DAIKIN

altherma

INSTALLATION MANUAL

Unit for air to water heat pump system

EDHQ011BB6V3
EDHQ014BB6V3
EDHQ016BB6V3

EDHQ011BB6W1
EDHQ014BB6W1
EDHQ016BB6W1

EDLQ011BB6V3
EDLQ014BB6V3
EDLQ016BB6V3

EDLQ011BB6W1
EDLQ014BB6W1
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EBHQ011BB6V3
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EBHQ011BB6W1
EBHQ014BB6W1
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EBLQ011BB6V3
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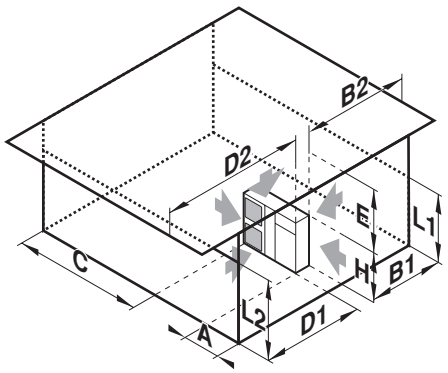
EBLQ016BB6V3

EBLQ011BB6W1
EBLQ014BB6W1
EBLQ016BB6W1



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	✓		✓	✓				≥100	≥100		≥100					
	✓				✓				≥100				≤500	≥1000		
	✓		✓	✓	✓			≥150	≥150		≥150		≤500	≥1000		
		✓										≥500				
		✓			✓					≤500		≥500		≥1000		
	✓	✓				L1<L2			≥100			≥500				
						L2<L1			≥100			≥500				
	✓	✓			✓	L1<L2	L1≤H		≥250	≤500		≥750		≥1000	0<L1≤1/2H	1
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							H<L1	L1≤H								
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							H<L2	L2≤H								
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		✓										≥1000				
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	✓	✓				L1<L2			≥300			≥1000				
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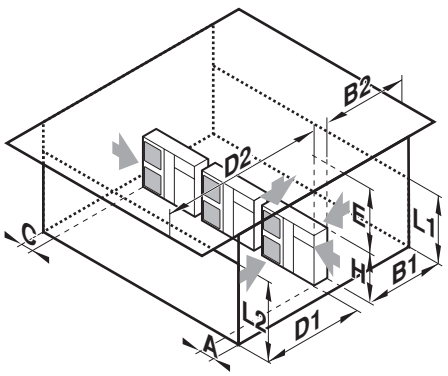
									≥300						1/2H<L2≤H	
						L1<L2	L1≤H		≥300	≤500		≥1000		≥1000	0<L1≤1/2H	1
												≥1250			1/2H<L1≤H	
	✓	✓			✓		H<L1	L1≤H								
						L2<L1	L2≤H		≥250			≥1500	≤500	≥1000	0<L2≤1/2H	2
									≥300						1/2H<L2≤H	
							H<L2	L2≤H								



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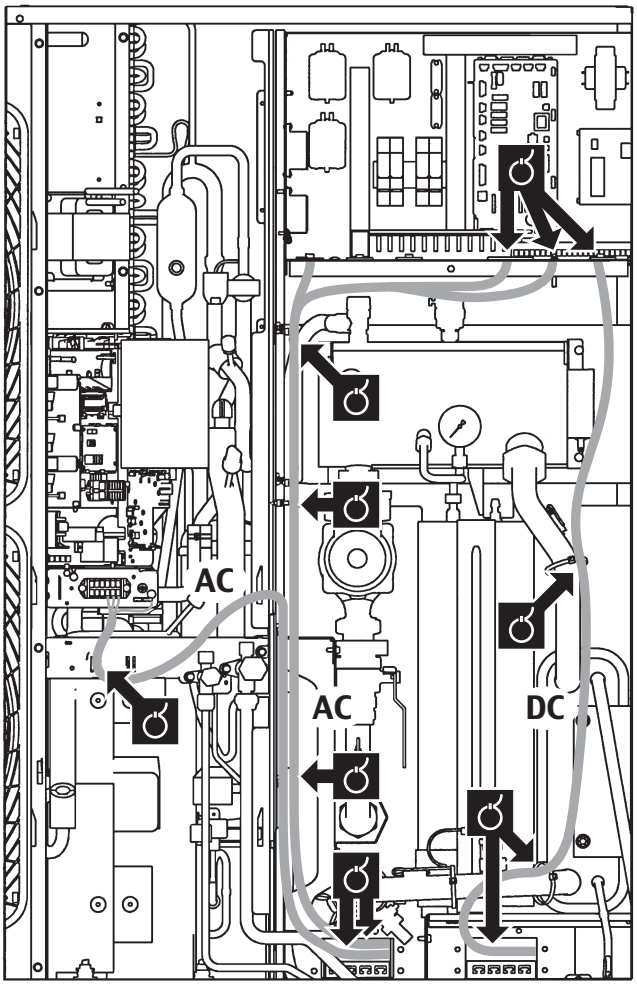
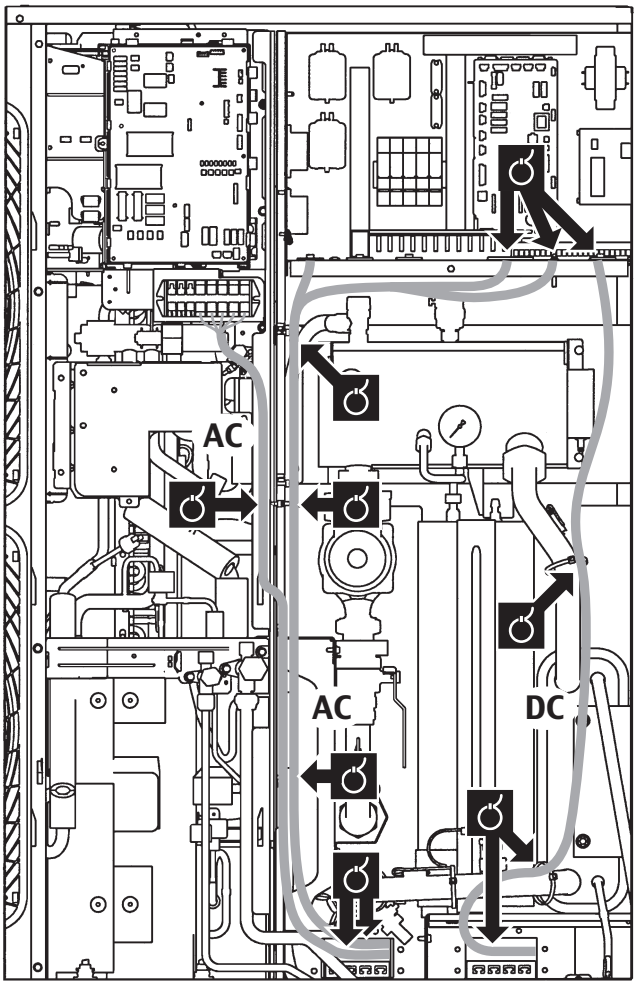
V3



W1



2

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 felelőssége 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:

EBHQ011BB6V3*, EBHQ014BB6V3*, EBHQ016BB6V3*, EBHQ011BB6W1*, EBHQ014BB6W1*, EBHQ016BB6W1*,
EBLQ011BB6V3*, EBLQ014BB6V3*, EBLQ016BB6V3*, EBLQ011BB6W1*, EBLQ014BB6W1*, EBLQ016BB6W1*,
EDHQ011BB6V3*, EDHQ014BB6V3*, EDHQ016BB6V3*, EDHQ011BB6W1*, EDHQ014BB6W1*, EDHQ016BB6W1*,
EDLQ011BB6V3*, EDLQ014BB6V3*, EDLQ016BB6V3*, EDLQ011BB6W1*, EDLQ014BB6W1*, EDLQ016BB6W1*,
* = , , 1, 2, 3, ..., 9, A, B, C, ..., Z

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

<A>	**DAIKIN.TCF.025D17/02-2011**
<B>	**DEKRA (NB0344)**
<C>	**2082543.0551-QUA/EMC**

3PW57792-10B

Jean-Pierre Beuselinck
General Manager
Ostend, 1st of April 2011

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

CONTENTS

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

⚠ 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.

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.

INFORMATION

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 here, all cover very important topics, so be sure to follow them carefully.

All activities described in this manual shall be carried out by an installer and in accordance with the applicable legislation.

Be sure to wear adequate personal protection equipment (protection gloves, safety glasses, …) when performing installation, maintenance or service to the unit.

If not sure of installation procedures or operation of the unit, always contact your local dealer for advice and information.

Improper installation or attachment of equipment or accessories could result in electric shock, short-circuit, leaks, fire or other damage to the equipment. Be sure only to use accessories and optional equipment made by Daikin which are specially designed for use with the products as of subject in this manual and have them installed by an installer.

DANGER: ELECTRICAL SHOCK

Switch off all power supply before removing the switch box 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 product.

This unit is used for both heating and cooling applications. The unit can be combined with Daikin fan coil units, floor heating applications, low temperature radiators, domestic hot water tank (option) and Daikin solar kit (option).

A remote controller is standard supplied with the unit to control your installation.

Heating/cooling units and heating only units

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

Nordic units

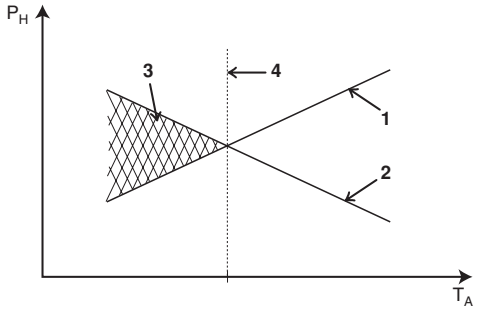
EDL and EBL units include special equipment (insulation, heater sheet,...) to ensure good operation in areas where low ambient temperature can occur together with high humidity conditions. In such conditions the EDH and EBH models may experience problems with severe ice build up on the air-cooled coil. In case such conditions are expected, the EDL or EBL must be installed instead. These models contain countermeasures (insulation, heater sheet,...) to prevent freeze up.

- Possible options

		Heater sheet	Drain socket
	EDLQ, EBLQ	Standard	Use prohibited
	EDHQ, EBHQ	Optional kit(a)	Optional kit(a)

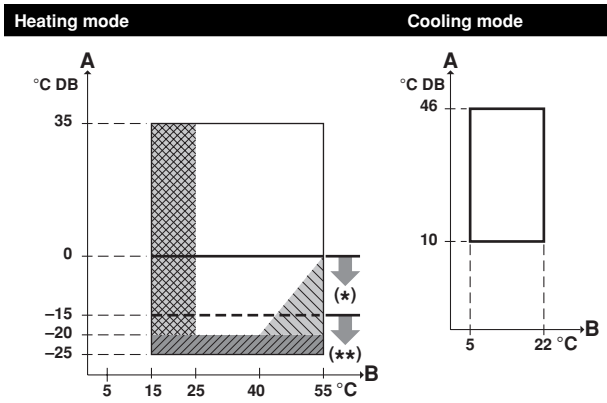
(a) Combination of both options is prohibited.

The units are delivered with an integrated backup heater for additional heating capacity during low outdoor temperatures. The backup heater also serves as a backup in case of malfunctioning of the unit and for freeze protection of the outside water piping during winter time. The backup heater factory set capacity is 6 kW, however, depending on the installation, the installer can limit the backup heater capacity to 3 kW/2 kW. The backup heater capacity decision is a mode based on the equilibrium temperature, see scheme below.



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 "10.10. Field settings" on page 32)
T_A Ambient (outdoor) temperature
P_H Heating capacity

Operation range



A Outdoor temperature
B Leaving water temperature
No heat pump operation, back up heater only (V3 and W1 models)
No heat pump operation, back up heater only (for V3 models only)
Operation possible, but no guarantee of capacity (for W1 models only)

(*)
- E(D/B)L* units include special equipment (insulation, heater sheet, ...) to ensure good operation in areas where low ambient temperatures can occur together with high humidity conditions. In such conditions the E(D/B)H* units may experience problems with severe ice build-up on the air-cooled coil. In case such conditions are expected, the E(D/B)L* units must be installed instead.
- Both E(D/B)L* and E(D/B)H* units have a freeze prevention function using the pump and backup heater to keep the water system safe from freezing in all conditions. In case accidental or intentional power shutdown is likely to happen, we recommend to use glycol.

(**) Only for E(D/B)L* units

Domestic hot water tank (option)

An optional domestic hot water tank can be connected to the unit. The domestic hot water tank is available in 2 types:

- tank with built-in electrical booster heater (EKHW*) in 3 different sizes: 150, 200 and 300 litre,
- tank without electrical booster heater (EKHTS) in 2 different sizes: 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 EKSOLHW solar kit, refer to the installation manual of that kit.

INFORMATION

Use the EKSOLHW solar kit only in combination with the EKHW* domestic hot water tank.

Connection between EKSOLHW and EKHTS domestic hot water tank is **NOT** possible.

Digital I/O PCB kit (option)

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

- remote alarm output
- heating/cooling ON/OFF output
- bivalent operation (permission signal for the auxiliary boiler) or additional external backup heater permission signal.

Refer to the operation manual of the 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.

Bottom plate heater EKBPHTH16A

	Connectable heaters EKBPHTH16A
EDLQ, EBLQ	Standard
EDHQ, EBHQ	Option

Room thermostat kit (option)

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

To obtain more information concerning these option kits, please refer to dedicated installation manuals of the kits.

Connection to a benefit kWh rate power supply

This equipment allows for connection to benefit kWh rate power supply delivery systems. Full control of the unit will remain possible only in case the benefit kWh rate power supply is of the type that power supply is not interrupted. Refer to "Connection to a benefit kWh rate power supply" on page 26 for more details.

3.2. Scope of this manual

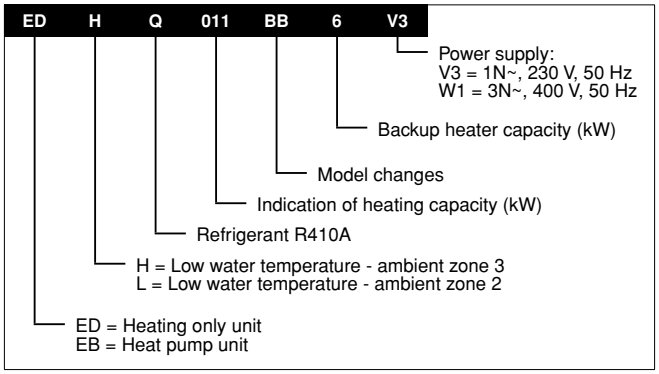
This manual does NOT include the selection procedure and the water system design procedure. Only some precautions and tips and tricks about the design of the water circuit are given in a separate chapter of this manual.

Once the selection is done and the water system is designed, this manual describes the procedures for handling, installing and connecting the EDH, EBH, EDL and EBL units. This manual has been prepared to ensure adequate maintenance of the unit, and it will provide help if problems occur.

INFORMATION

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

3.3. Model identification

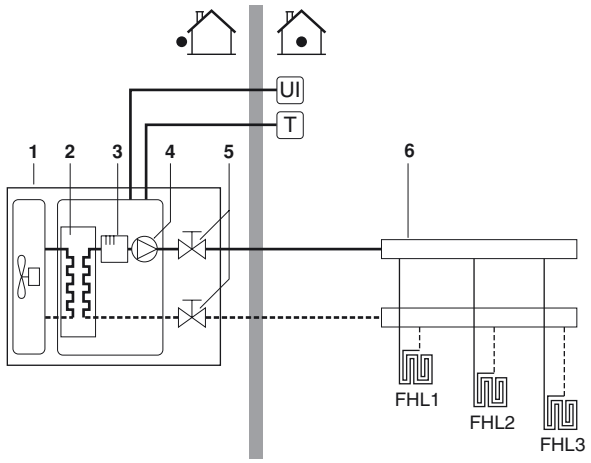


3.4. Typical application examples

The application examples given below are for illustration purposes only.

Application 1

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



1 Unit
2 Heat exchanger
3 Backup heater
4 Pump
5 Shut-off valve
6 Collector (field supply)
FHL1...3 Floor heating loop (field supply)
T Room thermostat (optional)
UI User interface

Unit operation and space heating

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

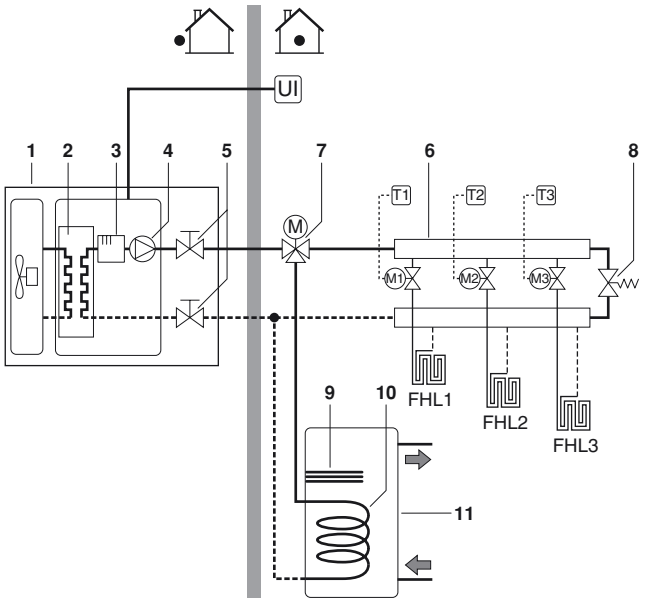
When the room temperature is above the thermostat set point, the unit will stop operating.

NOTICE

Make sure to connect the thermostat wires to the correct terminals (see "Connection of the thermostat cable" on page 25) and to configure the DIP switch toggle switches correctly (see "10.2. Room thermostat installation configuration" on page 29).

Application 2

Space heating only application without room thermostat connected to the 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 unit.



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

Pump operation

With no thermostat connected to the unit (1), the pump (4) can be configured to operate either as long as the unit is on, or until the required water temperature is reached.

INFORMATION

Details on pump configuration can be found under "10.3. Pump operation configuration" on page 29.

Space heating

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

NOTICE

When circulation in each floor heating loop (FHL1...3) is controlled by remotely controlled valves (M1...3), it is important to provide a by-pass valve (8) 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 "6.5. Water pipework" on page 16 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 a combination of the heat exchanger coil and the electrical booster heater(3) or backup heater(4).

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 booster heater (9)(5) or backup heater (3)(6) can provide auxiliary heating.

INFORMATION

It is possible to connect either a 2-wire or a 3-wire 3-way valve (7). Make sure to fit the 3-way valve correctly. For more details, refer to "Procedure for wiring the 3-way valve" on page 26.

Only for EKHW*:

- At low outdoor temperatures when space heating demand is higher, the unit can be configured to have the domestic hot water heated by the booster heater exclusively. This assures that the full capacity of the heat pump is available for space heating.
- Details on domestic hot water tank configuration for low outdoor temperatures can be found under "10.10. Field settings" on page 32, field settings [5-02] to [5-04].

Only for EKHTS:

- At low outdoor temperatures when space heating demand is higher, the unit can be configured to have the domestic hot water heated by the heat pump and backup heater at the same time. This assures that the interruption of space heating is limited to a minimum.
- Details on domestic hot water tank configuration for low outdoor temperatures can be found under "10.10. Field settings" on page 32, field settings [5-02] to [5-04].

