DAIKIN

altherma

Heating

Technical Data

Daikin Altherma high temperature split

EEDEN15-726

EKHBRD-ADY1

TABLE OF CONTENTS

EKHBRD-ADY1

1 Features

Floor standing heating only air to water heat pump combinable with existing radiators

- Energy efficient heating only system based on air to water heat pump technology
- Three phase floor standing indoor unit up to 16kW
- High temperature application: up to 80°C without electric heater
- Easy replacement of existing boiler, without changing heating pipes
- Combinable with high temperature radiators
- Low energy bills and low CO2 emissions
- Inverter controlled scroll compressor

Inverter

2 Specifications

2-1 Technical Specifications					EKHBRD011ADY1	EKHBRD014ADY1	EKHBRD016ADY1
Casing	Colour				Metallic grey		
	Material				Precoated sheet metal		
Dimensions	Unit	Height		mm	705		
		Width		mm	600		
		Depth		mm	695		
	Packed unit	Height		mm	860		
		Width		mm	680		
		Depth		mm	800		
Weight	Unit			kg	147		
	Packed unit			kg	156		
Packing	Material				EPS / Cardboard / MDF / Wood (pallet) / Metal		
	Weight			kg	8.75		
Pump	Type				DC motor		
	Nr of speeds				Inverter controlled		
	Nominal ESP unit	Heating		kPa	88.0 (1)	85.0 (1)	83.0 (1)
	Power input			W	87	95	101
Expansion vessel	Volume			l	12		
	Max. water pressure			bar	3		
	Pre pressure			bar	1		
Operation range	Heating	Ambient	Min.	°C	-20.0 (2) / 0.00 (3)		
			Max.	°C	20 (2)		
		Water side	Min.	°C	25		
			Max.	°C	80.0		
	Domestic hot water	Ambient	Min.	°CDB	-20.0 (3)		
			Max.	°CDB	35.0		
		Water side	Min.	°C	25		
			Max.	°C	80		
Refrigerant side heat exchanger	Type				Plate heat exchanger		
	Quantity				1		
	Plates	Quantity			60		
	Material				AISI 304		
	Insulation material				Felt type		
Water side Heat exchanger	Type				Plate heat exchanger		
	Quantity				1		
	Plates	Quantity			48		
	Material				AISI 316		
	Water volume			l	2.50		
	Water flow rate	Max.		l/min	31.6 (4)	40.0 (4)	45.8 (4)
		Heating	Nom.	l/min	15.8 (1)	20.1 (1)	22.9 (1)
	Insulation material				Felt		
Cascade compressor	Quantity				1		
	Motor	Type			Hermetically sealed scroll compressor		
		Starting method			Direct on line		
Refrigerant	Type				R-134a		
	Charge			kg	2.60		
Refrigerant circuit	Gas side diameter			mm	15.9		
	Liquid side diameter			mm	9.52		
	High pressure side	Design pressure		bar	38		
Refrigerant oil	Charged volume			l	1.50		
	Type				Daphne FVC68D		
Sound pressure level	Nom.			dBA	43.0 (5) / 46.0 (6) / 0.00 (7) / 0.00 (8)	45.0 (5) / 46.0 (6) / 0.00 (7) / 0.00 (8)	46.0 (5) / 46.0 (6) / 0.00 (7) / 0.00 (8)
	Night quiet mode	Level 1		dBA	40 (5) / 0 (7) / 0 (8)	43 (5) / 0 (7) / 0 (8)	45 (5) / 0 (7) / 0 (8)
Water filter	Diameter perforations			mm	1.00		
	Material				Brass		

2 Specifications

2-1 Technical Specifications					EKHBRD011ADY1	EKHBRD014ADY1	EKHBRD016ADY1
Water circuit	Piping connections diameter			inch	G 1" (female)		
	Piping			inch	1"		
	Safety valve			bar	3		
	Manometer				Yes		
	Drain valve / fill valve				Yes		
	Shut off valve				Yes		
	Air purge valve				Yes		
	Heating water system	Water volume	Max.	l	400		
			Min.	l	20		
Installation place					Indoor		
PED	Category				Excluded from scope of PED due to article 1, item 3.6 of 97/23/EC		
Control systems	Class of temperature control				VI		
	Contribution to seasonal space heating efficiency			%	4.00		

2-2 Electrical Specifications				EKHBRD011ADY1	EKHBRD014ADY1	EKHBRD016ADY1
Power supply	Name			Y1		
	Phase			3~		
	Frequency		Hz	50		
	Voltage		V	380-415		
	Voltage range	Min.	%	-10		
		Max.	%	6		
Current	Maximum running current	Heating	A	12.5		
	Recommended fuses		A	16		
Wiring connections-For power supply	Quantity			4G		
	Type of wires			Select diameter and type according to national and local regulations		
Wiring connections-Benefit kWh rate power supply installations	Quantity			4G+2G		
	Type of wires			Select diameter and type according to national and local regulations		
Wiring connections-For connection with outdoor unit	Quantity			2		
	Remark			F1 + F2		
Power supply intake				Both indoor and outdoor unit		

Notes

(1) Nominal water flow rate for Dt: 10°C

(2) Outdoor ambient, indoor ambient: 5°C~30°C

(3) For details see operation range TW drawing. In combination EKHBRD* + EMRQ* see EMRQ* operation range! -\> -15°C

(4) Maximum water flow rate for Dt: 5°C

(5) Sound levels are measured at: EW 55°C; LW 65°C; Dt 10°C; ambient conditions 7°CDB/6°CWB

(6) Sound levels are measured at: EW 70°C; LW 80°C; Dt 10°C; ambient conditions 7°CDB/6°CWB

(7) Sound level is valid in free field condition because it is measured in a semi-anechoic room. Measured value under actual installation conditions will be higher due to environmental noise and sound reflections.

