



Installation Operation Maintenance

Airfinity Rooftop Units

Models

IC - Cooling Only

IH - Heat Pump

50 - 135 kW



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RT-SVX081A-GB

TRANE
TECHNOLOGIES

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Original instructions



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General Information

Foreword

These instructions are given as a guide to good practice in the installation, start-up, operation, and maintenance by the user, of Trane Airfinity rooftop units. They do not contain full service procedures necessary for the continued successful operation of this equipment. The services of a qualified technician should be employed through the medium of a maintenance contract with a reputable service company. Read this manual thoroughly before unit start-up.

Units are assembled, pressure tested, dehydrated, charged and tested in accordance with factory standard before shipment.

Warnings and Cautions

Warnings and Cautions appear at appropriate sections throughout this manual. Your personal safety and the proper operation of this machine require that you follow them carefully. The constructor assumes no liability for installations or servicing performed by unqualified personnel.

WARNING! Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION! Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices or for equipment or property-damage-only accidents.

Safety Recommendations

To avoid death, injury, equipment or property damage, the following recommendations should be observed during maintenance and service visits:

1. The maximum allowable pressures for system leak testing on low and high pressure side are given in the chapter "Installation". Ensure to do not exceed test pressure by using appropriate device.
2. Disconnect the main power supply before any servicing on the unit.
3. Service work on the refrigeration system and the electrical system should be carried out only by qualified and experienced personnel.
4. To avoid any risk, it is recommended to place the unit on an area with restricted access.

Reception

On arrival, inspect the unit before signing the delivery note. Specify any visible damage on the delivery note, and send a registered letter of protest to the last carrier of the goods within 7 days of delivery.

Notify the local TRANE sales office at the same time. The delivery note must be clearly signed and countersigned by the driver.

Any concealed damage shall be notified by a registered letter of protest to the last carrier of the goods within 7 days of delivery. Notify the local Trane sales office at the same time.

Important notice: No shipping claims will be accepted by Trane if the above mentioned procedure is not respected. For more information, refer to the general sales conditions of your local Trane sales office.

Note: Unit inspection in France. Delay to send registered letter in case of visible and concealed damage is only 72 hours.

Loose Parts Inventory

Check all the accessories and loose parts that are shipped with the unit against the shipping list. Included in these items will be the all kind of sensors, thermostat and electrical diagrams, service literature, which are placed inside the control panel and/or indoor section for shipment. Do not place elements inside the control box during unit operation, it could damage internal components.

Warranty

Warranty is based on the general terms and conditions of the manufacturer. The warranty is void if the equipment is repaired or modified without the written approval of the manufacturer, if the operating limits are exceeded or if the control system or the electrical wiring is modified. Damage due to misuse, lack of maintenance or failure to comply with the manufacturer's instructions or recommendations is not covered by the warranty obligation. If the user does not conform to the rules of this manual, it may entail cancellation of warranty and liabilities by the manufacturer.

Refrigerant

Consult the addendum to Manuals for units with refrigerant, for conformity to the Pressure Equipment Directive (PED) 2014/68/EU and Machinery Directive 2006/42/EC.

General Information

Maintenance Contract

It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your installation by a specialist in our equipment. Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will occur. Finally, regular maintenance ensures the maximum operating life of your equipment. We would remind you that failure to respect these installation and maintenance instructions may result in immediate cancellation of the warranty.

Storage

Take precautions to prevent condensate formation inside the unit's electrical components and motors when:

- a. The unit is stored before it is installed; or,
- b. The unit is set on the roof curb and temporary auxiliary heat is provided in the building.

Isolate all side panel service entrances and base panel openings (e.g., conduit holes, Supply Air and Return Air openings, and flue openings) to minimize ambient air from entering the unit until it is ready for start-up.

Do not use the unit's heater as temporary heat without completing the start-up procedures detailed under "Unit Start-Up".

- Units charged with refrigerant should not be stored where temperatures exceed 68°C.
- At least every three months, attach a gauge and manually check the pressure in the refrigerant circuit.
- If the refrigerant pressure is below 13 bar (R-410A)/ 12.5 bar (R-454B) at 20°C or 10 bar at (R-410A)/9.5 bar (R-454B) at 10°C, call a qualified service organization or Trane sales office.

The Trane Company will not assume responsibility for equipment damage resulting from accumulation of condensate on the unit electrical components.

Training

To assist you in obtaining the best use of it and maintaining it in perfect operating condition over a long period of time, the manufacturer has at your disposal a refrigeration and air conditioning service school. The principal aim of this is to give operators and technicians a better knowledge of the equipment they are using, or that is under their charge. Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventive maintenance, which reduces the cost of owning the unit by avoiding serious and costly breakdown.

Outdoor Coil

There are 3 different types of outdoor coils for heat pump units (IH).

- Blue fin technology
- Aluminum fins
- Gold Epoxy coating

Blue fin technology is dedicated to unit usage in colder regions. When the outdoor ambient temperature is less than 5°C over a few consecutive days, it is highly recommended to use unit equipped with blue fin technology in order to avoid ice building on the outdoor coil.

Aluminum pure fins shall be used in warmer regions over the winter season. Gold Epoxy coating on the outdoor coil is dedicated to the region close to an ocean or a sea because of corrosion coming from salted air.

A microchannel coil is used on the cooling only units (IC).



Unit Model Number Description

Digit 1 - Manufacturing Location

E = Epinal France

Digit 2 - Unit Model

I = Airfinity

Digit 3 - Unit Type

C = Cooling only

H = Reversible heat pump

Digit 4, 5, 6 - Unit Size

038 = 38 kW

050 = 50 kW

060 = 60 kW

065 = 65 kW

075 = 75 kW

085 = 85 kW

100 = 100 kW

110 = 110 kW

130 = 130 kW

Digit 7 - Efficiency Level

S = Standard efficiency

Digit 8 - Refrigerant

A = R-410A Factory full refrigerant charge

8 = R-410A Factory refrigerant pre-charge

2 = Nitrogen charge (for units R-410A)

B = R-454B Factory full refrigerant charge

3 = Nitrogen charge (for units R-454B)

Digit 9 - Unit Voltage

D = 400 V - 3 Ph - 50 Hz

Digit 10 - Design Sequence

Digit 11 - Design Sequence

Digit 12 - Auxiliary Heat

X = Without

W = Hot water coil

E = Electric heater

M = Modulating gas burner

Digit 13 - Return Airflow Configuration

D = Downflow return

H = Horizontal return

Digit 14 - Supply Airflow Configuration

D = Downflow supply

H = Horizontal flow supply

U = Up flow supply

Digit 15 - Supply fan - Available Static Pressure

1 = Standard external static pressure

2 = High external static pressure

Digit 16 - Operating Map (Cooling Mode)

A = Standard ambient (Wide ambient condition...)

Digit 17 - Free Cooling (Economizer)

A = Temperature control

B = Enthalpy control

X = Without (full recirculation)

Digit 18 - Heat Recovery Module

X = Without

R = Configured for rotary wheel

B = Configured for rotary wheel high airflow

T = Energy Recovery Circuit ventilateur AC

U = Energy Recovery Circuit ventilateur EC

Digit 19 - Dehumidification

X = Without

A = Dehumidification control

Digit 20 - Outdoor Coil Treatment

B = Without

E = With coil treatment

Digit 21 - Indoor Coil Treatment

1 = Without

2 = With coil treatment

Digit 22 - Filtration

A = G4 (50 mm) filters

B = G4 (50 mm) + F7 (100 mm) filters

C = G4 (50 mm) + F9 (100 mm) filters

D = F5 (50 mm) + F7 (100 mm) filters

Digit 23 - Temperature Zone Sensor

X = Without

A = Duct-mounted zone sensor

B = Wall mounted zone sensor

Digit 24 - Room User Interface

X = Without

A = Wall-mounted interface THP05

Digit 25 - CO₂ Sensor

X = Without

1 = CO₂ sensor duct-mounted

2 = CO₂ sensor wall-mounted

Digit 26 - Smoke Detector

X = Without

1 = With

Digit 27 - Airflow Measurement

X = Without

A = Airflow measurement and display

Digit 28 - Dirty Filter Detection

X = Without

1 = With dirty filter detection

Unit Model Number Description

Digit 29 - Network protection relay

X = Phase reversal protection
A = Phase reversal and asymmetry protection

Digit 30 - Literature Language

A = Bulgarian
B = Spanish
C = German
D = English
E = French
H = Dutch
J = Italian
K = Finnish
L = Danish
M = Swedish
N = Turkish
P = Polish
R = Russian
T = Czech
U = Greek
V = Portuguese
W = Slovene
Y = Romanian
Z = Norwegian
1 = Slovak
2 = Croatian
3 = Hungarian

Digit 31 - Building Pressurization Control

X = Without
1 = Barometric relief damper
2 = Exhaust fan AC
3 = Exhaust fan EC
4 = Configured for return roofcurb

Digit 32 - Not Used

X = Not used

Digit 33 - External Customer Input/Output

X = Without
1 = With custom I/O

Digit 34 - Multi-Rooftop Control

X = Without
A = With master/slave
C = With Tracer Concierge Comfort
T = With Tracer Concierge Comfort with display
(recommended)

Digit 35 - Communication Interface

X = Without
1 = Modbus RTU
3 = BACnet (MSTP)
4 = BACnet (IP)
5 = Modbus TCP

Digit 36 - Refrigerant Leak Detector

X = Without
1 = With refrigerant leak detector

Digit 37 - Compressor Starter Type

X = Across the line
A = Soft starter

Digit 38 - Service User Interface

X = Without
1 = Service terminal
2 = With human user interface

Digit 39 - Fire Thermostat

X = Without
1 = With fire thermostat

Digit 40 - Droplet Eliminator

X = Without
A = With droplet eliminator

Digit 41 - Factory Manufacturing

E = Epinal, France
F = Epinal, France (ICS)
B = Epinal, France (Thermocold)

Digit 42 - Certification

B = Certification CE

Digit 43 - Downflow Direct Ducts Connection

X = Without
1 = With direct duct connections

Digit 44 - Condenser Guard Grill

X = Without
A = With condenser guard grill

Digit 45 - Export Packaging

X = Without
A = With export packaging

Digit 46 - Not Used

X = Not used

Digit 47 - External Ventilation Override

X = Without
A = With external ventilation override

Digit 48 - Programmable Relay

X = Without
A = With programmable relay

Digit 49 - External Setpoint Control

X = Without
A = with external set point control

Digit 50, 51, 52, 53, 54 - Not Used

X = Not used

Digit 55 - Special Design

X = Standard
S = Special design



IC - IH General Data

Table 1 – IC038 to IC130

		IC038	IC050	IC060	IC065	IC075	IC085	IC100	IC110	IC130
Performance Data Cooling Mode (1)										
R-410A										
Net Cooling Capacity R-410A	kW	45.1	56.7	62.4	75.1	86.1	92.2	110.0	122.8	136.5
Total Power Input R-410A	kW	12.8	18.3	20.6	24.2	26.3	29.7	35.7	40.9	46.5
Net EER R-410A		3.52	3.10	3.02	3.10	3.28	3.10	3.08	3.00	2.94
η S cool R-410A	%	190.0	175.9	164.7	178.8	183.9	170.8	158.1	156.2	148.2
Eurovent Seasonal Efficiency Class for Cooling R-410A		A	B	B	B	B	B	B	B	B
R-454B										
Net Cooling Capacity R-454B	kW	44.7	55.3	60.2	70.3	85.1	88.2	105.4	117.2	134.1
Total Power Input R-454B	kW	12.4	15.9	18.6	22.5	25.6	31.3	35.7	41.7	46.6
Net EER R-454B		3.60	3.48	3.23	3.12	3.33	2.82	2.96	2.81	2.88
η S cool R-454B	%	192.6	186.8	178.3	187.0	181.0	173.8	178.4	177.1	169.6
Eurovent Seasonal Efficiency Class for Cooling R-454B		A	A	B	A	B	B	B	B	B
Frame										
Frame		Frame 1S	Frame 1	Frame 1	Frame 1	Frame 2	Frame 2	Frame 3	Frame 3	Frame 3
Compressor										
Number of Circuits	#	1	2	2	2	2	2	2	2	2
Number of Compressor per Circuits	#	2	2	2	2	2	2	2	2	2
Type		Scroll Fixed Speed								
Nominal Tons (@60Hz)	TR	6.9	4.5	5.1	6	6.9	7.5	9	10	12
Compressor Speed	rpm	2900	2900	2900	2900	2900	2900	2900	2900	2900
Rated Load Amps (RLA) per Compressor	A	16.8	10.2	12.8	15.1	16.8	15.7	17.7	19.6	21.9
Locked Rotor Amps per Compressor	A	100	70	82	87	100	98	142	142	147
Oil and Refrigerant										
R-410A										
Oil Quantity per Compressors	l	1.73	1.73	1.73	1.73	1.73	3.0	3.3	3.3	3.3
Oil Quantity ckt1/ckt2	l	3.46	3.46/3.46	3.46/3.46	3.46/3.46	3.46/3.46	6.0/6.0	6.6/6.6	6.6/6.6	6.6/6.6
Refrigerant Charge per Circuit (kg CKT1/ kg CKT2)	kg	9.0	6.0/6.0	6.5/6.5	7.0/7.0	8.0/8.0	8.0/8.0	10.5/10.5	10.5/10.5	10.5/10.5
R-454B										
Oil Quantity per Compressors	l	1.73	1.73	1.73	1.73	1.73	3.0	3.3	3.3	3.3
Oil Quantity ckt1/ckt2	l	3.46	3.46/3.46	3.46/3.46	3.46/3.46	3.46/3.46	6.0/6.0	6.6/6.6	6.6/6.6	6.6/6.6
Refrigerant Charge per Circuit (kg CKT1/ kg CKT2)	kg	8.0	6.0/6.0	6.5/6.5	6.5/6.5	7.5/7.5	7.5/7.5	9.0/9.0	9.0/9.0	9.0/9.0
Electrical Data (2) (3)										
Main Power Supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Unit Max Amps	A	40	51	59	71	80	78	93	101	113
Unit Start-Up Amps (without soft starter)	A	124	112	129	144	164	160	218	233	281
Unit Start-Up Amps (with soft starter)	A	89	87	101	114	129	126	167	178	212
Maximum Short Circuit rating for 0,3 sec	kA	15	15	15	15	15	15	15	15	15
Disconnect Switch										
Disconnect Switch (standard unit)		Sirco 125A	Sirco 160A	Sirco 160A						
Cross Section Max (standard unit)	mm ²	50	50	50	50	50	50	50	95	95
Disconnect switch (unit auxiliary heat, heat recovery, return fans, exhaust fans)		Sirco 250A	Sirco 315A	Sirco 315A	Sirco 315A					
Cross Section Max (unit auxiliary heat, heat recovery, return fans, exhaust fans)	mm ²	150	150	150	150	150	150	240	240	240



IC - IH General Data

Table 1 – IC038 to IC130 (continued)

		IC038	IC050	IC060	IC065	IC075	IC085	IC100	IC110	IC130
Extra Amps of Options (2) (3)										
Electric Heater	A	36	36	54	54	54	54	90	90	90
Indoor Fan : Oversized	A	0.0	0.0	0.0	1.2	0.0	7.4	0.0	9.0	9.0
Exhaust Fan (AC fan)	A	0.6	0.6	0.6	0.6	1.2	1.2	1.2	1.2	1.2
Exhaust Fan (EC fan)	A	5.2	5.2	5.2	5.2	10.4	10.4	10.4	10.4	10.4
Return Roofcurb	A	5.3	5.3	5.3	9.0	10.6	10.6	10.6	10.6	18.0
Heat Recovery (not included current for oversized fan)	A	6.6	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Heat Recovery High airflow (not included current for oversized fan)	A	6.6	7.8	7.8	7.8	13.0	13.0	13.0	13.0	13.0
Gas Burner (modulation)	A	0.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Outdoor Coil										
Type		MCHE								
Face Area	m2	2.92	1.99	1.99	1.99	2.45	2.45	3.13	3.13	3.13
Fins per Inch	FPI	23	23	23	23	23	23	23	23	23
Number of Tubes per bank/ MCHE passes		128 (96-32)	128 (96-32)	128 (96-32)	128 (96-32)	128 (96-32)	128 (96-32)	154 (126-28)	154 (126-28)	154 (126-28)
Indoor Coil										
Type		Fins and Tubes								
Tube Size	Inches	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
Face Area	m2	1.812	1.812	1.812	1.812	2.412	2.412	3.015	3.015	3.015
Rows/Fin Series	#/FPF	3/168	3/168	3/168	4/168	4/168	4/168	4/168	4/168	4/168
Number of Tubes in the height		48	48	48	48	48	48	60	60	60
Drain Connection outside diameter	mm	35	35	35	35	35	35	35	35	35
Indoor Fan										
Standard										
Type		Plug Fans								
Minimum Airflow	m3/h	6240	8480	9680	10960	12560	13360	15840	17280	20400
Nominal Airflow	m3/h	7800	10600	12100	13700	15700	16700	19800	21600	25500
Maximal Airflow	m3/h	10140	13780	15730	17810	20410	21710	25740	28080	33150
Number	#	1	2	2	2	2	2	2	2	2
Diameter	mm	500	450	450	450	500	500	500	500	500
Drive Type		EC Motors								
Motor Power (Eurovent condition)	kW	0.929	1.194	1.358	2.236	2.3225	2.636	3.3353	3.8625	5.653
Motor Max Amps per Fan	A	5.3	4.7	4.7	4.7	5.3	5.3	9	9	9
Motor RPM at Nominal FLOW Rate (Eurovent condition)	RPM	1220.89	1242.4	1332.18	1573.4	1357.899	1425.8	1586.67	1681.776	1941.48
Available Static Pressure at Nominal Flow Rate	Pa	250	250	250	250	250	250	250	250	250
Oversized										
Type		Plug Fans								
Minimum Airflow	m3/h	6560	8480	9680	10960	12560	13360	15840	17280	20400
Nominal Airflow	m3/h	8200	10600	12100	13700	15700	16700	19800	21600	25500
Maximal Airflow	m3/h	10660	13780	15730	17810	20410	21710	25740	28080	33150
Number	#	1	2	2	2	2	2	2	3	3
Diameter	mm	500	450	450	500	500	500	500	500	500
Drive Type		EC Motors								
Motor Power (Eurovent condition)	kW	0.929	1.194	1.358	2.094	2.3225	2.685	3.3353	3.248	4.4859
Motor Max Amps per fan	A	5.3	4.7	4.7	5.3	5.3	9	9	9	9
Motor RPM at Nominal FLOW Rate (Eurovent condition)	RPM	1221	1242.4	1332.18	1281.1	1357.899	1422.83	1586.67	1294.88	1470.636
Available Static Pressure at Nominal Flow Rate	Pa	500	500	500	500	500	500	500	500	500



IC - IH General Data

Table 1 – IC038 to IC130 (continued)