NOTICE

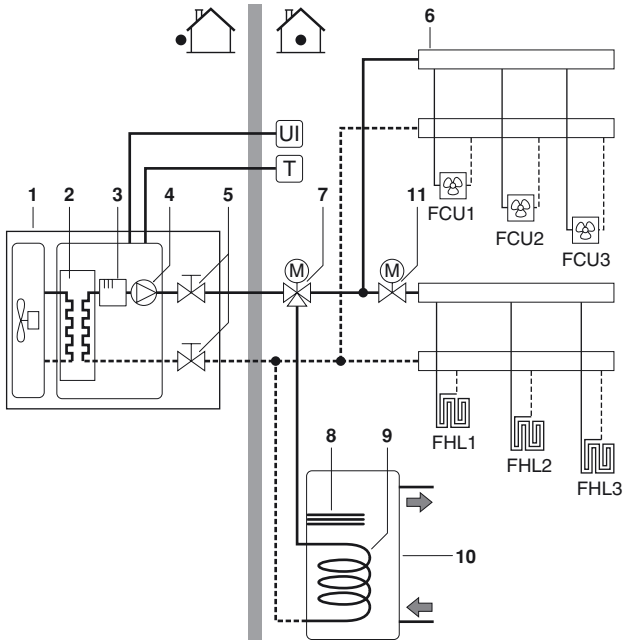
Be sure that the correct field settings are active or selected according to the applicable tank type. See field settings in "[4] Backup/booster heater operation and space heating off temperature" on page 34 for more details.

(1) For tank without electrical booster heater (EKHTS), the backup heater will be used in domestic water heating mode.
(2) Only applicable for tank with built-in electrical booster heater (EKHW*).
(3) Only applicable for tank with built-in electrical booster heater (EKHW*).
(4) Only applicable for tank without electrical booster heater (EKHTS).
(5) Only applicable for tank with built-in electrical booster heater (EKHW*).
(6) Only applicable for tank without electrical booster heater (EKHTS).

Application 3

Space heating and cooling application with the **room thermostat set for heating/cooling** *connected to the 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 unit.



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

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 unit (1) will switch to "heating mode"/"cooling mode". The unit (1) will start operating to achieve the target leaving hot/cold water temperature.

In case of cooling mode, the 2-way valve (11) 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 25) and to configure the DIP switch toggle switches correctly (see "10.2. Room thermostat installation configuration" on page 29).
- Wiring of the 2-way valve (11) 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.

(1) For tank without electrical booster heater (EKHTS), the backup heater will be used in domestic water heating mode.
(2) Only applicable for tank with built-in electrical booster heater (EKHW*).

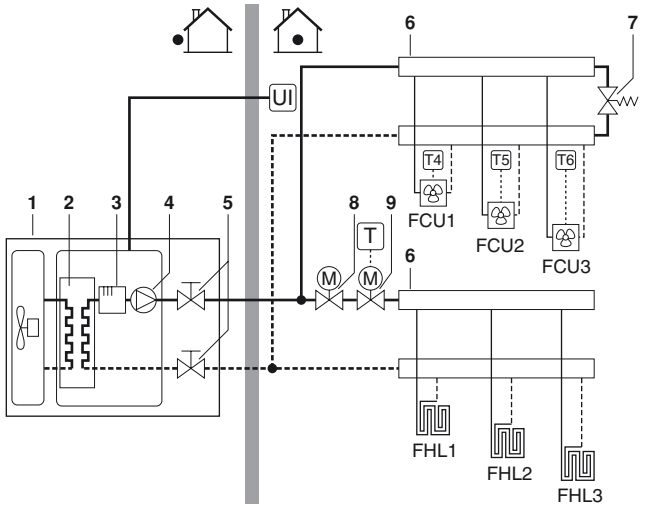
The ON/OFF setting of the heating/cooling operation is done by the room thermostat and cannot be done by the user interface.

Domestic water heating

Domestic water heating is as described under "Application 2" on page 5.

Application 4

Space heating and cooling application ***without the room thermostat connected to the 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 Unit
2 Heat exchanger
3 Backup heater
4 Pump
5 Shut-off valve
6 Collector (field supply)
7 By-pass valve (field supply)
8 Motorised 2-way valve to shut off the floor heating loops during cooling operation (field supply)
9 Motorised 2-way valve for activation of the room thermostat (field supply)
FCU1...3 Fan coil unit with thermostat (field supply)
FHL1...3 Floor heating loop (field supply)
T Heating only room thermostat (optional)
T4...6 Individual room thermostat for fan coil heated/cooled room (optional)
UI User interface

Pump operation

With no thermostat connected to the unit (1), the pump (4) can be configured to operate either as long as the unit is on, or until the required water temperature is reached.

INFORMATION

Details on pump configuration can be found under "10.3. Pump operation configuration" on page 29.

Space heating and cooling

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

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

With the unit in heating mode, the 2-way valve (8) is open. Hot water is provided to both the fan coil units and the floor heating loops.

With the unit in cooling mode, the motorised 2-way valve (8) 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 (7) to avoid the flow switch safety device from being activated. See also "Application 2" on page 5.
- Wiring of the 2-way valve (8) 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.

Application 5

Space heating with an auxiliary boiler (alternating operation)

Space heating application by either the Daikin unit or by an auxiliary boiler connected in the system. The decision whether either the E(D/B) unit or the boiler will operate can be achieved by an auxiliary contact or an E(D/B)* 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 7.

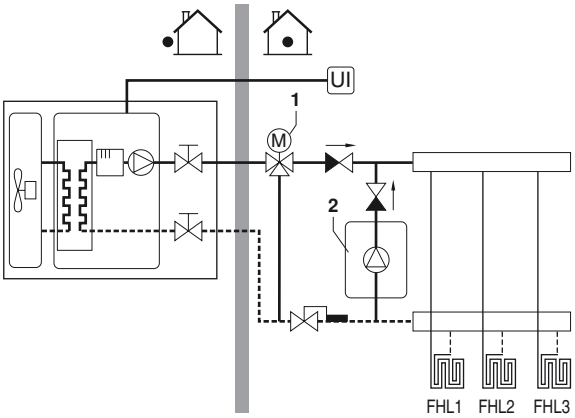
The E(D/B) unit controlled contact (also called 'permission signal for the auxiliary boiler") is determined by the outdoor temperature (thermistor located at the unit). See "Field wiring configuration B" on page 8.*

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 unit.

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

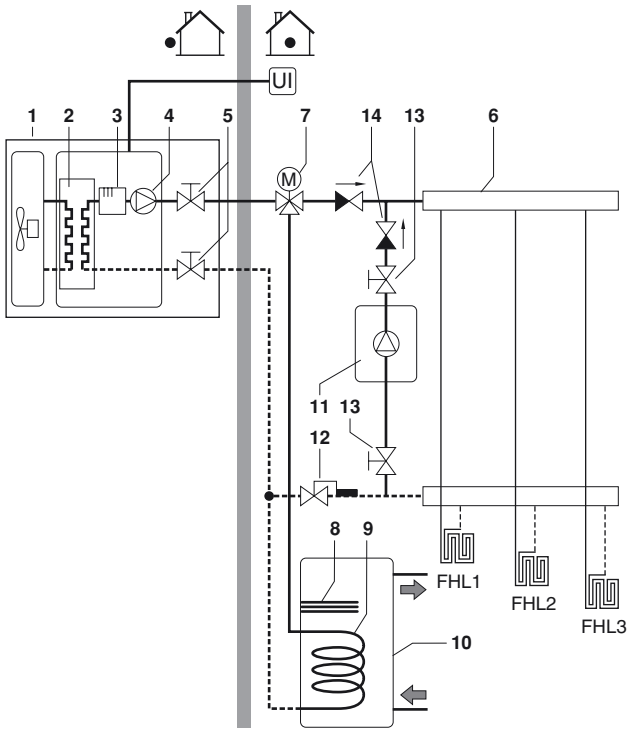
CAUTION

- Be sure that the boiler and the integration of the boiler in the system is in accordance with the applicable legislation.
- Always install a 3-way valve, even if no domestic hot water tank is installed. This to ensure that the freeze protection function (see "Freeze protection function" on page 35) can operate when the boiler is active.



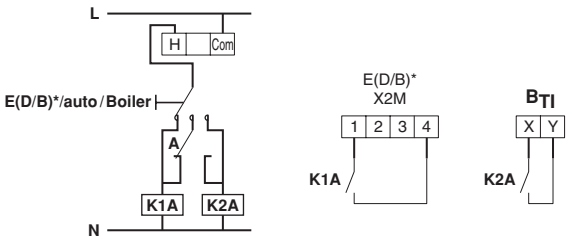
1 Motorised 3-way valve
2 Boiler
UI User interface

- Daikin can not be put responsible for incorrect or unsafe situations in the boiler system.



1 Unit
2 Heat exchanger
3 Backup heater(1)
4 Pump
5 Shut-off valve
6 Collector (field supply)
7 Motorised 3-way valve (delivered with the domestic hot water tank)
8 Booster heater(2)
9 Heat exchanger coil
10 Domestic hot water tank (optional)
11 Boiler (field supply)
12 Aquastat valve (field supply)
13 Shut-off valve (field supply)
14 Non-return valve (field supply)
FHL1...3 Floor heating loop (field supply)
UI User interface

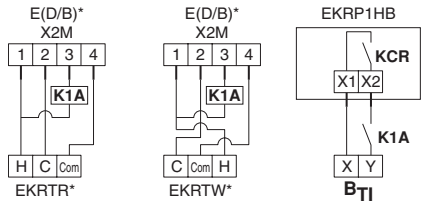
Field wiring configuration A



B_{TI} Boiler thermostat input
A Auxiliary contact (normal closed)
H Heating demand room thermostat (optional)
Com Common room thermostat (optional)
E(D/B)* Unit
auto Automatic
Boiler Boiler
K1A Auxiliary relay for activation of E(D/B)* unit (field supply)
K2A Auxiliary relay for activation of boiler (field supply)

(1) For tank without electrical booster heater (EKHTS), the backup heater will be used in domestic water heating mode.
(2) Only applicable for tank with built-in electrical booster heater (EKHW*).

Field wiring configuration B



B_{TI}	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 E(D/B)* unit (field supply)
KCR	Permission signal for the auxiliary boiler
E(D/B)*	Unit

Operation

■ **Configuration A**

When the room thermostat requests heating, either the E(D/B)* 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 E(D/B)* 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 E(D/B)* 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 E(D/B)* 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 E(D/B)* unit and the boiler. As the outdoor temperature is measured via the unit's air thermistor, make sure to install the 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 E(D/B)* 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 unit.

NOTICE

Make sure to configure the DIP switch SS2-3 on the PCB of the E(D/B)* switch box correctly. Refer to "10.2. Room thermostat installation configuration" on page 29.

For configuration B: Make sure to configure the field settings [C-02, C-03 and C-04] correctly. Refer to "Bivalent operation" on page 41.

NOTICE

Make sure that return water to the E(D/B)* 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 E(D/B)* unit.

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

Make sure that the room thermostat EKRTR or EKRTW are 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 E(D/B)* unit again.

INFORMATION

Manual permission towards the E(D/B)* unit on the boiler.

In case only the E(D/B)* 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.

Domestic water heating

Domestic water heating is as described under "Application 2" on page 5.

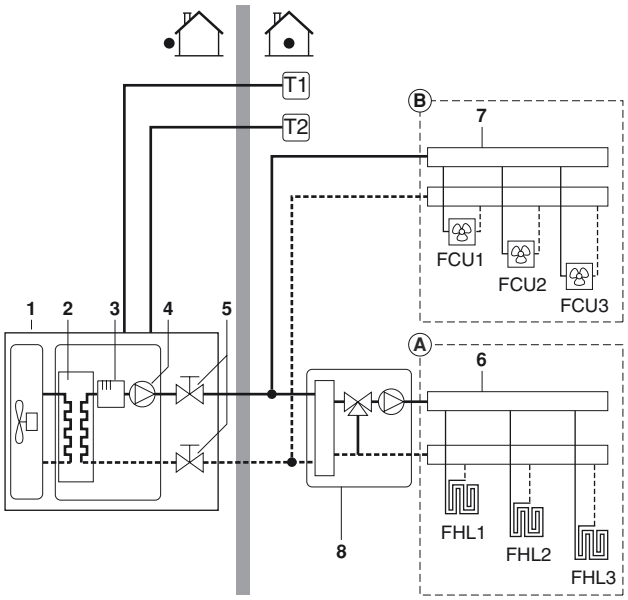
Application 6

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 achieve 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 unit water circuit and the floor heating loops after the mixing station. The control of this mixing station is not done by the 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 Unit
2 Heat exchanger
3 Backup heater
4 Pump
5 Shut-off valve
6 Collector zone A (field supply)
7 Collector zone B (field supply)
8 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)

INFORMATION

- 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.
- The hydraulic balance is very important. (unit - mixing station - FCU1...3)

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 unit, the pump (4) will operate when there is a request for heating from T1 and/or T2. The 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 unit and pump will stop operating.

NOTICE

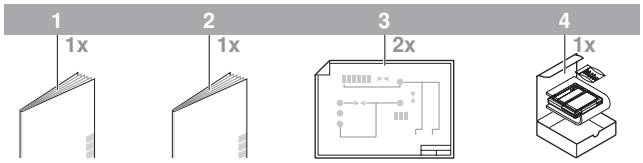
- Make sure to connect the thermostat wires to the correct terminals (see "5. Overview of the unit" on page 10).
- Make sure to configure the field settings [7-02], [7-03] and [7-04] correctly. Refer to "Dual set point control" on page 39.
- Make sure to configure the DIP switch SS2-3 on the PCB of the switch box correctly. Refer to "10.2. Room thermostat installation configuration" on page 29.
- It is the installers responsibility to make sure no unwanted situations can occur (e.g. too high water temperatures towards floor heating loops, etc.)
- Be aware that the actual water temperature through the floor heating loops depends on the control and setting of the mixing station.

INFORMATION

- 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
- 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.
- At this type of application heating/cooling selection always has to be done on the user interface. Refer to "Dual set point control" on page 39 for more details.

4. Accessories

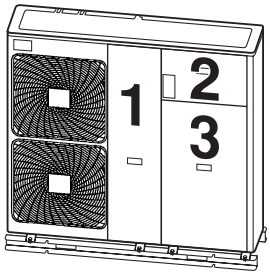
4.1. Accessories supplied with the unit



1 Installation manual
2 Operation manual
3 Wiring diagram sticker (inside unit cover doors 1 and 2)
4 User interface kit
(digital remote controller, 4 fixing screws and 2 plugs)

5. Overview of the unit

5.1. Opening the unit



Door 1	gives access to the compressor compartment and electrical parts
Door 2	gives access to the electrical parts of the hydraulic compartment
Door 3	gives access to the hydraulic compartment

DANGER: ELECTRICAL SHOCK

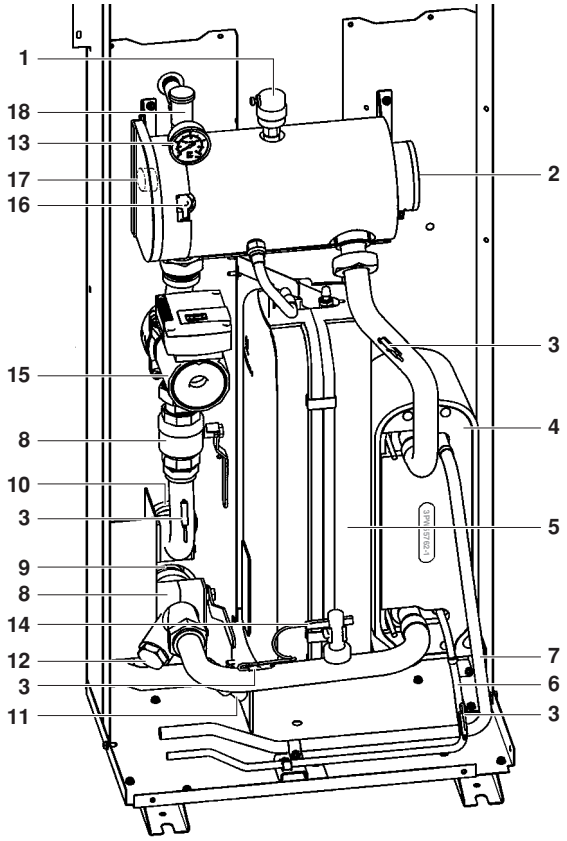
See "2. General safety precautions" on page 2.

DANGER: DO NOT TOUCH PIPING AND INTERNAL PARTS

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

5.2. Main components

Hydraulic compartment (door 3)



1. Air purge valve
Remaining air in the water circuit will be automatically removed via the air purge valve.

2. Backup heater
The backup heater consists of an electrical heating element that will provide additional heating capacity to the water circuit if the heating capacity of the unit is insufficient due to low outdoor temperatures, it also protects the external water piping from freezing during cold periods.

3. Temperature sensors
Four temperature sensors determine the water and refrigerant temperature at various points in the water circuit.

4. Heat exchanger

5. Expansion vessel (10 l)

6. Refrigerant liquid connection

7. Refrigerant gas connection

8. Shut-off valves
The shut-off valves on the water inlet connection and water outlet connection allow isolation of the unit water circuit side from the residential water circuit side. This facilitates draining and filter replacement of the unit.

9. Water inlet connection

10. Water outlet connection

11. Drain and fill valve

12. Water filter
The water filter removes dirt from the water to prevent damage to the pump or blockage of the evaporator. The water filter must be cleaned on a regular base. See "12. Maintenance and service" on page 50.

13. Manometer
The manometer allows readout of the water pressure in the water circuit.

14. Flow switch
The flow switch checks the flow in the water circuit and protects the heat exchanger against freezing and the pump against damage.

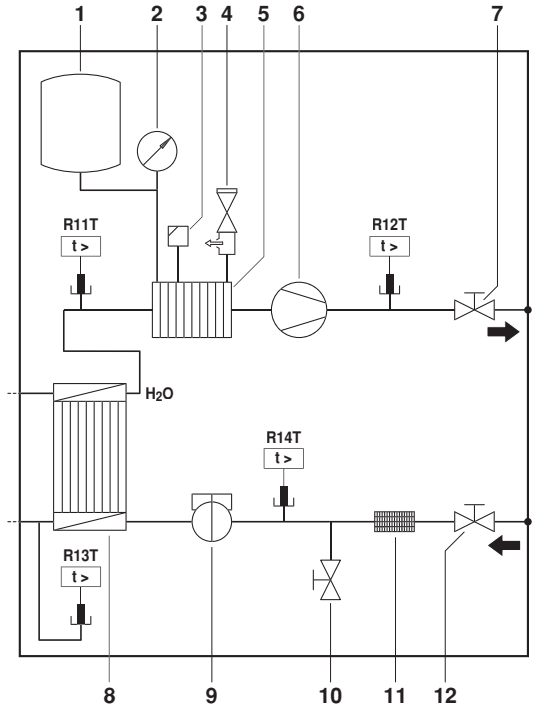
15. Pump
The pump circulates the water in the water circuit.

16. Backup heater thermal protector
The backup heater is equipped with a thermal protector. The thermal protector is activated when the temperature becomes too high.

17. 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).