(8) EW = entering water temperature - LW = leaving water temperature

In accordance with EN/IEC 61000-3-11, it may be necessary to consult the distribution network operator to ensure that the equipment is connected only to a supply with Zsys (system impedance) ≤ Zmax

European/International Technical Standard setting the limits for voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤ 75A.

Zsys: system impedance

Equipment complying with EN/IEC 61000-3-12

European/international technical standard setting the limits for harmonic currents produced by equipment connected to public low-voltage system with input current larger than 16A and ≤ 75A per phase.

Short-circuit power

Contains fluorinated greenhouse gases

3 Combination table

3 - 1 Combination Table

EKHBRD-ADY1

I. Combination table for pair combinations

Heating only indoor unit \ Heating only outdoor unit	ER(S/R)Q011AAV1	ER(S/R)Q014AAV1	ER(S/R)Q016AAV1	ER(S/R)Q011AAY1	ER(S/R)Q014AAY1	ER(S/R)Q016AAY1
EKHBRD011*V1	o					
EKHBRD014*V1		o				
EKHBRD016*V1			o			
EKHBRD011*Y1				o		
EKHBRD014*Y1					o	
EKHBRD016*Y1						o

Notes
ERRQ*- units include special equipment (insulation, heater sheet, ...) to ensure proper operation in areas with low ambient temperatures and high humidity conditions.
In such conditions, the ERSQ*- models may experience problems with severe ice buildup on the air-cooled coil.
These models contain countermeasures (insulation, heater sheet, ...) to prevent freeze-up.
For the combination with EMRQ*, refer to the combination table of EMRQ*.

II. Kit availability

1. Kit availability for outdoor units

Reference		Description	ERSQ011…	ERSQ014…	ERSQ016…	ERRQ011…	ERRQ014…	ERRQ016…
EKDK04	(1)	Drain plug kit	o	o	o	-	-	-
EKBPHTH16A	(1)	Bottom plate heater (option)	o	o	o	-	-	-
EK016SNC		Snow cover	o	o	o	o	o	o

Note :
For the combination with EMRQ*, refer to the combination table of EMRQ*.

2. Kit availability for indoor units

Reference		Description		EKHBRD…	
				V1	Y1
EKHTS200…	(6)	Stainless domestic hot water tank 200l		o	o
EKHTS260…	(6)	Stainless domestic hot water tank 260l		o	o
EKHTSU200…	(6)	Stainless domestic hot water tank 200l (UK)		o	o
EKHTSU260…	(6)	Stainless domestic hot water tank 260l (UK)		o	o
EKRP1HBA		Digital I/O PCB		o	o
EKBUHAA6V3		Backup heater 1~	(2)	o	-
EKBUHAA6W1		Backup heater 3~	(2)	-	o
EKRP1AHTA		Demand PCB	(3)	o	o
EKRUAHT(A/B)		Remote user interface	(4)	o	o
EKRTW		Room thermostat	(2)	o	o
EKRTR		Room thermostat	(2)	o	o
EKRTETS		Room thermostat	(2)	o	o
EKBPHTH16A		Bottom plate heater GQI based		o	o
EKRSVHTA	(7)	Refrigerant stop valves		o	o

3. Kit availability for domestic hot water tanks

Reference		Description	EKHTS…			EKHTSU…		
			AA	AB(9)	AC	AB(9)	AA	AC
EKUHWHTB		Option kit for the UK EKHTSU*	-	-	-	o	o	o
EKFMAHTB	(5)	Option kit for standalone tank	o	o	o	o	o	o

4. Combination table for AB/AC/AD indoor unit with AA/AB/AC domestic hot water tank (installed on top)

Domestic hot water tank \ Heating only indoor unit	EKHBRD...AA(V/Y)1	EKHBRD...(AB/AC/AD)(V/Y)1
EKHTS...AA	o	Requires EKMKHT2
EKHTS...AB(9)	Requires EKMKHT1	o
EKHTS...AC	Requires EKMKHT1	o

Remark Other combinations are not allowed.

(1) It is not allowed to combine a bottom plate heater with a drain plug/stop kit.
(2) Requires demand PCB EKRP1AHTA
(3) To be able to connect the room thermostat kit and the backup heater kit, its installation is required.
(4) The kit contains the same user interface as is standard delivered with the indoor unit. It can be mounted next to the indoor unit's standard user interface, or on another location.
If you install two user interfaces, designate one as master and the other as slave.
(5) Only required if the tank is NOT mounted on top of the EKHBRD* unit.
(6) See note 4. Combination table for indoor unit with domestic hot water tank
(7) For combination indoor units + outdoor units. (EKHBRD + EMRQ) Not mandatory