		IC038	IC050	IC060	IC065	IC075	IC085	IC100	IC110	IC130
Outdoor Fan										
Standard Ambient										
Type		Axial/Below /AC	Axial/Below /AC	Axial/Below /AC	Axial/Below /AC	Axial/Below /AC	Axial/Below /AC	Axial/Below /AC	Axial/Below /AC	Axial/Below /EC
Nominal Airflow/ckt	m ³ /h	14543	13687	13681	13675	14321	14318	14865	14860	19628
Number of Fan/ckt	#	1	1	1	1	1	1	1	1	1
Diameter	mm	760	760	760	760	760	760	760	760	800
Motor Power	kW	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	1.27
Motor Max Amps per Fan	A	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	3
Motor RPM	rpm	705	705	705	705	705	705	705	705	900
Filter										
Type (Standard)		G4 (65% Coarse)								
Number of Filters		6	6	6	6	8	8	12	12	12
Filter Size	mm	500x625	500x625	500x625	500x625	500x625	500x625	500x500	500x500	500x500
Physical Data for Standard Unit (4)										
Length	mm	2830	3010	3010	3010	3890	3890	3890	3890	3890
Width	mm	2250	2250	2250	2250	2250	2250	2250	2250	2250
Height	mm	1565	1565	1565	1565	1585	1585	1890	1890	1890
Operating Weight (Downflow Without Auxiliary Heat)	kg	880	1065	1103	1135	1312	1318	1525	1529	1529
Shipping Weight (Downflow Without Auxiliary Heat)	kg	936	1121	1159	1191	1372	1378	1585	1589	1589
Options Extra Weight (4)										
Hot Water Coil	kg	48	48	48	48	59	59	65	65	65
Electric Heater	kg	22	22	22	22	26	26	29	29	29
Gas Burner: Modulating Condensing	kg	76	76	90	90	118	118	138	138	138
Energy Recovery Module Standard Arflow (without packaging)	kg	396	396	396	396	477	477	549	549	549
Energy Recovery Module High Airflow (without packaging)	kg	N.A.	N.A.	N.A.	N.A.	508	508	580	580	580
Exhaust Fan AC	kg	50	50	50	50	77	77	78	78	78
Exhaust Fan EC	kg	84	84	84	84	135	135	136	136	136
Electric Heater										
Number of Capacity Step	Nb	2	2	2	2	2	2	2	2	2
Capacity Steps	kW	12,5/12,5	12,5/12,5	12,5/25	12,5/25	12,5/25	12,5/25	25/37,5	25/37,5	25/37,5
Gas Burner: Modulating Condensing										
Thermal Output (Hi) [Min-Max]	kW	8.5 - 42.0	8.5 - 42.0	12.4 - 65.0	12.4 - 65.0	16.4 - 82.0	16.4 - 82.0	21.0 - 100.0	21.0 - 100.0	21.0 - 100.0
Useful heat output [Min-Max]	kW	8.97 - 40.45	8.97 - 40.45	13.40 - 62.93	13.40 - 62.93	17.77 - 80.03	17.77 - 80.03	22.77 - 97.15	22.77 - 97.15	22.77 - 97.15
Gas Flow [Min-Max] (5)	m ³ /h	0.90 - 4.45	0.90 - 4.45	1.31 - 6.88	1.31 - 6.88	1.74 - 8.68	1.74 - 8.68	2.22 - 10.58	2.22 - 10.58	2.22 - 10.58
Gas connection ø		UNI/ISO 228/1 G3/4"								
Hot Water Coil										
Type		Fins and Tubes								
Tube Size	Inches	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
Face Area	m ²	0.769	0.769	0.769	0.769	1.087	1.087	1.087	1.087	1.087
Rows/Fin Series	#/FPF	2/144	2/144	2/144	2/144	2/144	2/144	2/144	2/144	2/144
Number of Tubes in the Height		25	25	25	25	25	25	25	25	25

IC - IH General Data

Table 1 – IC038 to IC130 (continued)

		IC038	IC050	IC060	IC065	IC075	IC085	IC100	IC110	IC130
Energy Recovery Module (ERM) (6)										
Minimum Fresh Airflow	m3/h	2500	2500	2500	2500	2500	2500	3900	3900	3900
Maximum Fresh Airflow PD=300Pa	m3/h	18000	18000	18000	18000	18000	18000	28000	28000	28000
Maximum Fresh Airflow PD=400Pa	m3/h	9500	9500	9500	9500	9500	9500	10000	10000	10000
Exchanger Wheel Diameter	mm	1200	1200	1200	1200	1200	1200	1500	1500	1500
Exhaust Air Fan Diameter	mm	400	400	400	400	400	400	400	400	400
Exhaust Air Fan Motor Power	kW	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35
Length x Width x Height	mm	1750x1175 x1575	1750x1175 x1575	1750x1175 x1575	1750x1175 x1575	2250x1175 x1595	2250x1175 x1595	2250x1175 x1900	2250x1175 x1900	2250x1175 x1900

(1) Indicative performances at standard Eurovent rating conditions. For detailed performances, consult order write up (OWU).

(2) Under 400V/50Hz/3Ph.

(3) Electrical and system data are indicative and subject to change without notice. Please refer to unit nameplate data.

(4) Indicative data. For details consult lifting and handling instructions in document package shipped with the unit.

(5) Value referenced to Gas G20 - for other refer to burner IOM manual.

(6) The ERM data is only for Digit -18 R.

Table 2 – IH038 to IH130

		IH038	IH050	IH060	IH065	IH075	IH085	IH100	IH110	IH130
Performance Data Cooling Mode (1)										
R-410A										
Net Cooling Capacity R-410A	kW	43.1	59.7	65.4	75.2	85.9	87.7	104.9	113.9	129.2
Total Power Input R-410A	kW	12.6	18.6	20.7	25.4	27.3	31.8	37.4	42.6	48.3
Net EER R-410A		3.43	3.21	3.16	2.97	3.15	2.76	2.81	2.67	2.67
η S cool R-410A	%	194.7	201.5	191.3	187.6	194.4	179.2	173.4	166.3	158.8
Eurovent Seasonal Efficiency Class for Cooling R-410		A	A	A	A	A	B	B	B	B
R-454B										
Net Cooling Capacity R-454B	kW	42.3	55.7	61.7	69.9	83.6	85.7	104.2	114.7	130.6
Total Power Input R-454B	kW	12.1	16.3	19.1	22.7	25.7	30.6	35.1	41.0	46.5
Net EER R-454B		3.49	3.42	3.23	3.08	3.25	2.80	2.97	2.80	2.81
η S cool R-454B	%	195.6	210.8	204.3	197.5	194.1	183.8	179.9	170.7	164.0
Eurovent Seasonal Efficiency Class for Cooling R-454B		A	A+	A+	A	A	B	B	B	B
Performance Data Heating Mode (1)										
R-410A										
Net Heating Capacity R-410A	kW	41.6	57.2	62.7	73.6	82.1	81.0	103.4	114.3	129.1
Power Input R-410A	kW	11.3	16.5	17.9	21.5	22.6	23.8	28.2	32.3	37.4
Net COP R-410A		3.67	3.46	3.50	3.42	3.63	3.41	3.67	3.54	3.45
η S heat R-410A	%	128.3	125.6	129.0	128.5	138.7	131.0	130.4	138.0	130.2
Eurovent Seasonal Efficiency Class for Heating R-410A		B	B	B	B	B	B	B	B	B
R-454B										
Net Heating Capacity R-454B	kW	40.1	50.9	57.1	65.9	77.0	78.8	100.6	111.8	128.0
Power Input R-454B	kW	10.8	14.0	16.1	18.7	20.9	23.4	27.2	30.7	36.8
Net COP R-454B		3.72	3.64	3.54	3.52	3.69	3.36	3.70	3.64	3.48
η S heat R-454B	%	127.0	125.1	125.7	126.0	135.7	128.3	137.3	137.5	129.3
Eurovent Seasonal Efficiency Class for Heating R-454B		B	B	B	B	B	B	B	B	B
Frame										
Frame		Frame 1S	Frame 1	Frame 1	Frame 1	Frame 2	Frame 2	Frame 3	Frame 3	Frame 3



IC - IH General Data

Table 2 – IH038 to IH130 (continued)

		IH038	IH050	IH060	IH065	IH075	IH085	IH100	IH110	IH130
Compressor										
Number of Circuits	#	1	2	2	2	2	2	2	2	2
Number of Compressor per Circuits	#	2	2	2	2	2	2	2	2	2
Type		Scroll Fixed Speed								
Nominal tons (@60Hz)	TR	6.9	4.5	5.1	6	6.9	7.5	9	10	12
Compressor speed	rpm	2900	2900	2900	2900	2900	2900	2900	2900	2900
Rated Load Amps (RLA) per Compressor	A	16.8	10.2	12.8	15.1	16.8	15.7	17.7	19.6	21.9
Locked Rotor Amps per Compressor	A	100	70	82	87	100	98	142	142	147
Oil and Refrigerant										
R-410A										
Oil quantity per compressors	l	1.73	1.73	1.73	1.73	1.73	3.0	3.3	3.3	3.3
Oil quantity ckt1/ckt2	l	3.46	3.46/3.46	3.46/3.46	3.46/3.46	3.46/3.46	6.0/6.0	6.6/6.6	6.6/6.6	6.6/6.6
Refrigerant charge per circuit (kg CKT1/ kg CKT2)	kg	11.0	8.5 / 8.5	9.0 / 9.0	9.0 / 9.0	11.0 / 11.0	11.0 / 11.0	14.0 / 14.0	14.0 / 14.0	14.0 / 14.0
R-454B										
Oil quantity per compressors	l	1.73	1.73	1.73	1.73	1.73	3.0	3.3	3.3	3.3
Oil quantity ckt1/ckt2	l	3.46	3.46/3.46	3.46/3.46	3.46/3.46	3.46/3.46	6.0/6.0	6.6/6.6	6.6/6.6	6.6/6.6
Refrigerant charge per circuit (kg CKT1/ kg CKT2)	kg	10.0	6.5 / 6.5	6.5 / 6.5	6.5 / 6.5	9.0 / 9.0	9.0 / 9.0	11.0 / 11.0	11.0 / 11.0	11.0 / 11.0
Electrical Data (2) (3)										
Main Power Supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Unit Max Amps	A	40	51	59	71	80	78	93	101	113
Unit Start-Up Amps (without soft starter)	A	124	112	129	144	164	160	218	233	281
Unit Start-Up Amps (with soft starter)	A	89	87	101	114	129	126	167	178	212
Maximum Short Circuit rating for 0,3 sec	kA	15	15	15	15	15	15	15	15	15
Disconnect Switch										
Disconnect switch (standard unit)		Sirco 125A	Sirco 125A	Sirco 125A	Sirco 125A	Sirco 125A	Sirco 125A	Sirco 125A	Sirco 160A	Sirco 160A
Cross section max (standard unit)	mm ²	50	50	50	50	50	50	50	95	95
Disconnect switch (unit auxiliary heat, heat recovery, return fans, exhaust fans)		Sirco 250A	Sirco 250A	Sirco 250A	Sirco 250A	Sirco 250A	Sirco 250A	Sirco 315A	Sirco 315A	Sirco 315A
Cross section max (unit auxiliary heat, heat recovery, return fans, exhaust fans)	mm ²	150	150	150	150	150	150	240	240	240
Extra Amps of Options (2) (3)										
Electric Heater	A	36	36	54	54	54	54	90	90	90
Indoor Fan : Oversized	A	0.0	0.0	0.0	1.2	0.0	7.4	0.0	9.0	9.0
Exhaust Fan (AC fan)	A	0.6	0.6	0.6	0.6	1.2	1.2	1.2	1.2	1.2
Exhaust Fan (EC fan)	A	5.2	5.2	5.2	5.2	10.4	10.4	10.4	10.4	10.4
Return Roofcurb	A	5.3	5.3	5.3	9.0	10.6	10.6	10.6	10.6	18.0
Heat Recovery (not included current for oversized fan)	A	6.6	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Heat Recovery High airflow (not included current for oversized fan)	A	6.6	7.8	7.8	7.8	13.0	13.0	13.0	13.0	13.0
Gas burner (modulation)	A	0.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
ERC (compressor + exhaust fans AC)	A	/	7.9	7.9	7.9	11.7	11.7	16.3	16.3	16.3
ERC (compressor + exhaust fans EC)	A	/	12.1	12.1	12.1	20.1	20.1	24.7	24.7	24.7



IC - IH General Data

Table 2 – IH038 to IH130 (continued)

		IH038	IH050	IH060	IH065	IH075	IH085	IH100	IH110	IH130
Outdoor Coil										
Type		Fins and Tubes								
Tube Size	Inches	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"
Face Area	m ²	2.046	2.046	2.046	2.046	2.502	2.502	3.1275	3.1275	3.1275
Rows/Fin Series	#/FPF	3/192	3/192	3/192	3/192	3/192	3/192	3/192	3/192	3/192
Number of Tubes in the height		48	48	48	48	48	48	60	60	60
Indoor Coil										
Type		Fins and Tubes								
Tube Size	Inches	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
Face Area	m ²	1.812	1.812	1.812	1.812	2.412	2.412	3.015	3.015	3.015
Rows/Fin Series	#/FPF	3/168	4/168	4/168	4/168	4/168	4/168	4/168	4/168	4/168
Number of Tubes in the height		48	48	48	48	48	48	60	60	60
Drain Connection outside diameter	mm	35	35	35	35	35	35	35	35	35
Indoor Fan										
Standard										
Type		Plug Fans								
Minimum Airflow	m ³ /h	6560	8480	9680	10960	12560	13360	15840	17280	20400
Nominal Airflow	m ³ /h	8200	10600	12100	13700	15700	16700	19800	21600	25500
Maximal Airflow	m ³ /h	10660	13780	15730	17810	20410	21710	25740	28080	33150
Number	#	1	2	2	2	2	2	2	2	2
Diameter	mm	500	450	450	450	500	500	500	500	500
Drive Type		EC Motors								
Motor Power (Eurovent condition)	kW	0.852	1.194	1.358	2.236	2.3225	2.636	3.3353	3.8625	5.653
Motor Max Amps per fan	A	5.3	4.7	4.7	4.7	5.3	5.3	9	9	9
Motor RPM at nominal flow rate (Eurovent condition)	RPM	1247.48	1242.4	1332.18	1573.4	1357.899	1425.8	1586.67	1681.776	1941.48
Available Static Pressure at nominal flow rate	Pa	250	250	250	250	250	250	250	250	250
Oversized										
Type		Plug Fans								
Minimum Airflow	m ³ /h	6560	8480	9680	10960	12560	13360	15840	17280	20400
Nominal Airflow	m ³ /h	8200	10600	12100	13700	15700	16700	19800	21600	25500
Maximal Airflow	m ³ /h	10660	13780	15730	17810	20410	21710	25740	28080	33150
Number	#	1	2	2	2	2	2	2	3	3
Diameter	mm	500	450	450	500	500	500	500	500	500
Drive Type		EC Motors								
Motor Power (Eurovent condition)	kW	0.852	1.194	1.358	2.094	2.3225	2.685	3.3353	3.248	4.4859
Motor Max Amps per Fan	A	5.3	4.7	4.7	5.3	5.3	9	9	9	9
Motor RPM at nominal flow rate (Eurovent condition)	RPM	1247.48	1242.4	1332.18	1281.1	1357.899	1422.83	1586.67	1294.88	1470.636
Available Static Pressure at nominal flow rate	Pa	500	500	500	500	500	500	500	500	500
Outdoor Fan										
Standard Ambient										
Type		Axial/Below/AC	Axial/Below/EC							
Nominal Airflow / ckt	m ³ /h	14543	13687	13681	13675	14321	14318	14865	14860	19628
Number of fan / ckt	#	1	1	1	1	1	1	1	1	1
Diameter	mm	760	760	760	760	760	760	760	760	800
Motor Power	kW	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	1.27
Motor Max Amps per Fan	A	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	3
Motor RPM	rpm	705	705	705	705	705	705	705	705	900



IC - IH General Data

Table 2 – IH038 to IH130 (continued)

		IH038	IH050	IH060	IH065	IH075	IH085	IH100	IH110	IH130
Filter										
Type (Standard)		G4 (65% Coarse)								
Number of Filters		6	6	6	6	8	8	12	12	12
Filter Size	mm	500x625	500x625	500x625	500x625	500x625	500x625	500x500	500x500	500x500
Physical Data for Standard Unit (4)										
Length	mm	3010	3010	3010	3010	3890	3890	3890	3890	3890
Width	mm	2250	2250	2250	2250	2250	2250	2250	2250	2250
Height	mm	1565	1565	1565	1565	1585	1585	1890	1890	1890
Operating Weight (Downflow Without Auxiliary Heat)	kg	921	1120	1125	1145	1320	1325	1534	1538	1538
Shipping Weight (Downflow Without Auxiliary Heat)	kg	977	1176	1181	1201	1380	1385	1594	1598	1598
Options Extra Weight (4)										
Hot Water Coil	kg	48	48	48	48	59	59	65	65	65
Electric Heater	kg	22	22	22	22	26	26	29	29	29
Gas Burner: modulating condensing	kg	76	76	90	90	118	118	138	138	138
Energy Recovery Module Standard Arflow (without packaging)	kg	396	396	396	396	477	477	549	549	549
Energy Recovery Module High Airflow (without packaging)	kg	N.A.	N.A.	N.A.	N.A.	508	508	580	580	580
Exhaust Fan AC	kg	50	50	50	50	77	77	78	78	78
Exhaust Fan EC	kg	84	84	84	84	135	135	136	136	136
ERC with AC Fans	kg	N.A.	164	164	164	218	218	233	233	233
ERC with EC Fans	kg	N.A.	200	200	200	279	279	294	294	294
Electric Heater										
Number of Capacity Steps	Nb	2	2	2	2	2	2	2	2	2
Capacity Steps	kW	12,5/12,5	12,5/12,5	12,5/25	12,5/25	12,5/25	12,5/25	25/37,5	25/37,5	25/37,5
Gas Burner: Modulating Condensing										
Thermal Output (Hi) [Min-Max]	kW	8.5 - 42.0	8.5 - 42.0	12.4 - 65.0	12.4 - 65.0	16.4 - 82.0	16.4 - 82.0	21.0 - 100.0	21.0 - 100.0	21.0 - 100.0
Useful Heat Output [Min-Max]	kW	8.97 - 40.45	8.97 - 40.45	13.40 - 62.93	13.40 - 62.93	17.77 - 80.03	17.77 - 80.03	22.77 - 97.15	22.77 - 97.15	22.77 - 97.15
Gas Flow [Min-Max]	m3/h	0.90 - 4.45	0.90 - 4.45	1.31 - 6.88	1.31 - 6.88	1.74 - 8.68	1.74 - 8.68	2.22 - 10.58	2.22 - 10.58	2.22 - 10.58
Gas Connection ø		UNI/ISO 228/1 G3/4"								
Hot Water Coil										
Type		Fins and Tubes	Fins and Tubes	Fins and Tubes	Fins and Tubes	Fins and Tubes	Fins and Tubes	Fins and Tubes	Fins and Tubes	Fins and Tubes
Tube Size	Inches	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
Face Area	m ²	0.769	0.769	0.769	0.769	1.087	1.087	1.087	1.087	1.087
Rows/Fin Series	#/FPF	2/144	2/144	2/144	2/144	2/144	2/144	2/144	2/144	2/144
Number of Tubes in the height		25	25	25	25	25	25	25	25	25
Energy Recovery Module (ERM) (6)										
Minimum Fresh Airflow	m3/h	2500	2500	2500	2500	2500	2500	3900	3900	3900
Maximum Fresh Airflow PD=300Pa	m3/h	18000	18000	18000	18000	18000	18000	28000	28000	28000
Maximum Fresh Airflow PD=400Pa	m3/h	9500	9500	9500	9500	9500	9500	10000	10000	10000
Exchanger Wheel Diameter	mm	1200	1200	1200	1200	1200	1200	1500	1500	1500
Exhaust Air Fan Diameter	mm	400	400	400	400	400	400	400	400	400
Exhaust Air Fan Motor Power	kW	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35
Length x Width x Height	mm	1750x1175 x1575	1750x1175 x1575	1750x1175 x1575	1750x1175 x1575	2250x1175 x1595	2250x1175 x1595	2250x1175 x1900	2250x1175 x1900	2250x1175 x1900

