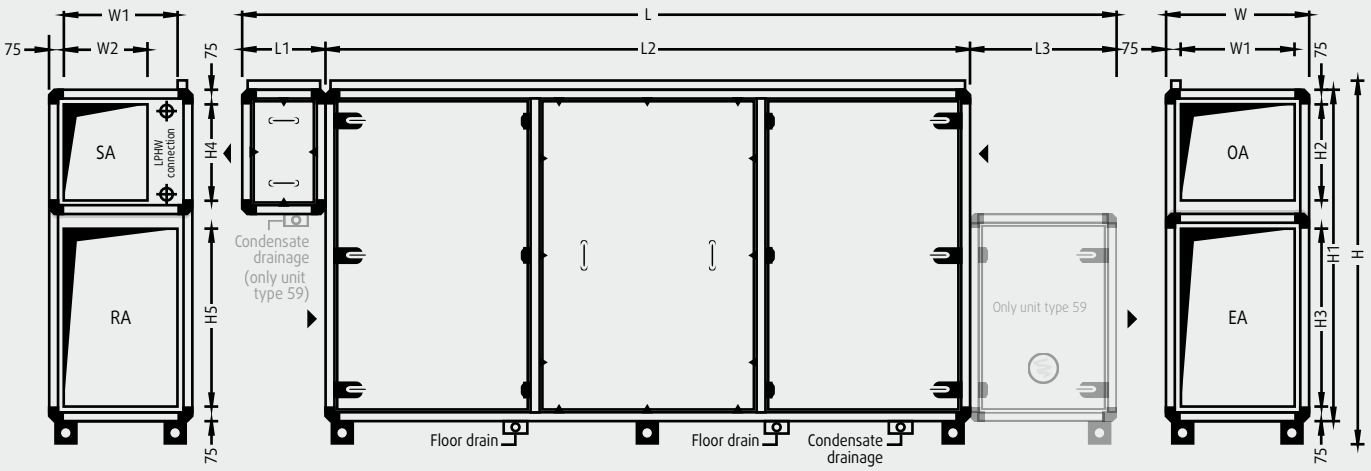
* only possible with optional recirculation air heating damper



1 Recirculation air heating damper (additional equipment)

Trisolair Type 52 and Type 59

System dimensions and weights



Unit feet 100 mm
Optional: adjustable feet from 100 to 120 mm

Mirror-image design possible.

Trisolair Type 52

Unit Type	L	W [1]	H [2]	L1	L2	W1	W2	H1	H2	H3	H4	H5	Weight
52 12 01	2,580	570	1,210*	410	2,170	420	350	1,050	325	420	420	325	420
52 18 01	3,060	730	1,530*	410	2,650	580	505	1,370	485	580	580	485	560
52 26 01	3,700	730	1,850	410	3,290	580	505	1,690	485	900	580	580	830
52 36 01	3,700	1,050	1,850	410	3,290	900	825	1,690	485	900	580	580	1,050

Controls cabinet

Unit Type	H x W x D	Position at unit
52 12 01	480 x 640 x 210	On top of unit
52 18 01	480 x 640 x 210	On top of unit
52 26 01	900 x 480 x 210	OA/EA side
52 36 01	900 x 480 x 210	OA/EA side

For service work, a clearance corresponding to dimension W is required on the operating side of the unit. If dimension W is smaller than one metre, please leave a clearance of one metre. For service work above the unit, please allow 50 mm working height clearance above the cable duct.

Please comply with the dimensions for body size, air duct connections and electrical switch cabinet.

Partitioning of unit for smaller apertures possible (at extra cost).

All lengths are given in mm, weights in kg, weight incl. Controls cabinet.

1 Door fitting assembly increase unit width by 25 mm each operating side
2 Height incl. 100 mm unit feet and 60 mm cable duct
* Controls cabinet arranged on top of unit, please add controls cabinet height (480 mm).

Trisolair Type 59 with compressor refrigeration system

Unit Type	L	W [1]	H [2]	L1	L2	L3	W1	W2	H1	H2	H3	H4	H5	Weight
59 18 01	4,110	730	1,530	730	2,650	730	580	505	1,370	485	580	580	485	770
59 26 01	4,750	730	1,850	730	3,290	730	580	505	1,690	485	900	580	580	1,050
59 36 01	4,750	1,050	1,850	730	3,290	730	900	825	1,690	485	900	580	580	1,280

Controls cabinet

Unit Type	H x W x D	Position
59 18 01	1,120 x 640 x 210	Wall mounting
59 26 01	1,120 x 640 x 210	Wall mounting
59 36 01	1,120 x 640 x 210	Wall mounting

