INSTALLATION MANUAL

Daikin Altherma indoor unit

EKHVH016BB6V3
EKHVX016BB6V3

EKHVH016BB6WN
EKHVX016BB6WN
EKHVH016BB9WN
EKHVX016BB9WN

CE - DECLARATION-OF-CONFORMITY
CE - KONFORMITÄTSERKLÄRUNG
CE - DECLARATION-DE-CONFORMITE
CE - CONFORMITEITSVERKLARING

CE - DECLARACION-DE-CONFORMIDAD
CE - DICHIARAZIONE-DI-CONFORMITA
CE - ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ

CE - DECLARAÇÃO-DE-CONFORMIDADE
CE - ЗАЯВЛЕНИЕ-О-СООТВЕТСТВИИ
CE - OPFYLDELSESERKLÆRING
CE - FÖRSÄKRAN-OM-ÖVERENSTÄMMELSE

CE - ERKLÆRING OM-SAMSVAR
CE - ILMOITUS-YHDENMUKAISUUDESTA
CE - PROHLÁŠENÍ-O-SHODĚ

CE - IZJAVA-O-USKLAĐENOSTI
CE - MEGFELELŐSÉGI-NYILATKOZAT
CE - DEKLARACJA-ZGODNOŚCI
CE - DECLARAŢIE-DE-CONFORMITATE

CE - IZJAVA O SKLADNOSTI
CE - VASTAVUSDEKLARATSIOON
CE - ДЕКЛАРАЦИЯ-ЗА-СЪОТВЕТСТВИЕ

CE - ATITIKTIES-DEKLARACIJA
CE - ATBILSTĪBAS-DEKLARĀCIJA
CE - VYHLÁSENIE-ZHODY
CE - UYUMLULUK-BİLDİRİSİ

Daikin Europe N.V.

01 (GB) declares under its sole responsibility that the equipment to which this declaration relates:
02 (D) erklärt auf seine alleinige Verantwortung, dass die Ausrüstung für die diese Erklärung bestimmt ist:
03 (F) déclare sous sa seule responsabilité que l'équipement visé par la présente déclaration:
04 (NL) verklaart hierbij op eigen exclusieve verantwoordelijkheid dat de apparatuur waarop deze verklaring betrekking heeft:
05 (E) declara bajo su única responsabilidad que el equipo al que hace referencia la declaración:
06 (I) dichiara sotto la propria responsabilità che gli apparecchi a cui è riferita questa dichiarazione:
07 (GR) δηλώνει με αποκλειστική της ευθύνη ότι ο εξοπλισμός στον οποίο αναφέρεται η παρούσα δήλωση:
08 (P) declara sob sua exclusiva responsabilidade que os equipamentos a que esta declaração se refere:
09 (RUS) заявляет, исключительно под свою ответственность, что оборудование, к которому относится настоящее заявление:
10 (DK) erklærer som eneansvarlig, at udstyret, som er omfattet af denne erklæring:
11 (S) deklarerar i egenskap av huvudansvarig, att utrustningen som berörs av denna deklaration innebär att:
12 (N) erklærer et fullstendig ansvar for at det utstyr som berøres av denne deklarasjon, innebærer at:
13 (FIN) ilmoittaa yksinomaan omalla vastuullaan, että tämän ilmoituksen tarkoittamat laitteet:
14 (CZ) prohlašuje ve své plné odpovědnosti, že zařízení, k němuž se toto prohlášení vztahuje:
15 (HR) izjavljuje pod isključivo vlastitom odgovornošću da oprema na koju se ova izjava odnosi:
16 (H) teljes felelősségе tudatában kijelenti, hogy a berendezések, melyekre e nyilatkozat vonatkozik:
17 (PL) deklaruje na własną wyłączną odpowiedzialność, że urządzenia, których ta deklaracja dotyczy:
18 (RO) declară pe proprie răspundere că echipamentele la care se referă această declaraţie:
19 (SLO) z vso odgovornostjo izjavlja, da je oprema naprav, na katero se izjava nanaša:
20 (EST) kinnitab oma täielikul vastutusel, et käesoleva deklaratsiooni alla kuuluv varustus:
21 (BG) декларира на своя отговорност, че оборудването, за което се отнася тази декларация:
22 (LT) visiška savo atsakomybe skelbia, kad įranga, kuriai taikoma ši deklaracija:
23 (LV) ar pilnu atbildību apliecina, ka tālāk aprakstītās iekārtas, uz kurām attiecas šī deklarācija:
24 (SK) vyhlasuje na vlastnú zodpovednosť, že zariadenie, na ktoré sa vzťahuje toto vyhlásenie:
25 (TR) tamamen kendi sorumluluğunda olmak üzere bu bildirinin ilgili olduğu donanımının aşağıdaki gibi olduğunu beyan eder:

EKHVH016BB6V3, EKHVH016BB6WN, EKHVH016BB9WN,
EKHVX016BB6V3, EKHVX016BB6WN, EKHVX016BB9WN,

01 are in conformity with the following standard(s) or other normative document(s), provided that these are used in accordance with our instructions:
02 der/den folgenden Norm(en) oder einem anderen Normdokument oder -dokumenten entspricht/entsprechen, unter der Voraussetzung, daß sie gemäß unseren Anweisungen eingesetzt werden:
03 sont conformes à la/aux norme(s) ou autre(s) document(s) normatif(s), pour autant qu'ils soient utilisés conformément à nos instructions:
04 conform de volgende norm(en) of één of meer andere bindende documenten zijn, op voorwaarde dat ze worden gebruikt overeenkomstig onze instructies:
05 están en conformidad con la(s) siguiente(s) norma(s) u otro(s) documento(s) normativo(s), siempre que sean utilizados de acuerdo con nuestras instrucciones:
06 sono conformi al(i) seguente(i) standard(s) o altro(i) documento(i) a carattere normativo, a patto che vengano usati in conformità alle nostre istruzioni:
07 είναι σύμφωνα με το(α) ακόλουθο(α) πρότυπο(α) ή άλλο έγγραφο(α) κανονισμών, υπό την προϋπόθεση ότι χρησιμοποιούνται σύμφωνα με τις οδηγίες μας:
08 estão em conformidade com a(s) seguinte(s) norma(s) ou outro(s) documento(s) normativo(s), desde que estes sejam utilizados de acordo com as nossas instruções:
09 соответствуют следующим стандартам или другим нормативным документам, при условии их использования согласно нашим инструкциям:
10 overholder følgende standard(er) eller andet/andre retningsgivende dokument(er), forudsat at disse anvendes i henhold til vore instrukser:
11 respektive utrustning är utförd i överensstämmelse med och följer följande standard(er) eller andra normgivande dokument, under förutsättning att användning sker i överensstämmelse med våra instruktioner:
12 respektive utstyr er i overensstemmelse med følgende standard(er) eller andre normgivende dokument(er), under forutssetning av at disse brukes i henhold til våre instrukser:
13 vastaavat seuraavien standardien ja muiden ohjeellisten dokumenttien vaatimuksia edellyttäen, että niitä käytetään ohjeidemme mukaisesti:
14 za předpokladu, že jsou využívány v souladu s našimi pokyny, odpovídají následujícím normám nebo normativním dokumentům:
15 u skladu sa slijedećim standardom(ima) ili drugim normativnim dokumentom(ima), uz uvjet da se oni koriste u skladu s našim uputama:
16 megfelelnek az alábbi szabvány(ok)nak vagy egyéb irányadó dokumentum(ok)nak, ha azokat előírás szerint használják:
17 spełniają wymogi następujących norm i innych dokumentów normalizacyjnych, pod warunkiem że używane są zgodnie z naszymi instrukcjami:
18 sunt în conformitate cu următorul (următoarele) standard(e) sau alt(e) document(e) normativ(e), cu condiţia ca acestea să fie utilizate în conformitate cu instrucţiunile noastre
19 skladni z naslednjimi standardi in drugimi normativi, pod pogojem, da se uporabljajo v skladu z našimi navodili:
20 on vastavuses järgmis(t)e standardi(te)ga või teiste normatiivsete dokumentidega, kui neid kasutatakse vastavalt meie juhenditele:
21 съответстват на следните стандарти или други нормативни документи, при условие, че се използват съгласно нашите инструкции:
22 atitinka žemiau nurodytus standartus ir (arba) kitus norminius dokumentus su sąlyga, kad yra naudojami pagal mūsų nurodymus:
23 tad, ja lietoti atbilstoši ražotāja norādījumiem, atbilst sekojošiem standartiem un citiem normatīviem dokumentiem:
24 sú v zhode s nasledovnou(ými) normou(ami) alebo iným(i) normatívnym(i) dokumentom(ami), za predpokladu, že sa používajú v súlade s našim návodom:
25 ürünün, talimatlarımıza göre kullanılması koşuluyla aşağıdaki standartlar ve norm belirten belgelerle uyumludur:

EN60335-2-40,

01 following the provisions of:
02 gemäß den Vorschriften der:
03 conformément aux stipulations des:
04 overeenkomstig de bepalingen van:
05 siguiendo las disposiciones de:
06 secondo le prescrizioni per:
07 με τήρηση των διατάξεων των:
08 de acordo com o previsto em:
09 в соответствии с положениями:
10 under iagttagelse af bestemmelserne i:
11 enligt villkoren i:
12 gitt i henhold til bestemmelsene i:
13 noudattaen määräyksiä:
14 za dodržení ustanovení předpisu:
15 prema odredbama:
16 követi a(z):
17 zgodnie z postanowieniami Dyrektyw:
18 în urma prevederilor:
19 ob upoštevanju določb:
20 vastavalt nõuetele:
21 следвайки клаузите на:
22 laikantis nuostatų, pateikiamų:
23 ievērojot prasības, kas noteiktas:
24 održiavajúc ustanovenia:
25 bunun koşullarına uygun olarak:

Low Voltage 2006/95/EC
Electromagnetic Compatibility 2004/108/EC *

01 Directives, as amended.
02 Direktiven, gemäß Änderung.
03 Directives, telles que modifiées.
04 Richtlijnen, zoals geamendeerd.
05 Directivas, según lo enmendado.
06 Direttive, come da modifica.
07 Οδηγιών, όπως έχουν τροποποιηθεί.
08 Directivas, conforme alteração em.
09 Директив со всеми поправками.
10 Direktiver, med senere ændringer.
11 Direktiv, med företagna ändringar.
12 Direktiver, med foretatte endringer.
13 Direktivejä, sellaisina kuin ne ovat muutettuina.
14 v platném znění.
15 Smjernice, kako je izmijenjeno.
16 irányelv(ek) és módosításaik rendelkezéseit.
17 z późniejszymi poprawkami.
18 Directivelor, cu amendamentele respective.
19 Direktive z vsemi spremembami.
20 Direktiivid koos muudatustega.
21 Директиви, с техните изменения.
22 Direktyvose su papildymais.
23 Direktīvās un to papildinājumos.
24 Smernice, v platnom znení.
25 Değiştirilmiş halleriyle Yönetmelikler.

01 **Note** * as set out in **<A>** and judged positively by **<B>** according to the **Certificate <C>**.
02 **Hinweis** * wie in der **<A>** aufgeführt und von **<B>** positiv beurteilt gemäß **Zertifikat <C>**.
03 **Remarque** * tel que défini dans **<A>** et évalué positivement par **<B>** conformément au **Certificat <C>**.
04 **Bemerk** * zoals vermeld in **<A>** en positief beoordeeld door **<B>** overeenkomstig **Certificaat <C>**.
05 **Nota** * como se establece en **<A>** y es valorado positivamente por **<B>** de acuerdo con el **Certificado <C>**.
06 **Nota** * delineato nel **<A>** e giudicato positivamente da **<B>** secondo il **Certificato <C>**.
07 **Σημείωση** * όπως καθορίζεται στο **<A>** και κρίνεται θετικά από το **<B>** σύμφωνα με το **Πιστοποιητικό <C>**.
08 **Nota** * tal como estabelecido em **<A>** e com o parecer positivo de **<B>** de acordo com o **Certificado <C>**.
09 **Примечание** * как указано в **<A>** и в соответствии с положительным решением **<B>** согласно **Свидетельству <C>**.
10 **Bemærk** * som anført i **<A>** og positivt vurderet af **<B>** i henhold til **Certifikat <C>**.
11 **Information** * enligt **<A>** och godkänts av **<B>** enligt **Certifikatet <C>**.
12 **Merk** * som det fremkommer i **<A>** og gjennom positiv bedømmelse av **<B>** ifølge **Sertifikat <C>**.
13 **Huom** * jotka on esitetty asiakirjassa **<A>** ja jotka **<B>** on hyväksynyt **Sertifikaatin <C>** mukaisesti.
14 **Poznámka** * jak bylo uvedeno v **<A>** a pozitivně zjištěno **<B>** v souladu s **osvědčením <C>**.
15 **Napomena** * kako je izloženo u **<A>** i pozitivno ocijenjeno od strane **<B>** prema **Certifikatu <C>**.
16 **Megjegyzés** * a(z) **<A>** alapján, a(z) **<B>** igazolta a megfelelést, a(z) **<C>** **tanúsítvány** szerint.
17 **Uwaga** * zgodnie z dokumentacją **<A>**, pozytywną opinią **<B>** i **Świadectwem <C>**.
18 **Notă** * aşa cum este stabilit în **<A>** şi apreciat pozitiv de **<B>** în conformitate cu **Certificatul <C>**.
19 **Opomba** * kot je določeno v **<A>** in odobreno s strani **<B>** v skladu s **certifikatom <C>**.
20 **Märkus** * nagu on näidatud dokumendis **<A>** ja heaks kiidetud **<B>** järgi vastavalt **sertifikaadile <C>**.
21 **Забележка** * както е изложено в **<A>** и оценено положително от **<B>** съгласно **Сертификата <C>**.
22 **Pastaba** * kaip nustatyta **<A>** ir kaip teigiamai nuspręsta **<B>** pagal **Sertifikatą <C>**.
23 **Piezīmes** * kā norādīts **<A>** un atbilstoši **<B>** pozitīvajam vērtējumam saskaņā ar **sertifikātu <C>**.
24 **Poznámka** * ako bolo uvedené v **<A>** a pozitívne zistené **<B>** v súlade s **osvedčením <C>**.
25 **Not** * **<A>**'da belirtildiği gibi ve **<C>** **Sertifikasına** göre **<B>** tarafından olumlu olarak değerlendirildiği gibi.

<A>	**DAIKIN.TCF.025D8/09-2010**
<B>	**KEMA (NB0344)**
<C>	**2082543.0551-QUA/EMC**

3PW54195-11C

Jean-Pierre Beuselinck
General Manager
Ostend, 1st of September 2010

DAIKIN EUROPE N.V.
Zandvoordestraat 300, B-8400 Oostende, Belgium

CONTENTS

CAREFULLY READ THESE INSTRUCTIONS BEFORE INSTALLATION. THEY WILL TELL YOU HOW TO INSTALL AND HOW TO CONFIGURE THE UNIT PROPERLY. KEEP THIS MANUAL IN A HANDY PLACE FOR FUTURE REFERENCE.

The original instructions are written in English. All other languages are translations of the original instructions.

1. DEFINITIONS

1.1. Meaning of warnings and symbols

Warnings in this manual are classified according to their severity and probability of occurrence.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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.

NOTICE

Indicates situations that may result in equipment or property-damage accidents only.

This symbol identifies useful tips or additional information.

Some types of danger are represented by special symbols:

Electric current.

Danger of burning and scalding.

1.2. Meaning of used terms

Installation manual:

Instruction manual specified for a certain product or application, explaining how to install, configure and maintain it.

Operation manual:

Instruction manual specified for a certain product or application, explaining how to operate it.

Maintenance instructions:

Instruction manual specified for a certain product or application, which explains (if relevant) how to install, configure, operate and/or maintain the product or application.

Dealer:

Sales distributor for products as per the subject of this manual.

Installer:

Technical skilled person who is qualified to install products as per the subject of this manual.

User:

Person who is owner of the product and/or operates the product.

Service company:

Qualified company which can perform or coordinate the required service to the unit.

Applicable legislation:

All international, European, national and local directives, laws, regulations and/or codes which are relevant and applicable for a certain product or domain.

Accessories:

Equipment which is delivered with the unit and which needs to be installed according to instructions in the documentation.

Optional equipment:

Equipment which can optionally be combined to the products as per the subject of this manual.

Field supply:

Equipment which needs to be installed according to instructions in this manual, but which are not supplied by Daikin.

2. General safety precautions

The precautions listed here are divided into the following four types. They all cover very important topics, so be sure to follow them carefully.

DANGER: ELECTRICAL SHOCK

Switch off all power supply before removing the switchbox service panel or before making any connections or touching electrical parts.

Do not touch any switch with wet fingers. Touching a switch with wet fingers can cause electrical shock. Before touching electrical parts, turn off all applicable power supply.

To avoid electric shock, be sure to disconnect the power supply 1 minute or more before servicing the electrical parts. Even after 1 minute, always measure the voltage at the terminals of main circuit capacitors or electrical parts and, before touching, be sure that those voltages are 50 V DC or less.

When service panels are removed, live parts can easily be touched by accident. Never leave the unit unattended during installation or servicing when the service panel is removed.

DANGER: DO NOT TOUCH PIPING AND INTERNAL PARTS

Do not touch the refrigerant piping, water piping or internal parts during and immediately after operation. The piping and internal parts may be hot or cold depending on the working condition of the unit.

Your hand may suffer burns or frostbite if you touch the piping or internal parts. To avoid injury, give the piping and internal parts time to return to normal temperature or, if you must touch them, be sure to wear protective gloves.

WARNING

- Never directly touch any accidental leaking refrigerant. This could result in severe wounds caused by frostbite.
- Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear proper gloves.

CAUTION

Do not rinse the unit. This may cause electric shocks or fire.

3. Introduction

3.1. General information

Thank you for purchasing this indoor unit.

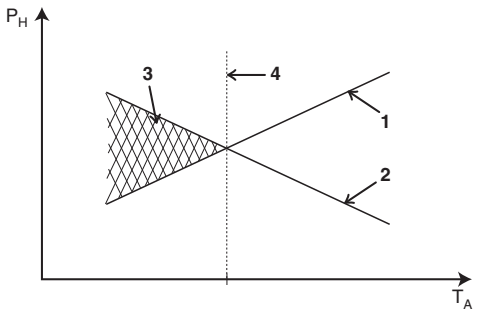
The unit is the indoor part of the air to water ERHQ or ERLQ heat pumps. These units are designed for floor mounted indoor installation. See "6.1. Selecting an installation location" on page 11. The units can be combined with Daikin fan coil units, floor heating applications, low temperature radiators, Daikin domestic water heating applications and solar kit for domestic hot water applications.

Heating/cooling units and heating only units

The unit range consists of two main versions: a heating/cooling (EKHVX) version and a heating only (EKHVH) version.

Both versions are delivered with an integrated backup heater for additional heating capacity during cold outdoor temperatures. The backup heater also serves as a backup in case of malfunctioning of the outdoor unit. The backup heater models are available for a heating capacity of 6 and 9 kW, and – depending on the heating capacity – for three different power supply specifications.

Indoor unit model	Backup heater capacity	Backup heater nominal voltage
EKHVX016BB6V3	6 kW	1x 230 V
EKHVX016BB6WN	6 kW	3x 400 V
EKHVX016BB9WN	9 kW	3x 400 V



1 Heat pump capacity
2 Required heating capacity (site dependent)
3 Additional heating capacity provided by the backup heater
4 Equilibriumtemperature (can be set through the user interface, refer to "8.8. Field settings" on page 26)
T_A Ambient (outdoor) temperature
P_H Heating capacity

3.2. Combination and options

Domestic hot water tank (option)

An optional EKHTS* domestic hot water tank can be connected to the indoor unit. The EKHTS* domestic hot water tank is available in two different water capacities: 200 and 260 litre.

Refer to the domestic hot water tank installation manual for further details.

Solar kit for domestic hot water tank (option)

For information concerning the EKSOLHT solar kit, refer to the installation manual of that kit.

Digital I/O PCB kit (option)

An optional EKRP1HB digital I/O PCB can be connected to the indoor unit and allows:

- remote alarm output,
- heating/cooling ON/OFF output,
- bivalent operation (permission signal for the auxiliary boiler).

Refer to the operation manual of the indoor unit and to the installation manual of the digital I/O PCB for more information.

Refer to the wiring diagram or connection diagram for connecting this PCB to the unit.

Remote thermostat kit (option)

An optional room thermostat EKRTW or EKRTR can be connected to the indoor unit. Refer to the installation manual of the room thermostat for more information.

Connection to a benefit kWh rate power supply

This equipment allows for connection to benefit kWh rate power supply delivery systems. Refer to "Connection to a benefit kWh rate power supply" on page 22 for more details.

3.3. Scope of the manual

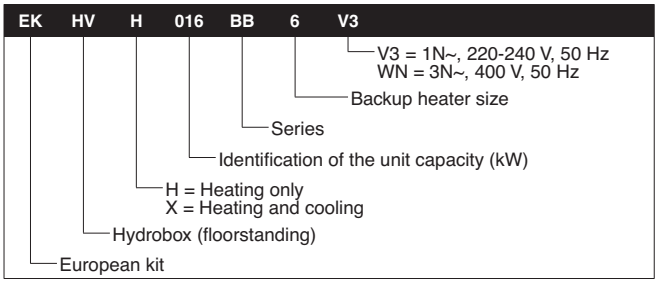
This manual does NOT include the selection procedure and the water system design procedure. Only some precautions and tips and tricks about the design of the water circuit are given in a separate chapter of this manual.

Once the selection is done and the water system is designed, this manual describes the procedures for handling, installing and connecting the EKHV(H/X) units. This manual has been prepared to ensure adequate maintenance of the unit, and it will provide help if problems occur.

Refer to the installation manual of the outdoor unit for items not described in this manual.

The operation of the indoor unit is described in the indoor unit operation manual.

3.4. Model identification

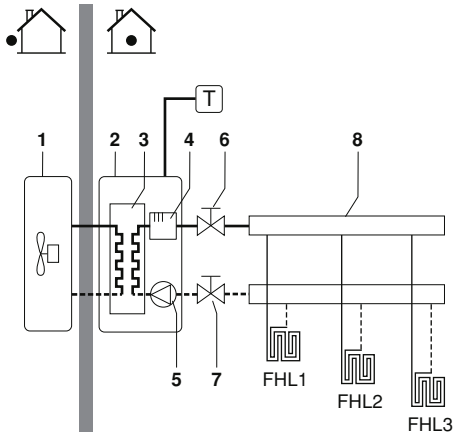


3.5. Typical application examples

The application examples given below are for illustration purposes only.

Application 1

Space heating only application with the room thermostat connected to the indoor unit.



1 Outdoor unit
2 Indoor unit
3 Heat exchanger
4 Backup heater
5 Pump
6 Shut-off valve
7 Shut-off valve
8 Collector (field supply)
FHL1...3 Floor heating loop
T Room thermostat (optional)

Pump operation and space heating

When the room thermostat (T) is connected to the indoor unit, the pump (4) will operate when there is a heating request from the room thermostat, and the outdoor unit will start operating to achieve the target leaving water temperature as set on the user interface.