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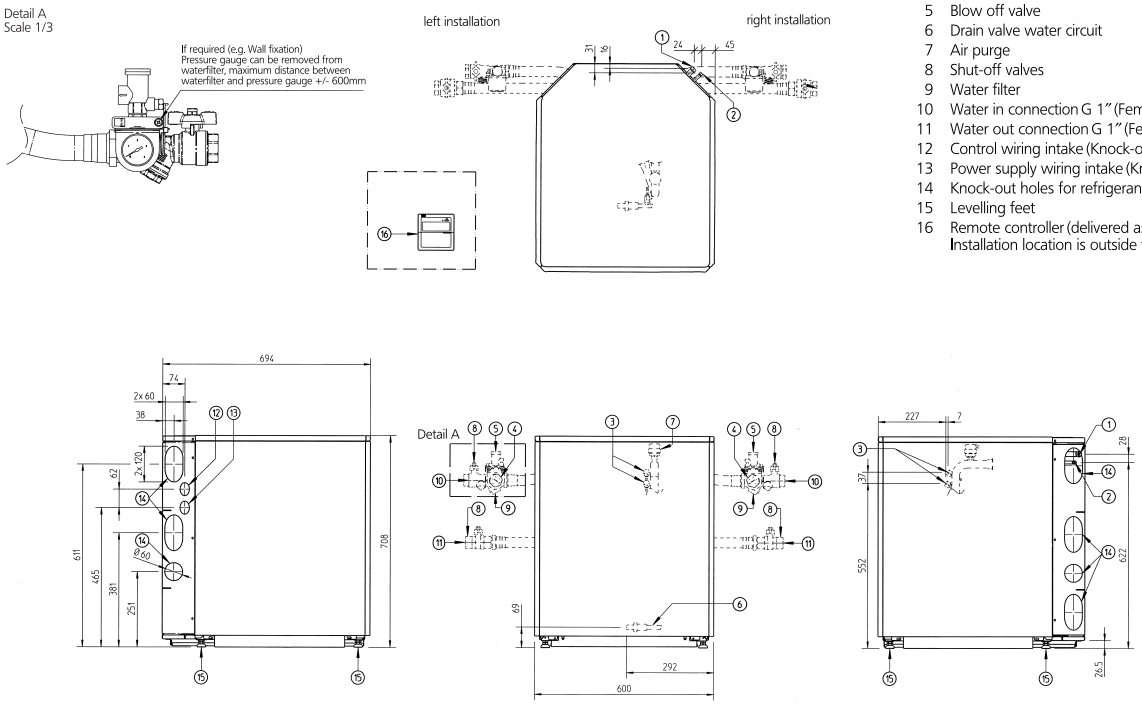
4 Dimensional drawings

4 - 1 Dimensional Drawings

EKHBRD-ADY1



1 Gas pipe connection ⌀ 15.9 Solder (R410A)
2 Liquid pipe connection ⌀ 9.5 Solder (R410A)
3 R134a Service ports ⌀ 12.7 flare
4 Pressure gauge
5 Blow off valve
6 Drain valve water circuit
7 Air purge
8 Shut-off valves
9 Water filter
10 Water in connection G 1″ (Female)
11 Water out connection G 1″ (Female)
12 Control wiring intake (Knock-out hole ⌀ 37)
13 Power supply wiring intake (Knock-out hole ⌀ 37)
14 Knock-out holes for refrigerant piping and water piping
15 Levelling feet
16 Remote controller (delivered as accessory)
Installation location is outside the unit

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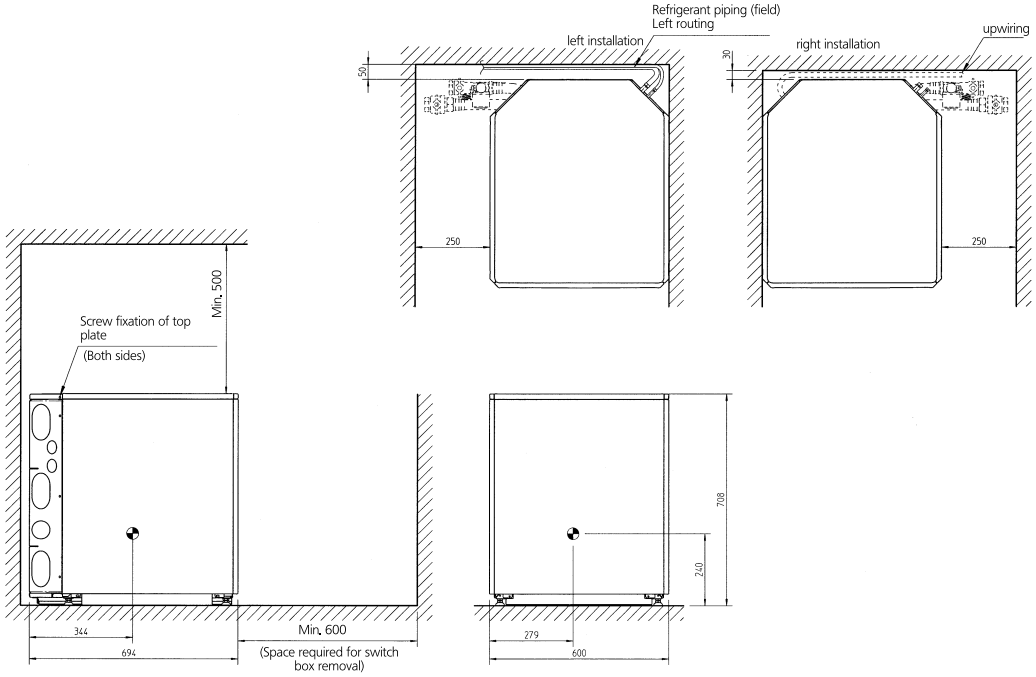
EKHBRD-ADY1