IC - IH General Data

Table 2 – IH038 to IH130 (continued)

		IH038	IH050	IH060	IH065	IH075	IH085	IH100	IH110	IH130
Energy Recovery Circuit (ERC)										
Cooling Mode (7)										
R-410A										
Net Cooling Capacity (ERC only) R-410A	kW	N.A	17.2	17.2	17.2	22.2	22.2	28.8	28.8	28.8
ERC Compressor Power Input R-410A	kW	N.A	4.4	4.4	4.4	3.9	3.9	5.4	5.4	5.4
ERC Exhaust Fans Power Input R-410A	kW	N.A	0.5	0.5	0.5	1.1	1.1	0.9	0.9	0.9
Total ERC Power Input R-410A	kW	N.A	4.9	4.9	4.9	5.0	5.0	6.3	6.3	6.3
R-454B										
Net Cooling Capacity (ERC only) R-454B	kW	N.A	16.6	16.6	16.6	21.5	21.5	28.7	28.7	28.7
ERC Compressor Power Input R-454B	kW	N.A	4.3	4.3	4.3	3.9	3.9	5.7	5.7	5.7
ERC Exhaust Fans Power Input R-454B	kW	N.A	0.5	0.5	0.5	1.1	1.1	0.9	0.9	0.9
Total ERC Power Input R-454B	kW	N.A	4.8	4.8	4.8	5.0	5.0	6.6	6.6	6.6
Heating Mode (7)										
R-410A										
Net Heating Capacity (ERC only) R-410A	kW	N.A	18.3	18.3	18.3	21.5	21.5	27.9	27.9	27.9
ERC Compressor Power Input R-410A	kW	N.A	2.8	2.8	2.8	2.9	2.9	3.9	3.9	3.9
ERC Exhaust Fans Power Input R-410A	kW	N.A	0.5	0.5	0.5	0.8	0.8	0.9	0.9	0.9
Total ERC Power Input R-410A	kW	N.A	3.3	3.3	3.3	3.7	3.7	4.8	4.8	4.8
R-454B										
Net Heating Capacity (ERC only) R-454B	kW	N.A	18.5	18.5	18.5	19.6	19.6	26.8	26.8	26.8
ERC Compressor Power Input R-454B	kW	N.A	3.1	3.1	3.1	2.6	2.6	3.8	3.8	3.8
ERC Exhaust Fans Power Input R-454B	kW	N.A	0.5	0.5	0.5	0.8	0.8	0.9	0.9	0.9
Total ERC Power Input R-454B	kW	N.A	3.6	3.6	3.6	3.4	3.4	4.7	4.7	4.7
Exhaust Fans and Air Management										
Number of Exhaust Fans		N.A	1	1	1	2	2	2	2	2
Minimum Fresh Air	%	N.A	20%	20%	20%	20%	20%	20%	20%	20%
Maximum Recommended Fresh Air (compared to max airflow)	%	N.A	39%	34%	30%	50%	47%	41%	38%	32%
Maximum Fresh Air (building pressurisation issues to be considered)	%	N.A	100%	100%	100%	100%	100%	100%	100%	100%
Maximum Return Air Pressure Drop (without Return Roofcurb) AC Fans	Pa	N.A	100	100	100	100	100	100	100	100
Maximum Return Air Pressure Drop (without Return Roofcurb) EC Fans	Pa	N.A	400	400	400	400	400	400	400	400
Maximum Additional Air Pressure Drop (indoor coil)	Pa	N.A	15	25	25	20	20	20	25	25
Oil and Refrigerant										
ERC Circuit Refrigerant Charge	kg	N.A	2.3	2.3	2.3	2.7	2.7	3.4	3.4	3.4
ERC Circuit Oil Quantity	l	N.A	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Dimensions										
Length x Width x Height (ERC + IH standard)	mm	N.A	3010x2250 x1565	3010x2250 x1565	3010x2250 x1565	3890x2250 x1585	3890x2250 x1585	3890x2250 x1890	3890x2250 x1890	3890x2250 x1890

(1) Indicative performances at standard Eurovent rating conditions. For detailed performances, consult order write up (OWU).

(2) Under 400V/50Hz/3Ph.

(3) Electrical and system data are indicative and subject to change without notice. Refer to unit nameplate data.

(4) Indicative data. For details consult lifting and handling instructions in document package shipped with the unit.

(5) Value referenced to Gas G20 - for other refer to burner IOM manual.

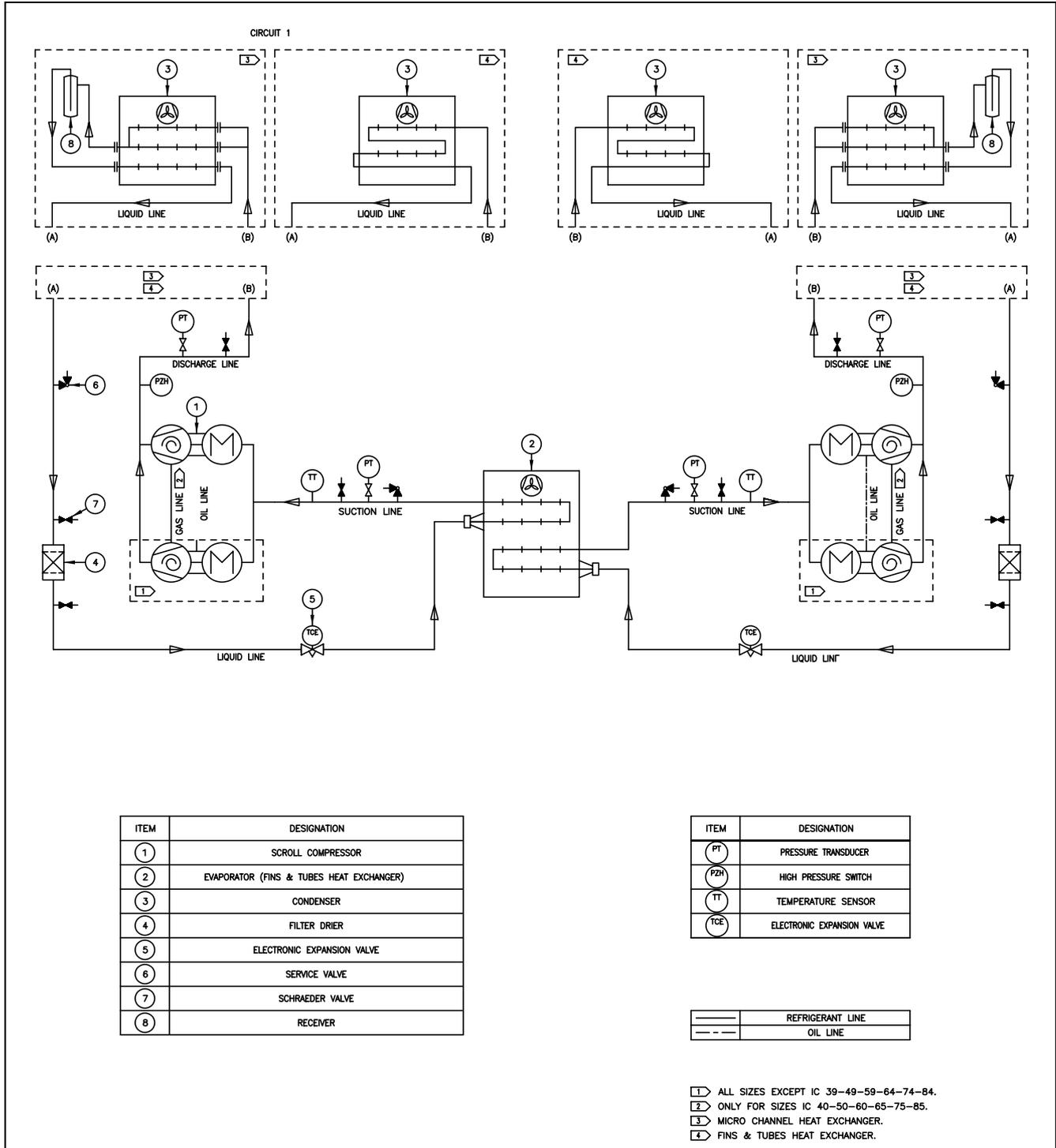
(6) The ERM data is only for Digit -18 R.

(7) Indicative performances of ERC at standard Eurovent rating conditions, 50% of nominal airflow, 50 Pa return air pressure drop and 150 Pa supply air pressure drop. For detailed performances, consult order write up (OWU).

Unit Operating Principle

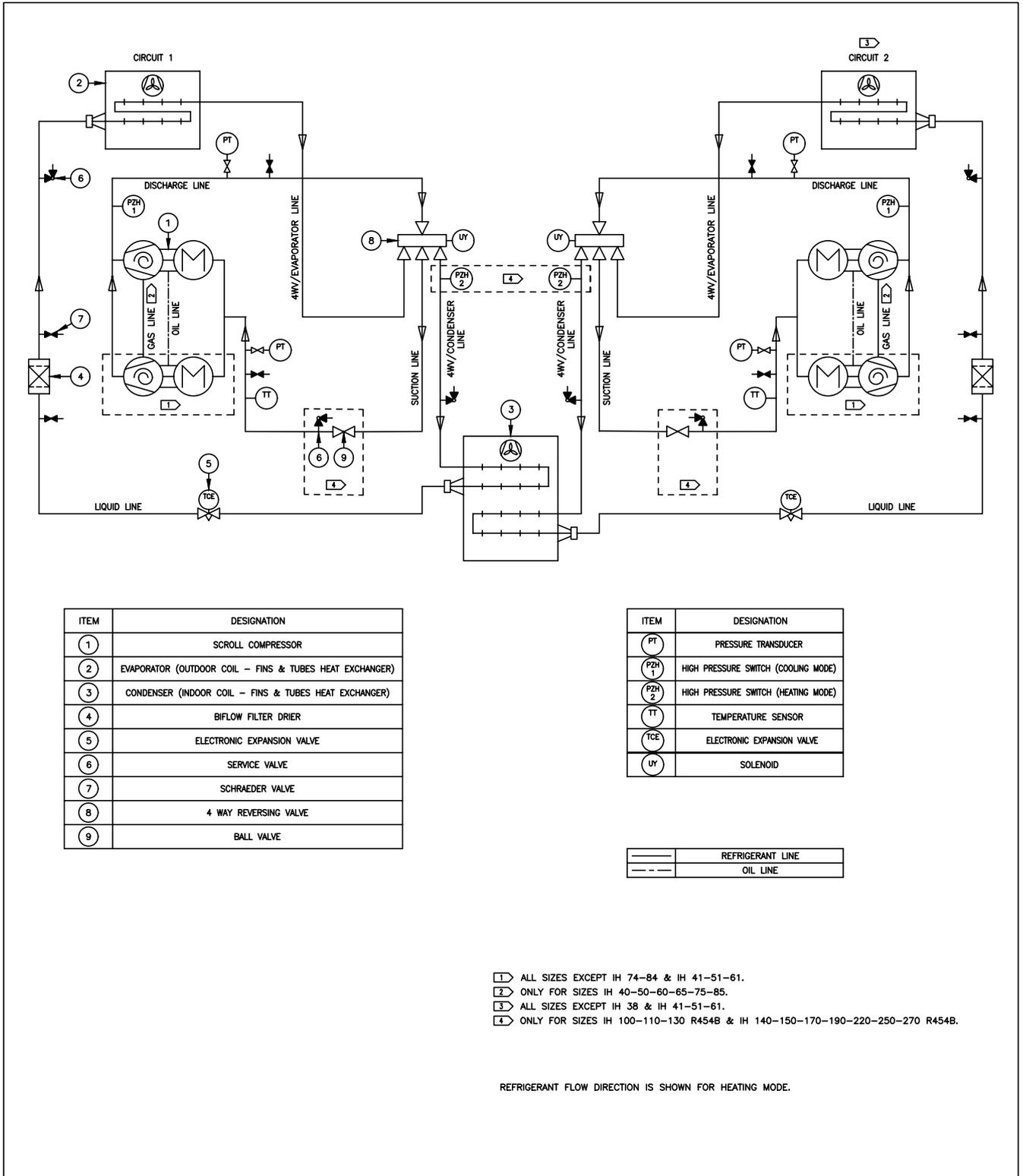
Unit Synoptic

Figure 1a – Airfinity IC units typical refrigeration schematic



Unit Operating Principle

Figure 1b – Airfinity IH units typical refrigeration schematic



Installation

General information: The installation must conform to all local standards and regulations.

Reception of Units

Unit Handling

The unit is supplied on wooden blocks. It is recommended to check the machine's condition upon reception.

There are two ways to handle the unit:

1. Handle the machine using a forklift, in accordance with applicable safety regulations. Handling of the unit is prohibited unless forks are longer than the length of the unit (not recommended as there is a risk of damage if not done carefully).
2. Use a lifting beam correctly adjusted to fit the unit (recommended).

The units are supplied on the truck but are not unloaded. A lifting lug is provided on each corner of the unit's base to facilitate handling. 4 shackles and 4 slings are required.

Use a lifting beam to prevent the cables pressing too hard on top of the unit during lifting.

Important: For unit to fit on the roof curb the wooden blocks must be removed.

Lifting and Moving Instructions

Specific lifting method is recommended as follows:

1. The units are supplied with four lifting points
2. Slings and spreader bar to be provided by rigger and attached to the four lifting points.
3. Minimum rated lifting capacity (vertical) of each sling and spreader bar shall be no less than the unit shipping weight.

CAUTION!

The unit must be lifted with the utmost care. Avoid shock load by lifting slowly and evenly.

4. Remove slings and spreader bars when installation is completed.

The detailed handling, lifting instructions including all weights and sling lengths are given on the specific drawings and instructions shipped with the unit.

Roof Curb Installation

Roof curbs are available as an accessory for "downflow" units to support the unit and ensure the water tightness between the rooftop and the roof. Four types of roofcurbs are available: the standard version to allow the installation of the unit on a flat roof with different return flow patterns (return roofcurb down, return roofcurb horizontal, multidirectional roofcurb) and the adjustable version for a slope roof installation (adjustable roofcurb down). The roofcurb characteristic is given in roofcurb submittal drawings sent with the unit.

Figure 2 - Roofcurb down

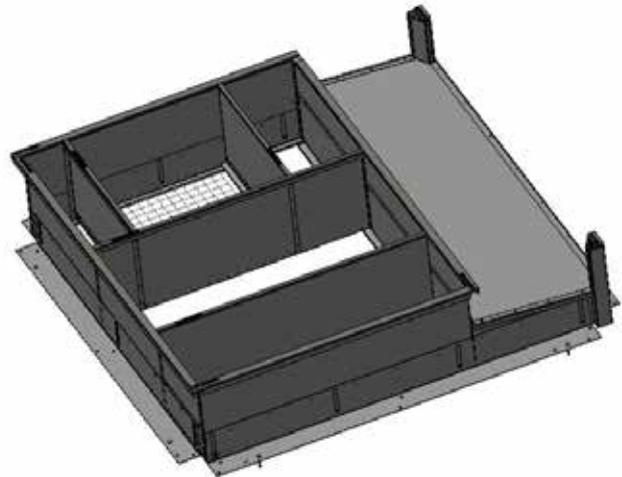
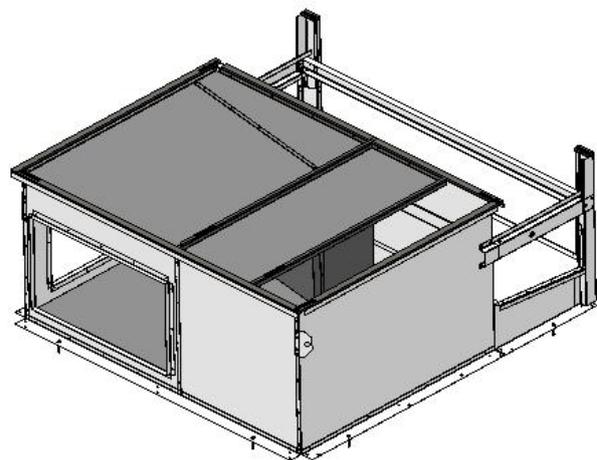


Figure 3 - Roofcurb multidirectional assembly

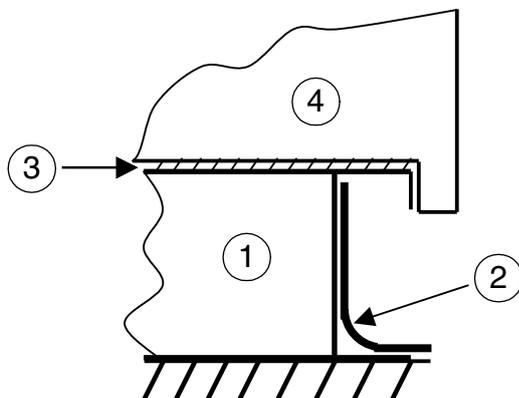


Instructions for the roofcurb assembly and installation with curb dimensions are provided with each roofcurb kit.

In order to insure watertightness of the roofcurb assembly, it is important to respect the schematics below and to consult the booklet for roofcurb assembly shipped with the roofcurb module. Be sure that gasket is positioned on the roofcurb and without damage before unit positioning.

To avoid any property damage or personal injury, it is the installer's responsibility to make sure that the installation will not impair the function of this curb, or the unit to be installed; and that the roofcurb and unit must be completely sealed, preventing any water or air leakage damage.