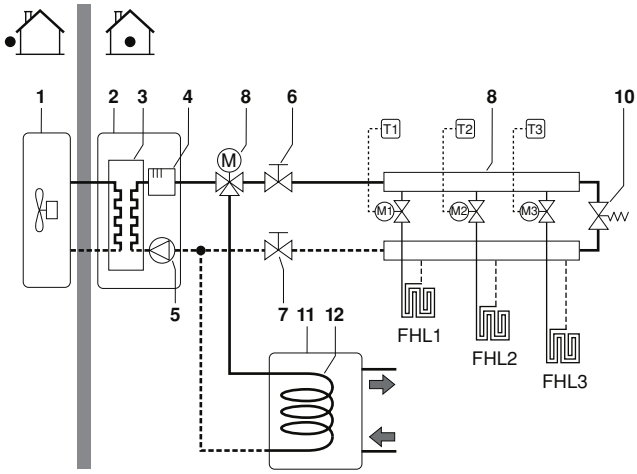
When the room temperature is above the thermostat set point, the outdoor unit and pump will stop operating.

NOTICE

Make sure to connect the thermostat wires to the correct terminals (see "Connection of the thermostat cable" on page 21) and to configure the DIP switch toggle switches correctly (see "8.2. Room thermostat installation configuration" on page 24).

Application 2

Space heating only application without room thermostat connected to the indoor unit. The temperature in each room is controlled by a valve on each water circuit. Domestic hot water is provided through the domestic hot water tank which is connected to the indoor unit.



1 Outdoor unit
2 Indoor unit
3 Heat exchanger
4 Backup heater
5 Pump
6 Shut-off valve
7 Shut-off valve
8 Collector (field supply)
9 Motorised 3-way valve (delivered with domestic hot water tank)
10 By-pass valve (field supply)
11 Domestic hot water tank (optional)
12 Heat exchanger coil
FHL1...3 Floor heating loop
T1...3 Individual room thermostat (optional)
M1...3 Individual motorised valve to control loop FHL1...3 (field supply)

Pump operation

With no thermostat connected to the indoor unit (2), the pump (4) can be configured to operate either as long as the indoor unit is on, or until the required water temperature is reached.

Details on pump configuration can be found under "8.3. Pump operation configuration" on page 24.

Space heating

The outdoor unit (1) will operate to achieve the target leaving water temperature as set on the user interface.

NOTICE

When circulation in each space heating loop (FHL1..3) is controlled by remotely controlled valves (M1..3), it is important to provide a by-pass valve (9) to avoid the flow switch safety device from being activated.

The by-pass valve should be selected as such that at all time the minimum water flow as mentioned under "6.7. General precautions concerning water circuit" on page 14 is guaranteed.

It is recommended to select a pressure difference controlled by-pass valve.

Domestic water heating

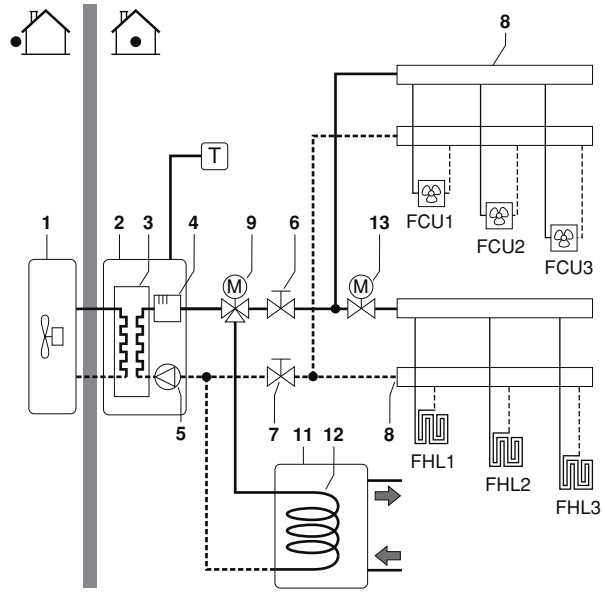
When domestic water heating mode is enabled (either manually by the user, or automatically through a schedule timer) the target domestic hot water temperature will be achieved by the heat exchanger coil.

When the domestic hot water temperature is below the user configured set point, the 3-way valve will be activated to heat the domestic hot water by means of the heat pump. In case of large domestic hot water demand or a high domestic hot water temperature setting, the backup heater can provide auxiliary heating.

Application 3

*Space heating and cooling application with the **room thermostat set for heating/cooling** connected to the indoor unit. Heating is provided through floor heating loops and fan coil units. Cooling is provided through the fan coil units only.*

Domestic hot water is provided through the domestic hot water tank which is connected to the indoor unit.



1	Outdoor unit
2	Indoor unit
3	Heat exchanger
4	Backup heater
5	Pump
6	Shut-off valve
7	Shut-off valve
8	Collector (field supply)
9	Motorised 3-way valve (delivered with domestic hot water tank)
11	Domestic hot water tank (optional)
12	Heat exchanger coil
13	Motorised 2-way valve (field supply)
FCU1...3	Fan coil unit (optional)
FHL1...3	Floor heating loop
T	Room thermostat with heating/cooling switch (optional)

Pump operation and space heating and cooling

According to the season, the customer will select heating or cooling on the room thermostat (T). This selection is not possible by operating the user interface.

When space heating/cooling is requested by the room thermostat (T), the pump will start operating and the indoor unit (2) will switch to "heating mode"/"cooling mode". The outdoor unit (1) will start operating to achieve the target leaving hot/cold water temperature.

In case of cooling mode, the 2-way valve (13) will close as to prevent cold water running through the floor heating loops (FHL).

NOTICE

Make sure to connect the thermostat wires to the correct terminals (see "Connection of the thermostat cable" on page 21) and to configure the DIP switch toggle switches correctly (see "8.2. Room thermostat installation configuration" on page 24).

NOTICE

Wiring of the 2-way valve (13) is different for a NC (normal closed) valve and a NO (normal open) valve! Make sure to connect to the correct terminal numbers as detailed on the wiring diagram.

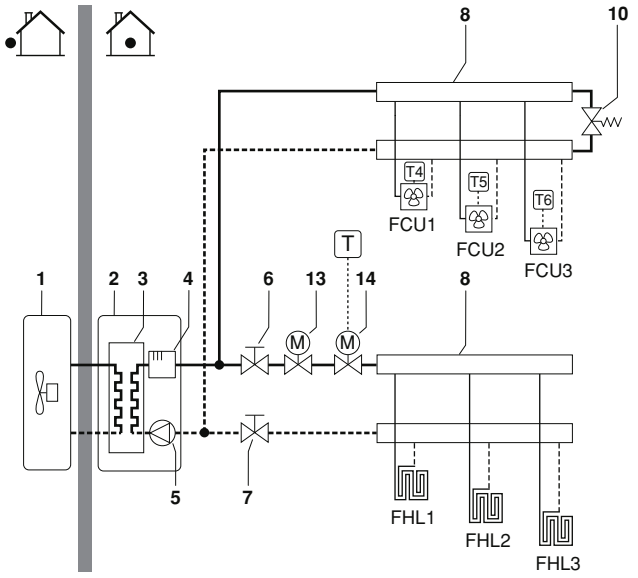
The ON/OFF setting of the heating/cooling operation is done by the room thermostat and cannot be done by the user interface on the indoor unit.

Domestic water heating

Domestic water heating is as described under "Application 2" on page 4.

Application 4

*Space heating and cooling application **without the room thermostat connected to the indoor unit**, but with the heating only room thermostat (set heating only) controlling the floor heating and the heating/cooling thermostat (set heating/cooling) controlling the fan coil units. Heating is provided through floor heating loops and fan coil units. Cooling is provided through the fan coil units only.*



1	Outdoor unit
2	Indoor unit
3	Heat exchanger
4	Backup heater
5	Pump
6	Shut-off valve
7	Shut-off valve
8	Collector (field supply)
10	By-pass valve (field supply)
13	Motorised 2-way valve to shut off the floor heating loops during cooling operation (field supply)
14	Motorised 2-way valve for activation of the room thermostat (field supply)
FCU1...3	Fan coil unit (optional)
FHL1...3	Floor heating loop
T	Heating only room thermostat (optional)
T4...6	Individual room thermostat for fan coil heated/cooled room (optional)

Pump operation

With no thermostat connected to the indoor unit (2), the pump (4) can be configured to operate either as long as the indoor unit is on, or until the required water temperature is reached.

Details on pump configuration can be found under "8.3. Pump operation configuration" on page 24.

Space heating and cooling

According to the season, the customer will select heating or cooling through the user interface on the indoor unit.

The outdoor unit (1) will operate in heating mode or cooling mode to achieve the target leaving water temperature.

With the unit in heating mode, the 2-way valve (13) is open. Hot water is provided to both the fan coil units and the floor heating loops.

With the unit in cooling mode, the 2-way valve (13) is closed to prevent cold water running through the floor heating loops (FHL).

NOTICE

When closing several loops in the system by remotely controlled valves, it might be required to install a by-pass valve (9) to avoid the flow switch safety device from being activated. See also "Application 2" on page 4.

NOTICE

Wiring of the 2-way valve (13) is different for a NC (normal closed) valve and a NO (normal open) valve! Make sure to connect to the correct terminal numbers as detailed on the wiring diagram.

The ON/OFF setting of the heating/cooling operation is done by the user interface on the indoor unit.

Application 5

Space heating with an auxiliary boiler (alternating operation)

Space heating application by either the Daikin indoor unit or by an auxiliary boiler connected in the system. The decision whether either the EKHV indoor unit or the boiler will operate can be achieved by an auxiliary contact or an EKHV* indoor controlled contact.*

The auxiliary contact can e.g. be an outdoor temperature thermostat, an electricity tariff contact, a manually operated contact, etc. See "Field wiring configuration A" on page 6.

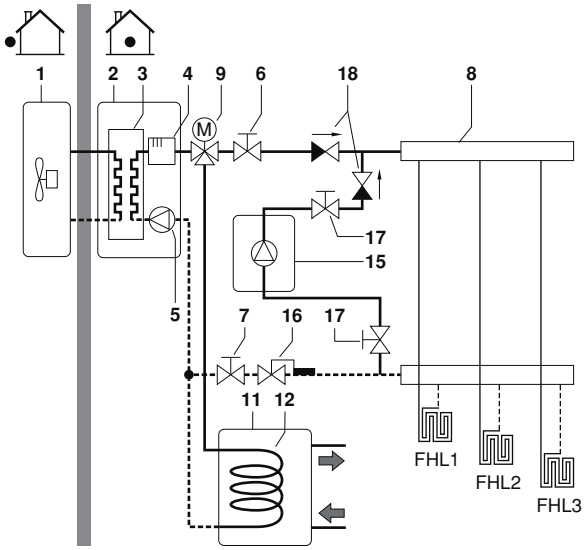
The EKHV indoor unit controlled contact (also called 'permission signal for the auxiliary boiler") is determined by the outdoor temperature (thermistor located at the outdoor unit). See "Field wiring configuration B" on page 6.*

Bivalent operation is only possible for space heating operation, **not** for the domestic water heating operation. Domestic hot water in such an application is always provided by the domestic hot water tank which is connected to the Daikin indoor unit.

The auxiliary boiler must be integrated in the piping work and in the field wiring according to the illustrations below.

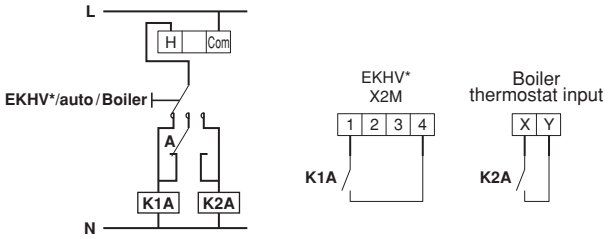
CAUTION

- Be sure that the boiler and the integration of the boiler in the system is in accordance with relevant European and national regulations.
- Daikin can not be put responsible for incorrect or unsafe situations in the boiler system.



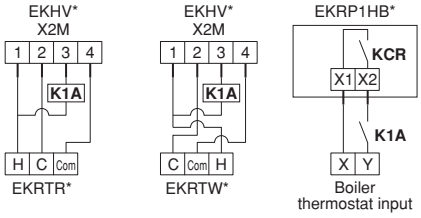
1	Outdoor unit
2	Indoor unit
3	Heat exchanger
4	Backup heater
5	Pump
6	Shut-off valve
7	Shut-off valve
8	Collector (field supply)
9	Motorised 3-way valve (delivered with the domestic hot water tank)
11	Domestic hot water tank (optional)
12	Heat exchanger coil
15	Boiler (field supply)
16	Aquastat valve (field supply)
17	Shut-off valve (field supply)
18	Non-return valve (field supply)
FHL1...3	Floor heating loop (field supply)

Field wiring configuration A



Boiler thermostat input	Boiler thermostat input
A	Auxiliary contact (normal closed)
H	Heating demand room thermostat (optional)
K1A	Auxiliary relay for activation of EKHV* unit (field supply)
K2A	Auxiliary relay for activation of boiler (field supply)

Field wiring configuration B



Boiler thermostat input	Boiler thermostat input
C	Cooling demand room thermostat (optional)
H	Heating demand room thermostat (optional)
Com	Common room thermostat (optional)
K1A	Auxiliary relay for activation of bolier unit (field supply)
KCR	Permission signal for the auxiliary boiler

Operation

- **Configuration A**
  When the room thermostat requests heating, either the EKHV* unit or the boiler starts operating, depending on the position of the auxiliary contact (A).
- **Configuration B**
  When the room thermostat requests heating, either the EKHV* unit or the boiler starts operating, depending on the outdoor temperature (status of "permission signal for the auxiliary boiler").
  When the permission is given towards the boiler, the space heating operation by the EKHV* unit will be automatically switched off.
  For more details see field setting [C-02~C-04].

NOTICE

- **Configuration A**
  Make sure that auxiliary contact (A) has sufficient differential or time delay so as to avoid frequent changeover between the EKHV* unit and the boiler. If the auxiliary contact (A) is an outdoor temperature thermostat, make sure to install the thermostat in the shade, so that it is not influenced or turned ON/OFF by the sun.
  Configuration B
  Make sure that the bivalent hysteresis [C-04] has sufficient differential to avoid frequent changeover between the EKHV* unit and the boiler. As the outdoor temperature is measured via the outdoor unit, air thermistor make sure to install the outdoor unit in the shade, so that it is not influenced by the sun.
  Frequent switching may cause corrosion of the boiler in an early stage. Contact the manufacturer of the boiler.
- During heating operation of the EKHV* unit, the unit will operate so as to achieve the target leaving water temperature as set on the user interface. When weather dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature.
  During heating operation of the boiler, the boiler will operate so as to achieve the target leaving water temperature as set on the boiler controller.
  Never set the target leaving water temperature set point on the boiler controller above 55°C.
- Make sure to only have 1 expansion vessel in the water circuit. An expansion vessel is already premounted in the Daikin indoor unit.

NOTICE

Make sure to configure the DIP switch SS2-3 on the PCB of the EKHV* switchbox correctly. Refer to "8.2. Room thermostat installation configuration" on page 24.

For configuration B: Make sure to configure the field settings [C-02, C-03 and C-04] correctly. Refer to "Bivalent operation [C-02]=1" on page 32.

NOTICE

Make sure that return water to the EKHV* heat exchanger never exceeds 55°C.

For this reason, never put the target leaving water temperature set point on the boiler controller above 55°C and install an aquastat[(a)] valve in the return water flow of the EKHV* unit.

Make sure that the non-return valves (field supply) are correctly installed in the system.

Make sure that the room thermostat (th) is not frequently turned ON/OFF.

Daikin shall not be held liable for any damage resulting from failure to observe this rule.

(a) The aquastat valve must be set for 55°C and must operate to close the return water flow to the unit when the measured temperature exceeds 55°C. When the temperature drops to a lower level, the aquastat valve must operate to open the return water flow to the EKHV* unit again.

Manual permission towards the EKHV* unit on the boiler.

In case only the EKHV* unit should operate in space heating mode, disable the bivalent operation via setting [C-02].

In case only the boiler should operate in space heating mode, increase the bivalent ON temperature [C-03] to 25°C.

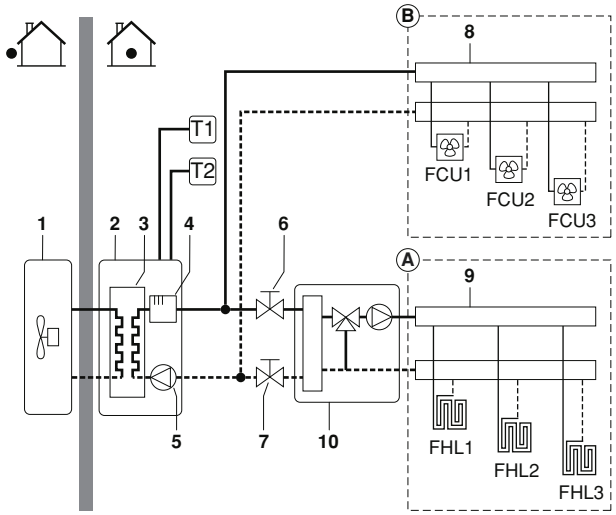
Application 6

Space heating with room thermostat application through floor heating loops and fan coil units. The floor heating loops and fan coil units require different operating water temperatures.

The floor heating loops require a lower water temperature in heating mode compared to fan coil units. To achive these two set points, a mixing station is used to adapt the water temperature according to requirements of the floor heating loops. The fan coil units are directly connected to the indoor unit water circuit and the floor heating loops after the mixing station. The control of this mixing station is not done by the indoor unit.

The operation and configuration of the field water circuit is the responsibility of the installer.

Daikin only offers a dual set point control function. By this function two set points can be generated. Depending on the required water temperature (floor heating loops and/or fan coil units are required) first set point or second set point can be activated.



1	Outdoor unit
2	Indoor unit
3	Heat exchanger
4	Backup heater
5	Pump
6	Shut-off valve
7	Shut-off valve
8	Collector zone A (field supply)
9	Collector zone B (field supply)
10	Mixing station (field supply)
T1	Room thermostat for zone A (optional)
T2	Room thermostat for zone B (optional)
FCU1...3	Fan coil unit (optional)
FHL1...3	Floor heating loop (field supply)

The advantage of the dual set point control is that the heat pump will/can operate at the lowest required leaving water temperature when only floor heating is required. Higher leaving water temperatures are only required in case fan coil units are operating.
This results in a better performance of the heat pump.

Pump operation and space heating

When the room thermostat for the floor heating loop (T1) and the fan coil units (T2) are connected to the indoor unit, the pump (4) will operate when there is a request for heating from T1 and/or T2. The outdoor unit will start operating to achieve the target leaving water temperature. The target leaving water temperature depends on which room thermostat is requesting heating.

	Set point	Field setting	Thermo status			
Zone A	First	UI	ON	OFF	ON	OFF
Zone B	Second	[7-03]	OFF	ON	ON	OFF
Resulting water temperature			UI	[7-03]	[7-03]	—
Result pump operation			ON	ON	ON	OFF

When the room temperature of both zones is above the thermostat set point, the outdoor unit and pump will stop operating.

NOTICE

- Make sure to connect the thermostat wires to the correct terminals (see "5. Overview of unit" on page 9).
- Make sure to configure the field settings [7-02], [7-03] and [7-04] correctly. Refer to "[7] Dual set point control" on page 30.
- Make sure to configure the DIP switch SS2-3 on the PCB of the EKHV switch box correctly. Refer to "8.2. Room thermostat installation configuration" on page 24.

- The request signals for space heating can be implemented in two different ways (installer choice).
  - Thermo ON/OFF signal from room thermostat
  - Status signal (active/not active) from the mixing station
- It is the installers responsibility to make sure no unwanted situations can occur (e.g. too high water temperatures towards floor heating loops, etc.)
- Daikin does not offer any type of mixing station. Dual set point control only provides the possibility to use two set points.
- When only zone A request heating, zone B will be fed with water at a temperature equal to the first set point. This can lead to unwanted heating of zone B.
- When only zone B request heating, the mixing station will be fed with water at a temperature equal to the second set point.
  Depending on the control of the mixing station, the floor heating loop can still receive water at a temperature equal to set point of the mixing station.

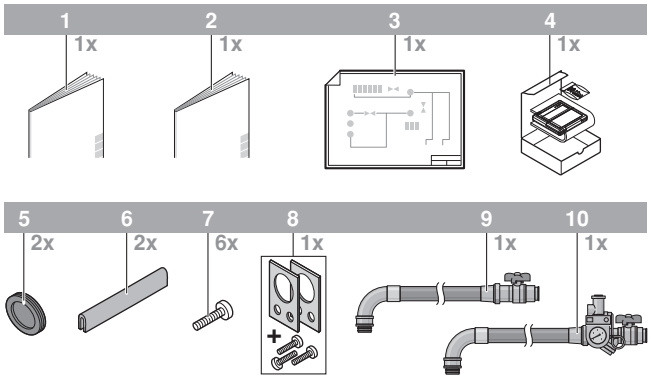
NOTICE

Be aware that the actual water temperature through the floor heating loops depends on the control and setting of the mixing station.

4. Accessories

4.1. Accessories supplied with this unit

Following accessories can be found in the unit.

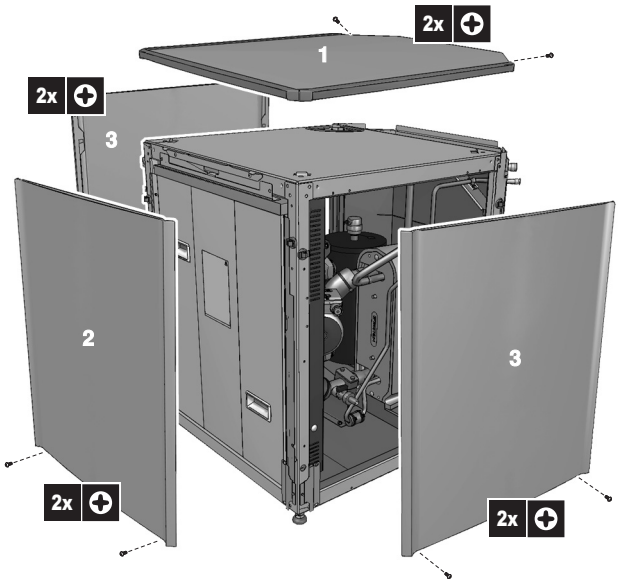


1	Installation manual
2	Operation manual
3	Wiring diagram sticker (inside decoration panel)
4	User interface kit (remote controller, 4 fixing screws, 2 plugs)
5	Grommet (small)
6	Grommet (large)
7	Top plate fixing screws + lifting fixing screws (8 screws)
8	Kit for lifting the unit
9	Flexible water outlet piping
10	Flexible water inlet piping (with manometer)

5. Overview of unit

5.1. Opening the unit

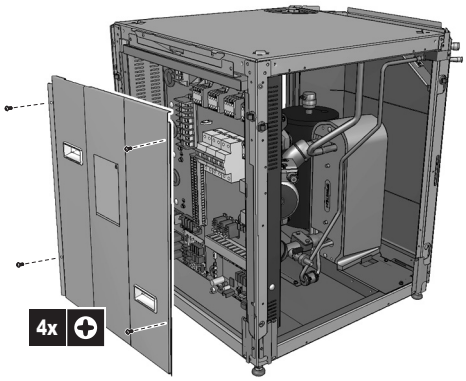
To gain access to the unit, front plate, top plate and the side plates need to be opened.



1	Top plate
2	Front plate
3	Side plate

Once the unit is opened, access is possible to the main components.