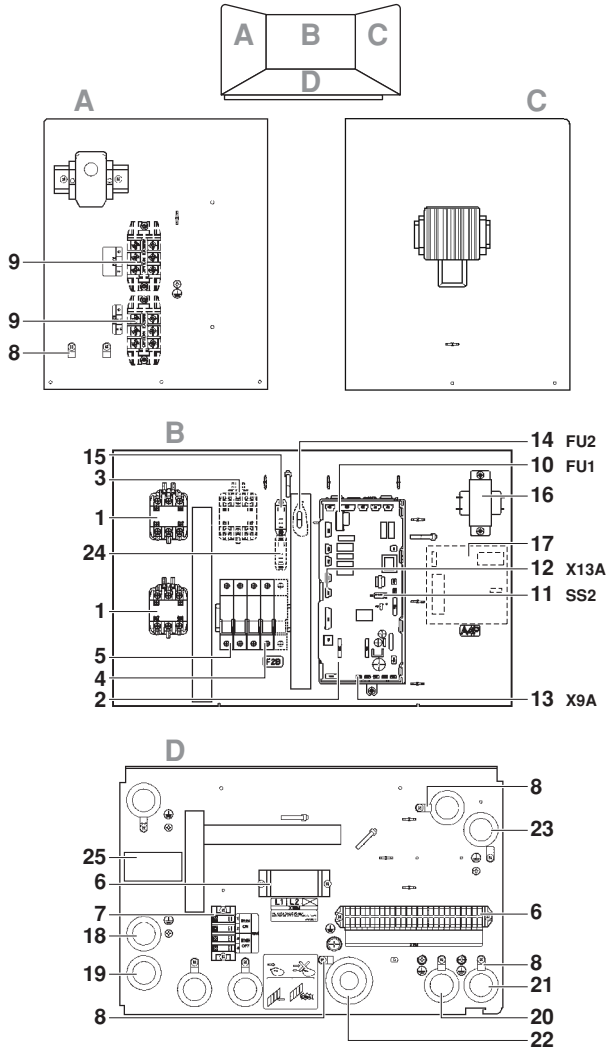
18. Pressure relief valve
The pressure relief valve prevents excessive water pressure in the water circuit by opening at 3 bar and discharging some water.

Functional diagram of hydraulic compartment (door 3)



1 Expansion vessel
2 Manometer
3 Air purge valve
4 Pressure relief valve
5 Backup heater vessel with backup heater
6 Pump
7 Shut-off valve water outlet
8 Heat exchanger
9 Flow switch
10 Drain/fill valve
11 Filter
12 Shut-off valve water inlet with drain valve
R11T~R14T Temperature sensors

Switch box main components (door 2)



1. Backup heater contactors K1M and K5M

2. Main PCB
The main PCB (Printed Circuit Board) controls the functioning of the unit.

3. Booster heater contactor K3M (only for installations with domestic hot water tank)

4. Booster heater circuit breaker F2B (only for installations with domestic hot water tank)
The circuit breaker protects the booster heater in the domestic hot water tank against overload or short circuit.

5. Backup heater circuit breaker F1B
The circuit breaker protects the backup heater electrical circuit against overload or short circuit.

6. Terminal blocks
The terminal blocks allow easy connection of field wiring.

7. Terminal block for backup heater capacity limitation.

8. Cable tie mountings
The cable tie mountings allow to fix the field wiring with cable ties to the switch box to ensure strain relief.

9. Terminal blocks X3M, X4M (only for installations with domestic hot water tank)

10. PCB fuse FU1

11. DIP switch SS2
The DIP switch SS2 provides 4 toggle switches to configure certain installation parameters. See "10.1. DIP switch settings overview" on page 28.

12. X13A socket
The X13A socket receives the K3M connector (only for installations with domestic hot water tank).

13. X9A socket
The X9A socket receives the thermistor connector (only for installations with domestic hot water tank).

14. Pump fuse FU2 (in line fuse)

15. Pump relay K4M

16. Transformer TR1 for PCB power supply

17. A4P digital I/O PCB (only for installations with solar kit or digital I/O PCB)

18. Conduit hole to pass through the booster heater power supply cable.

19. Conduit hole to pass through the booster heater power supply cable and the thermal protection cable.

20. Conduit hole to pass through the room thermostat cable and 2-way valve and 3-way valve control cables.

21. Conduit hole to pass through the thermistor cable and user interface cable (and benefit kWh rate cable).

22. Conduit hole to pass through the backup heater power supply wiring.

23. Conduit hole to pass through optional I/O PCB connection wiring.

24. K7A relay for solar pump (optional)

This relay and its output on X2M can be activated when the solar input on A4P becomes active.

25. Terminal for expansion vessel heater and, only for EDL and EBL units, plate heat exchanger heater and switch box heater.

NOTICE

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

6. INSTALLATION

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.
- Carry out the specified installation work in consideration of strong winds, typhoons, or earthquakes.
  Improper installation work may result in accidents due to fall of equipment.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Be sure that sufficient precautions are taken, in accordance with the applicable legislation, in case of refrigerant leakage.

CAUTION

Do not install the unit in places such as the following:

- Where there is mist of mineral oil, oil spray or vapour.
  Plastic parts may deteriorate, and cause them to fall out or water to leak.
- Where corrosive gas, such as sulphurous acid gas, is produced.
  Corrosion of copper pipes or soldered parts may cause the refrigerant to leak.
- Where there is machinery which emits electromagnetic waves.
  Electromagnetic waves may disturb the control system, and cause malfunction of the equipment.
- Where flammable gases may leak, where carbon fibre or ignitable dust is suspended in the air or where volatile flammables, such as thinner or gasoline, are handled.
  Such gases may cause a fire.
- Where the air contains high levels of salt such as that near the ocean.
- Where voltage fluctuates a lot, such as that in factories.
- In vehicles or vessels.
- Where acidic or alkaline vapour is present.
- Install the unit, power wire and connecting wire at least 1 meter away from televisions or radios to prevent image interference or noise.
  (Depending on the radio waves, a distance of 1 meter may not be sufficient to eliminate the noise.)

General

1 Select an installation site where the following conditions are satisfied and that meets with your customer's approval.

- Places which are well-ventilated.
- Places where the unit does not bother next-door neighbours.
- Safe places which can withstand the unit's weight and vibration and where the unit can be installed level.
- Places where servicing space can be well ensured.
- Places where the units' piping and wiring lengths come within the allowable ranges.
- Places where water leaking from the unit cannot cause damage to the location (e.g. in case of a blocked drain pipe).
- Places where the rain can be avoided as much as possible.
- Do not install the unit in places often used as workplace.
  In case of construction works (e.g. grinding works) where a lot of dust is created, the unit must be covered.
- Do not place any objects or equipment on top of the unit (top plate)
- Do not climb, sit or stand on top of the unit.
- All piping lengths and distances have been taken into consideration.

Requirement	Value
Maximum allowable distance between the domestic hot water tank and the unit (only for installations with domestic hot water tank). The thermistor cable supplied with the domestic hot water tank is 12 m in length. In order to optimise efficiency Daikin recommends to install the 3-way valve and the domestic hot water tank as close as possible to the unit.	10 m

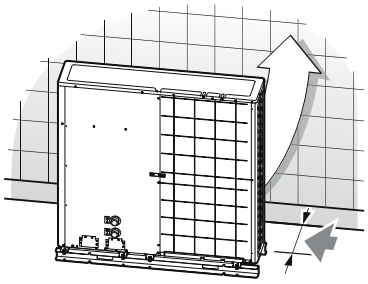
2 When installing the unit in a place exposed to strong wind, pay special attention to the following.

Strong winds of 5 m/sec or more blowing against the unit's air outlet causes short circuit (suction of discharge air), and this may have the following consequences:

- deterioration of the operational capacity,
- frequent frost acceleration in heating operation,
- disruption of operation due to rise of high pressure,
- when a strong wind blows continuously on the face of the unit, the fan can start rotating very fast until it breaks.

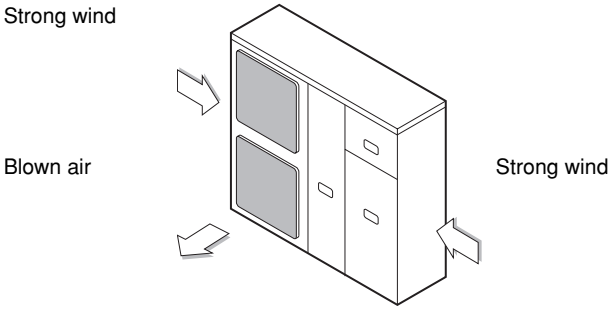
Refer to the figures for installation of this unit in a place where the wind direction can be foreseen.

■ Turn the air outlet side toward the building's wall, fence or screen.



Make sure there is enough room to do the installation

■ Set the outlet side at a right angle to the direction of the wind.



3 Prepare a water drainage channel around the foundation, to drain waste water from around the unit.

4 If the water drainage of the unit is not easy, please build up the unit on a foundation of concrete blocks, etc. (the height of the foundation should be maximum 150 mm).

5 If you install the unit on a frame, please install a waterproof plate within 150 mm of the underside of the unit in order to prevent the invasion of water from the lower direction.

6 When installing the unit in a place frequently exposed to snow, pay special attention to elevate the foundation as high as possible.

7 If you install the unit on a building frame, please install a waterproof plate (field supply) (within 150 mm of the underside of the unit) in order to avoid the drainwater dripping. (See figure).

Selecting a location in cold climates

NOTICE

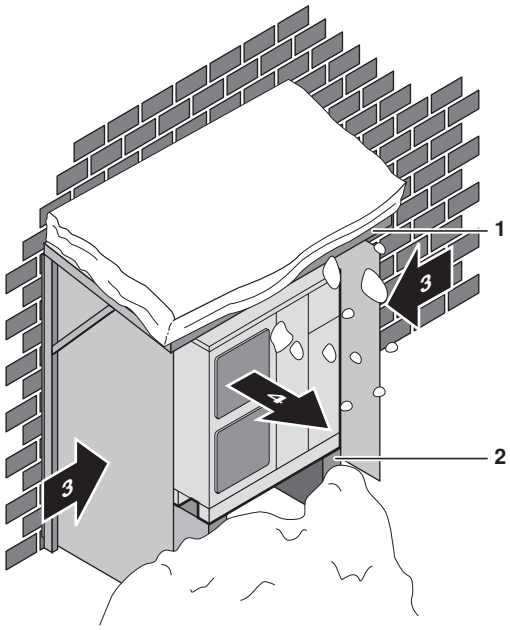
When operating the unit in a low outdoor ambient temperature, be sure to follow the instructions described below.

■ To prevent exposure to wind, install the unit with its suction side facing the wall.

■ Never install the unit at a site where the suction side may be exposed directly to wind.

■ To prevent exposure to wind, install a baffle plate on the air discharge side of the unit.

■ In heavy snowfall areas it is very important to select an installation site where the snow will not affect the unit and to set the outlet side at a right angle to the direction of the wind:

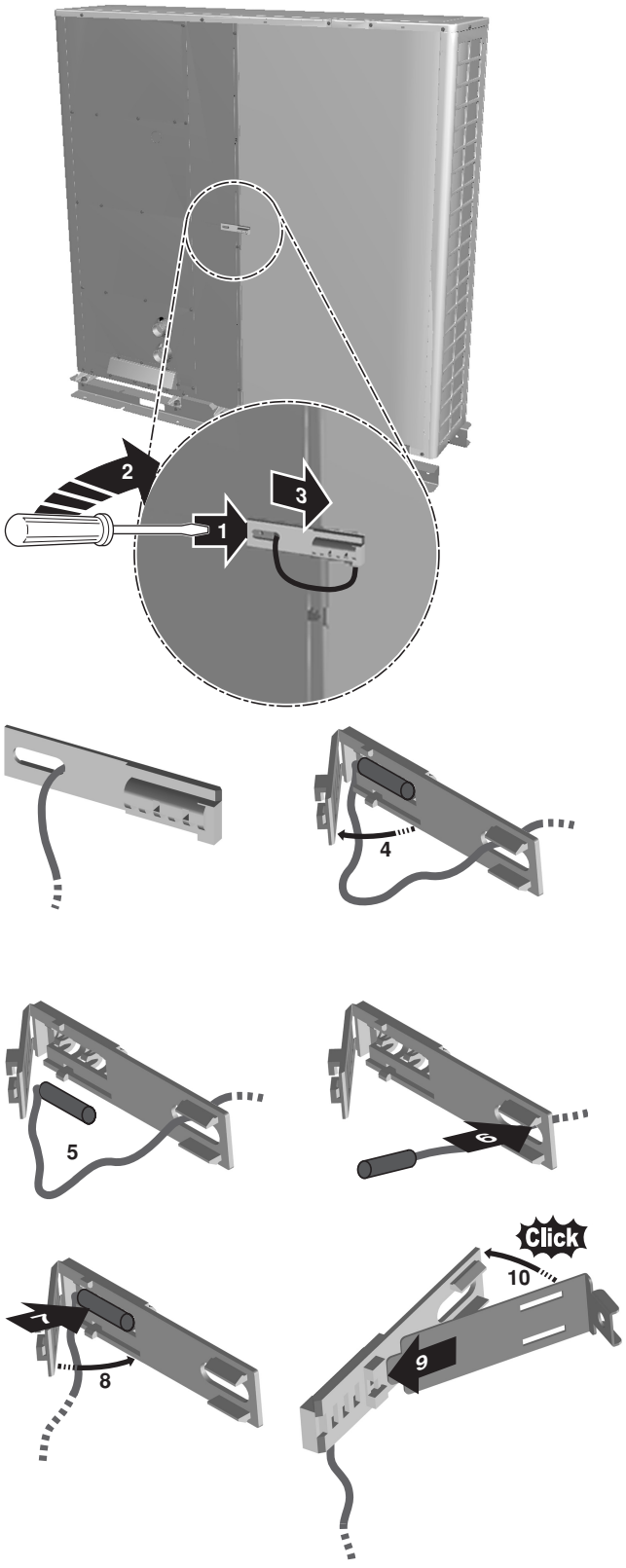


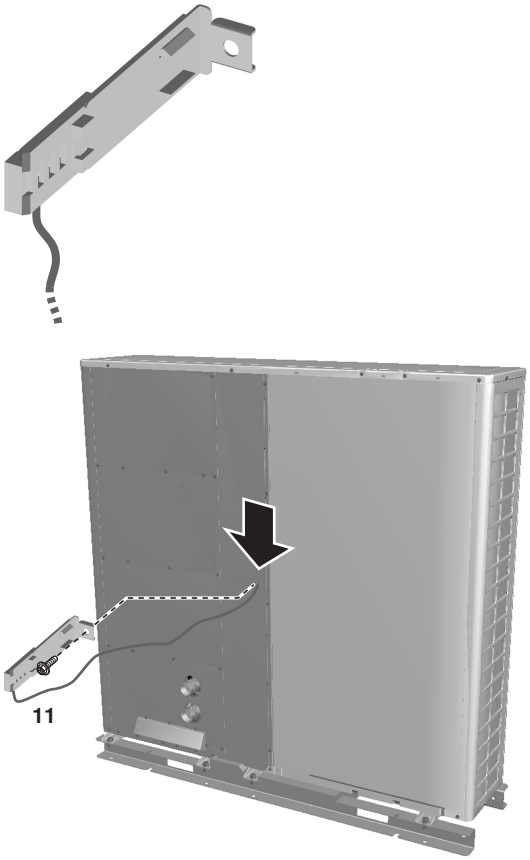
1 Construct a large canopy.
2 Construct a pedestal. Install the unit high enough off the ground to prevent burying in snow.
3 Strong wind
4 Discharge air

■ For E(D/B)L only. Follow the procedure as described below for modifying the position of the air thermistor (R1T). The thermistor fixture is delivered in the accessory bag.

INFORMATION

Spare thermistor fixing plate is delivered in the accessory bag.





6.2. Installation servicing space

The numerical figures used in the figures represent the dimensions in mm.

(Refer to "6.4. Precautions on installation" on page 16)

Precaution

(A) In case of non-stacked installation figure 1

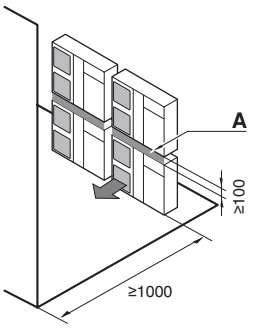
	Suction side obstacle	✓	Obstacle is present
	Discharge side obstacle	1	In these cases, close the bottom of the installation frame to prevent the discharged air from being bypassed
	Left side obstacle		
	Right side obstacle	2	In these cases, only 2 units can be installed.
	Top side obstacle		This situation is not allowed

NOTICE

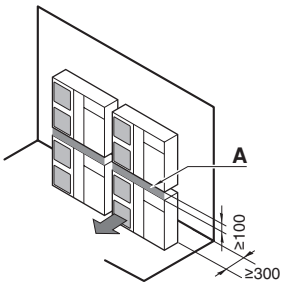
Minimum distance B1 in figure 1 mentions the space required for correct operation of the unit. Required space for servicing though is 300 mm.

(B) In case of stacked installation

1. In case obstacles exist in front of the outlet side.



2. In case obstacles exist in front of the air inlet.

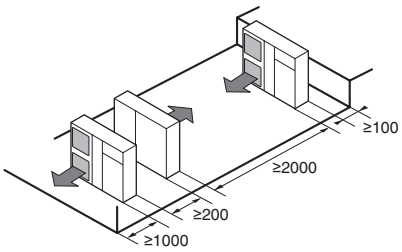


Do not stack more than one unit.

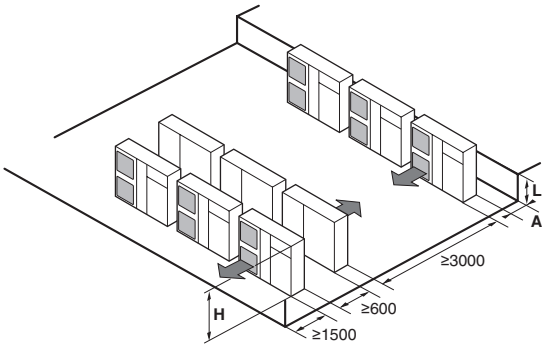
About 100 mm is required as the dimension for laying the upper unit's drain pipe. Get the portion A sealed so that air from the outlet does not bypass.

(C) In case of multiple-row installation (for roof top use, etc.)

1. In case of installing one unit per row.



2. In case of installing multiple units (2 units or more) in lateral connection per row.



Relation of dimensions of H, A and L are shown in the table below.

	L	A
L≤H	0<L≤1/2H	250
	1/2H<L	300
H<L	Installation not allowed	

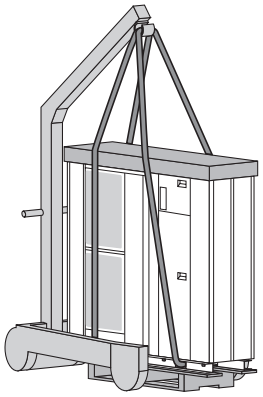
6.3. Before installation

Inspection

At delivery, the unit must be checked and any damage must be reported immediately to the carrier claims agent.

Handling

Bring the unit as close as possible to its final installation position in its original package in order to prevent damage during transport. Due to relatively large dimensions and high weight, the handling of the unit is only to be done by means of lifting tools with slings. These slings can be fitted into specially for this purpose foreseen sleeves at the base frame.



CAUTION

- To avoid injury, do not touch the air inlet or aluminium fins of the unit.
- Do not use the grips in the fan grills to avoid damage.
- Unit is top heavy!
  Prevent the unit from falling due to inclination during handling.
  Centre of gravity is indicated on the unit.

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.

CAUTION

Safely dispose of packing materials. Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.

Opening/closing the unit

- Be sure to confirm the model name and the serial no. of the outer (front) plates when attaching/detaching the plates to avoid mistakes.
- When closing the service panels, take care that the tightening torque does not exceed 4.1 N•m.

Accessory check

Check if all unit accessories are enclosed.

WARNING

Be sure to use only the specified accessories and parts for installation work. Failure to use the specified parts may result in water leakage, electric shocks, fire or the unit falling.

Important information regarding the refrigerant used

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. Do not vent gases into the atmosphere.

Refrigerant type: R410A
GWP(1) value: 1975

(1) GWP = global warming potential

The refrigerant quantity is indicated on the unit name plate

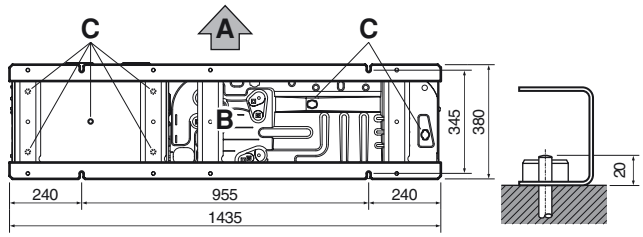
6.4. Precautions on installation

Foundation work

WARNING

Install the unit on a foundation that can withstand its weight.
Insufficient strength may result in the fall of equipment and cause injury.