Technical specifications and services

Unit Type		52 12 01	52 18 01	52 26 01	52 36 01
Optimum flow rate	m^3/h	1,200	1,800	2,600	3,600
Max. volume flow rate	m^3/h	1,600	2,500	3,200	5,000
Coefficient of power efficiency according to EN 13053:2012	%	73	73	76	75
Total electrical power rating[1]	kW	0.65	1.29	1.76	2.15
Current consumption [1]	A	6.0	13.8	8.0	6.6
Operating voltage		1 / N / PE 230 V 50 Hz		3 / N / PE 400 V 50 Hz	
Ext. pressure loss					
Supply and fresh air channel	Pa	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300
Sound power level [2]					
Supply air vent	dB(A)	82	73	69	66
RA connection	dB(A)	74	70	65	63
Outside air vent	dB(A)	65	62	58	55
EA connection	dB(A)	85	75	70	68
Acoustic pressure at a distance of 1 m from the device [2]	dB(A)	66	56	52	49
Fan units					
Rated motor input for supply air [3]	kW	0.35	0.68	0.95	1.09
Rated motor input for return air [3]	kW	0.30	0.61	0.81	1.06
SFP category supply air | return air		2 | 1	3 | 2	3 | 2	2 | 2
Nominal rating supply air | return air	kW	0.7 | 0.7	1.4 | 1.4	2.5 | 2.5	2.0 | 2.0
Efficiency classes according to EN 13053:2012					
Heat recovery class		H1	H1	H1	H1
Power consumption of fan motors SA | RA		P1 | P1	P2 | P2	P1 | P1	P1 | P1
Air velocity class		V1	V1	V1	V1
Filtration according to DIN EN 779					
Outside air		F7			
Return Air		M5			
LPHW					
Heating capacity SA=22°C [4]	kW	2.4	3.3	3.9	6.1
Heating capacity SA=30°C [4]	kW	5.6	8.1	10.7	15.6
Heating capacity Defrost [4,5]	kW	2.3	3.3	4.7	6.7
Water flow rate and pressure losses					
LPHW	m^3/h | kPa	0.25 | 5.3	0.51 | 5.4	0.50 | 5.3	0.50 | 7.4
LPHW (pump warm water) valve	m^3/h | kPa	0.15 | 5.7	0.21 | 11.2	0.29 | 8.4	0.63 | 13.3
Connections					
LPHW connection	DN	32	32	32	32
LPHW control valve connection	DN	10	10	10	10
Floor drains	DN	20	20	20	20
LPCW (optional) [6]					
Cooling capacity SA ≒ 18°C [7]	kW	5.8	9.4	12.0	20.2
Additional power consumption for supply air	W	60	30	80	90
LPCW connection	DN	32	32	32	32
LPCW control valve-connection	DN	15	20	25	25
Water flow rate and pressure losses					
LPCW	m^3/h | kPa	0.18 | 3.6	0.35 | 4.7	0.52 | 3.6	0.69 | 4.1
LPCW valve	m^3/h | kPa	0.18 | 8.6	0.35 | 4.7	0.52 | 10.5	0.69 | 7.6

Specifications of technical data relate to the optimum flow rate and return air condition 22°C / 40% r.h., outside air condition -12°C / 90% r.h. and an altitude height of zero metres above sea level, unless otherwise specified

1 dependent on configuration of measurement and control system/unit

2 at 250 Hz mid-band frequency

3 with average filter contamination

4 FL = 70°C

5 at OA=-15°C, SA=18°C, 66% optimum flow rate and active defrost function

6 note additional power consumption for supply air, additional base frame required for condensate drain

7 FL = 6°C

Please seek approval of technical data and specifications prior to start of the planning process.

Technical specifications and services

Unit Type		59 18 01	59 26 01	59 36 01
Optimum flow rate	m^3/h	1,800	2,600	3,600
Max. volume flow rate	m^3/h	2,500	3,200	4,800
Coefficient of power efficiency according to EN 13053:2012	%	75	76	75
Total electrical power rating[1]	kW	3,97	6,25	7,85
Current consumption [1]	A	20,8	18,0	21,6
Operating voltage		3 / N / PE 400 V 50 Hz		
Ext. pressure loss				
Supply and fresh air channel	Pa	300	300	300
Return and exhaust air channel	Pa	300	300	300
Sound power level [2]				
Supply air vent	dB(A)	71	72	64
RA connection	dB(A)	71	66	64
Outside air vent	dB(A)	63	64	56
EA connection	dB(A)	73	68	65
Acoustic pressure at a distance of 1 m from the device [2]	dB(A)	57	56	50
Fan units				
Rated motor input for supply air [3]	kW	0.74	1.11	1.25
Rated motor input for return air [3]	kW	0.63	0.84	1.10
SFP category supply air | return air		3 | 3	3 | 2	3 | 2
Nominal rating supply air | return air	kW	1.4 | 1.4	2.5 | 2.5	2.0 | 2.0
Compressor refrigeration system				
Filling volume for refrigerant type R410A	kg	4.0	4.5	5.5
Rated compressor input [4]	kW	2.6	4.3	5.5
Mechanical cooling capacity	kW	8.6	12.7	17.7
Refrigeration capacity	EER	3.3	3.0	3.2
Efficiency classes according to EN 13053:2012				
Heat recovery class		H1	H1	H1
Power consumption of fan motors SA | RA		P2 | P2	P1 | P1	P1 | P1
Air velocity class		V1	V1	V1
Filtration according to DIN EN 779				
Outside air		F7		
Return Air		M5		
LPHW				
Heating capacity SA=22°C [5]	kW	3.2	3.7	6.0
Heating capacity SA=30°C [5]	kW	8.0	10.6	15.5
Heating capacity Defrost [5, 6]	kW	3.3	4.7	6.7
Water flow rate and pressure losses				
LPHW	m^3/h | kPa	0.51 | 5.4	0.50 | 5.2	0.51 | 7.2
LPHW (pump warm water) valve	m^3/h | kPa	0.21 | 11.0	0.29 | 8.4	0.36 | 13.1
Connections				
LPHW connection	DN	32	32	32
LPHW control valve connection	DN	10	10	10
Floor drains	DN	20	20	20

Specifications of technical data relate to the optimum flow rate and return air condition 22°C / 40% r.h., outside air condition -12°C / 90% r.h. and an altitude height of zero metres above sea level, unless otherwise specified

Please seek approval of technical data and specifications prior to start of the planning process.

1 dependent on configuration of measurement and control system/unit
2 at 250 Hz mid-band frequency
3 with average filter contamination
4 RA = 26°C/55% r.h., OA = 32°C/40% r.h., SA = 17°C
5 FL = 70°C
6 with optional OA bypass. At OA=-15°C, SA=18°C, 66% optimum flow rate and active defrost function