To gain access to the electrical components, the switch box needs to be opened:



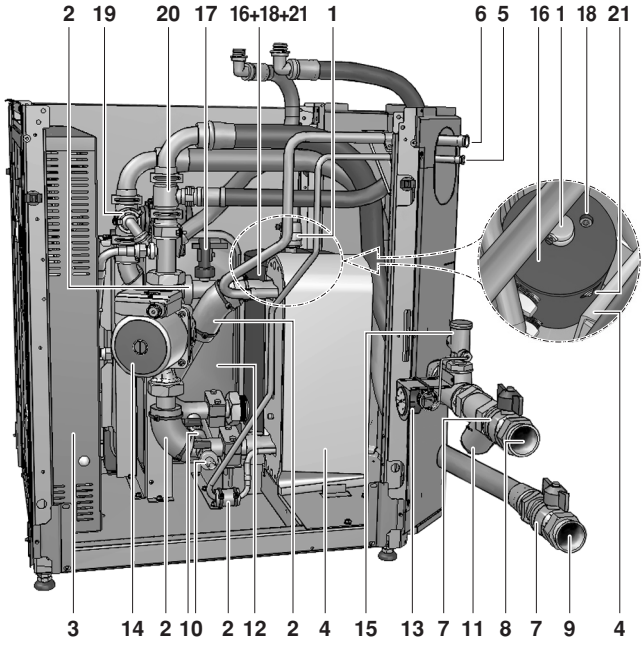
DANGER: ELECTRICAL SHOCK

See "2. General safety precautions" on page 2.

DANGER: DO NOT TOUCH PIPING AND INTERNAL PARTS

See "2. General safety precautions" on page 2.

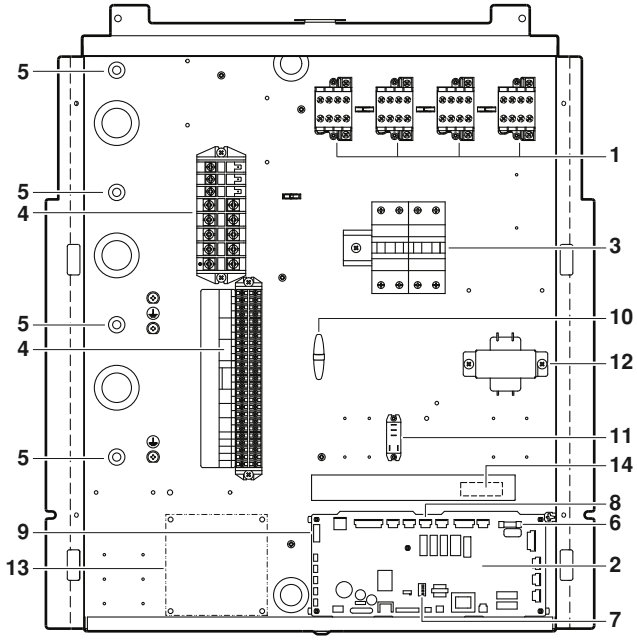
5.2. Main components in the unit



1. Air purge valve
   Remaining air in the water circuit will be automatically removed via the air purge valve.
2. Temperature sensors (thermistors)
   Temperature sensors determine the water and refrigerant temperature at various points in the circuit.
3. Switch box
   The switch box contains the main electronic and electrical parts of the indoor unit.
4. Heat exchanger
5. Refrigerant liquid connection R410A
6. Refrigerant gas connection R410A
7. Shut-off valves
   The shut-off valves on the water inlet connection and water outlet connection allow isolation of the indoor unit water circuit side from the residential water circuit side. This facilitates draining and filter cleaning of the indoor unit.
8. Water inlet connection

9. Water outlet connection
10. Drain/fill valves
11. Water filter
    The water filter removes dirt from the water to prevent damage to the pump or blockage of the heat exchanger. The water filter must be cleaned on a regular base. See "10.1. Maintenance activities" on page 40.
12. Expansion vessel (10 l)
13. Manometer
    The manometer allows readout of the water pressure in the water circuit.
14. Pump
    The pump circulates the water in the water circuit.
15. Pressure relief valve
    The pressure relief valve prevents excessive water pressure in the water circuit by opening at 3 bar and discharging some water.
16. Backup heater
    The backup heater consists of an electrical heating element in the backup heater vessel that will provide additional heating capacity to the water circuit if the heating capacity of the outdoor unit is insufficient due to low outdoor temperatures.
    It also can boost the domestic hot water tank temperature up to 60°C (if the domestic hot water tank is installed)
17. Flow switch
    The flow switch checks the flow in the water circuit and protects the heat exchanger against freezing and the pump against damage.
18. Backup heater thermal protector
    The backup heater is equipped with a thermal protector. The thermal protector is activated when the temperature becomes too high.
19. 3-way valve (option) (delivered with the EKHTS* domestic hot water tank)
    The motorized 3-way valve controls whether the water outlet is used for space heating or the domestic hot water tank.
20. T-piece (option) (delivered with the EKHTS* domestic hot water tank)
21. Backup heater thermal fuse
    The backup heater is equipped with a thermal fuse. The thermal fuse is blown when the temperature becomes too high (higher than the backup heater thermal protector temperature).

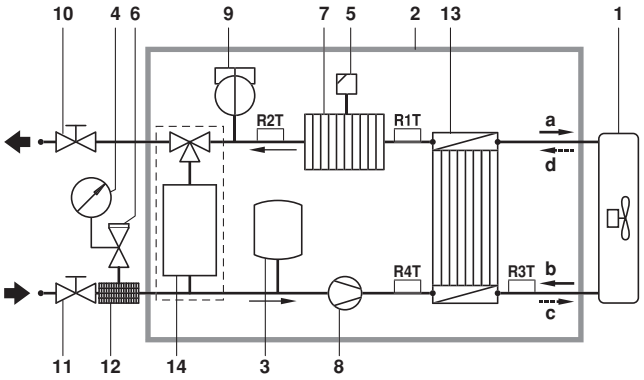
5.3. Switch box main components



1. Backup heater contactors K1M, K2M, K5M and K6M.
2. Main PCB
   The main PCB (Printed Circuit Board) controls the functioning of the unit.
3. Backup heater circuit breaker F1B, F3B
   The circuit breaker protects the backup heater electrical circuit against overload or short circuit.
4. Terminal blocks
   The terminal blocks allow easy connection of field wiring.
5. Cable tie mountings
   The cable tie mountings allow to fix the field wiring with cable ties to the switch box to ensure strain relief.
6. PCB fuse FU1
7. DIP switch SS2
   The DIP switch SS2 provides 4 toggle switches to configure certain installation parameters. See "8.1. DIP switch settings overview" on page 24.
8. X13A socket
   The X13A socket receives the K3M connector (only for installations with domestic hot water tank).
9. X9A socket
   The X9A socket receives the thermistor connector (only for installations with domestic hot water tank).
10. Pump fuse FU2 (in line fuse)
11. Pump relay K4M
12. Transformer TR1
13. A4P
    Digital I/O PCB (only for installations with solar kit or digital I/O PCB kit).
14. X6YA/X6YB/X6Y
    Connectors for connecting to a benefit kWh rate power supply.

The electrical wiring diagram can be found on the inside of the switch box cover.

5.4. Functional diagram



1	Outdoor unit
2	Indoor unit
3	Expansion vessel
4	Manometer
5	Air purge valve
6	Safety valve
7	Backup heater
8	Pump
9	Flow switch
10	Shut-off valve water outlet
11	Shut-off valve water inlet
12	Filter
13	Heat exchanger
14	EKHTS* domestic hot water tank (optional)
a	Evaporator refrigerant out
b	Evaporator refrigerant in
c	Condenser refrigerant out
d	Condenser refrigerant in
R1T	Outlet water heat exchanger thermistor
R2T	Outlet water backup heater thermistor
R3T	Refrigerant liquid side thermistor
R4T	Inlet water thermistor

6. INSTALLATION OF THE UNIT

6.1. Selecting an installation location

WARNING

Be sure to provide for adequate measures in order to prevent that the unit be used as a shelter by small animals.

Small animals making contact with electrical parts can cause malfunctions, smoke or fire. Please instruct the customer to keep the area around the unit clean and clear.

General precautions on installation location

Select an installation site that meets the following requirements:

- The foundation must be strong enough to support the weight of the unit. The floor is flat to prevent vibrations and noise generation and to have sufficient stability.
  This is especially of importance when the optional domestic hot water tank is installed on top of the unit.
- The space around the unit is adequate for maintenance and servicing (refer to "Service space of the unit" on page 12).
- The space around the unit allows for sufficient air circulation.
- There is no danger of fire due to leakage of inflammable gas.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Select the location of the unit in such a way that the sound generated by the unit does not disturb anyone, and the location is selected according the applicable legislation.
  If the sound is measured under actual installation conditions, the measured value will be higher than the sound pressure level mentioned in "12. Unit specifications" on page 44 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, …)
- All piping lengths and distances have been taken into consideration (For requirements of piping length for the refrigerant piping, refer to the outdoor unit installation manual).

Requirement	Value
Maximum allowable distance between the domestic hot water tank and the indoor unit (only for installations with domestic hot water tank).	10 m

If the installation is equipped with a domestic hot water tank (optional), please refer to the domestic hot water tank installation manual.

- Take care that in the event of a water leak, water cannot cause any damage to the installation space and surroundings.
- The installation location is frost-free.
- Be sure that sufficient precautions are taken, in accordance with the applicable legislation, in case of refrigerant leakage.
- When installing the unit in a small room, take measures in order to keep the refrigerant concentration from exceeding allowable safety limits in the event of a refrigerant leak.

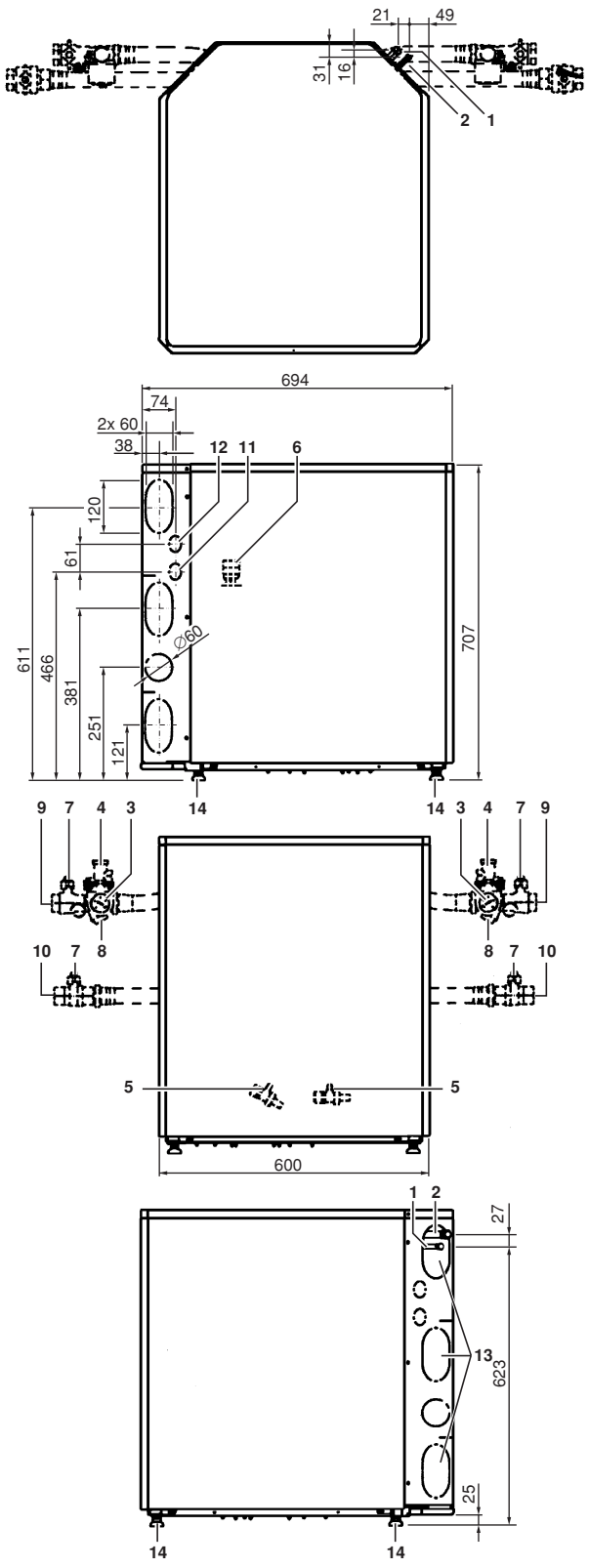
WARNING

Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency.

- Do not climb, sit or stand on top of the unit.
- Do not place any objects or equipment on top of the unit (top plate).
- Do not install the unit in places often used as workplace. In case of construction works, where a lot of dust is created, the unit must be covered.
- Do not install the unit in places with high humidity (e.g. bathroom) (max humidity (RH)=85%).

6.2. Dimensions and service space

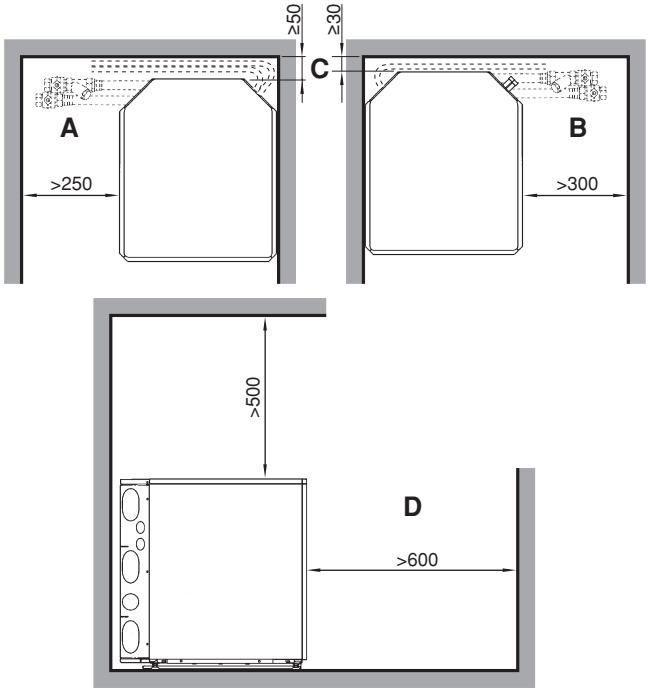
Dimensions of the unit



Unit of measurement: mm

1	Refrigerant gas pipe connection Ø15.9 solder (R410A)
2	Refrigerant liquid pipe connection Ø9.5 solder (R410A)
3	Pressure gauge
4	Blow off valve
5	Drain valve water circuit
6	Air purge
7	Shut-off valves
8	Water filter
9	Water in connection G1"1/4 (female)
10	Water out connection G1"1/4 (female)
11	Control wiring intake (knock-out hole Ø37)
12	Power supply wiring intake (knock-out hole Ø37)
13	Knock-out hole for refrigerant piping and water piping
14	Levelling feet

Service space of the unit



Unit of measurement: mm

A	Left installation (top view)
B	Right installation (top view)
C	Space required for refrigerant piping (in case of left installation) and electrical wiring
D	Space required for switch box removal

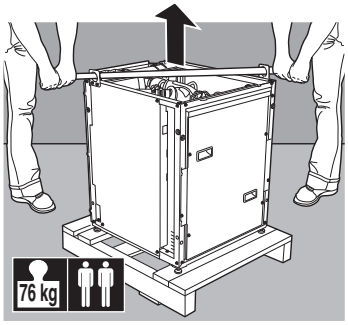
6.3. Inspecting, handling and unpacking the unit

- At delivery, the unit must be checked and any damage must be reported immediately to the carrier's claims agent.
- Bring the unit as close as possible to its final installation position in its original package to prevent damage during transport.
- Unpack the indoor unit completely according to the instructions mentioned on the unpacking instructions sheet.
- Check if all indoor unit accessories (see "4. Accessories" on page 9) are enclosed.

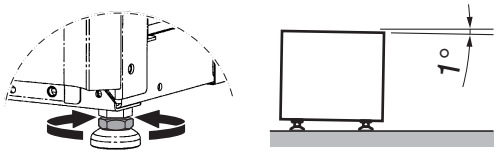
WARNING

Tear apart and throw away plastic packaging bags so that children will not play with them. Children playing with plastic bags face danger of death by suffocation.

- Place the unit in the appropriate installation location.
  The weight of the unit is approximately 76 kg. At least two persons are required to lift the unit.
  Use the plates delivered with the unit to lift the unit.



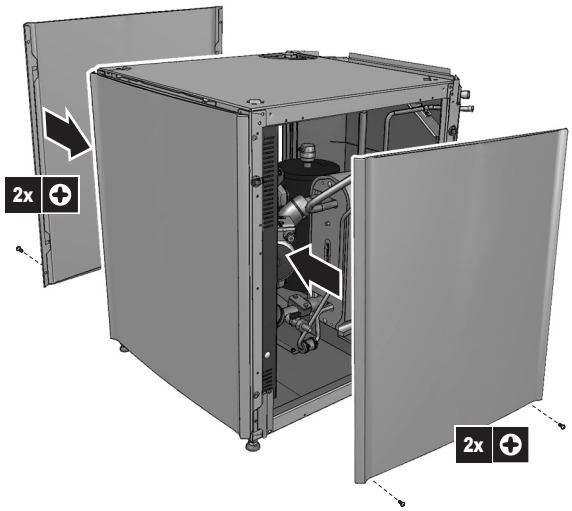
- Level the unit to a stable position using the levelling feet. The maximum allowed deviation from a horizontal position is 1°.



- Standard installation location of the optional domestic hot water tank is on top of the indoor unit.

  If available service space to left and/or right side is limited, carefully consider all tank module installation steps first.

- Fix the side plates with the appropriate screws.



- Close the decoration panel(s) which will be on the wall side and for which fixation is not possible anymore after the unit is put on its final location.

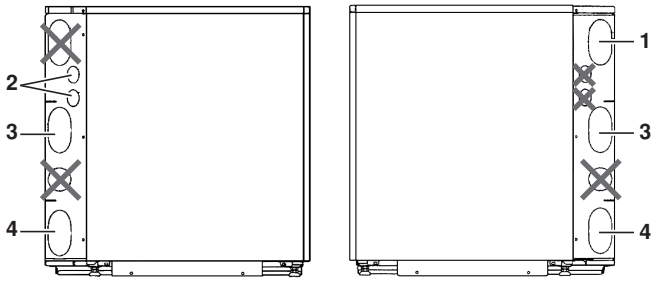
6.4. Installing the unit

Preparations before installation on final installation place

After unpacking the unit and before installing the unit on its final installation position, following preparations need to be done:

- Open the unit
  Refer to the "5.1. Opening the unit" on page 9.
- Knock out the needed knockout holes.
  This installation instruction consists of installation of
  - refrigerant piping,
  - water piping and
  - electrical wiring.

  For each of these a dedicated knock out hole is foreseen at the backside of the unit:

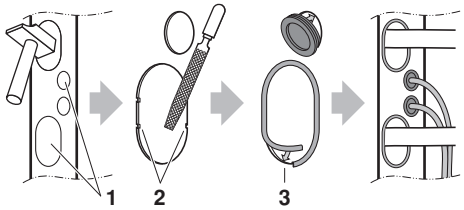


1 Knock out hole for refrigerant piping
2 Knock out hole for electrical wiring
3 Knock out hole for water inlet piping
4 Knock out hole for water outlet piping
A Left installation
B Right installation

NOTICE

- Knockout holes are foreseen at both sides of the unit. Pay attention to knock out the correct holes depending on your installation location.
- Refrigerant piping and water piping must go through different knockout holes.
- The electrical wiring must always enter the unit at the upper knockout holes at the left side of the unit (see the figure above).

To punch a knockout hole, punch it with a hammer, remove all burrs and install the supplied grommets (see "4. Accessories" on page 9).



1 Knockout hole
2 Burr
3 Grommet

- Take out all accessories from the indoor unit.
  The flexible water piping, valves, accessory bag, and remote controller kit are located behind the back plate.

6.5. Refrigerant piping work

WARNING

Installation shall be done by an installer, the choice of materials and installation shall comply with the applicable legislation. In Europe the EN378 is the applicable standard that shall be used.

For all guidelines, instructions and specifications regarding refrigerant piping work between the indoor unit and the outdoor unit, please refer to the outdoor unit installation manual.

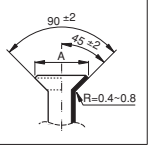
NOTICE

Before brazing protect the inside of the unit against damage caused by the flame when brazing.

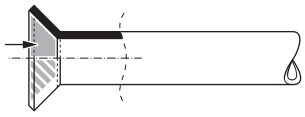
It is not needed to take out the back plate for the installation.

Guidelines for flare connection

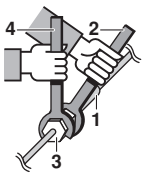
- Flares should not be re-used. New ones should be made in order to prevent leaks.
- Use a pipe cutter and flare tool suitable for the refrigerant used.
- Only use the annealed flare nuts included with the unit. Using different flare nuts may cause the refrigerant to leak.
- Please refer to the table for flaring dimensions and tightening torques (too much tightening will result in splitting the flare).

Piping size (mm)	Tightening torque (N·m)	Flare dimensions A (mm)	Flare shape (mm)
Ø9.5	33~39	12.8~13.2	
Ø15.9	63~75	19.4~19.7	

- When connecting the flare nut, coat the flare inner surface with ether oil or ester oil and initially tighten 3 or 4 turns by hand before tightening firmly.



- When loosening a flare nut, always use two wrenches together. When connecting the piping, always use a spanner and torque wrench together to tighten the flare nut to prevent flare nut cracking and leaks.



1 Piping union
2 Spanner
3 Flare nut
4 Torque wrench

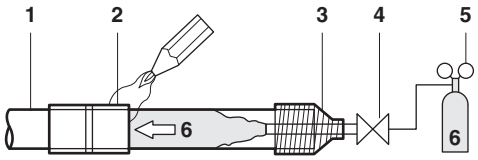
Not recommended, but in case of emergency
Should you be forced to connect the piping without a torque wrench, follow the following installation method:

- Tighten the flare nut using a spanner until the tightening torque suddenly increases.
- From that position further tighten the flare nut the angle listed below:

Piping size (mm)	Further tightening angle (degrees)	Recommended arm length of spanner (mm)
Ø9.5	60~90	±200
Ø15.9	30~60	±300

Caution for brazing.

- Make sure to blow through with nitrogen when brazing.
  Blowing through with nitrogen prevents the creation of large quantities of oxidized film on the inside of the piping. An oxidized film adversely affects valves and compressors in the refrigerating system and prevents proper operation.
- The nitrogen pressure should be set to 0.02 MPa (i.e., just enough so it can be felt on the skin) with a pressure-reducing valve.



1 Refrigerant piping
2 Part to be brazed
3 Taping
4 Hands valve
5 Pressure-reducing valve
6 Nitrogen

- Do not use anti-oxidants when brazing the pipe joints. Residue can clog pipes and break equipment.
- Do not use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (BCuP) which does not require flux.
- Flux has an extremely harmful influence on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will deteriorate the refrigerant oil.

6.6. Water Piping

The unit is equipped with a water inlet and water outlet for connection to a water circuit. This circuit must be provided by an installer and must comply with the applicable legislation.

NOTICE

The unit is only to be used in a closed water system. Application in an open water circuit can lead to excessive corrosion of the water piping.