- Check the strength and level of the installation ground so that the unit will not cause any operating vibration or noise after installation.
- In accordance with the foundation drawing in the figure, fix the unit securely by means of the foundation bolts. (Prepare four sets of M12 foundation bolts, nuts and washers each which are available on the market.)
- It is best to screw in the foundation bolts until their length are 20 mm from the foundation surface.



A Discharge side
B Bottom view (mm)
C Drain hole

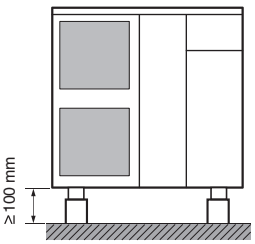
Drain work

Check in the combination table under "Possible options" on page 3 whether drain work is allowed. In case drain work on your unit is allowed and the installation site requires drain work, then follow the guidelines below.

- Drain kits for drainage are available as option.
- If drain work from the unit causes trouble (for example, if the drain water may splash on people) provide the drain piping using a drain socket (optional) and insulate the pipe to prevent condensation.
- Make sure the drain works properly.

NOTICE

If drain holes of the unit are covered by a mounting base or by floor surface, raise the unit in order to provide a free space of more than 100 mm under the unit.



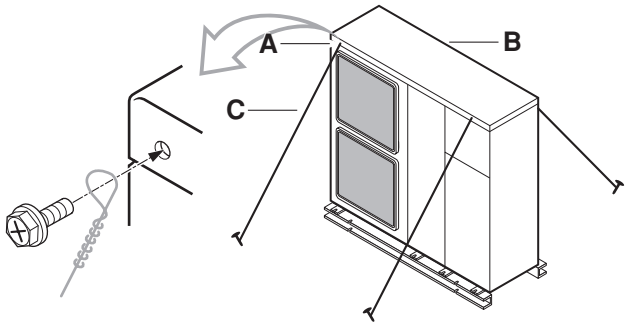
Installation method for prevention of falling over

CAUTION

Do not allow a child to mount on the unit or avoid placing any object on the unit. Falling or tumbling may result in injury.

If it is necessary to prevent the unit from falling over, install as shown in the figure:

- prepare all 4 wires as indicated in the drawing,
- unscrew the top plate at the 4 locations indicated A and B,
- put the screws through the nooses and screw them back tight.



A Location of the 2 fixation holes on the front side of the unit
B Location of the 2 fixation holes on the rear side of the unit
C Wires (field supply)

6.5. Water pipework

Checking the water circuit

INFORMATION

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

The units are 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.

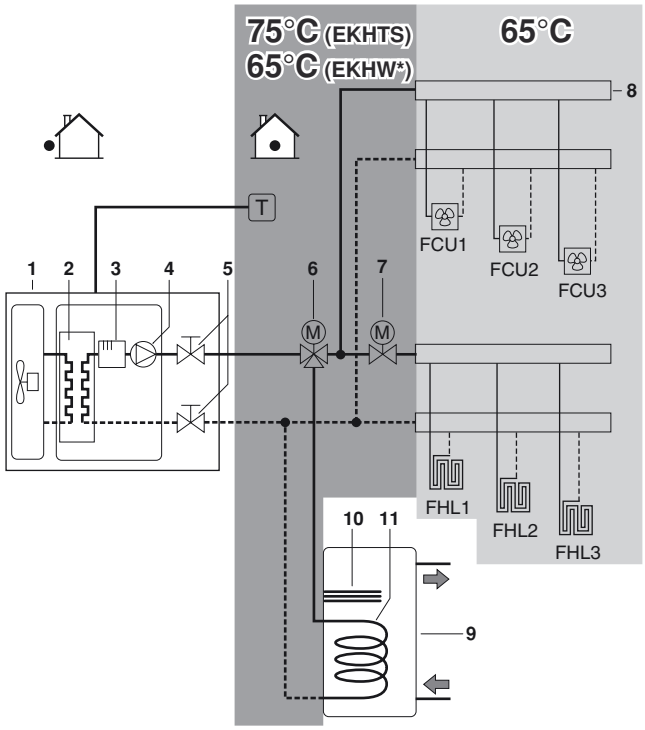
NOTICE

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.

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 during space heating is 65°C (safety device setting) and 75°C[1] during domestic hot water operation (safety device setting). Make sure that the installed piping and piping accessories (e.g., valve, connections, ...) can withstand the temperatures as shown in the figure below.



1 Unit
2 Heat exchanger
3 Backup heater[2]
4 Pump
5 Shut-off valve
6 Motorised 3-way valve (delivered with domestic hot water tank)
7 Motorised 2-way valve (field supply)
8 Collector (field supply)
9 Domestic hot water tank (optional)
10 Booster heater[3]
11 Heat exchanger coil
FCU1...3 Fan coil unit (optional)
FHL1...3 Floor heating loop
T Room thermostat (optional)

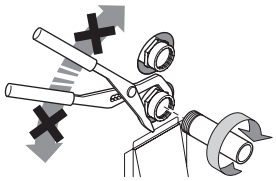
- Provide adequate safeguards in the water circuit to be sure that the water pressure will never exceed the maximum allowable working pressure (4 bar).
- Drain taps must be provided at all low points of the system to permit complete drainage of the circuit during maintenance.
  A drain valve is provided in the unit to drain the water from the unit water system.
- Make sure to provide a proper drain for the pressure relief valve to avoid any water coming into contact with electrical parts.
- Air vents must be provided at all high points of the system. The vents should be located at points which are easily accessible for servicing. An automatic air purge is provided inside the unit. Check that this air purge valve is not tightened too much so that automatic release of air in the water circuit remains possible.

(1) Be sure that the correct field settings are active or selected according to the applicable tank type. See field settings in "[4] Backup/booster heater operation and space heating off temperature" on page 34 for more details.
(2) For tank without electrical booster heater (EKHTS), the backup heater will be used in domestic water heating mode.
(3) Only applicable for tank with built-in electrical booster heater (EKHW*).

- Take care that the components installed in the field piping can withstand the water pressure and water temperature.
- Always use materials which are compatible with water used in the system and with the materials used in the unit.

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. The sealant must be able to withstand the pressures and temperatures of the system.
- 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 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 unit will be stopped.
- Never use Zn-coated parts in the water circuit. Excessive corrosion of these parts may occur as copper piping is used in the unit's internal water circuit.
- When using a 3-way valve in the water circuit.
  It is very important to guarantee full separation between domestic hot water and floor heating water circuit.
- When using a 3-way valve or a 2-way valve in the water circuit, the maximum change over time of the valve shall be less than 60 seconds.

NOTICE

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.

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 unit, is 20 l minimum. Refer to "14. Technical specifications" on page 54 to know the internal water volume of the unit.

INFORMATION

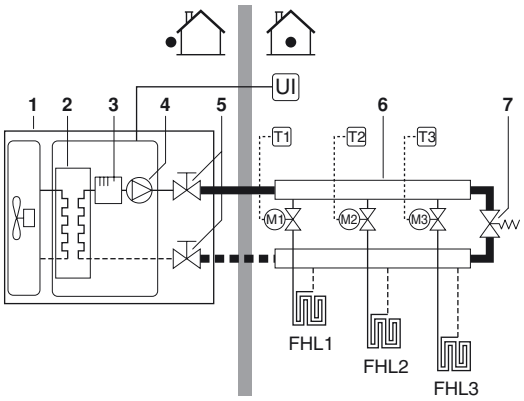
In most applications this minimum water volume will have a satisfying result.

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 Unit
2 Heat exchanger
3 Backup heater[a]
4 Pump
5 Shut-off valve
6 Collector (field supply)
7 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)
UI User interface

(a) For tank without electrical booster heater (EKHTS), the backup heater will be used in domestic water heating mode.

2 Using the table below, determine if the expansion vessel pre-pressure requires adjustment.

3 Using the table and instructions below, 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" • 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" • 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 unit. If the unit is located at the highest point of the installation, the installation height is considered 0 m.

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

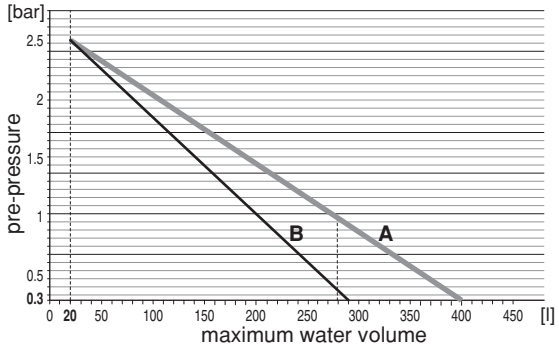
Checking the maximum allowed water volume

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 unit is too small for the installation.



pre-pressure = pre-pressure
maximum water volume = maximum water volume
A = System without glycol
B = System with 25% propylene glycol

(Refer to "Caution: "Use of glycol"" on page 19)

Example 1

The 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 unit is installed at the highest point in the water circuit. The total water volume in the water circuit (no glycol used) 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 an installer.

Connecting the water circuit

Water connections must be made in accordance with the applicable legislation and the outlook diagram delivered with the unit, respecting the water in- and outlet.

NOTICE

Be careful not to deform the unit piping by using excessive force when connecting the piping. Deformation of the piping can cause the unit to malfunction.

Protecting the water circuit against freezing

Frost can cause damage to the hydraulic system. As this unit is installed outdoors and thus the hydraulic system is exposed to freezing temperatures, care must be taken to prevent freezing of the system.

All hydraulic parts are insulated to reduce heat loss. Insulation must be foreseen on the field piping.

The unit is already equipped with several features to prevent freezing.

- The software contains special functions using pump and back up heater to protect the complete system against freezing.

  This function will only be active when the unit is off.
- Only for EDL and EBL units:
  As extra safety, a heatertape is winded around the piping to protect vital parts of the hydraulic system inside the unit.

  This heatertape will only be active in case of an abnormal situation concerning the pump and will only protect internal parts of the unit. It can not protect field installed parts outside the unit.

  Field heater tape must be foreseen by the installer.

However in case of power failure, above mentioned features can not protect the unit from freezing.

If power failure can happen at times the unit is unattended, Daikin recommends adding glycol to the water system. Refer to Caution: "Use of glycol" on page 19.

Refer to "Freeze protection function" on page 35.

Depending on the expected lowest outdoor temperature, make sure the water system is filled with a weight concentration of glycol as mentioned in the table below.

Minimum outdoor temperature	Glycol[(a)(b)]
–5°C	10%
–10°C	15%
–15°C	20%
–20°C	25%
–25°C	30%

WARNING

ETHYLENE GLYCOL IS TOXIC

INFORMATION

[(a)]The concentrations mentioned in the table above will not prevent the medium from freezing, but prevent the hydraulics from bursting.

[(b)]The maximum allowed water volume is then reduced according to the figure "Maximum allowed water volume" on page 18.

Caution: Use of glycol

- For installations with a domestic hot water tank, the use of propylene glycol, including necessary inhibitors, is only allowed if classified as Category 3 according to EN1717 or equivalent based on the applicable legislation.
- In case of over-pressure when using glycol, be sure to connect the safety valve to a drain pan in order to recover the glycol.

  For this purpose a knock out hole is foreseen in the backplate of the unit making it possible to connect a drain pipe to the safety valve.

  Connecting a drain pipe is not required if no glycol is used. The discharged water is then drained via the bottom of the unit.

NOTICE

For Australia and New Zealand only:

If a hot water tank is connected to this unit and an antifreeze solution is added to the water circuit, the antifreeze additive must be non-toxic and coloured with a dye at a concentration level high enough that any leakage into the potable water is easily discernible.

Materials approved by Food Standards Australia New Zealand are acceptable.

NOTICE

Corrosion of the system due to presence of glycol

Uninhibited glycol will turn acidic under the influence of oxygen. This process is accelerated by presence of copper and at higher temperatures. The acidic uninhibited glycol attacks metal surfaces and forms galvanic corrosion cells that cause severe damage to the system.

It is therefore of extreme importance:

- that the water treatment is correctly executed by a qualified water specialist;
- that a glycol with corrosion inhibitors is selected to counteract acids formed by the oxidation of glycols;
- that in case of an installation with a domestic hot water tank, only the use of propylene glycol, including necessary inhibitors classified as Category 3 according to EN1717 or equivalent based on the applicable legislation is allowed. In other installations the use of ethylene glycol is permitted as well;
- that no automotive glycol is used because their corrosion inhibitors have a limited lifetime and contain silicates which can foul or plug the system;
- that galvanized piping is not used in glycol systems since its presence may lead to the precipitation of certain components in the glycol's corrosion inhibitor;

that it has to be made sure the glycol is compatible with the used materials in the system.

INFORMATION

Be aware of the hygroscopic property of glycol: it absorbs moisture from its environment.

Leaving the cap off the glycol container causes the concentration of water to increase. The glycol concentration is then lower than assumed. And in consequence, freezing can happen after all.

Preventive actions must be taken to ensure minimal exposure of the glycol to air.

Also refer to "Checks before initial start-up" on page 30.

7. Charging water

1 Connect the water supply to a drain and fill valve (see "5.2. Main components" on page 10).

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.

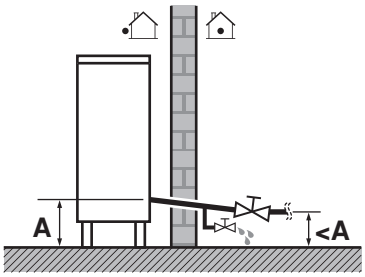
4 Check that the backup heater vessel is filled with water by opening the pressure relief valve. Water must flow out of the valve.

INFORMATION

- 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 should 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.

NOTICE

If no glycol is in the system in case of a power supply failure or pump operating failure, drain the system (as suggested in the figure below).



When water is at standstill inside the system, freezing is very likely to happen and damaging the system in the process.

8. Piping insulation

The complete water circuit, inclusive all piping, must be insulated to prevent condensation during cooling operation and reduction of the heating and cooling capacity as well as prevention of freezing of the outside water piping during winter time. The thickness of the sealing materials must be at least 13 mm with 0.039 W/mK in order to prevent freezing on the outside water piping.

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

9. Electrical wiring work

9.1. 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

DANGER: ELECTRICAL SHOCK

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

WARNING

- All field wiring must be carried out in accordance with the wiring diagram supplied with the unit and the instructions given below.
- Electrical connections shall be made to fixed wiring.
- 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 relevant local laws and regulations.
- Use only copper wires.
- For W1
  Make sure to connect power supply cables in normal phase. If connected in reverse phase, the remote controller of the unit indicates *"Ú?"* and the equipment cannot operate. Change any two of the three power supply cables (L1, L2, L3) to correct phase.
- Never squeeze bundled cables. Secure the electrical wiring with cable ties as shown in figure 2 so that it does not come into contact with the piping (particularly on the high-pressure side) or sharp edges.
  Make 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 circuit breaker in accordance with the applicable legislation. Failure to do so may cause electric shock or fire.
- When installing the earth leakage circuit breaker make sure that it is compatible with the inverter (resistant to high frequency electrical noise) to avoid unnecessary opening of the earth leakage circuit breaker.

  NOTICE

  The earth leakage circuit breaker must be a high-speed type breaker of 30 mA (<0.1 s).

- As this unit is equipped with an inverter, installing a phase advancing capacitor not only will deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves. Therefore, never install a phase advancing capacitor.
- 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.

9.2. Internal wiring - Parts table

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

Door 1 compressor compartment and electrical parts

A1P ..... Main PCB
A2P ..... Inverter PCB
A3P ..... Noise filter PCB
A4P ..... PCB (only for V3 models)
BS1~BS4..... Push button switch
C1~C4..... Capacitor
DS1 ..... DIP switch
E1H ..... Bottom plate heater
E1HC..... Crankcase heater
F1U,F2U..... Fuse (31.5 A/250 V) (only for W1 models)
F1U,F3U,F4U .. Fuse (T 6.3 A/250 V) (only for V3 models)
F3U~F6U..... Fuse (T 6.3 A/250 V) (only for W1 models)
F6U ..... Fuse (T 5.0 A/250 V) (only for V3 models)
F7U ..... Fuse (T 5.0 A/250 V) (only for W1models)
F7U,F8U..... Fuse (F 1.0 A/250 V) (only for V3 models)
F8U,F9U..... Fuse (F 1.0 A/250 V) (only for W1 models)
H1P~H7P ..... Orange LED service monitor
(A1P only for W1 models, A2P only for V3 models)
H2P: prepare, test = flickering
H2P: malfunction detection = light up
HAP (A1P)..... Green LED service monitor
HAP (A2P)..... Green LED service monitor (only for W1 models)
K1M,K2M ..... Magnetic contactor (only for W1 models)
K1R ..... Magnetic relay (Y1S) (only for V3 models)
K1R (A1P) ..... Magnetic relay (Y1S) (only for W1 models)
K1R (A2P) ..... Magnetic relay (only forW1 models)
K2R (A1P) ..... Magnetic relay (Y2S) (only for W1 models)
K3R (A1P) ..... Magnetic relay (E1HC) (only for W1 models)
K4R ..... Magnetic relay (E1HC) (only for V3 models)
K10R,K11R ..... Magnetic relay (only for V3 models)
L1R..... Reactor (only for V3 models)
L1R~L3R..... Reactor (only for W1 models)
L4R..... Reactor for (fan motor) (only for W1 models)
M1C..... Motor (compressor)
M1F ..... Motor (upper fan)
M2F ..... Motor (lower fan)
PS ..... Switching power supply
Q1DI..... Earth leakage circuit breaker
R1,R2 ..... Resistor (only for V3 models)
R1~R4 ..... Resistor (only for W1 models)
R1T ..... Thermistor (air)
R2T ..... Thermistor (discharge)
R3T ..... Thermistor (suction)
R4T ..... Thermistor (heat exchanger)
R5T ..... Thermistor (heat exchanger middle)
R6T ..... Thermistor (liquid)
R7T ..... Thermistor (fin) (only for W1 models)
R10T ..... Thermistor (fin) (only for V3 models)
RC ..... Signal receiver circuit (only for V3 models)
S1NPH ..... Pressure sensor
S1PH..... High pressure switch
TC ..... Signal transmission circuit (only for V3 models)
V1R ..... Power module
V2R ..... Power module (only for W1 models)
V2R,V3R ..... Diode module (only for V3 models)
V3R ..... Diode module (only for W1 models)
V1T..... IGBT (only for V3 models)
X1M ..... Power supply terminal strip
Y1E..... Electronic expansion valve
Y1S..... Solenoid valve (4-way valve)
Y3S..... Solenoid valve (only for W1 models)
Z1C~Z3C..... Noise filter (ferrite core) (only for V3 models)
Z1C~Z9C..... Noise filter (ferrite core) (only for W1 models)
Z1F~Z4F..... Noise filter

OPTIONAL CONNECTOR

X1Y..... Connector
X6A,X77A..... Connector (only for W1 models)

NOTES

1. THIS WIRING DIAGRAM ONLY APPLIES TO THE COMPRESOR MODULE SWITCH BOX

2.
L : LIVE
N: : NEUTRAL
: FIELD WIRING
: TERMINAL STRIP
: CONNECTOR
: CONNECTION

3.
: PROTECTIVE EARTH (SCREW)
: CONNECTOR
: NOISELESS EARTH
: TERMINAL

4. NOT APPLICABLE

5. DO NOT OPERATE THE UNIT BY SHORT-CIRCUITING PROTECTION DEVICE S1PH

6. COLOURS:

BLK	: BLACK	ORG	: ORANGE
BLU	: BLUE	RED	: RED
BRN	: BROWN	WHT	: WHITE
GRN	: GREEN	YLW	: YELLOW

7. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCHES (DS1) BY SERVICE MANUAL.
FACTORY SETTING OF ALL SWITCHES: "OFF".