Figure 4 - Waterproofing



1. Roofcurb
2. Roof membrane
3. Seal
4. Rooftop

Installing the Unit

The structure accommodating the unit(s) must be designed to support the equipment in operation, as a minimum. Refer to submittals drawings supplied with the unit for dimensions, weight and clearance requirement around unit.

Unit Support

Install the unit on a flat foundation strong enough to support unit loading and level (within 5 mm across the length and width of the unit). If the unit is to be roof mounted check the building codes for weight distribution requirements

Location and Clearances

Choose a location that will enable air to circulate freely in the condenser coil and allow air to be discharged above the fans. The clearance distances for air circulation and maintenance are indicated in the submittals drawings.

Placing and Rigging

The rooftop units are designed to be installed outdoor and must be positioned horizontally (vertical air discharge off the condenser).

Slab Mount

For ground level installation, the unit base should be adequately supported and hold the unit near level.

In areas where snowfall is common, the unit must be elevated enough to ensure that the bottom of the outdoor coil is above the height of the expected snow accumulation.

Where severely cold temperatures are a consideration, elevation of the unit is again recommended to ensure that defrost water does not create an ice build up that will interfere with unit operation. In addition, runoff water from roofs, etc. must not be allowed to fall on the outdoor coil; any blockage of airflow through the coil can be detrimental to unit operation and reliability.

The manufacturer suggests that the bottom of the outdoor coil be raised 30cm above grade or roof to prevent possible ice build-up problems.

The unit frame structure is not designed to be supported by four points (mounting on spring isolators for instance).

The unit must therefore rest on its whole base.

Installation

Unit Overall View

Figure 5 - Indoor section

Embedded Control Solutions

Trane controller with embedded energy saving functionalities. Centralized control panel for easy access and service. Remote service terminal provided as an option.

EC Plug Fan

Compact, quiet and more efficient compared to traditional axial fans. Rail system for easy access and maintenance.

Double Skin Panel

Double wall and thick glass wool insulation provided as standard with all units, for higher indoor air quality.

Sloped Drain Pan

Non-corrosive sloped drain for improved condensate management, thus preventing formation of microbial agents that lead to poor air quality.

Epoxy Coating

High quality Epoxy coating on fin and tube heat exchanger prevents corrosion and extends unit lifetime

Fresh Air Hood

Foldable for easy transportation and installation

OD Coils

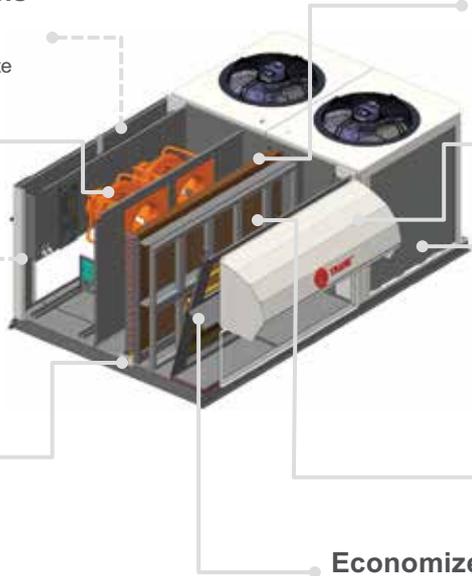
Blue fin technology, Aluminium fin or Gold Epoxy MCHE (IC)
High corrosion resistance Epoxy coating fins (Optional)

High Quality Air Filtration

Two rails for wide range of filtration up to F9, capable of meeting local regulations

Economizer with Intelligent Control

Provided as standard with the every Airfinity™ unit, the economizer permits free cooling when conditions are favorable, saving up to 20% on annual energy consumption.



Dimensions/Weights and Clearance

This information is supplied in the document package shipped with the unit.

Connection of Duct Network

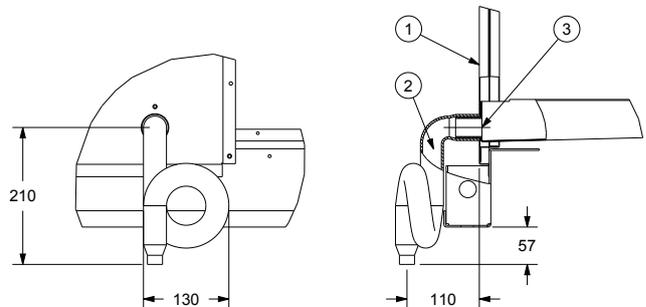
Supply and return openings have curb flanges provided for easy duct installation. It is recommended to insulate the circumference of the curb after the unit is mounted to prevent condensation.

CAUTION! All ductwork must be run and attached to the curb flanges before the unit is set into place.

Guidelines for Ductwork Construction

- Connections to the unit should be made with 7.5 cm canvas connectors to minimize noise and vibration transmission.
- Elbows with turning vanes or splitters recommended to minimize air noise and resistance.
- The first elbow in the ductwork leaving the unit should be no closer than 60cm from the unit, to minimize noise and resistance.

Figure 7 - Supplied trap



1. Panel enclosure
2. Atmosphere pressure
3. Static drain

Attaching Horizontal Ductwork to Unit

- All conditioned air ductwork should be insulated to minimize heating and cooling duct losses. Use minimum of 5cm of insulation with a vapor barrier. The outside ductwork must be weather proofed between the unit and the building.
- When attaching ductwork to a horizontal unit, provide a flexible watertight connection to prevent noise transmission from the unit to the ducts. The flexible connection must be indoors and made out of heavy canvas.

Note: Do not draw the canvas taut between the solid ducts.

Condensate Drain Piping

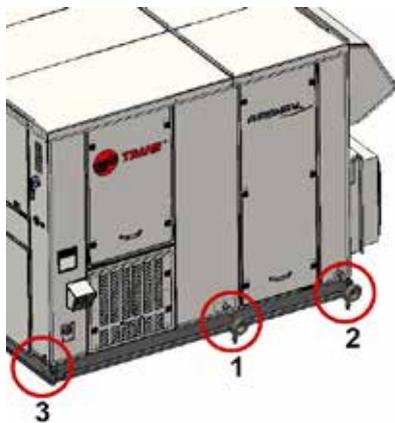
Each unit is equipped with a diameter 35 mm male drainage connector. A P trap is supplied and must be connected to the drainage as shown in “Figure 7 - Supplied trap”.

Slope the drainage pipe down at least 1 percent to ensure an adequate condensate flow.

Check all the condensate drainage pipe fittings comply with the applicable construction regulations and waste disposal standards.

Figure 8 - Drain piping location

- 1: Unit drain pan
- 2: ERC drain pan
- 3: Modulating burner condensates



Filter Installation

Access to the filter cells is done via the filter access door. Filter support can be slid laterally.

Each unit is shipped with this available filter combination:

- G4 (65% Coarse) is standard installation by default
- G4 (65% Coarse) + F7 (ePM1 55%)
- G4 (65% Coarse) + F9 (ePM1 80%)
- M5 (85% Coarse) + F7 (ePM1 55%)

Note: F7 (ePM1 55%) + F9 (ePM1 80%) combination is not allowed.

The number and the size of the filter cells are determined by the frame of the unit. Each unit has 2 rails of filter.

Per Rail

Frame 1: 6 filters of 500 x 625

Frame 2: 8 filters of 500 x 625

Frame 3: 12 filters of 500 x 500

There is 3 different types of filters which are place on rails of 50 mm or 100 mm upstream of the indoor coil.

Figure 9 - Filter pressure drop

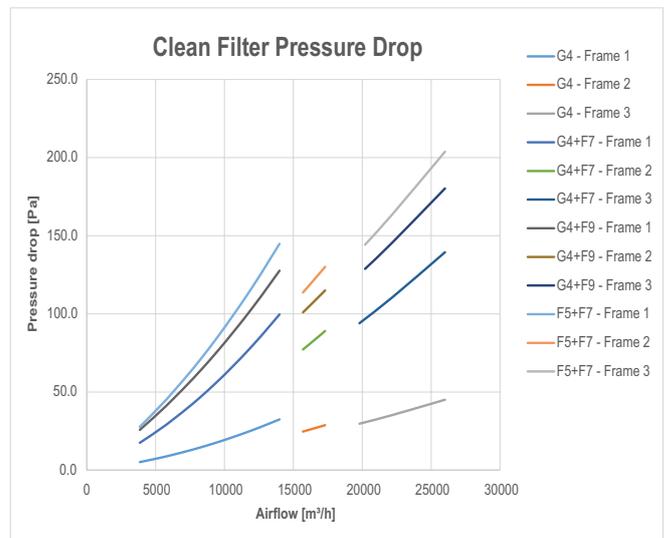


Figure 10 - Hot water coil pressure drop

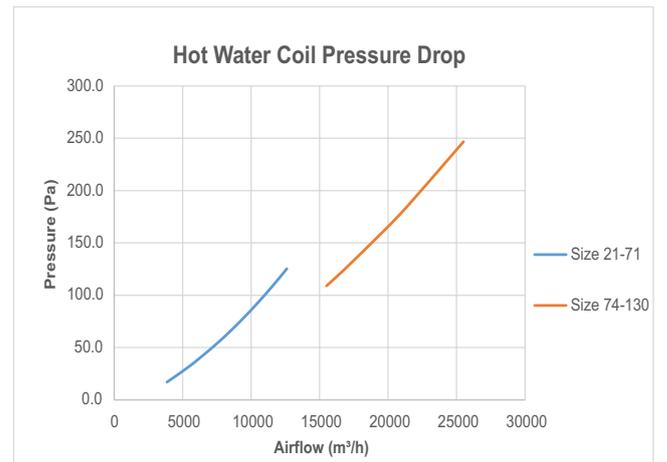
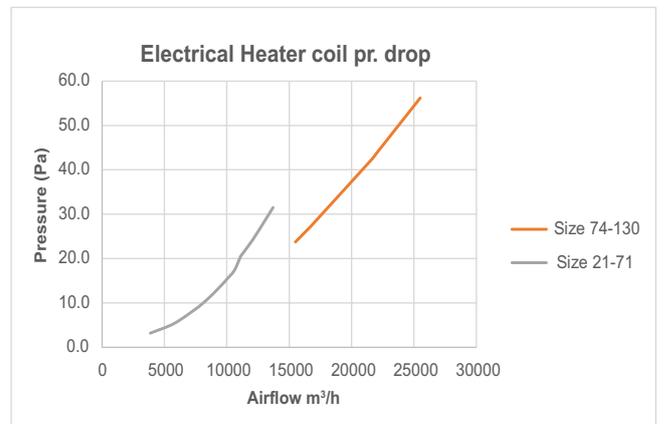


Figure 11 - Electrical heater coil pressure drop



Installation

Supply Plug Fan Airflow Adjustment

1. Order write up (OWU) indicate design airflow, supply and design air pressure drop.
2. Verify on site supply fan airflow. It should match OWU design airflow.
3. If on site airflow is different from OWU design airflow the actual supply and design air pressure drop should be different from design values, Trane service technician should be mandated to perform air flow adjustment and optimization.

Dirty Filter Detection

Dirty filter sensor is differential pressure sensor measuring air pressure drop difference through the air filters. It is installed in the upper position of the internal cabinet before the air filters in direction of indoor airflow. Thanks to this sensor we detect dirty filter, in order to ensure right filtration and also we avoid a filter damage because of high pressure drop.

Value set by default is 50Pa. Please refer to the table below to set the sensor to the required value.

Air Filter Combination	Setting on the Differential Pressure Drop Sensor (Pa)
G4 (65% Coarse)	125
G4 (65% Coarse) + F7 (ePM1 55%)	325
G4 (65% Coarse) + F9 (ePM1 80%)	425
M5 (85% Coarse) + F7 (ePM1 55%)	375

After required value setting a technician must verify that no one of the sensor ports are blocked, even a tube.

A tests is required with defined set value when it is reached or exceeded, a fault is sent to control via a dry contact to display an alarm.



Supply Fan Airflow Measurement Option

The airflow measurement option when selected is associated with an air differential pressure sensor which measures the pressure difference before the inlet nozzle and inside the inlet nozzle.

Unit airflow can be calculated on the basis of the differential pressure (difference in pressure of the static pressures) in keeping with the following equation:

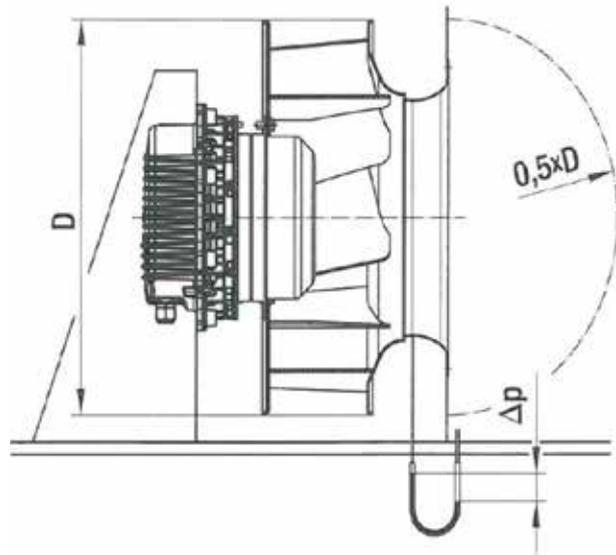
$$Qv = k \cdot \sqrt{\Delta P} \cdot N$$

Qv in [m³/h] and Δp in [Pa]

N number of fans

k takes into account the specific nozzle characteristics.

Connection on the unit side is accomplished via a pre-mounted T tube connector. This tube connector is suited for pneumatic hoses with an internal diameter of 4 mm.



k factors:

Fan diameter	400	450	500
k-factor	188	240	281

According to the option chosen, airflow or fan RPM can be read directly on the optional display or should be determined by connecting a differential pressure meter to the pre mounted T connector.

Setup is -20%/+30% variation versus factory setting (190m³h-1/kW @ 250 Pa).

Refrigerant Leak Detector R-454B

Refrigerant leak detector R-454B is supplied and wired in each unit selected with refrigerant R-454B. Along with this option, each unit selected with R-454B is also equipped by default with the airflow rate measurement option, to have an additional level of security.

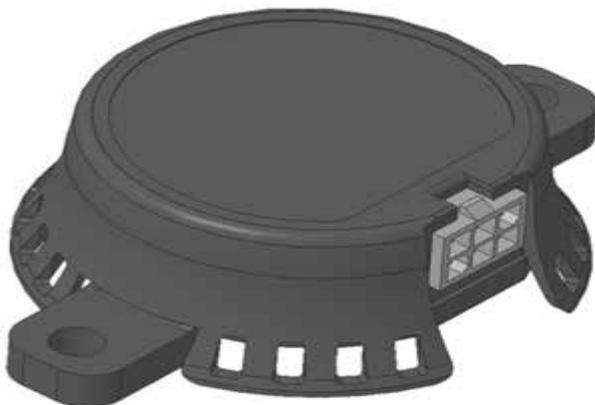
On Airfinity One units, refrigerant leak detector is installed at the bottom in the indoor section, between the indoor coil and the damper. It is placed close to the door panel in order to have accessibility for maintenance (see the following images).

The detector alarm limit is set to a refrigerant concentration equivalent to approximately 15 percent of LFL (Lower Flammable Limit). The alarm limit is a factory preset and it is not adjustable.

Operating temperature : -40 °C to 80 °C.

Operating relative humidity : 0 to 100 %.

Accuracy at ambient temperature 15 °C to 25 °C (30 to 70 % RH) is about ± 2.5 %, measurement range 0 to 25 % LFL.



Gas Pipework

Installation of Gas Piping (To be Performed by the Contractor)

The installation rules for public buildings shall be followed: refer to the brochure in the "Journal Officiel" number 1477-1 (France only).

The gas supply piping and the gas stop valve shall be dimensioned to guarantee the gas supply pressure at the unit's inlet when it is functioning at full capacity.

It is recommended to install one expansion valve as close as possible to each installed unit. The piping must be self-supporting before the final branch connection to the unit. Allow for a dust trap (filter) upstream of the connection to the unit. Search for gas pipe leaks using tensio-active product such as "Teepol" or "1000 bulles" or another equivalent method. Soapy water must not be used.

WARNING!

Never use a flame to search for leaks. The required gas pressures at the unit's inlet connection are specified in table «Marking Category of gas section in different countries»

CAUTION!

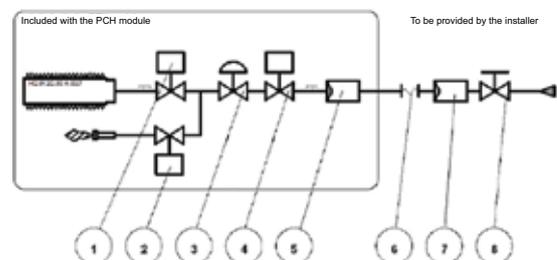
The piping must not exert any stress on the branch connection to the burner.

The heating system must be isolated by the gas stop valve on the gas supply piping during the pressure tests, as soon as the pressure exceeds 0.060 bar (60 mbar).

If pressure greater than 0.060 bar is applied to the gas valve inlet the unit may be damaged. In this case it is mandatory to add a pressure reducer.

Connect condensation pipe for modulating burner. 2 stages burner is not supposed produce condensate and the small amount of condensate possibly produced in particular working conditions will in case evaporate

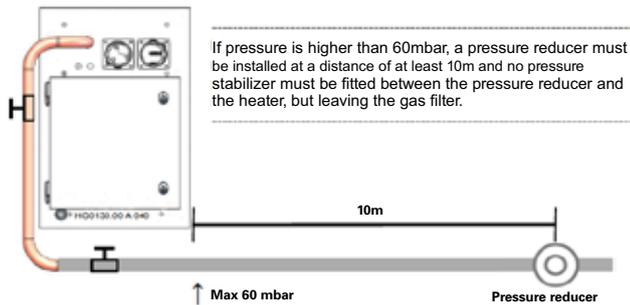
Figure 12 - Typical gas supply pipework



KEY

1. Main burner gas solenoid valve
2. Pilot burner gas solenoid valve
3. Pressure stabilizer
4. Safety gas solenoid valve
5. Gas filter (small section)
6. Anti-vibration joint
7. Gas filter (large section)
8. Gas valve

Installation



During the installation, we recommend to tighten the nut fastening the external gas supply pipe without exceeding the tightening torques shown below:

- Ø 3/4-inch: 150 Nm;

Smoke Outlet Features

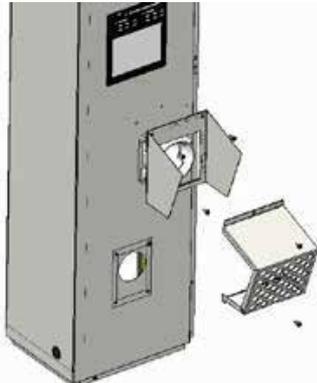
Unit is shipped with an outlet adaptor for connection to exhaust pipe. If there is no exhaust pipe used, a terminal feature located on the accessories should be installed.

Note: Exhaust pipe material has to be chosen carefully to avoid corrosion.