6.7. General precautions concerning water circuit

Before continuing the installation of the unit, check the following points:

- The maximum water pressure is 4 bar.
- The maximum water temperature is 65°C.
- Provide adequate safeguards in the water circuit to be sure that the water pressure will never exceed the maximum allowable working pressure (4 bar).
- Shut-off valves from flexible hoses delivered with the unit should be installed so that normal servicing can be accomplished without draining the system.
- Drain taps must be provided at all low points of the system to permit complete drainage of the circuit during maintenance or service to the unit. A drain valve is provided in the unit to drain the water from the unit water system.

If air, moisture or dust gets in the water circuit, problems may occur. Therefore, always take into account the following when connecting the water circuit:

- Use clean pipes only.
- Hold the pipe end downwards when removing burrs.
- Cover the pipe end when inserting it through a wall so that no dust and dirt enter.
- Use a good thread sealant for the sealing of the connections.
- When using non-brass metallic piping, make sure to insulate both materials from each other to prevent galvanic corrosion.
- Because brass is a soft material, use appropriate tooling for connecting the water circuit. Inappropriate tooling will cause damage to the pipes.
- Select piping diameter in relation to required water flow and available external static pressure of the pump.
- The minimum required water flow for the indoor unit operation is 16 l/min. When the water flow is lower than this minimum value, flow error 7H will be displayed and the operation of the indoor unit will be stopped.

WARNING

It is strongly recommended to install an additional filter on the heating water circuit. Especially to remove metallic particles from the field heating piping, it is advised to use a magnetic or cyclone filter which can remove small particles. Small particles can damage the unit and will not be removed by the standard filter of the heat pump unit.

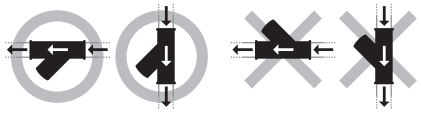
Precautions when connecting field piping and regarding insulation

The complete water circuit, inclusive all piping, must be insulated to prevent reduction of the heating capacity.

If the indoor ambient temperature is higher than 30°C and the humidity is higher than RH 80% then the thickness of the insulation materials should be at least 20 mm in order to avoid condensation on the surface of the insulation.

NOTICE

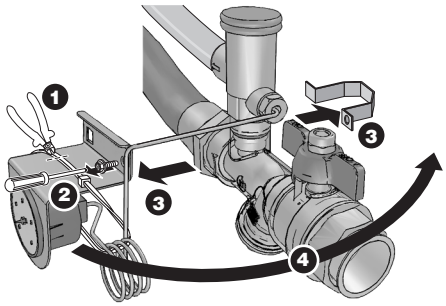
- Consider carefully the installation location of the flexible water inlet pipe.
- According to the direction of the water flow, the water filter must be positioned as shown in the figure.

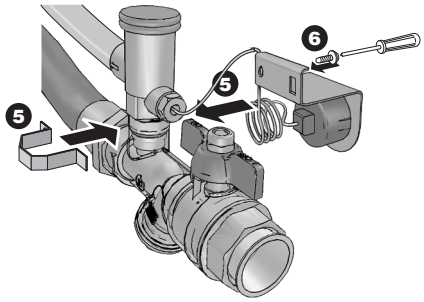


- Provide sufficient space allowing easy access to clean the water filter and regular operation check of the safety valve.
- Provide a flexible hose for pressure relief valve blow-off (field supply).
- Consider to support the water inlet pipe and water outlet pipe so not to stress the field piping.

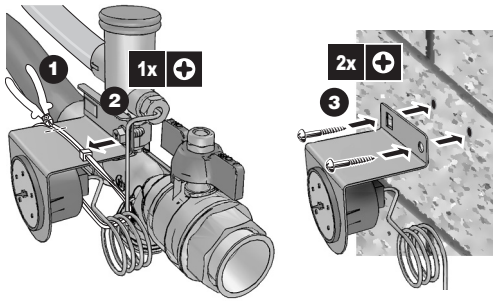
It is very important to keep good visibility of the manometer. The position of the manometer can be changed as shown in the figure below. Make sure that the capillary tube does not come in contact with sharp edges and prevent bending of the capillary tube as much as possible.

- Change the position of the manometer when piping is on the left side of the unit





- Mounting of the manometer against a wall (the 2 screws are field supply).



Checking the water volume and expansion vessel pre-pressure

The unit is equipped with an expansion vessel of 10 litre which has a default pre-pressure of 1 bar.

To assure proper operation of the unit, the pre-pressure of the expansion vessel might need to be adjusted and the minimum and maximum water volume must be checked.

1 Check that the total water volume in the installation, excluding the internal water volume of the indoor unit, is 20 l minimum. Refer to "Technical specifications" on page 44 to know the internal water volume of the indoor unit.

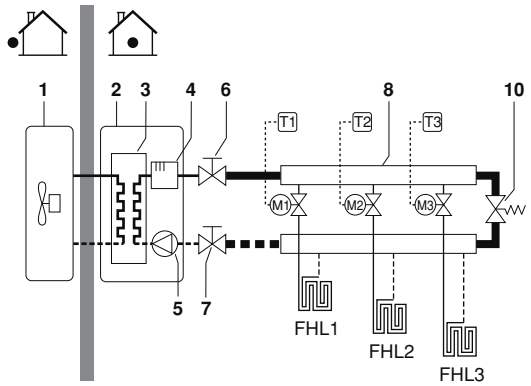
In most applications this minimum water volume will have a satisfying result.

In critical processes or in rooms with a high heat load though, extra water volume might be required.

NOTICE

When circulation in each space heating loop is controlled by remotely controlled valves, it is important that this minimum water volume is kept even if all the valves are closed.

Example



1	Outdoor unit
2	Indoor unit
3	Heat exchanger
4	Backup heater
5	Pump
6	Shut-off valve
7	Shut-off valve
8	Collector (field supply)
10	By-pass valve (field supply
FHL1...3	Floor heating loop (field supply)
T1...3	Individual room thermostat (optional)
M1...3	Individual motorised valve to control loop FHL1...3 (field supply)

2 Using the table below, determine if the expansion vessel pre-pressure requires adjustment and determine if the total water volume in the installation is below the maximum allowed water volume.

Installation height difference[(a)]	Water volume	
	≤280 l	>280 l
≤7 m	No pre-pressure adjustment required.	Actions required: • pre-pressure must be decreased, calculate according to "Calculating the pre-pressure of the expansion vessel" on page 16 • check if the water volume is lower than maximum allowed water volume (use graph below)
>7 m	Actions required: • pre-pressure must be increased, calculate according to "Calculating the pre-pressure of the expansion vessel" on page 16 • check if the water volume is lower than maximum allowed water volume (use graph below)	Expansion vessel of the unit too small for the installation.

(a) Installation height difference: height difference (m) between the highest point of the water circuit and the indoor unit. If the indoor unit is located at the highest point of the installation, the installation height is considered 0 m.

6.8. Charging water

- During filling, it might not be possible to remove all air in the system. Remaining air will be removed through the automatic air purge valves during first operating hours of the system. Additional filling with water afterwards might be required.
- The water pressure indicated on the manometer will vary depending on the water temperature (higher pressure at higher water temperature).
  However, at all times water pressure shall remain above 1 bar to avoid air entering the circuit.
- The unit might dispose some excessive water through the pressure relief valve.
- Water quality must be according to EU directive 98/83 EC.

Calculating the pre-pressure of the expansion vessel

The pre-pressure (Pg) to be set depends on the maximum installation height difference (H) and is calculated as below:

Pg=(H/10+0.3) bar

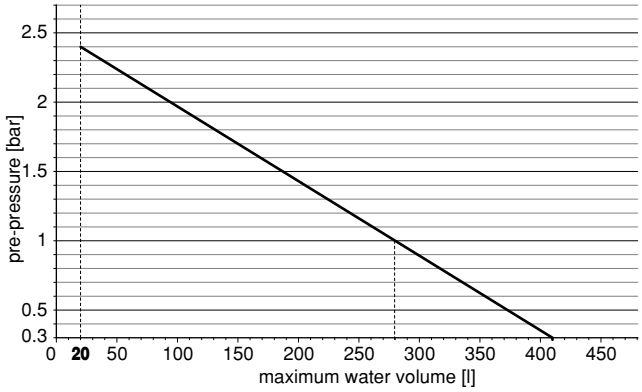
Checking the maximum allowed water volume

To determine the maximum allowed water volume in the entire circuit, proceed as follows:

1 Determine for the calculated pre-pressure (Pg) the corresponding maximum water volume using the graph below.

2 Check that the total water volume in the entire water circuit is lower than this value.

If this is not the case, the expansion vessel inside the indoor unit is too small for the installation.



pre-pressure	=	pre-pressure
maximum water volume	=	maximum water volume

Example 1

The indoor unit is installed 5 m below the highest point in the water circuit. The total water volume in the water circuit is 100 l.

In this example, no action or adjustment is required.

Example 2

The indoor unit is installed at the highest point in the water circuit. The total water volume in the water circuit is 350 l.

Result:

- Since 350 l is higher than 280 l, the pre-pressure must be decreased (see table above).
- The required pre-pressure is: Pg=(H/10+0.3) bar=(0/10+0.3) bar=0.3 bar
- The corresponding maximum water volume can be read from the graph: approximately 410 l.
- Since the total water volume (350 l) is below the maximum water volume (410 l), the expansion vessel suffices for the installation.

Setting the pre-pressure of the expansion vessel

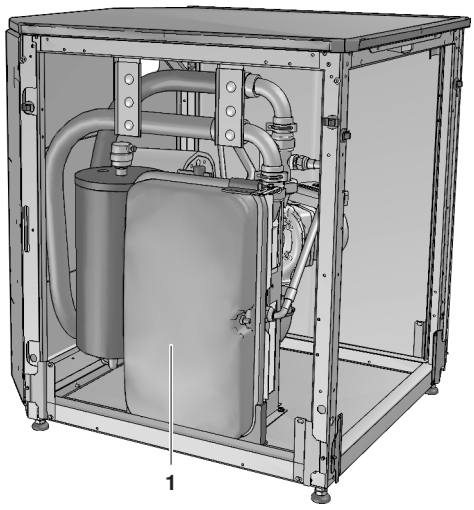
When it is required to change the default pre-pressure of the expansion vessel (1 bar), keep in mind the following guidelines:

- Use only dry nitrogen to set the expansion vessel pre-pressure.
- Inappropriate setting of the expansion vessel pre-pressure will lead to malfunction of the system. Therefore, the pre-pressure should only be adjusted by a licensed installer.

To set the pre-pressure, the expansion vessel needs to be accessed from the front or from the left.

Accessing the expansion vessel:

- Remove the front and left decoration panels, refer to "5.1. Opening the unit" on page 9.
- Remove the switch box, refer to "Removing the switch box" on page 40.



1 Expansion vessel

Charging water

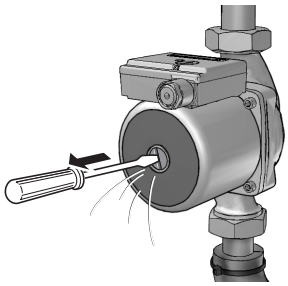
1 Connect the water supply to a drain and fill valve (see "5.2. Main components in the unit" on page 9).

2 Make sure the automatic air purge valve is open (at least 2 turns).

3 Fill with water until the manometer indicates a pressure of approximately 2.0 bar. Remove air in the circuit as much as possible using the air purge valves. Air present in the water circuit might cause malfunctioning of the backup heater.

NOTICE

If air purge problems occur due to air in the suction side of the pump, then air can be removed by temporarily unscrewing the nut in the head of the pump as indicated in the figure.



7. Electrical wiring work

7.1. Precautions on electrical wiring work

WARNING: Electrical installation

All field wiring and components must be installed by an installer and must comply with the applicable legislation

NOTICE: Electrical wiring work recommendations.

To persons in charge of electrical wiring work:
Do not operate the unit until the refrigerant piping is complete. Running the unit before the piping is ready will break the compressor.

DANGER: ELECTRICAL SHOCK

See "2. General safety precautions" on page 2.

WARNING

- A main switch or other means for disconnection, having a contact separation in all poles, must be incorporated in the fixed wiring in accordance with the applicable legislation.
- Use only copper wires.
- All field wiring must be carried out in accordance with the wiring diagram supplied with the unit and the instructions given below.
- Never squeeze bundled cables and be sure that it does not come in contact with the non-insulated piping and sharp edges. Be sure no external pressure is applied to the terminal connections.
- Power supply wires must be attached securely.
- If the power supply has a missing or wrong N-phase, equipment will break down.
- Be sure to establish an earth. Do not earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock.
- Be sure to install an earth leakage protector in accordance with the applicable legislation. Failure to do so may cause electric shock or fire.
- Be sure to use a dedicated power circuit, never use a power supply shared by another appliance.
- Be sure to install the required fuses or circuit breakers.

7.2. Internal wiring - Parts table

Refer to the internal wiring diagram supplied with the unit (on the inside of the indoor unit switch box cover). The abbreviations used are listed below.

A1P.....Main PCB
A2P.....User interface
A3P (EKRTW/R).....Thermostat (PC=internal Power Cicuit) (optional)
A3P (EKSR3PA).....Solar pump station PCB (optional)
A4P (EKRP1HB).....Digital I/O PCB (optional)
A4P (EKRTR).....Receiver PCB (optional)
BSK (EKSR3PA).....Solar pump station relay (optional)
E1H,E2H,E3H.....Backup heater element
F1B,F3B.....Fuse backup heater
F1T.....Thermal fuse backup heater
FU1.....Fuse 3.15 A T 250 V for PCB
FU2.....Fuse 5 A T 250 V
FuR,FuS.....Fuse 5 A 250 V for digital I/O PCB
K1M,K2M.....Contactor backup heater step
K4M.....Pump relay
K5M,K6M.....Contactor for backup heater all pole disconnection
M1P.....Pump
M2S.....2-way valve for cooling mode (field supply)
M3S.....3-way valve: floor heating/domestic hot water
PHC1.....Optocoupler input circuit
Q1DI,Q2DI.....Earth leakage circuit breaker (field supply)
Q1L.....Thermal protector backup heater
R1H (EKRTR).....Humidity sensor (optional)
R1T (EKRTW).....Ambient sensor (optional)
R1T.....Outlet water heat exchanger thermistor
R2T (EKRTETS).....External sensor (floor or ambient) (optional)
R2T.....Outlet water backup heater thermistor
R3T.....Refrigerant liquid side thermistor
R4T.....Inlet water thermistor
R5T.....Domestic hot water thermistor
S1L.....Flow switch
S2S.....Benefit kWh rate power supply contact
S3S.....Dual set point 2 contact
S4S.....Dual set point 1 contact
SS1.....DIP switch
TR1.....Transformer 24 V for PCB
V1S,V2S.....Spark suppression 1, 2
X1M~X9M.....Terminal strip
L.....Live
N.....Neutral
.....Field wiring
.....Terminal strip
.....Connector
.....Terminal
.....Protective earth
BLK.....Black
BLU.....Blue
BRN.....Brown
GRN.....Green
GRY.....Grey
ORG.....Orange
PNK.....Pink
RED.....Red
VIO.....Violet
WHT.....White
YLW.....Yellow

NOTES

1 THIS WIRING DIAGRAM ONLY APPLIES TO THE INDOOR UNIT

2 USE A DEDICATED POWER CIRCUIT FOR THE BACKUP HEATER. NEVER USE A POWER CIRCUIT SHARED BY OTHER APPLIANCE.

3 NO/NC: NORMAL OPEN/NORMAL CLOSED
SPST: SINGLE POLE SINGLE THROW

5 DO NOT OPERATE THE UNIT BY SHORT-CIRCUITING ANY PROTECTION DEVICE

8 FOR EKSOLHTBV1, REFER TO OPTION MANUAL

9 MAXIMUM LOAD: 0.3 A - 250 V AC
MINIMUM LOAD: 20 mA - 5 V DC

10 230 V AC OUTPUT
MAXIMUM LOAD: 0.3 A

11 FOR BENEFIT kWh RATE POWER SUPPLY INSTALLATION: REFER TO INSTALLATION MANUAL

WIRING DEPEND ON MODEL	Wiring depend on model
OPTION	Option
FIELD WIRING	Field wiring
PCB	PCB
WIRE COLOUR	Wire colour
Electric heater fuse	Electric heater fuse
POWER SUPPLY	Power supply
OUTDOOR UNIT	Outdoor unit
POSITION IN SWITCH BOX	Position in switch box
Only for *** option	Only for *** option
Only for *** model	Only for *** model
Only for EKBPHT and depending on model	Only for EKBPHT and depending on model
Only for benefit kWh rate power supply installation: use normal kWh rate power supply for indoor unit	Only for benefit kWh rate power supply installation: use normal kWh rate power supply for indoor unit
Indoor power supply from outdoor (standard)	Indoor power supply from outdoor (standard)
User interface	User interface
Outside unit	Outside unit
Change-over to boiler output	Change-over to boiler output
Solar pump connection	Solar pump connection
Alarm output	Alarm output
Solar input	Solar input
Cooling/heating on/off output	Cooling/heating on/off output
Dual set point application (refer to installation manual)	Dual set point application (refer to installation manual)
See note ***	See note ***

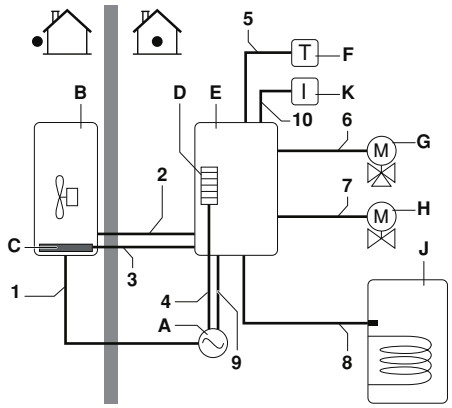
7.3. Field wiring

WARNING

- Switch off the power supply before making any connections.
- All field wiring and components must be installed by a licensed electrician and must comply with relevant European and national regulations.

Overview

The illustration below gives an overview of the required field wiring between several parts of the installation. Refer also to "3.5. Typical application examples" on page 4.



A Single power supply for outdoor unit, backup heater
B Outdoor unit
C Bottom plate heater EKBPHT(1)
D Backup heater
E Indoor unit
F Room thermostat (optional)
G 3-way valve for domestic hot water tank (optional)
H 2-way valve for cooling mode (field supply)
J Domestic hot water tank (optional)
K User interface (digital controller)

Item	Description	Required number of conductors	Maximum running current
1	Power supply cable for outdoor unit	2+GND or 3+GND	(a)
2	Indoor unit power supply and communication cable	3+GND	(b)
3	Power cable for bottom plate heater	2	(c)
4	Power supply cable for backup heater	2+GND or 3+GND	(d)
5	Room thermostat cable	3 or 4	100 mA(c)
6	3-way valve control cable	3+GND	100 mA(c)
7	2-way valve control cable	2+GND	100 mA(c)
8	Thermistor cable	2	(e)
9	Benefit kWh rate power supply cable (voltage free contact)	2	(f)
10	User interface cable	2	(g)

(a) Refer to nameplate on outdoor unit.
(b) Cable section 2.5 mm^2
(c) Minimum cable section 0.75 mm^2
(d) See table under "Connection of the backup heater power supply" on page 21.
(e) The thermistor and connection wire (12 m) are delivered with the domestic hot water tank.
(f) Cable section 0.75 mm^2 till 1.25 mm^2, maximum length: 50 m.
Voltage free contact shall ensure the minimum applicable load of 15 V DC, 10 mA.
(g) Cable section 0.75 mm^2 till 1.25 mm^2, maximum length: 500 m.

(1) Bottom plate heater is only applicable in combination with ERLQ or in case of optional EKBPHT kit.

CAUTION

Select all cables and wire sizes in accordance with relevant local and national regulations.

WARNING

After finishing the electric work, confirm that each electric part and terminal inside the electric parts box is connected securely.

Field wiring guidelines

- Most field wiring on the indoor unit side is to be made on the terminal block inside the switch box. To gain access to the terminal block, remove the indoor unit cover.

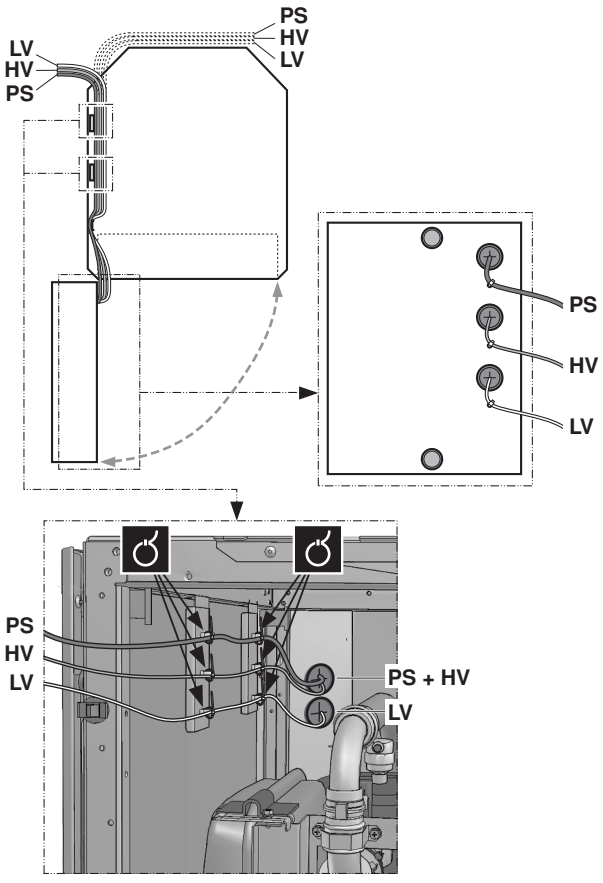
  WARNING

  Switch off all power supply – i.e. outdoor unit power supply and backup heater – before removing the switch box service panel.

- A dedicated power circuit is required for the backup heater.
- Take out the switchbox and put it in front of the unit and open the switchbox cover. Refer to "6.1. Selecting an installation location" on page 11.

  When installing field supply or option cables, always make sure that the switchbox is placed before the unit. This will make it possible to remove the switchbox easily during service.

Route the wires into the unit as follows:



PS Power supply
HV High voltage
LV Low voltage

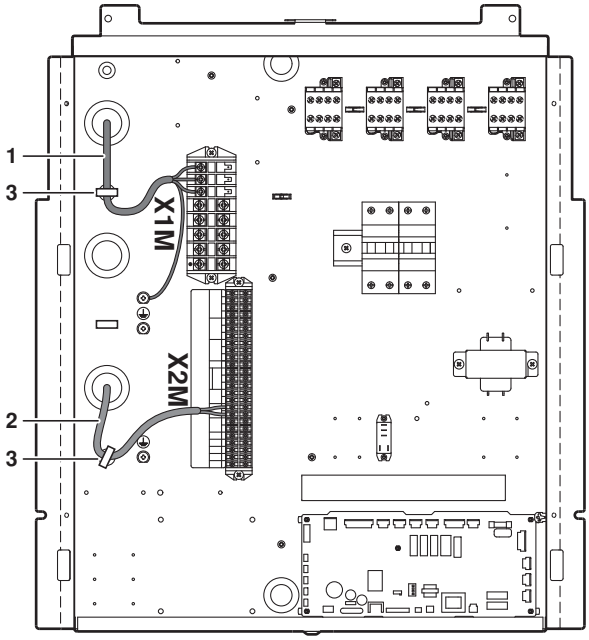
To avoid electric noise problems, be sure that cables are put in the correct bundle as mentioned on the figure.
Be sure to fix the cable with cable ties to the cable tie mountings to ensure strain relief and to make sure that it does not come in contact with the piping and sharp edges.