8.
: OPTION
: WIRING DEPENDENT ON MODEL

POWER SUPPLY UNIT	POWER SUPPLY UNIT
TO HYDROMODULE SWITCH BOX	TO HYDROMODULE SWITCH BOX
COMPRESSOR MODULE SWITCH BOX	COMPRESSOR MODULE SWITCH BOX
COMPRESSOR TERMINAL POSITION	COMPRESSOR TERMINAL POSITION
REACTOR BOX	REACTOR BOX
WIRE ENTRANCE	WIRE ENTRANCE

Door 2 electrical parts of the hydraulic compartment

A11P.....Main PCB
A12P.....User interface PCB (remote controller)
A3P.....Thermostat (EKRTW*, EKRTR*)(PC=Power Circuit)
A3P.....Solar pump station PCB (EKSR3PA)
A4P.....Digital I/O PCB (EKRP1HB)
A4P.....Receiver PCB (EKRTR*)
E11H,E12H.....Backup heater element 1, 2
E13H.....Backup heater element 3 (only for W1 models)
E4H.....Booster heater
E5H.....Switch box heater
E6H.....Expansion vessel heater
E7H.....Plate heat exchanger heater
F1B.....Fuse backup heater
F1T.....Thermal fuse backup heater
F2B.....Fuse booster heater
FU1.....Fuse 3.15 A T 250 V for PCB
FU2.....Fuse 5 A T 250 V
FuS,FuR.....Fuse 5 A 250 V for digital I/O PCB
K1M.....Contactor backup heater step
K3M.....Contactor booster heater
K4M.....Pump relay
K5M.....Contactor for backup heater all pole disconnection
M1P.....Pump
M2S.....2-way valve for cooling mode
M3S.....3-way valve: floor heating/domestic hot water
PHC1.....Optocoupler input circuit
Q1DI,Q2DI.....Earth leakage circuit breaker
Q1L.....Thermal protector backup heater
Q2L.....Thermal protector 1 booster heater
Q3L.....Thermal protector 2 booster heater (only for W1 models)
R1H.....Humidity sensor (EKRTR*)
R1T.....Ambient sensor (EKRTW*, EKRTR*)
R2T.....External sensor (floor or ambient) (EKRTETS)
R5T.....Domestic hot water thermistor (EKHW*+EKHTS)
R11T.....Outlet water heat exchanger thermistor
R12T.....Outlet water backup heater thermistor
R13T.....Refrigerant liquid side thermistor
R14T.....Inlet water thermistor
S1L.....Flow switch
S1S.....Solar pump station relay
S1T.....Thermostat switch box heater
S2S.....Benefit kWh rate power supply contact
S2T.....Thermostat expansion vessel heater
S3S.....Dual set point 2 contact
S3T.....Thermostat plate heat exchanger
S4S.....Dual set point 1 contact
SS1.....DIP switch
TR1.....Transformer 24 V for PCB, for relays and valves
V1S,V2S.....Spark suppression 1, 2
X1M~X11M.....Terminal strips
X2Y~X5Y,X9B..Connector

NOTES

1. THIS WIRING DIAGRAM ONLY APPLIES TO THE HYDROMODULE SWITCH BOX
2. USE A DEDICATED POWER CIRCUIT FOR THE BACKUP HEATER AND BOOSTER HEATER. NEVER USE A POWER CIRCUIT SHARED BY OTHER APPLIANCE.
3. : FIELD WIRING
   NO/NC : NORMAL OPEN/NORMAL CLOSED
   SPST : SINGLE POLE SINGLE THROW
4. : TERMINAL STRIP
   : CONNECTOR
   : TERMINAL
   : PROTECTIVE EARTH
5. DO NOT OPERATE THE UNIT BY SHORT-CIRCUITING ANY PROTECTION DEVICE
6. COLOURS:

BLK	: BLACK	PNK	: PINK
BLU	: BLUE	RED	: RED
BRN	: BROWN	VIO	: VIOLET
GRN	: GREEN	WHT	: WHITE
GRY	: GREY	YLW	: YELLOW
ORG	: ORANGE		

7. FOR *KHWSU*V3, REFER TO OPTION MANUAL
8. FOR *KSOLHWAV1, 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. BACKUP HEATER KW REDUCTION. REFER TO INSTALLATION MANUAL
12. FOR BENEFIT kWh RATE POWER SUPPLY INSTALLATION, REFER TO INSTALLATION MANUAL

POWER SUPPLY	POWER SUPPLY
Only for benefit kWh rate power supply installation: use normal kWh rate power supply for E5H, E6H, E7H.	Only for benefit kWh rate power supply installation: use normal kWh rate power supply for E5H, E6H, E7H.
FROM COMPRESSOR MODULE SWITCH BOX	FROM COMPRESSOR MODULE SWITCH BOX
To bottom plate heater	To bottom plate heater
E5H, E6H, E7H, internally powered (Standard)	E5H, E6H, E7H, internally powered (Standard)
POSITION OF PARTS	POSITION OF PARTS
HYDROMODULE SWITCH BOX	HYDROMODULE SWITCH BOX
domestic hot water tank	domestic hot water tank
change-over to boiler output	change-over to boiler output
Solar pump connection	Solar pump connection
Alarm output	Alarm output
cooling/heating on/off output	cooling/heating on/off output
Solar input	Solar input
Standard 6 kW	Standard 6 kW
Reduced 3 kW	Reduced 3 kW
Dual set point application (refer to installation manual)	Dual set point application (refer to installation manual)
3 wire type (SPST)	3 wire type (SPST)
NO valve	NO valve
NC valve	NC valve
user interface	user interface
OUTSIDE UNIT	OUTSIDE UNIT
only for... option	only for... option
electric heater fuse	electric heater fuse
KHW kit fuse	*KHW* kit fuse

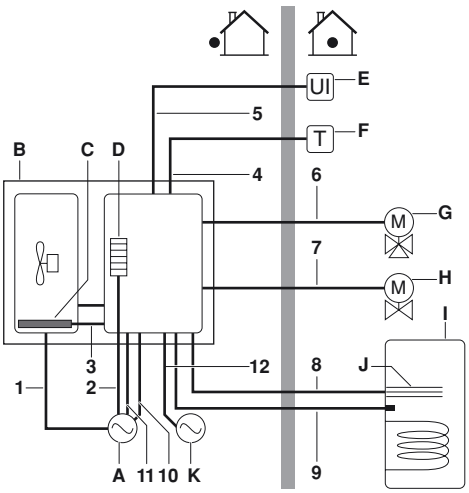
WIRING DEPENDENT ON MODEL
FIELD WIRING
OPTION
FIELD WIRING
PCB
WIRE COLOUR

9.3. System overview of 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 the applicable legislation.

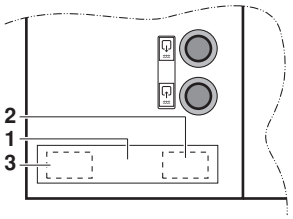
The illustration below gives an overview of the required field wiring between several parts of the installation. Refer also to "3.4. Typical application examples" on page 4.



A Single power supply for unit, backup heater and booster heater
B Unit
C Bottom plate heater EKBPHT(1)
D Backup heater(2)
E User interface (digital controller)
F Room thermostat (field supply, optional)
G 3-way valve for domestic hot water tank (field supply, optional)
H 2-way valve for cooling mode (field supply, optional)
I Domestic hot water tank (optional)
J Booster heater(3)
K Power supply (normal kWh rate power supply: only in case of benefit kWh rate power supply installation)

Item	Description	AC/ DC	Required number of conductors	Maximum running current
1	Power supply cable for unit	AC	2+GND	(a)
2	Power supply cable for backup heater	AC	2+GND	(b)
3	Power cable for bottom plate heater	AC	2	(c)
4	Room thermostat cable	AC	3 or 4	100 mA(d)
5	User interface cable	DC	2	100 mA(e)
6	3-way valve control cable	AC	2+GND	100 mA(d)
7	2-way valve control cable	AC	2+GND	100 mA(d)
8	Booster heater power supply and thermal protection cable(f)	AC	4+GND	(b)
9	Thermistor cable	DC	2	(g)
10	Booster heater power supply cable(f)	AC	2+GND	13 A
11	Benefit kWh rate power supply cable (voltage free contact)	DC	2	100 mA(h)
12	Normal kWh rate power supply	AC	2+GND	(i)

(a) Refer to nameplate on the unit.
(b) See table under "Connection of the backup heater power supply" on page 24.
(c) Minimum cable section 1.5 mm^2
(d) Minimum cable section 0.75 mm^2
(e) Cable section 0.75 till 1.25 mm^2, maximum length: 500 m.
(f) Only applicable for tank with built-in electrical booster heater (EKHW*).
(g) The thermistor and connection wire (12 m) are delivered with the domestic hot water tank.
(h) Cable section 0.75 till 1.25 mm^2, maximum length: 500 m. Voltage free contact shall ensure the minimum applicable load of 15 V DC, 10 mA.
(i) Cable section 2.5 mm^2



1 Protection cap
2 Entry for cables
3 Entry for low voltage cables (<30 V)

CAUTION

Select all cables and wire sizes in accordance with the applicable legislation.

WARNING

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

(1) Bottom plate heater is only applicable in combination with E(D/B)LQ or in case of optional EKBPHT kit.
(2) For tank without electrical booster heater (EKHTS), the backup heater will be used in domestic water heating mode.
(3) Only applicable for tank with built-in electrical booster heater (EKHW*).

9.4. Field wiring guidelines

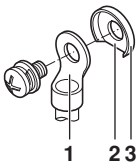
- Most field wiring on the unit is to be made on the terminal block inside the switch box. To gain access to the terminal block, remove the switch box service panel (door 2).

> **WARNING**
>
> Switch off all power supply – i.e. unit power supply and backup heater and domestic hot water tank power supply (if applicable) – before removing the switch box service panel.

- Cable tie mountings are provided at the bottom of the switch box. Fix all cables using cable ties (field supply).
- A dedicated power circuit is required for the backup heater.
- Installations equipped with a domestic hot water tank (optional), require a dedicated power circuit for the **booster heater**(1). Please refer to the domestic hot water tank installation manual.
- Lay the electrical wiring so that the front cover does not rise up when doing wiring work and attach the front cover securely (see figure 2).
- Follow the electric wiring diagram for electrical wiring works (the electric wiring diagrams are located on the rear side of doors 1 and 2).

9.5. Precautions on wiring of power supply

- Use a round crimp-style terminal for connection to the power supply terminal board. In case it cannot be used due to unavoidable reasons, be sure to observe the following instruction.



1 Round pressure terminal
2 Cut out section
3 Cup washer

  - Do not connect wires of different gauge to the same power supply terminal. (Looseness in the connection may cause overheating.)
  - When connecting wires of the same gauge, connect them according to the below figure.

- Use the correct screwdriver to tighten the terminal screws. Small screwdrivers can damage the screw head and prevent appropriate tightening.
- Over-tightening the terminal screws can damage the screws.
- See the table below for tightening torques for the terminal screws.

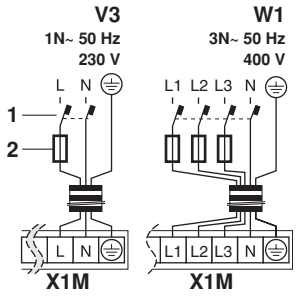
	Tightening torque (N·m)
M4 (X1M)	1.2~1.8
M5 (X1M)	2.0~3.0
M5 (EARTH)	3.0~4.0

- Attach an earth leakage circuit breaker and fuse to the power supply line (see "Specifications of standard wiring components" on page 24.
- In wiring, make certain that prescribed wires are used, carry out complete connections, and fix the wires so that outside forces are not applied to the terminals.

(1) Only applicable for tank with built-in electrical booster heater (EKHW*).

Specifications of standard wiring components

Door 1: compressor compartment and electrical parts: **X1M**



1 Earth leakage circuit breaker
2 Fuse

	V3	W1
Minimum circuit amps (MCA)(a)	26.5	14
Recommended field fuse	32 A	20 A
Wire type(b)	H05VV-U3G	H05VV-U5G
Size	Wiring size must comply with the applicable local and national code	
Wire type of wiring between the units	H05VV-U4G2.5	

(a) Stated values are maximum values.
(b) Only in protected pipes, use H07RN-F when protected pipes are not used.

> **NOTICE**
>
> The earth leakage circuit breaker must be a high-speed type breaker of 30 mA (<0.1 s).

Procedure

1 Using the appropriate cable, connect the power circuit to the main circuit breaker as shown on the wiring diagrams (inside of door 1) and in figure 2.

2 Fix the cable with cable ties to the cable tie mountings to ensure strain relief. (Positions are marked with ☌ in figure 2).

Connection of the backup heater power supply

Power circuit and cable requirements

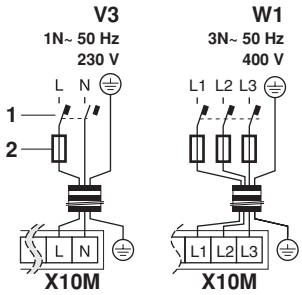
> **CAUTION**
>
> - Be sure to use a dedicated power circuit for the backup heater. Never use a power circuit shared by another appliance.
> - Use one and same dedicated power supply for the unit, backup heater and booster heater(a) (domestic hot water tank).

(a) Only applicable for tank with built-in electrical booster heater (EKHW*).

This power circuit must be protected with the required safety devices according to the applicable legislation.

Select the power cable in accordance with the applicable legislation. For the maximum running current of the backup heater, refer to the table below.

Door 2: electrical parts of the hydraulic compartment: **X10M**



1 Earth leakage circuit breaker
2 Fuse

Model	Backup heater capacity	Backup heater nominal voltage	Maximum running current	Z_{max} (Ω)
V3(a) (b)	6 kW	1x 230 V	26 A	0.29
W1	6 kW	3x 400 V	8.7 A	—
V3(c)	3 kW	1x 230 V	13 A	—
W1	2 kW	3x 400 V	5.0 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}.
(c) Refer to procedure how to set the backup heater to lower capacity.

NOTICE

The earth leakage circuit breaker must be a high-speed type breaker of 30 mA (<0.1 s).

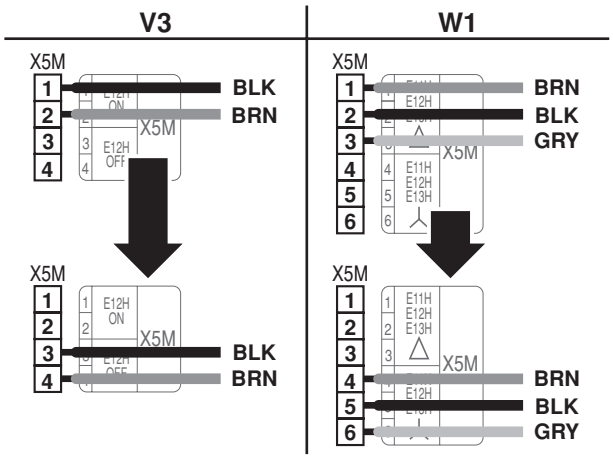
1 Using the appropriate cable, connect the power circuit to the main circuit breaker as shown on the wiring diagrams (inside of door 2) and in figure 2.

2 Connect the earth conductor (yellow/green) to the earthing screw next to the X10M terminal.

3 Fix the cable with cable ties to the cable tie mountings to ensure strain relief. (Positions are marked with ☌ in figure 2.)

Note: only relevant field wiring is shown.

4 If the backup heater capacity is to be set lower than the default value (6 kW), this can be done by reconnecting wires according to following figure. The backup heater capacity is now 3 kW for V3 models or 2 kW for W1 models.



(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 thermostat cable

Connection of the thermostat cable depends on the application.

See also "3.4. Typical application examples" on page 4 and "10.2. Room thermostat installation configuration" on page 29 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 "10.2. Room thermostat installation configuration" on page 29 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.

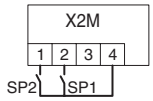
See also "3.4. Typical application examples" on page 4 and "Dual set point control" on page 39.

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 "10.3. Pump operation configuration" on page 29 and field setting [F-00] in "[F] Option setup" on page 43.

Connection of the valve control cables

Valve requirements

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

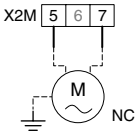
Procedure for wiring the 2-way valve

1 Using the appropriate cable, connect the valve control cable to the X2M terminal as shown on the wiring diagram (inside of door 2).

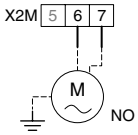
NOTICE

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.

Procedure for 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 (inside of door 2).

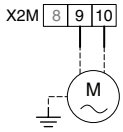
NOTICE

Two types of 3-way valves can be connected. Wiring is different for each type:

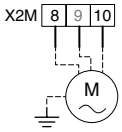
- "Spring return 2-wire" type 3-way valve
  The 3-way valve should be fitted as such that when the 3-way valve is idle (not activated), the space heating circuit is selected.
- "SPST 3-wire" type 3-way valve

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.

"Spring return 2-wire" valve



"SPST 3-wire" valve



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

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

CAUTION

For a benefit kWh rate power supply like illustrated below as type 1 (allowed for all models)

- If the benefit kWh rate power supply is of the type that power supply is not interrupted, then control of the unit is still possible. The controller, the expansion vessel heater, plate heat exchanger heater and switch box heater have power supply and the freeze protection function can operate when required.
- During the period that the benefit kWh rate is active and power supply is continuous, then stand-by power consumption is possible (PCB, controller, pump, ...).
- If the benefit kWh rate is active for more than 2 hours, backup heater operation can be required (part of the freeze protection function, see "Protecting the water circuit against freezing" on page 19). For this reason, the backup heater shall be connected to a normal kWh rate power supply and the correct setting [d-00] must be selected. See "[d] Benefit kWh rate power supply/Local shift value weather dependent" on page 42.

For a benefit kWh rate power supply like illustrated below as types 2 or 3

If during benefit kWh rate power supply, the main power supply is shut off, and the normal kWh rate power supply is not connected to 1-2, X11M (only allowed for EDL and EBL models) then:

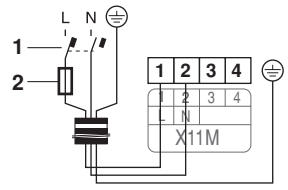
1. the expansion vessel heater, plate heat exchanger heater and switch box heater can not be controlled,
2. the controller display will be blank + after 2 hours, the real time clock of the controller will be reset,
3. the freeze protection function (refer to "Freeze protection function" on page 35) can not operate.

To overcome 1, 2 and 3 the unit should be connected to a normal kWh rate power supply via 1-2 X11M to allow continuous control and operation (e.g., pump, expansion vessel heater, plate heat exchanger heater, switch box heater, and freeze protection function).

The power supply (compressor compartment, X1M: L1, L2, L3, N) interruption may not be longer than 2 hours to guarantee to optimized startup condition for compressor.

Connect the unit to a normal kWh rate power supply

1 Using the appropriate cable, connect the power supply to the circuit heater as shown in the wiring diagram and in the figure below.