Figure 13 - Exhaust gas terminal installation



1: Exhaust pipe adaptor with gasket



2: Terminal parts installation

General Electrical Recommendations

Electrical Parts

When reviewing this manual keep in mind.

- All field-installed wiring must be in accordance with local regulations, CE directives and guidelines. Be sure to satisfy proper equipment grounding requirements according CE.
- The following standardized values - Maximum Amps - Short Circuit Amps - Starting Amps are displayed on unit nameplate.
- All field-installed wiring must be checked for proper terminations, and for possible shorts or grounds.

Note: always refer to wiring diagrams shipped with unit or unit submittal for specific electrical schematic and connection information.

WARNING Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

Important!

Do not allow conduit to interfere with other components, structural members or equipment. Control voltage (230 V) wiring in conduit must be separate from conduit carrying low voltage (<30V) wiring. To prevent control malfunctions, do not run low voltage wiring (<30V) in conduit with conductors carrying more than 30 volts.

CAUTION!

Inverters are equipped with integrated filters. They are not compatible with insulated neutral load earthing arrangements.

WARNING! Hazardous Voltage with Capacitor!

Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Disconnect all electric power, including remote disconnects and discharge all motor start/run and AFD (Adaptive Frequency TM Drive) capacitors before servicing.

Any contact with electric components, even after the unit has been switched off, can cause serious injury or death. Wait at least 5 minutes after switching off the unit, until the current dissipates.

- For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharges capacitors. Verify with an appropriate voltmeter that all capacitors have discharged.
- DC bus capacitors retain hazardous voltages after input power has been disconnected. Follow proper lockout/ tagout procedures to ensure the power cannot be inadvertently energized After disconnecting input power, wait five (5) minutes for units which are equipped with EC fans and wait twenty (20) minutes for units which are equipped with variable frequency drive (0V DC) before touching any internal components. Failure to follow these instructions could result death or serious injury.

Installer-Supplied Components

Customer wiring interface connections are shown in the electrical schematics and connection diagrams that are shipped with the unit. The installer must provide the following components if not ordered with the unit:

- Power supply wiring (in conduit) for all field-wired connections.
- All control (interconnecting) wiring (in conduit) for field supplied devices.
- Circuit breakers.

Installation

Grounding

Be sure to ground the unit and differential protection should be suited for industrial machinery with current leak which can be higher than 300 mA (several motors and frequency drives).

CAUTION!

To avoid corrosion, overheating or general damage, at terminal connections of power supply wiring, unit is designed for copper mono-conductors only. In case of multiconductor cable, an intermediate connection box must be added. For cable with alternative material, bi-material connecting devices are mandatory. Cable routing inside control panel should be made case by case by installer.

WARNING Ground Wire!

All field-installed wiring must be completed by qualified personnel. All field-installed wiring must comply with local codes and regulations. Failure to follow this instruction could result in death or serious injury. All power supply wiring must be sized and selected accordingly by the project engineer in accordance with local codes and regulations.

WARNING!

The Warning Label which is displayed on the equipment and shown on wiring diagrams and schematics. Strict adherence to these warnings must be observed. Failure to do so may result in personal injury or death.

CAUTION!

Units must not be linked to the neutral wiring of the installation. Units are compatible with the following neutral operating conditions:

TNS	IT	TNC	TT
Standard**	Special	Special	Standard*

* Differential protection should be suited for industrial machinery with current leak which can be higher than 300 mA (several motors and frequency drives). Neutral wire not distributed.

** Neutral wire not distributed

Electrical Connections

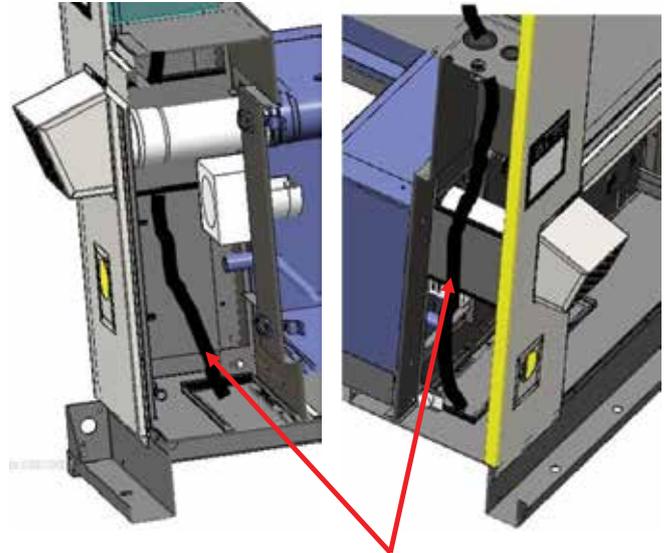
The electric panel is located on the length of the indoor section behind the plug fan section. The unit is designed to run with 400V (+/-10%) - 50 Hz (+/-1%) - 3 ph.

2 glands are available on each unit to be able to connect the unit to the main supply either from the side or from the bottom.

CAUTION!

Be sure that layout of electrical conduit is remote enough from hot components (burner, electrical heater...).

Figure 14 - Supply Power wiring layout to avoid hot areas



Example of wiring layout of supply power to avoid hot area.

CAUTION!

After completion of wiring, check all electrical connections, and ensure all connections are tight. Replace and secure all electrical box covers and access doors before leaving unit or connecting power to circuit supplying unit.

Scroll Compressors

Proper phasing of the electrical power wiring is critical for proper operation and reliability of the scroll compressor and fans.

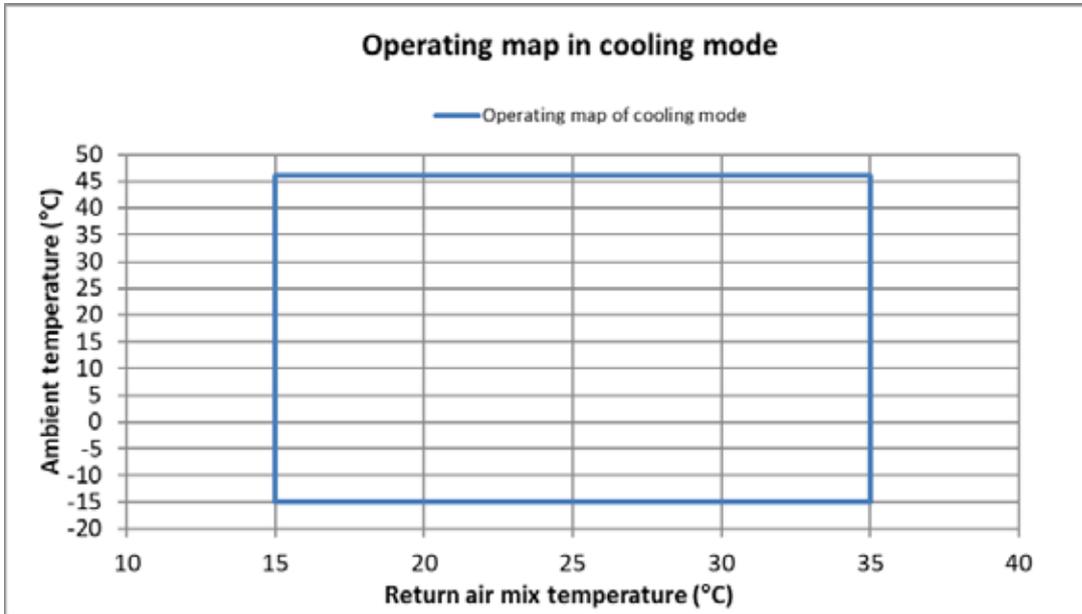
Proper rotation of the scroll compressor must be established before the unit is started. This is accomplished by confirming that the electrical phase sequence of the power supply is correct. The motor is internally connected for clockwise rotation with the inlet power supply phased A, B, C.

The direction of rotation may be reversed by interchanging any two of the line wires. It is this possible interchange of wiring that makes a phase sequence indicator necessary if the operator is to quickly determine the phase rotation of the compressor motor.

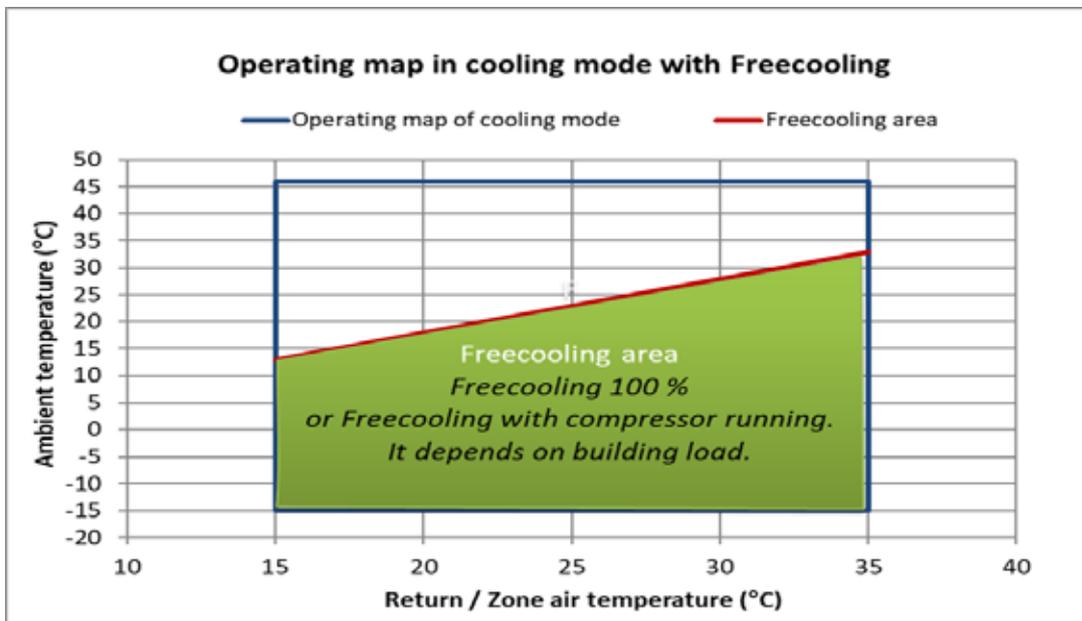
The "ABC" indicator on the face of the phase indicator will glow if phase is ABC for terminals L1, L2, and L3.

Operating Map

Cooling Mode

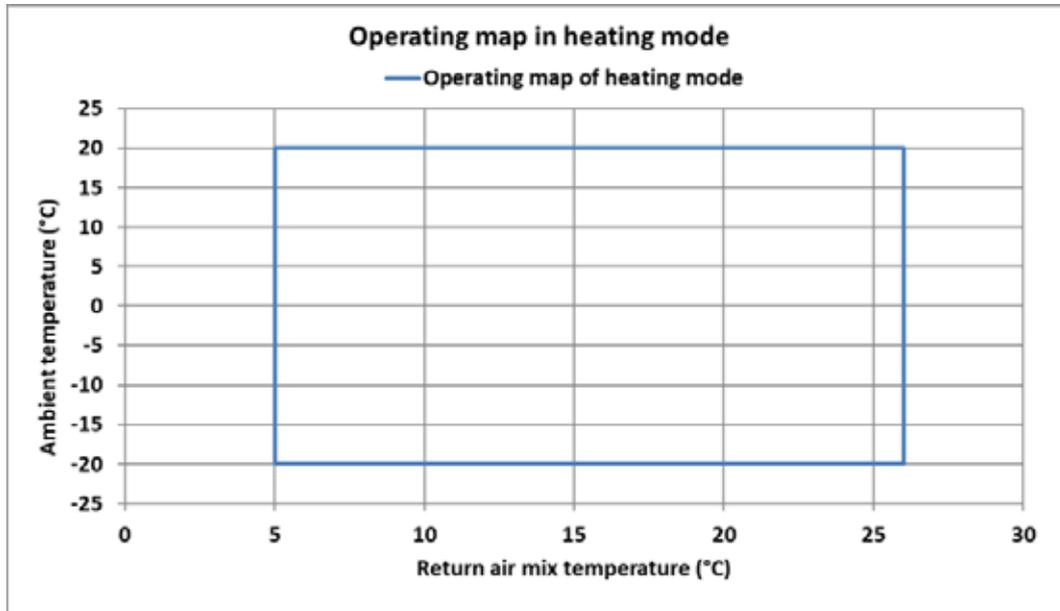


Minimum Outdoor Temperature = -15°C.
 Maximum Outdoor Temperature = 46°C.
 Minimum Indoor Coil Mixed Temperature = 15°C.
 Maximum Indoor Coil Mixed Temperature = 35°C.



Free cooling area:
 Outdoor temperature 13°C and Return/Zone temperature 15°C.
 Outdoor temperature 33°C and Return / Zone temperature 35°C.

Heating Mode



Trane Rooftop can operate until an ambient temperature of -20°C if the unit operated in steady conditions.

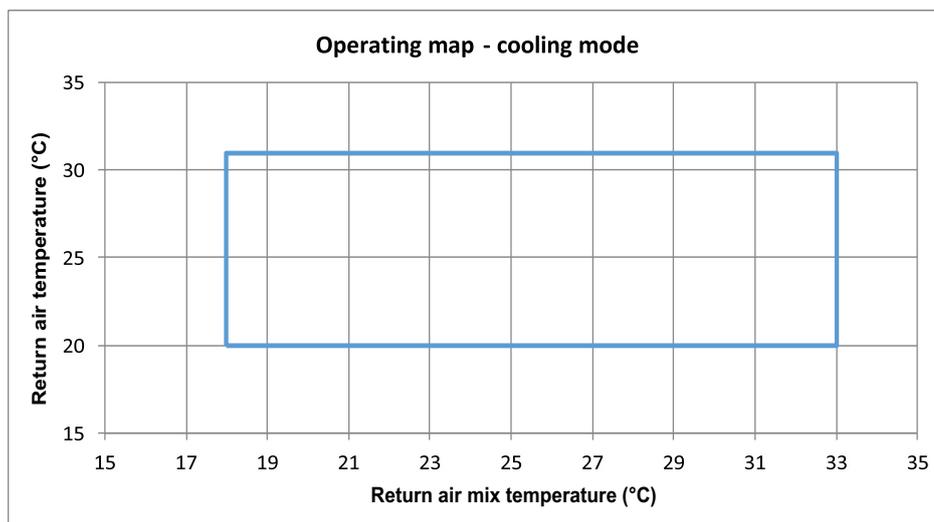
Minimum Outdoor Temperature = -20°C.

Maximum Outdoor Temperature = 20°C.

Minimum indoor Coil Mixed Temperature = 5°C.

Maximum Indoor Coil Mixed Temperature = 26°C.

ERC Cooling Mode



Minimum Return Air Mix Temperature = 18°C.

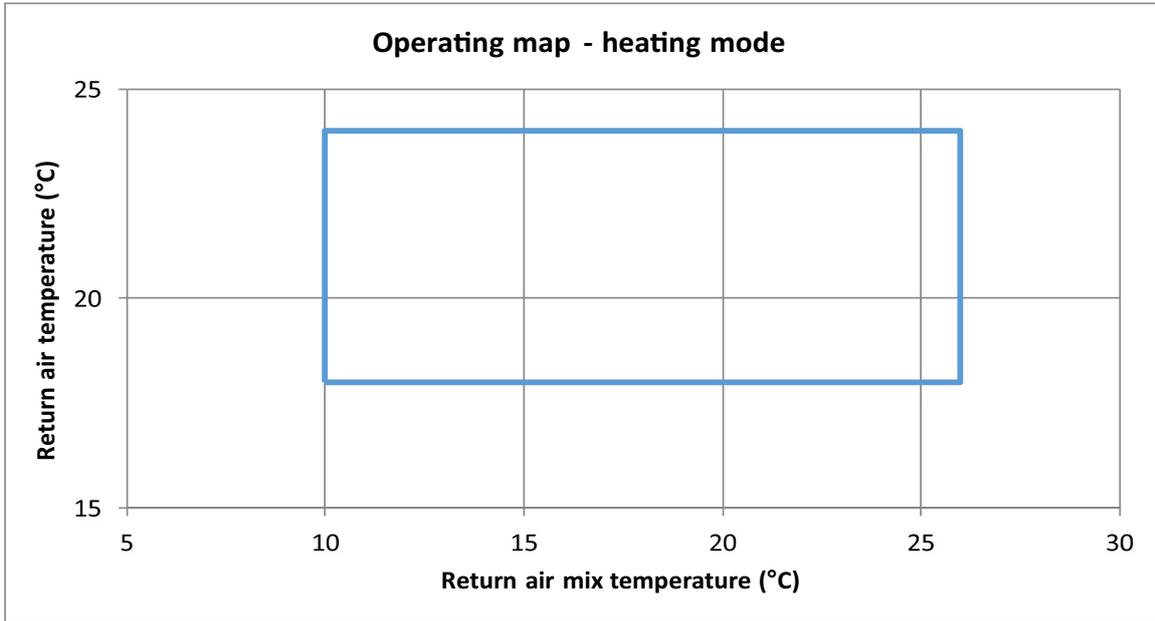
Maximum Return Air Mix Temperature = 33°C.

Minimum Return Air Temperature = 20°C.

Maximum Return Air Temperature = 31°C.

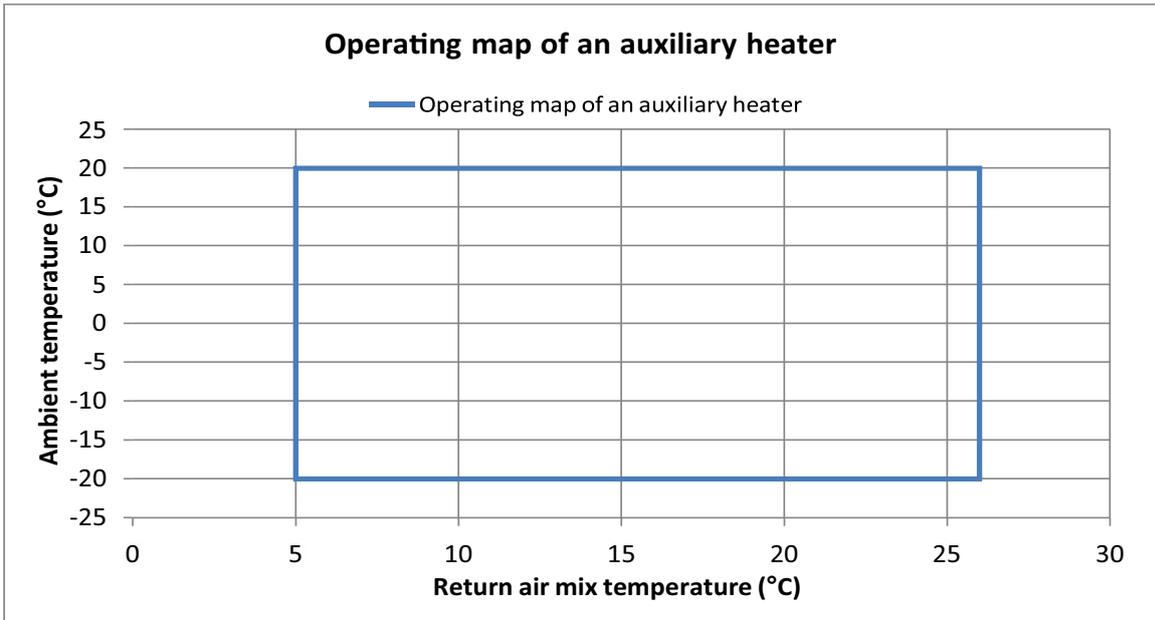
Options

ERC Heating Mode



Minimum Return Air Mix Temperature = 18°C.
 Maximum Return Air Mix Temperature = 24°C.
 Minimum Return Air Temperature = 10°C.
 Maximum Return Air Temperature = 26°C.