CAUTION

Do not push or place redundant cable length in the unit.

7.4. Connection

Use the appropriate cables, connect the power supply and user interface wiring to the appropriate terminals as shown below.



1 Power supply
2 User interface wiring
3 Stress relief

Refer also to the wiring diagram for further details.

For the connections of optional PCB's please refer to the respective installation manual.

Connection of the indoor unit power supply and communication cable

Power circuit and cable requirements

Power supply for the indoor unit is to be provided through the outdoor unit. Data communication with the outdoor unit is provided through the same cable.

For all guidelines and specifications regarding field wiring between the indoor unit and the outdoor unit, please refer to the outdoor unit installation manual.

Procedure

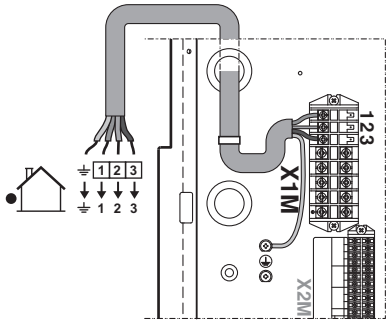
1 Using the appropriate cable, connect the power circuit to the appropriate terminals as shown on the wiring diagram and the illustration below.

2 Connect the earth conductor (yellow/green) to the earthing screw on the switch box mounting plate.

3 Fix the cable with cable ties to the cable tie mountings to ensure strain relief.

4 When routing out cables, make sure that these do not obstruct mounting of the indoor unit cover.

Note: only relevant field wiring is shown.



Connection of the backup heater power supply

Power circuit and cable requirements

CAUTION

Use a dedicated power circuit for the backup heater. Never use a power circuit shared by another appliance.

This power circuit must be protected with the required safety devices according to local and national regulations.

Select the power cable in accordance with relevant local and national regulations. For the maximum running current of the backup heater, refer to the table below.

Indoor unit model	Backup heater capacity	Backup heater nominal voltage	Maximum running current	Z_{max} (Ω)
EKHVH016BB6V3[a][b]	6 kW	1x 230 V	26 A	0.29
EKHVH016BB6WN	6 kW	3x 400 V	8.6 A	—
EKHVH016BB9WN	9 kW	3x 400 V	13 A	—

(a) Equipment complying with EN/IEC 61000-3-12(1)
(b) This equipment complies with EN/IEC 61000-3-11(2) provided that the system impedance Z_{sys} is less than or equal to Z_{max} at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a system impedance Z_{sys} less than or equal to Z_{max}.

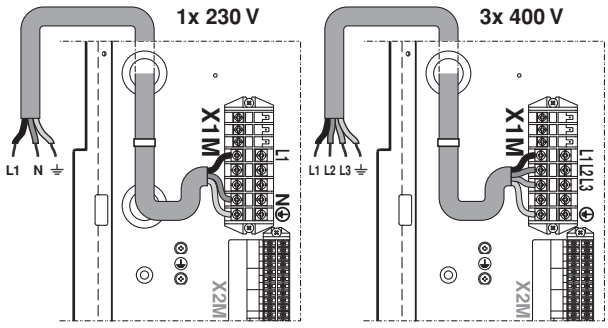
Procedure

1 Using the appropriate cable, connect the power circuit to the main circuit breaker as shown on the wiring diagram and the illustration below.

2 Connect the earth conductor (yellow/green) to the earthing screw on the X1M terminal.

3 Fix the cable with cable ties to the cable tie mountings to ensure strain relief.

Note: only relevant field wiring is shown.



Connection of the thermostat cable

Connection of the thermostat cable depends on the application.

See also "3.5. Typical application examples" on page 4 and "8.2. Room thermostat installation configuration" on page 24 for more information and configuration options on pump operation in combination with a room thermostat.

Thermostat requirements

- Power supply: 230 V AC or battery operated
- Contact voltage: 230 V.

Procedure

1 Connect the thermostat cable to the appropriate terminals as shown on the wiring diagram and installation manual of the room thermostat kit.

2 Fix the cable with cable ties to the cable tie mountings to ensure strain relief.

3 Set DIP switch SS2-3 on the PCB to ON. See "8.2. Room thermostat installation configuration" on page 24 for more information.

Connection of the first set point and second set point contacts

The connection of the set point contact is only relevant in case dual set point contact is enabled.

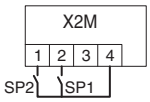
See also "3.5. Typical application examples" on page 4 and "[7] Dual set point control" on page 30.

Contact requirements

The contact shall be a voltage free contact that ensure 230 V (100 mA).

Procedure

1 Connect the contact of first set point and second set point to the appropriate terminals as shown in the figure below



SP1 First set point contact
SP2 Second set point contact

2 Fix the cables with cable ties to the cable tie mountings to ensure strain relief.

3 Depending on the required pump operation set DIP switch SS2-3 and field setting [F-00]. See "8.3. Pump operation configuration" on page 24 and field setting [F-00] in "[F] Option setup" on page 34.

(1) European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤75 A per phase.
(2) 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 ≤75 A.

Connection of the valve control cables

Valve requirements

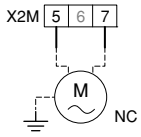
- Power supply: 230 V AC
- Maximum running current: 100 mA

Wiring the 2-way valve

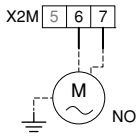
1 Using the appropriate cable, connect the valve control cable to the X2M terminal as shown on the wiring diagram.

> **NOTICE**
>
> Wiring is different for a NC (normal closed) valve and a NO (normal open) valve. Make sure to connect to the correct terminal numbers as detailed on the wiring diagram and illustrations below.

Normal closed (NC) 2-way valve



Normal open (NO) 2-way valve



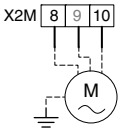
2 Fix the cable(s) with cable ties to the cable tie mountings to ensure strain relief.

Wiring the 3-way valve

1 Using the appropriate cable, connect the valve control cable to the appropriate terminals as shown on the wiring diagram.

The "SPST 3-wire" type 3-way valve is included in the EKHTS option. The 3-way valve should be fitted as such that when terminal ports 9 and 10 are electrified, the domestic hot water circuit is selected.

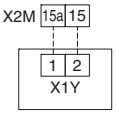
"SPST 3-wire" valve



2 Fix the cable(s) with cable ties to the cable tie mountings to ensure strain relief.

Wiring the bottom plate heater

1 Using the appropriate cable, connect the power supply cable to the appropriate terminals as shown on the wiring diagram below.



bottom plate heater

2 Fix the cable(s) with cable ties to the cable tie mountings to ensure strain relief.

3 When routing out cables, make sure that these do not obstruct mounting of the indoor unit cover.

4 Select the appropriate field setting values for the bottom plate heater. See "[F-02]", "[F-03]", and "[F-04]" on page 34.

Connection to a benefit kWh rate power supply

Electricity companies throughout the world work hard to provide reliable electric service at competitive prices and are often authorized to bill clients at benefit rates. E.g. time-of-use rates, seasonal rates, Wärmepumpentarif in Germany and Austria, ...

This equipment allows for connection to such benefit rate power supply delivery systems.

Consult with the electricity company acting as provider at the site where this equipment is to be installed to know whether it is appropriate to connect the equipment in one of the benefit kWh rate power supply delivery systems available, if any.

When the equipment is connected to such benefit kWh rate power supply, the electricity company is allowed to:

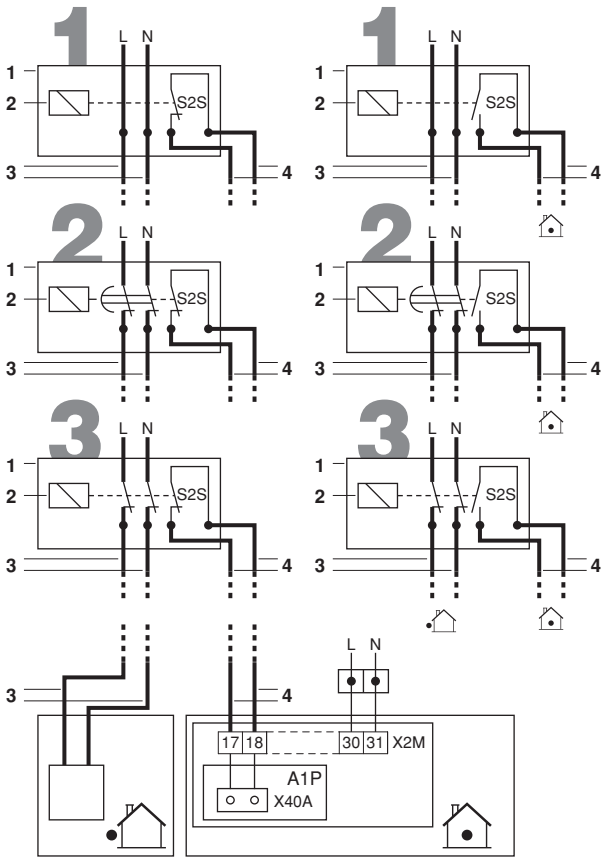
- interrupt power supply to the equipment for certain periods of time;
- demand that the equipment only consumes a limited amount of electricity during certain periods of time.

The indoor unit is designed to receive an input signal by which the unit switches into forced off mode. At that moment, the outdoor unit compressor will not operate.

Possible types of benefit kWh rate power supply

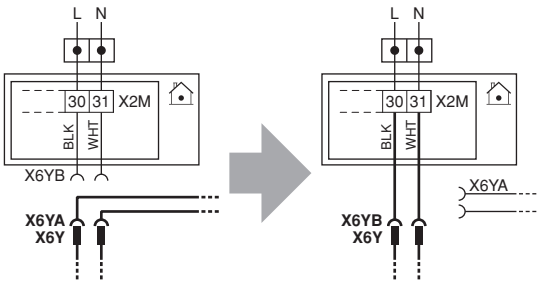
Possible connections and requirements to connect the equipment to such power supply are illustrated in the figure below:

[D-01]=1 **[D-01]=2**



1 Benefit kWh rate power supply box
2 Receiver controlling the signal of the electricity company
3 Power supply to outdoor unit (refer to the installation manual delivered with the outdoor unit)
4 Voltage free contact to indoor unit

Disconnect terminal X6YA from X6Y and connect X6YB to X6Y.



When the outdoor unit is connected to a benefit kWh rate power supply, the voltage free contact of the receiver controlling the benefit kWh rate signal of the electricity company must be connected to clamps 17 and 18 of X2M (as illustrated in the figure above).

When parameter [D-01]=1 at the moment that the benefit kWh rate signal is sent by the electricity company, that contact will open and the unit will go in forced off mode(1).

When parameter [D-01]=2 at the moment that the benefit kWh rate signal is sent by the electricity company, that contact will close and the unit will go in forced off mode(2).

Type 1

This type of benefit kWh rate power supply is not interrupted.

Type 2

This type of benefit kWh rate power supply is interrupted after elapse of time.

Type 3

This type of benefit kWh rate power supply is interrupted immediately.

- In case the benefit kWh rate power supply function is enabled, the screed dry-out function can not be enabled.
- When connecting the equipment to a benefit kWh rate power supply, change field setting [D-01]. In case the benefit kWh rate power supply is of the type that power supply is not interrupted (like illustrated above as type 1) change both field settings [D-01] and [D-00]. Refer to "[D] Benefit kWh rate power supply/Local shift value weather dependent" on page 33 of chapter "Field settings".
- If the benefit kWh rate power supply is of the type that power supply is not interrupted, the unit will be forced to off. Controlling the solar pump is still possible.
  When the benefit kWh rate signal is sent, the centralised control indicator will flash to indicate that the benefit kWh rate is active.

(1) When the signal is released again, the voltage free contact will close and the unit will restart operation. It is therefore important to leave the auto restart function enabled. Refer to "[3] Auto restart" on page 28.
(2) When the signal is released again, the voltage free contact will open and the unit will restart operation. It is therefore important to leave the auto restart function enabled. Refer to "[3] Auto restart" on page 28.

Installation and connection of the remote controller

The unit is equipped with a remote controller offering user-friendly way to set up, use and maintain the unit. Before operating the remote controller, follow this installation procedure.

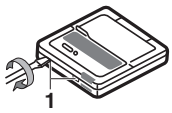
The wiring for connection is not included.

NOTICE

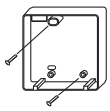
The remote controller, delivered in a kit, has to be mounted indoors.

1 Remove the front part of the remote controller.

Insert a slotted screwdriver into the slots (1) in the rear part of the remote controller, and remove the front part of the remote controller.



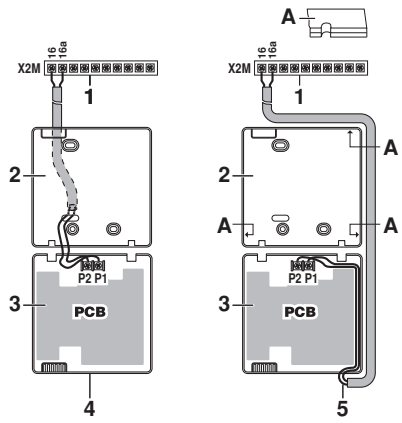
2 Fasten the remote controller on a flat surface.



Be careful not to distort the shape of the lower part of the remote controller by over tightening the mounting screws.

3 Wire the unit.

Wired from the back / Wired from the sides

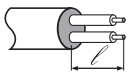


1 Unit
2 Rear part of the digital controller
3 Front part of the digital controller
4 Wired from the rear
5 Wired from the top
A When wired from the sides, notch the part for he wiring to pass through with nippers

Connect the terminals on top of the front part of the remote controller and the terminals inside the unit (P1 to X2M: 16, P2 to X2M: 16a).

NOTICE

Peel the shield for the part that has to pass through the inside of the remote controller case ( ).

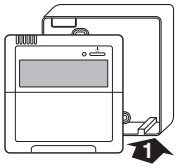


4 Reattach the upper part of the remote controller.

NOTICE

Be careful not to pinch the wiring when attaching.

First begin fitting from the clips at the bottom.



8. START-UP AND CONFIGURATION

The indoor unit should be configured by the installer to match the installation environment (outdoor climate, installed options, etc.) and user expertise.

ATTENTION

It is important that **all** information in this chapter is read sequentially by the installer and that the system is configured as applicable.

DANGER: ELECTRIC SHOCK

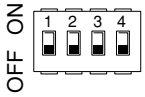
See "2. General safety precautions" on page 2.

8.1. DIP switch settings overview

DIP switch SS2 is located on the switch box PCB (see "5.3. Switch box main components" on page 10) and allows configuration of domestic hot water tank installation, room thermostat connection and pump operation.

WARNING

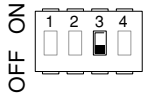
Switch off the power supply before opening the switch box service panel and making any changes to the DIP switch settings.



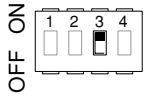
DIP switch SS2	Description	ON	OFF
1	Not applicable for installer	—	(Default)
2	Domestic hot water tank installation (see "8.4. Domestic hot water tank installation configuration" on page 25)	Installed	Not installed (Default)
3	Room thermostat connection (see "8.2. Room thermostat installation configuration" on page 24)	Room thermostat connected	No room thermostat connected (Default)
4	Not applicable. Do not change the default setting.		

8.2. Room thermostat installation configuration

- When **no room thermostat** is connected to the indoor unit, toggle switch SS2-3 should be set to **OFF**.



- When the **room thermostat** is connected to the indoor unit, toggle switch SS2-3 should be set to **ON**.

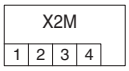
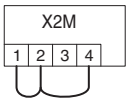


- On the room thermostat, confirm the correct settings (6r02=yes, 6r05=9, 6r06=5) to prevent the pump from repeatedly turning on and off (i.e. chattering), and thereby impacting the lifetime of the pump.

- When the room thermostat is connected to the indoor unit, the heating and cooling schedule timers are never available. Other schedule timers are not affected. For more information on the schedule timers, refer to the operation manual.
- When the room thermostat is connected to the indoor unit, and the ☀/❄ button or button is pressed, the centralised control indicator will flash to indicate that the room thermostat has priority and controls on/off operation and change over operation.

The following table summarizes the required configuration and thermostat wiring at the terminal block (X2M: 1, 2, 3, 4) in the switch box. Pump operation is listed in the third column. The three last columns indicate whether the following functionality is available on the user interface (UI) or handled by the thermostat (T):

- space heating or cooling on/off ( )
- heating/cooling changeover (☀/❄)
- heating and cooling schedule timers ( )

Thermostat	Configuration	Pump operation			
No thermostat	• SS2-3 = OFF • wiring: (non) 	determined by leaving water temperature(a)	UI	UI	UI
	• SS2-3 = ON • wiring: 	on when space heating or cooling is on ( )	UI	UI	UI
Heating only thermostat	• SS2-3 = ON • wiring: (see installation manual of the room thermostat kit)	on when heating request by room thermostat	T	—	—
Thermostat with heating/cooling switch	• SS2-3 = ON • wiring: (see installation manual of the room thermostat kit)	on when heating request or cooling request by room thermostat	T	T	—

(a) The pump will stop when space heating/cooling is turned off or when the water reaches the desired water temperature as set on the user interface. With space heating/cooling turned on, the pump will then run every 5 minutes during 3 minutes to check the water temperature.

8.3. Pump operation configuration

To set the pump speed, refer to "8.7. Setting the pump speed" on page 26.

Without room thermostat: DIP switch SS2-3=OFF

When no thermostat is connected to the indoor unit, pump operation will be determined by the leaving water temperature.

To force continuous pump operation when no room thermostat is connected do the following:

- set toggle switch SS2-3 to ON,
- short-circuit the terminal numbers 1-2-4 on the terminal block in the switch box.

With room thermostat DIP switch: SS2-3=ON

When the thermostat is connected to the indoor unit, the pump will operate continuously whenever there is heating or cooling demand requested by the thermostat.

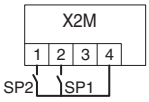
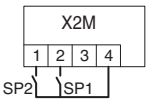
Dual set point

When dual set point is enabled, the pump operation will be determined depending on the status of the DIP switch SS2-3 and set point selection contacts. Refer to the pump operation configurations when the thermostat is connected or not as described above.

When dual set point is enabled, the "forced continuous pump operation" is not possible. When SS2-3 is ON while SP1 and SP2 are both closed, the pump operation will be the same operation as "with room thermostat" and the second set point will be the applicable set point. Refer to "[7] Dual set point control" on page 30.

The following table summarizes the required configuration and wiring at the terminal block (X2M: 1, 2, 4) in the switch box. Pump operation is listed in the third column. The three last columns indicate whether the following functionality is available on the user interface (UI) or handled by the set point selection contacts SP1 and SP2:

- space heating or cooling on/off
- heating/cooling changeover
- heating and cooling schedule timers

Dual set point				
Configuration	**Pump operation**			
• [7-02]=1 • SS2-3 = OFF • wiring: 	determined by leaving water temperature(a)	UI	UI	UI
• [7-02]=1 • SS2-3 = ON • wiring: 	on when main or/and sub set point is requested	SP2/SP1	UI	—

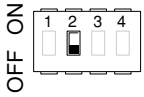
SP1 = First set point contact

SP2 = Second set point contact

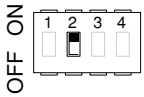
(a) The pump will stop when space heating/cooling is turned off or when the water reaches the desired water temperature as set on the user interface. With space heating/cooling turned on, the pump will then run every 5 minutes during 3 minutes to check the water temperature.

8.4. Domestic hot water tank installation configuration

- When **no domestic hot water tank** is installed, toggle switch SS2-2 should be set to **OFF** (default).



- When a **domestic hot water tank** is installed, toggle switch SS2-2 should be set to **ON**.



When SS2-3 was set to ON without all necessary and correct wiring connections between indoor unit and switchbox of the domestic hot water tank, the error code RC will be displayed on the user interface.

8.5. Pre-operation checks

After the installation of the unit, first check the following items. Once all below checks are fulfilled, the unit must be closed, only then can the unit be powered up.

DANGER

Switch off all relevant power supply before making any connections.

1 Installation

Check that the unit is properly installed to avoid abnormal noises and vibrations when starting the unit.

2 Field wiring

Make sure that the field wiring between local supply panel and indoor unit, outdoor unit and indoor unit, indoor unit and valves (when applicable), indoor unit and room thermostat (when applicable), and indoor unit and domestic hot water tank has been carried out according to the instructions described in the chapter "7.3. Field wiring" on page 19, according to the wiring diagrams and according to European and national regulations.

3 Power supply voltage

Check the power supply voltage on the local supply panel. The voltage must correspond to the voltage on the identification label of the unit.

4 Earth wiring

Make sure that the earth wires have been connected properly and that the earth terminals are tightened.

5 Insulation test of the main power circuit

Using a mega tester for 500 V, check that the insulation resistance of 2 MΩ or more is attained by applying a voltage of 500 V DC between power terminals and earth. Never use the mega tester for the transmission wiring.

6 Fuses or protection devices

Check that the fuses or the locally installed protection devices are of the size and type specified in the chapter "Technical specifications" on page 44. Make sure that neither a fuse nor a protection device has been bypassed.

7 Internal wiring

Visually check the switch box on loose connections or damaged electrical components.

8 Pipe size and pipe insulation

Be sure that correct pipe sizes are installed and that the insulation work is properly executed.

9 Stop valves

Be sure that the stop valves are open on both liquid and gas side.

10 Damaged equipment

Check the inside of the unit on damaged components or squeezed pipes.

11 Refrigerant leak

Check the inside of the unit on refrigerant leakage. If there is a refrigerant leak, call your local dealer.

12 Water leak

Check the inside of the unit on water leakage. in case there is a water leakage close the water inlet and water outlet shut-off valves and call your local dealer.

13 Air purge valve

Make sure the air purge valve is open (at least 2 turns).

14 Shut-off valves

Make sure that the shut-off valves are correctly installed and fully open.

NOTICE

Operating the system with closed valves will damage the pump!

15 Air inlet/outlet

Check that the air inlet and outlet of the unit is not obstructed by paper sheets, cardboard, or any other material.

16 Backup heater circuit breaker F1B/F3B

Do not forget to turn on the backup heater circuit breaker F2B in the switchbox (F1B/F3B depends on the backup heater type). Refer to the wiring diagram.

17 Fixation

Check that the unit is properly fixed, to avoid abnormal noises and vibrations when starting up the unit.

18 Pressure relief valve

Check if the backup heater is completely filled with water by operating the pressure relief valve. It should purge water instead of air.

NOTICE

Operating the system with the backup heater not completely filled with water will damage the backup heater!

8.6. Powering up the indoor unit

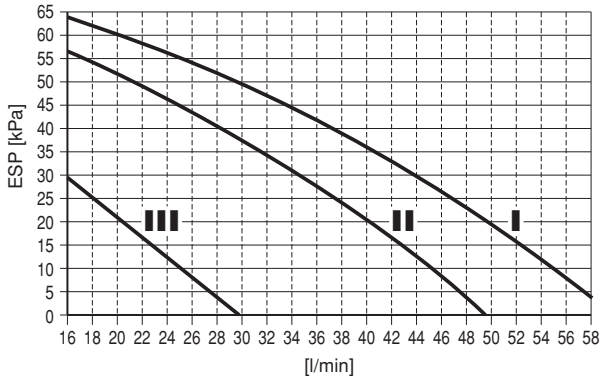
When power supply to the indoor unit is turned on, "88" is displayed on the user interface during its initialisation, which might take up to 30 seconds. During this process the user interface cannot be operated.