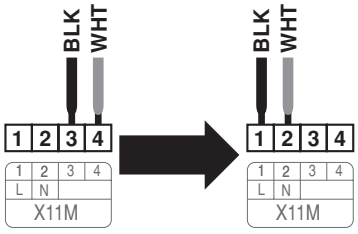


1 Earth leakage circuit breaker
2 Fuse

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

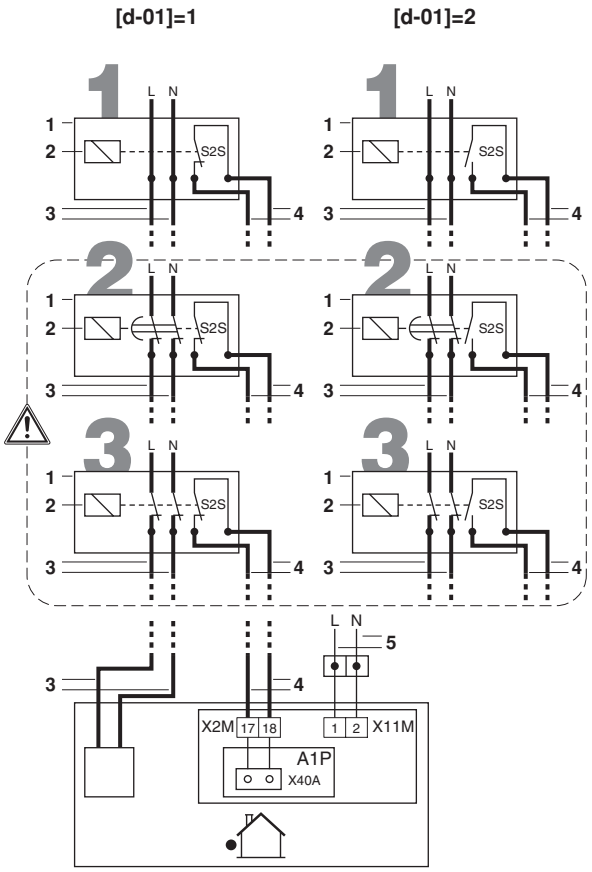
3 Fix the cable with cable ties to the cable tie mountings to ensure strain relief.

4 Reconnect the wires according to the figure below.



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:



1 Benefit kWh rate power supply box
2 Receiver controlling the signal of the electricity company
3 Power supply to unit
4 Voltage free contact
5 Normal kWh rate power supply

⚠ Allowed only for EDL and EBL unit models

When the 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.

INFORMATION

- 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]. When benefit kWh rate power supply is of type 1 or when the unit is connected to a normal kWh rate power supply (via 1-2, X11M) change both field settings [d-01] and [d-00]. Refer to "[d] Benefit kWh rate power supply/Local shift value weather dependent" on page 42.
- If the benefit kWh rate power supply is of type 1 or when the unit is connected to a normal kWh rate power supply, 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.
- If the benefit kWh rate power supply is of type 2 or 3 and the unit is not connected to a normal kWh rate power supply, then the backup heater and booster heater cannot be controlled. This power supply interruption should not be longer than 2 hours, otherwise the real time clock of the controller will be reset.
  During power supply interruption, the controller display will be blank.
  Refer to "For a benefit kWh rate power supply like illustrated below as types 2 or 3" on page 26.

(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 34.
(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 34.

Installation of the digital controller

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

Wiring specifications

Wire specification	Value
Type	2 wire
Section	0.75~1.25 mm^2
Maximum length	500 m

NOTICE

The wiring for connection is not included.

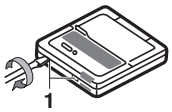
Procedure

NOTICE

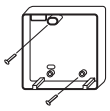
The digital controller, delivered in a kit, has to be mounted indoors.

1 Remove the front part of the digital controller.

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



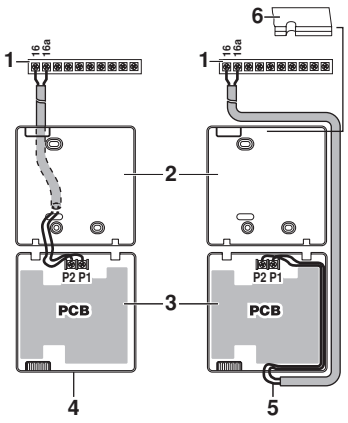
2 Fasten the digital controller on a flat surface.



NOTICE

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

3 Wire the unit.

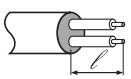


1 Unit
2 Rear part of the digital controller
3 Front part of the digital controller
4 Wired from the rear
5 Wired from the top
6 Notch the part for the wiring to pass through with nippers, etc.

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

NOTICE

- When wiring, run the wiring away from the power supply wiring in order to avoid receiving electric noise (external noise).
- Peel the shield for the part that has to pass through the inside of the digital controller case (ℓ).

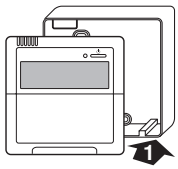


4 Reattach the upper part of the digital controller.

CAUTION

Be careful not to pinch the wiring when attaching.

First begin fitting from the clips at the bottom.



10. START-UP AND CONFIGURATION

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

CAUTION

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

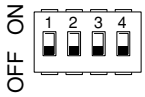
See "2. General safety precautions" on page 2.

10.1. DIP switch settings overview

DIP switch SS2 is located on the switch box PCB (see "Switch box main components (door 2)" on page 11) 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.

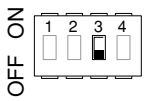


DIP switch SS2	Description	ON	OFF
1	Not applicable for installer	—	(Default)
2	Domestic hot water tank installation (see "10.4. Domestic hot water tank installation configuration" on page 30)	Installed	Not installed (Default)
3	Room thermostat connection(see "10.2. Room thermostat installation configuration" on page 29)	Room thermostat connected	No room thermostat connected (Default)
4	This setting(a) decides the operation mode when there is a simultaneous demand for more space heating/cooling and domestic water heating.	Heating/cooling priority	Priority to highest demand side(b)

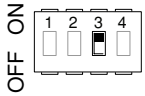
(a) Only applicable in case DIP switch 2=ON.
(b) Heating/cooling or domestic water heating mode can be restricted by schedule timer and/or field settings (4, 5, 8).

10.2. Room thermostat installation configuration

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



- When the **room thermostat** is connected to the 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.

INFORMATION

- When a room thermostat is connected to the 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 a room thermostat is connected to the 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 changeover 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) X2M 1 2 3 4	determined by leaving water temperature(a)	UI	UI	UI
	• SS2-3=ON • wiring: X2M 1 2 3 4	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.

10.3. Pump operation configuration

INFORMATION

To set the pump speed, refer to "10.8. Setting the pump speed" on page 31.

Without room thermostat: DIP switch SS2-3=OFF

When no thermostat is connected to the 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 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 table below.

INFORMATION

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 the table below.

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: X2M 1 2 3 4 SP2 SP1	determined by leaving water temperature(a)	UI	UI	UI
• [7-02]=1 • SS2-3=ON • wiring: X2M 1 2 3 4 SP2 SP1	on when main or/and sub set point is requested	SP2/SP1	UI	—

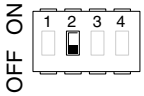
SP1 = First set point contact

SP2 = Second set point contact

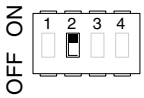
(a) The pump will stop when space heating/cooling is turned off or when the water reaches the desired water temperature as set on the user interface. With space heating/cooling turned on, the pump will then run every 5 minutes during 3 minutes to check the water temperature.

10.4. 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**.



As mentioned in "Domestic hot water tank (option)" on page 3, 2 types of domestic hot water tanks are available:

- tank with built-in electrical booster heater (EKHW*)([4-03] default value will be 3),
- tank without electrical booster heater (EKHTS)([4-03] default value will be 5).

NOTICE

For correct operation of the system, it is very important to make the correct and complete wiring connections between the unit and switch box(a) of the domestic hot water tank before setting SS2-2 to ON.

The applicable logic and settings (example [4-03] default) are activated according to the connected tank. See "[4] Backup/booster heater operation and space heating off temperature" on page 34 for more details.

(a) Only applicable for tank with built-in electrical booster heater (EKHW*).

10.5. Initial start-up at low outdoor ambient temperatures

During initial start-up and when water temperature is low, it is important that the water is heated gradually. Failure to do so may result in cracking of concrete floors due to rapid temperature change. Please contact the responsible cast concrete building contractor for further details.

To do so, the lowest leaving water set temperature can be decreased to a value between 15°C and 25°C by adjusting the field setting [9-01] (heating set point lower limit). Refer to "10.10. Field settings" on page 32.

INFORMATION

If leaving water temperature is set between 15°C and 25°C, heating is performed by the backup heater only.

INFORMATION

The function underfloor heating screed dry-out program offers the possibility to execute automatically the gradual heat up. See "11.5. Underfloor heating screed dry-out program" on page 49.

10.6. Pre-operation checks

Checks before initial start-up

DANGER

Switch off all relevant power supply before making any connections.

After the installation of the unit, check the following before switching on the circuit breaker:

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 unit and valves (when applicable), unit and room thermostat (when applicable), and unit and domestic hot water tank has been carried out according to the instructions described in the chapter "9. Electrical wiring work" on page 20, according to the wiring diagrams and according to the applicable legislation.

3 Fuses or protection devices

Check that the fuses or the locally installed protection devices are of the size and type specified in the chapter "14. Technical specifications" on page 54. Make sure that neither a fuse nor a protection device has been bypassed.

4 Backup heater circuit breaker F1B/F3B

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

5 Booster heater circuit breaker F2B(1)

Do not forget to turn on the booster heater circuit breaker F2B in the switch box (applies only to units with optional domestic hot water tank).

6 Earth wiring

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

7 Internal wiring

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

8 Fixation

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

9 Damaged equipment

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

10 Refrigerant leak

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

11 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.

12 Pipe size and pipe insulation

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

13 Stop valves

Make sure that the stop valves on the unit (gas and liquid) are fully open.

14 Air purge valve

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

(1) Only applicable for tank with built-in electrical booster heater (EKHW*).

15 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!

16 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.

17 Shut-off valves

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

NOTICE

Operating the system with closed valves will damage the pump!

10.7. Powering up the unit

When power supply to the 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.

10.8. Setting the pump speed

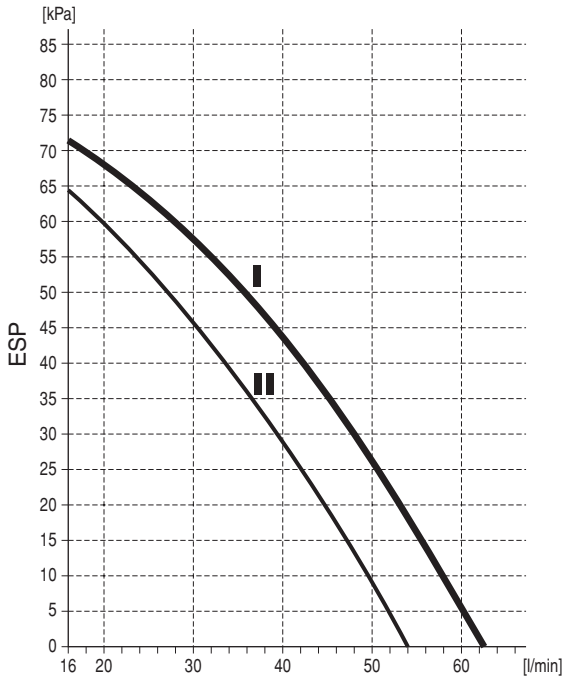
The pump speed can be selected on the pump (see "5.2. Main components" on page 10).

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 low speed (**II**).

INFORMATION

The speed dial on the pump indicates 3 speed settings. However, only 2 speed settings exist: low speed and high speed. The indicated medium speed setting on the speed dial is equal to low speed.

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



10.9. Failure diagnosis at the moment of first installation

- In case nothing is displayed on the remote controller (the current set temperature does not display), check for any of the following abnormalities before you can diagnose possible malfunction codes.
  - Disconnection or wiring error (between power supply and unit and between unit and remote controller).
  - The fuse on the PCB may have run out.
- If the remote controller shows *"E3"*, *"E4"* or *"L8"* as an error code, there is a possibility that either the stop valves are closed, or that air inlet or air outlet are blocked.
- If the error code *"U2"* is displayed on the remote controller, check for voltage imbalance.
- If the error code *"L4"* is displayed on the remote controller, it is possible that air inlet or air outlet are blocked.
- The reversed phase protection detector of this product only works during the initialisation stage after a power reset.

  The reversed phase protection detector is designed to stop the product in case of an abnormality when the product is started up.
  - When the reversed phase protection circuit forced the unit to stop, check if all phases are existing. If this is the case, shut off the power supply to the unit and replace two of three phases. Turn on power again and start the unit.
  - Reversed phase detection is not performed while the product is operating.
  - In case of possible reversal of phases after a momentary black out of power and the power goes on and off while the product is operating, install a reversed phase protection circuit on site. Such situation is not unimaginable when using generators. Running the product in reversed phase can break the compressor and other parts.
- For a missing phase in case of W1 units, *"E7"* or *"U2"* will be displayed on the remote controller of the unit.

Operation will be impossible with either one of these phenomena. If this happens, turn off the power, re-check the wiring and switch the position of two of the three electrical wires.

10.10. Field settings

The 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.

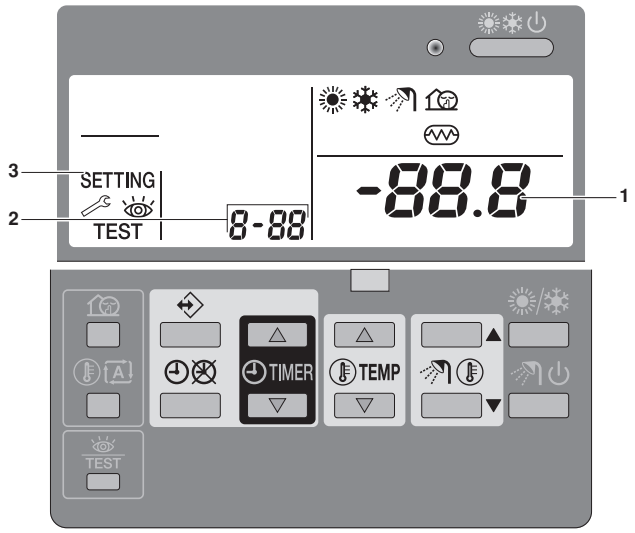
Each field setting is assigned a 3-digit number or code, for example [5-03], which is indicated on the user interface display. The first digit [5] indicates the 'first code' or field setting group. The second and third digit [03] together indicate the 'second code'.

A list of all field settings and default values is given under "10.11. Field settings table" on page 44. 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 under "Detailed description" on page 32.

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.

NOTICE

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.

INFORMATION

- Before shipping, the set values have been set as shown under "10.11. Field settings table" on page 44.
- When exiting FIELD SET MODE, "88" may be displayed on the user interface LCD while the unit initialises itself.

Detailed description

[0] User permission level

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

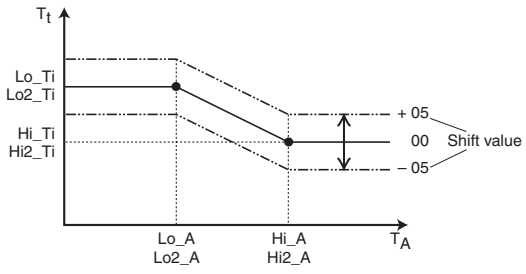
Three permission levels are defined (see the table below). Switching between level 1 and level 2/3 is done by simultaneously pressing buttons TIMER▲ and TIMER▼ immediately followed by simultaneously pressing buttons and , and keeping all 4 buttons pressed for at least 5 seconds (in normal mode). Note 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].

Button		Permission level 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

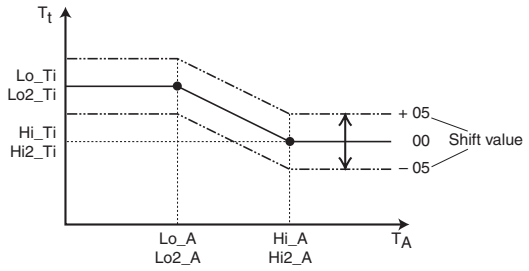
The weather dependent set point field settings define the parameters for the weather dependent operation of the unit. When weather dependent operation is active the water temperature is determined automatically depending on the outdoor temperature: low outdoor temperatures will result in warmer water 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 low 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 high outdoor temperatures (i.e. Hi_A) less warm water suffices.



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

- Field settings for cooling operation (EB units)
  - [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 low outdoor temperatures (i.e. Lo2_A) less cold water suffices.
  - [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 high outdoor temperatures (i.e. Hi2_A) colder water is required.



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

[2] Disinfection function

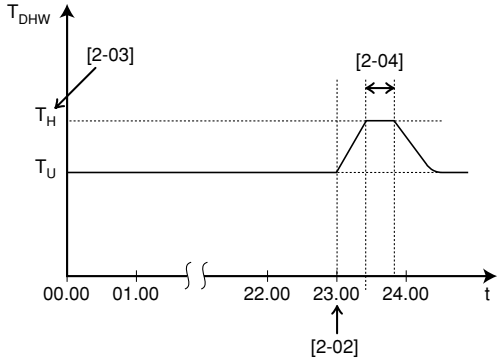
Applies only to installations with a domestic hot water tank.

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 the applicable legislation.

- [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 rise above a set maximum value. This maximum allowable hot water temperature shall be selected according to the applicable legislation.

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.

[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.

INFORMATION

Continuous unit control can be guaranteed independent of the benefit kWh rate power supply status, by connecting the unit to a normal kWh rate power supply. See "Connection to a benefit kWh rate power supply" on page 26.

[4] Backup/booster heater operation and space heating off temperature

Backup heater operation (only for EKHW* or applications without tank installed)

INFORMATION

Applicable for tank with built-in electrical booster heater (EKHW*)

OR

when no optional domestic hot water tank connected to the application (all information and limitation related to the booster heater can be neglected).

The operation of the backup heater can altogether be enabled or disabled, or it can be disabled depending on operation of the booster heater.

- [4-00] Status: defines whether backup heater operation is enabled (1) or disabled (0).
- [4-01] Priority: defines whether backup heater and booster heater can operate simultaneously (0), or if the booster heater operation has priority over the backup heater operation (1), or if the backup heater operation has priority over the booster heater operation (2).

INFORMATION

When the priority field setting is set to ON (1), space heating performance of the system might be decreased at low outdoor temperatures, since in case of domestic water heating demand the backup heater will not be available for space heating (space heating will still be provided by the heat pump).

When the priority field setting is set to ON (2), domestic water heating performance of the system might be decreased at low outdoor temperatures, since in case of space heating demand the booster heater will not be available for domestic water heating. However domestic water heating by heat pump will still be available.

NOTICE

When the priority field setting is set to OFF (0), make sure that electrical power consumption does not exceed supply limits.

Booster heater operation (only for EKHW*)

INFORMATION

Applicable for tank with built-in electrical booster heater (EKHW*)

Applies only to installations with a domestic hot water tank.

The operation of the booster heater can be enabled or limited depending on outdoor temperature (T_A), domestic hot water temperature (T_{DHW}) or operation mode of the heat pump.

- [4-03] Booster heater operation: defines whether the optional booster heater operation is enabled (1) or has certain limitations (0/2/3/4).

Explanation of settings of [4-03]

Booster heater will/can only operate if domestic hot water mode is activated (🔥).

- [4-03]=0, then booster heater operation is only allowed during "[2] Disinfection function" and "Powerful domestic water heating" (see operation manual).
  This setting is only recommended in case the capacity of the heat pump can cover the heating requirements of the house and domestic hot water over the complete heating season.
  The result of this setting is that the domestic hot water will never be heated by the booster heater except for "[2] Disinfection function" and "Powerful domestic water heating" (see operation manual).

INFORMATION

If the booster heater operation is limited ([4-03]=0) and the ambient temperature T_A is lower than the field setting to which parameter [5-03] is set and [5-02]=1, then the domestic hot water will not be heated.

The consequence of this setting is that the domestic hot water temperature (T_{DHW}) can be maximum the heat pump OFF temperature ($T_{HP\ OFF}$). Refer to setting of "[6-00]" on page 37 and "[6-01]" on page 37.