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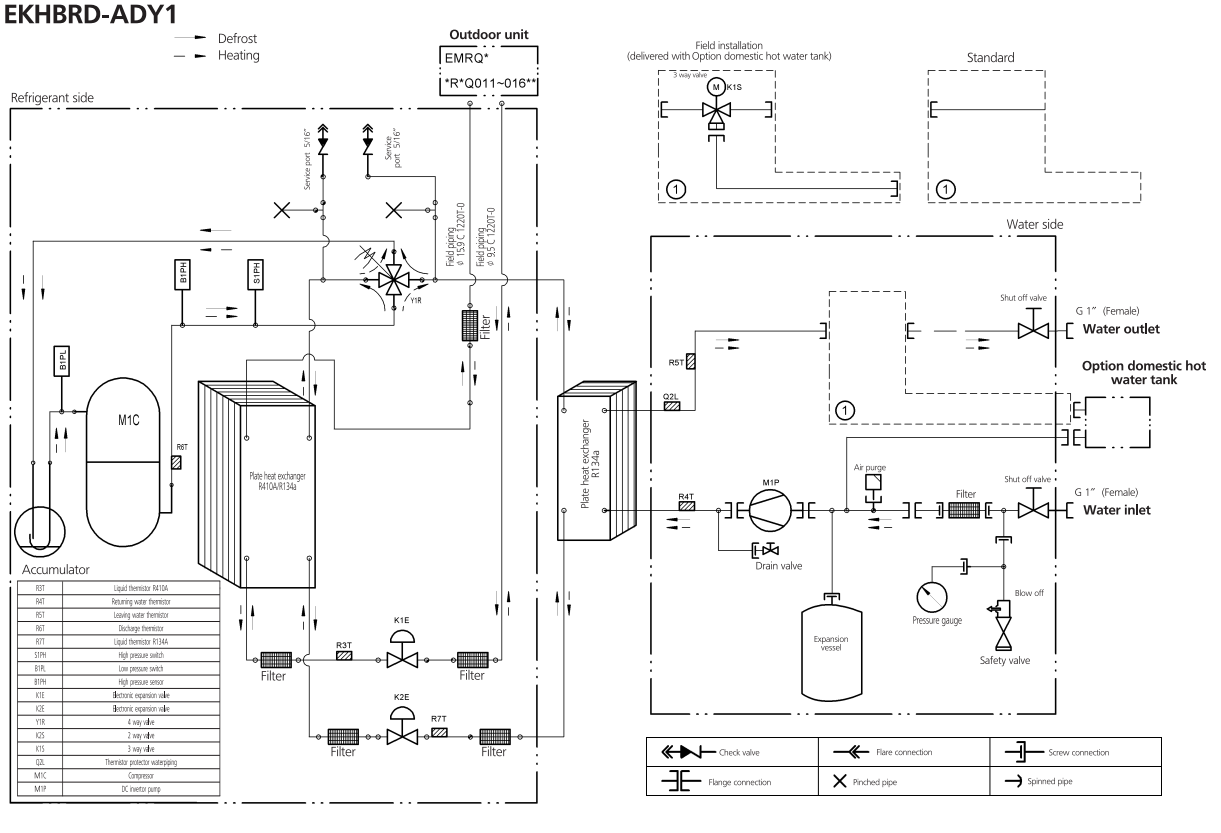
5 Piping diagrams

5 - 1 Piping Diagrams



6 Wiring diagrams

6 - 1 Wiring Diagrams - Single Phase

EKHBRD-ADY1

NOTES TO GO THROUGH BEFORE STARTING THE UNIT

X1M : Main terminal
X2M : Field wiring terminal for high voltage
X3M : Field wiring terminal for low voltage

— - — - : Earth wiring
---------- : Field supply


: Option


: Wiring depending on model


: Not mounted in switchbox


: PCB

—**/12.2 : Connection ** continues on page 12 column 2


: Several wiring possibilities

User installed:

- ☐ Bottom plate heater
- ☐ Back up heater
- ☐ Domestic hot water tank
- ☐ Domestic hot water tank with solar connection
- ☐ Room thermostat (Wired)
- ☐ Room thermostat (Wireless)
- ☐ External temperature sensor
- ☐ Remote user interface
- ☐ Digital I/O PCB
- ☐ Demand PCB
- ☐ Solar pump and control station