8.7. Setting the pump speed

The pump speed can be selected on the pump (see "5.2. Main components in the unit" on page 9).

The default setting is high speed (**I**). If the water flow in the system is too high (e.g., noise of running water in the installation) the speed can be set to medium speed (**II**) or low speed (**III**).

The available external static pressure (ESP, expressed in kPa) in function of the water flow (l/min) is shown in the graph below.



8.8. Field settings

The indoor unit shall be configured by the installer to match the installation environment (outdoor climate, installed options, etc.) and user demand. Thereto, a number of so called field settings are available. These field settings are accessible and programmable through the user interface on the indoor unit.

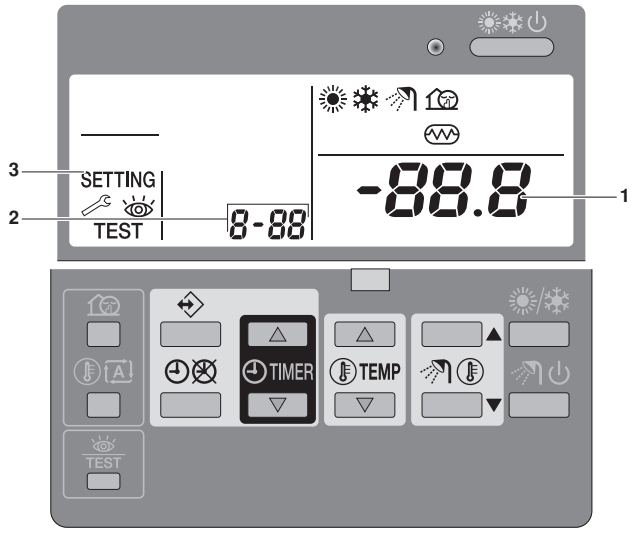
Each field setting is assigned a 3-digit number or code, for example [1-03], which is indicated on the user interface display. The first digit [1] indicates the 'first code' or field setting group. The second and third digit [03] together indicate the 'second code'.

A list of all field settings and default values is given under "8.9. Field settings table" on page 35. In this same list, we provided for 2 columns to register the date and value of altered field settings at variance with the default value.

A detailed description of each field setting is given in chapter "Detailed description" on page 27.

Procedure

To change one or more field settings, proceed as follows.



1 Press the TEST button for a minimum of 5 seconds to enter FIELD SET MODE.
The SETTING icon (3) will be displayed. The current selected field setting code is indicated *8-88* (2), with the set value displayed to the right *-88.8* (1).

2 Press the TEMP ▲ button to select the appropriate field setting first code.

3 Press the TEMP ▼ button to select the appropriate field setting second code.

4 Press the TIMER ▲ button and TIMER ▼ button to change the set value of the select field setting.

5 Save the new value by pressing the ⏲⊗ button.

6 Repeat step 2 through 4 to change other field settings as required.

7 When finished, press the TEST button to exit FIELD SET MODE.

- Changes made to a specific field setting are only stored when the ⏲⊗ button is pressed. Navigating to a new field setting code or pressing the TEST button will discard the change made.
- Before shipping, the set values have been set as shown under "8.9. Field settings table" on page 35.
- When exiting FIELD SET MODE, "88" may be displayed on the user interface LCD while the unit initialises itself.

[0] User permission level

If required, certain user interface buttons can be made unavailable for the user.

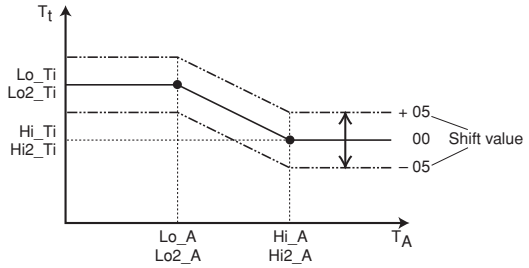
Three permission levels are defined (see the table below). Switching between level 1 and level 2/3 is done by simultaneously pressing buttons TIMER ▲ and TIMER ▼ immediately followed by simultaneously pressing buttons and , and keeping all 4 buttons pressed for at least 5 seconds (in normal mode). Note that no indication on the user interface is given. When level 2/3 is selected, the actual permission level – either level 2 or level 3 – is determined by the field setting [0-00].

		Permission level		
Button		**1**	**2**	**3**
Quiet mode button		operable	—	—
Weather dependent set point button		operable	—	—
Schedule timer enable/disable button		operable	operable	—
Programming button		operable	—	—
Time adjust buttons	TIMER ▲ TIMER ▼	operable	—	—
Inspection/test operation button	TEST	operable	—	—

[1] Weather dependent set point

The weather dependent set point field settings define the parameters for the weather dependent operation of the unit. When weather dependent operation is active the water temperature is determined automatically depending on the outdoor temperature: colder outdoor temperatures will result in warmer water and vice versa. During weather dependent operation, the user has the possibility to shift up or down the target water temperature by a maximum of 5°C. See the operation manual for more details on weather dependent operation.

- Field settings for heating operation
  - [1-00] Low ambient temperature (Lo_A): low outdoor temperature.
  - [1-01] High ambient temperature (Hi_A): high outdoor temperature.
  - [1-02] Set point at low ambient temperature (Lo_Ti): the target outgoing water temperature when the outdoor temperature equals or drops below the low ambient temperature (Lo_A).
    Note that the Lo_Ti value should be higher than Hi_Ti, as for colder outdoor temperatures (i.e. Lo_A) warmer water is required.
  - [1-03] Set point at high ambient temperature (Hi_Ti): the target outgoing water temperature when the outdoor temperature equals or rises above the high ambient temperature (Hi_A).
    Note that the Hi_Ti value should be *lower* than Lo_Ti, as for warmer outdoor temperatures (i.e. Hi_A) less warm water suffices.
- Field settings for cooling operation
  - [1-05] Weather dependent for cooling function enable (1)/ disable (0)
  - [1-06] Low ambient temperature (Lo2_A): low outdoor temperature.
  - [1-07] High ambient temperature (Hi2_A): high outdoor temperature.
  - [1-08] Set point at low ambient temperature (Lo2_Ti): the target outgoing water temperature when the outdoor temperature equals or drops below the low ambient temperature (Lo2_A).
    Note that the Lo2_Ti value should be higher than Hi2_Ti, as for colder outdoor temperatures (i.e. Lo2_A) warmer water is required.
  - [1-09] Set point at high ambient temperature (Hi2_Ti): the target outgoing water temperature when the outdoor temperature equals or rises above the high ambient temperature (Hi2_A).
    Note that the Hi2_Ti value should be lower than Lo2_Ti, as for warmer outdoor temperatures (i.e. Hi2_A) less warm water suffices.



T_t	Target water temperature
T_A	Ambient (outdoor) temperature
Shift value	= Shift value

[2] Disinfection function

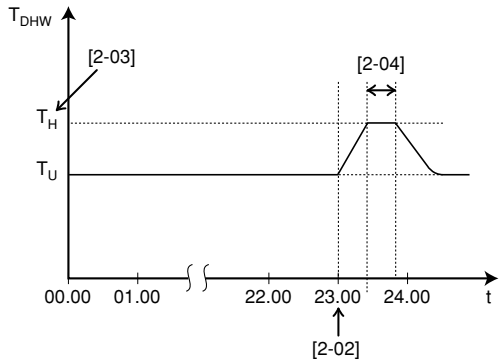
Applies only to installations with a domestic hot water tank.

The disinfection function disinfects the domestic hot water tank by periodically heating the domestic hot water to a specific temperature.

CAUTION

The disinfection function field settings must be configured by the installer according to local and national regulations.

- [2-00] Operation interval: day(s) of the week at which the domestic hot water should be heated.
- [2-01] Status: defines whether the disinfection function is turned on (1) or off (0).
- [2-02] Start time: time of the day at which the domestic hot water should be heated.
- [2-03] Set point: high water temperature to be reached.
- [2-04] Interval: time period defining how long the set point temperature should be maintained.



T_{DHW}	Domestic hot water temperature
T_U	User set point temperature (as set on the user interface)
T_H	High set point temperature [2-03]
t	Time

WARNING

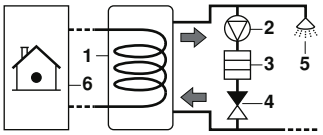
Be aware that the domestic hot water temperature at the hot water tap will be equal to the value selected in field setting [2-03] after a disinfection operation.

If this high domestic hot water temperature can be a potential risk for human injuries, a mixing valve (field supply) shall be installed at the hot water outlet connection of the domestic hot water tank. This mixing valve shall secure that the hot water temperature at the hot water tap never rises above a set maximum value. This maximum allowable hot water temperature shall be selected according to local and national regulations.

CAUTION

Make sure that the disinfection function start time [2-02] with defined duration [2-04] is not interrupted by possible domestic hot water demand.

According to local and national regulations, it may be required to disinfect the domestic hot water tank at a higher temperature (>60°C). In that case Daikin suggests to install a shunt pump and a heater element parallel on the domestic hot water tank according to the figure below.



1 Domestic hot water tank
2 Shunt pump (field supply)
3 Heater element (field supply)
4 Non-return valve (field supply)
5 Shower (field supply)
6 Indoor unit

WARNING

Never heat up the domestic water tank temperature higher than 80°C. This will cause damage to the equipment and potentially danger of leakage of hot water which can cause burning wounds.

[3] Auto restart

When power returns after a power supply failure, the auto restart function reapplies the user interface settings at the time of the power supply failure.

NOTICE

It is therefore recommended to leave the auto restart function enabled.

Note that with the function disabled the schedule timer will not be activated when power returns to the unit after a power supply failure. Press the ⏲⊗ button to enable the schedule timer again.

- [3-00] Status: defines whether the auto restart function is turned **ON (0)** or **OFF (1)**.

NOTICE

If the benefit kWh rate power supply is of the type that power supply is interrupted, then always allow the auto restart function.

[4] Backup heater operation and space heating off temperature

Backup heater operation

The operation of the backup heater can altogether be enabled, disabled, or limited.

- [4-00] Status: defines whether backup heater operation is disabled (0), enabled (1) or limited (2).
  When [4-00]=2, the backup heater is only allowed during domestic hot water.

- In special conditions, for example the outdoor cannot work due to malfunction, the backup heater will also be allowed to operate during space heating.
- If the backup heater operation is disabled ([4-00]=0), the domestic water will not be heated.

Space heating off temperature

- [4-02] Space heating off temperature: outdoor temperature above which space heating is turned off, to avoid overheating.
- [4-06] Backup heater emergency operation: defines whether backup heater is allowed (1) or not allowed (0) during emergency operation.
  Emergency operation will startup backup heater operation during certain outdoor malfunctions.
- [4-07] Backup heater second step: defines whether backup heater second step is allowed (1) or not allowed (0).
  In this way it is possible to limit the backup heater capacity.
  Backup heater capacity limitation: second step disabled (only for units with a domestic hot water tank installed).

If the storage temperature set point is higher than 50°C, Daikin advises not to disable the backup heater second step because it will have a big impact on the required time for the unit to heat up the domestic hot water tank.

[5] Equilibrium temperature and space heating priority temperature

Equilibrium temperature — The 'equilibrium temperature' field settings apply to operation of the **backup heater** during space heating.

When the equilibrium temperature function is enabled, operation of the backup heater is restricted to low outdoor temperatures, i.e. when the outdoor temperature equals or drops below the specified equilibrium temperature. This function reduces the working time of the backup heater.

- [5-00] Equilibrium temperature status: the equilibrium temperature function is enabled (1) (this field setting is fixed and can not be modified).
- [5-01] Equilibrium temperature: outdoor temperature below which operation of the backup heater is allowed.

Space heating priority temperature — Applies only to installations with a domestic hot water tank. The domestic water is heated by heat pump and backup heater. — The 'space heating priority temperature' field settings apply to operation of the 3-way valve and the **backup heater** during domestic hot water operation.
When the space heating priority function is enabled, it is assured that the full capacity of the heat pump is used as much as possible for space heating when the outdoor temperature equals or drops below the specified space heating priority temperature, i.e. low outdoor temperature. This is done by allowing the backup heater to assist during domestic hot water heating. This means the heating up time of domestic water heating will be kept to a minimum and as much as possible capacity of the heatpump is used for space heating.

- [5-02] Space heating priority temperature: outdoor temperature below which the domestic water heat up time is reduced to a minimum, as the backup heater will additionally assist during low domestic hot water tank temperature situations (this field setting is fixed and can not be modified).
- [5-03] Space heating priority temperature: outdoor temperature below which the backup heater is allowed to assist during domestic hot water heating. This means the heating up time of domestic water heating will be kept to a minimum and as much as possible capacity of the heatpump is used for space heating.

NOTICE

[5-01] Equilibrium temperature and [5-03] Space heating priority temperature are field settings that are related to backup heater. So it is obliged to set [5-01] and [5-03] to the same setting value.

If the backup heater operation is limited ([4-00]=0) and the ambient outdoor temperature T_A is lower than the field setting to which parameter [5-03] is set, then the domestic hot water will not be heated with the backup heater.

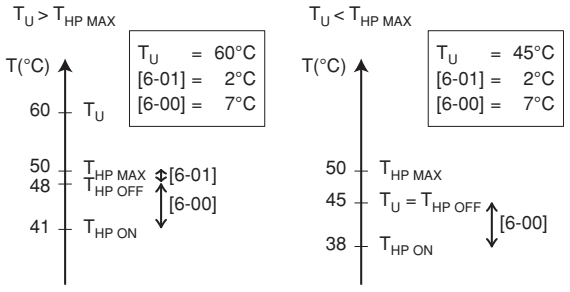
[6] DT for heat pump domestic water heating mode

Applies only to installations with a domestic hot water tank.

The 'DT (temperature difference) for heat pump domestic water heating mode' field settings determine the temperatures at which heating of the domestic hot water by the heat pump will be started (i.e., the heat pump ON temperature) and stopped (i.e., the heat pump OFF temperature).
When the domestic hot water temperature drops below the heat pump ON temperature ($T_{HP\ ON}$), heating of the domestic hot water by the heat pump will be started. As soon as the domestic hot water temperature reaches the heat pump OFF temperature ($T_{HP\ OFF}$) or the user set point temperature (T_U), heating of the domestic water by the heat pump will be stopped.

The heat pump OFF temperature, and the heat pump ON temperature, and its relation with field settings [6-00] and [6-01] are explained in the illustration below.

- [6-00] Start: temperature difference determining the heat pump ON temperature ($T_{HP\ ON}$). See illustration.
- [6-01] Stop: temperature difference determining the heat pump OFF temperature ($T_{HP\ OFF}$). See illustration.



T_U	User set point temperature (as set on the user interface)
$T_{HP\ MAX}$	Maximum heat pump temperature at sensor in domestic hot water tank (50°C)(depending on T_A)[(a)]
$T_{HP\ OFF}$	Heat pump OFF temperature
$T_{HP\ ON}$	Heat pump ON temperature

(a) 50°C = $T_{HP\ MAX}$ at $T_A \leq 25$°C.
48°C = $T_{HP\ MAX}$ at $T_A > 25$°C.

The maximum domestic hot water temperature that can be reached with the heat pump is 50°C. It is advised to select $T_{HP\ OFF}$ not higher than 48°C in order to improve performance of the heat pump during domestic water heating mode.

When setting [4-03]=0 or 2 special attention to setting [6-00] is recommended. A good balance between the required domestic hot water temperature and heat pump ON temperature ($T_{HP\ ON}$) is a must.

- [6-03] till [6-08] Domestic hot water storage and reheat operation

Scheduled domestic hot water storage:

The storage set point can be accessed directly using the and buttons.

- [6-03] Scheduled storage: defines whether the scheduled domestic water heating storage during night is enabled (1) or not (0).
- [6-04] Scheduled storage start time: time of the night at which the domestic water should be heated.

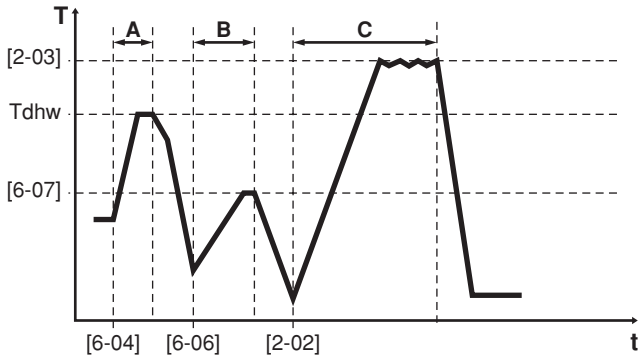
Selecting powerful domestic water heating operation

1 Press for 5 seconds to activate powerful domestic water heating operation.
Icons and start flashing.
Powerful domestic water heating is deactivated automatically when the set point for the domestic hot water is reached.

Scheduled/ continuous domestic hot water reheat:

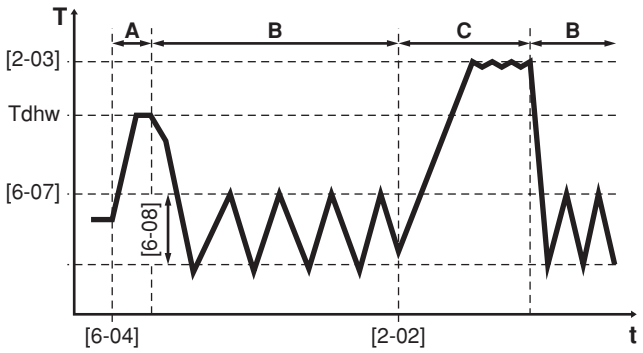
- [6-05] Reheat: defines whether the scheduled domestic water reheat during daytime is enabled (1) or continuous reheat is enabled (2) or reheat is disabled (0)
- [6-06] Scheduled reheat start time: time of the day at which the domestic water should be heated.
- [6-07] Domestic hot water reheat set point
- [6-08] Domestic hot water reheat set point hysteresis

Example 1: Scheduled storage [6-03]=1, scheduled reheat [6-05]=1, disinfection function [2-01]=1 activated.



A	**Scheduled storage operation:** activated at [6-04], heat up domestic hot water untill domestic hot water user interface set point Tdhw (e.g 55°C) is reached.
B	**Scheduled reheat operation**: activated at [6-06], heat up domestic hot water untill domestic hot water reheat set point [6-07] (e.g 45°C) is reached.
C	**Disinfection operation** (if activated): activated at [2-02], heat up domestic hot water untill domestic hot water disinfection set point [2-03] (e.g 60°C) is reached. Refer to "[2] Disinfection function" on page 27.
t	Time
T	Domestic hot water temperature
Tdhw	Domestic hot water user interface set point

Example 2: Scheduled storage [6-03]=1, continuous reheat [6-05]=2, disinfection function [2-01]=1 activated.



A	**Scheduled storage operation**: activated at [6-04], heat up domestic water till domestic hot water user interface set point Tdhw (e.g 55°C), is reached.
B	**Continuous reheat operation**: continues activated heat up domestic water till domestic hot water reheat set point [6-07] (e.g 45°C) is reached with a hysteresis of [6-08].
C	Disinfection operation (if activated): activated at [2-02] ,heat up domestic water till domestic hot water disinfection set point [2-03] (e.g 60°C) is reached. Refer to "[2] Disinfection function" on page 27.
t	Time
T	Domestic hot water temperature
Tdhw	Domestic hot water user interface set point

- Make sure the domestic water is only heated up to the domestic hot water temperature you require.

  Start with a low domestic hot water storage temperature set point, and only increase if you feel that the domestic hot water supply temperature is not sufficient for your needs (this depends on your water using pattern).
- Make sure the domestic water is not heated unnecessary. Start with activating automatic storage during night (default setting). If it seems that the domestic hot water night storage operation is not sufficient for your needs, an additional scheduled reheat during daytime can be set.

[7] Dual set point control

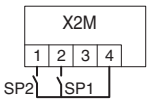
Applies only to installations with different heat emitter which require different set points.

Dual set point control makes it possible to generate 2 different set points.

There is no indication available which set point is active!

- [7-02] Dual set point control status: defines whether the dual set point control is enabled (1) or disabled (0).
- [7-03] Second set point heating: specifies the second set point temperature in heating operation.
- [7-04] Second set point cooling: specifies the second set point temperature in cooling operation.

- The first set point heating/cooling is the set point selected on the user interface.
  - In heating mode the first set point can be a fixed value or weather dependent.
  - In cooling mode the first set point is always a fixed value.
- The second set point heating [7-03] should be linked to the heat emitters which requires the highest set point in heating mode. Example: fan coil unit.
- The second set point cooling [7-04] should be linked to the heat emitters which requires the lowest set point in cooling mode. Example: fan coil unit.
- The actual second set point heating value depends on the selected value of setting [7-03].
  - In case [7-03]=1~24, the actual second set point will be first set point heating increased with [7-03] (the maximum is 55°C).
    In this way the second set point heating is linked to the first set point heating.
  - In case [7-03]=25~55, the actual second set point heating is equal to [7-03].
- The selection of second set point or first set point is determined by the terminals (X2M: 1, 2, 4).
  The second set point has always priority on the first set point.



SP1	First set point contact
SP2	Second set point contact

When dual set point control is enabled, heating/cooling selection always has to be done on the user interface.

NOTICE

It is the responsibility of the installer to make sure no unwanted situations can occur.

It is very important that the water temperature to the floor heating loops never becomes too high in heating mode or never too cold in cooling mode. Failure to observe this rule can result in construction damage or discomfort. For example in cooling mode condensation on the floor can occur when water towards the floor heating loops is too cold (dew point).

[8] Domestic water heating mode timer

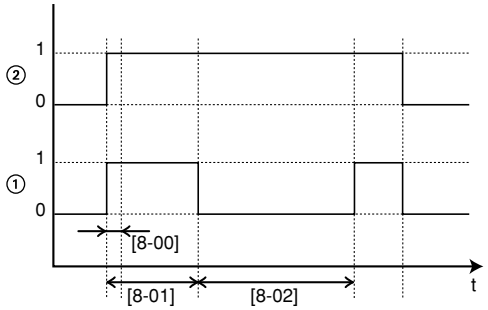
Applies only to installations with a domestic hot water tank.

The 'domestic water heating mode timer' field settings defines the minimum and maximum domestic water heating times, minimum time between two domestic water heating cycles.

- [8-00] Minimum running time: specifies the minimum time period during which heat pump domestic water heating mode should be activated, even when the target domestic hot water temperature for heat pump ($T_{HP\ OFF}$) has already been reached.
- [8-01] Maximum running time: specifies the maximum time period during which heat pump domestic water heating mode can be activated, even when the target domestic hot water temperature for heat pump ($T_{HP\ OFF}$) has not yet been reached.
  The actual maximum running time will automatically variate between [8-01] and [8-01]+[8-04] depending on the outdoor temperature. See figure in chapter "[8-04]" on page 31.

Note that when the unit is configured to work with a room thermostat (refer to "8.2. Room thermostat installation configuration" on page 24), the maximum running timer will only be taken into account when there is a request for space cooling or space heating. When there is no request for space cooling or space heating, domestic water heating by the heat pump will continue until the 'heat pump OFF temperature' (see field settings [6] on page 29) is reached. When no room thermostat is installed, the timer is always taken into account.

- [8-02] Anti-recycling time: specifies the minimum required interval between two heat pump domestic water heating mode cycles.
  The actual anti-recycling time will automatically variate between [8-02] and 0 depending on the outdoor temperature. See figure in chapter "[8-04]" on page 31.