- [4-03]=1, then booster heater heater operation is only determined by booster heater OFF temperature ($T_{BH\ OFF}$), booster heater ON temperature ($T_{BH\ ON}$) and/or schedule timer. Refer to setting "[7-00]" on page 38 and "[7-01]" on page 38.
- [4-03]=2, then booster heater operation is only allowed if heat pump is out of "operation range" of heat pump domestic water heating mode (T_A<[5-03] or T_A>35°C) or domestic hot water temperature is 2°C lower then the heat pump OFF temperature ($T_{HP\ OFF}$) for domestic hot water mode ($T_{DHW} \geq T_{HP\ OFF}-2°C$). (Refer to setting "[5-03]" on page 36, "[6-00]" on page 37, and "[6-01]" on page 37).
  Results in the most optimum coverage of domestic hot water heated by the pump.
- [4-03]=3, then booster heater operation is the same as setting 1, except that booster heater is OFF when the heat pump is active in domestic hot water mode. The consequence of this functionality is that setting [8-03] is not relevant.
  Results in optimum coverage of domestic hot water heated by heat pump in relation with [8-04].

INFORMATION

- When setting [4-03]=1/2/3/4, the booster heater operation can still be restricted by the schedule timer as well. I.e., when booster heater operation is preferred during certain period of the day. (See operation manual)
- When setting [4-03]=2, the booster heater will be allowed to operate when T_A<[5-03] independent of the status of [5-02]. If bivalent operation is enabled and permission signal for auxiliary boiler is ON, the booster heater will be restricted even when T_A<[5-03]. (See "[C-02]" on page 41).
- Booster heater is always allowed during powerful and disinfection function, except for the period that the backup heater operation is required for safety reasons and [4-02]=1.

- [4-03]=4, then booster heater operation is the same as setting 2, except that the domestic water heating (heat pump and booster) will operate according to the scheduled storage and reheat function. See field settings "[6-03]" on page 37 and "[6-05]" on page 37.

CAUTION

For optional domestic hot water tank, the field setting [4-03] shall be 0, 1, 2, 3, or 4.

In case [4-03]=5, there is an incorrect field wiring between tank and unit. The required corrective action is described in "Symptom 8: [4-03] and maximum tank set point is not according to the the applicable tank" on page 52.

INFORMATION

[4-03]=3 (default), this setting is automatically selected if the correct and complete wiring connections between unit and switch box[(a)] of the optional domestic hot water tank are done BEFORE SS2-2 is set to ON. [4-03]=0~4 activate the applicable logic and field settings for EKHW*.

(a) Only applicable for tank with built-in electrical booster heater (EKHW*).

Backup heater operation (only for EKHTS)

INFORMATION

For tank without electrical booster heater (EKHTS), the backup heater will be used in domestic water heating mode.

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 water heating mode.

INFORMATION

- In special conditions, for example the unit 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.

CAUTION

For optional domestic hot water tank EKHTS, the field setting [4-03] shall be 5.

[4-03]=5, this setting is automatically selected if the EKHTS tank is connected and SS2-2 is set to ON. [4-03]=5 activate the applicable logic and field settings for EKHTS.

INFORMATION

- Make sure that the domestic hot water set point is according to your requirements.
  Start with a low domestic hot water set point, and only increase if you feel that the domestic hot water supply temperature is not sufficient for your requirements (this depends on your water using pattern).
- Make sure the domestic water is not heated unnecessary.

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 unit 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.

INFORMATION

Only for EKHTS: 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.

Freeze protection function

- [4-04] Freeze protection function. This function avoids freezing of the (outside) water piping between the house and the unit. In case of low ambient temperatures, it will activate the pump/backup heater. The default freeze protection function takes into account freezing of insufficiently insulated water piping. Basically it means that the pump is activated whenever ambient temperatures become close to freezing, independently of the working temperature.

[5] Equilibrium temperature and space heating priority temperature

Equilibrium temperature (only for EKHW*)

The 'equilibrium temperature' field settings apply to operation of the **backup heater**.

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. When the function is disabled, operation of the backup heater is possible at all outdoor temperatures. Enabling this function reduces the working time of the backup heater.

- [5-00] Equilibrium temperature status: specifies whether the equilibrium temperature function is enabled (1) or disabled (0).
- [5-01] Equilibrium temperature: outdoor temperature below which operation of the backup heater is allowed.

Space heating priority temperature (only for EKHW*)

Applies only to installations with a domestic hot water tank(1). The 'space heating priority temperature' field settings apply to operation of the 3-way valve and the **booster heater** in the domestic hot water tank.

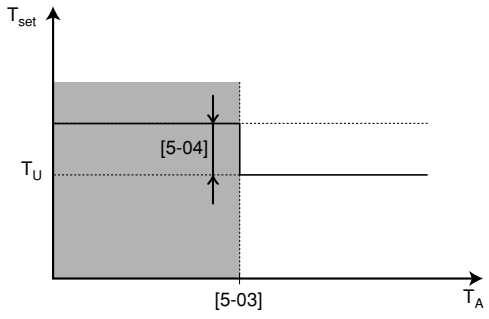
When the space heating priority function is enabled, it is assured that the full capacity of the heat pump is used for space heating only when the outdoor temperature equals or drops below the specified space heating priority temperature, i.e. low outdoor temperature. In this case the domestic hot water will only be heated by the booster heater.

- [5-02] Space heating priority status: specifies whether space heating priority is enabled (1) or disabled (0).
- [5-03] Space heating priority temperature: outdoor temperature below which the domestic hot water will be heated by the booster heater only, i.e. low outdoor temperature.

INFORMATION

If the booster heater operation is limited ([4-03]=0) and the ambient temperature T_A is lower than the field setting to which parameter [5-03] is set and [5-02]=1, then the domestic hot water will not be heated.

- [5-04] Set point correction for domestic hot water temperature: set point correction for the desired domestic hot water temperature, to be applied at low outdoor temperature when space heating priority is enabled. The corrected (higher) set point will make sure that the *total* heat capacity of the water in the tank remains approximately unchanged, by compensating for the colder bottom water layer of the tank (because the heat exchanger coil is not operational) with a warmer top layer.



T_{set} Domestic hot water set point temperature
T_U User set point (as set on the user interface)
T_A Ambient (outdoor) temperature
Space heating priority

WARNING

Be aware that the domestic hot water temperature will be automatically increased with the value selected in field setting [5-04] (if the outdoor temperature drops below field setting [5-03]) compare to the user set point for domestic hot water (T_U). Refer to field setting [5-03], [7-00] and the operation manual to select preferable set point.

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 rise above a set maximum value. This maximum allowable hot water temperature shall be selected according to the applicable legislation.

Equilibrium temperature (only for EKHTS)

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 (only for EKHTS)

Applies only to installations with a domestic hot water tank(2). 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 heat pump 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 heat pump 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.

INFORMATION

If the backup heater operation is limited ([4-00]=0) and the ambient 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.

(1) Only applicable for tank with built-in electrical booster heater (EKHW*).

(2) Only applicable for tank with built-in electrical booster heater (EKHW*).

[6] DT for heat pump domestic water heating mode/scheduled storage and reheat domestic water heating

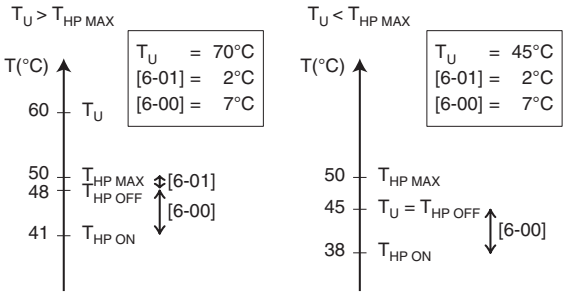
DT for heat pump domestic water heating mode

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 hot water by the heat pump will be stopped (by switching the 3-way valve).

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)[(1)]
$T_{HP\ OFF}$ Heat pump OFF temperature
$T_{HP\ ON}$ Heat pump ON temperature

INFORMATION

The maximum domestic hot water temperature that can be reached with the heat pump is 50°C[(a)]. 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, 2, 4, or 5 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.

(a) Depending on unit and tank selection. See operation range domestic hot water for more details.

Scheduled storage domestic water heating[(2)]

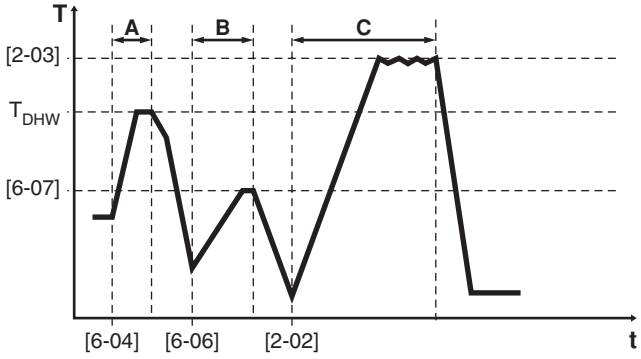
The storage set point can be accessed directly using the ▲ and ▼ buttons.

- [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.

Scheduled reheat domestic water heating[(3)]

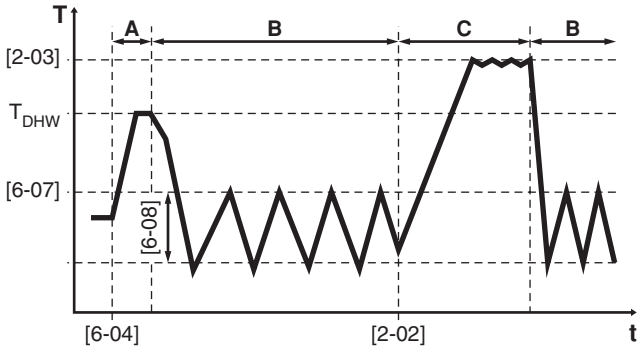
- [6-05] Reheat: defines whether the scheduled domestic water reheat during daytime is enabled (1) or continuous reheat is enabled (2) or reheat is disabled (0)
- [6-06] Scheduled reheat start time: time of the day at which the domestic water should be heated.
- [6-07] Domestic hot water reheat set point
- [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 T_{DHW} (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 33.
t Time
T Domestic hot water temperature
T_{DHW} 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 hot water untill domestic hot water user interface set point T_{DHW} (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 hot water untill domestic hot water disinfection set point [2-03] (e.g 60°C) is reached. Refer to "[2] Disinfection function" on page 33.
t Time
T Domestic hot water temperature
T_{DHW} Domestic hot water user interface set point

(1) Depending on unit and tank selection. See operation range domestic hot water for more details.
(2) The scheduled storage/reheat domestic water heating is only applicable in case [4-03]=4 or 5.
(3) The scheduled storage/reheat domestic water heating is only applicable in case [4-03]=4 or 5.

INFORMATION

- Make sure that the domestic hot water set point is according to your requirements.

  Start with a low domestic hot water storage set point, and only increase if you feel that the domestic hot water supply temperature is not sufficient for your requirements (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 scheduled storage domestic water heating during the night is not sufficient for your requirements, an additional scheduled reheat during daytime can be set.

[7] DT for booster heater and dual set point control

DT for booster heater (only for EKHW*)

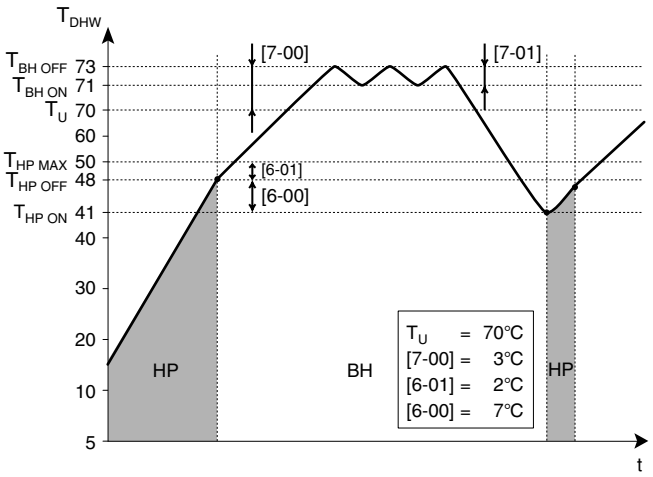
Applies only to installations with a domestic hot water tank(1).

When the domestic hot water is heated and the domestic hot water set point temperature (as set by the user) has been reached, the booster heater will continue to heat the domestic hot water to a temperature a few degrees above the set point temperature, i.e. the booster heater OFF temperature. These extra degrees are specified by the domestic hot water step length field setting. Correct setting prevents the booster heater from repeatedly turning on and off (i.e. chattering) to maintain the domestic hot water set point temperature. Note: the booster heater will turn back on when the domestic hot water temperature drops [7-01] (field setting) below the booster heater OFF temperature.

INFORMATION

If the schedule timer for booster heater (see the operation manual) is active, the booster heater will only operate if allowed by this schedule timer.

- [7-00] Domestic hot water step length: temperature difference above the domestic hot water set point temperature before the booster heater is turned off.



BH Booster heater
HP Heat pump. If heating up time by the heat pump takes too long, auxiliary heating by the booster heater can take place
$T_{BH\ OFF}$ Booster heater OFF temperature (T_U+[7-00])
$T_{BH\ ON}$ Booster heater ON temperature ($T_{BH\ OFF}$–[7-01])
$T_{HP\ MAX}$ Maximum heat pump temperature at sensor in domestic hot water tank
$T_{HP\ OFF}$ Heat pump OFF temperature ($T_{HP\ MAX}$–[6-01])
$T_{HP\ ON}$ Heat pump ON temperature ($T_{HP\ OFF}$–[6-00])
T_{DHW} Domestic hot water temperature
T_U User set point temperature (as set on the user interface)
t Time

WARNING

Be aware that the domestic hot water temperature will be automatically increased (always) with the value selected in field setting [7-00] compared to the user set point for domestic hot water (T_U). Refer to field setting [7-00] and the operation manual to select preferable set point.

If this 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 rise above a set maximum value. This maximum allowable hot water temperature shall be selected according to the applicable legislation.

INFORMATION

If the booster heater operation is limited ([4-03]=0), then set point of field setting parameter [7-00] has only meaning for powerful domestic water heating.

- [7-01] Hysteresis value booster heater: temperature difference determining the booster heater ON temperature ($T_{BH\ ON}$). $T_{BH\ ON}$=$T_{BH\ OFF}$–[7-01]

INFORMATION

The minimum value for booster heater ON temperature ($T_{BH\ ON}$) is 2°C (fixed) below heat pump OFF temperature ($T_{HP\ OFF}$).

(1) Only applicable for tank with built-in electrical booster heater (EKHW*).

Dual set point control

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

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

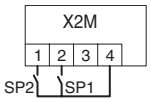
INFORMATION

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.

NOTICE

- 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 can be a fixed value or weather dependent.
- The second set point heating [7-03] should be linked to the heat emitters which require the highest set point in heating mode. Example: fan coil units.
- The second set point cooling [7-04] is always a fixed value. It should be linked to the heat emitters which require the lowest set point in cooling mode. Example: fan coil units.
- 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

INFORMATION

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.

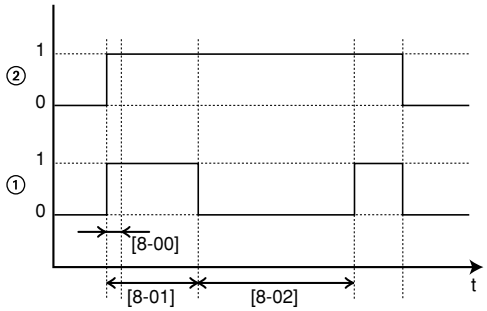
The 'domestic water heating mode timer' field setting defines the minimum and maximum domestic water heating times, minimum time between two domestic water heating cycles by heat pump, and booster heater delay time.

- [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 40.

INFORMATION

Note that when the unit is configured to work with a room thermostat (refer to "10.2. Room thermostat installation configuration" on page 29), the maximum running timer will only be taken into account when there is a request for space heating or space cooling. When there is no request for space heating or space cooling, domestic water heating by the heat pump will continue until the 'heat pump OFF temperature' (see field settings "[6]" on page 37) 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 40.



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

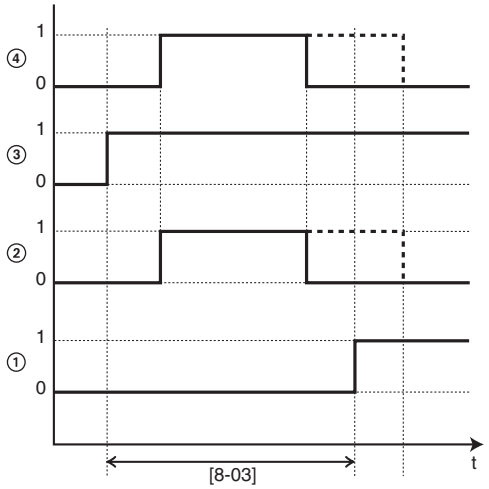
INFORMATION

- If the outdoor temperature is higher than the field setting to which parameter [4-02] is set, and lower than the field setting to which parameter [F-01], then field settings of parameters [8-01], [8-02], and [8-04] are not considered.
- Parameter [F-01] is only applicable for EB units.

■ [8-03] Booster heater delay time (only for EKHW*): specifies the start-up time delay of the booster heater operation when heat pump domestic water heating mode is active.

INFORMATION

- When heat pump is active in domestic water heating mode, the delay time of booster heater is [8-03].
- When heat pump is not active in domestic water heating mode, the delay time is 20 min.
- The delay timer starts from booster heater ON temperature ($T_{BH\ ON}$)



1 Booster heater operation (1=active, 0=not active)
2 Heat pump domestic water heating mode (1=active, 0=not active)
3 Hot water request for booster heater (1=request, 0=no request)
4 Hot water request for heat pump (1=request, 0=no request)
t Time

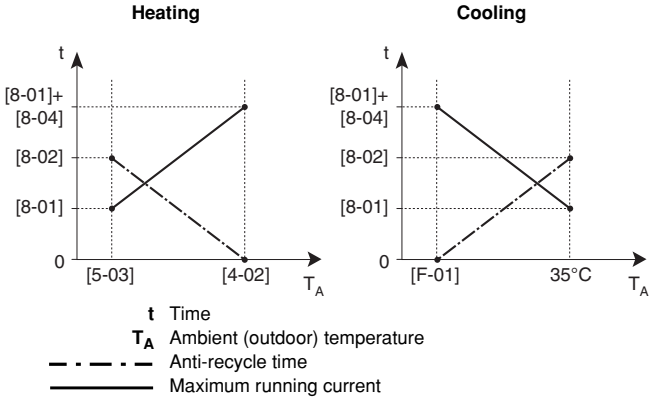
INFORMATION

- By adapting the booster heater delay time versus the maximum running time, an optional balance can be found between the energy efficiency and the heat up time.
- However, if the booster heater delay time is set too high, it might take a long time before the domestic hot water reaches its set temperature upon domestic hot water mode request.
- The purpose of [8-03] is to delay the booster heater in relation with the heat pump operation time in domestic water heating mode.
- The setting [8-03] has only meaning if setting [4-03]=1. Setting [4-03]=0/2/3/4 limits the booster heater automatically in relation to heat pump operation time in domestic water heating mode.
- Take care that [8-03] is always in relation with the maximum running time [8-01].

Example: [4-03]=1

	Energy saving settings	Quick heating settings (default)
[8-01]	20~60 min	30 min
[8-03]	[8-01]+20 min	20 min

■ [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 current

INFORMATION

Only for EKHW*: The full advantage of [8-04] will be applicable if setting [4-03] is not 1.

[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.

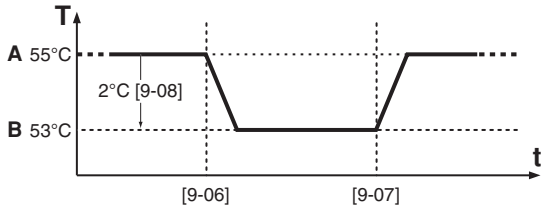
Automatic setback function

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.