Auxiliary Heating Mode



Maximum Outdoor Temperature (@ Eurovent) = 20°C.
 Minimum Outdoor Temperature = -20°C.
 Maximum Indoor Coil Entering Temperature = 26°C.
 Minimum indoor Coil Entering Temperature = 5°C.

Options

Free cooling economizer unit is supplied with economizer and fresh air hood as a standard feature. Fresh air percentage can vary from 0 to 100%.

An economizer consists of:

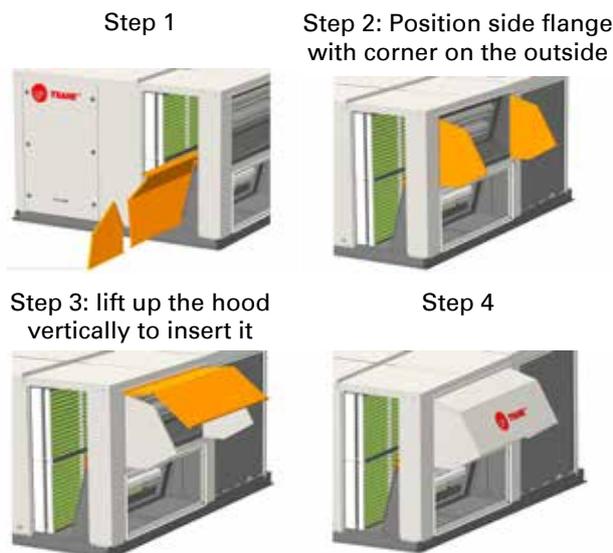
- A motorized damper with separate fresh air and return air sections.
- A fresh air hood with a grill delivered folded in the unit.
- All necessary sensors for free cooling operation.

The mechanical opening of the damper is managed by the actuator which is adjusted by Trane controller.

Damper is activated in free cooling mode and may be further controlled by temperature control with return and outdoor air sensors or by enthalpy control with addition to temperature sensor of return and outdoor humidity sensor.

Fresh Air Hood Installation

Figure 15 - Fresh air hood assembly steps



CAUTION! In case of ERC, installation of ERC module has to be made prior to fresh air hood.

Building Pressurization Control

Barometric Relief

The barometric relief allows to minimize overpressure in the building caused by the introduction of fresh air. This option is typically installed when fresh air intake is below 25% of the nominal air flow and when the return air pressure drop is below 25Pa.

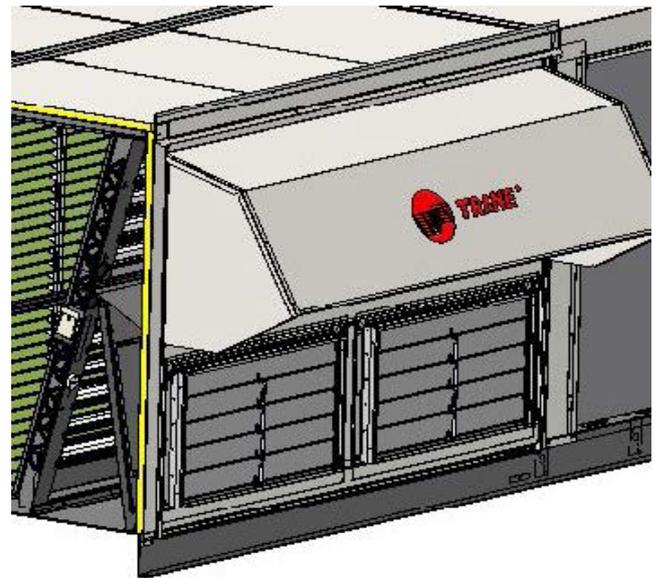
Barometric damper is available as option into economizer option on downflow and not compatible with heat recovery module unit only.

When the pressure of the building increase, the dampers open and relieve air to the outside.

If the return air duct pressure drop is higher than the building overpressure, the dampers will not open.

If the return air duct pressure drop is lower than the building overpressure, the dampers will open and relieve air outside of the building.

Figure 16 - Barometric relief



Exhaust Fans

The exhaust axial fans are used to minimize the overpressure in the building caused by the introduction of fresh air.

This option is typically used when the fresh air intake needed is between 40 to 50% of the nominal air flow or when the return air duct pressure drop is higher than 25Pa (<70Pa or 150Pa according to option selected).

This option includes hoods, gravity dampers and axial fans.

Optional service Terminal allow to adjust exhaust fans start and stop value according to fresh air damper position.

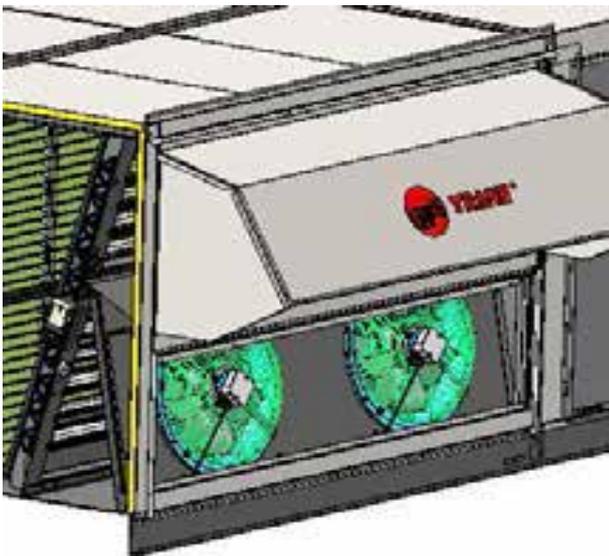
When the supply air fan is ON, the exhaust fans turn on whenever the position of the fresh air dampers meet or exceed the exhaust fan set point. (If the potentiometer is set at 40%, the exhaust fans will start when the fresh air dampers will meet or exceed 40% opening).

Options

Operation

- When the exhaust fans are OFF :
 - The barometric dampers open when the air pressure inside the building increases. As the building pressure increases, the pressure in the unit return section also increases, opening the dampers and relieving the air.
 - If return air pressure drop > building overpressure ($\Delta P > P_b - P_{atm}$) → barometric damper is closed.
 - If return air pressure drop < building overpressure ($\Delta P < P_b - P_{atm}$) → barometric damper opens and a maximum of 25 percent of the nominal airflow can be exhausted.
- When the exhaust fans turn ON:
 - Around 50% of airflow can be exhausted, depending on the pressure drop in the return air duct.
 - The two fans work always together, on stage ON-OFF.
 - Each fan has two speeds, which makes two configurable speeds by changing the wiring on site.
 - The exhaust fan is started when fresh air dampers meet or exceed a preset percentage of fresh air.

Figure 17 - Exhaust fan



Configured for Return Roofcurb (ESP=250 PA)

Two types of return roofcurbs modules have been developed (downflow and horizontal flow) in order to minimize overpressure in the building caused by the introduction of fresh air when there is a significant pressure drop in the return duct (250 Pa maximum) and when supply fan is not enough to overcome both supply and return external static pressure.

The module is fully controlled and powered by the rooftop control. The assembly detail is given in the submittal shipped with the document package sent with the unit.

Figure 18 - Return roofcurb downflow

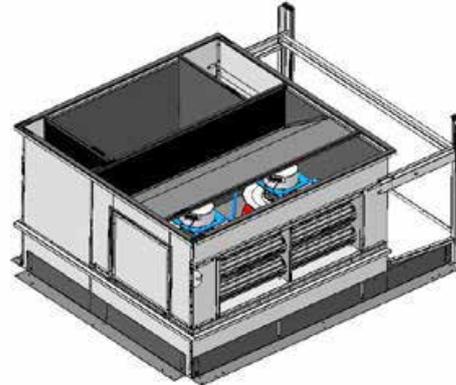
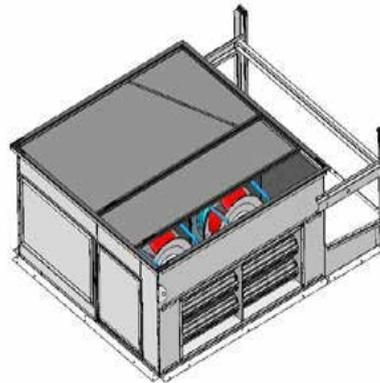


Figure 19 - Return roofcurb horizontal flow



Exhaust Fan EC

The exhaust fans EC are used to minimize overpressure in the building caused by the introduction of fresh air. This option is typically used when large fresh air intake needed (40 to 50% of the nominal airflow) or when the return air duct pressure drop is higher than 70Pa. This option includes hoods, gravity dampers and EC Exhaust fans. Exhaust fans speed has to be adjusted during the commissioning using the optional service Terminal to balance building pressure.

Installation

- The Exhaust fan module is delivered dismounted on the same pallet than the main unit. (See fig)
- The Exhaust module as to be installed on the exhaust section. (See fig...)
- The exhaust module electrical wiring has to be connected to the main unit. (See fig)

Exhaust Fan Speed Setting

- Step 1: Adjust the unit fan speed @ the nominal flow rate using the optional service terminal.
- Step 2: Adjust the exhaust fans speed using optional service terminal to reach right amount of exhaust air.

Hot Water Coil (HWC)

Figure 20 - Hot water coil location in the unit



HWC applies when additional heat is required. Hot water comes from external boiler or other device. HWC provides heating with a coil located after the indoor coil and offer full modulation heating control through the use of a 3 ways valve. Control is based on mixed air temperature and zone temperature.

Factory setting is given to heat pump operation. Hot water is called in addition. Priority can be switched on site.

Antifreeze protection opens the 3 ways valve when the coil temperature is closed to the freezing point (2°C). In antifreeze mode, unit operating, indoor fan is stopped and unit locked out in manual reset. Fresh air damper is closed and the modulating valves open. The freeze protection works with manual reset.

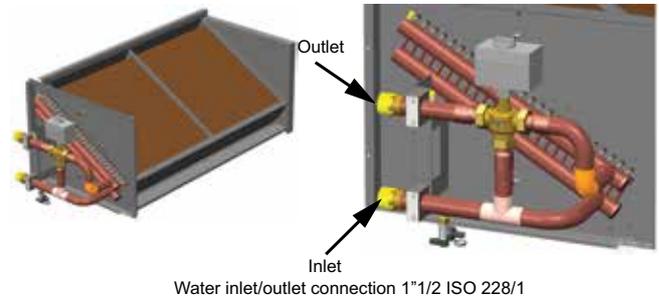
Important Notice: It is important that the pump circulating hot water is permanently working to avoid water to freeze in the coil. Otherwise, in order to prevent water from freezing in the coil during unoccupied period or shutdown limited period, it is recommended to use ethylene glycol. The service of a water treatment specialist is recommended as water used can cause scaling deposits, erosion or corrosion. Insulate and proceed to heater wire installation on all the water piping likely to be exposed to freezing temperatures in order to avoid freeze up of the coil and heat losses. The water distribution network must be fitted with vents in places where air is likely to be trapped.

Table 5 - Ethylene glycol percentage

Ethylene glycol percentage	Freezing point
(%)	(°C)
10	-4
20	-10

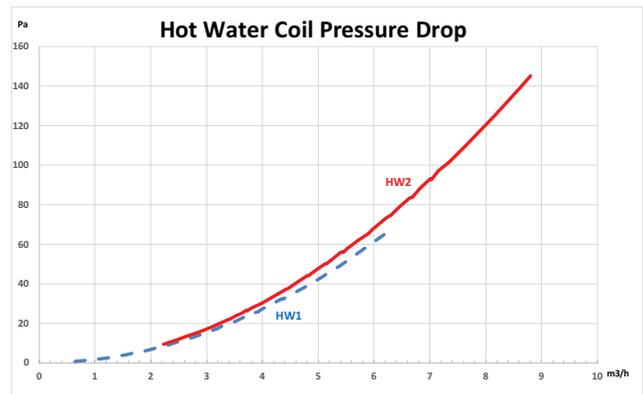
Water Connections Dimensions and Characteristics

Figure 21 - Hot water coil view and connections



The hot water coil is factory mounted and placed in the discharge section. Two holes are provided to connect the hot water coil. The tubes for entering and leaving water are equipped with a threaded female connection.

Figure 22 - Hot water coil pressure drop



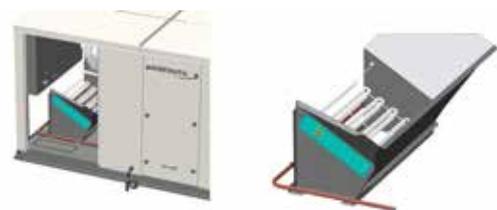
Electric Heater

Electric heaters are fitted on the supply fan discharge.

Heaters have two heating stages and provided with two types of overheat thermostats:

- Automatic reset thermostats which stop the electric heater when the air temperature rises to 65°C. Automatic reset at 32°C.
- The manual reset thermostat which stops the unit when the air temperature rises to 128°C.

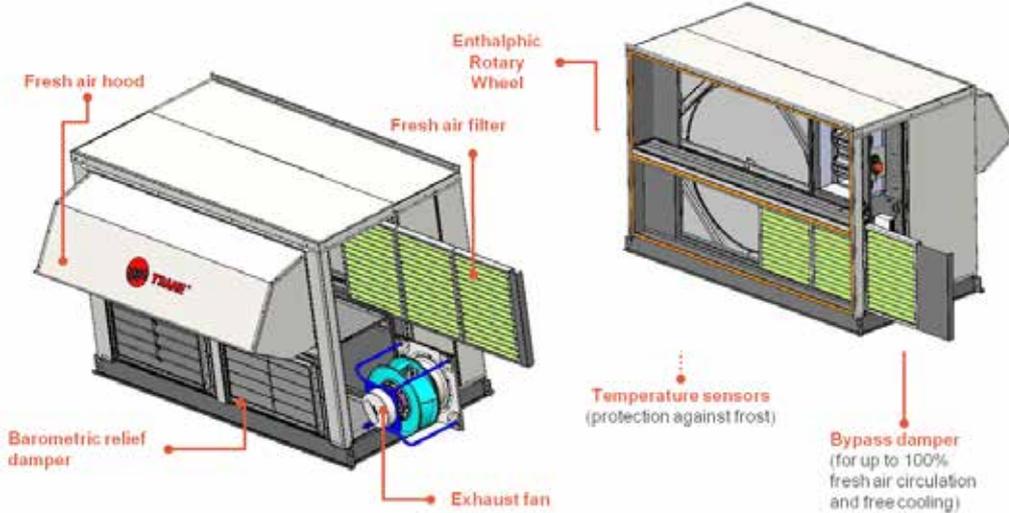
Figure 23 - Heater onto unit and heater detail



Options

Heat Recovery Module

Figure 24



Energy Recovery Module is a module that transfers heat (cool or warm) from exhaust air to fresh air. It is an add-on module that includes a heat exchanger, exhaust fan, filters and dampers, heat exchanger: rotary wheel. The module is shipped separately and connected to the rooftop on jobsite. The module is fully controlled and

powered by the rooftop itself. Free cooling mode is still available.

Assembly of the module should be done according to the below instructions and with the help of submittal and electrical drawings shipped with the unit.