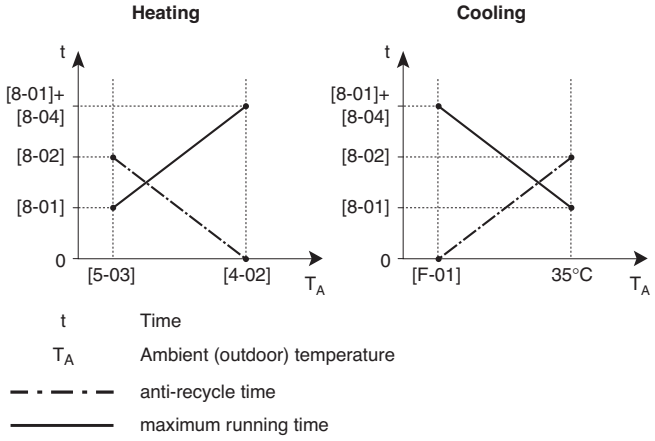
1 Heat pump domestic water heating mode (1 = active, 0 = not active)

2 Hot water request for heat pump (1 = request, 0 = no request)

t Time

If the outdoor temperature is higher than the field setting to which parameter [4-02] is set, then field settings of parameters [8-01], [8-02], and [8-04] are not considered.

- [8-04] Additional running time at [4-02]/[F-01]: specifies the additional running time on the maximum running time at outdoor temperature [4-02] or [F-01]. See figure below.



t Time

T_A Ambient (outdoor) temperature

anti-recycle time

maximum running time

[9] Heating and cooling set point ranges

The purpose of this field setting is to prevent the user from selecting a wrong (i.e., too hot or too cold) leaving water temperature. Thereto the heating temperature set point range and the cooling temperature set point range available to the user can be configured.

CAUTION

- In case of a floor heating application, it is important to limit the maximum leaving water temperature at heating operation according to the specifications of the floor heating installation.
- In case of a floor cooling application, it is important to limit the minimum leaving water temperature at cooling operation (field setting of parameter [9-03]) to 16~18°C to prevent condensation on the floor.

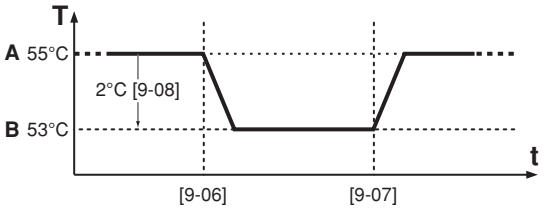
- [9-00] Heating set point upper limit: maximum leaving water temperature for heating operation.
- [9-01] Heating set point lower limit: minimum leaving water temperature for heating operation.
- [9-02] Cooling set point upper limit: maximum leaving water temperature for cooling operation.
- [9-03] Cooling set point lower limit: minimum leaving water temperature for cooling operation.
- [9-04] Overshoot setting: defines how much the water temperature may rise above the set point before the compressor stops. This function is only applicable in heating mode.

[9-05~9-08] Automatic setback function

Setback function provides the possibility to lower the water temperature during space heating. The setback function can for instance be activated during the night because the temperature demands during night and day are not the same.

- Remark that the ⓕ icon will be flashing during setback operation. The calculated leaving water setback set point is **not** shown during setback operation.
- By default the setback function is disabled.
- The setback function can be combined with the automatic weather dependent set point operation.
- Setback function is an automatic daily scheduled function.
- The setback function can be combined with the schedule timer. When setback is active, the scheduled space heating set point will be lowered with the [9-08] leaving water setback value.

- [9-05] Defines whether the setback function is turned ON (1) or OFF (0)
- [9-06] Start time: time at which setback is started
- [9-07] Stop time: time at which setback is stopped
- [9-08] Leaving water setback value



A Normal leaving water temperature set point or calculated weather depended set point
B Calculated leaving water setback temperature set point
t Time
T Temperature

It is advised to set the start time of automatic storage during night [6-04] on the moment that the setback function starts [9-06].

Pay attention not to set the setback value too low, especially during colder periods (e.g. winter time). It is possible that the room temperature can not be reached (or it will take a much longer time) because of the big temperature difference.

[A] Quiet mode

This field setting allows to select the desired quiet mode. Two quiet modes are available: quiet mode A and quiet mode B.

In quiet mode A, priority is given to the outdoor unit operating quietly under **all** circumstances. Fan and compressor speed (and thus performance) will be limited to a certain percentage of the speed at normal operation. In certain cases, this might result in reduced performance.

In quiet mode B, quiet operation might be overridden when higher performance is required. In certain cases, this might result in less quiet operation of the outdoor unit to meet the requested performance.

- [A-00] Quiet mode type: defines whether quiet mode A (0) or quiet mode B (2) is selected.
- [A-01] Parameter 01: do not change this setting. Leave it set to its default value.

NOTICE

Do not set other values than the ones mentioned.

[C] Setup on EKRP1HB digital I/O PCB

Solar priority mode

- [C-00] Solar priority mode setting: for information concerning the EKSOLHT solar kit, refer to the installation manual of that kit.

Alarm output logic

- [C-01] Alarm output logic: defines the logic of the alarm output on the EKRP1HB digital I/O PCB.
  [C-01]=0, the alarm output will be powered when an alarm occurs (default).
  [C-01]=1, the alarm output will not be powered when an alarm occurs. This field setting allows for distinction between detection of an alarm and detection of a power failure to the unit.

[C-01]	Alarm	No alarm	No power supply to unit
0 (default)	Closed output	Open output	Open output
1	Open output	Closed output	Open output

Bivalent operation [C-02]=1

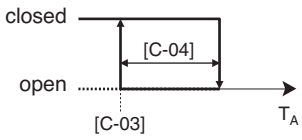
Applies only to installations with an auxiliary boiler (alternating operation, parallel connected). The purpose of this function is to determine – based on the outdoor temperature – which heating source can/will provide the space heating, either the Daikin indoor unit or an auxiliary boiler.

The field setting "bivalent operation" apply only the indoor unit space heating operation and the permission signal for the auxiliary boiler.

When the "bivalent operation" function is enabled, the indoor unit will stop automatically in space heating operation when the outdoor temperature drops below "bivalent ON temperature" and the permission signal for the auxiliary boiler becomes active.

When the bivalent operation function is disabled, the space heating by indoor unit is possible at all outdoor temperatures (see operation ranges) and permission signal for auxiliary boiler is always disactivated.

- [C-02]=1 Bivalent operation status is enabled (1)
- [C-03] Bivalent ON temperature: defines the outdoor temperature below which the permission signal for the auxiliary boiler will be active (closed, KCR on EKRP1HB) and space heating by indoor unit will be stopped.
- [C-04] Bivalent hysteresis: defines the temperature difference between bivalent ON temperature and bivalent OFF temperature.
  Permission signal X1–X2 (EKRP1HB)



T_A Outdoor temperature

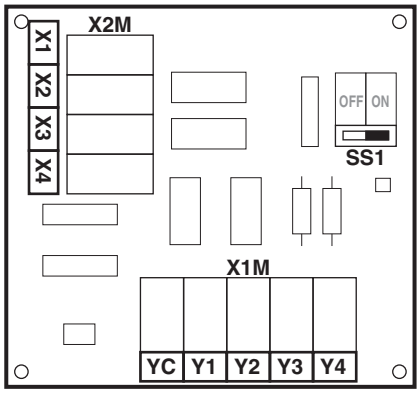
CAUTION

Make sure to observe all rules mentioned in application 5 when bivalent operation function is enabled.

Daikin shall not be held liable for any damage resulting from failure to observe this rule.

CAUTION

- In case the outdoor unit is single phase, the combination of setting [4-03]=0/2 with bivalent operation at low outdoor temperature can result in domestic hot water shortage.
- The bivalent operation function has no impact on the domestic water heating mode. The domestic hot water is still and only heated by the indoor unit.
- The permission signal for the auxiliary boiler is located on the EKRP1HB (digital I/O PCB). When it is activated, the contact X1, X2 is closed and open when it is disactivated. See figure for the schematic location of this contact.



Additional external backup heater operation [C-02]=2

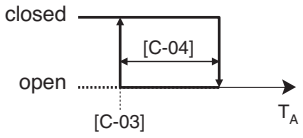
This function give the possibility to drive an additional external backup heater.
The additional external backup heater can be used to assist space heating (not domestic hot water heating) during low ambient conditions.

The signal for additional external heater will be activated when the second step of the internal backup heater is closed and when the outdoor temperature goes below [C-03] setting with [C-04] hysteresis.

When [4-07] "Backup heater second step" is disabled, then additional external backup heater signal will never be activated.

- [C-02]=2 Additional external backup heater operation is enabled (2)
- [C-03] external backup heater ON temperature: defines the outdoor temperature below which the permission signal for the external backup heater will be active (closed, KCR on EKRP1HB).
- [C-04] external backup heater hysteresis

External backup heater signal X1–X2 (EKRP1HB)



T_A Outdoor temperature

[D] Benefit kWh rate power supply/Local shift value weather dependent

Benefit kWh rate power supply

- [D-00] Switching off heaters: Defines which heaters are switched off when the benefit kWh rate signal of the electricity company is received.
  If [D-01]=1 or 2 and the benefit kWh rate signal of the electricity company is received, following devices will be switched off:

[D-00]	Compressor	Backup heater
0 (default)	Forced off	Forced off
2	Forced off	Permitted

Do not select 1 or 3 value.

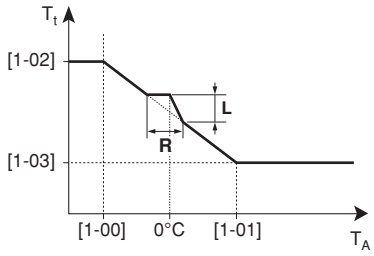
[D-00] settings 2 is only meaningful if the benefit kWh rate power supply is of the type that power supply is not interrupted.

- [D-01] Unit connection to benefit kWh rate power supply: Defines whether or not the outdoor unit is connected to a benefit kWh rate power supply.
  If [D-01]=0, the unit is connected to a normal power supply (default value).
  If [D-01]=1 or 2, the unit is connected to a benefit kWh rate power supply. In this case the wiring requires specific installation like explained in "Connection to a benefit kWh rate power supply" on page 22.
  When parameter [D-01]=1 at the moment that the benefit kWh rate signal is sent by the electricity company, that contact will open and the unit will go in forced off mode(1).
  When parameter [D-01]=2 at the moment that the benefit kWh rate signal is sent by the electricity company, that contact will close and the unit will go in forced off mode(2).
  When backup heater is forced off at "benefit kWh rate power supply" it is possible to define if pump operation is forced off or permited. (Refer to "[D-05]" on page 34.)

Local shift value weather dependent

The local shift value weather dependent field setting is only relevant in case weather dependent set point (see field setting "[1] Weather dependent set point" on page 27) is selected.

- [D-03] Local shift value weather dependent: determines the shift value of the weather dependent set point around outdoor temperature of 0°C.



T_t	Target water temperature
T_A	Outdoor temperature
R	Range
L	Local shift value
[1-00], [1-01], [1-02], [1-03]	Applicable field setting of the weather dependent set point [1]

(1) When the signal is released again, the voltage free contact will close and the unit will restart operation. It is therefore important to leave the auto restart function enabled. Refer to "[3] Auto restart" on page 28.
(2) When the signal is released again, the voltage free contact will open and the unit will restart operation. It is therefore important to leave the auto restart function enabled. Refer to "[3] Auto restart" on page 28.

[D-03]	Outdoor temperature range (T_A)	Local shift value
0	—	—
1	–2°C~2°C	2
2		4
3	–4°C~4°C	2
4		4

- [D-05] Pump operation forced off (0) or permitted (1) during backup heater is forced off at "benefit kWh rate power supply" ([D-00]=0 or 1).

[E] Unit information readout

- [E-00] Readout of the software version (example: 23)
- [E-01] Readout of the EEPROM version (example: 23)
- [E-02] Readout of the unit model identification (example: 11)
- [E-03] Readout of the liquid refrigerant temperature
- [E-04] Readout of the inlet water temperature

[F] Option setup

Pump operation

The pump operation field setting apply to the pump operation logic only when DIP switch SS2-3 is OFF.

When the pump operation function is disabled the pump will stop if the outdoor temperature is higher than the value set by [4-02] or if the outdoor temperature drops below the value set by [F-01]. When the pump operation is enabled, the pump operation is possible at all outdoor temperatures. Refer to "8.3. Pump operation configuration" on page 24.

- [F-00] Pump operation: specifies wether the pump operation function is enabled (1) or disabled (0).

Space cooling permission

- [F-01] Space cooling permission temperature: defines the outdoor temperature below which space cooling is turned off.

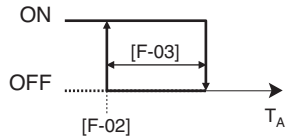
This function is only valid for EKHBX when space cooling is selected.

Bottom plate heater control

Applies only to installation with an outdoor unit ERLQ or in case the option bottom plate heater kit is installed.

- [F-02] Bottom plate heater ON temperature: defines the outdoor temperature below which the bottom plate heater will be activated by indoor unit in order to prevent ice build-up in the bottom plate of the outdoor unit at lower outdoor temperatures.
- [F-03] Bottom plate heater hysteresis: defines the temperature difference between bottom plate heater ON temperature and the bottom plate heater OFF temperature.

Bottom plate heater



T_A Outdoor temperature

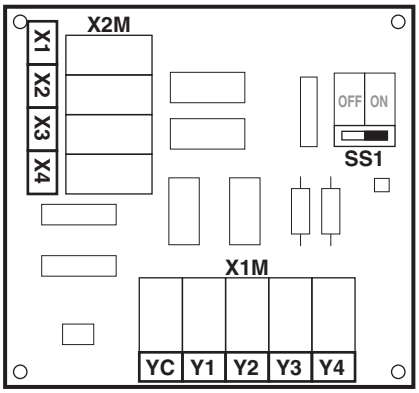
CAUTION

The bottom plate heater is controlled via X14A. Make sure [F-04] is correctly set.

Functionality of X14A

- [F-04] Functionality of X14A: specifies if the logic of X14A follows the output signal for the solar kit model (EKSOLHT) EKHBH/X_AA/AB (0) or if the logic of X14A follows the output for the bottom plate heater (1).

Independent from field setting [F-04], the contact X3-X4 (EKRP1HB) follows the logic of the output signal for the solar kit model (EKSOLHT). See figure below for the schematic location of this contact.



8.9. Field settings table

First code	Second code	Setting name	Installer setting at variance with default value				Default value	Range	Step	Unit
			Date	Value	Date	Value				
0	**User permission level**									
	00	User permission level					3	2/3	1	—
1	**Weather dependent set point**									
	00	Low ambient temperature (Lo_A)					–10	–20~5	1	°C
	01	High ambient temperature (Hi_A)					15	10~20	1	°C
	02	Set point at low ambient temperature (Lo_Ti)					40	25~55	1	°C
	03	Set point at high ambient temperature (Hi_Ti)					25	25~55	1	°C
	05	Weather dependent for cooling function enable/disable					0 (OFF)	0/1	—	—
	06	Low ambient temperature (Lo2_A)					20	10~25	1	°C
	07	High ambient temperature (Hi2_A)					35	25~43	1	°C
	08	Set point at low ambient temperature (Lo2_Ti)					22	5~22	1	°C
	09	Set point at high ambient temperature (Hi2_Ti)					18	5~22	1	°C
2	**Disinfection function**									
	00	Operation interval					Fri	Mon~Sun, All	—	—
	01	Status					1 (ON)	0/1	—	—
	02	Start time					23:00	0:00~23:00	1:00	hour
	03	Set point (for combination with domestic hot water tank without built-in booster heater, [4-05]=5)					60	fixed	5	°C
	04	Interval (for combination with domestic hot water tank without built-in booster heater, [4-05]=5)					60	40~60	5	min
3	**Auto restart**									
	00	Status					0 (ON)	0/1	—	—
4	**Backup heater operation and space heating off temperature**									
	00	Backup heater operation					1 (ON)	0/1/2	—	—
	01	Not applicable. Do not change the default value.					—	—	—	—
	02	Space heating off temperature					35	14~35	1	°C
	03	Booster heater operation					5[(a)]	fixed	—	—
	04	Not applicable. Do not change the default value.					—	—	—	—
	05	Not applicable. Do not change the default value.					—	—	—	—
	06	Backup heater emergency operation					1 (enabled)	0/1	1	—
	07	Backup heater second step					1 (enabled)	0/1	1	—
5	**Equilibrium temperature and space heating priority temperature**									
	00	Equilibrium temperature status (for combination with domestic hot water tank without built-in booster heater, [4-05]=5, this setting is fixed and can not be consulted)					1 (ON)	—	—	—
	01	Equilibrium temperature					0	–15~35	1	°C
	02	Space heating priority status (for combination with domestic hot water tank without built-in booster heater, [4-05]=5, this setting is fixed and can not be consulted)					1 (ON)	—	—	—
	03	Space heating priority temperature					0	–15~35	1	°C
	04	Not applicable. Do not change the default value.					—	—	—	—

First code	Second code	Setting name	Installer setting at variance with default value				Default value	Range	Step	Unit
			Date	Value	Date	Value				
6	**DT for heat pump domestic water heating mode**									
	00	Start					2	2~20	1	°C
	01	Stop					2	0~10	1	°C
	02	Not applicable. Do not change the default value.					—	—	—	—
	Domestic water heating storage and reheat timing operation setup									
	03	Scheduled time storage					1 (ON)	0/1	1	—
	04	Scheduled time storage start time					1:00	0:00~23:00	1:00	hour
	05	Scheduled time reheat or continuous reheat					0 (OFF)	0/1/2	1	—
	06	Scheduled time reheat start time					15:00	0:00~23:00	1:00	hour
	07	Domestic hot water reheat set point					45	30~50	1	°C
	08	Domestic hot water reheat set point hysteresis					10	2~20	1	°C
7	**Dual set point control**									
	00	Not applicable. Do not change the default value.					—	—	—	—
	01	Not applicable. Do not change the default value.					—	—	—	—
	02	Dual set point control status					0 (OFF)	0/1	—	—
	03	Second set point heating					10	1~24 / 25~55	1	°C
	04	Second set point cooling					7	5~22	1	°C
8	**Domestic water heating mode timer**									
	00	Minimum running time					5	0~20	1	min
	01	Maximum running time					30	5~95	5	min
	02	Anti-recycling time					0.5	0~10	0.5	hour
	03	Not applicable. Do not change the default value.					—	—	—	—
	04	Additional running time at [4-02]/[F-01]					95	0~95	5	min
9	**Heating and cooling set point ranges**									
	00	Heating set point upper limit					55	37~55	1	°C
	01	Heating set point lower limit					25	15~37	1	°C
	02	Cooling set point upper limit					22	18~22	1	°C
	03	Cooling set point lower limit					5	5~18	1	°C
	04	Overshoot setting[(b)]					1	1~4	1	°C
	Automatic set back function									
	05	Set back function					0 (OFF)	0/1	1	—
	06	Set back operation start time					23:00	0:00~23:00	1:00	hour
	07	Set back operation stop time					5:00	0:00~23:00	1:00	hour
	08	Leaving water set back value					2	0~10	1	°C
A	**Quiet mode type**									
	00	Quiet mode type					0	0/2	—	—
	01	Satus					3	—	—	—
	02	Not applicable. Do not change the default value.					1[(c)]	Read only	—	—
	03	Not applicable. Do not change the default value.					0[(c)]	Read only	—	—
	04	Not applicable. Do not change the default value.					0[(c)]	Read only	—	—
b	Not applicable									
	00	Not applicable. Do not change the default value.					0[(c)]	Read only	—	—
	01	Not applicable. Do not change the default value.					0[(c)]	Read only	—	—
	02	Not applicable. Do not change the default value.					0[(c)]	Read only	—	—
	03	Not applicable. Do not change the default value.					0[(c)]	Read only	—	—
	04	Not applicable. Do not change the default value.					0[(c)]	Read only	—	—

First code	Second code	Setting name	Installer setting at variance with default value				Default value	Range	Step	Unit
			Date	Value	Date	Value				
C	**Setup on EKRP1HB digital I/O PCB**									
	00	Solar priority mode setting					0	0/1	1	—
	01	Alarm output logic					0	0/1	1	—
	02	X1-X2 function: Bivalent operation status or additional external backup heater					0	0/1/2	1	—
	03	Bivalent ON temperature or additional external backup heater temperature					0	–25~25	1	°C
	04	Bivalent hysteresis or additional external backup heater hysteresis					3	2~10	1	°C
	05	Not applicable. Do not change the default value.					—	—	—	—
D	**Benefit kWh rate power supply/local shift value weather dependent**									
	00	Switching off heaters					0	0/1/2/3	1	—
	01	Unit connection to benefit kWh rate power supply					0 (OFF)	0/1/2	1	—
	02	Not applicable. Do not change the default value.					—	—	—	—
	03	Local shift value weather dependent					0 (OFF)	0/1/2/3/4	1	—
	04	Not applicable. Do not change the default value.					—	—	—	—
	05	Pump operation is active during benefit kWh rate power supply and [D-00]=0 or 1 (backup heater forced off) setting					1	0/1	1	—
	06	Not applicable. Do not change the default value.					—	—	—	—
E	**Unit information readout**									
	00	Software version						Read only	—	—
	01	EEPROM version						Read only	—	—
	02	Unit model identification Do not change the default value						Depending on model	—	—
	03	Liquid refrigerant temperature						Read only	1	°C
	04	Inlet water temperature						Read only	1	°C
F	**Option setup**									
	00	Pump operation stop					0	0/1	—	—
	01	Space cooling permission temperature					20	10~35	1	°C
	02	Bottom plate heater ON temperature					3	3~10	1	°C
	03	Bottom plate heater hysteresis					5	2~5	1	°C
	04	Functionality of X14A[(b)]					1	0/1	—	—
	Underfloor heating screed dry-out program									
	05	Action number selection					1	1~20	1	—
	06	Heating set point of selected action number [F-05]					25.0[(d)]	25~55	1	°C
	07	Time of selected action number [F-05]					0[(d)]	0~72	12	hour
	08	Underfloor heating screed dry-out program enabled/disabled					0 (OFF)	0/1	1	—
	09	Latest action number executed					0	0~21 (Read only)	0	—

(a) Domestic hot water tank without built-in booster heater.
(b) Only possible to modify the first 3 minutes after power ON.
(c) The default value is only an indication as it is depending on the connected outdoor unit type.
(d) For all action numbers of [F-05].

9. Final check and test run

The installer is obliged to verify correct operation of the indoor and outdoor unit after installation.

9.1. Final check

Before switching on the unit, read the following recommendations:

- When the complete installation and all necessary settings have been carried out, be sure that all panels of the unit are closed. If this is not the case, inserting your hand through the remaining openings can cause serious injury due to electrical and hot parts inside the unit.
- The service panel of the switch box may only be opened by a licensed electrician for maintenance purposes.

9.2. Automatic test run

When the unit is put into operation (by pressing the button) for the first time, the system will automatically perform a test run in cooling mode. The test run will take up to 3 minutes, during which no specific indication is given on the user interface.

During the automatic test run, it is important to ensure that the water temperature does not drop below 10°C, which might activate the freeze-up protection and thereby prevent the test run to finish.
Should the water temperature drop below 10°C, press the ☀/❄ button so the ☀ icon is displayed. This will activate the backup heater during the automatic test run and raise the water temperature sufficiently.

If the automatic test run has ended successfully, the system will automatically resume normal operation.

If there are misconnections or malfunctions, an error code will be displayed on the user interface. To resolve the error codes, see "11.3. Error codes" on page 43.