Legend

* : included in option kit
\# : field supplied

A1P		: Main PCB
A2P		: User interface PCB
A3P		: control PCB
A4P		: Inverter control PCB
A5P		: Inverter PCB
A6P		: Filter PCB
A7P	*	: Digital I/O PCB
A8P	*	: Demand PCB
A9P	*	: Solar pump station PCB
A10P	*	: Thermostat PCB
A11P	*	: Receiver PCB
B1PH		: High pressure sensor
B1PL		: Low pressure sensor
BS1-BS4 (A4P)		: Push button
BSK	*	: Solar pumpstation relay
C1-C2		: Filter capacitor
C1-C2 (A5P)		: PCB Capacitor
DS1 (A*P)		: Dipswitch
E7H	*	: Bottom plate heater
F1-F2		: Inline fuse
F1U (A1P,A3P)		: Fuse (T, 3.15A, 250V)
F1U-F2U (A4P)		: Fuse (3.15A, 500V)
F3U-F5U (A4P)		: Fuse (6.3A, 250V)
F1U-F2U (A7P)	*	: Fuse (5A, 250V)
H1P -H7P (A4P)		: PCB LED
HAP (A*P)		: PCB LED
K1A		: Interface relay
K1E		: Electronic expansion valve
K2E		: Electronic expansion valve
K1M - K2M		: PCB Contactor
K*R (A*P)		: PCB Relay
K1S	*	: 3 way valve
M1C		: Compressors
M1F		: Switchbox cooling fan
M1P		: DC inverter pump
PC (A11P)	*	: Power circuit
PHC1		: Optocoupler input circuit
PS (A*P)		: Switching power supply
Q1DI-Q2DI	#	: Earth leakage circuit breaker
Q2L		: Thermal protector water piping
R1 (A5P)		: Resistance
R1L		: Reactor
R1H (A10P)	*	: Humidity sensor
R1T (A10P)	*	: Ambient sensor
R2T	*	: Domestic hot water thermistor
R2T	*	: External sensor (floor or ambient)
R3T		: Liquid thermistor R410a
R4T		: Returning water thermistor
R5T		: Leaving water thermistor
R6T		: Discharge thermistor
R7T		: Liquid thermistor R134a
R8T		: Fin thermistor
RC (A*P)		: Receiver circuit
S1PH		: High pressure switch
S1S	#	: benefit kWh rate power supply contact
S3S	#	: Input multiple setpoint 1
S4S	#	: Input multiple setpoint 2
SS1 (A1P)		: Selector switch (Emergency)
SS1 (A2P)		: Selector switch (master slave)
SS1 (A7P)	*	: Selector switch
TC (A*P)		: Transmitter circuit
T1R-T2R (A*P)		: Diode bridge
V1C-V12C		: Ferrite core noise filter
X1M-X3M		: Terminal strip
X*M (A*P)	*	: PCB terminal strip
X5Y		: Connector
Y1R		: 4 way valve
Z1F-Z5F (A*P)		: Noise filter

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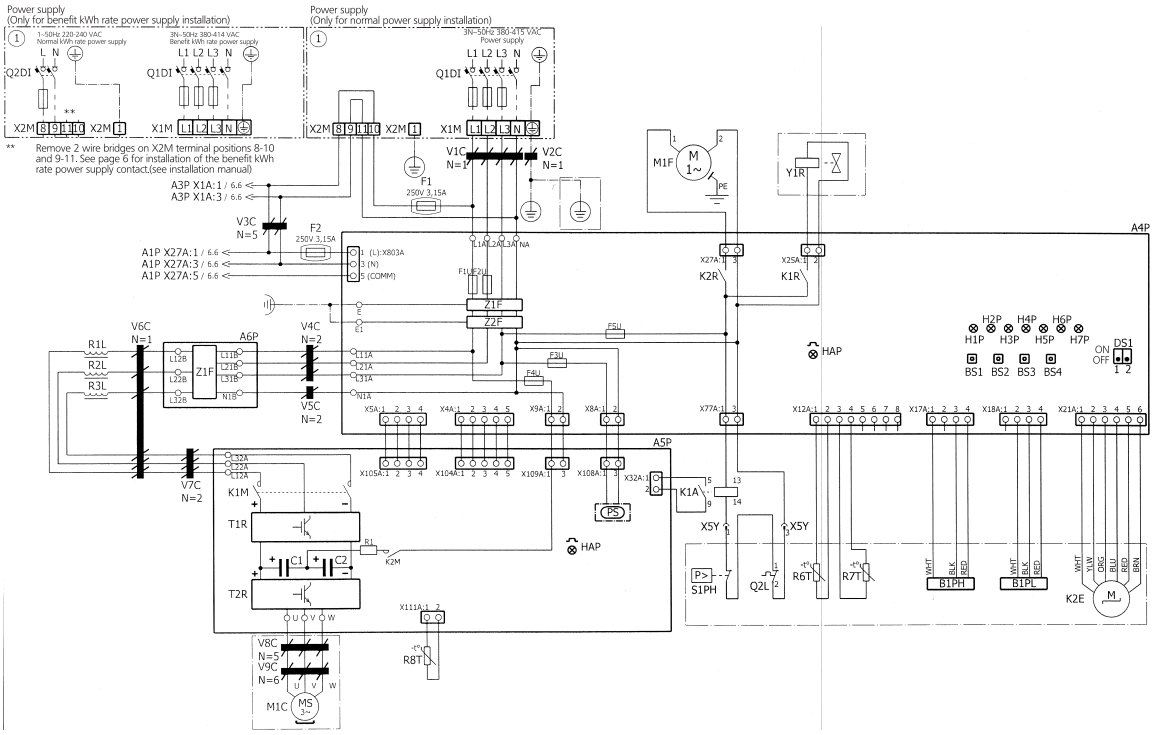
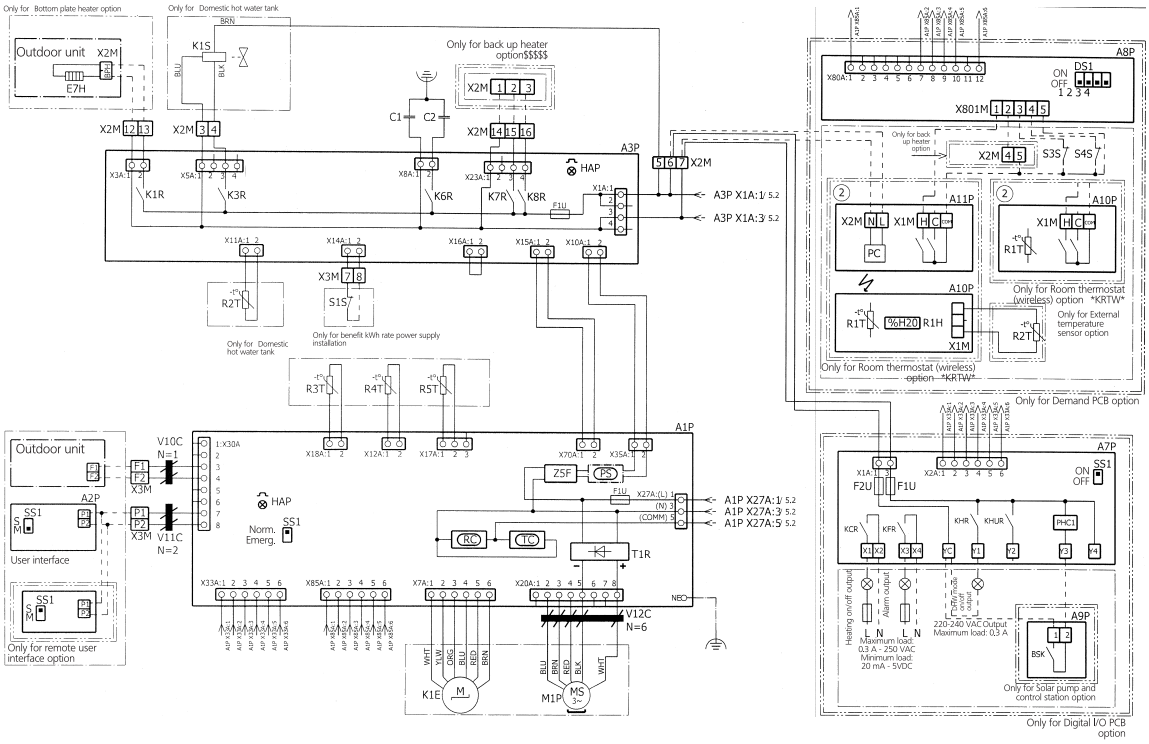
6 Wiring diagrams