Figure 25

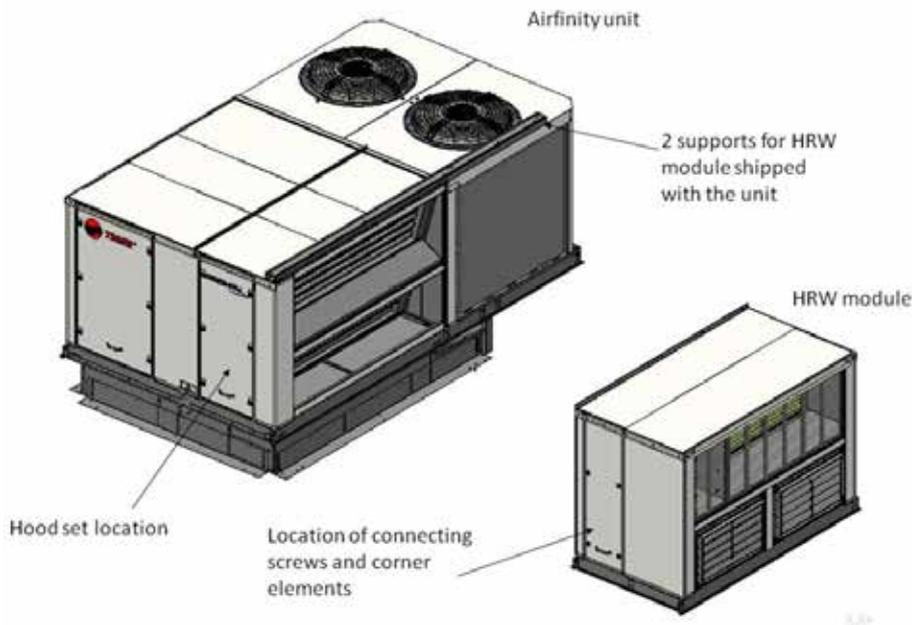
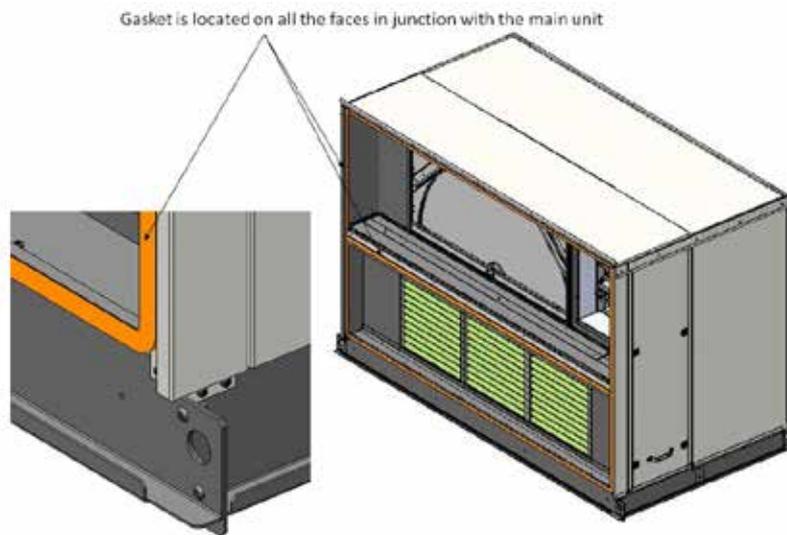
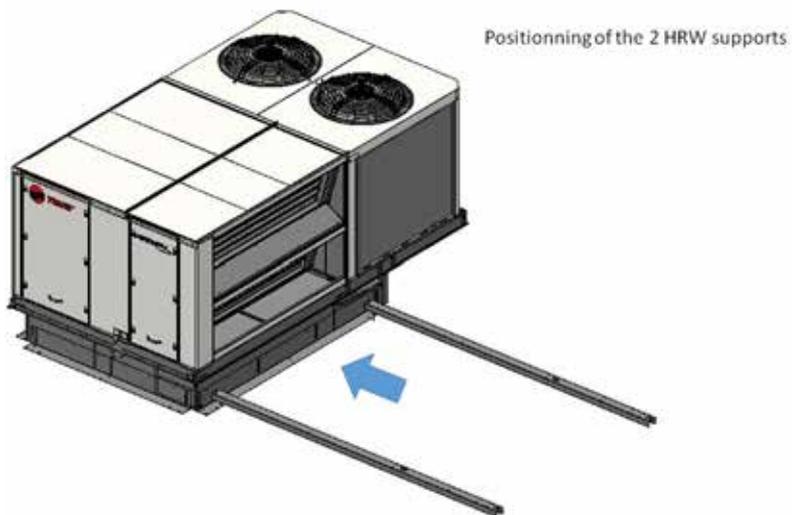
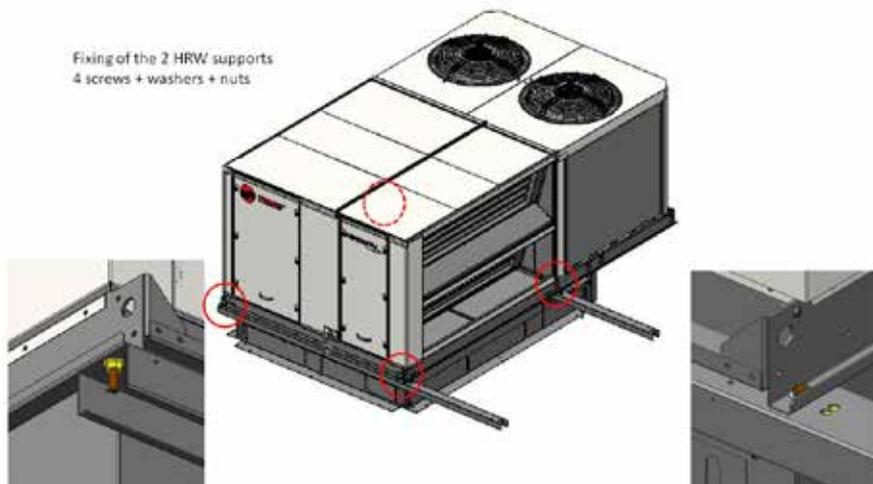
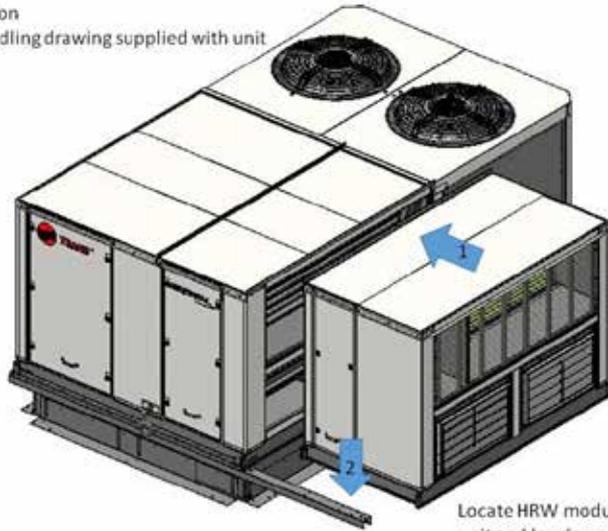


Figure 26**Figure 27****Figure 28**

Options

Figure 29

HRW module installation
For details refer to handling drawing supplied with unit



Locate HRW module to 100 mm of the unit and lay down on the 2 support

Figure 30



Make a close contact to the unit to crush the seal. Assemble the HRW module on the 2 support (see details A and B) with screw set and fix the module a the roof level with 4 or 5 tapping screws according to detail C.

Figure 31

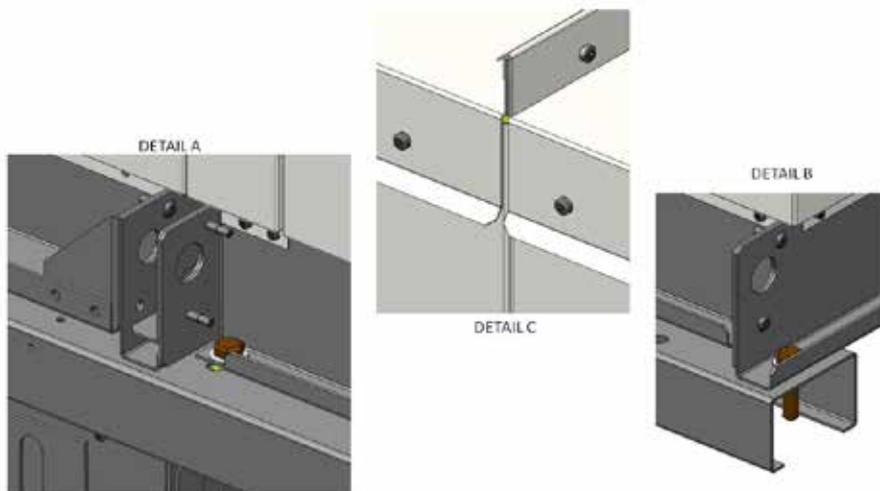


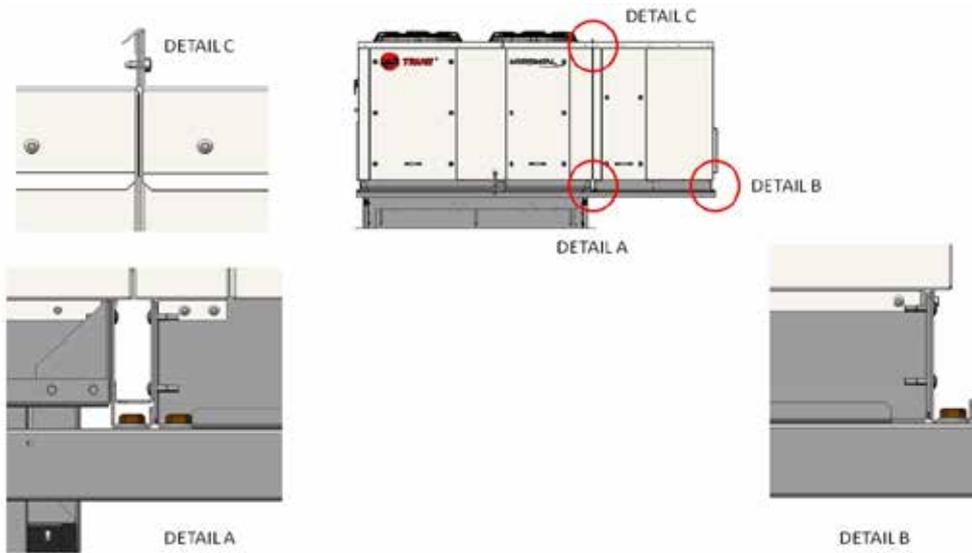
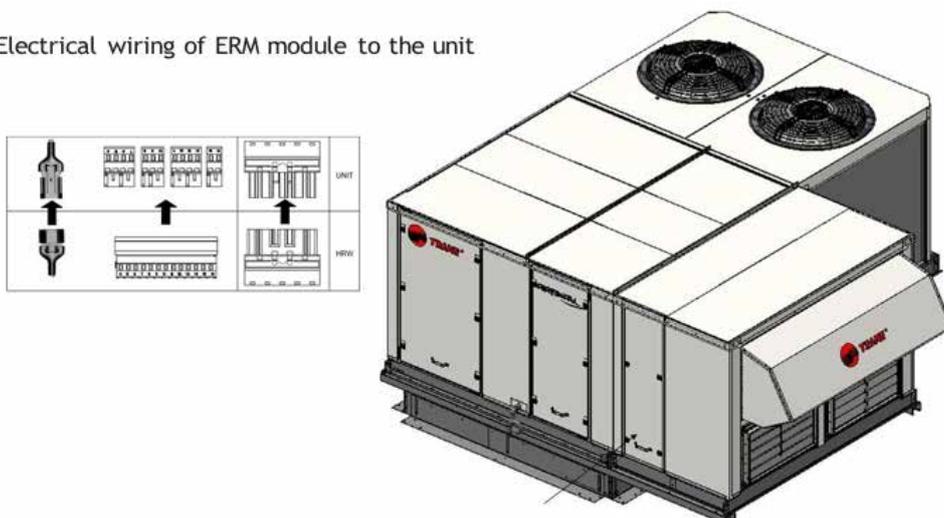
Figure 32

Figure 33

Figure 34

Electrical wiring of ERM module to the unit

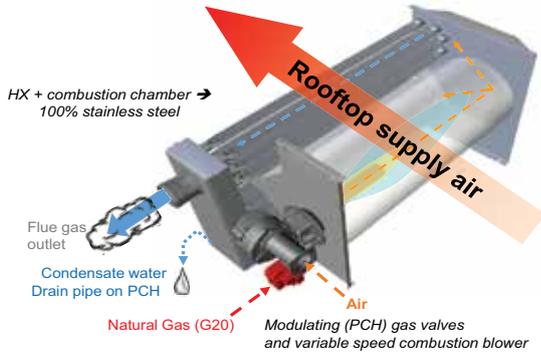


Options

Burner Module

PCH : premix burner with a condensing heat exchanger

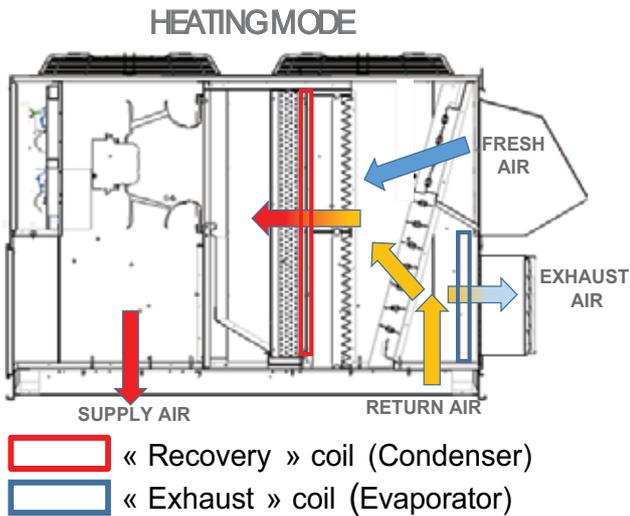
Figure 35 - Modulating (PCH) gas valves and variable speed combustion blower



Energy Recovery Circuit (ERC)

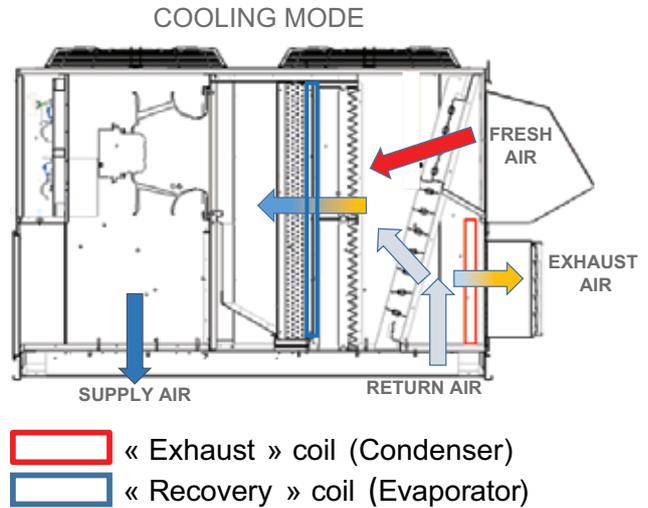
The ERC consists of an additional refrigeration circuit which recovers the energy in the exhaust air to pre-heat or pre-cooled the fresh air. The ERC includes a compressor, heat exchanger coils and exhaust fan.

Figure 36 - Heating mode



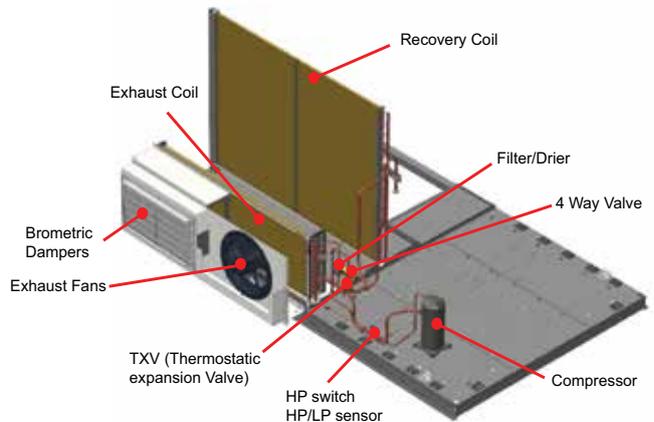
Hot air coming from the building causes refrigerant evaporation in the "exhaust" coil. Then refrigerant is compressed and conveyed to "Recovery" coil and mix air is preheated through refrigerant condensation in "Recovery" coil.

Figure 37 - Cooling mode



Cold air coming from the building causes refrigerant condensation in the "Exhaust" coil, then refrigerant is expanded and conveyed to "Recovery" coil. Mix air is pre-cooled through refrigerant evaporation in "Recovery" coil.

Figure 38 - Thermodynamic heat recovery



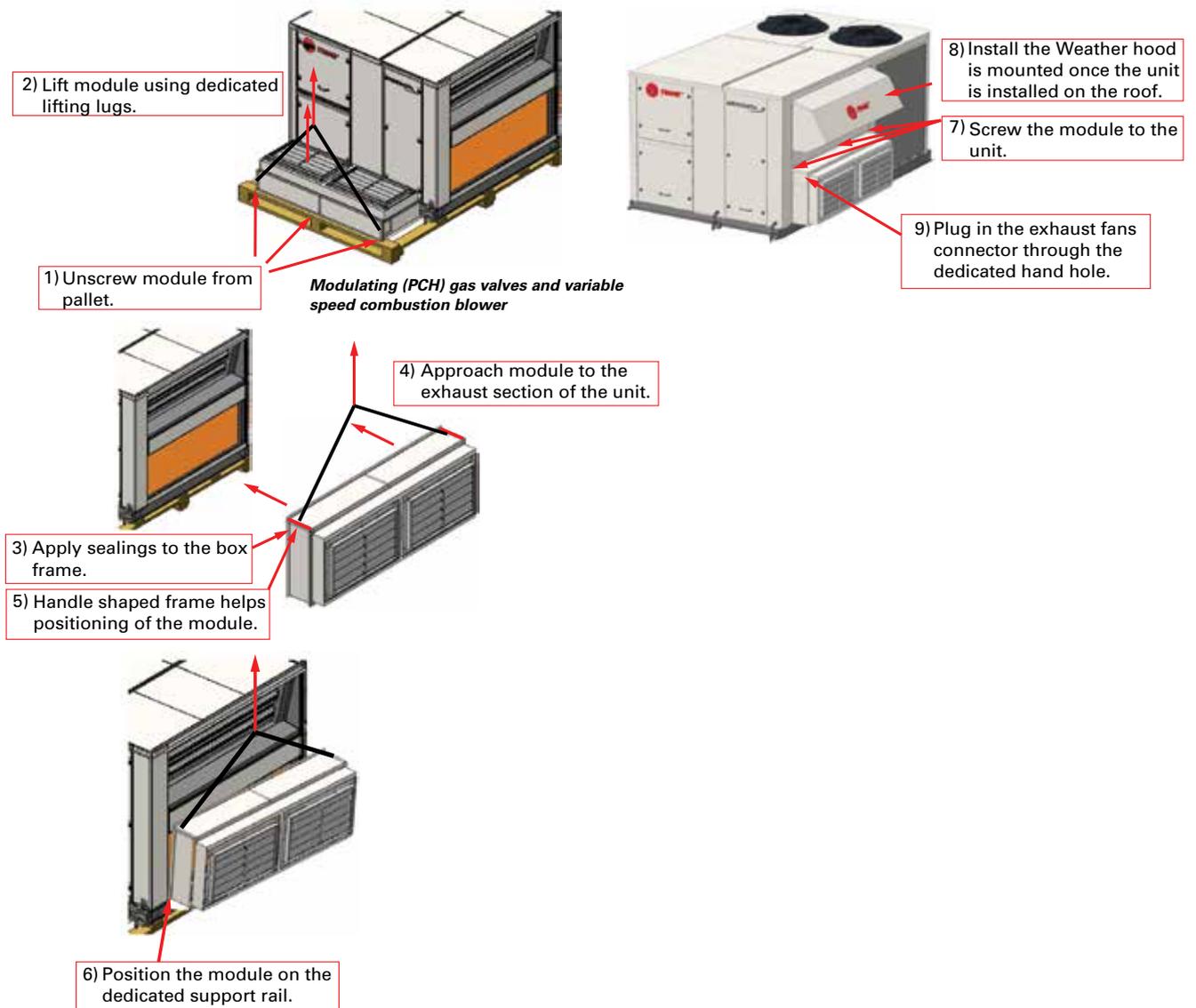
Assembly Procedure of Fan Block

All ERC specific electrical components are in the electrical box. Electrical connections of exhaust fan must be performed on site.

ERC Fan Module Installation

The module is screwed on the main unit pallet

Figure 39 - ERC Installation process





Controls

Controls/Tracer[®] TD-7 Operator Interface

Control Overview

Airfinity rooftop units use the following control/interface components:

- Tracer[®] Symbio[™] 800 Controller
- Tracer TD-7 Operator Interface

Communication Interfaces

There are four connections on the Tracer[®] Symbio[™] 800 that support the communication interface:

- BACnet[®] MS/TP
- BACnet[®] IP
- MODBUS RTU
- MODBUS TCP

Tracer TD-7 Operator Interface

Operator Interface

Information is tailored to operators, service technicians and owners. When operating a rooftop, there is specific information you need on a day-to-day basis, like set points, limits, diagnostic information, and reports. Day-to-day operational information is presented at the display. Logically organized groups of information-rooftop mode of operation, active diagnostics, settings and reports put information conveniently at your fingertips.

Tracer TU

The TD-7 operator interface allows for daily operation tasks and set point changes. However to adequately service Airfinity rooftop units, Tracer[®] TU service tool is required (Non-Trane personnel, contact your local Trane office for software purchase information). Tracer TU adds a level of sophistication that improves service technician effectiveness and minimizes rooftop downtime. This portable PC-based service-tool software supports service and maintenance tasks.