INFORMATION

- 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

In case the EKHW* is installed and [4-03]=4 or the EKHTS tank is installed, 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].

INFORMATION

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 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 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 EKSOLHW 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

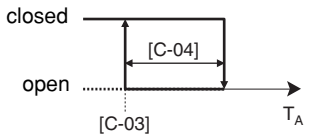
Applies only to installations with an auxiliary boiler (alternating operation, parallel connected). The purpose of this function is to determine – based on the outdoor temperature – which heating source can/will provide the space heating, either the Daikin unit or an auxiliary boiler.

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

When the "bivalent operation" function is enabled, the 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 unit is possible at all outdoor temperatures (see operation ranges) and permission signal for auxiliary boiler is always disactivated.

- [C-02] Bivalent operation status: defines whether bivalent operation is enabled (1) or disabled (0).
- [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 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

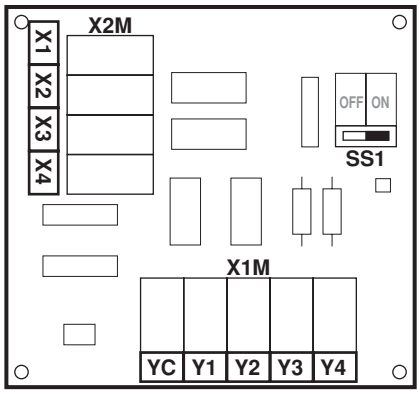
CAUTION

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.

INFORMATION

- In case the outdoor unit is not single phase (W1), 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 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 permission signal [C-02]=2

This function gives the possibility to drive an additional external backup heater.

The additional external backup heater can be used to assist space heating (not domestic water heating) during low ambient conditions.

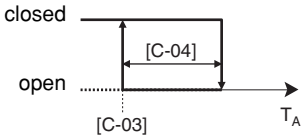
The signal for additional external heater will be activated when the second step of the internal backup heater is closed and when the outdoor temperature goes below [C-03] setting with [C-04] hysteresis.

INFORMATION

When [4-07] "Backup heater second step" is disabled, then the 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 permission signal X1–X2 (EKRP1HB)



T_A Outdoor temperature

CAUTION

It is the responsibility of the installer to make sure no unwanted situations can occur and that all safeties are implemented according to applicable legislation.

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

INFORMATION

Permission signal X1–X2 can only be for the bivalent operation **OR** external backup heater permission signal.

Both functions cannot be used at the same time.

[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.

  Only for EKHW*(1):

[d-00]	Compressor	Back up heater	Booster heater
0 (default)	Forced off	Forced off	Forced off
1	Forced off	Forced off	Permitted
2	Forced off	Permitted	Forced off
3	Forced off	Permitted	Permitted

  Only for EKHTS(2):

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

INFORMATION

- [d-00] settings 1, 2 and 3 are only meaningful if the benefit kWh rate power supply is of type 1 or the unit is connected to a normal kWh rate power supply (via 1-2 X11M) and the backup heater and booster heater are not connected to the benefit kWh rate power supply.
- For EKHTS, do not select 1 or 3 value.

- [d-01] Unit connection to benefit kWh rate power supply: Defines whether or not the 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 26.

  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(3).

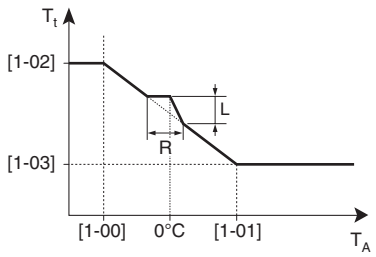
  When parameter [d-01]=2 at the moment that the benefit kWh rate signal is sent by the electricity company, that contact will close and the unit will go in forced off mode(4).

(1) Only applicable for tank with built-in electrical booster heater (EKHW*).
(2) Only applicable for tank without electrical booster heater (EKHTS).
(3) 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 34.
(4) 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 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 32) 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]~[1-04] Applicable field settings of the weather dependent set point [1].

[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

[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

NOTICE

[E-03] and [E-04] readouts are not permanently refreshed. Temperature readouts are updated after looping through the field setting first codes again only.

[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 "10.3. Pump operation configuration" on page 29.

- [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.

INFORMATION

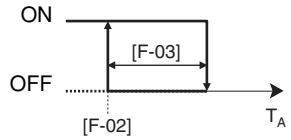
This function is only valid for EB units when space cooling is selected.

Bottom plate heater control

Applies only to installation with an E(D/B)LQ unit 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 in order to prevent ice build-up in the bottom plate 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

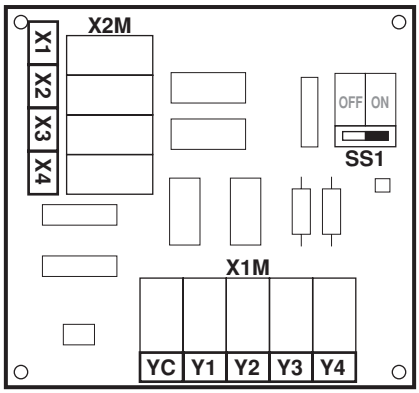
The bottom plate heater is controlled via X14A. Make sure [F-04] is correctly set.

Functionality of X14A

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

INFORMATION

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



10.11.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 (only in combination with domestic hot water tank **without** electrical booster heater (EKHTS), [4-03]=5)					60	fixed	5	°C
	03	Set point (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*), [4-03]≠5)					70	55~80	5	°C
	04	Interval (only in combination with domestic hot water tank **without** electrical booster heater (EKHTS), [4-03]=5)					60	40~60	5	min
	04	Interval (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*), [4-03]≠5)					10	5~60	5	min
3	**Auto restart**									
	00	Status					0 (ON)	0/1	—	—
4	**Backup/booster heater operation and space heating off temperature**									
	00	Backup heater operation (only in combination with domestic hot water tank **without** electrical booster heater (EKHTS))					1 (ON)	0/1/2	—	—
	00	Backup heater operation (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*))					1 (ON)	0/1	—	—
	01	Backup/booster heater priority					0 (OFF)	0/1/2	—	—
	02	Space heating off temperature					35	14~35	1	°C
	03	Booster heater operation (only in combination with domestic hot water tank **without** electrical booster heater (EKHTS))					5	fixed	—	—
	03	Booster heater operation (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*))					3	0/1/2/3/4	—	—
	04	Freeze protection function					0 (active)	Read only	—	—
	05	Not applicable.					—	—	—	—
	06	Backup heater emergency operation					1 (enabled)	0/1	1	—
	07	Backup heater second step					1 (enabled)	0/1	1	—

First code	Second code	Setting name	Installer setting at variance with default value				Default value	Range	Step	Unit
			Date	Value	Date	Value				
5	**Equilibrium temperature and space heating priority temperature**									
	00	Equilibrium temperature status (only in combination with domestic hot water tank **without** electrical booster heater (EKHTS), [4-03]=5, this setting is fixed and can not be consulted)					1 (ON)	—	—	—
	00	Equilibrium temperature status (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*), [4-03]≠5)					1 (ON)	0/1	—	—
	01	Equilibrium temperature					0	–15~35	1	°C
	02	Space heating priority status (only in combination with domestic hot water tank **without** electrical booster heater (EKHTS), [4-03]=5, this setting is fixed and can not be consulted)					1 (ON)	—	—	—
	02	Space heating priority status (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*), [4-03]≠5)					0 (OFF)	0/1	—	—
	03	Space heating priority temperature					0	–15~35	1	°C
	04	Set point correction for domestic hot water temperature (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*), [4-03]≠5)					10	0~20	1	°C
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.					—	—	—	—
	Scheduled storage and reheat domestic water heating[(a)]									
	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	**DT for booster heater and dual set point control**									
	00	Domestic hot water step length (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*), [4-03]≠5)					0	0~4	1	°C
	01	Hysteresis value booster heater (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*), [4-03]≠5)					2	2~40	1	°C
	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 (only in combination with domestic hot water tank **without** electrical booster heater (EKHTS), [4-03]=5)					0.5	0~10	0.5	hour
	02	Anti-recycling time (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*), [4-03]≠5)					3	0~10	0.5	hour
	03	Booster heater delay time (only in combination with domestic hot water tank **with** built-in electrical booster heater (EKHW*), [4-03]≠5)					50	20~95	5	min
	04	Additional running time at [4-02]/[F-01]					95	0~95	5	min

First code	Second code	Setting name	Installer setting at variance with default value				Default value	Range	Step	Unit
			Date	Value	Date	Value				
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 operation					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**									
	00	Quiet mode type					0	0/2	—	—
	01	Status					3	—	—	—
	02	Not applicable. Do not change the default value.					1	Read only	—	—
	03	Not applicable. Do not change the default value.					0	Read only	—	—
	04	Not applicable. Do not change the default value.					0	Read only	—	—
b	**Not applicable**									
	00	Not applicable. Do not change the default value.					0	Read only	—	—
	01	Not applicable. Do not change the default value.					0	Read only	—	—
	02	Not applicable. Do not change the default value.					0	Read only	—	—
	03	Not applicable. Do not change the default value.					0	Read only	—	—
	04	Not applicable. Do not change the default value.					0	Read only	—	—
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.					—	—	—	—
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.					0 (OFF)	—	—	—
	03	Local shift value weather dependent					0 (OFF)	0/1/2/3/4	1	—
	04	Not applicable.					—	—	—	—
	05	Pump operation forced off or permitted during backup heater is forced off at benefit kWh rate power supply ([d-00]=0 or 1)					0 (forced off)	0/1	1	—
	06	Not applicable.					—	—	—	—
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

First code	Second code	Setting name	Installer setting at variance with default value				Default value	Range	Step	Unit
			Date	Value	Date	Value				
F	**Option setup**									
	00	Pump operation stop					0 (enabled)	0/1	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[(c)]	15~55	1	°C
	07	Time of selected action number [F-05]					0[(c)]	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) The storage and reheat function is only applicable in case [4-03]=4 or 5.
(b) Only possible to modify the first 3 minutes after power ON.
(c) For all action numbers of [F-05].

11. Test run and final check

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

11.1. 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.

DANGER

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

INFORMATION

Note that during the first running period of the unit, required power input may be higher than stated on the nameplate of the unit. This phenomenon originates from the compressor that needs elapse of a 50 hours run in period before reaching smooth operation and stable power consumption.

11.2. Pre-run checks

Items to check	
Electrical wiring Inter-unit wiring Earth wire	■ Is the wiring as mentioned on the wiring diagram? Make sure no wiring has been forgotten and that there are no missing phases. ■ Is the unit properly earthed? ■ Is the wiring between units connected in series correct? ■ Are any of the wiring attachment screws loose? ■ Is the insulation resistance at least 1 MΩ? - Use a 500 V mega-tester when measuring insulation. - Do not use a mega-tester for low-voltage circuits.

11.3. 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 "13.3. Error codes" on page 53.

NOTICE

When the unit is put into pump down operation, 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).

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

2 Depending on the 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 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 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 "13.3. Error codes" on page 53.

INFORMATION

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

DANGER

- Never leave the unit unattended with an open front panel during test run.
- To protect the compressor, make sure to turn on the power supply 6 hours before starting operation.

11.5. 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 execute 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.

INFORMATION

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:

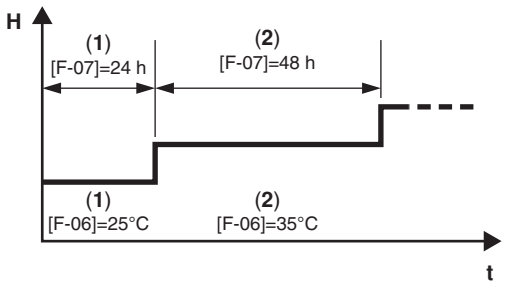
- [F-05] Action number selection
- [F-06] Heating set point of selected action number [F-05]
- [F-07] Time of selected action number [F-05] (steps of 12 hours)
- [F-08] Underfloor heating screed dry-out program enabled (1)/disabled (0)
- [F-09] (Read only) Latest action number executed.
  In case "underfloor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

Getting started

- 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 "13.3. Error codes" on page 53.

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 programmed as follows:
  (refer to "10.10. Field settings" on page 32 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 step 1 through 3 to program all the actions.

INFORMATION

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

- Consult the different actions to confirm good setting values as follows:
  (Refer to "10.10. Field settings" on page 32 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 step 1 through 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

INFORMATION

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 人 is also displayed.

3 During activation

The underfloor heating dry-out program will automatically run through 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.

INFORMATION

- 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 "13.3. Error codes" on page 53.
  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.

12. Maintenance and service

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

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

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 switch off the circuit breakers) or open protection devices of the unit.
- Make sure that before starting any maintenance or repair activity, also the power supply to the 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.
- After measuring the residual voltage, pull out the fan connector.
- Make sure you do not touch a conductive section.
- The fan may rotate due to strong backblow wind, causing the capacitor to charge. This may result in an electric shock.
- Do not rinse the 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.

After maintenance, make sure the fan connector is connected again. Otherwise, the unit may break down.

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

NOTICE

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 water pipes during and immediately after operation as the pipes may be hot. Your hand may suffer burns. To avoid injury, give the piping time to return to normal temperature or be sure to wear proper gloves.

DANGER

- 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.
- Do not touch the internal parts (pump, backup heater, etc.) during and immediately after operation.

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

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

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.

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 Domestic hot water tank booster heater

Applies only to installations with a domestic hot water tank(1).

It is advisable to remove lime buildup on the booster heater to extend its life span, especially in regions with hard water. To do so, drain the domestic hot water tank, remove the booster heater from the domestic hot water tank and immerse in a bucket (or similar) with lime-removing product for 24 hours.

8 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, K3M, K5M (applications with domestic hot water tank only) and K4M by use of an ohm meter. All contacts of these contactors must be in open position.

(1) Only applicable for tank with built-in electrical booster heater (EKHW*).

9 In case of use of glycol

(Refer to Caution: "Use of glycol" on page 19)

Document the glycol concentration and the pH-value in the system at least once a year.

- A pH-value below 8.0 indicates that a significant portion of the inhibitor has been depleted and that more inhibitor needs to be added.
- When the pH-value is below 7.0 then oxidation of the glycol occurred, the system should be drained and flushed thoroughly before severe damage occurs.

Make sure that the disposal of the glycol solution is done in accordance with the applicable legislation.

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.

INFORMATION

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

13. 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 installer.

13.1. 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.

DANGER

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 cannot 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!

NOTICE

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

13.2. General symptoms

Symptom 1: The unit is turned on (LED is lit) but the unit is not heating or cooling 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 "10.8. Setting the pump speed" on page 31).
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 17).

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 4. 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 18).

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 17).

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 "10.10. Field settings" on page 32.

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 "10.10. Field settings" on page 32. Check whether or not the thermal protector of the backup heater has been activated (refer to Main components, "16. Backup heater thermal protector" on page 11 for location of the reset button). Check if booster heater and backup heater are configured to operate simultaneously (field setting [4-01], see "10.10. Field settings" on page 32). Check whether or not the thermal fuse of the backup heater is blown (refer to "Main components", "17. Backup heater thermal fuse" on page 11 for location of the reset button).
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 booster heater operation at a higher outdoor temperature.

Symptom 8: [4-03] and maximum tank set point is not according to the the applicable tank

1. In case of domstic hot water tank with built-in electrical booster heater (EKHW*) and [4-03]=5 or maximum domestic hot water set point is 60°C, the wrong field setting and logic is activated according to the applicable tank.
2. In case of domestic hot water tank without booster heater (EKHTS) and [4-03]≠5 or maximum domestic hot water set point is 78°C, the wrong field setting and logic is activated according to the applicable tank.

Possible causes	Corrective action
At the time of setting DIP switch SS2-2, wrong field wiring caused wrong detection of tank type.	Check all field wiring between unit and tank switch box. **Reset procedure** • Power off the unit and put SS-2 to OFF. • Power on the unit, it means that the unit will detect no domestic hot water tank. • Power off the unit and put SS2-2 to ON again. • Power on the unit and the unit will detect again the type of tank: tank with built-in electrical booster heater (EKHW*)([4-03] default value will be 3), **or** tank without electrical booster heater (EKHTS)([4-03] default value will be 5).

Symptom 9: Temperature values displayed on the remote controller (user interface) are displayed in °F instead of °C

Possible causes	Corrective actions
You accidentally changed the setting to view the temperature values in °F by pushing the ▲ and ▼ buttons simultaneously.	To change the display back to °C, push ▲ and ▼ buttons simultaneously for 5 seconds. Execute same procedure to change back to the °F display. The default temperature display is in °C.

13.3. 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 all 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 "14. Technical specifications" on page 54). • Also refer to "7. Charging water" on page 20. • 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 "10.8. Setting the pump speed" on page 31). • 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. • If EKHWSU version of domestic hot water tank is installed, check if the setting of the additional thermostat in the tank switch box is correct (≥50°C). • Check that the pump fuse (FU2) and PCB fuse (FU1) are not blown.
8F	Outlet water temperature of 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 unit too high (>65°C)	• 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	Hydraulic PCB defective	Contact your local dealer.
A5	Too high (during heating operation) or too low (during cooling operation) refrigerant temperature (measured by R13T)	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" on page 10 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.
AC	Booster heater thermal protector is open (applies only to installations with a domestic hot water tank with built-in electrical booster heater (EKHW*))	Reset the thermal protector.
	Secondary thermal protector is open (applies only to units with a EKHWSU domestic hot water tank installed)	Reset the thermal protector.
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	Compressor PCB defective	Contact your local dealer.
E3	Abnormal high pressure	Check that the unit is operating within its operating range (refer to "14. Technical specifications" on page 54). Contact your local dealer.
E4	Actuation of low pressure sensor	Check that the unit is operating within its operating range (refer to "14. Technical specifications" on page 54). Contact your local dealer.
E5	Overload activation of compressor	Check that the unit is operating within its operating range (refer to "14. Technical specifications" on page 54). 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 booster 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 coil blockage)	Clean the 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 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.

Error code	Failure cause	Corrective action
J8	Liquid pipe 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.
U1	Power supply cables are connected in the reverse phase instead of the normal phase.	Connect the power supply cables in normal phase. Change any two of the three power supply cables (L1, L2, L3) to correct phase.
U2	Main circuit voltage failure	Contact your local dealer.
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	Contact your local dealer.

14. Technical specifications

14.1. General

	EDLQ	EDHQ	EBLQ	EBHQ
Nominal capacity				
• heating	Refer to the Technical Data			
• cooling	Refer to the Technical Data			
Dimensions H x W x D	1418 x 1435 x 382 mm			
Weight				
• machine weight	180 kg			
• operation weight	185 kg			
Connections				
• water inlet/outlet	G 5/4" FBSP(a)			
• water drain	hose nipple			
Expansion vessel				
• volume	10 l			
• maximum working pressure (MWP)	3 bar			
Pump				
• type	water cooled			
• no. of speed	2			
Internal water volume	5.5 l			
Pressure relief valve water circuit	3 bar			
Operation range - water side				
• heating	+15~+55°C		+15~+55°C	
• cooling	—		+5~+22°C	
Operation range - air side				
• heating	–15~+35°C(b)		–15~+35°C(b)	
• cooling	—		+10~+46°C	
• domestic hot water by heat pump	–15~+35°C(b)		–15~+35°C(b)	

(a) FBSP = Female British Standard Pipe
(b) EDL and EBL models can reach –20°C / EDL_W1 and EBL_W1 models can reach –25°C, but this is without capacity guarantee

14.2. Electrical specifications

	V3 models (1N~)	W1 models (3N~)
Standard unit (power supply via unit)		
• power supply	230 V 50 Hz 1P	400 V 50 Hz 3P
• nominal running current	—	5.8 A
Backup heater		
• power supply	See "Connection of the backup heater power supply" on page 24	
• maximum running current	See "Connection of the backup heater power supply" on page 24	

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