6 - 1 Wiring Diagrams - Single Phase

EKHBRD-ADY1



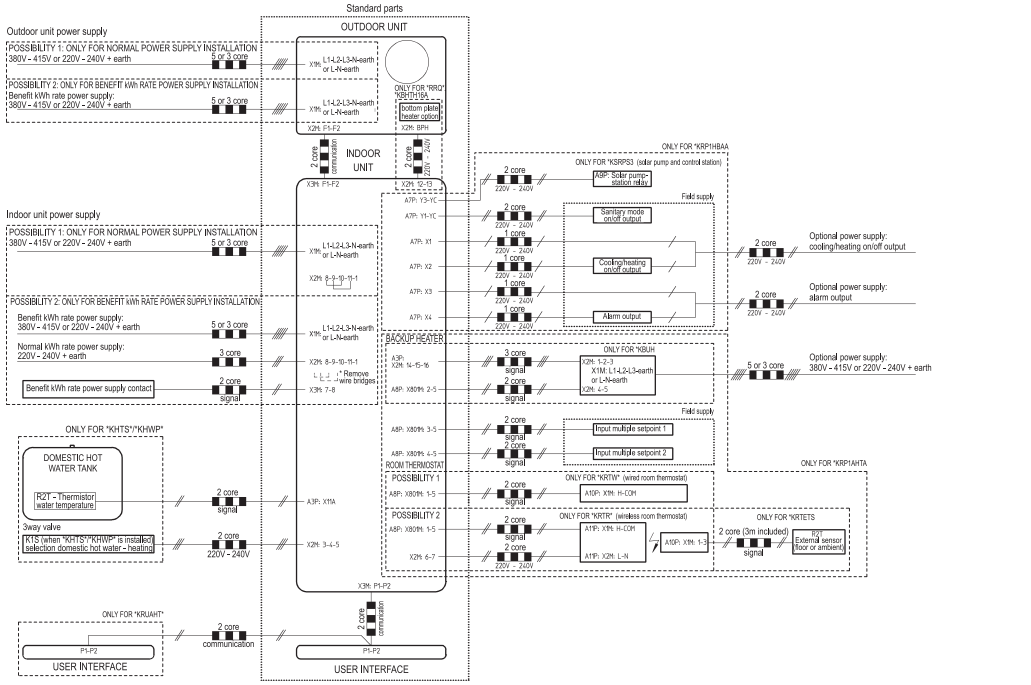
EKHBRD-ADY1



7 External connection diagrams

7 - 1 External Connection Diagrams

EKHBRD



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NOTES

1. In case of signal cable or communication cable, keep minimum distance to power cables > 25mm

8 Sound data

8 - 1 Sound Power Spectrum

EKHBRD-ADY1

	Sound power Lw per Octave band (dB)							Total (dBA)
	125	250	500	1000	2000	4000	8000	LwA
EKHBRD011*	53	61	61	49	43	39	34	59
EKHBRD014*	73	61	61	51	43	42	38	60
EKHBRD016*	72	61	60	49	44	43	39	60

Notes

- Measured according to ISO3744
- Reference acoustic pressure = 10e-6μW/m²
- dBA=A-weighted sound power level

- Unit condition: Ta=7/6°C - Heating setpoint70/80°C - Maximum compressor frequency

- If sound is measured under actual installation conditions, the measured value will be higher due to environmental noise and sound reflections. Choose the installation location carefully and do not install in a sound sensitive environment (e.g. living room, bedroom, . . .).