When the outdoor unit is put into pump down operation (see the outdoor unit installation manual), the automatic test run flag will be cleared. The next time the system is put into operation, the automatic test run will be executed again.

After finishing automatic test run or power ON/OFF, the compressor will operate in the selected operation mode and continue for certain time (set point on the remote controller is overruled during this operation).

9.3. Test run operation (manual)

If required, the installer can perform a manual test run operation at any time to check correct operation of cooling, heating and domestic water heating.

Procedure

1 Push the TEST button 4 times so the **TEST** icon will be displayed.

2 Depending on the indoor unit model, heating operation, cooling operation or both must be tested as follows (when no action is performed, the user interface will return to normal mode after 10 seconds or by pressing the TEST button once):
   - To test the heating operation push the ☀/❄ button so the ☀ icon is displayed. To start the test run operation press the button.
   - To test the cooling operation push the ☀/❄ button so the ❄ icon is displayed. To start the test run operation press the button.
   - To test the domestic water heating operation push the button. The test run operation will start without pressing the button.

3 The test run operation will end automatically after 30 minutes or when reaching the set temperature. The test run operation can be stopped manually by pressing the TEST button once. If there are misconnections or malfunctions, an error code will be displayed on the user interface. Otherwise, the user interface will return to normal operation.

4 To resolve the error codes, see "11.3. Error codes" on page 43.

- To display the last resolved error code, push the TEST button 1 time. Push the TEST button again 4 times to return to normal mode.
- It is not possible to perform a test run if a forced operation from the outdoor unit is in progress. Should forced operation be started during a test run, the test run will be aborted.

9.4. Underfloor heating screed dry-out program

This function allows the installer to define and automatically execute an "underfloor heating screed dry-out" program.

The program is used to dry-out the screed of an underfloor heating during the construction of a house.

Disclaimer

1. Even though the program will be executed automatically the different programmed actions, the installer is responsible to check on regular basis the good working of the setup.
2. Please pay attention that the installer has full responsibility to select the correct program that fits to the type of used screed for the floor.

Benefit kWh rate power supply cannot be used in combination with "underfloor heating screed dry-out program". (In case [D-01] is enabled, [F-08] can not be set.)

Field settings

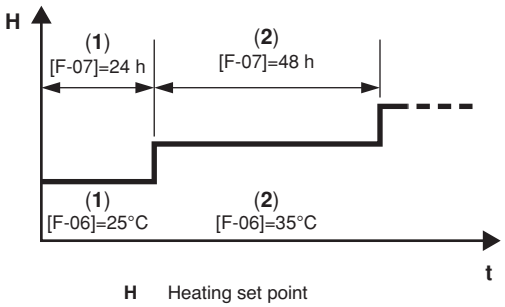
Underfloor screed dry-out field settings:

- [F-05] Action number selection
- [F-06] Heating set point of selected action number [F-05]
- [F-07] Time of selected action number [F-05] (steps of 12 hours)
- [F-08] Underfloor heating screed dry-out program enabled (1)/disabled (0)
- [F-09] (Read only) Latest action number executed.
  In case "underfloor heating screed dry-out program" is executed successful then [F-09] has value 21.

- Each action is executed with a programmed heating set point for a programmed time (steps of 12 hours).
- A maximum of 20 different actions can be programmed.
- The program is activated in the test run operation.
- When the program is stopped by an error or an operation switch off or a power failure, the U3 error code will be displayed.
  To resolve the error codes, see "11.3. Error codes" on page 43.

Procedure

Example of program:



H Heating set point
t Time
(**1**) Action number 1
(**2**) Action number 2

1 Set field settings

- The different actions are program as follows:
  (refer to "8.8. Field settings" on page 26 to know how to change the field settings)

1 Set in [F-05] (Action number), the action to be programmed, example 1.
Save the new value by pressing the ⏲⊗ button.

2 Set in [F-06] (Heating set point of selected action number [F-05]), example 25°C.
Save the new value by pressing the ⏲⊗ button.

3 Set in [F-07] (Time of selected action number [F-05]), example 24 hours.
Save the new value by pressing the ⏲⊗ button.

4 Repeat steps 1 trough 3 to program all the actions.

- The not set actions will not be programmed because these actions has time [F-07] equal to 0 hours as default.
- So in case to many actions are programmed and the quantity needs to be reduced, set the time [F-07] to 0 hours of the actions that does not need to be executed.

- Consult the different actions to confirm good setting values as follows:
  (refer to "8.8. Field settings" on page 26 to know how to change the field settings)

1 Set in [F-05] (Action number), the action to be consulted, example 1.
Save the new value by pressing the ⏲⊗ button.

2 Consult [F-06] (Heating set point of selected number [F-05])

3 Consult [F-07] (Time of selected number [F-05]), example 24 hours.

4 Repeat steps 1 trough 3 to consult all the actions.

- Enable the "underfloor heating screed dry-out program" as follows:

1 Set in [F-08] (Underfloor heating screed dry-out program enabled/disabled) to 1 (enabled).

2 When finished, press the TEST button to exit the FIELD SET MODE.

2 Activate

The activation of the "Underfloor heating screed dry-out program" is similar to the starting the Test run operation

1 Push the TEST button 4 times so the **TEST** icon will be displayed.

2 To start the "Underfloor heating dry-out program" press the ❄❄ button.

3 The "Underfloor heating dry-out program" will start and display the action and temperature setting of action number 1. The icon is also displayed.

3 During activation

The underfloor heating dry-out program will automatically run trough all programmed actions.

4 End

1 When all actions are executed, the program will automatically be stopped by switching off the unit and the **TEST** icon will be disappeared.

2 When the (Underfloor heating dry-out program) has ended successfully the [F-09] will have value 21.

- When the program is stopped by an error, by an operation switch off or by a power failure, then the U3 error will be displayed.
  To resolve the error codes, see "11.3. Error codes" on page 43.
  In this case [F-09] (Latest action number executed) will contain the latest action executed.
- [F-08] The "Underfloor heating screed dry-out program enabled (1)/disabled (0)" is always set to 0 (disable) when a program has been started once. This means that in case a second time an underfloor heating screed dry-out program must be started then [F-08] needs to be set again.

10. Maintenance and Service

In order to ensure optimal operation of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals, preferable yearly.

This maintenance shall be carried out by the installer or service agent.

10.1. Maintenance activities

Cautions before obtaining maintenance and service

DANGER: ELECTRIC SHOCK

- Before carrying out any maintenance or repair activity, always switch off the circuit breaker on the supply panel, remove the fuses or open the protection devices of the unit.
- Make sure that before starting any maintenance or repair activity, also the power supply to the outdoor unit is switched off.
- Do not touch live parts for 10 minutes after the power supply is turned off because of high voltage risk.
- The heater of the compressor may operate even in stop mode.
- Please note that some sections of the electric component box are hot.
- Make sure you do not touch a conductive section.
- Do not rinse the indoor unit. This may cause electric shocks or fire.
- When service panels are removed, live parts can be easily touched by accident.
  Never leave the unit unattended during installation or servicing when service panel is removed.

See "2. General safety precautions" on page 2.

WARNING: Play it safe!

Touch a metal part by hand (such as the stop valve) in order to eliminate static electricity and to protect the PCB before performing service.

DANGER: DO NOT TOUCH PIPING AND INTERNAL PARTS

- Do not touch water pipes during and immediately after operation as the pipes may be hot.
- Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts.
- Do not touch the internal parts (pump, backup heater, etc.) during and immediately after operation.

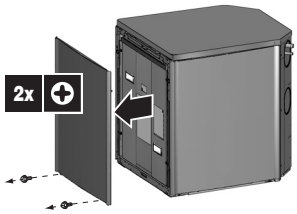
See "2. General safety precautions" on page 2.

Opening the unit

To execute the maintenance activities as mentioned below, it is only required to remove the front decoration panel.

Removing the front panel

To take away the front decoration panel, remove the 2 bottom screws and then unhitch the panel.



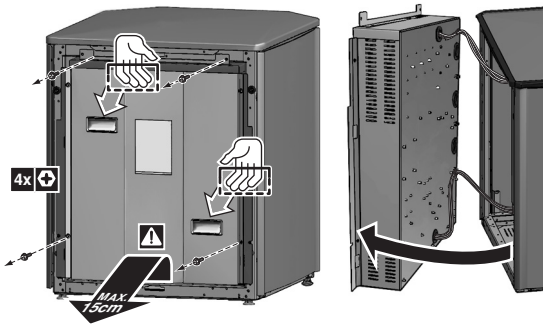
Removing the switch box

Loosen the front screws and unhitch the total switch box.

WARNING

Switch off all power supply – also outdoor unit power supply, etc., ... – before removing the switch box service cover.

The switch box can now be placed just before the indoor unit. The compressor cable located at the backside of the unit can be untied to place the switch box further away from the unit.



WARNING

Make sure to always fix the cover with the screws when removing the switch box.

Parts inside the unit can be hot and burning is possible.

Make sure to switch off all power supplies before removing the switch box from the unit.

The described checks must be executed at least **once a year**.

1 Water pressure

Check if the water pressure is above 1 bar. If necessary add water.

2 Water filter

Clean the water filter.

3 Water pressure relief valve

Check for correct operation of the pressure relief valve by turning the red knob on the valve counter-clockwise:

- If you do not hear a clacking sound, contact your local dealer.
- In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.

4 Pressure relief valve hose

Check that the pressure relief valve hose is positioned appropriately to drain the water.
If the (optional) drain pan kit is installed, make sure that the pressure relief valve hose end is positioned in the drain pan.

5 Backup heater vessel insulation cover

Check that the backup heater insulation cover is fastened tightly around the backup heater vessel.

6 Domestic hot water tank pressure relief valve (field supply)

Applies only to installations with a domestic hot water tank.
Check for correct operation of the pressure relief valve on the domestic hot water tank.

7 Indoor unit switch box

- Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring.
- Check for correct operation of contactors K1M, K2M, K3M, K5M (applications with domestic hot water tank only) and K4M by use of an ohmmeter. All contacts of these contactors must be in open position.

WARNING

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similary qualified persons to avoid a hazard.

Refer to the service manual to carry out any service mode operation.

11. Troubleshooting

This section provides useful information for diagnosing and correcting certain troubles which may occur in the unit.

This troubleshooting and related corrective actions may only be carried out by your local installer.

11.1. General guidelines

Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

WARNING

When carrying out an inspection on the switch box of the unit, always make sure that the main switch of the unit is switched off.

When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. Under no circumstances safety devices may be bridged or changed to a value other than the factory setting. If the cause of the problem can not be found, call your local dealer.

If the pressure relief valve is not working correctly and is to be replaced, always reconnect the flexible hose attached to the pressure relief valve, to avoid water dripping out of the unit!

DANGER: ELECTRIC SHOCK

See "2. General safety precautions" on page 2.

WARNING

In order to avoid a hazard due to inadvertent resetting of the thermal cut-out, this appliance must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.

DANGER: DO NOT TOUCH PIPING AND INTERNAL PARTS

- Do not touch water pipes during and immediately after operation as the pipes may be hot.
- Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts.
- Do not touch the internal parts (pump, backup heater, etc.) during and immediately after operation.

See "2. General safety precautions" on page 2.

For problems related to the optional solar kit for domestic water heating, refer to the troubleshooting in the installation manual of that kit.

11.2. General symptoms

Symptom 1: The unit is turned on (LED is lit) but the unit is not heating as expected

POSSIBLE CAUSES	CORRECTIVE ACTION
The temperature setting is not correct.	Check the controller set point.
The water flow is too low.	• Check that all shut-off valves of the water circuit are completely open. • Check if the water filter needs cleaning. • Make sure there is no air in the system (purge air). • Check on the manometer that there is sufficient water pressure. The water pressure must be >1 bar (water is cold). • Check that the pump speed setting is on the highest speed. • Make sure that the expansion vessel is not broken. • Check that the resistance in the water circuit is not too high for the pump (refer to "8.7. Setting the pump speed" on page 26).
The water volume in the installation is too low.	Make sure that the water volume in the installation is above the minimum required value (refer to "Checking the water volume and expansion vessel pre-pressure" on page 16).

Symptom 2: The unit is turned on but the compressor is not starting (space heating or domestic water heating)

POSSIBLE CAUSES	CORRECTIVE ACTION
The unit must start up out of its operation range (the water temperature is too low).	In case of low water temperature, the system utilizes the backup heater to reach the minimum water temperature first (15°C). • Check that the backup heater power supply is correct. • Check that the backup heater thermal fuse is closed. • Check that the backup heater thermal protector is not activated. • Check that the backup heater contactors are not broken.
The benefit kWh rate power supply settings and electrical connections do not match.	If [D-01]=1 or 2, the wiring requires specific installation like illustrated in "Connection to a benefit kWh rate power supply" on page 22. Other correctly installed configurations are possible, but are to be specific for the type of benefit kWh rate power supply type at this specific site.
The benefit kWh rate signal was sent by the electricity company.	Wait for the power to return.

Symptom 3: Pump is making noise (cavitation)

POSSIBLE CAUSES	CORRECTIVE ACTION
There is air in the system.	Purge air.
Water pressure at pump inlet is too low.	• Check on the manometer that there is sufficient water pressure. The water pressure must be >1 bar (water is cold). • Check that the manometer is not broken. • Check that the expansion vessel is not broken. • Check that the setting of the pre-pressure of the expansion vessel is correct (refer to "Setting the pre-pressure of the expansion vessel" on page 17).

Symptom 4: The water pressure relief valve opens

POSSIBLE CAUSES	CORRECTIVE ACTION
The expansion vessel is broken.	Replace the expansion vessel.
The water volume in the installation is too high.	Make sure that the water volume in the installation is under the maximum allowed value (refer to "Checking the water volume and expansion vessel pre-pressure" on page 16).

Symptom 5: The water pressure relief valve leaks

POSSIBLE CAUSES	CORRECTIVE ACTION
Dirt is blocking the water pressure relief valve outlet.	Check for correct operation of the pressure relief valve by turning the red knob on the valve counter clockwise: • If you do not hear a clacking sound, contact your local dealer. • In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.

Symptom 6: The user interface displays "NOT AVAILABLE" when pressing certain buttons

POSSIBLE CAUSES	CORRECTIVE ACTION
The current permission level is set to a level that prevents using the pressed button.	Change the "user permission level" field setting [0-00], see "Field settings" in the operation manual.

Symptom 7: Space heating capacity shortage at low outdoor temperatures

POSSIBLE CAUSES	CORRECTIVE ACTION
Backup heater operation is not activated.	Check that the "backup heater operation status" field setting [4-00] is turned on, see "8.8. Field settings" on page 26. Check whether or not the thermal protector of the backup heater has been activated (refer to Main components in the unit, "Backup heater thermal protector" on page 10 for location of the reset button). Check whether or not the thermal fuse of the backup heater is blown (refer to "Backup heater thermal fuse" in the chapter "5.2. Main components in the unit" on page 9).
The backup heater equilibrium temperature has not been configured correctly.	Raise the 'equilibrium temperature' field setting [5-01] to activate backup heater operation at a higher outdoor temperature.
Too much heat pump capacity is used for heating domestic hot water (applies only to installations with a domestic hot water tank).	Check that the 'space heating priority temperature' field settings are configured appropriately: • Make sure that the 'space heating priority status' field setting [5-02] is enabled. • Raise the 'space heating priority temperature' field setting [5-03] to activate backup heater operation at a higher outdoor temperature.

11.3. Error codes

When a safety device is activated, the user interface LED will be flashing, and an error code will be displayed.

A list of errors and corrective actions can be found in the table below.

Reset the safety by turning the unit OFF and back ON.

Instruction to turn the unit OFF			
User interface mode (heating/cooling ☀/❄)	Domestic water heating mode (🚿)	Push the button	Push the 🚿 ⏻ button
ON	ON	1 time	1 time
ON	OFF	1 time	—
OFF	ON	—	1 time
OFF	OFF	—	—

In case this procedure for resetting the safety is not successful, contact your local dealer.

Error code	Failure cause	Corrective action
80	Inlet water temperature thermistor failure (inlet water thermistor broken)	Contact your local dealer.
81	Outlet water temperature thermistor failure (outlet water temperature sensor broken)	Contact your local dealer.
89	Water heat exchanger freeze-up failure (due to water flow too low)	Refer to error code 7H.
	Water heat exchanger freeze-up failure (due to refrigerant shortage)	Contact your local dealer.
7H	Flow failure (water flow too low or no water flow at all, minimum required water flow is 16 l/min)	• Check that all shut off valves of the water circuit are completely open. • Check if the water filter needs cleaning. • Check that the unit is operating within its operating range (refer to "Technical specifications" on page 44). • Also refer to "Charging water" on page 17. • Make sure there is no air in the system (purge air). • Check on the manometer that there is sufficient water pressure. The water pressure must be >1 bar (water is cold). • Check that the pump speed setting is on the highest speed. • Make sure that the expansion vessel is not broken. • Check that the resistance in the water circuit is not too high for the pump (refer to "8.7. Setting the pump speed" on page 26). • If this error occurs at defrost operation (during space heating or domestic water heating), make sure that the backup heater power supply is wired correctly and that fuses are not blown. • Check that the pump fuse (FU2) and PCB fuse (FU1) are not blown.
8F	Outlet water temperature of indoor unit too high (>75°C) during domestic water heating	• Check that the contactor of the electric backup heater is not short circuited. • Check that the outlet water thermistor is giving the correct read out.
8H	Outlet water temperature of indoor unit too high (>65°C) not during domestic water heating	• Check that the contactor of the electric backup heater is not short circuited. • Check that the outlet water thermistor is giving the correct read out.
A1	Indoor unit PCB defective	Contact your local dealer.
A5	Too low (during cooling operation) or too high (during heating operation) refrigerant temperature (measured by R3T)	Contact your local dealer.
AA	Backup heater thermal protector is open	Reset the thermal protector by pressing the reset button (refer to "5.2. Main components in the unit" on page 9 for location of the reset button)
	Check the reset button of the thermal protector. If both the thermal protector and the controller are reset, but the AA error code persists, the backup heater thermal fuse has blown.	Contact your local dealer.
C0	Flow switch failure (flow switch remains closed while pump is stopped)	Check that the flow switch is not clogged with dirt.
C4	Heat exchanger thermistor failure (heat exchanger temperature sensor broken)	Contact your local dealer.
E1	Outdoor unit PCB defective	Contact your local dealer.
E3	Abnormal high pressure	Check that the unit is operating within its operating range (refer to "Technical specifications" on page 44). Contact your local dealer.
E4	Actuation of low pressure sensor	Check that the unit is operating within its operating range (refer to "Technical specifications" on page 44). Contact your local dealer.
E5	Overload activation of compressor	Check that the unit is operating within its operating range (refer to "Technical specifications" on page 44). Contact your local dealer.
E7	Fan lock failure (fan is locked)	Check if the fan is not obstructed by dirt. If the fan is not obstructed, contact your local dealer.
E9	Malfunction of electronic expansion valve	Contact your local dealer.
EC	Domestic hot water temperature too high (>89°C)	• Check that the contactor of the electric backup heater is not short circuited. • Check that the domestic hot water thermistor is giving the correct read out.
F3	Too high discharge temperature (e.g. due to outdoor coil blockage)	Clean the outdoor coil. If the coil is clean, contact your local dealer.
H3	Malfunctioning HPS system	Contact your local dealer.
H9	Outdoor temperature thermistor failure (outdoor thermistor is broken)	Contact your local dealer.
HC	Domestic hot water tank thermistor failure	Contact your local dealer.
J1	Malfunction of pressure sensor	Contact your local dealer.
J3	Discharge pipe thermistor failure	Contact your local dealer.
J5	Suction pipe outdoor unit thermistor failure	Contact your local dealer.
J6	Aircoil thermistor frost detection failure	Contact your local dealer.
J7	Aircoil thermistor mean temperature failure	Contact your local dealer.
J8	Liquid pipe outdoor unit thermistor failure	Contact your local dealer.
L4	Electric component failure	Contact your local dealer.
L5	Electric component failure	Contact your local dealer.
L8	Electric component failure	Contact your local dealer.
L9	Electric component failure	Contact your local dealer.
LC	Electric component failure	Contact your local dealer.
P1	PCB failure	Contact your local dealer.
P4	Electric component failure	Contact your local dealer.
PJ	Failure of capacity setting	Contact your local dealer.
U0	Refrigerant failure (due to refrigerant leak)	Contact your local dealer.
U2	Main circuit voltage failure	Contact your local dealer.

Error code	Failure cause	Corrective action
U3	Underfloor heating screed dry-out program has been stopped by another error, or by pushing operation off button, or by power failure.	The error can only be reset in the test mode as follows: First, press the TEST button 4 times so the **TEST** icon will be displayed. Then press the button 1 time. Finally push the TEST button to exit the test mode. Notes: • -In this case [F-09] "Latest action number executed" will contain the latest action number executed. • -[F-08] "Underfloor heating screed dry-out program enabled (1)/disabled (0)" is always cleared to 0 (disable). This means that in case a second time a "Underfloor heating screed dry-out program" must be started, [F-08] needs to be set again.
U4	Communication failure	Contact your local dealer.
U5	Communication failure	Contact your local dealer.
U7	Communication failure	Contact your local dealer.
U8	Communication failure or model set up not confirmed	Contact your local dealer.

12. UNIT SPECIFICATIONS

Technical specifications

		EKHVH016BB6V3	EKHVH016BB6WN	EKHVH016BB9WN	EKHVX016BB6V3	EKHVX016BB6WN	EKHVX016BB9WN
Casing material		Pre-coated sheet metal			Pre-coated sheet metal		
Dimensions HxWxD	(mm)	705x600x695			705x600x695		
Weight							
• with packaging	(kg)	76			76		
• without packaging	(kg)	67			67		
Water connections							
• water inlet/outlet		G 1"1/4 FBSP[(a)]			G 1"1/4 FBSP[(a)]		
• water inlet/outlet material		brass			brass		
• maximum working pressure	(bar)	3			3		
Refrigerant connections							
• refrigerant gas side	(mm)	15.9 (5/8 inch)			15.9 (5/8 inch)		
• refrigerant liquid side	(mm)	9.5 (3/8 inch)			9.5 (3/8 inch)		
Pump							
• type		Water cooled			Water cooled		
• no. of speed		3			3		
Sound pressure level	(dBA)	Refer to technical data			Refer to technical data		
Pressure relief valve water circuit	(bar)	3			3		
Operation range - water side (heating)	(°C)	+15~+55			+15~+55		
Operation range - water side (cooling)	(°C)	—			+5~+22		
Operation range - air							
• space heating	(°C)	–20~+35			–20~+35		
• domestic hot water	(°C)	–20~46			–20~46		
Operation range - air							
• cooling	(°C)	+10~+46			+10~+46		

(a) FBSP = Female Britisch Standard Pipe

Electrical specifications

	EKHVH016BB6V3	EKHVH016BB6WN	EKHVH016BB9WN	EKHVX016BB6V3	EKHVX016BB6WN	EKHVX016BB9WN
Standard unit (power supply via outdoor unit)						
• power supply	230 V 50 Hz 1P					
Backup heater						
• power supply	See "Connection of the backup heater power supply" on page 21					
• maximum running current	See "Connection of the backup heater power supply" on page 21					

NOTES

4PW64331-1 00000004

Copyright 2010 Daikin

DAIKIN EUROPE N.V.
Zandvoordestraat 300, B-8400 Oostende, Belgium

4PW64331-1 07.2010