Main Symbio[™] 800 control instructions are described in user guide RT-SVU014 document.

Zone Temperature Source

The zone temperature source are summarized in the table below by hierarchy order.

Source	Condition
1. BAS	BAS command enabled and Value in validity range [-10°C; +50°C]
2. Air-FI [®] Wireless Zone Temp Sensor	Ad-hoc Config enabled and Value in validity range [-10°C; +50°C]
3. External Zone Temperature wired sensor	Sensor installed and Ad-hoc Config enabled and Value in validity range [-10°C; +50°C]
4. Return Air Temp	Value in validity range [-10°C; +50°C]

CO₂ Sensor

CO₂ sensor can be either in air return duct or wall mounted. It maintains a CO₂ concentration below a preset value to ensure acceptable comfort.

Controls the opening of the fresh air damper of the economizer. The outside air damper will modulate in order to maintain the CO₂ concentration below the setpoint.

To open damper it should combine the amount of desired fresh air and the free cooling mode to modulate from 0 to 100% maximum opening of the dampers. It is possible to preset a minimum opening during commissioning.

The CO₂ sensor is set for 0-10V analog outputs and provide sensing of carbon dioxide over a range of 0-2000 ppm. The sensor requires a 24 VDC power supply. Consult wiring diagram supplied with the unit for details.

The resolution of analog outputs reaches 10 ppm CO₂. The information is then sent to the controller CH536 to control the opening position of the fresh air damper.

Avoid locating the duct sensor on surfaces with an uncooled, unheated area behind them or in "dead" spot behind doors or in corners. The CO₂ wall mounted sensor should be placed on a flat surface, 1.4 m from the floor in an area of the room where there is free air circulation.



CO₂ Sensor Maintenance

This CO₂ sensor has excellent stability and requires no maintenance. In most environments the recommended calibration interval is five years. A trained service technician can use a portable CO₂ meter to certify sensor calibration. If, when checking the sensor, the reading differs too much from the reference value, the sensor can be recalibrated in the field. A calibration kit, software, and calibration gases are required. If certified accuracy is required, the sensor must be calibrated against accurate and traceable calibration gases in a laboratory. Consult Trane BAS for further details.

Fire Thermostat

U12 is the dedicated I/O. Optional fire thermostat should be configured if present according to wiring diagram.

Clogged Filter Detector

This device is mounted in the filter section. The sensor measures the difference in pressure before and after the filter section. The information is sent to the optional service terminal or the BMS.

Smoke Detector

This device is used to detect smoke in the air stream. It includes a factory mounted detector located in the control panel. When smoke is detected, it shuts off the unit.

Other Accessories Available

THP05 : wall mounted thermostat

Refer to separate documentation for more information.

Alarm and Warnings

Alarms stop the unit or reduce the heating/cooling capacity. Alarm can be either manual reset (requires human intervention to re-start the unit) or automatic reset.

Warning run the unit in fall-back mode.

Example: If outdoor air humidity sensor is not working, the economizer runs in dry-bulb mode.

Events are accessible through optional local service terminal which display the current events and display history of past events (up to 99 alarms and 99 warnings).

Refrigerant Leak Detector R-454B

When a refrigerant leak of R-454B is detected (concentration > 500 ppm) during a unit operation then the control algorithm switches off immediately all compressors, the auxiliary heater, closes EEV, opens fresh air on 100% and keeps running outdoor, indoor fans and exhaust fans (if installed) at least for 10 min.

A corresponding alarm will be displayed on the human interface.

It is not possible to reset the alarm during the 10 minute of the ventilation, not possible to run the compressors or an auxiliary heater during this period.

After 10 minute, it is possible to reset the alarm if the concentration < 500 ppm and to run the unit again. But it is highly recommended to verify refrigeration circuit, and look for a refrigerant leak. In case of a leak the unit probably cannot start again because of low refrigerant charge in the system. Do not forget to verify both refrigerant circuits of Duplex units.

It is highly recommended to verify both refrigerant circuits, and to repair impacted refrigerant circuit, even if there is the second refrigerant circuit (duplex unit) which should not be impacted.

When the unit is in OFF mode, and a refrigerant leak is detected, only an alarm is displayed on the service terminal, and no ventilation is running. Then it is necessary to verify physically the refrigerant circuit. It is not possible to run the unit.



Operation

Test Procedures

Operating checklist before start-up.

- Review submittals for rooftop and accessories as well as main wiring diagrams and options shipped with the unit.
- Unit is level, with sufficient clearance all round.
- Duct network is correctly sized according to the unit configuration, insulated, and water-tight.
- Condensate drainage line is correctly sized, equipped with a trap, and sloped.
- Filters are in position, of correct size and quantity and clean.
- Wiring is correctly sized and connected in accordance with wiring diagrams.
- Power supply lines are protected by recommended fuses and correctly earthed.
- Thermostat is correctly wired and positioned.
- Unit is checked for refrigerant charge and leaks.
- Indoor and outdoor fans rotate freely and are fixed on shafts.
- Supply fan rotation speed is set.
- Access panels and doors are replaced to prevent air entering and risks of injury.
- When a ball valve is present on the refrigerant suction line, check if the valve is open before starting the unit.

WARNING!

If any operating checks must be performed with the unit operating, it is the technician's responsibility to recognize any possible hazards and proceed in a safe manner. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.

Power-Up Initialization

CAUTION!

Before proceeding with any test procedure or operation, make sure that crankcase heaters have been energized for at least 8 hours.

Starting the Unit in Cooling Mode

Before start-up, ensure that all power cables are tightened.

Verify that the unit airflow rate is adjusted.

Operating Pressures

After the unit has operated in cooling mode for a short period of time, install pressure gauges on the gauge ports of the discharge and suction line valves.

Note: Always route refrigerant hoses through the port hole provided and ensure that the compressor access panel is in place.

Final Installation Checklist

- Are all power cables tightened
Check torque of power cables contact!
- Is the condenser fan and indoor blower operating correctly, i.e. correct rotation and without undue noise?
- Are the compressors operating correctly and has the system been checked for leaks?
- Have the voltage and running currents been checked to determine if they are within limits?
- Have the air discharge grilles been adjusted to balance the system?
- Has the ductwork been checked for air leaks and any condensation?
- Has the air temperature rise been checked?
- Has the indoor airflow been checked and adjusted if necessary?
- Has the unit been checked for tubing and sheet metal rattles or any unusual noises?
- Are all covers and panels in place and properly fastened?

To keep the unit operating safely and efficiently, the manufacturer recommends that a qualified service technician check the entire system at least once each year, or more frequently if conditions warrant.

Upon power initialization, the control performs self-diagnostic checks to ensure that all internal controls are functioning. It checks the configuration parameters against the components connected to the system.

Operation

Gas Burner First Start

The PCH burner are supplied with factory settings according to model number gas selection. They are tested for the gas specified on the burner nameplate.

However it is required to:

- Check the gas category
- Check the gas intake pressure on the gas valve
- Perform the combustion analysis to verify that the level of flue gases corresponds to the data contained in general data table or in manufacturer IOM manual.

When turned on for the first time, the pilot burner may not ignite due to air kept in gas hose. There is the need to reset the equipment and repeat the operation until gas hose is purged and it ignites.

Consult electrical drawing and supplier IOM shipped with the unit.

Figure 40 - Example of PCH burner

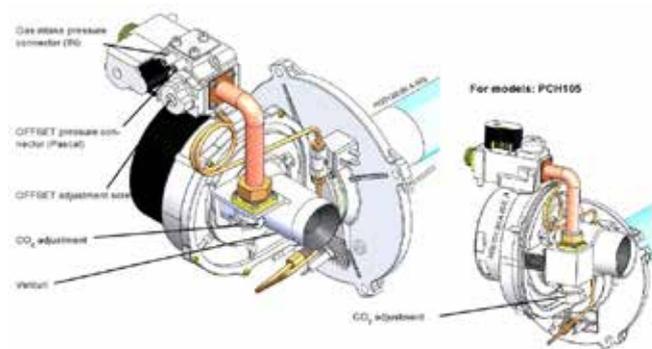


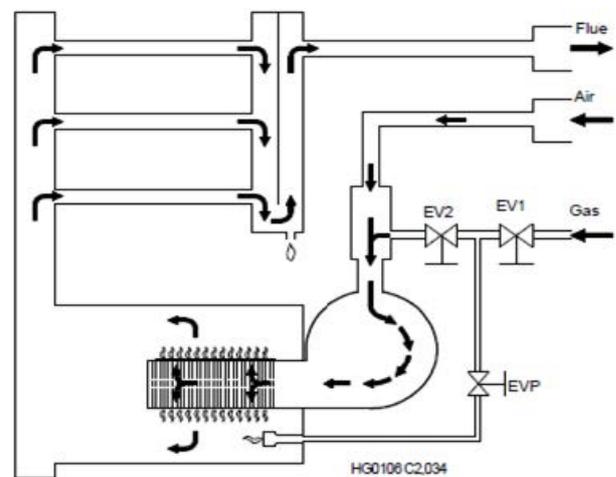
Table 7 - Marking category of gas section in different countries

CATEGORY	G20
II ₂ Esi3P	FR
	mbar 20
II ₂ H3B/P	DK, FI, GR, SE, NO, IT, CZ, EE, LT, SI, AL, MK, BG, RO, HR, TR
	mbar 20
II ₂ H3B/P	AT, CH
	mbar 20
II ₂ HS3B/P	HU
	mbar 25
II ₂ L3B/P	NL
	mbar -
II ₂ H3P	ES, GB, IE, PT, SK
	mbar 20
I ₂ E(S)	BE < 70kW
	mbar 20
I ₂ E(R)	BE > 70kW
	mbar 20
II ₂ ELwLs3B/P	PL
	mbar 20
II ₂ E3P	LU
	mbar 20
II ₂ ELL3B/P	DE
	mbar 20
I ₃ P	BE
	mbar -
I ₂ H	LV
	mbar 20

Premix burner working cycle

1. Heat request signal coming from CH536.
2. Burner fan starts to pre-wash combustion chamber.
3. EV1 and EVP gas valves open to allow gas to feed pilot burner.
4. Start-up electrode gives ignition sparks on pilot burner.
5. EV2 main gas valve opens to gas feed main burner.
6. Combustion starts thanks to pilot flame ignition.
7. Pilot and main burners work together for a short time, then the electronic boards close EVP and stops the pilot.

Figure 41 - Premix burner of working cycle



Interface Panel

PCH

Red 3 digit LCD display

Module status (rdy, On, Off, Fxx...)

3 levels menu:

- I/O (Input/Output)
- PAR (parameters)
- Flt (Faults)



ERC First Start and Control

- Check ERC compressor rotation.
- Power indoor fans and set to design supply airflow.
- Set return roofcurb fans (if present) to design airflow.
- Power exhaust fans and check correct rotation.
- In both heating and cooling mode, ERC compressor has priority to start.
- ERC compressor is not authorised to start when indoor air temperature is outside its operating map or fresh air rate is under 20%.
- Outside operating conditions, ERC does not start, and unit control is as usual.
- When ERC becomes available its compressor gets loading priority.



Maintenance

End User Routine Maintenance

Some of the periodic maintenance functions for the unit can be undertaken by the end user. This includes replacing (disposable) or cleaning (permanent) air filters, cleaning unit cabinet, cleaning the condenser coil, and carrying out a general unit inspection on a regular basis.

WARNING!

Disconnect the power supply before removing access panels to service the unit. Failure to disconnect power before attempting any servicing can result in severe injury or death.

Air Filters

It is very important for the central duct system air filters and drive box filters to be kept clean.

These should be inspected at least once a month when the system is in constant operation (in new buildings, the filters should be checked every week for the first four weeks). If disposable-type filters are used, they should only be replaced with ones of the same type and size.

The economizer fresh air filter should be inspected (washed if needed) at least once a month.

Note: Do not attempt to clean disposable filters. Permanent filters can be cleaned by washing with a mild detergent and water. Ensure that the filters are thoroughly dry before reinstalling them in the unit (or duct system).

Note: Replace permanent filters when required or at least annually if washing fails to clean them, or they show signs of deterioration. Be sure to use the same type and size as were originally installed.

Condenser Coil

Unfiltered air circulates through the unit's condenser coil and can cause the coil's surface to become clogged with dust, dirt, etc. To clean the coil, brush the coil surface in the direction of the fins with a soft bristled brush.

Keep all vegetation away from the condenser coil area.

During winter conditions, it is imperative to ensure that the coils and fans remain snow-free, as accumulation of snow can hinder the proper functioning and efficiency of the unit.

Hot Water Coil (Option)

Stop the unit. Do not disconnect the main supply to the unit. This will permit the anti-frost protection to continue to operate, and avoid water to freeze-up in the coil.

Service Technician Maintenance

Before the cooling season, your service technician may examine the following areas of your unit:

- Filters, for cleaning or replacement.
- Motors and drives system components.
- Economizer gaskets, for replacement if necessary.
- Condenser coils, for cleaning.
- Safety controls, for mechanical cleaning.
- Electrical components and wiring, for replacement and tightening of connections as necessary.
- Condensate drain, for cleaning.
- Unit duct connections, to ensure they are physically sound and sealed to the unit casing.
- Unit mounting support, to ensure that it is sound.
- The unit, to ensure there is no obvious deterioration.

Before the heating season, your service technician may examine the following areas of your unit:

- The unit, to ensure that the condenser coil can receive the required airflow (that the condenser fan grille is not obstructed).
- The control panel wiring, to verify that all electrical connections are tight, and that wire insulation is intact.

Troubleshooting Alarm and Warnings

The optional control display has the ability to provide the service personnel with some unit diagnostics and system status information.

1. Step the system through all of the available modes, and verify operation of all outputs, controls, and modes. If a problem in operation is noted in any mode, proceed to troubleshooting search.
2. Refer to the individual component test procedures if other microelectronic components are suspect.
3. In addition, review carefully the components which can lead to the alarm: temperature sensor, zone temperature sensor, clogged filter switch.



Recommended Service Routine Frequencies

As a commitment to our customers, we have created a wide service network staffed with experienced factory authorized technicians. At Trane we offer all the benefits of after sales service direct from the manufacturer and we are committed to our mission statement to provide efficient customer care.

We would be delighted to discuss your individual requirement with you. For further information regarding Trane maintenance agreements please contact your local TRANE sales office.

RECOMMENDED YEARLY SERVICE ROUTINE FREQUENCIES

Year	Commissioning	500/1000 hr Visit	Annual Maintenance	Inspection Visit
1	X	X		XX
2			X	XXX
3			X	XXX
4			X	XXX
5			X	XXX
6			X	XXX
7			X	XXX
8			X	XXX
9			X	XXX
10			X	XXX
+10			Every year	Every 3 year

This timetable is applicable to units operating in normal conditions with an average of 4000 hours per year. If operating conditions are abnormally severe, an individual timetable must be made for that unit.

Maintenance Routine

Commissioning

- Check installation of equipment/pre-commission.
- Check configuration and adjust settings of unit control module.
- Check operational set points and performance.
- Check operation of all safety devices.
- Megger the motor compressor windings.
- Check unit operation.
- Record operating temperatures pressures, amperages and voltage.
- Carry out leak test.
- Fill the start up log sheet and review with the operator.

Gas Heat

- Check operation of gas train components.
- Check burner sequence of operation.
- Check combustion blower assembly.
- Check gas pressure to unit.
- Inspect flame condition.
- Carry out flue gas analysis.

Electric Heat

- Inspect all electrical connections.
- Verify correct operation of heating elements.

Hot Water/Steam

- Inspect valves and traps.
- Verify operation of heating.

500/1000 Hours Visit

- Visit at the end of running in period.
- Replace compressor oil on all circuit's.
- Replace liquid line drier cores on each circuit (if applicable).
- Carry out leak test.
- Inspect contacts and tighten terminals.
- Record operating pressures, amperages and voltage.
- Check condition of evaporator and condenser coils.
- Check operation of machines/compare conditions of operation against original commissioning data.
- Fill out the 500/1000 hours visit log sheet and review with the operator.
- Carry out flue gas analysis (Gas Heating).
- Log book to be stamped validating 500/1000hr visit.

Inspection Visit

- Carry out leak test.
- Inspect contacts and tighten terminals.
- Record operating pressures, amperages and voltage.
- Check condition of evaporator and condenser coils.
- Check operation of machines/compare conditions of operation against original commissioning data.
- Carry out flue gas analysis (Gas Heating).
- Complete log sheet and review with the operator.

Annual Maintenance

- Check operational set points and performance.
- Calibrate controls.
- Check operation of all safety devices.
- Inspect contacts and tighten terminals.
- Megger the motor compressor windings.
- Record operating pressures, amperages and voltage.
- Carry out leak test.
- Check configuration of unit control module.
- Replace line drier cores on each circuit (if applicable).
- Carry out system analysis.
- Change the oil as required based upon results of the Trane laboratory analysis.
- Lubricate motors/dampers/bearings (where applicable).
- Check condition of evaporator and condenser coils.
- Check operation of machines/compare conditions of operation against original commissioning data.
- Complete annual maintenance visit log sheet and review with the operator.

Gas Heat

- Check operation of gas train components.
- Check burner sequence of operation.
- Check combustion blower assembly clean if required.
- Check gas pressure to unit.
- Inspect flame condition.
- Carry out flue gas analysis.

Electric Heat

- Inspect all electrical connections.
- Verify correct operation of heating elements.

Hot Water/Steam

- Inspect valves and traps.
- Verify operation of heating.
- Inspect coil.



Additional Services

Oil Analysis

Trane Oil Analysis is a predictive tool used to detect minor issues before they become major problems. It also reduces failure detection time and allows planning for appropriate maintenance. Oil changes can be reduced by half resulting in lower operating costs and a lower impact on the environment.

Refrigerant Analysis

This service includes a thorough analysis for contamination and solution upgrade.

It is recommended that this analysis be performed every 6 months.

Trane Select Agreements

Trane Select Agreements are programs tailored to your needs, your business and your application. They offer four different levels of coverage. From preventive maintenance plans to fully comprehensive solutions, you have the option of selecting the coverage that best suits your requirements.

5-years Motor-Compressor Warranty

This Service will provide a 5-years part and labor warranty for the motor compressor only.

This Service is only available for units covered by a 5-years Maintenance Contract.

Energy Enhancement

With Trane Building Advantage you can now explore cost effective ways to optimize the energy efficiency of your existing system and generate immediate savings. Energy management solutions are not only for new systems or buildings. Trane Building Advantage offers solutions designed to unlock energy savings in your existing system.

EC Fans

NOTE: If the built-in device is switched off for a long time in a dry environment it is important to do this run one hour at full speed at least every 4 month. If the built-in appliance is shut down for a long time period in a humid environment (e.g. outdoors), it is important to run it for at least three hours at full speed every month, so that the bearings are in movement and that the condensate having possibly entered the interior can evaporate.

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.

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