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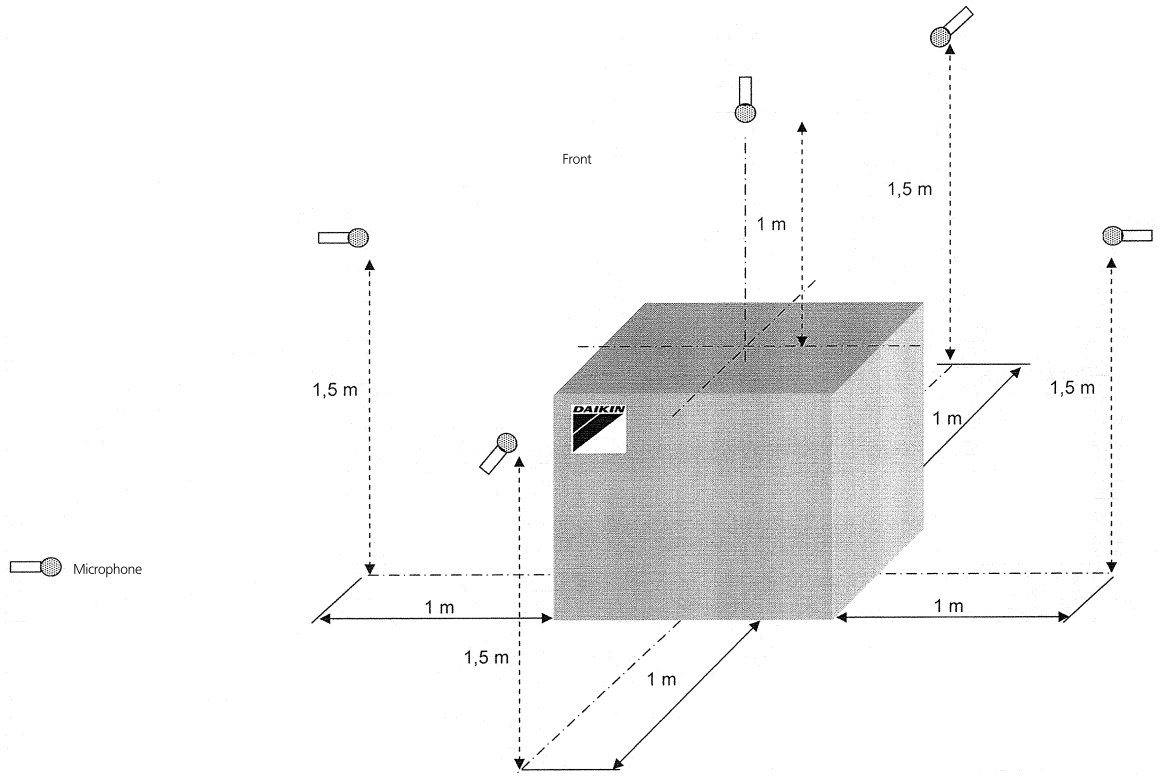
8 Sound data

8 - 2 Sound Pressure Spectrum - Heating



Sound levels

Sound pressure [dBA] - standalone			
	11(V1/Y1)	14(V1/Y1)	16(V1/Y1)
[EW/LW 55/65°C]			
Front	40	43	46
Left / Right / Back / Top (*)	43	45	46
[EW/LW 70/80°C]			
Front	46	46	46
Left / Right / Back / Top (*)	46	46	46
[EW/LW 55/65°C] - Low sound mode n°1			
Front	39	40	43
Left / Right / Back / Top (*)	40	43	45

Sound pressure [dBA] - Integrated (+Tank)			
	11(V1/Y1)	14(V1/Y1)	16(V1/Y1)
[EW/LW 55/65°C]			
Front	38	39	42
Left / Right / Back / Top (*)	41	44	45
[EW/LW 70/80°C]			
Front	43	43	43
Left / Right / Back / Top (*)	46	46	46
[EW/LW 55/65°C] - Low sound mode n°1			
Front	37	38	39
Left / Right / Back / Top (*)	40	41	44

Notes

- The above data is valid in free field condition, because it is measured in a semi-anechoic room. If sound is measured under actual installation conditions, the measured value will be higher due to environmental noise and sound reflections. Choose the installation location carefully and do not install in a sound sensitive environment (e.g. living room, bedroom, ...)
- dB(A) = A-weighted sound power level (A-scale according to IEC)
- EW = Entering water temperature
- LW = Leaving water temperature
- Reference acoustic pressure 0dB = 20µPa
- Sound pressure level of low sound mode n°2 and n°3 is lower than n°1
- (*) Does not occur simultanuously on all sides.

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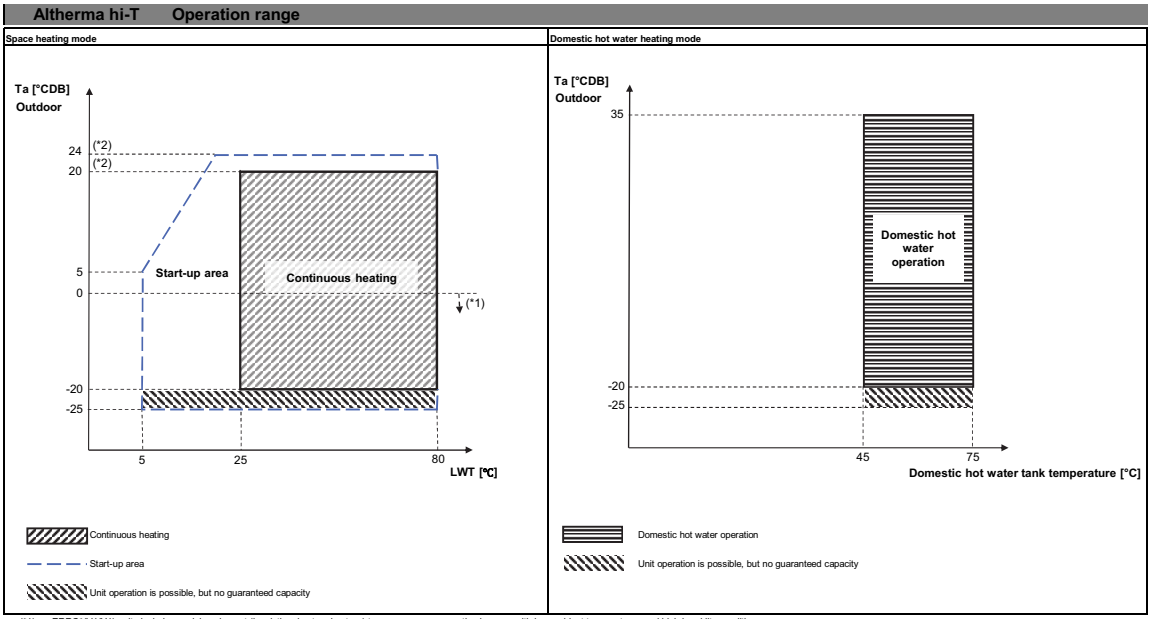
9 Operation range

9 - 1 Operation Range

EKHBRD-ADY1

Altherma hi-T Operation range



(*1) ERRQ*(V1/Y1) units include special equipment (insulation, heater sheet, ...) to ensure proper operation in areas with low ambient temperatures and high humidity conditions.
In such conditions, the ERSQ*(V1/Y1) models may experience problems with severe ice buildup on the air-cooled coil.
In case of high humidity conditions (>92%) in this operation area, a ERRQ*(V1/Y1) model should be used instead of a ERSQ*(V1/Y1) model. This to avoid freeze-up of the outdoor unit.
These models contain countermeasures (insulation, heater sheet, ...) to prevent freeze-up.

(*2) Via field setting

Remark
Only for EKHBRD* + ER(R/S)Q*.
For EKHBRD* + EMRQ*, see capacity table EMRQ*.

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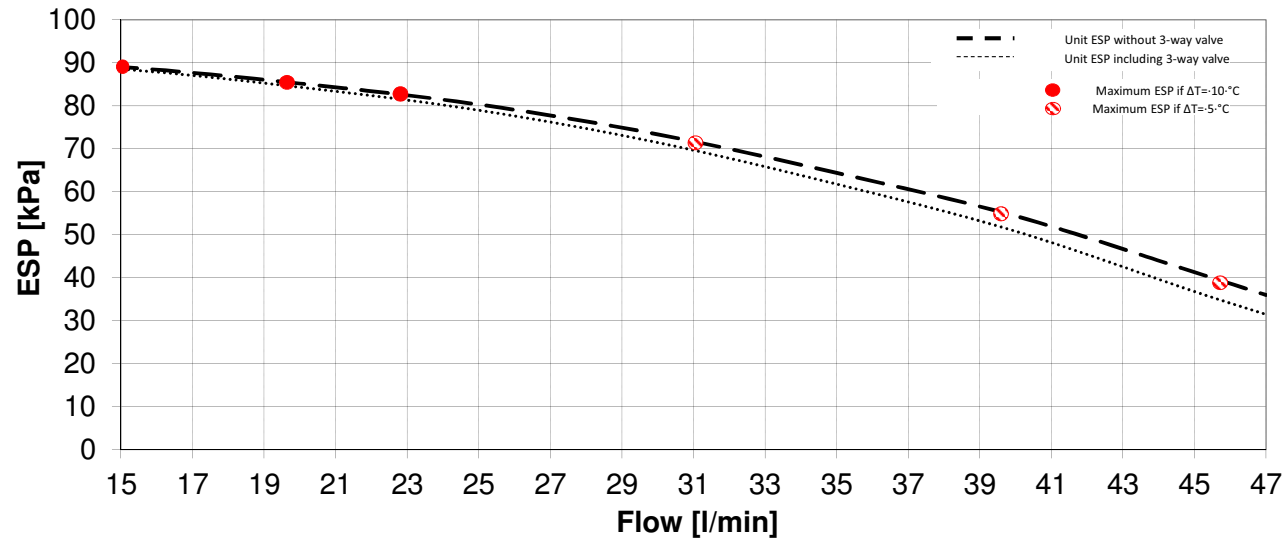
10 Hydraulic performance

10 - 1 Static Pressure Drop Unit

EKHBRD-ADY1



Notes

1. The ESP curves are the maximum ESP curves, with and without domestic hot water tank installed on top of the indoor unit (pump rpm: 4000).
   The pump of the indoor unit is inverter-controlled and functions to have a fixed ΔT between the return water temperature and the leaving water temperature.
2. In case of installing a domestic hot water tank, there is an additional pressure drop over the 3-way valve (delivered as an accessory with the tank).

ESP: External Static Pressure
Flow: water flow through the unit

Warning

1. Selecting a flow outside the operating area can damage the unit or cause the unit to malfunction.
   See also the minimum and maximum allowed water flow range in the technical specifications.
2. Water quality must be according to EU directive 98/83 EC.

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